IMPACT ASSESSMENT REPORT

BAJAJ WATER CONSERVATION PROJECT (BWCP)

Implementing partner – Action for Agricultural Renewal in Maharashtra

Release Date: 31-12-2024

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

FY	Financial Year
CSR	Corporate Social Responsibility
SDGs	Sustainable Development Goals
VDC	Village Development Committee
SHG	Self-Help Group
UG	User Group
WUGs	Water User Groups
OECD	Organisation for Economic Cooperation & Development

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The Bajaj Water Conservation Project (BWCP), implemented by AFARM with support from Bajaj Auto Ltd., addressed critical water scarcity and groundwater depletion challenges in 28 villages of Aurangabad, Maharashtra. Launched in December 2017, the 5-year project mobilised the community to engage in sustainable water management practices, significantly improving the availability of water resources for drinking and agriculture. Extensive interventions including Nala deepening, installation of recharge shafts, and bunding activities, were implemented. The Comprehensive community-driven programs have ensured that 2,758 farming households have access to improved irrigation, with soil conservation measures covering over 63,000 hectares.

This report details the substantial impact achieved thus far, demonstrating how the project has elevated the socio-economic resilience of the communities involved. Through the implementation of water-use efficiency measures, the demonstration of climate-resilient farming practices, and the introduction of alternative livelihoods, the project has reduced vulnerability to seasonal droughts, improved agricultural outputs, and established a foundation for sustainable resource management.

PROJECT DETAILS

Implementation year
FY 2017 - FY 2022

Assessment year
FY 2024 - FY 2025

Implementing Partner
Action for Agricultural Renewal in Maharashtra

Project location
Aurangabad District, Maharashtra

Beneficiaries
6,051 Households from Gangapur Taluka

Budget
₹2,060 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

BASELINE SURVEY AND PROJECT STAFFING

Conducted a household survey covering 5,185 households and assessed 1,543 wells and 372 bore wells to monitor groundwater status.

Recruited civil engineers, watershed specialists, and community organisers who supported both technical and social mobilisation efforts across project villages.

CAPACITY BUILDING AND COMMUNITY ENGAGEMENT

41 awareness events were conducted involving 2,150 farmers in discussions on topics like water budgeting, groundwater management, and climate-resilient agriculture.

46 exposure visits were arranged for 1,402 community members from VDCs, SHGs, and UGs to observe successful water conservation and agricultural practices.

Delivered 56 training sessions to 1,791 SHG members, as well as 237 training sessions to 1,659 WUG members on water budgeting and groundwater management.

WATER RESOURCE DEVELOPMENT AND CONSERVATION

Completed 117 nala deepening and widening projects, 10 percolation tank deepening efforts, 38 new Cement Nala Bunds (CNBs), and 15 Gabion structures.

Planted 5,561 bamboo plants and sowed 6,600 kg of grass seeds on guide bunds to improve soil retention and prevent erosion.

Installed 72 recharge shafts to enhance groundwater recharge.

EFFICIENT WATER USE

Demonstrated efficient water use through micro-irrigation systems, with 11.1 hectares under drip irrigation and 0.4 hectares under sprinkler irrigation.

Established a water budget for all project villages.

AGRICULTURAL PRODUCTIVITY ENHANCEMENT

Conducted 238 demonstrations on sustainable agricultural practices across Kharif and Rabi crops.

Organised 107 Farmer Field School (FFS) sessions for farmers, promoting best practices for cultivating cotton, maize, and other seasonal crops.

Distributed 8,080 horticulture plants and set up 75 vermicompost units to diversify income sources and enhance soil quality.

LIVELIHOOD ENHANCEMENT

Delivered 33 training sessions to women farmers in 20 villages on goat rearing and dairy.

Established 4 dairy units and 1 goat-rearing unit through SHG initiatives.

INTERACTION WITH WOMEN FARMERS

Key Findings

WATER ACCESSIBILITY AND GROUNDWATER RECHARGE

87.2%

of the respondents experienced drinking water scarcity for only 1-month post-intervention, compared to over 6 months for 72.5% of the respondents before the project.

Dependency on water tankers reduced significantly, with 93.2% of the respondents no longer reliant on tankers, compared to 94.3% pre-intervention.

IMPROVED IRRIGATION AND AGRICULTURAL PRODUCTIVITY

53.2%

of the respondents reported assured irrigation for 10.0–15.0% of their cultivable land, showing significant improvement in water access for farming.

Kharif crop yields increased for 50.9% of the farmers by 15.0–19.0%, and 41.1% observed more than 20.0% increase in yields post-intervention.

COMMUNITY-LED WATER MANAGEMENT

86.4%

of the respondents adhered to water governance protocols established through the project.

84.2%

of the respondents contributed to water user charges, indicating strong participation in maintaining water resources.

Key Impacts

Key water resource structures completed include 117 nala deepening projects, 38 cement Nala Bunds (CNBs), 15 gabion structures, and 10 percolation tanks, significantly boosting water retention.

Groundwater recharge structures improved water availability, with 72 recharge shafts installed and protective irrigation provided for 876.5 hectares.

Drinking water security was achieved for 6,051 households across 28 villages, with 87.2% of the respondents experiencing drinking water scarcity for only 1 month annually, compared to over 6 months pre-intervention.

Dependency on water tankers reduced significantly, with 93.2% of the respondents no longer reliant on them.

Adoption of micro-irrigation systems rose from 6.8% to 98.1%, demonstrating complete uptake of water-efficient practices.

Protective irrigation expanded to 3,940 hectares, supporting sustainable agriculture, with 53.2% of the cultivable land receiving assured irrigation.

Kharif crop yields increased for 50.9% of the farmers by 15.0–19.0%, and 41.1% saw a yield increase of over 20.0%.

Soil moisture security was enhanced for 5,781 hectares of rainfed Kharif crops through soil conservation and water management measures.

Community participation strengthened, with 86.4% of the respondents adhering to water governance protocols.

SUSTAINABLE GROUNDWATER MANAGEMENT AND SOIL CONSERVATION

Soil moisture security improved for 5,781 hectares of rainfed crops through interventions like nala deepening, recharge shafts, and soil conservation measures.

77.4%

of the respondents reported repairs to Earthen Nala Bunds (ENBs), significantly reducing soil erosion and runoff.

03. OECD FRAMEWORK

RELEVANCE

BWCP is highly relevant to the water-scarce, drought-prone regions in Maharashtra's Aurangabad district, addressing urgent needs in water accessibility sustainable agriculture, and community livelihood resilience. The project's community-led approach to water and soil conservation, coupled with training in climate-resilient farming, aligns well with local priorities.

COHERENCE

The intervention is well aligned with SDG goals:

National Programs and Missions:

- Jal Jeevan Mission
- Jal Shakti Abhiyan
- Pradhan Mantri Krishi Sinchai Yojana (PMKSY)
- National Mission for Sustainable Agriculture (NMSA)
- Jalyukta Shivar Abhiyan

EFFECTIVENESS

The project effectively met its objectives, securing drinking water for 6,051 households, increasing irrigated farmland by 3,940 hectares, and empowering 1,300+ farmers with climate-resilient practices. The establishment of local Water User Groups and SHGs enhanced community ownership and contributed towards the adoption of widespread water governance practices.

EFFICIENCY

The support enabled the efficient execution of the BWCP by providing essential resources for infrastructure development and capacity-building. This backing facilitated the swift implementation of water resource structures like Nala deepening, Cement Nala Bunds, and percolation tanks.

IMPACT

BWCP significantly improved water security, agricultural productivity, and economic resilience. Groundwater recharge and protective irrigation led to stable crop production, while the formation of SHGs and vermicompost units provided sustainable income opportunities and strengthened community bonds.

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

SUSTAINABILITY

The project's sustainability is driven by active local involvement, with 108 WUGs and 191 SHGs established to continue managing resources.The training for WUG and VDC members, and community-led maintenance practices ensure long-term resilience and self-sufficiency.

CHAPTER 4
INTRODUCTION

FDG with Project Beneficiares

NEED OF THE PROGRAM

The Bajaj Water Conservation Project (BWCP), led by Action for Agricultural Renewal in Maharashtra (AFARM), aimed to address water scarcity, improve soil conservation, and strengthen agricultural resilience in 28 villages across Gangapur and Aurangabad blocks in Maharashtra.

This five-year initiative, spanning from December 2017 to September 2022, focused on securing drinking water, enhancing irrigation, and building local capacities for long-term water resource management. The primary beneficiaries included farmers and households in drought-prone areas affected by erratic rainfall and water scarcity. With substantial support from the Bajaj Group, the project implemented soil and water conservation measures, developed water resources, trained local committees, and promoted sustainable livelihood practices to uplift the socio-economic status of these communities.

OBJECTIVES OF THE PROGRAM

- To build capacities of water-centric Community-Based Organisations (CBOs) for sustainable water management.
- To improve water accessibility for irrigation, expanding cultivable land under protective irrigation.
- To secure drinking water supplies in the project villages through sustainable groundwater management.
- To enhance soil moisture for rainfed crops via soil conservation and runoff control.
- To mitigate the impacts of climate change by encouraging climate-resilient agricultural practices.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – AFARM

Action for Agricultural Renewal in Maharashtra (AFARM) is dedicated to promoting sustainable agricultural practices and enhancing the livelihoods of rural farmers in Maharashtra. Established in 1994, AFARM focuses on addressing the challenges faced by the agricultural sector.

The organisation works collaboratively with farmers, local communities, and government bodies to implement innovative agricultural strategies. AFARM also provides training and capacity-building programs to empower farmers with the knowledge and skills needed to adopt sustainable practices and improve their productivity.

WATER RESERVIOR

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited had appointed SoulAce to conduct a study on the work undertaken by AFARM and assess the impact of its CSR initiative in enhancing water conservation efforts in Aurangabad.

OBJECTIVES OF THE STUDY

To evaluate the effectiveness of the project in improving water resource management and irrigation accessibility for sustainable agricultural practices in the region.

To determine the broader impact on agricultural productivity and resilience by enhancing water availability and storage capacity for local farmers.

To assess the role of BWCP in advancing socio-economic outcomes for farming communities through improved water infrastructure and irrigation systems.

MIXED METHODS APPROACH

The impact assessment study adopted a comprehensive mixed-methods strategy, blending quantitative and qualitative approaches to offer a more intricate understanding of the project's impact. Quantitative methods involve structured surveys administered to a sample of beneficiaries selected through simple random sampling. Qualitative methods included in-depth interviews conducted with farmers, local community residents, SHG members, and the project staff. These methods aim to gather insights into the project's impact from diverse perspectives and to triangulate findings for robust assessment.

APPLICATION OF QUANTITATIVE TECHNIQUES

In the quantitative aspect, the study utilised structured surveys administered through stratified random sampling and purposive sampling. This approach ensures representative data collection and allows for statistical analysis to measure the project's effectiveness in providing financial support to students for continuing higher education without interruptions.

APPLICATION OF QUALITATIVE TECHNIQUES

The Qualitative methods include in-depth interviews conducted with key stakeholders. These interviews aim to gather detailed insights into operational improvements, challenges encountered, and overall perceptions of the essential project process.The Qualitative data enriches the study by providing contextual understanding and personal viewpoints crucial for evaluating the project's impact.

ENSURING TRIANGULATION

The quantitative research findings were cross-validated with the insights derived from the qualitative research. The report was structured to reflect this triangulation, thereby enhancing the reliability of the findings.

INTERACTION WITH PROJECT BENEFICIARY

DESIGN SNAPSHOT

Name of the project

Bajaj Water Conservation Project (BWCP)

Implementing agency

Action for Agricultural Renewal in Maharashtra

Research design used

Descriptive research design

Sampling technique

Stratified Random Sampling & Purposive Sampling

Sample size

265 Farmers

Qualitative method used

Semi-structured interviews, Open-ended interviews, and Beneficiary Testimonials

KEY STAKEHOLDERS

- Farmers
- Local Community
- Village Development Committees
- Self-Help Groups
- User Groups
- Local Government Authorities
- Bajaj Representatives

STUDY TOOLS

Questionnaires for primary beneficiaries:

- Structured questionnaires were developed.
- Project details for each of the focus areas were reviewed.
- Indicators were pre-defined before conducting the surveys.

Questionnaires for secondary beneficiaries and stakeholders :

A semi-structured questionnaire was developed for each type of sample of this group. Stakeholders were identified across the focus areas. Semi-structured questionnaires and interviews were conducted with farmers, SHG members and the project staff.

ETHICAL CONSIDERATIONS

The impact evaluation adhered to a strong ethical framework, ensuring responsible and ethical research practices. Participants' rights and well-being were prioritised at every stage of the study. Informed consent was obtained by clearly explaining the study's objectives, procedures, potential risks, and benefits, allowing participants to make fully informed decisions after addressing any questions. Confidentiality was strictly maintained, with data securely stored, accessible only to authorised personnel, and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of coercion, ensuring autonomy and respect for individual choice. Participants were consistently treated with respect, dignity, and fairness, with their well-being prioritised. Support or assistance was readily available whenever needed to ensure their comfort and safety throughout the research process.

CHAPTER 6
KEY STUDY FINDINGS AND IMPACTS

The chapter explores the partnership between Bajaj Auto Limited and AFARM, focusing on their joint efforts to improve water security.

GEOGRAPHICAL COVERAGE

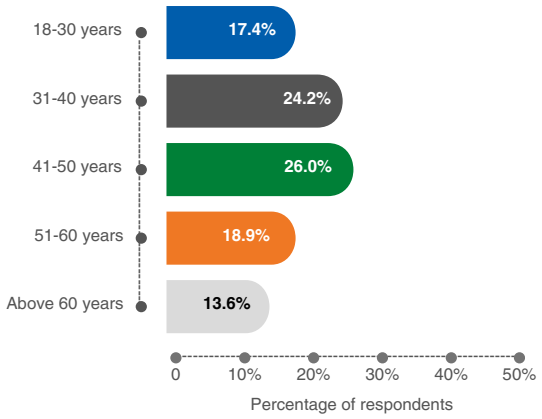
Maharashtra

OUTREACH AND INCLUSIVITY

Small scale farmers, Women SHG members

DEMOGRAPHY OF BENEFICIARY POPULATION

CHART 1: AGE GROUP DISTRIBUTION



In chart 1, 26.0% of respondents are predominantly in the 41-50 years age group, closely followed by 24.2% in the 31-40 years range. The 18-30 years age group comprises 17.4% of participants, while 18.9% are in the 51-60 years category. Lastly, 13.6% of respondents are above 60 years of age.

CHART 2: GENDER-WISE DISTRIBUTION OF RESPONDENTS

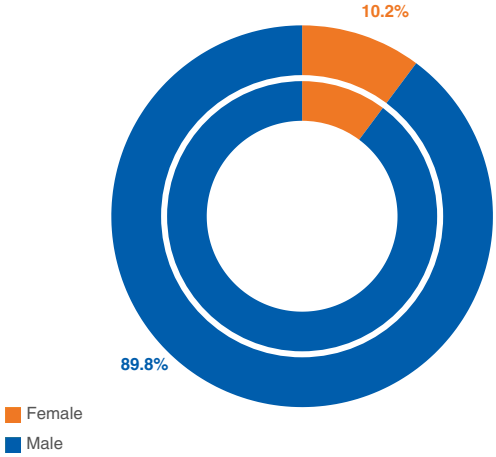
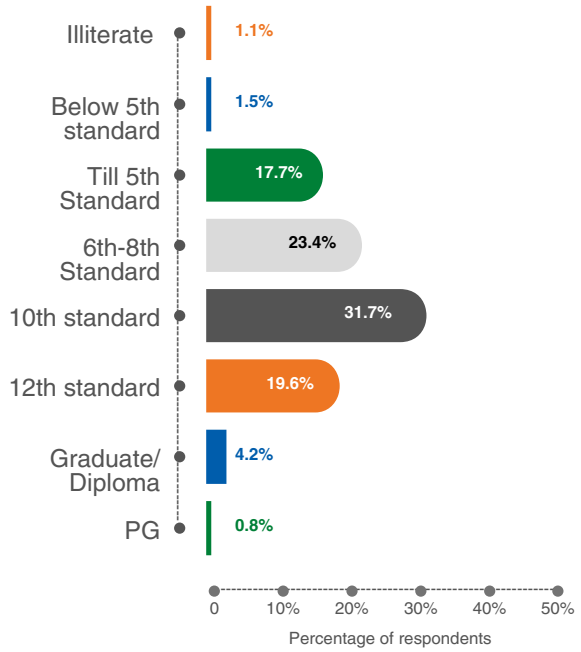


Chart 2 illustrates that a significant majority, 89.8%, of the respondents are male, whereas females make up only 10.2% of the total.

INTERACTION WITH WATER USER COMMITTEE

CHART 3: STATUS OF EDUCATION



In chart 3, it shows that 31.7% of the respondents have completed their 10th standard, making it the most common level of education. This is followed by 23.4% who have education up to the 6th-8th standard and 19.6% who have completed their 12th standard. Additionally, 17.7% have education only up to the 5th standard, while 1.1% are illiterate.

The proportion of respondents with higher education qualifications, including graduates and post-graduates, is relatively low at 5%.

CHART 4: AREA OF LAND OWNED

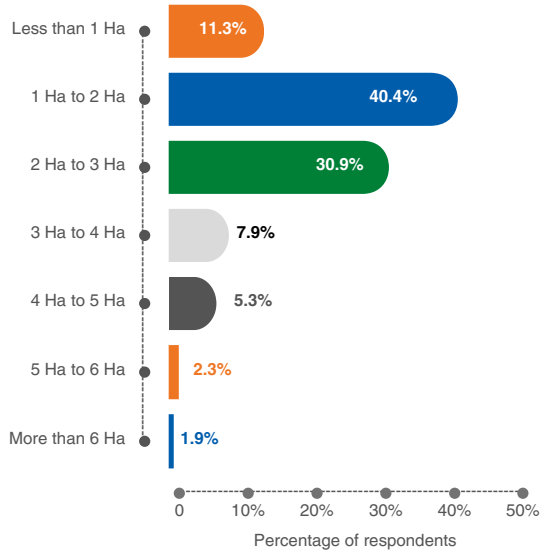


Chart 4 reveals that 40.4% of respondents own between 1-2 hectares of land, indicating a significant portion of farmers operate within this range. Additionally, 30.9% of respondents own 2-3 hectares, while 11.3% own less than 1 hectare.

Smaller percentages indicate land ownership in the ranges of 3-4 hectares (7.9%), 4-5 hectares (5.3%), 5-6 hectares (2.3%), and more than 6 hectares (1.9%).

CHART 5: ANNUAL FAMILY INCOME

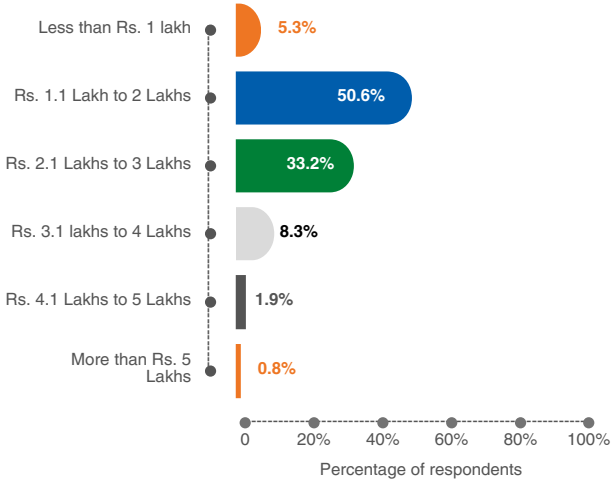
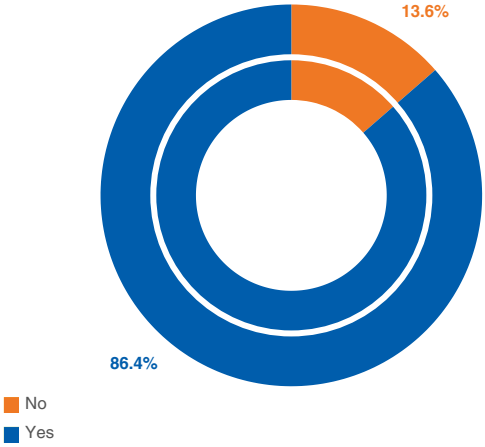


Chart 5 shows that 50.6% of respondents earn ₹1.1–₹2 lakhs annually, followed by 33.2% earning ₹2.1–₹3 lakhs, with smaller percentages in other income brackets.

INTERACTION WITH VERMI COMPOSTING FARMER

BUILT CAPACITIES OF WATER-CENTRIC COMMUNITY-BASED ORGANIZATIONS (CBOS) FOR SUSTAINABLE WATER MANAGEMENT

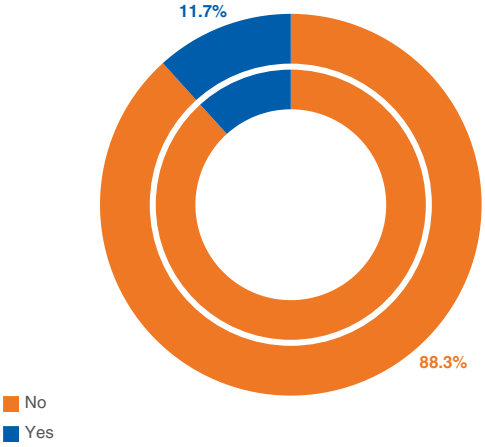
CHART 6: ADHERENCE TO WATER GOVERNANCE PROTOCOLS



In Chart 6, 86.4% of respondents reported following the water governance protocols established by community institutions. This adherence can be attributed to the training and awareness programs facilitated by the project. Meanwhile, 13.6% indicated they did not follow these protocols, suggesting gaps in engagement or understanding.

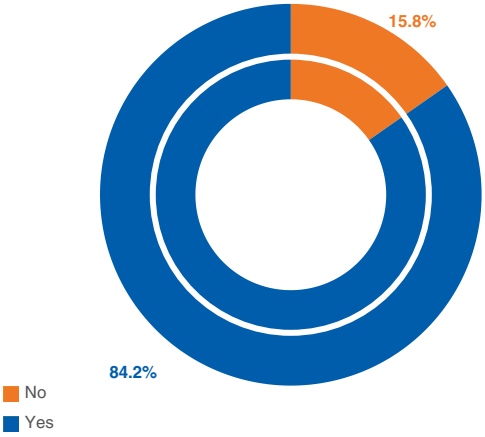
> Being part of our village's water management group has been very beneficial. Following these protocols has taught us how much we can achieve by organising and tracking our water use, making it easier to plan for dry seasons. Now, the whole community respects the way we manage water, and it is helping us avoid shortages.
>
> **— Bhurabai Golwal, Falutabad**

CHART 7: MEMBERSHIP IN WATER USER GROUPS (WUG)



In Chart 7, only 11.7% of respondents confirmed they are members of a Water User Group. Meanwhile, 88.3% of respondents indicated they were not members, which indicates a lack of representation of community residents in certain areas.

CHART 8: PAYMENT OF WATER USER CHARGES



In Chart 8, 84.2% of respondents reported paying water user charges for the operation and maintenance of community water sources. This indicates a strong recognition of the importance of sustaining these resources. However, 15.8% indicated they do not pay these charges, suggesting potential issues with affordability or awareness of the charges.

“Through the training, I have joined local water user groups and have learned the importance of community-based water management. We now follow governance protocols strictly, and I actively contribute in maintaining our water sources. It feels empowering to be part of a group that ensures our water resources are managed and sustained for everyone’s benefit.”

— Somnath Gangadhar Chopade, SHG Member, Jambhala

IMPROVED WATER ACCESSIBILITY FOR IRRIGATION

TABLE 1: SOURCES OF WATER FOR IRRIGATION

Source of Water for Irrigation	No. of Respondents	% of Respondents
Ground Water (Wells/Borewells)	265	100%

This is a table; 100% of respondents indicated they used groundwater as the primary source of irrigation. This preference is attributed to the increased availability and reliability of groundwater post-intervention.

> The Bajaj Water Conservation Project, implemented with AFARM, has significantly transformed Rajangaon Pol. The Nala deepening initiative near my well, located just 100 meters from the intervention site, has greatly enhanced water availability, benefiting both agriculture and access to drinking water. Previously barren farmland has now been cultivated, thanks to improved irrigation systems introduced by the project. Villagers have diversified their income sources through initiatives like SHGs, making them more self-reliant and financially stable. This initiative has not only uplifted individual livelihoods but also strengthened community resilience. I hope such impactful projects continue to support villages like ours, fostering further independence and prosperity.
>
> **Sachin Babasaheb Kurahde, VDC & GP Member, Rajangaon Pol**

CHART 10: THE AREA RECEIVED PROTECTIVE IRRIGATION DURING KHARIF SEASON

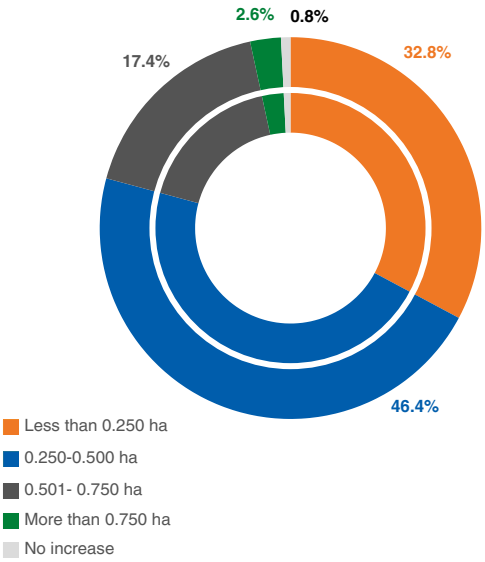


Chart 10 illustrates the distribution of respondents based on the area of land that received protective irrigation due to improved water storage and groundwater recharge following the CSR intervention.

The majority (46.4%) of respondents irrigated 0.250–0.500 ha of land, followed by 32.8% with less than 0.250 ha and 17.4% with 0.501–0.750 ha. Only 2.6% irrigated more than 0.750 ha, highlighting limited access to protective irrigation on larger plots, while 0.8% reported no increase in irrigation.

> With access to regular irrigation during the Kharif season, my two acres feel more productive than ever. It has truly changed things for us; I can plant with confidence, knowing there'll be enough water for my maize crop to thrive. The extra income is a relief, too.
>
> — Samadhan Palhal, Asegoan

CHART 11: PERCENTAGE OF CULTIVABLE LAND WITH ASSURED IRRIGATION

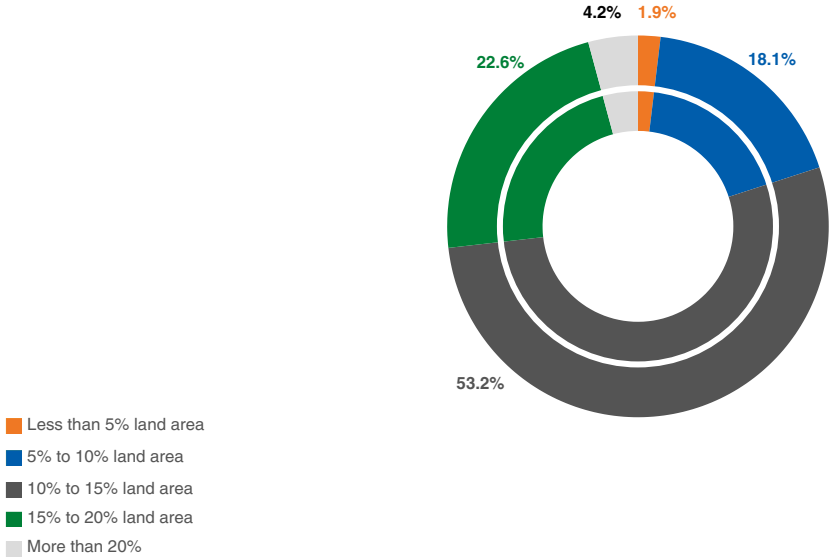


Chart 11 shows the percentage of cultivable land area that received assured irrigation as a result of the project.

Only 1.9% of respondents reported less than 5% of their cultivable land under assured irrigation, while 18.1% had 5% to 10% irrigated. The majority (53.2%) reported that 10% to 15% of their land received assured irrigation, reflecting significant improvements due to enhanced facilities. Additionally, 22.6% reported 15% to 20% irrigated land, and 4.2% had more than 20% of their land under assured irrigation.

> Before the training, irrigation was a major challenge, limiting how much we could cultivate. But with new water management skills, we have expanded our farm area under protective irrigation, especially during the Kharif season. This has not only increased crop yield but has made farming more reliable.
>
> **— Kavita Sanjay Sonawane, SHG Member, Fatulabad**

INTERACTION WITH WATER USER COMMITTEE

SUSTAINABLE GROUNDWATER MANAGEMENT

CHART 12: MONTHS OF DRINKING WATER SCARCITY BEFORE THE INTERVENTION

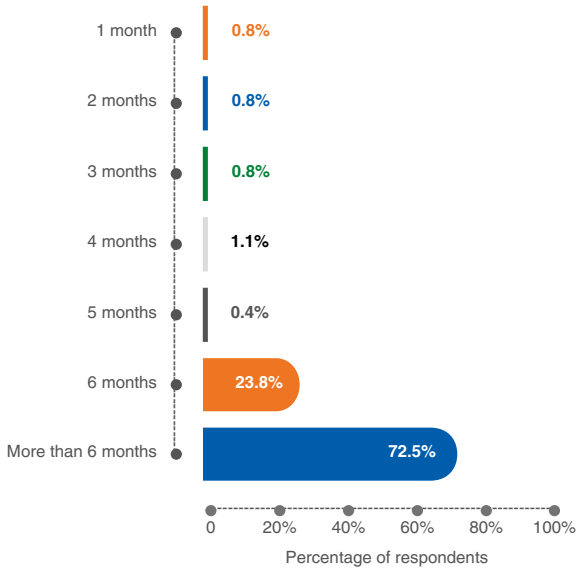
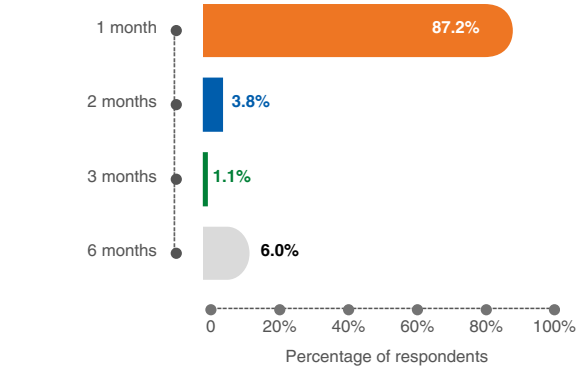


Chart 12 depicts, 72.5% of respondents experienced drinking water scarcity for more than 6 months before the intervention.

Meanwhile, 23.8% reported scarcity for 6 months, 0.4% for 5 months, 1.1% for 4 months and 0.8% of the respondents experienced scarcity for 1-3 months each, highlighting varying degrees of vulnerability.

CHART 13: MONTHS OF DRINKING WATER SCARCITY AFTER THE INTERVENTION

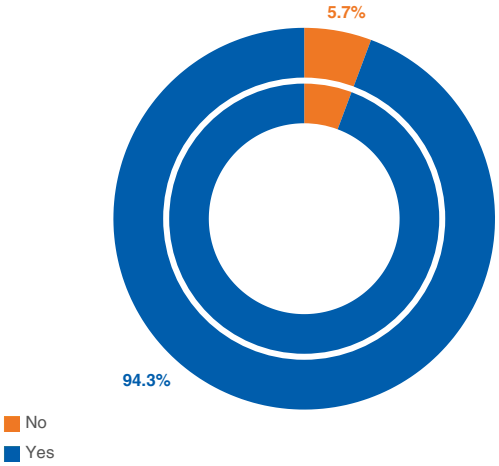


In Chart 13, 87.2% of respondents reported experiencing drinking water scarcity for 1 month after the intervention. This positive change can be attributed to improved groundwater management practices.

Meanwhile, 6% noted scarcity for more than 6 months, indicating persistent challenges.

> Before the project, water scarcity was an unavoidable issue, and we faced high costs and frequent dependence on water tankers. Through the Village Development Committee, we have implemented systems to monitor groundwater levels and regulate usage effectively. These efforts have greatly improved our water quality and supply, creating a sense of relief and stability in Eklahra.
>
> **— Dadasaheb Nivrutti Gangurde, Village Development Committee Member, Eklahara**

CHART 14: DEPENDENCE ON WATER TANKERS BEFORE THE INTERVENTION



As shown in chart 14, 94.3% of respondents relied on water tankers for drinking water before the intervention, highlighting a significant gap in local supply, while only 5.7% had minimal reliance. Currently, 93.2% of respondents are no longer dependent on water tankers due to the water resource development activities in the region.

> Before, water scarcity was a big issue, and we'd have to rely on tankers for drinking water for a few months each year. Since we began managing groundwater better, those tanker visits are nearly gone, and we're saving money and worry.
>
> **— Shaikh Nasir Shaikh Ismail, Turkabad**

"The committee has put in great efforts to manage our groundwater, setting up groups to oversee usage and ensuring a steady supply. This has helped us reduce our reliance on other sources and has brought a stable and affordable water supply to our village.

— Rahul Dnyaneshwar Kurhade, VDC Committee Member, Ranjangoan Pol"

ENHANCED SOIL MOISTURE VIA SOIL CONSERVATION AND RUNOFF CONTROL

CHART 15: TYPES OF WATER RESOURCE DEVELOPMENT ACTIVITIES

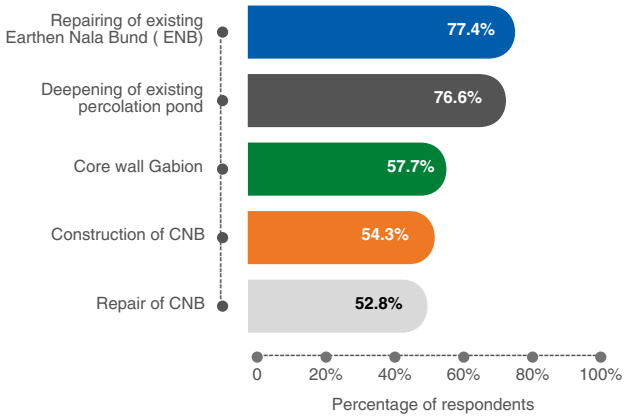


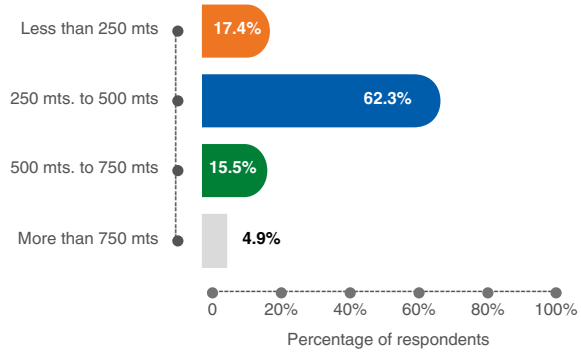
Chart 15 reveals the respondents' collective awareness of the importance of sustainable water resource management in the region.

The majority of the respondents (77.4%) reported the repair of Earthen Nala Bunds (ENBs), preventing soil erosion and managing surface runoff, that improved agricultural productivity. 76.6% noted the deepening of percolation ponds, enhancing groundwater recharge and water storage capacity. 57.7% mentioned the construction of core wall gabions, while 54.3% highlighted the construction of Check Naka Bunds (CNB), crucial for crop health. Additionally, 52.8% indicated that repairs to existing CNBs were carried out to maintain effective water management systems.

> "We were shown how to create water retention pits on our farms, which has helped keep the soil moist for longer periods. Even with less rainfall, the crops do not suffer as they used to. It's simple, but these pits have made a big difference to my maise yields."
>
> **—Asaram Keshav Gangurde, Eklahara**

> "The dairy and goat rearing training has not only been beneficial for income but has also brought awareness of soil conservation and runoff control techniques. These changes have made a noticeable difference in our crops, helping retain soil moisture even in dry spells, which ensures better growth and yield."
>
> **— Sonu Dinkar Salunke, SHG Member, Sindhi Sirsgaon**

CHART 16: DISTANCE OF FARMLAND FROM NEAREST WATERSHED STRUCTURES



As Chart 16 shows, 62.3% of respondents reported their farmland lies within 250 to 500 meters of a watershed structure, while 17.4% stated it is less than 250 meters away, ensuring close to moderate water access, vital for efficient farming and maintaining crop health. 15.5% mentioned being 500 to 750 meters away, and 4.9% reported being more than 750 meters away, facing the greatest challenges in water access, especially during droughts or low rainfall.

CHART 17: HEIGHT OF WATER LEVEL IN SUMMER SEASON

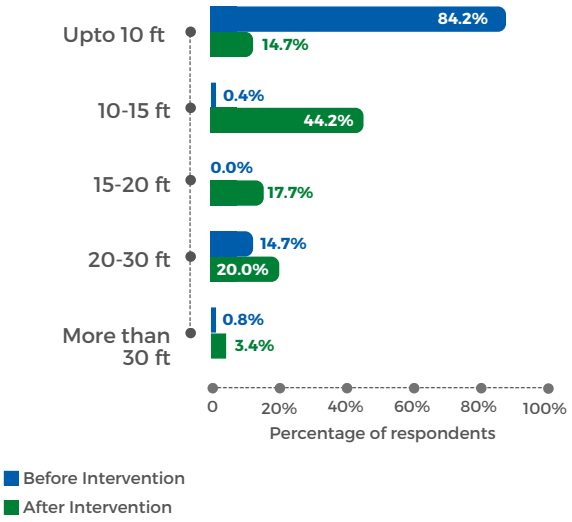


Chart 17 reveals the findings of well water levels in the summer season, highlighting significant shifts before and after the intervention. Overall, the summer analysis reflects a transition from shallow to deeper water levels, underscoring the need for sustainable resource management: Before the intervention, 84.2% reported shallow water levels up to 10 ft, dropping to 14.7% afterwards (post-intervention). Access to water between 10-15 ft increased from 0.4% to 44.2%, and 17.7% accessed water from 15-20 ft, a range previously unreported. Water access between 20-30 ft rose from 14.7% to 20.0%, and access beyond 30 ft increased from 0.8% to 3.4%, showing a shift toward deeper extraction.

CHART 18: HEIGHT OF WATER LEVEL IN RAINY SEASON

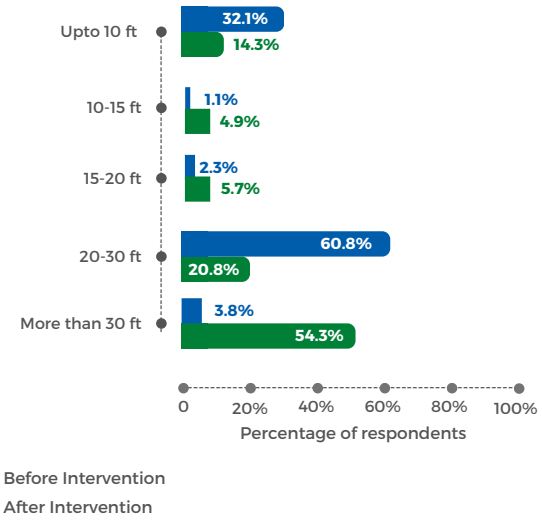


Chart 18 reveals the findings of well water levels during the rainy season, presenting a contrasting picture, highlighting changes before and after the intervention, with a concerning shift towards deep.

- **Upto 10 ft:** Dropped from 32.1% to 14.3%, suggesting ineffective retention of shallow water despite rain.
- **10-15 ft:** Increased slightly from 1.1% to 4.9%, indicating modest improvement in deeper access.
- **15-20 ft:** Rose from 2.3% to 5.7%, reflecting better access to deeper water layers.
- **20-30 ft:** Fell dramatically from 60.8% to 20.8%, raising concerns about surface water retention.
- **More than 30 ft:** Surged from 3.8% to 54.3%, indicating a heavy reliance on deep water sources.

INTERACTION WITH WATER USERS COMMITTEE

ENCOURAGING CLIMATE-RESILIENT AGRICULTURAL PRACTICES

FINDINGS FROM FOCUSED GROUP DISCUSSION CONDUCTED WITH FARMERS OF VILLAGE: SINDHI SHIRASGAON

Sindhi Shirasgaon, located in Gangapur Taluka, Maharashtra, is an agricultural community historically plagued by water scarcity and poor irrigation infrastructure. The Bajaj Water Conservation Project (BWCP) addressed these issues by implementing water resource development, crop diversification, and capacity-building initiatives.

This FGD with farmers from Sindhi Shirasgaon highlighted three primary themes: (1) Infrastructure for Water Conservation, (2) Improved Farming Techniques, and (3) Strengthened Community Structures.

INFRASTRUCTURE FOR WATER CONSERVATION

Nala widening and deepening were key interventions discussed by participants. Farmers shared how the excavated soil was repurposed to level their fields, which improved farming conditions. The project also introduced new reservoir structures to store water for longer periods, ensuring reliable access even during dry spells.

IMPROVED FARMING TECHNIQUES

Through training in grass seeding, fruit crops, and skill development, farmers adopted techniques like crop rotation and low-water irrigation methods such as drip systems. The focus on sustainable practices helped optimise water use and increase yield. Several participants reported transitioning from traditional crops to high-value crops like vegetables and fruits, which significantly enhanced household incomes.

STRENGTHENED COMMUNITY STRUCTURES

The project focused on training for VDCs, WUGs, and SHGs, empowering these groups to manage resources and solve problems. Farmers credited the WUGs for ensuring equitable water distribution and promoting collective action. SHGs, particularly those led by women, have become a cornerstone of community development, fostering financial independence and collaborative decision-making.

FGD WITH SHG MEMBERS

CHART 19: AREAS OF CLIMATE-RESILIENT CROPPING KNOWLEDGE

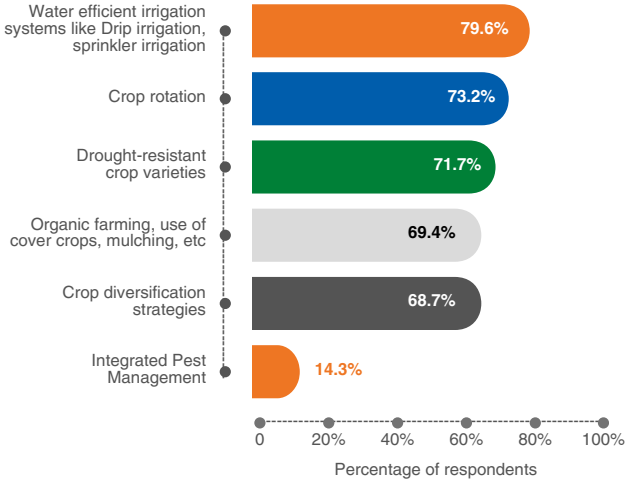


Chart 19 reveals the findings of the adoption of new climate-resilient cropping practices by farmers.

The majority of the farmers/respondents (79.6%) gained knowledge of water-efficient irrigation systems, 73.2% learned about crop rotation for soil health, and 71.7% gained insights on drought-resistant crops. 69.4% were educated on organic farming techniques like cover crops and mulching, while 68.7% learned about crop diversification to reduce climate-related risks. However, only 14.3% received training in Integrated Pest Management (IPM), indicating limited exposure to pest management techniques.

> "The demonstrations were helpful for us, especially with crop rotation and pest management techniques. They made us aware of how working together and sharing methods improves everyone's yield, not just our own. Now, our village has more discussions around sustainable practices, and there is a stronger sense of society."
>
> **— Vinayak Sonawane, Sindhi Sirsgoan**

> "This training opened up new possibilities beyond traditional farming. Now, in addition to crops, dairy farming is part of our income and helps manage risk better. Having multiple sources of income makes me feel prepared for the ups and downs in agriculture."
>
> **— Somnath Gangadhar Chopade, SHG Member, Jambhala**

CHART 20: PRACTICES OF CLIMATE-RESILIENT CROPPING ADOPTED

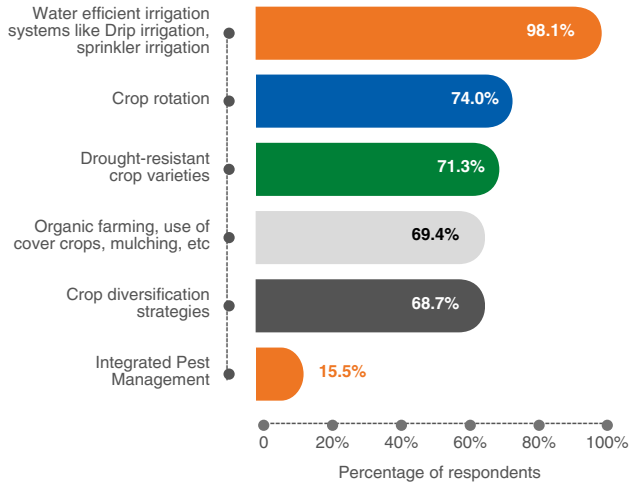


Chart 20 reveals the findings of the cropping practices adopted by farmers after training:

The majority of the farmers/respondents (98.1%) adopted water-efficient irrigation systems like drip and sprinkler, while 74.0% implemented crop rotation, closely matching the knowledge gained. 71.3% adopted drought-resistant crop varieties, reflecting direct knowledge transfer, and 69.4% adopted organic farming techniques, mirroring the training. 68.7% implemented crop diversification strategies for climate resilience, consistent with training. Adoption of Integrated Pest Management (IPM) was 15.5%, slightly higher than the knowledge gained, suggesting additional learning sources or interest in sustainable pest control.

> Through the training, I learned how to rotate crops and keep the soil healthy, which has helped during dry spells. These methods keep the land strong and ready, even in tough conditions. It has been good for the environment and my yield.
>
> **— Bhurabai Golwal, Falutabad**

> With practices like contour farming and rainwater harvesting, we've seen our soil retain more moisture, even in dry periods. Our maise crop yield has improved as a result, and it feels rewarding to see the benefits of these conservation efforts.
>
> **— Dadasaheb Nivrutti Gangurde, Village Development Committee Member, Eklahra**

CHART 21: PRACTICING MICRO IRRIGATION

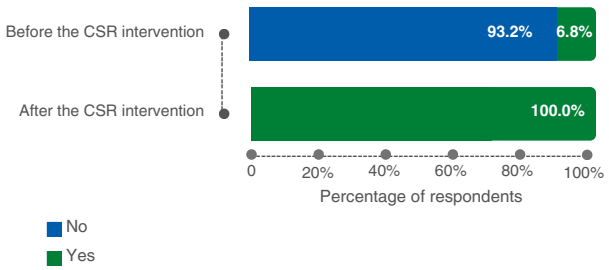
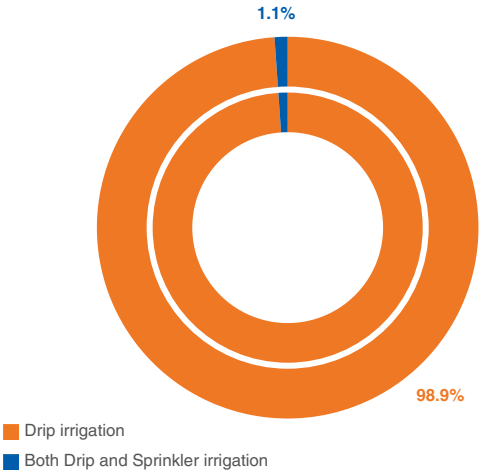


Chart 21 shows that before the CSR Intervention, only 6.8% of the population practised micro-irrigation. Post-intervention, 100% of the respondents adopted micro-irrigation. This significant increase demonstrates that the community has adopted it complete adoption of micro-irrigation practices, transforming water management practices in farming.

> Since learning new irrigation techniques, managing water has become more efficient, and I have been able to protect more of my land during dry spells. With this knowledge, we are finally seeing the benefits of each drop of water on the farm, and it has made a difference for everyone.
>
> **— Narayan Dhane, Jambhala**

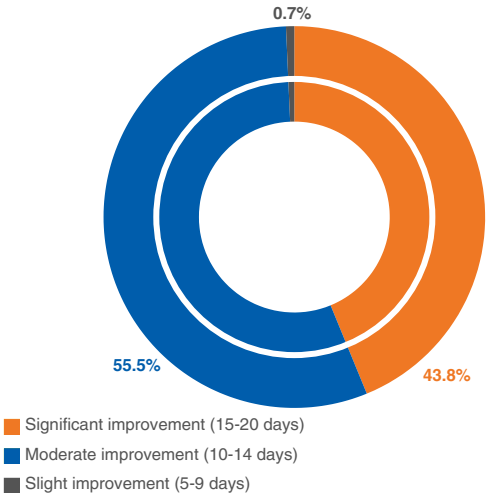
CHART 22: TYPES OF MICRO IRRIGATION METHODS ADOPTED



In Chart 22, 98.9% of respondents reported using drip irrigation systems. This preference demonstrates a shift toward efficient water use. Meanwhile, 1.1% reported using sprinkler systems.

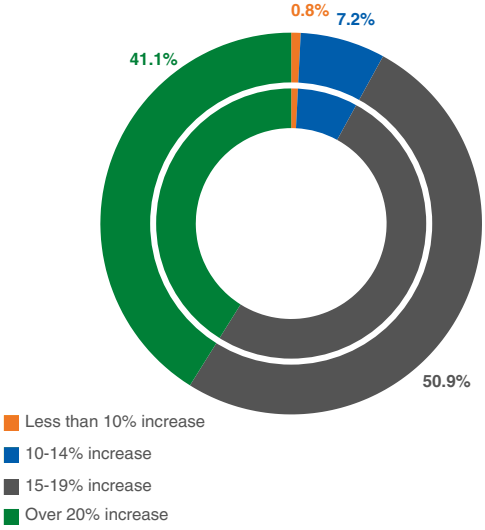
PROJECT BRANDING

CHART 23: LEVEL OF IMPROVEMENT IN KHARIF CROP RESILIENCE



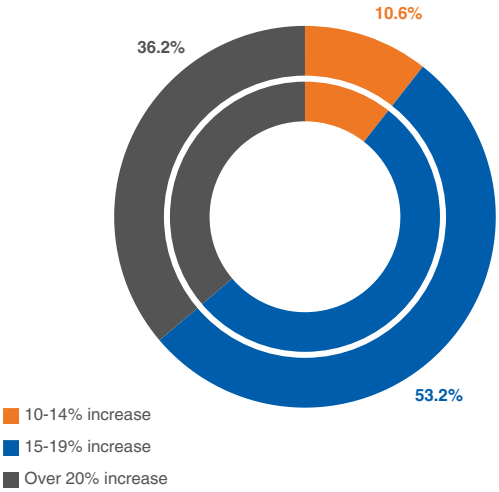
In Chart 23, 43.8% of respondents observed significant improvement in the resilience of their Kharif crops during dry spells. This positive outcome can be attributed to the adoption of climate-resilient practices. Meanwhile, 55.5% noted moderate improvement, suggesting further support may be needed. Lastly, 0.7% reported slight improvement, indicating persistent vulnerabilities.

CHART 24: PERCENTAGE INCREASE IN KHARIF CROP YIELD



In Chart 24, 50.9% of respondents noted a 15-19% increase in Kharif crop yields after the intervention. 41.1% of respondents noted an over 20% increase. 7.2% of respondents noted a 10-14% increase, and 0.8% of the respondents noted less than a 10% increase.

CHART 25: PERCENTAGE INCREASE IN RABI CROP YIELD



In Chart 25, 53.2% of respondents noted a 15-19% increase in Rabi crop yields after the intervention. 36.2% of respondents noted an over 20% increase and 10-14% of the respondents noted a 10-14% increase.

INTERACTION WITH WUG MEMBER

CASE STUDY
NITIN'S PROGRESS: TRANSFORMING SINDHI SHIRASGAON

For Nitin Gulabrao Sonawane, a 45-year-old farmer from Sindhi Shirasgaon, farming once felt like a constant struggle. Erratic rainfall and lack of proper soil management made sustaining a livelihood challenging. However, with the introduction of the Bajaj Water Conservation Project (BWCP), Nitin's farming practices took a positive turn. He gained access to Stylo Hamata seeds and training in vermicomposting, which he adopted enthusiastically to improve his farm's productivity.

"The training and support provided by BWCP not only made my land fertile but also allowed me to earn more by switching to finance crops."

Nitin shares. Initially, the community hesitated to support the project, but with the persistence of committee members, the transformation became evident. The revamped irrigation system and strengthened SHGs provided additional support to local farmers, making their practices more sustainable.
Nitin highlights the need for continued efforts to maintain water reservoirs and ensure cleanliness.

"With ongoing support, we can sustain these improvements and keep our village progressing."

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

Farmers

- Gained access to assured irrigation for cultivable land due to Nala deepening, recharge shafts, and protective irrigation measures, reducing dependency on erratic rainfall.
- Achieved significant increases in crop yields, with 50.9% of the farmers reporting a 15–19% rise in Kharif yields and 41.1% observing over 20% improvements post-intervention.
- Adopted climate-resilient agricultural practices, including crop rotation, organic farming, and micro-irrigation, resulting in more sustainable farming and higher productivity.
- Enhanced financial stability through alternative income sources such as dairy and goat rearing, initiated through training and support for SHGs.

Women SHG Members

- Trained in income-generating activities such as vermicomposting and livestock management, empowering them to contribute actively to household and community development.
- Played pivotal roles in water governance and resource management through SHGs and WUGs, strengthening their leadership skills and financial independence.

COMMUNITY LEVEL

- Water security improved across 28 villages.
- Community-led governance practices were established through 108 WUGs and 191 SHGs, promoting equitable distribution and maintenance of water resources.
- Increased participation in capacity-building initiatives, with over 1,400 community members attending exposure visits and training.

DISTRICT LEVEL

- Improved agricultural productivity and water availability boosted the district's economic stability.
- Rehabilitation of water resources, including 117 Nala deepening projects, 38 Cement Nala Bunds (CNBs), and 72 recharge shafts, strengthened the district's ability to withstand droughts and manage water resources sustainably.
- Strengthened collaboration among local governance structures, such as gram panchayats, SHGs, and WUGs, to implement and maintain water governance systems effectively.

STATE LEVEL

- Enhanced the state’s agricultural sustainability by improving irrigation across 3,940 hectares, reducing dependence on seasonal rainfall.
- Advanced soil conservation efforts across 5,781 hectares, mitigating soil erosion and increasing the productivity of rainfed crops, contributing to Maharashtra’s efforts toward sustainable land use and climate adaptation.
- By demonstrating efficient water management practices, such as micro-irrigation adoption rising from 6.8% to 100%, the project set a benchmark for state-wide replication in other water-stressed regions.

NATIONAL LEVEL

- Aligned with national goals under programs such as the Jal Shakti Abhiyan and Pradhan Mantri Krishi Sinchai Yojana (PMKSY).
- Reduced dependence on water tankers for 93.2% of the households, demonstrating a tangible improvement in rural water infrastructure and contributing to national water security goals.
- Promoted rural self-reliance by creating and empowering 191 SHGs and 108 WUGs, addressing national goals of fostering local governance and inclusive development.

INTERACTION WITH WATER USER COMMITTEE

CHAPTER 8
HYDROLOGICAL ASSESSMENT

OBJECTIVES OF THE ASSESSMENT

Change in surface water holding capacity and reduction in run-off.

Change/improvement of groundwater table/recharge.

Change in land use pattern, agricultural productivity, and soil moisture conditions.

PROJECT LOCATIONS

The project was implemented in the Gangapur taluka of Aurangabad district. The measures that were implemented as a part of the water conservation efforts can broadly be categorised into construction and repair of Water Harvesting Structures (WHS), measures for Soil Moisture Conditions (SMC) improvement, and promoting water use efficiency. The details of the same are as below:

TABLE 1: DETAILS OF THE INTERVENTIONS

District	Aurangabad		Block	Gangapur	Area of Watershed		243.36 Sq. Km.	
	Cement Nala Bund	KT Weir	Nala Deepening & Widening	Core Wall Gabion	Percolation Tank	Farm Pond	Earthen Nala Bund	Recharge Shaft
Nos.	41 + 13	1	83.47	15	13	2	4	72
Unit	1381380	30560	8969630	411610	7800	1112840	6720	947432

The maps below give the location of the intervention watershed in the Aurangabad district of Maharashtra and all the available locations of the various interventions across the intervention watersheds as a part of this project.

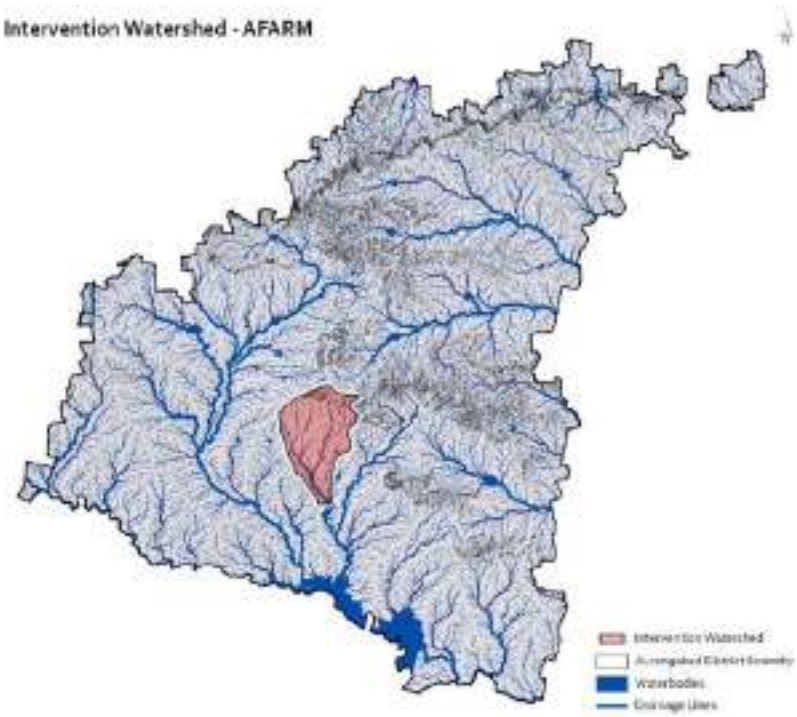


FIGURE 1: PROJECT LOCATIONS IN AURANGABAD

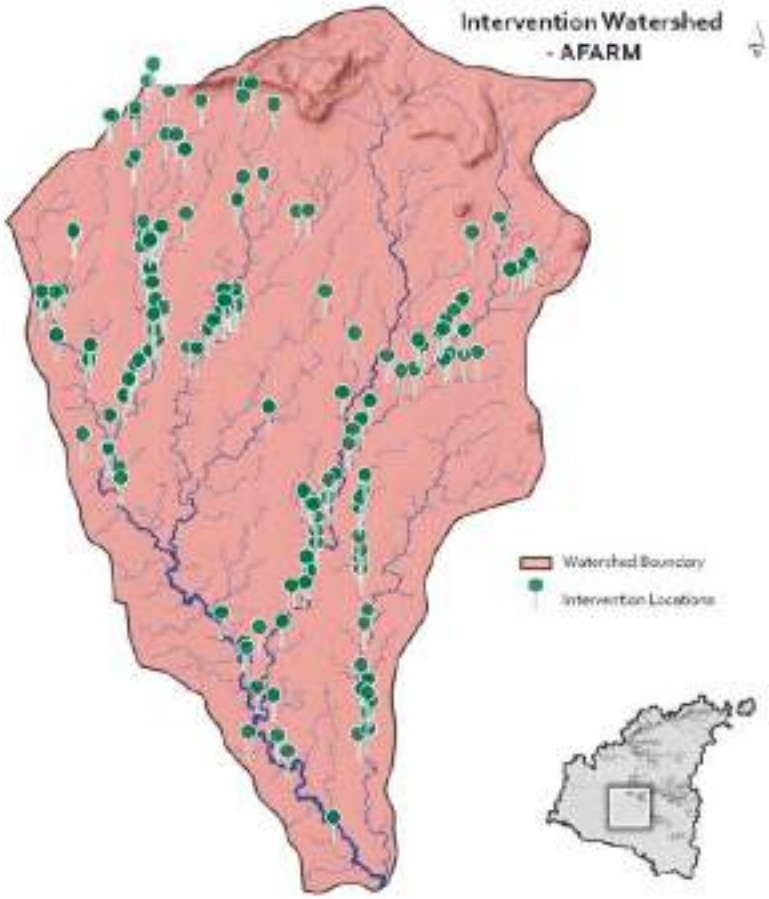


FIGURE 2: LOCATION OF PROJECT INTERVENTIONS

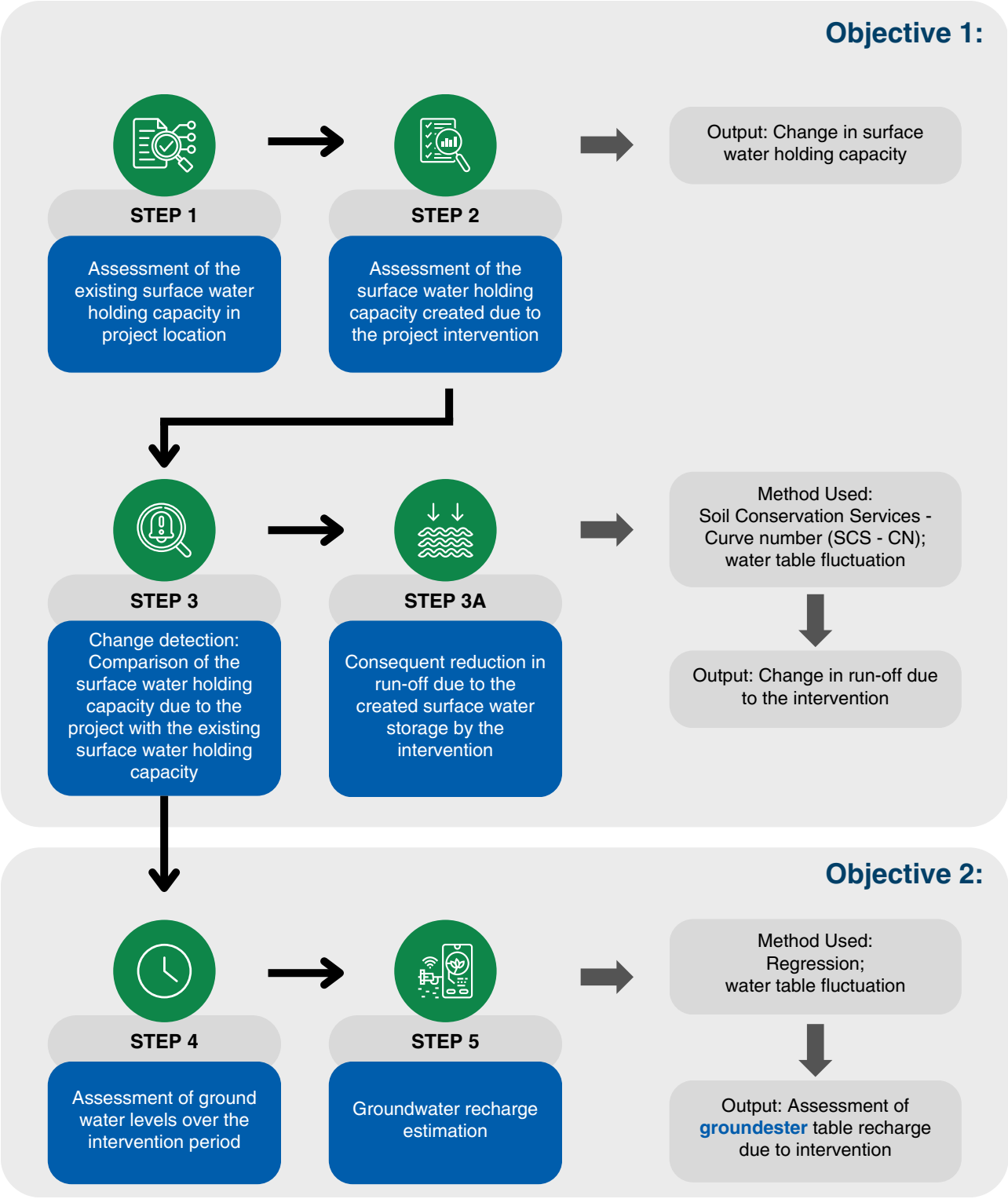
The detailed location of all the interventions covered as a part of the evaluations are provided in Annexure 1. The additional parameters that were considered are geology, hydrogeology, and soil types and the information about the same are provided in Annexure 2.

While some of the assessments, such as the run-off estimation and the contribution of the interventions to the ground water levels, were done only considering the intervention area, some assessments, such as the rainfall and the ground water depth assessments, had to be done considering a larger area such as the entire block or the district due to the constraints faced with data availability. Care was taken to ensure that the results were represented correctly in this condition to varying assessment units.[1]

[1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

ASSESSMENT APPROACH

The assessment approach consists of various steps for each objective, as shown below:



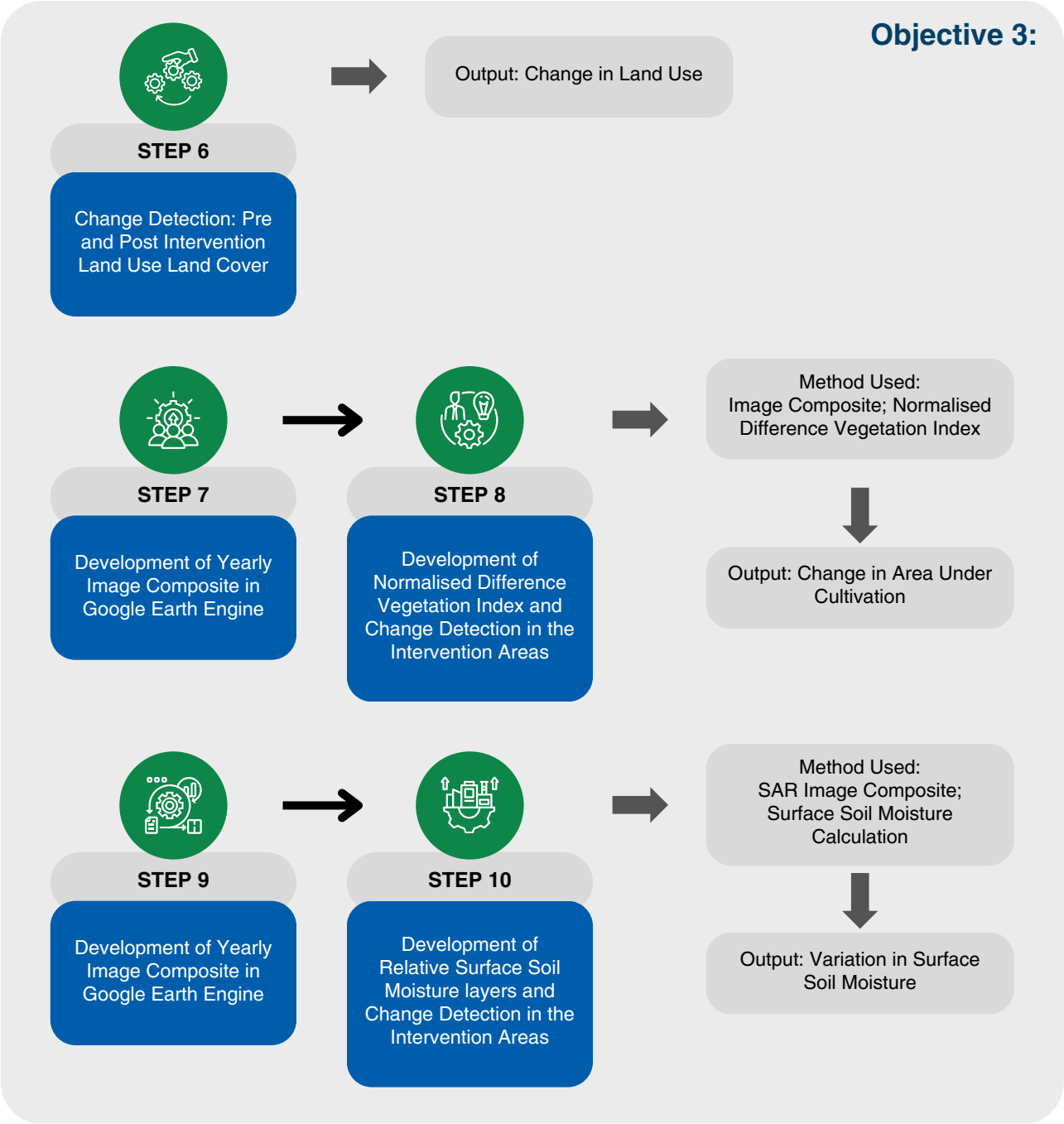


FIGURE 3: APPROACH OF THE ASSESSMENT

DATA COLLECTION

The following datasets have been collected from the field to facilitate the objectives of the study:

- All the intervention locations that were available (Annexure 1)
- Photos from the field survey (Annexure 6)

In addition to the above datasets, additional data was collected from various sources to fill in the data gaps that were present in the conduct of the assessment. These are as follows:

- Depth to water level from the NGO partners and the Central Ground Water Board (CGWB) (Annexure 3)
- Rainfall data from the Indian Meteorological Department (IMD) (Annexure 4)

Other datasets that were used in the assessment are as follows:

- Soil types from the National Remote Sensing Centre[2] (Annexure 2)
- Aquifer system from Central Ground Water Board (CGWB) (provided in Annexure 2)
- Specific Yield from Central Ground Water Board (CGWB) (provided in Annexure 2)

- Land Use Land Cover change between 2017 – 2023 from ESRI Living Atlas[3]
- Global Hydrologic Soil Groups for Run-off Estimation[4] (Annexure 2)

RESULTS

The results of the assessment to identify the impacts of the interventions on water conservation are presented in the below sections. It includes an assessment of rainfall and water level trends, an estimation of recharge due to rainfall, an assessment of surface water holding capacity and the associated run-off reduction and the estimation of recharge due to the interventions, the change in land use land cover, the changes in vegetation levels, and the changes in soil moisture conditions over the course of the intervention period.

Analysis of Rainfall Trends

Overall, while the values of rainfall have shown a slight positive trend during the intervention period with significant peaks observed during the north-east monsoon period, the graphs below show the trend in their change over time.

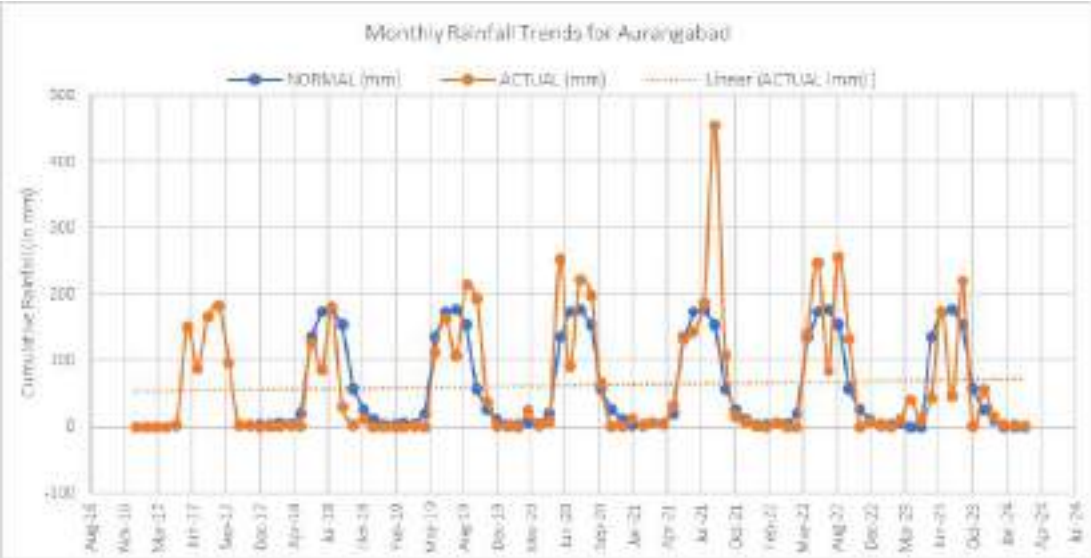


FIGURE 4: MONTHLY CUMULATIVE RAINFALL OVER THE INTERVENTION PERIOD (IN MM)

The trends of normal and actual rainfall reveal that over the intervention period, the rains have been above normal for most of the years. The slight positive trend that comes through is due to the above-normal rainfall received in June and August of most years and the unseasonal rainfall received in some of the years during the non-monsoon months.

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO
[3]Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.
[4]Ross, C.W., L. Prihodko, J.Y. Anchang, S.S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Run-off Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1566

Change in Water Level

The depth to water level data was obtained from two sources: one is the NGO partners, and the other is the annual Ground Water Year Books for Maharashtra published by the Central Ground Water Board (CGWB) for the years between 2017 and 2023. However, a complete collection of the data for the entire period from 2017 and since was not available with either source. Thus, for the final assessment, the datasets from both sources were combined after evaluating them individually and ensuring cohesion, and any missing values were filled out using statistical methods. The detailed dataset is provided in Annexure 3. The figures below show the ground water level trends in in the intervention districts:

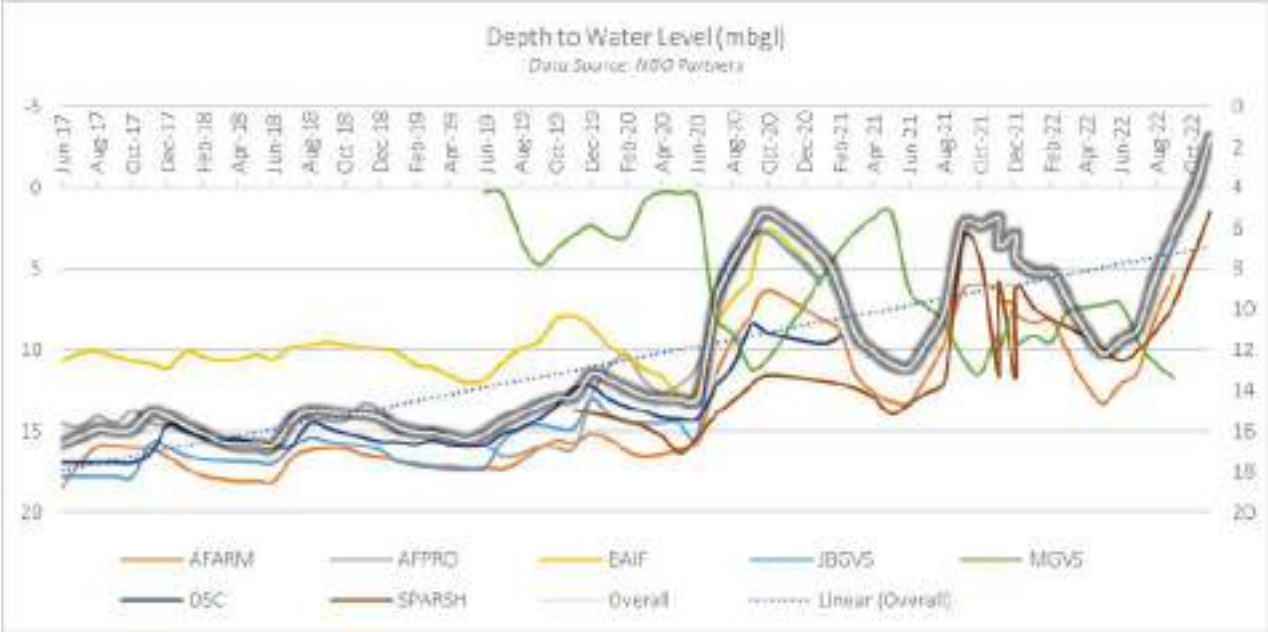


FIGURE 5: DEPTH TO WATER LEVEL (IN MBGL) – NGO PARTNERS

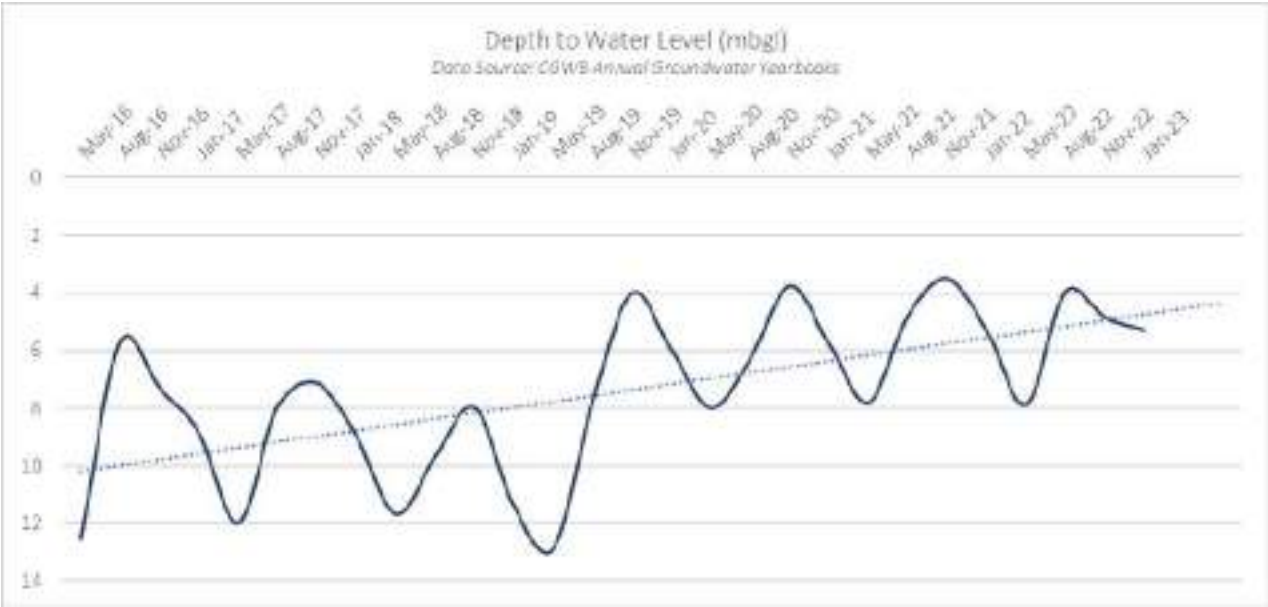


FIGURE 6: DEPTH TO WATER LEVEL (IN MBGL) – CGWB

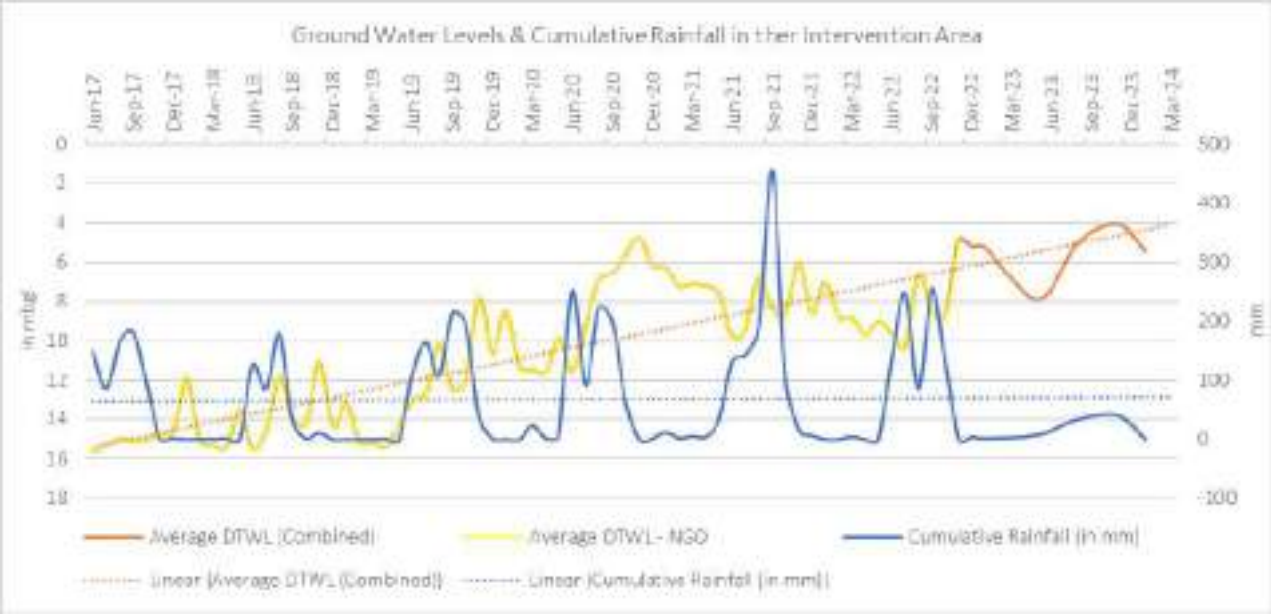


FIGURE 7: GROUND WATER LEVELS DURING AND SINCE THE INTERVENTION PERIOD (IN MBGL) COMPARED WITH MONTHLY CUMULATIVE RAINFALL (IN MM)

For this step of the assessment, the rainfall data from IMD was compared with the combined depth-to-water level data from the NGO partners and the CGWB. The rationale behind this is that rainfall is the most critical variable that determines the level of water availability below ground. Thus, by establishing the role of rainfall in the change in water levels, we would be able to identify the role of the measures implemented on the ground in augmenting the ground water levels.

A regression analysis of rainfall and depth to water level was conducted to assess the strength of the relationship between these two variables (detailed results in Annexure 4). The p-value obtained is greater than 0.05 for the intervention area, indicating no statistically significant relationship. However, the low R^2 (coefficient of determination) values obtained for the intervention area, along with the weak positive correlation established between rainfall and groundwater, suggest that while the impact of rainfall may be small, it has had its influence(although not significantly). [Here the R^2 value represents the proportion of variation in depth to water levels that can be explained by rainfall, indicating how well rainfall predicts water level changes. In this case, the low R^2 values suggest that multiple other factors also play a role. Detailed results are provided below.[5]]

This essentially means that rainfall influence on the ground water level has been to a minimal extent in the intervention areas over the period from 2017 to the relative present. However, over this period, the rainfall received has shown a very slight negative trend while the ground water levels have shown significant positive trends. Considering the R2 values and the results of the correlation analysis, it can be understood that while the rainfall and ground water levels are not closely related, the factors such as improved water percolation and water storage mechanisms have had significant contributions in augmenting the ground water levels, supported by the rainfall trends. The ground water levels are expected to continue to rise and stabilise at a high level over the coming years and the contributions of the interventions would help in improving the ground water levels. The availability of the most recent and more local measurements will help in assessing the same more accurately.

Note: The last available data on ground water depth data is till January 2023. The data from May 2023 to the present has not been published yet. Thus, in the absence of the necessary data, statistical methods were used to project the values for this period. This projected data might not necessarily reflect the true levels of ground water levels, and the derived estimates are bound to change on the availability of official measurements of ground water depth for 2023 and 2024.

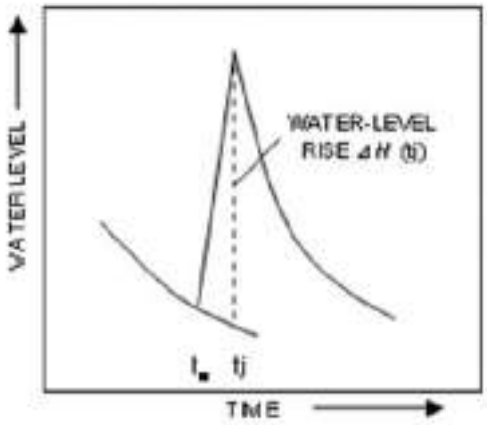
[5] The ground water recharge calculations based only on data from NGO partners and based only on CGWB data are provided in the attached Excel document sheets 9 and 10, respectively.

Estimation of Ground Water Recharge Due to Rainfall

The Water Table Fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The water-table fluctuation method is based on the premise that rises in groundwater levels in unconfined aquifers are due to recharge arriving at the water table. Recharge is calculated as the change in water level over time multiplied by the specific yield.[6]

$$R(tj) = Sy^* \Delta H(tj)$$

where R(tj) (m) is recharge occurring between times t0 and tj, Sy is specific yield (dimensionless), and ΔH(tj) is the peak water level rise attributed to the recharge period (cm).



The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology.[7] [8] The specific yield values identified for the different types of aquifers found across the intervention areas identified from the Groundwater Estimation Committee reports are given below:

Location	Aurangabad
Major Aquifer System	Basalt
Sy Range	0.01 – 0.03
Sy Chosen	0.02
RIF Range	0.12 – 0.14
RIF Chosen	0.13

As per the results of the method, about 13.1% of the rainfall has recharged directly to the ground in the intervention sites. The results and calculations are presented below:

TABLE 2: WATER TABLE FLUCTUATION METHOD RESULTS

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2017	687.704	1.100	0.02	0.022002477	22.0024773	3.2%	5354641.69
2018	438.020	4.509	0.02	0.090184267	90.1842666	20.6%	21947730.12
2019	826.440	7.633	0.02	0.152661156	152.6611561	18.5%	37152443.32
2020	862.400	6.835	0.02	0.136709574	136.7095736	15.9%	33270380.06
2021	1099.640	3.748	0.02	0.074956747	74.95674684	6.8%	18241878.68

[6]USGS GWRP: Techniques/Methods -Water-Table Fluctuation (WTF) Method
[7]The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology[7][7]. The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:
[8]Detailed Guidelines (cgwb.gov.in)

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2022	865.360	5.505	0.02	0.11010815	110.10815	12.7%	26796513.96
2023	548.052	3.844	0.02	0.076883855	76.883855	14.0%	18710870.13
Average Recharge directly due to Rainfall received						**13.1%**	**161474457.95**

Further, the groundwater recharge from Rainfall Infiltration Method (RIF) can be obtained from the following relation:
Groundwater Recharge = Geographical Area x Actual Rainfall x Infiltration Factor

TABLE 3: RAINFALL INFILTRATION METHOD

Area (in sq. m.) =			243365400
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)
2017	0.687703555	0.089401462	21757222.59
2018	0.43802	0.0569426	13857858.63
2019	0.82644	0.1074372	26146497.15
2020	0.8624	0.112112	27284181.72
2021	1.09964	0.1429532	34789862.7
2022	0.86536	0.1124968	27377828.73
2023	0.548051549	0.071246701	17338981.97
Total			**168552433.5**

Estimation of percent rainfall converted into groundwater recharge

As per GEC-1997 norms, the rainfall recharge as computed by the WTF method has been compared with that of the RIF method, and finally, the rainfall recharge is assigned a value based on set criteria to avoid unreasonably high or low estimates.

A quantity called percentage difference (PD) is the difference between the rainfall recharge computed by the water table method (A) and the recharge by the rainfall infiltration method (B) and expressed as a percentage of the rainfall recharge by rainfall infiltration method is computed as below:

$$PD = \frac{(A - B)}{B} \times 100$$

where 'A' is the rainfall recharge by the WTF method and 'B' is the rainfall recharge by the RIF method.
The set criteria (GEC 1997) to be adopted are as follows:
(a) If PD ≥ – 20 and < + 20%, then the value of the water table fluctuation method is adopted.
(b)If PD ≤ – 20%, then the value of 0.8 × rainfall infiltration factor method is adopted.
(c)If PD ≥ + 20%, then the value of 1.2 × rainfall infiltration factor method is adopted.

By following the above criteria, ground water recharge is estimated.

Organisation	Rainfall Infiltration Method	WTF Model	Percentage Difference	Criteria	Volume of recharge due to rainfall (Cu. m.)
	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)			
AFARM	168552433.5	161474457.95	-4.19	A	161474457.95

Over the period of 2017 to 2023 an almost 7-year period covering the interventions and their operations till the present, the amount of ground water recharge directly due to rainfall stands at 16,14,74,457.95 Cu. m. across the intervention watershed, which is about 12.45% of the total rainfall received over the intervention area.

Change in surface water holding capacity and run-off reduction

The intervention area is spread over multiple watersheds in the southern part of the state. On-site verification and satellite imagery show that the major land use in the intervention area is rangelands, followed by crops. Based on the information available from the field survey and the organisation, the volume of storage created is estimated.

The change in surface storage in the intervention area was net positive, i.e., no existing surface storage was considered in the pre-intervention period[9] and although the surface storage of about 1,28,67,972 cubic meters was created through the project, an intervention volume of 29,43,110 cubic meters is being considered for assessment as there might be a double accounting of the storage of nalas as it is also included in considering the storage of the check dam type of interventions.

Estimation of ground water recharge due to the interventions

Groundwater recharge due to the interventions occurs primarily through the capture and storage of surface runoff water using Cement Nala Bunds, as well as through natural processes and Groundwater Recharge Shafts.

Run-off is defined as the portion of the precipitation that makes its way towards rivers or oceans as surface or subsurface flow. After the occurrence of infiltration and other losses from precipitation (rainfall), excess rainfall flows out through the small natural channels on the land surface and into the main drainage channels. Such types of flow are called surface flows. A part of the infiltrated rainwater moves parallel to the land surface as subsurface flow and reappears on the surface at certain other points. Such flows are called interflows. Another part of the infiltrated water percolates downwards to ground water and moves laterally to emerge in depression and rivers and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

While the interventions such as the Cement Nala Bunds and the Gabion Structure capture the surface flows, both these structures and the Ground Water Recharge Shafts contribute to the recharge of the ground water in the intervention sites.

Estimation of the run-off can give us an estimate of the amount of water that has been essentially captured by the intervention structures as surface storage, and thus point towards the potential amount of water available for ground water recharge. Run-off can be estimated by various methods, such as:

- Empirical formulae and tables
- Run-off Estimation based on Land Use and Treatment
- Rational Method
- Empirical formulae for flood peak

[9] This is due to the constraints of establishing the status of all water bodies in the intervention area.

In this assessment, we are using the method of empirical formulae and tables along with run-off estimation based on land use and treatment, as it has proven to be the most reliable to conduct the assessment in the absence of reliable ground water level data and access to the intervention sites on the ground.

1 BINNIE'S PERCENTAGES

It provides the relationship of run-off to rainfall with a view to express the former as a percentage of the latter. The percentages mentioned below are based on observations on two **rivers- Narmada River and Chambal River in Madhya Pradesh.**

TABLE 4: RUN-OFF AS A % OF THE RAINFALL RECEIVED

Annual Rainfall (mm)	Runoff (%)
500	15
600	21
700	25
800	29
900	34
1,000	38
1,100	40

2 COEFFICIENTS

The run-off 'R' in cm and rainfall 'P' in cm can be correlated as R = KP, where 'K' is the run-off coefficient. The run-off coefficient depends on factors affecting run-off. This method is applicable only for small projects such as the ones implemented as a part of this project. The usual values of K are as given below.

TABLE 5: USUAL VALUES OF RUNOFF COEFFICIENTS (K)

Type of Area	K
Urban Residential	0.3 - 0.5
Forests	0.05 - 0.2
Commercial & Industrial	0.9
Parks, farms, Pastures	0.05 - 0.3
Asphalt or concrete pavement	0.85

3 BARLOW'S TABLES

The following values of K (in percentage) for various types of catchments were developed by T.G. Barlow based on the studies of catchments mostly under 130 sq. km. in Uttar Pradesh.

TABLE 6: BARLOW'S PERCENTAGE RUNOFF COEFFICIENTS

Class	Description of Catchment	Percent runoff
A	Flat, cultivated and black cotton soils	10
B	Flat, partly cultivated-various soils	15
C	Average	20
D	Hills and plains with little cultivation	35
E	Very hilly and steep, with hardly any cultivation	45

These percentages are for the average type of monsoon and are to be modified by the application of the following coefficients according to the nature of the season, as shown below.

TABLE 7: BARLOW'S RUN-OFF COEFFICIENTS FOR DIFFERENT NATURES OF SEASON

Nature of Season	Class of catchments				
	A	B	C	D	E
Light rain, no heavy downpour	0.7	0.8	0.8	0.8	0.8
Average or varying rainfall, no continuous downpour	1	1	1	1	1
Continuous downpour	1.5	1.5	1.6	1.7	1.8

As part of this method, the special tropical rainfall was divided into the following four classes:

- **Negligible falls:** All rainfalls under 12 mm a day unless continuous for several days; also rainfalls 12 to 40 mm a day, when there is no rain.
- **Light falls:** All rainfalls up to 25 mm a day followed by similar or heavier falls. Steady pours of 25 to 40 mm a day, when there is no rain of similar or greater amount before or after that.
- **Medium falls:** Rainfalls from 25 to 40 mm a day when preceded or followed by any but light falls.
- **Heavy Falls:**
  - All rainfalls are over 75 mm a day or continuous falls at 50 mm a day.
  - All rainfalls of an intensity of 50 mm or more per hour.

The run-off percentages, as shown in the following table, were developed by combining the type of catchment and nature of the season.

TABLE 8: BARLOW'S RUNOFF PERCENTAGES

Nature of Rainfall	Percentage of Flow in Catchments of Different Type				
	A	B	C	D	E
Negligible falls	-	-	-	-	-
Light falls	1%	3%	5%	10%	15%
Medium falls	10%	15%	20%	25%	33%
Heavy falls	20%	33%	40%	55%	70%

4 ESTIMATION OF DIRECT RUNOFF FROM RAINFALL

In this method of run-off estimation, the effects of the surface conditions of a watershed area are evaluated by means of land use and treatment classes. Land use is the watershed cover, and it includes every kind of vegetation, litter and mulch, and fallow, as well as non-agricultural uses such as water surfaces (lakes, swamps, etc) and impervious surfaces (roads, roofs, etc.). Land treatment applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing and management practices such as grazing control or rotation of crops. The classes consist of use and treatment combinations to be found in watersheds. Land use and treatment classes are readily obtained either by observation or by measurement of plant and litter density and extent in sample areas.

4.1 Hydrological Soil Groups

There are four soil groups that are used in determining the hydrological soil cover complexes, which are used in a method for estimating the run-off from rainfall.

The major characteristics of these groups are described below. The respective infiltration rates and permeability of soils in different groups are also shown below. The infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The permeability rate is the rate at which water moves in the soil, which is controlled by the nature and characteristics of soil horizons.

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.	Low	High rate
Group B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	High	Low rate

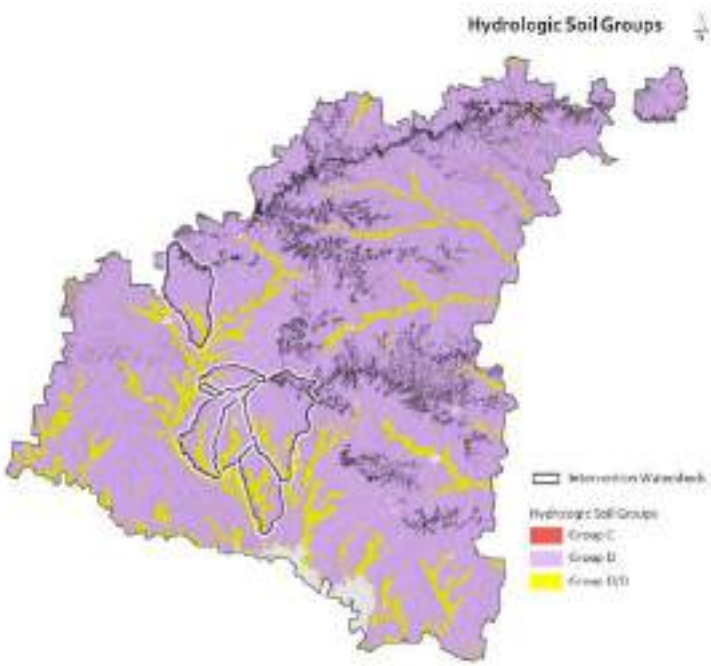


FIGURE 8: HYDROLOGIC SOIL GROUPS OF THE PROJECT WATERSHEDS

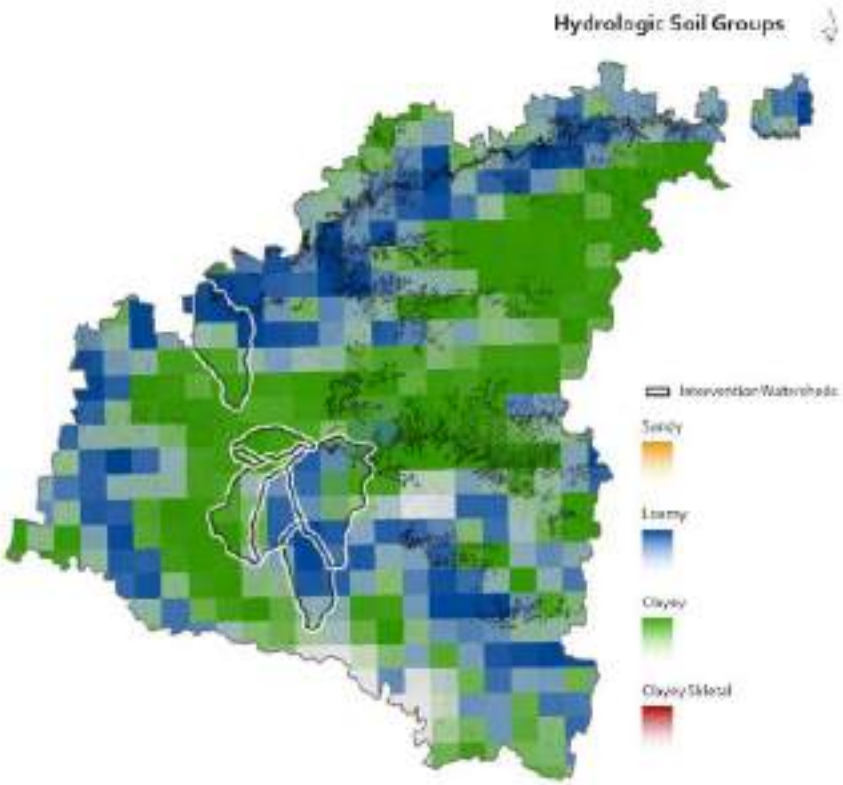


FIGURE 9: SOIL CHARACTERISTICS IN THE PROJECT WATERSHEDS

TABLE 9: INFILTRATION RATES

Class	Rates / hr in		Remarks
	Inches	Millimetres	
Very Low	Below 0.1	Below 2.5	Highly clayey soils
Low	0.1 - 0.5	2.5 - 12.5	Shallow soils, clay soils, soils low in organic matter
Medium	0.5 - 1.0	12.5 - 25.0	Sandy loams, silt loams
High	Above 1.0	Above 25.0	Deep sands, well aggregated soils

TABLE 10: RELATIVE CLASSES OF SOIL PERMEABILITY

Class	Permeability	
	Inches/ hr	mm/ hr
Slow		
Very Slow	Less than 0.05	1.3
Slow	0.05 to 0.20	1.31 to 5.00
Moderate		
Moderately Slow	0.20 to 0.30	5.01 to 20.00
Moderate	0.80 to 2.50	20.01 to 50.00
Moderately Rapid	2.50 to 5.00	50.01 to 130.00
Rapid		
Rapid	5.00 to 10.00	130.01 to 250.00
Very Rapid	Over 10.00	Over 250.00

4.2 Land Use and Treatment Classes

The commonly used land use and treatment classes are briefly described below. These classes are used in determining hydrologic soil-cover complexes, which are used in one of the methods for estimating runoff from rainfall.

- **Cultivated lands:** These include all field crops such as maize, sugarcane, paddy and wheat.
- **Fallow lands:** These are lands taken up for cultivation, but are temporarily out of cultivation for a period of not less than one year, and not more than 5 years. Current fallow lands are cropped areas kept fallow during the current year.
- **Uncultivated lands include:**
  - Permanent pastures and other grazing lands.
  - Cultivable waste, which are lands available for cultivation whether or not taken up for cultivation or abandoned after a few years for one reason or another. Land once cultivated but uncultivated for 5 years in succession shall also be included in this category.
- Forest area includes all lands classed as forest under any legal enactment dealing with forest or administered as forest whether State-owned or private and whether wooded or maintained as potential forest land.
- Tree crops include woody perennial plants that reach a mature height of at least 8 feet and have well-defined stems and a definite crown shape.
- Lands put to non-agricultural uses are areas occupied by buildings, roads, railroads, etc.
- Barren and uncultivable lands include areas covered by mountains, deserts, etc.

Based on these assessments, the following were estimated:

Surface Storage

The volume of surface storage created by the intervention = 29,43,110 m3

Rainfall & Runoff

- Total rainfall received over the intervention period and since = 1,14,86,26,280.3040 m3
- Total run-off generated over the intervention area = 34,45,87,884.09 m3
- Percentage of rainfall that is converted to runoff = 30%

The intervention area received enough rainfall for all the intervention structures to be at a constant capacity of 13.4% throughout the period since 2017 as a part of and due to the project Bajaj Water Conservation Project implemented by AFARM in Aurangabad. This shall be interpreted as the intervention structures always having water and never drying since 2017 or operating at more than 50% storage filled through the dry seasons since 2017.

Runoff Reduction

- The volume of surface run-off stored by the intervention measures after considering 40% evaporation loss = 2,37,35,802.96 m3.

Which is,

- 6.8% of the total run-off generated as a part of and due to the water conservation efforts of this project (or)
- 2.06% of the total rainfall received during the project period and ever since

This means that the interventions that were created as a part of this project have contributed to a combined reduction in surface run-off by about 6.8% in the intervention area. Although this number is a conservative estimation and , it is bound to increase over the years. Care must be taken to ensure the effective functioning of these water harvesting structures.

Regular desilting and clearing of overgrowth, along with any structural repairs, are required across all the structures to ensure that their storage capacity is maintained, and the structural integrity is preserved.

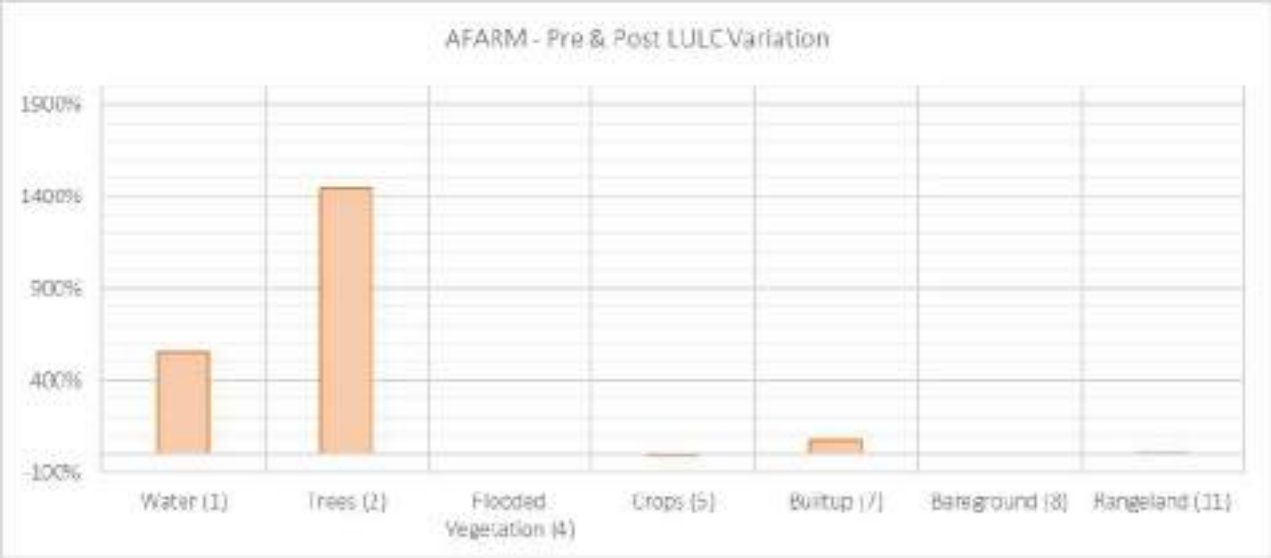
Thus, in total, 12.45% of the rainfall is converted into direct recharge, about 6.8% of the rainfall is stored in the intervention-created surface storage, 40% is lost as evaporation, and the remaining 40.66% accounts for factors such as run-off that is stored in other water bodies present, run-off that is not captured evapotranspiration, and other losses.

5 CHANGE IN LAND USE PATTERN

Land use and land cover change detection involves analyzing how land is utilized and how its physical coverage alters over time. Changes in land use patterns, such as urban expansion, deforestation, agricultural expansion, and the impacts of natural disasters, can be tracked using remote sensing techniques, satellite imagery, and geographic information systems (GIS). The land use and land cover for the intervention areas were developed through supervised classification of Sentinel-2 Full Colour Composite (FCC) imagery for both the pre- and post-intervention periods.

TABLE 11: ZONAL STATISTICS OF LULC FOR THE INTERVENTION AREA

Organisation	AFARM				
Total Area of Watershed (Sq.Km.)	243.3654				
Soil Group	D				
Landuse Classes	Landuse - 2017		Landuse - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.4358	0.18	2.8502	1.17	553.95%
Trees (2)	0.1839	0.08	2.8502	1.17	1449.75%
Flooded Vegetation (4)					0.00%
Crops (5)	209.0662	85.91	196.2171	80.63	-6.15%
Builtup (7)	13.4602	5.53	23.2563	9.56	72.78%
Bardeground (8)			0.0019		0.00%
Rangeland (11)	20.2023	8.30	20.7269	8.52	2.60%



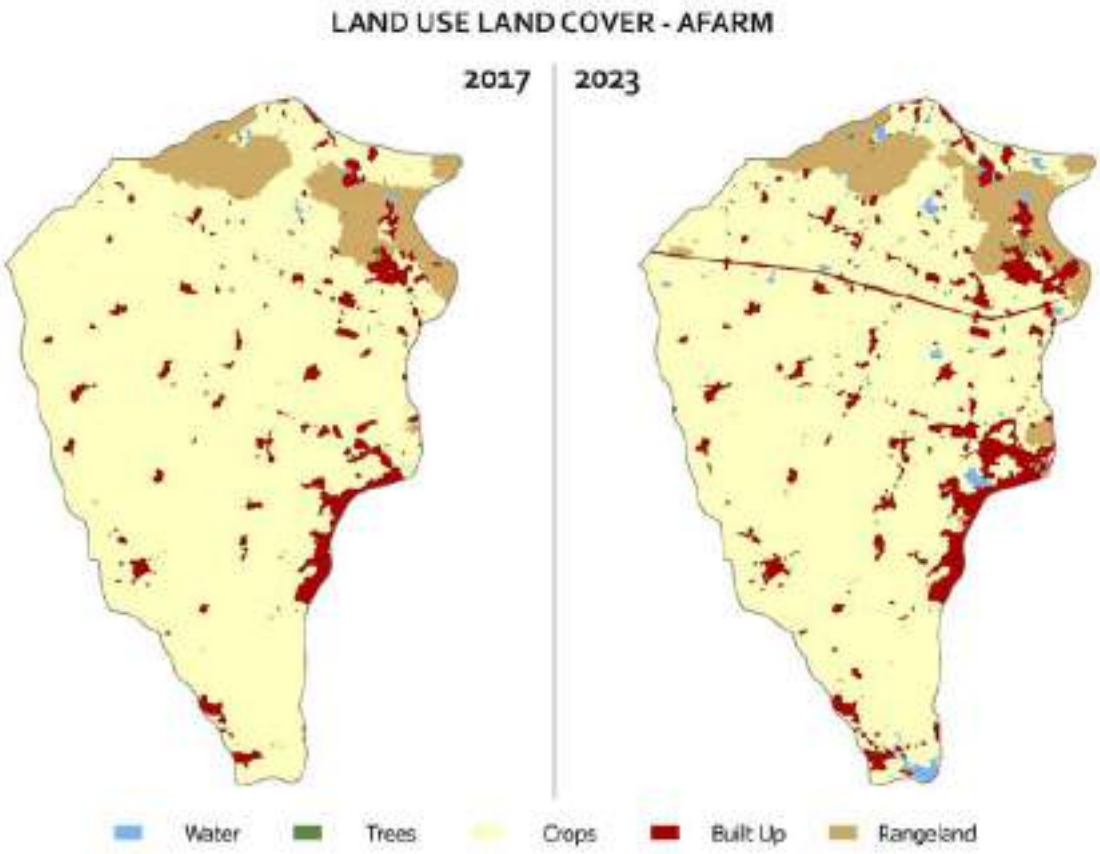


FIGURE 10: PRE- AND POST-INTERVENTION LULC OF THE INTERVENTION WATERSHED

It can be observed from the above table and charts that in terms of total area, the area under crops is the highest, followed by similar values for built-up areas and rangelands. Looking at the changes in land use that have happened through the course of the intervention period and since, major changes can be observed in the growth of areas under water and trees, minor reduction in the area under crops and minor growth in the area built up and rangelands. In terms of total area, the reduction in area under crops can be attributed mainly to the increase in built-up area. The following section will offer more clarity on the changes to cropping intensity.

6

VEGETATION INDEX (VI)/CROPPING INTENSITY

Vegetation Indices are combinations of surface reflectance at two or more wavelengths designed to highlight a particular property of vegetation. They are derived using the reflectance properties of vegetation. For this assessment, the Normalised Difference Vegetation Index (NDVI) is used. NDVI is an indicator that shows the greenness, density, and health of vegetation in each pixel of a satellite image. The index detects and quantifies the presence of living green vegetation using this reflected light in the visible and near-infrared bands.

The standard formula for calculating NDVI is: NDVI = (NIR – red) / (NIR + red)

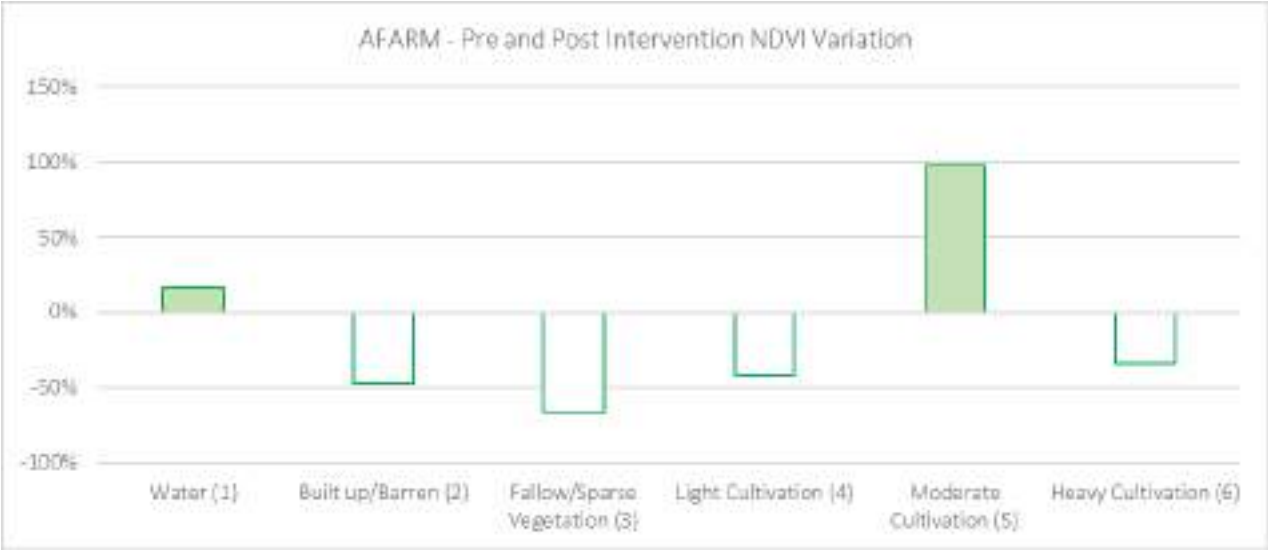
NIR is the near infra-red, band 8, and red, band 4 of Sentinel-2 imagery. Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states.

The NDVI value ranges from -1 to 1 and shows the vigour of the crop:

- **Values close to 1:** the more intense the green, the more vigorous the vegetation and vegetation cover. Considerations for the type of farming, bare soil, etc. must be made. The index also measures the vigour of the underbrush.
- **Values close to 0:** areas with very little vegetation, early stages of cultivation, bare soil, or non-productive areas.
- **Negative values:** usually associated with areas of water, snow, or clouds.

TABLE 12: ZONAL STATISTICS VALUES OF THE VEGETATION INDEX

District	Aurangabad				
Organisation	AFARM				
Total Area of Watershed (Sq.Km.)	243.3654				
Soil Group	D				
Vegetation Index Classes	VI - 2017		VI - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.4690	0.19	0.5489	0.23	17.04%
Built up/Barren (2)	26.8816	11.05	14.3175	5.88	-46.74%
Fallow/Sparse Vegetation (3)	42.0204	17.27	14.3308	5.89	-65.90%
Light Cultivation (4)	88.4024	36.32	51.4868	21.16	-41.76%
Moderate Cultivation (5)	80.8450	33.22	159.5403	65.56	97.34%
Heavy Cultivation (6)	4.7071	1.93	3.1048	1.28	-34.04%



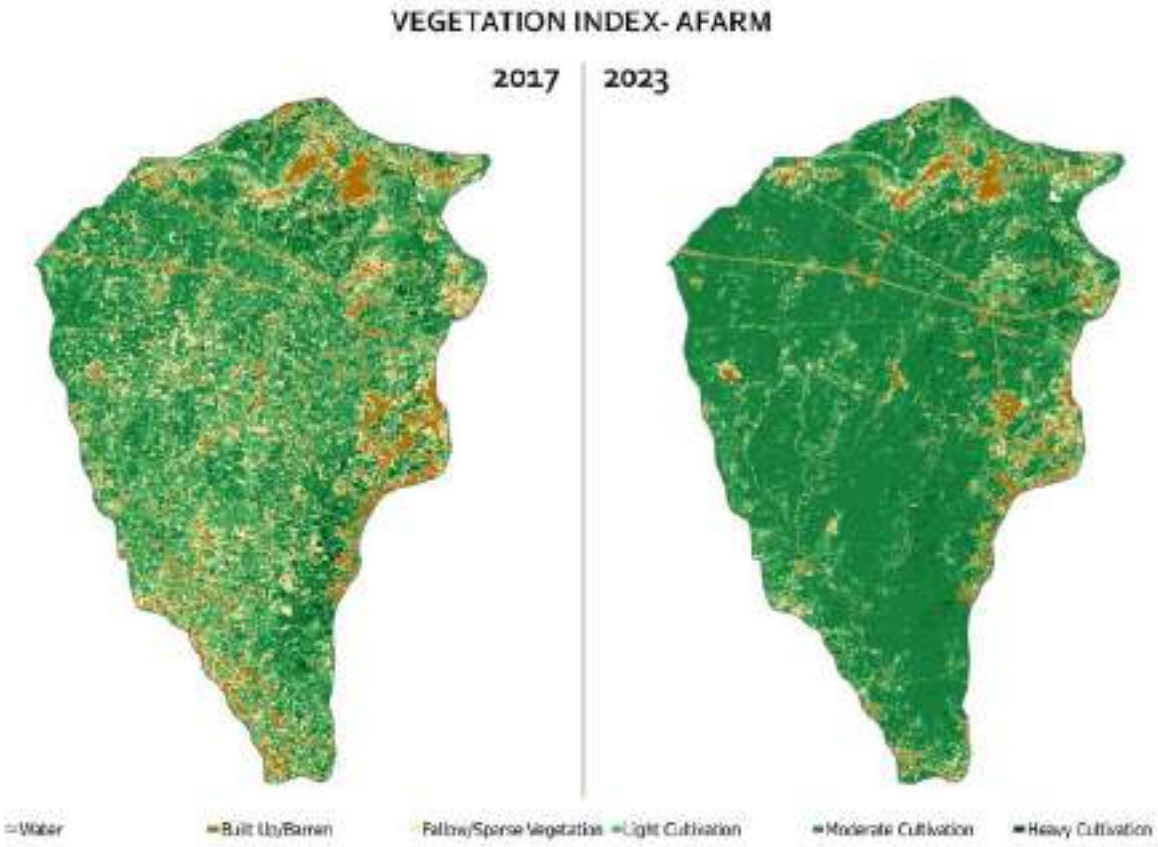


FIGURE 11: PRE- AND POST-INTERVENTION VEGETATION INDEX ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the vegetation index reveals that in the intervention watershed, the area under moderate cultivation has grown significantly along with the area under water, while the area under other classes has shrunk. With respect to the methodology applied for this analysis, it can be interpreted that the area under light cultivation corresponds to single cropping, moderate cultivation to double cropping and heavy cultivation to triple cropping. Thus, the area under double cropping has increased, indicating improved water accessibility and use, among other factors.

7 SOIL MOISTURE

Surface soil moisture (SSM), defined as the water content of the top few centimetres of soil, is a key variable that affects run-off generation, water recharge and vegetation growth. The Synthetic Aperture Radar (SAR) data from Sentinel-1 satellite is used here to study the surface soil moisture, which is in turn derived from relative soil moisture, which represents the soil moisture for a given soil column on a relative scale between soil saturation and wilting levels.

The surface soil moisture saturation is calculated as percentages using the formula[11]:

$$\mathrm{SSM}(t) = \frac{\Delta\sigma^0(\Theta, t)}{S(\Theta)} \quad [\%]$$

Where $\Delta\sigma0(\Theta,t)$ represents the change in normalized backscatter (relative to dry conditions), and $S(\Theta)$ is the sensitivity to SSM changes at the reference angle. The sensitivity is equivalent to the local backscatter dynamic range, estimated by the difference between normalized backscatter coefficients under wet and dry conditions using,

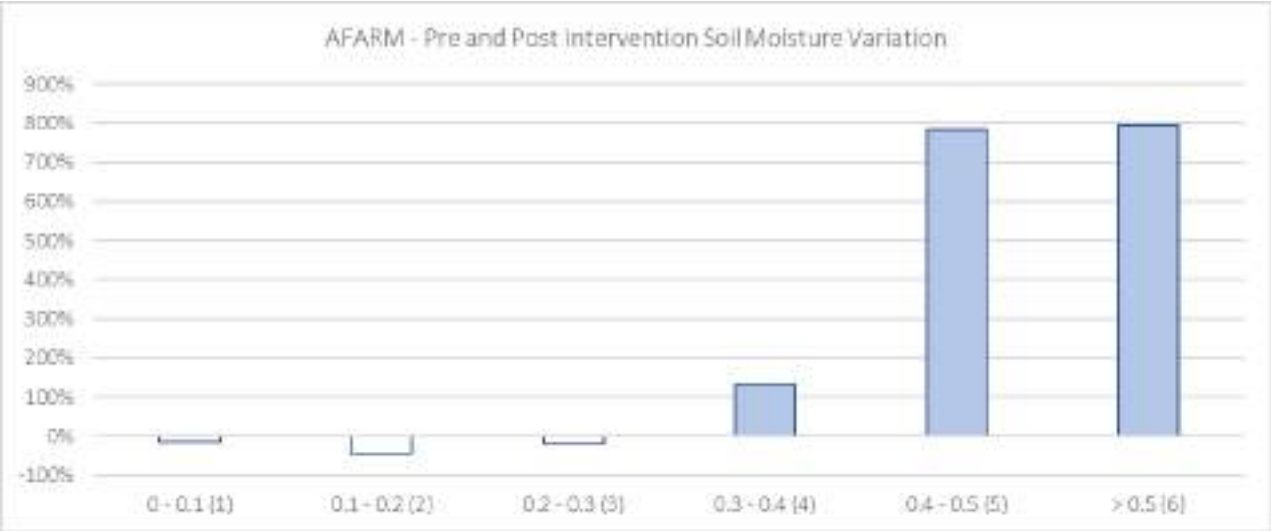
[11]Detailed methodology is provided at https://doi.org/10.1109/TGRS.2018.2858004

$$S(\Theta) = \sigma^0_{\text{wet}}(\Theta) - \sigma^0_{\text{dry}}(\Theta) \quad [\text{dB}].$$

Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states. The values range from 0 to 100 %, where values close to 0 represent water and built-up areas.

TABLE 13: ZONAL STATISTICS OF SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHEDS

District	Aurangabad				
Organisation	AFARM				
Total Area of Watershed (Sq.Km.)	243.3654				
Soil Group	D				
Soil Moisture Classes	SM - 2017		SM - 2023		% Difference
	Area	% Area	Area	% Area	
0 - 0.1 (1)	38.2169	15.70	33.2725	13.67	-12.94%
0.1 - 0.2 (2)	63.2528	25.99	34.6515	14.24	-45.22%
0.2 - 0.3 (3)	109.8822	45.15	88.8593	36.51	-19.13%
0.3 - 0.4 (4)	29.9928	12.32	69.6398	28.62	132.19%
0.4 - 0.5 (5)	1.7148	0.70	15.1290	6.22	782.25%
> 0.5 (6)	0.1897	0.08	1.6982	0.70	795.04%



[11] Detailed methodology is provided in https://doi.org/10.1109/TGRS.2018.2858004

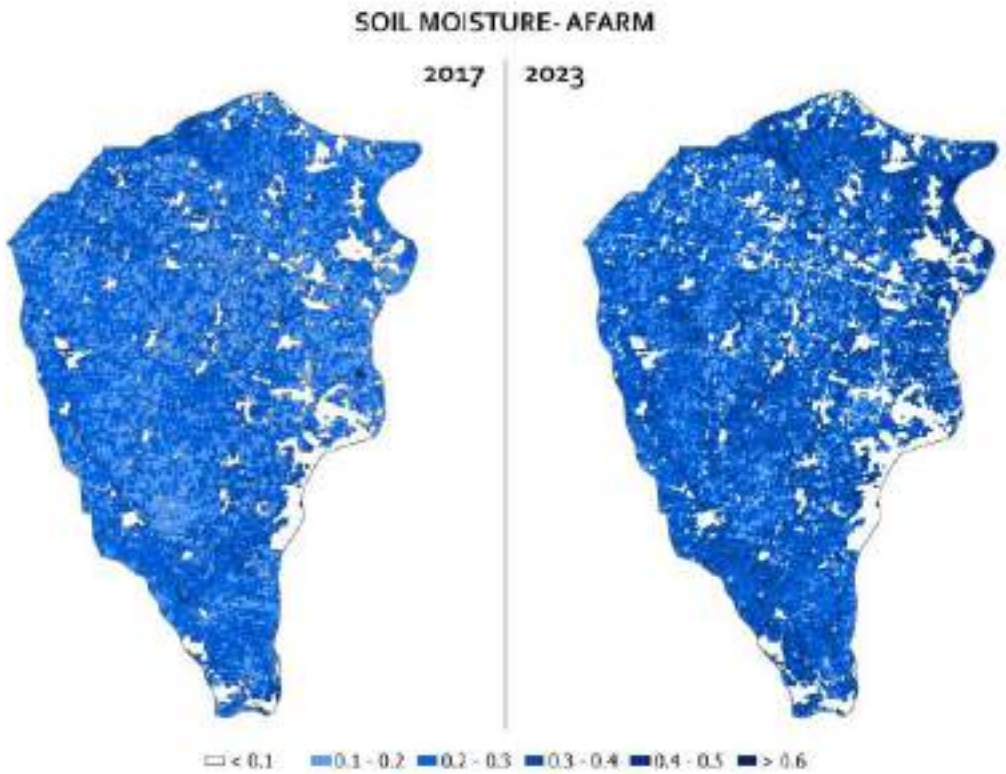


FIGURE 12: PRE AND POST INTERVENTION SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the soil moisture across the intervention watershed shows that there have been significant changes in the values of surface soil moisture over the course of the intervention period and since. The area under soil moisture values greater than 40% has seen a significant increase, while the area under low soil moisture values has reduced. This is to be interpreted because of multiple factors, such as the rainfall received, the vegetative cover, and the availability of surface and ground water, among others.

CONCLUSIONS

This section provides a summary of the key findings of the assessment and the limitations encountered in the process of the assessment. For more accurate quantification outcomes, further studies will have to be done using datasets of higher details and corroboration from the field.

KEY FINDINGS

In summation, the key findings from the above assessments are as follows:

- The total surface storage created in the intervention area due to the project is 29,43,110 cubic meters.
- The influence of rainfall on the ground water levels has not been very significant. However, a positive correlation between both was observed.
- The ground water levels in the intervention watershed have been increasing since 2017, are presently at high values, and are expected to persist at similar levels in the coming years. Availability of more recent data will shed more light on the trends that can be expected.
- Ground water recharge directly due to rainfall in the intervention area is about 12.45% of the total rainfall received.
- The volume of surface run-off stored by the intervention measures is 6.89% of the total run-off generated as a part of and due to the interventions (or) 2.07% of the total rainfall received during the period of the project intervention and ever since.
- Analysis of LULC, NDVI, and SSM reveal that there has been a marked increase in area under moderate or double cultivation while the crop cover overall has reduced slightly likely due to the increase in area under built up. The surface soil moisture has shown a remarkable change, with most of the area having a moisture content of more than 40%.

TABLE 14: SUMMARY OF FINDINGS

District		Aurangabad
Organisation		AFARM
Total Area of Watershed (Sq. Km.)		243.3654
Soil Group		D
Volume of Storage Created (Cu. m.)		2943110
Q - Total run-off over intervention area (Cu. m.)		344587884.1
Average % of fullness throughout the intervention period		13.44%
Run-off volume stored in interventions	Pre-Evaporation Loss	39559671.6
	Post Evaporation Loss	23735802.96
% of run-off stored by interventions	Pre-Evaporation Loss	11.48%
	Post Evaporation Loss	6.89%
% of rainfall stored by interventions	Pre-Evaporation Loss	3.44%
	Post Evaporation Loss	2.07%
Surface water contribution to ground water recharge (40%) (Cu. m.)		9494321.18
Recharge only due to rainfall (Entire intervention period and since)	Cu. m.	161474457.9
	%	12.45%

LIMITATIONS

The most significant limitation faced was in terms of data availability. With the resolution of the available open-source satellite imagery being capped at 10m, 30m and 50m, the land use, vegetation index and soil moisture that can be generated, respectively, also lack resolution, especially considering the small size of the intervention area that had to be assessed. Assumptions were made to calculate the storage capacity of water harvesting structures. Owing to the limitation in the availability of data on the number of interventions, their locations and the respective dimensions, the assessments are based primarily on data from secondary sources, with the primary data being used wherever possible. Further, most of the secondary data that was available and obtained has shortcomings in one or more areas, such as the temporal coverage or the spatial resolution. Further constraints were due to the unavailability of up-to-date and reliable ground water data. With the continuous measurement of this information, the efficiency of the assessment can be improved.

ANNEXURE 1

INTERVENTIONS

Organisation	Village	Type of Activity	Latitude	Longitude
AFARM	Abdimandi	NDW	19.93333	75.22250
AFARM	Abdimandi	NDW	19.92250	75.23098
AFARM	Abdimandi	NDW	19.92053	75.22754
AFARM	Abdimandi	NDW	19.92395	75.23049
AFARM	Abdimandi	NDW	19.91982	75.22543
AFARM	Abdimandi	CWG	19.92250	75.23098
AFARM	Abdimandi	CWG	19.92053	75.22754
AFARM	Abdimandi	CWG	19.91982	75.22543
AFARM	Abdimandi	CWG	19.92167	75.22943
AFARM	Abdimandi	CWG	19.92395	75.23049
AFARM	Abdimandi	CWG	19.92947	75.21542
AFARM	Asegaon	NDW	19.90306	75.18444
AFARM	Asegaon	NDW	19.89619	75.20804
AFARM	Asegaon	NDW	19.89370	75.20017
AFARM	Asegaon	NDW	19.89783	75.20967
AFARM	Asegaon	NDW	19.89707	75.19308
AFARM	Asegaon	NDW	19.88543	75.18852
AFARM	Asegaon	CNB - New	19.88543	75.18852
AFARM	Asegaon	CNB - Repair	19.89619	75.20804
AFARM	Asegaon	CWG	19.89326	75.19667
AFARM	Asegaon	NDW	19.91398	75.17664
AFARM	Eklahera	NDW	19.84436	75.17196
AFARM	Eklahera	NDW	19.84808	75.17443
AFARM	Eklahera	NDW	19.84137	75.18618
AFARM	Eklahera	NDW	19.84422	75.18590
AFARM	Eklahera	NDW	19.84615	75.18624
AFARM	Eklahera	NDW	19.83682	75.16791
AFARM	Eklahera	NDW	19.83776	75.17168
AFARM	Eklahera	NDW	19.84075	75.17274
AFARM	Eklahera	CNB - New	19.83682	75.16791
AFARM	Eklahera	CNB - New	19.83776	75.17168
AFARM	Eklahera	CNB - New	19.84075	75.17274
AFARM	Eklahera	CNB - Repair	19.84436	75.17196
AFARM	Eklahera	CNB - Repair	19.84808	75.17443
AFARM	Eklahera	Recharge Shaft	19.83776	75.17168
AFARM	Eklahera	Recharge Shaft	19.84075	75.17274
AFARM	Eklahera	Recharge Shaft	19.84075	75.17274

Organisation	Village	Type of Activity	Latitude	Longitude
AFARM	Eklahera	Recharge Shaft	19.84075	75.17274
AFARM	Eklahera	Recharge Shaft	19.84436	75.17196
AFARM	Eklahera	Recharge Shaft	19.84436	75.17196
AFARM	Eklahera	Recharge Shaft	19.84436	75.17196
AFARM	Eklahera	Recharge Shaft	19.84436	75.17196
AFARM	Fatulabad	Recharge Shaft	19.91039	75.15367
AFARM	Fatulabad	Recharge Shaft	19.91039	75.15367
AFARM	Fatulabad	Recharge Shaft	19.91005	75.15254
AFARM	Fatulabad	Recharge Shaft	19.91005	75.15254
AFARM	Fatulabad	Recharge Shaft	19.91039	75.15367
AFARM	Fatulabad	Recharge Shaft	19.91039	75.15367
AFARM	Fatulabad	Recharge Shaft	19.91039	75.15367
AFARM	Fatulabad	Recharge Shaft	19.91039	75.15367
AFARM	Girnera	NDW	19.93502	75.16934
AFARM	Girnera	NDW	19.93536	75.17249
AFARM	Jambhala	NDW	19.94402	75.15524
AFARM	Jambhala	NDW	19.94487	75.16063
AFARM	Jambhala	NDW	19.96857	75.15573
AFARM	Jambhala	NDW	19.96840	75.15749
AFARM	Jambhala	PT	19.96520	75.15520
AFARM	Jambhala	PT	19.96308	75.16350
AFARM	Sindhi Sirasgaon	NDW	19.91453	75.15336
AFARM	Sindhi Sirasgaon	NDW	19.89921	75.14077
AFARM	Sindhi Sirasgaon	NDW	19.90836	75.15027
AFARM	Sindhi Sirasgaon	NDW	19.91170	75.15031
AFARM	Sindhi Sirasgaon	NDW	19.90893	75.14966
AFARM	Sindhi Sirasgaon	NDW	19.89898	75.14310
AFARM	Sindhi Sirasgaon	NDW	19.90403	75.14620
AFARM	Sindhi Sirasgaon	NDW	19.90648	75.14754
AFARM	Sindhi Sirasgaon	CNB - New	19.90893	75.14966
AFARM	Sindhi Sirasgaon	CNB - New	19.89898	75.14310
AFARM	Sindhi Sirasgaon	CNB - New	19.90403	75.14620
AFARM	Sindhi Sirasgaon	CNB - New	19.90648	75.14754
AFARM	Sindhi Sirasgaon	CNB - New	19.91170	75.15031
AFARM	Sindhi Sirasgaon	NDW	19.91454	75.15006
AFARM	Sindhi Sirasgaon	CNB - New	19.91454	75.15006
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91170	75.15031
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.90648	75.14754
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.90648	75.14754
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.90648	75.14754
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.90648	75.14754

Organisation	Village	Type of Activity	Latitude	Longitude
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91170	75.15031
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91170	75.15031
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91454	75.15006
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91454	75.15006
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91454	75.15006
AFARM	Eklahera	Recharge Shaft	19.83776	75.17168
AFARM	Eklahera	Recharge Shaft	19.83776	75.17168
AFARM	Eklahera	Recharge Shaft	19.83776	75.17168
AFARM	Eklahera	Recharge Shaft	19.83776	75.17168
AFARM	Eklahera	Recharge Shaft	19.83776	75.17168
AFARM	Eklahera	Recharge Shaft	19.83776	75.17168
AFARM	Eklahera	Recharge Shaft	19.83776	75.17168
AFARM	Eklahera	Recharge Shaft	19.83776	75.17168
AFARM	Haibatpur	NDW	19.83776	75.16203
AFARM	Haibatpur	NDW	19.88746	75.18144
AFARM	Haibatpur	CNB - New	19.88746	75.18144
AFARM	Haibatpur	ENB	19.88377	75.16203
AFARM	Kasoda	NDW	19.83051	75.18795
AFARM	Kasoda	NDW	19.82692	75.18697
AFARM	Kasoda	NDW	19.81020	75.15896
AFARM	Kasoda	NDW	19.82194	75.15555
AFARM	Kasoda	NDW	19.80812	75.16329
AFARM	Kasoda	NDW	19.82750	75.16555
AFARM	Kasoda	CNB - New	19.82194	75.15555
AFARM	Kasoda	CNB - New	19.82990	75.14963
AFARM	Kasoda	CNB - New	19.80812	75.16329
AFARM	Kasoda	CNB - New	19.82750	75.16555
AFARM	Kasoda	CNB - New	19.82194	75.15555
AFARM	Kasoda	CNB - New	19.82990	75.14963
AFARM	Kasoda	CNB - Repair	19.82597	75.15950
AFARM	Kasoda	DW	19.82063	75.15631
AFARM	Mustafabad	NDW	19.88059	75.18627
AFARM	Mustafabad	CNB - Repair	19.88059	75.18627
AFARM	Mustafabad	CNB - Repair	19.87784	75.18396
AFARM	Nandeda	NDW	19.85131	75.17443
AFARM	Nandeda	NDW	19.85831	75.17382
AFARM	Nandeda	NDW	19.86178	75.17121
AFARM	Nandeda	NDW	19.85745	75.18578
AFARM	Nandeda	NDW	19.84994	75.18570
AFARM	Nandeda	CNB - Repair	19.85831	75.17382
AFARM	Nandeda	CNB - Repair	19.85989	75.17737

Organisation	Village	Type of Activity	Latitude	Longitude
AFARM	Nandeda	CNB - Repair	19.85495	75.17441
AFARM	Nandeda	CWG	19.85971	75.17322
AFARM	Nandeda	CWG	19.85745	75.18578
AFARM	Nandeda	ENB	19.86178	75.17121
AFARM	Nandeda	Recharge Shaft	19.86178	75.17121
AFARM	Nandeda	Recharge Shaft	19.86178	75.17121
AFARM	Nandeda	Recharge Shaft	19.86178	75.17121
AFARM	Nandeda	Recharge Shaft	19.86178	75.17121
AFARM	Nandeda	Recharge Shaft	19.85831	75.17382
AFARM	Nandeda	Recharge Shaft	19.85831	75.17382
AFARM	Nandeda	Recharge Shaft	19.85831	75.17382
AFARM	Narayanpur	NDW	19.85995	75.18608
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91454	75.15006
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91454	75.15006
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91454	75.15006
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91454	75.15006
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91170	75.15031
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91170	75.15031
AFARM	Sindhi Sirasgaon	Recharge Shaft	19.91170	75.15031
AFARM	Takali kadim	PT	19.93806	75.15379
AFARM	Takali kadim	PT	19.93444	75.14028
AFARM	Takali kadim	PT	19.93806	75.15379
AFARM	Apegaon	NDW	19.86552	75.12296
AFARM	Apegaon	NDW	19.86782	75.12278
AFARM	Apegaon	NDW	19.87312	75.11963
AFARM	Apegaon	NDW	19.87662	75.11318
AFARM	Apegaon	NDW	19.88658	75.12408
AFARM	Apegaon	NDW	19.86497	75.12322
AFARM	Apegaon	NDW	19.88147	75.12040
AFARM	Apegaon	CNB - New	19.88147	75.12040
AFARM	Apegaon	CNB - New	19.87265	75.11988
AFARM	Apegaon	Recharge Shaft	19.88658	75.12408
AFARM	Apegaon	Recharge Shaft	19.88658	75.12408
AFARM	Apegaon	Recharge Shaft	19.88658	75.12408
AFARM	Apegaon	Recharge Shaft	19.88658	75.12408
AFARM	Ek Waghalgaon	NDW	19.91436	75.10759
AFARM	Ek Waghalgaon	NDW	19.91068	75.10262
AFARM	Ek Waghalgaon	NDW	19.91384	75.10235
AFARM	Ek Waghalgaon	CWG	19.91068	75.10262
AFARM	Ek Waghalgaon	CWG	19.91384	75.10235
AFARM	Ek Waghalgaon	CWG	19.91368	75.10607

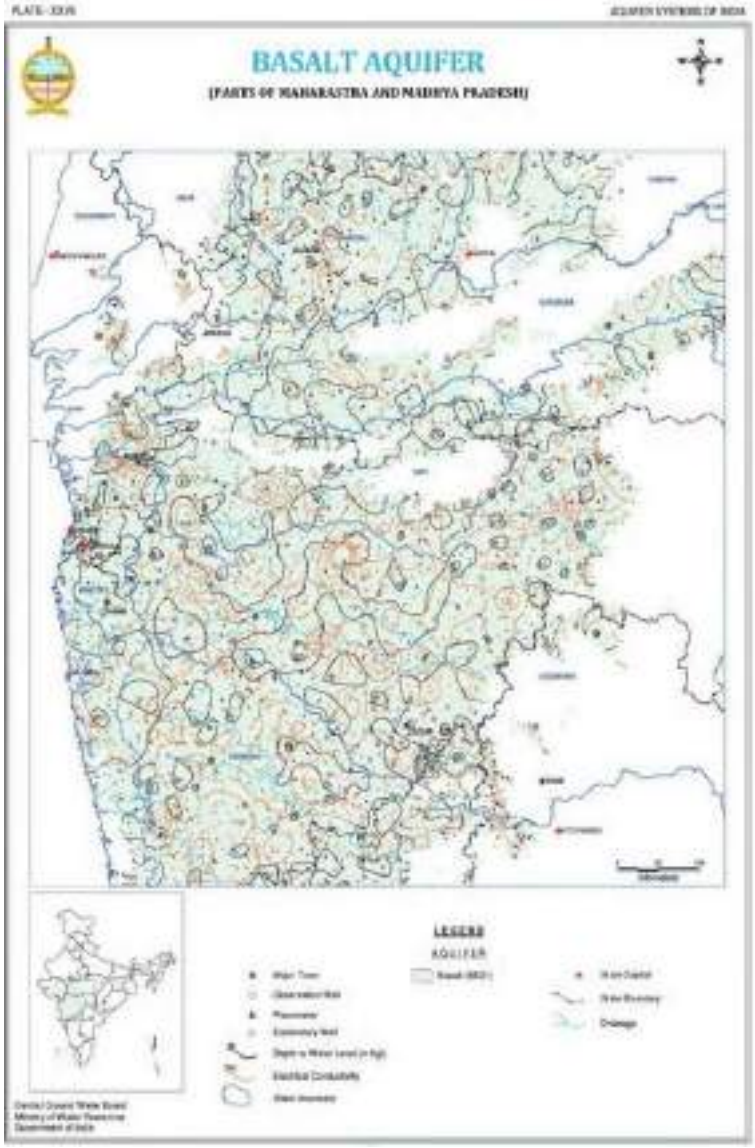
Organisation	Village	Type of Activity	Latitude	Longitude
AFARM	Pachpirwadi	NDW	19.96929	75.13047
AFARM	Pachpirwadi	NDW	19.96155	75.10540
AFARM	Pachpirwadi	NDW	19.96153	75.10642
AFARM	Pachpirwadi	PT	19.97484	75.11704
AFARM	Pahadpur	NDW	19.89476	75.12685
AFARM	Pahadpur	NDW	19.89595	75.12790
AFARM	Pahadpur	NDW	19.89847	75.13084
AFARM	Pahadpur	NDW	19.89473	75.12681
AFARM	Pahadpur	CNB - New	19.89847	75.13084
AFARM	Pahadpur	CNB - New	19.89476	75.12685
AFARM	Pahadpur	CNB - New	19.89595	75.12790
AFARM	Pahadpur	NDW	19.89100	75.12521
AFARM	Pahadpur	Recharge Shaft	19.89100	75.12521
AFARM	Pahadpur	Recharge Shaft	19.89100	75.12521
AFARM	Pahadpur	Recharge Shaft	19.89100	75.12521
AFARM	Pahadpur	Recharge Shaft	19.89100	75.12521
AFARM	Pahadpur	Recharge Shaft	19.89100	75.12521
AFARM	Potul	NDW	19.92900	75.12934
AFARM	Potul	NDW	19.93225	75.12913
AFARM	Narayanpur	NDW	19.86148	75.18677
AFARM	Narayanpur	NDW	19.86627	75.17941
AFARM	Narayanpur	CNB - New	19.86627	75.17941
AFARM	Narayanpur	CNB - Repair	19.85995	75.18608
AFARM	Narayanpur	CNB - Repair	19.87404	75.18307
AFARM	Narayanpur	NDW	19.86461	75.17756
AFARM	Narayanpur	NDW	19.86594	75.18724
AFARM	Narayanpur	CWG	19.86594	75.18724
AFARM	Talesaman	NDW	19.90127	75.20121
AFARM	Talesaman	NDW	19.89979	75.20213
AFARM	Talesaman	CNB - New	19.89979	75.20213
AFARM	Talesaman	CNB - New	19.90127	75.20121
AFARM	Turkabad Kharadi	NDW	19.79858	75.15672
AFARM	Turkabad Kharadi	NDW	19.79338	75.16689
AFARM	Turkabad Kharadi	NDW	19.81615	75.18623
AFARM	Turkabad Kharadi	NDW	19.79799	75.18542
AFARM	Turkabad Kharadi	NDW	19.80499	75.18858
AFARM	Turkabad Kharadi	NDW	19.80977	75.18631
AFARM	Turkabad Kharadi	NDW	19.77595	75.17898
AFARM	Turkabad Kharadi	NDW	19.79934	75.18831
AFARM	Turkabad Kharadi	NDW	19.81234	75.18808
AFARM	Turkabad Kharadi	CNB - New	19.79945	75.18820

Organisation	Village	Type of Activity	Latitude	Longitude
AFARM	Turkabad Kharadi	CNB - New	19.77595	75.17898
AFARM	Turkabad Kharadi	CNB - New	19.81234	75.18808
AFARM	Turkabad Kharadi	CNB - New	19.81234	75.18808
AFARM	Turkabad Kharadi	CNB - Repair	19.80965	75.18638
AFARM	Turkabad Kharadi	KT Weir	19.79758	75.16435
AFARM	Turkabad Kharadi	CNB - New	19.80370	75.18773
AFARM	Turkabad Kharadi	CNB - Repair	19.80682	75.18878
AFARM	Turkabad Kharadi	CNB - Repair	19.80882	75.18800
AFARM	Wanjarwadi	NDW	19.90374	75.21332
AFARM	Wanjarwadi	NDW	19.89810	75.21685
AFARM	Wanjarwadi	NDW	19.89722	75.21328
AFARM	Wanjarwadi	NDW	19.90692	75.20877
AFARM	Wanjarwadi	NDW	19.90348	75.20702
AFARM	Wanjarwadi	NDW	19.90412	75.20781
AFARM	Wanjarwadi	NDW	19.91195	75.21286
AFARM	Wanjarwadi	CNB - New	19.90692	75.20877
AFARM	Wanjarwadi	CNB - New	19.91195	75.21286
AFARM	Wanjarwadi	CNB - New	19.90348	75.20702
AFARM	Wanjarwadi	CNB - New	19.90412	75.20781
AFARM	Wanjarwadi	ENB	19.90374	75.21332
AFARM	Wanjarwadi	ENB	19.90374	75.21332
AFARM	Wanjarwadi	NDW	19.90914	75.21053
AFARM	Fatulabad	NDW	19.91170	75.15031
AFARM	Fatulabad	NDW	19.91043	75.15158
AFARM	Fatulabad	NDW	19.91072	75.15201
AFARM	Fatulabad	NDW	19.91221	75.15376
AFARM	Potul	NDW	19.92571	75.12857
AFARM	Potul	NDW	19.91189	75.13223
AFARM	Potul	NDW	19.91633	75.13136
AFARM	Potul	NDW	19.92923	75.13289
AFARM	Potul	NDW	19.93091	75.13376
AFARM	Potul	NDW	19.93091	75.13376
AFARM	Potul	NDW	19.92089	75.13073
AFARM	Potul	NDW	19.92755	75.13110
AFARM	Potul	CNB - New	19.91622	75.13064
AFARM	Potul	CNB - New	19.91991	75.13090
AFARM	Potul	CNB - New	19.92748	75.13086
AFARM	Potul	Recharge Shaft	19.91633	75.13136
AFARM	Potul	Recharge Shaft	19.91633	75.13136
AFARM	Potul	Recharge Shaft	19.91633	75.13136
AFARM	Potul	Recharge Shaft	19.91633	75.13136

Organisation	Village	Type of Activity	Latitude	Longitude
AFARM	Potul	Recharge Shaft	19.92748	75.13086
AFARM	Potul	NDW	19.91189	75.13223
AFARM	Ranjangaon pol	NDW	19.89596	75.11482
AFARM	Ranjangaon pol	PT	19.89999	75.11514
AFARM	Ranjangaon pol	CNB - New	19.89605	75.11481
AFARM	Ranjangaon pol	PT	19.89999	75.11514
AFARM	Ranjangaon pol	PT	19.89999	75.11514
AFARM	Shahanawazpur	Farm Pond	19.92933	75.11087
AFARM	Shahanawazpur	NDW	19.92976	75.11071
AFARM	Shahanawazpur	NDW	19.90402	75.09175
AFARM	Shahanawazpur	Recharge Shaft	19.92976	75.11071
AFARM	Shahanawazpur	Recharge Shaft	19.90402	75.09175
AFARM	Shahanawazpur	Recharge Shaft	19.90402	75.09175
AFARM	Shahanawazpur	Recharge Shaft	19.92976	75.11071
AFARM	Shahanawazpur	Recharge Shaft	19.92976	75.11071
AFARM	Shahanawazpur	Recharge Shaft	19.92976	75.11071
AFARM	Shahanawazpur	Recharge Shaft	19.90402	75.09175
AFARM	Shahanawazpur	Recharge Shaft	19.90402	75.09175
AFARM	Shahanawazpur	Recharge Shaft	19.90402	75.09175
AFARM	Shahanawazpur	Recharge Shaft	19.90402	75.09175
AFARM	Shahanawazpur	Recharge Shaft	19.90402	75.09175
AFARM	Taklichiwadi	NDW	19.94786	75.12613
AFARM	Taklichiwadi	PT	19.94961	75.12699
AFARM	Umarpur	NDW	19.90142	75.13274
AFARM	Umarpur	NDW	19.90981	75.13439
AFARM	Umarpur	NDW	19.90799	75.13169
AFARM	Umarpur	NDW	19.90374	75.13188
AFARM	Umarpur	CNB - New	19.90374	75.13188
AFARM	Umarpur	CNB - New	19.90799	75.13169
AFARM	Warzadi	NDW	19.95118	75.14008
AFARM	Warzadi	NDW	19.96035	75.12695
AFARM	Warzadi	NDW	19.96215	75.12708
AFARM	Warzadi	PT	19.95526	75.13510
AFARM	Fatulabad	CNB - New	19.91236	75.15377
AFARM	Fatulabad	CWG	19.91005	75.15254
AFARM	Warzadi	PT	19.96639	75.13582
AFARM	Warzadi	PT	19.96399	75.14429
AFARM	Warzadi	CWG	19.95118	75.14008
AFARM	Warzadi	Farm Pond	19.95514	75.13787

ANNEXURE 2

AQUIFER TYPES



ANNEXURE 3

GROUND WATER DATA FROM NGO PARTNERS

Month	Overall	AFARM	AFPRO	BAIF	IBGVS	MGVS	DSC	SPARSH
Jun-17	16.63291	18.4859	14.58687	10.69306	17.82977		16.94432	
Jul-17	16.26051	17.0063	14.74356	10.21412	17.82977		16.94432	
Aug-17	15.89246	15.97236	14.09885	10.08629	17.82977		16.94432	
Sep-17	15.99119	15.97269	14.48917	10.42153	17.82977		16.94432	
Oct-17	15.91418	16.0541	13.77258	10.6804	17.82977		16.94432	
Nov-17	15.07609	16.14039	14.54373	10.82194	15.79072		16.36963	
Dec-17	15.28061	16.60187	14.73175	11.08952	16.01258		14.60358	
Jan-18	15.78315	17.30227	14.91724	10.10798	16.53142		15.00358	
Feb-18	16.13479	17.84025	14.97115	10.4525	16.72761		15.40358	
Mar-18	16.51477	17.97279	15.98083	10.60847	16.8196		15.50358	
Apr-18	16.62765	18.13107	16.29189	10.67028	16.86864		15.50358	
May-18	16.62098	18.09931	16.29604	10.27359	16.91076		15.73273	
Jun-18	16.69555	18.13702	16.3129	10.57145	16.95413		15.95796	
Jul-18	15.50553	16.69937	14.05222	9.815423	16.06409		15.9358	
Aug-18	15.01052	16.20999	14.20889	9.682651	15.42218		14.55511	
Sep-18	15.05038	16.07885	14.39571	9.491008	15.62163		14.78352	
Oct-18	15.16348	16.10001	14.42797	9.644355	15.78725		15.1284	
Nov-18	15.17444	16.44153	13.33897	9.762581	15.92178		15.36963	
Dec-18	15.36046	16.62517	13.66385	9.907863	16.17475		15.65383	
Jan-19	15.8186	16.82288	15.05846	10.15556	16.86158		15.67173	
Feb-19	16.04574	17.11898	15.06166	10.91272	16.98911		15.80602	
Mar-19	16.07413	17.19947	14.86218	11.01964	17.13002		15.57515	
Apr-19	16.2723	17.34318	15.35987	11.54101	17.14388		15.87414	
May-19	16.44105	17.36081	15.88693	11.99407	17.14754		15.97938	
Jun-19	16.10688	17.2031	15.93713	11.76859	17.15451	0.277391	15.85558	
Jul-19	15.56118	17.31602	16.54885	10.78943	15.61434	0.348696	15.14322	
Aug-19	15.14828	16.84152	16.44286	9.884798	14.79275	3.06913	14.80938	
Sep-19	14.7353	16.00015	16.00323	9.444855	14.64434	4.722174	14.25667	
Oct-19	14.41852	15.58738	16.04686	8.134355	14.7935	3.752174	13.4587	
Nov-19	14.2605	15.71996	16.07115	7.933548	14.79892	2.902609	12.35138	13.65
Dec-19	13.15947	15.16932	12.87619	8.591613	13.02254	2.354783	12.22696	13.86173
Jan-20	13.50751	15.523	11.01615	9.742177	14.02072	2.95913	13.06469	14.10765
Feb-20	13.91775	16.18292	10.32401	10.47444	14.5	2.95913	13.47667	14.35867

Month	Overall	AFARM	AFPRO	BAIF	IBGVS	MGVS	DSC	SPARSH
Mar-20	14.28585	16.56471	11.95991	11.11508	14.50964	0.848261	13.79832	14.71327
Apr-20	14.41203	16.43971	12.63387	11.605	14.51155	0.277391	14.1599	15.28357
May-20	14.42773	16.14156	12.15853	12.86661	14.51303	0.348696	14.2333	16.34756
Jun-20	14.38114	15.66726	11.00691	12.45274	15.42309	0.562609	14.20179	15.32653
Jul-20	9.755855	11.79976	7.473272	8.679274	6.809025	7.867826	12.33864	14.00612
Aug-20	7.548825	9.349312	5.364055	6.890806	4.173814	8.950435	10.91253	13.11888
Sep-20	6.125983	7.931561	3.3447	5.522581	2.986949	11.15043	8.431204	12.19184
Oct-20	5.247161	6.359467	2.800991	2.585645	2.846589	10.53522	8.929444	11.53724
Nov-21	5.501639	6.182822	3.349032	3.729032	3.431144	8.904783	9.05779	11.62806
Dec-21	6.33661	7.110027	4.57894	3.990645	4.446605	7.23087	9.751852	11.74082
Jan-21	7.318161	8.136312	6.028249	5.681855	5.664746	5.543913	9.541019	11.9348
Feb-21	9.135047	8.85904				5.800435	9.105494	12.11653
Mar-21	11.24193	11.52013				2.722174		12.39551
Apr-21	12.15048	12.68736				1.787391		12.96302
May-21	12.71124	13.18658				1.43087		13.91327
Jun-21	12.86181	13.2347				6.348261		13.29663
Jul-21	11.61871	11.62628				7.265652		12.61735
Aug-21	9.965919	9.479765				8.348261		11.82388
Sep-21	5.784916	6.325738				10.47		3.040816
Oct-21	5.208947	5.949663				11.43522		4.449918
Nov-21	6.860644	6.968752				10.17435		5.754082
Dec-21	7.530835	7.799558				9.47		6.258163
Jan-22	8.187613	8.372819				9.083043		7.414286
Feb-22	8.245786	8.184013				9.448261		8.152041
Mar-22	9.600788	10.16328				7.543913		8.62449
Apr-22	11.14324	12.09247				7.335217		9.140816
May-22	12.19883	13.30435				7.161304		10.00816
Jun-22	11.49931	12.10334				7.161304		10.67449
Jul-22	10.85145	11.24381				9.491739		9.973469
Aug-22	8.170429	7.784348				10.87652		8.713265
Sep-22	6.129714	5.404415				11.69826		7.035714
Oct-22	4.264286							4.264286
Nov-22	1.561224							1.561224

GROUND WATER DATA FROM CGWB

Well name	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water	Date	Depth to water
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ANNEXURE 4

RAINFALL

Monthly rainfall (in mm) trends for Aurangabad from 01-Jan-2018 to 31-Mar-2024

Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)
Jan-17		0.00	Nov-18	24.8	11.03	Sep-20	153.4	197.37	Jul-22	172.8	247.29
Feb-17		0.00	Dec-18	10.3	0	Oct-20	56.9	65.44	Aug-22	175.9	84.34
Mar-17		0.00	Jan-19	2.7	0	Nov-20	24.8	1.45	Sep-22	153.4	255.34
Apr-17		0.00	Feb-19	2.5	0	Dec-20	10.3	1.33	Oct-22	56.9	132.92
May-17		2.44	Mar-19	4.6	0	Jan-21	2.7	12.03	Nov-22	24.8	0
Jun-17		149.79	Apr-19	3.5	0.94	Feb-21	2.5	2.27	Dec-22	10.3	7.04
Jul-17		86.36	May-19	18.9	0	Mar-21	4.6	5.84	Jan-23	2.7	3.14
Aug-17		165.79	Jun-19	134.6	110.63	Apr-21	3.5	4.66	Feb-23	2.5	0
Sep-17		182.62	Jul-19	172.8	162.87	May-21	18.9	30.6	Mar-23	4.6	9.83
Oct-17		95.61	Aug-19	175.9	106.42	Jun-21	134.6	132.15	Apr-23	0	39.76
Nov-17		2.83	Sep-19	153.4	213.73	Jul-21	172.8	142.21	May-23	0	9.41
Dec-17		2.27	Oct-19	56.9	193.39	Aug-21	175.9	186.88	Jun-23	134.6	43.71
Jan-18	2.7	0	Nov-19	24.8	37	Sep-21	153.4	454.42	Jul-23	172.8	173.41
Feb-18	2.5	0.72	Dec-19	10.3	1.46	Oct-21	56.9	106.39	Aug-23	175.9	46.79
Mar-18	4.6	0.53	Jan-20	2.7	0.12	Nov-21	24.8	15.3	Sep-23	153.4	220.1
Apr-18	3.5	2.01	Feb-20	2.5	0	Dec-21	10.3	6.89	Oct-23	56.9	0.85
May-18	18.9	0.17	Mar-20	4.6	22.92	Jan-22	2.7	0.2	Nov-23	24.8	54.85
Jun-18	134.6	126.39	Apr-20	3.5	2.42	Feb-22	2.5	0	Dec-23	10.3	14.13
Jul-18	172.8	85.65	May-20	18.9	6.26	Mar-22	4.6	4.91	Jan-24	0	2.44
Aug-18	175.9	180.45	Jun-20	134.6	251.86	Apr-22	3.5	0	Feb-24	0	2.25
Sep-18	153.4	29.42	Jul-20	172.8	91.32	May-22	18.9	0	Mar-24	0	0.1
Oct-18	56.9	1.65	Aug-20	175.9	221.91	Jun-22	134.6	140.36			

ANNEXURE 5

REGRESSION & CORRELATION

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.028569498
R Square	0.000816216
Adjusted R Square	-0.013457838
Standard Error	3.542306917
Observations	72

Correlation	*Column 1*	*Column 2*
Column 1	1	
Column 2	0.028569498	1

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.717513774	0.717513774	0.057181806	0.811705719
Residual	70	878.3556808	12.5479383		
Total	71	879.0731946			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.29983462	0.520525671	19.7873711	2.20591E-30	9.261678903	11.33799033	9.261678903	11.33799033
X Variable 1	0.001100177	0.004600801	0.239127175	0.811705719	-0.008075832	0.010276186	-0.008075832	0.010276186

ANNEXURE 7

PHOTOS

बजाज जलसंधारण प्रकल्प

CHAPTER 9
RECOMMENDATIONS

PROMOTE ADOPTION OF MICRO IRRIGATION SYSTEM THROUGH LOCALISED TRAINING

Expand access to proven water-efficient techniques such as drip irrigation and sprinkler systems, showing a complete adoption rate (6.8% to 98.1%) during the project. Focus on localised demonstration plots to further encourage uptake and effectiveness.

EXPAND CLIMATE-RESILIENT CROPPING DEMONSTRATIONS

Building upon the success of climate-resilient practices adopted by farmers (e.g., crop rotation, drought-resistant seed varieties). Expand these demonstrations to include adaptive crops, low-water-use plants, and organic soil amendments, as observed during the project interventions.

FACILITATE ACCESS TO IRRIGATION INFRASTRUCTURE

Encourage the replication of successful interventions such as Nala deepening, Cement Nala Bunds (CNBs), and recharge shafts, which collectively improved soil moisture across 5,781 hectares and assured irrigation for 53.2% of the land. Highlight these interventions in capacity-building sessions and through collaboration with local governments.

10. SUSTAINABILITY

A thorough evaluation of the Bajaj Water Conservation Project (BWCP) reveals that it has created a self-reinforcing cycle of development in the community. The enhanced community governance mechanisms and continuous skill development created a self-sustaining environment where sustainable practices are embedded in everyday life. As a result, the project's footprint endures in the improved resilience of local agriculture and the empowered local institutions managing vital resources. The key drivers of sustainable change:

1. Community Ownership Through Participatory Governance
BWCP's core strength lies in its emphasis on community-led management. By establishing VDCs, WUGs, and SHGs, the project has transferred the ownership of water management directly to the community. Findings from the study show that these groups are active in implementing water governance protocols and have also taken charge of maintaining infrastructure like reservoirs and recharge shafts. This participatory model has reduced the community's dependence on the implementing agency for sustaining improved water availability outcomes, making the community resilient to seasonal challenges.

2. Capacity Building for Climate-Resilient Agriculture
The project's training initiatives have equipped farmers with skills to adopt sustainable agricultural practices. The training sessions on micro-irrigation, crop rotation, vermicomposting, and water budgeting equipped farmers to maximize their resources effectively. This capacity development led to outcomes such as increased crop yields, enhanced soil health and reduced reliance on erratic rainfall. The improved agricultural productivity boosted local incomes and reinforced the community's ability to manage resources independently, ensuring long-term sustainability.

CHAPTER 11
CONCLUSION

In conclusion, this project has successfully strengthened the capabilities of water-centric Community-Based Organisations (CBOs), empowering them to adopt sustainable water management practices. Through targeted training and resource support, local CBOs have notably enhanced their capacity to tackle water-related challenges effectively.

Additionally, substantial efforts were made to improve soil moisture retention for rainfed crops by implementing robust soil conservation and runoff control measures. These initiatives have bolstered crop resilience against climate variability, fostering greater agricultural stability. The project also aimed to mitigate climate change impacts by encouraging climate-resilient agricultural practices. By equipping farmers with the knowledge and resources needed to embrace these methods, the project promotes a sustainable agricultural ecosystem adaptable to changing climates.

Bajaj's support has been invaluable in this transformative journey, showcasing a profound commitment to strengthening sustainable water and agricultural infrastructure. By fostering a collaborative approach, the project not only addresses immediate water scarcity and agricultural challenges but also contributes to the long-term resilience of local communities. This initiative aligns with a shared vision of promoting environmental equity and enhancing the quality of life for the community.

IMPACT ASSESSMENT REPORT

BAJAJ WATER CONSERVATION PROJECT (BWCP)

Implementing partner – Action for Food Production (AFPRO)

Release Date: 31-12-2024

SoulAce
Path to Sustainability
SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

FY	Financial Year
CSR	Corporate Social Responsibility
SDGs	Sustainable Development Goals
VDC	Village Development Committee
SHG	Self-Help Group
WUGs	Water User Groups
OECD	Organisation for Economic Cooperation & Development

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The Bajaj Water Conservation Project (BWCP), launched in November 2017 in collaboration with AFPRO, aimed to address critical water and agricultural challenges in Gangapur Taluka, Aurangabad. Spanning 22 villages, this five-year project covered a substantial rural area impacted by water scarcity, soil erosion, and limited access to sustainable agriculture practices. Bajaj Auto Ltd. supported this initiative through its CSR efforts, which were driven by a commitment to bring sustainable rural development. The key activities of the project included the construction of water storage infrastructure, soil conservation, the promotion of precision irrigation, and community-led water governance. This report details the achievements, including enhanced water availability, increased crop yields, and improved livelihood opportunities for over 5,000 rural households.

PROJECT DETAILS

Implementation year

FY 2017 - FY 2022

Assessment year

FY 2024 - FY 2025

Implementing Partner

Action for Food Production

Project location

Aurangabad District, Maharashtra

Beneficiaries

12,353 farmers, 5,027 Rural Households and 27,576 Population from 22 Villages from Gangapur Block,

Budget

₹1461.62 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

BASELINE AND ASSESSMENT

Completed household survey for 5,027 households covering over 27,576 individuals.

Conducted well inventory across 20 villages, with monthly monitoring.

WATER RESOURCE DEVELOPMENT

Nala Deepening and Widening:
Treated 79 sites across 15 villages, creating an additional water storage capacity of approximately 2,437.25 million litres.

Desiltation of Percolation Tanks:
Completed at 39 sites in 15 villages, adding an extra 4,024.26 million litres of storage capacity. Excavated silt, totalling 134,142 cubic meters, to enrich 540 hectares of agricultural land.

Farm Ponds:
Constructed 180 ponds across 20 villages, with a total storage capacity increase of 873.4 million litres.

Micro-Irrigation Systems:
Installed over 68 systems covering 21.06 hectares.

An additional 9,277 kg of Stylo hemata grass seeds were sown along Nala banks to reinforce soil stability.

VDC-WUG MEMBERS OF BUTTE WADGAON IN DISCUSSION WITH SOULACE DATA COLLECTORS

MALUNJA INTERVENTION SITE

Implemented bunding and other conservation techniques on over 1186 hectares, allowing rainfed Kharif crops to withstand days of dry spells.

AGRICULTURAL PRODUCTIVITY ENHANCEMENT

Formed 377 learner groups with 12,353 farmers, promoting knowledge of sustainable crop management.

Established 2,870 crop demonstration plots to showcase best practices in Integrated Pest Management (IPM), Integrated Nutrient Management (INM), and climate-resilient cropping.

Analysed 825 soil samples, providing farmers with soil health cards and tailored recommendations on nutrient management.

TRAINING AND CAPACITY BUILDING

Conducted 72 training sessions for 259 VDC members across 20 villages, focusing on water resource management, documentation, and financial management.

Supported 127 existing SHGs with 1,323 women members through 58 training sessions, promoting savings and income generation activities.

Held 94 training sessions for 1,615 WUG members, teaching them maintenance, water budgeting, and sustainable water use.

Organised 28 visits for 379 farmers to agriculture research centres and model villages, where participants learned modern techniques in crop production, soil conservation, and livestock management.

Key Findings

WATER ACCESSIBILITY AND MANAGEMENT

79.5%

of the households now face drinking water scarcity for only one month annually, compared to reliance on tankers by 91.3% pre-intervention.

79.2%

of the respondents joined Water User Groups, and 83.3% adhered to water governance protocols.

AGRICULTURAL PRODUCTIVITY

49.3%

of the farmers reported irrigation for 0.25–0.5 hectares during the Kharif season, compared to limited access pre-intervention.

Cotton yields above 5 quintals per acre rose from 22.3% to 66.9%, and maize yields of 3.0–4.0 metric tons increased from 10.1% to 56.3%.

Farmers cultivating 0.25–0.5 hectares of orchards increased from 36.7% to 51.9%.

75.0%

of the farmers adopted drip irrigation, 44.3% practised crop rotation and 35.2% grew drought-resistant crops.

Farmers cultivating more than two crops annually rose from 1.9% to 48.5%.

Key Impact

Improved water accessibility, reducing drinking water scarcity to just one month annually for 79.5% of the households while raising groundwater levels from 25–30 feet to 15–20 feet.

Enhanced water storage capacity by 6.46 billion litres, benefiting 5,027 households.

Strengthened agricultural resilience, with protective irrigation covering 49.3% of the farmers for 0.25–0.5 hectares and cotton yields increasing by 200%, with 66.9% of farmers achieving yields above 5 quintals per acre.

Accelerated economic growth, as annual agricultural income grew by 10–30% for 83.7% of respondents, with 19.7% reporting a 25–30% increase.

Diversified livelihoods, with 51.9% of the farmers expanding orchard cultivation to 0.25–0.5 hectares and vegetable farming.

Strengthened community governance, with 79.2% participation in Water User Groups and 56.8% involvement in Village Development Committees.

Enhanced climate resilience, with 75.0% adopting drip irrigation, 44.3% practising crop rotation, and 35.2% growing drought-resistant crops.

Increased land productivity, with 50.0% of the respondents reporting an increase in cultivable land by 0.25–0.5 hectares during the Rabi season.

03. OECD FRAMEWORK

RELEVANCE

The Bajaj Water Conservation Project (BWCP) addresses critical water and agricultural challenges in Gangapur Taluka, aligning with the needs of the local community suffering from water scarcity and agricultural limitations. The project is relevant not only to the immediate context of the beneficiaries—over 12,000 farmers and 5,000 rural households—but also to broader objectives of sustainable rural development. By focusing on both water resource management and agricultural productivity, the project is strategically positioned to enhance the livelihoods of the rural population.

COHERENCE

The project aligns with several Sustainable Development Goals (SDGs):

Additionally, the project complements state and national initiatives such as:

- Jalyukta Shivar Abhiyan
- Jal Jeevan Mission
- Pradhan Mantri Krishi Sinchai Yojana

EFFECTIVENESS

BWCP has effectively achieved its objectives, as evidenced by the significant improvements in water availability and agricultural productivity. The reduction in reliance on water tankers and the reduction in water scarcity experienced by 79.5% of the survey population highlights the project's success in improving local water management. Moreover, the increase in cropping intensity and average cotton production showcases the project's effectiveness in enhancing agricultural practices, directly impacting the livelihoods of farmers.

EFFICIENCY

The project's implementation over five years reflects the efficient use of resources allocated to multiple interventions. Key outputs, such as the construction of farm ponds and the establishment of micro-irrigation systems, illustrate effective project management and resource allocation.

The high participation rates in community-led activities, such as nala deepening and widening, further demonstrate the project's efficiency in engaging beneficiaries in its implementation.

IMPACT

The project's impact is profound, with tangible improvements in community well-being and agricultural resilience. Key impacts include reduced water scarcity days, increased groundwater levels, diversified agricultural practices & yields, contributing to enhanced food security and economic stability for rural households. The expansion of areas under protective irrigation and Rabi irrigation demonstrates a long-term positive effect on crop production, which is crucial for the region's economic development.

SUSTAINABILITY

The project demonstrates sustainability with increased awareness and capacity building through extensive training and community engagement. This multifaceted approach aimed to create a self-sustaining model for water conservation, reduce dependence on external resources, and build long-term resilience against climate change, benefiting thousands of rural families in Gangapur Taluka.

CHAPTER 4
INTRODUCTION

Focused Group Discussion with Gram Panchayat members of Butte Wadgaon

BACKGROUND AND NEED OF THE PROGRAM

The Bajaj Water Conservation Project (BWCP), a collaboration between Bajaj Auto Ltd. and Action for Food Production (AFPRO), was initiated in November 2017 with a primary objective of addressing water scarcity, improving agricultural productivity, and uplifting socio-economic conditions in rural Aurangabad, Maharashtra. The project focused on 22 villages across Gangapur Taluka, covering 12,669 hectares and benefiting 5,027 households.

The rationale behind the project was the pressing need for sustainable water management solutions in the region, where farming depends heavily on seasonal rainfall. Low water availability affected both drinking and irrigation needs, leading to financial hardships among smallholder and marginal farmers. By introducing effective water conservation practices and improved irrigation infrastructure, the BWCP aimed to enhance agricultural resilience and ensure water security for the local population.

With the support of Bajaj Auto Ltd, AFPRO implemented a comprehensive strategy that included water resource development, soil and water conservation, and community-driven water management protocols. Special attention was given to creating a sustainable impact by training CBOs in water management, empowering women through SHGs, and promoting climate-resilient agricultural practices.

OBJECTIVES OF THE PROGRAM

To increase access to water resources for irrigation and drinking by developing and improving local water infrastructure.

To enhance agricultural productivity and resilience through climate-smart practices, efficient water use, and soil conservation.

To empower local communities, especially women, by building capacity and encouraging active participation in water management and sustainable agricultural practices.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – AFPRO

Action for Food Production (AFPRO), established in 1967, is a public charitable organisation focused on promoting sustainable development in rural communities across India. AFPRO works to improve water resource management, agricultural productivity, and livelihood opportunities, with a strong emphasis on community empowerment and environmental sustainability.

AFPRO's initiatives are multifaceted, covering soil and water conservation, climate-resilient agriculture, and capacity building for community-based organisations. Through its integrated approach, AFPRO aims to enhance the quality of life for rural populations by increasing access to safe water, supporting sustainable agriculture practices, and fostering local ownership of development initiatives. Their projects have benefited thousands, providing rural communities with tools for self-sufficiency, resource management, and resilience against climate change impacts.

INTERACTION WITH GP VDC

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited had appointed SoulAce to conduct a study on the work undertaken by Action for Food Production (AFPRO) and assess the impact of the water conservation initiative in enhancing agricultural productivity, water management, and sustainability outcomes.

OBJECTIVES OF THE STUDY

To evaluate the impact of community groups on sustainable water management in the region.

To examine improvements in agricultural practices, including irrigation coverage and cropping intensity.

To assess the influence of interventions on crop productivity and diversification, including orchard and vegetable cultivation.

MIXED METHODS APPROACH

The impact assessment study adopted a comprehensive mixed-methods strategy, blending quantitative and qualitative approaches to offer a more intricate understanding of the project's impact. Quantitative methods involve structured surveys administered to a sample of beneficiaries selected through simple random sampling. Qualitative methods included in-depth interviews conducted with farmers, Gram Panchayat members, and members of various community-based organisations. These methods aim to gather insights into the project's impact from diverse perspectives and to triangulate findings for robust assessment.

APPLICATION OF QUANTITATIVE TECHNIQUES

In the quantitative aspect, the study utilised structured surveys administered through stratified random sampling and purposive sampling. This approach ensures representative data collection and allows for statistical analysis to measure the project's effectiveness in providing financial support to students for continuing higher education without interruptions.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods include in-depth interviews conducted with key stakeholders. These interviews aim to gather detailed insights into operational improvements, challenges encountered, and overall perceptions of the process of the essential project. Qualitative data enriches the study by providing contextual understanding and personal viewpoints crucial for evaluating project impact.

ENSURING TRIANGULATION

The quantitative research findings were cross-validated with the insights derived from the qualitative research. The report was structured to reflect this triangulation, enhancing the reliability of the findings.

WATER INTERVENTION SITE

RESEARCH DESIGN

Name of the project

Bajaj Water Conservation Project

Implementing agency

Action for Food Production

Research design

Descriptive Research

Sampling technique

Stratified Random Sampling and Purposive Sampling

Sample size

264

Qualitative methods used

Semi-structured Questionnaire, Open-ended interviews, and Beneficiary Testimonials

KEY STAKEHOLDERS

- Farmers
- Households
- Community-Based Organisations
- Gram Panchayat
- AFPRO
- Bajaj Team

STUDY TOOLS

Questionnaires for primary beneficiaries:

Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys.

Questionnaires for stakeholders :

A semi-structured questionnaire was developed for each type of sample of this group. Stakeholders were identified across the focus areas. Semi-structured questionnaires and interviews were conducted with farmers and members of community groups – CBOs, SHGs and WUGs.

ETHICAL CONSIDERATIONS

The impact evaluation adhered to a strong ethical framework, ensuring responsible and ethical research practices. Participants' rights and well-being were prioritised at every stage of the study. Informed consent was obtained by clearly explaining the study's objectives, procedures, potential risks, and benefits, allowing participants to make fully informed decisions after addressing any questions. Confidentiality was strictly maintained, with data securely stored, accessible only to authorised personnel, and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of coercion, ensuring autonomy and respect for individual choice. Participants were consistently treated with respect, dignity, and fairness, with their well-being prioritised. Support or assistance was readily available whenever needed to ensure their comfort and safety throughout the research process.

CHAPTER 6
KEY STUDY FINDINGS AND IMPACTS

The chapter explores the partnership between Bajaj Auto Limited and AFPRO, focusing on their joint efforts to enhance water conservation in the region.

A survey among the primary beneficiaries was conducted to assess the impact of interventions on water availability and sustainable water management and to evaluate improvements in agricultural practices and crop productivity in the region. The findings are discussed along with key insights.

GEOGRAPHICAL COVERAGE

Aurangabad, Maharashtra

OUTREACH AND INCLUSIVITY

Farmers

DEMOGRAPHIC INFORMATION

CHART 1: AGE GROUP DISTRIBUTION

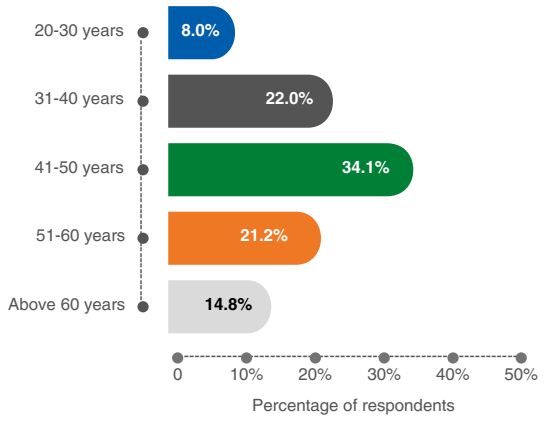
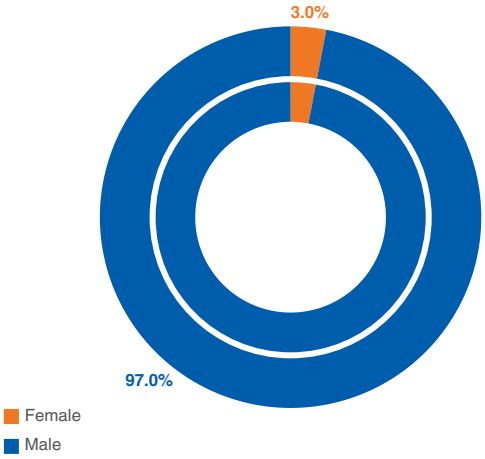


Chart 1 shows that the majority of the respondents (34.1%) fall within the 41-50 age bracket, 22% are aged 31-40, and 21.2% are aged 51-60. The youngest group, aged 20-30, comprises 8%, while 14.8% are over 60.

CHART 2: GENDER DISTRIBUTION



As the chart shows, 97% of respondents are male. Only 3% of respondents are female.

FGD WITH VILLAGERS

CHART 3: EDUCATION LEVELS

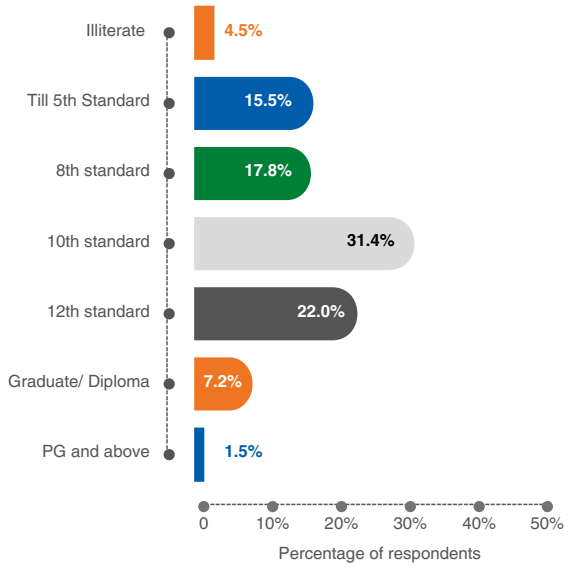


Chart 3 shows the education levels of the respondents.

Among the respondents, 31.4% reported completing education up to the 10th standard, 22% up to the 12th standard, and 17.8% till the 8th standard, while 15.5% have studied only till the 5th standard. Additionally, 7.2% are graduates or diploma holders, and 1.5% possess postgraduate education or above.

CHART 4: ANNUAL FAMILY INCOME

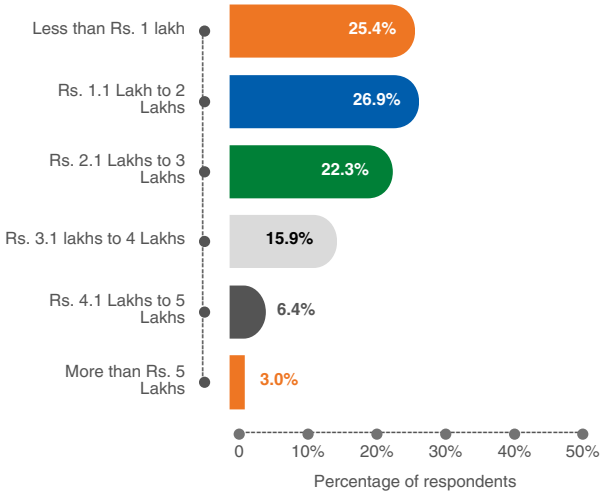


Chart 4 indicates the annual family incomes of the respondents as given below:

Among the respondents, 25.4% reported an annual family income of less than ₹1 lakh, while 26.9% fell within ₹1.1 to 2 lakhs. Those earning ₹2.1 to 3 lakhs constitute 22.3%, and 15.9% fall in the ₹3.1 to 4 lakhs bracket, reflecting moderate income levels. Families with incomes between ₹4.1 to 5 lakhs make up 6.4%, and those earning more than ₹5 lakhs represent 3%.

AGRICULTURAL PRACTICES AND LAND OWNERSHIP

CHART 5: LAND OWNERSHIP

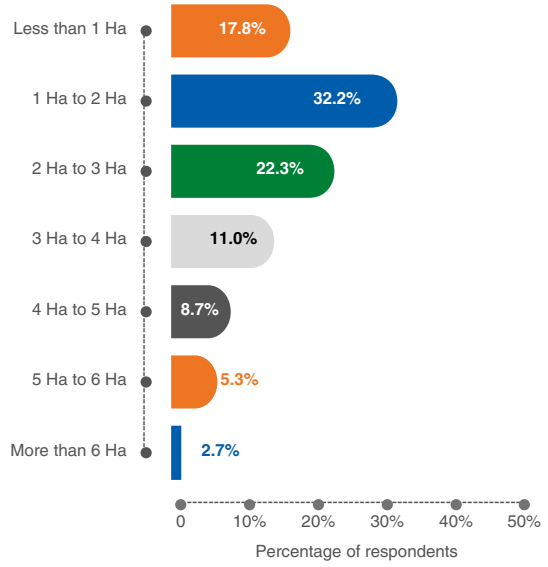


Chart 5 presents the varying levels of land holdings owned by the farmer respondents.

The majority of the respondents (32.2%) own between 1 to 2 hectares, while 17.8% have less than 1 hectare. Landholdings of 2 to 3 hectares and 3 to 4 hectares are owned by 22.3% and 11% of respondents, respectively. Additionally, 8.7% own between 4 to 5 hectares, 5.3% between 5 to 6 hectares, and 2.7% own more than 6 hectares.

CHART 6: MAJOR CROPS

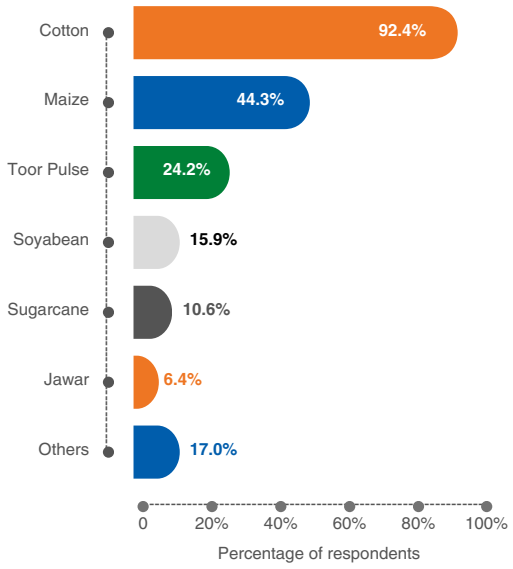


Chart 6 indicates the diversity of cropping patterns in the areas as suggested by the respondents.

Cotton is the dominant crop, grown by 92.4% of respondents, followed by maize, reported as a major crop by 44.3%. Other crops include Toor Pulse (24.2%), soybeans (15.9%), sugarcane (10.6%), and jowar (6.4%), indicating crop diversity.

SHEKTA WATER INTERVENTION SITE

WATER ACCESSIBILITY AND MANAGEMENT

CHART 7: WATER SCARCITY FOR IRRIGATION PURPOSES BEFORE INTERVENTION

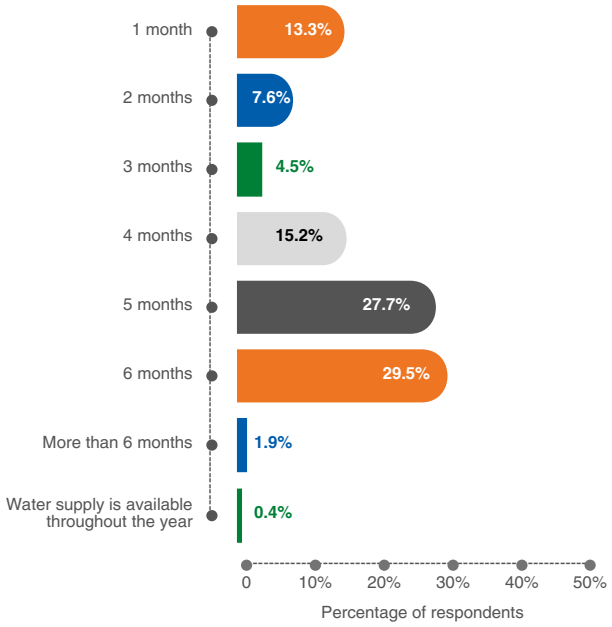
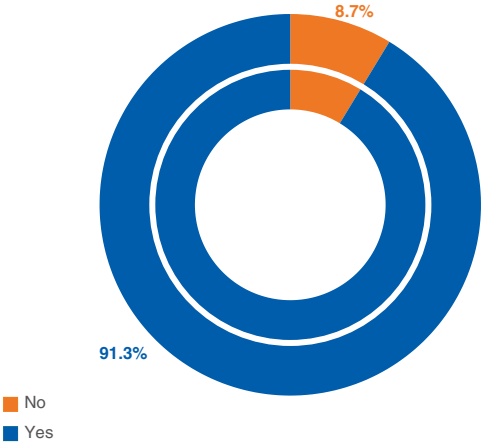


Chart 7 shows that before the intervention, only 13.3% of respondents experienced irrigation water scarcity for 1 month. 7.6% faced scarcity for 2 months, while 4.5% experienced it for 3 months. A significant number of respondents faced longer periods of scarcity, with 15.2% experiencing it for 4 months, 27.7% for 5 months, and 29.5% for 6 months.

Only 1.9% of respondents reported having water scarcity for more than 6 months, and a mere 0.4% had access to water supply throughout the year. These statistics reflect the severe challenges that existed prior to the intervention, emphasising the critical need for improved water management solutions.

CHART 8: DEPENDENCE ON WATER TANKERS FOR DRINKING WATER BEFORE INTERVENTION



As Chart 8 shows, the majority of the respondents (91.3%) were dependent on water tankers for their drinking water, while 8.7% were not before the intervention. This dependency shows the dire need for improved infrastructure and systems to ensure consistent access to drinking water.

> The community's dependence on water tankers has significantly decreased since we started managing our water resources more effectively. With the introduction of tap water in our village, we are witnessing a major shift. It's rewarding to see how our engagement and efforts as Gram Panchayat members have led to such positive changes for everyone.
>
> **- Ayub Yakub Beg, Gram Panchayat Member, Shiregaon**

CHART 9: DRINKING WATER SCARCITY AFTER INTERVENTION

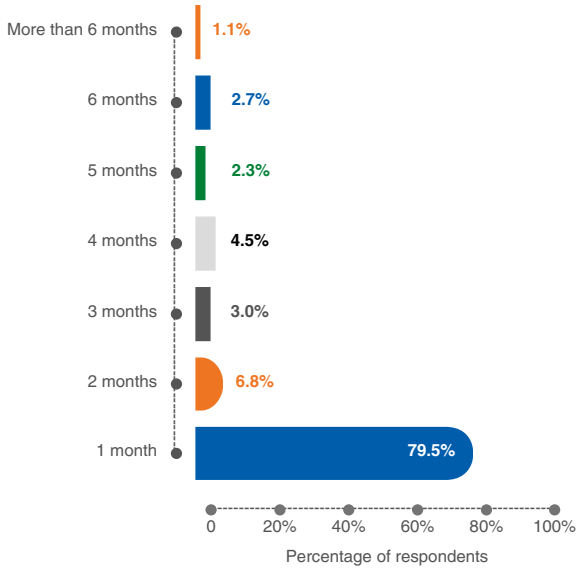


Chart 9 shows a reduction in the percentage of respondents experiencing water scarcity after the intervention. 79.5% reported facing drinking water scarcity for only 1 month a year, indicating that the measures implemented have effectively reduced the duration of water scarcity for most of the community. In contrast, 6.8% experienced scarcity for 2 months, 3.0% for 3 months, 4.5% for 4 months, 2.3% for 5 months, and 2.7% for 6 months. Only 1.1% faced scarcity for more than 6 months, demonstrating that most respondents now experience limited periods of water scarcity.

> Since we have implemented and maintained these water structures, the quality of water available to our community has improved significantly. As Gram Panchayat members, we are committed to ensuring our village has access to clean water year-round. It is fulfilling to see how our management practices lead to tangible benefits for our residents.
>
> **— Nitin Kahrle, Gram Panchayat Member, Shiregaon**

IMPACT ON CROP RESILIENCE AND YIELD

CHART 10: AREAS OF CLIMATE-RESILIENT CROPPING IN WHICH RESPONDENTS GAINED KNOWLEDGE

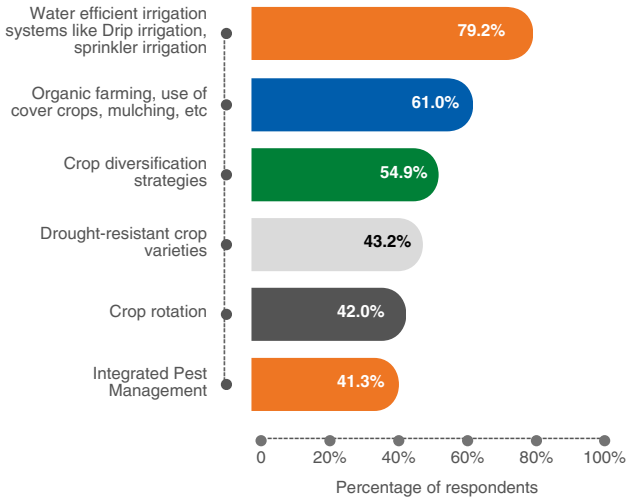


Chart 10 shows that the majority of respondents (79.2%) received training in water-efficient irrigation systems like drip irrigation and sprinkler systems. 61.0% learned organic farming methods like mulching. Training in climate-resilient cropping strategies equipped farmers to better manage water and implement practices that reduced vulnerability to climate variations, enhancing crop resilience. Among the respondents, 54.9% gained insights into crop diversification strategies, 43.2% learned about drought-resistant crop varieties, 42.0% were trained on crop rotation, and 41.3% were educated on integrated pest management techniques.

> "The installation and maintenance of water structures have transformed our village. We have adopted advanced irrigation techniques like drip and sprinkler methods, leading to improved income and living standards for everyone."
>
> **— Kokila Jadav, VDC Member, Buttewadgaon**

CHART 11: PRACTICES OF CLIMATE-RESILIENT CROPPING ADOPTED BY RESPONDENTS

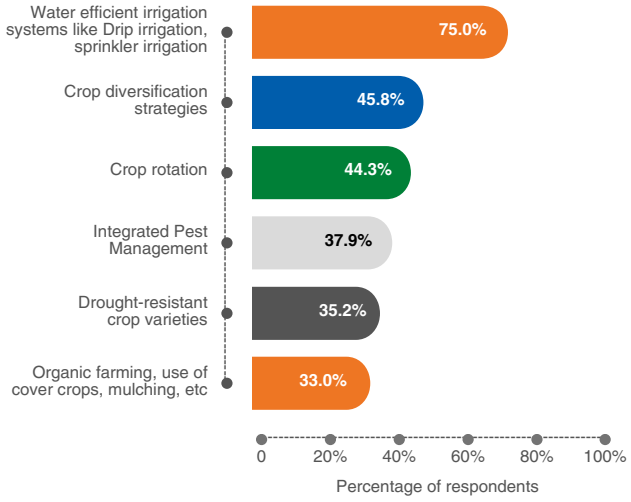


Chart 11 shows that the majority of the respondents (75.0%) reported adopting water-efficient irrigation systems, 45.8% embraced crop diversification, and 44.3% practised crop rotation. Additionally, 37.9% use integrated pest management, 35.2% incorporate drought-resistant crop varieties, and 33.0% practice organic farming with techniques like cover crops and mulching. These high adoption rates indicate a positive shift towards sustainable farming methods, improving long-term crop resilience and yield.

> "I have three acres of land where I primarily grow cotton and tur. I learned about soil testing through BSWP-AFPRO in our village. The process was simple; I submitted five samples from different parts of my farm. It took about 25 days to get the results, which provided valuable information on soil nutrients and how to apply fertilisers correctly. This helped me make better decisions on crop selection, and I have seen an increase in my production with reduced costs. Now, I plan to conduct soil tests every three years to keep my farming effective. Since following the soil test recommendations, I have noticed a significant improvement in crop yield and avoided wasting water and fertilisers. It has made a real difference in my income—about a 60% increase. I believe soil testing is essential for every farmer to enhance productivity and sustainability."
>
> **— Babasaheb Gote, Soil Testing Beneficiary, Shiregaon**

CHART 12: RESILIENCE OF KHARIF CROPS DURING DRY SPELLS

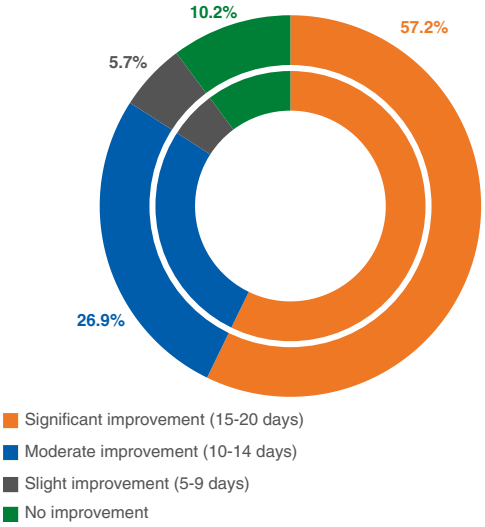


Chart 12 shows that 57.2% of respondents observed significant improvements in the resilience of their Kharif crops during dry spells, with an extension of 15-20 days, indicating a substantial positive impact of the interventions. Additionally, 26.9% noted moderate improvements (10-14 days), 5.7% experienced slight improvements (5-9 days), and 10.2% reported no improvement, suggesting that most respondents benefited from increased resilience.

CHART 13: AREA OF LAND RECEIVING PROTECTIVE IRRIGATION DURING KHARIF SEASON

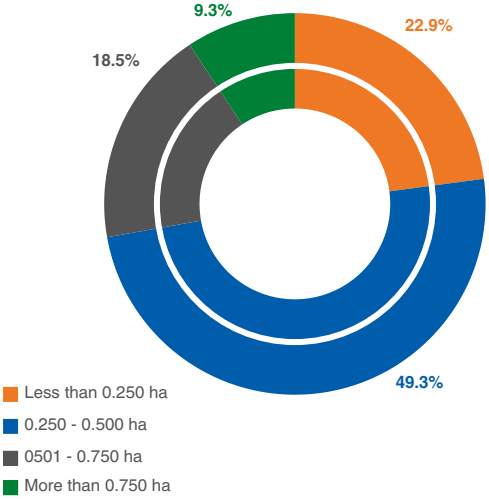


Chart 13 shows that land under protective irrigation increased after the CSR intervention during the Kharif season. 49.3% of respondents reported that between 0.250 and 0.500 hectares of their land received protective irrigation, while 18.5% indicated that between 0.501 and 0.750 hectares received this support, and 9.3% reported more than 0.750 hectares benefiting from protective irrigation, reflecting effective water management strategies.

CHART 14: ADDITIONAL CULTIVABLE LAND AFTER PROJECT INTERVENTION

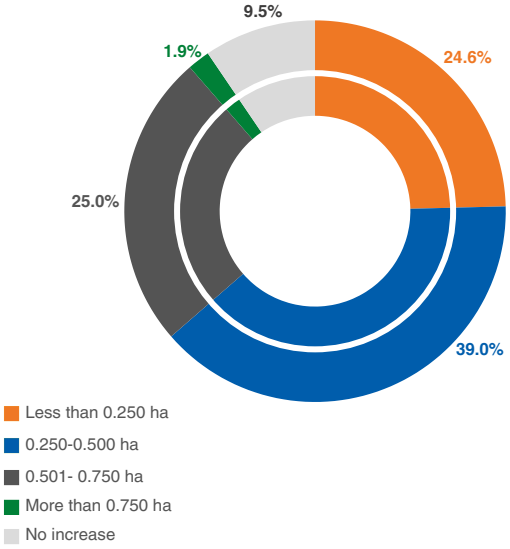


Chart 14 shows that 39.0% of respondents reported an increase in cultivable land of 0.250 to 0.500 hectares, indicating successful land development efforts. Furthermore, 24.6% saw increases of less than 0.250 hectares, 25.0% experienced increases of 0.501 to 0.750 hectares, and 1.9% reported increases of more than 0.750 hectares. However, 9.5% did not observe any increase in cultivable land.

CHART 15: INCREASE IN CULTIVABLE LAND AREA DURING RABI SEASON

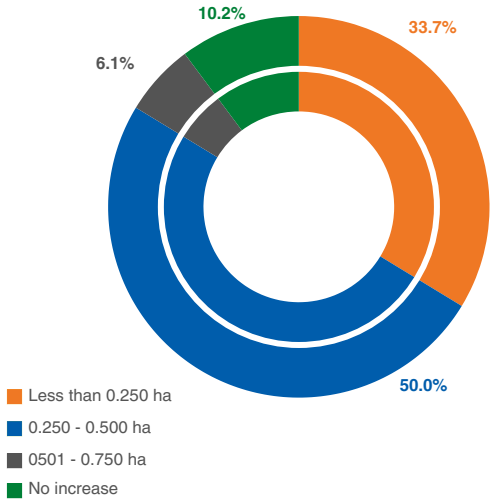


Chart 15 shows that during the Rabi season, 50.0% of respondents reported an increase in cultivable land between 0.250 and 0.500 hectares, reflecting effective cropping practices post-intervention.

Additionally, 33.7% noted increases of less than 0.250 hectares, and 6.1% noted increases in 0.501-0.750 hectares. 10.2% reported no increase at all.

FINDINGS FROM FGD CONDUCTED IN VADAGAV RAMPURI

Vadagav Rampuri is located in Gangapur Taluka, Aurangabad, a region historically characterised by water scarcity and dependence on rain-fed agriculture. BWCP, which was implemented in partnership with AFPRO, has introduced several initiatives to address these issues, including improved irrigation infrastructure, water storage development, and training in sustainable agricultural practices.

The FGD was conducted with farmers who have directly benefited from these interventions. The discussion explored three key themes: (1) Agricultural diversification, (2) Water resource management, and (3) Sustainability of interventions.

AGRICULTURAL DIVERSIFICATION

Farmers highlighted significant changes in cropping patterns, including a shift from traditional crops to maize, cotton, and tur, alongside the introduction of tomatoes and chilli as key vegetables. This diversification has improved household diets and increased agricultural income by 15-20%.

WATER RESOURCE MANAGEMENT

AFPRO's initiatives, such as the construction of farm ponds and percolation tanks, played a critical role in raising water levels from 25-30 feet to 15-20 feet below ground. Improved irrigation practices have also brought previously uncultivable land into production. However, participants noted irregular maintenance of water structures, which poses a risk to long-term water availability.

SUSTAINABILITY OF INTERVENTIONS

While the capacity-building sessions conducted by AFPRO under the BWCP equipped farmers with knowledge of integrated nutrient management and precision irrigation, limited technical support for fruit cultivation restricted further income diversification. Participants emphasised the need for regular maintenance mechanisms and enhanced technical support to sustain the program's benefits.

SOULACE TEAM MEMBERS INTERACTING WITH THE FARMER-BENEFICIARIES AND WUG MEMBERS

AGRICULTURAL PRACTICES AND CROP YIELD

CHART 16: PRIMARY METHOD OF IRRIGATION

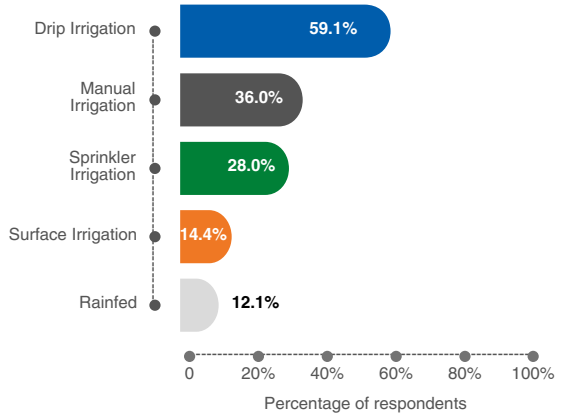


Chart 16 suggests that 59.1% of respondents use drip irrigation, followed by 36.0% who rely on manual irrigation. Sprinkler irrigation is used by 28.0%. 14.4% and 12.1% rely on surface irrigation and rainfed irrigation, respectively.

The prevalence of drip irrigation suggests an increase in water-use efficiency, potentially leading to more stable and enhanced crop yields.

> Implementing drip irrigation in our village has been a transformative step. We are now able to grow two crops a year, which is a significant increase in productivity. The training provided by BWCP-AFPRO helped us understand how to maximise our water resources, and seeing the results in our fields has been incredibly rewarding.
>
> **— Kyyum Aziz Sheikh, Gram Panchayat Member, Shekta**

CHART 17: CROPS FOR WHICH MICRO IRRIGATION WAS APPLIED

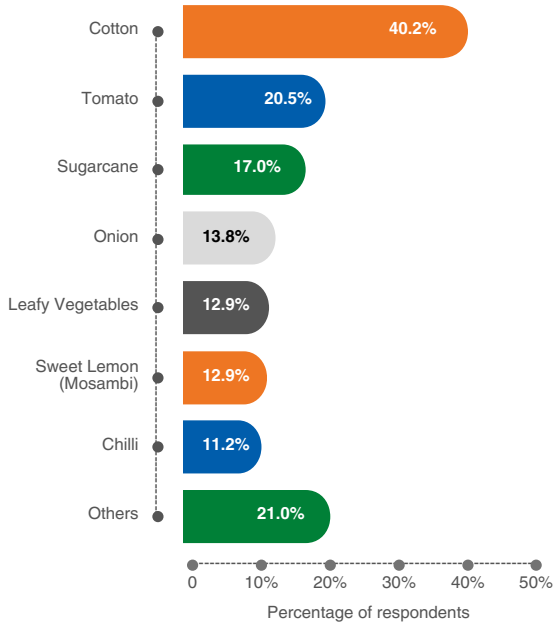
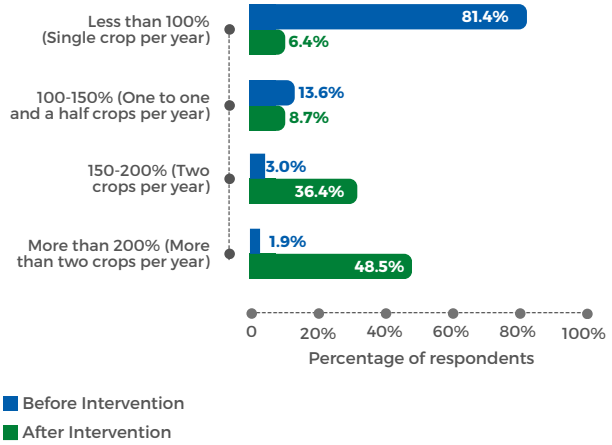


Chart 17 highlights that cotton (40.2%) and tomatoes (20.5%) are the primary crops benefiting from micro-irrigation, followed by sugarcane (17.0%). Micro-irrigation's application to key crops such as cotton and tomatoes demonstrates how water management practices for high-value or water-intensive crops maximised both water efficiency and yield.

Micro-irrigation was also applied for the cultivation of onion (13.8%), leafy vegetables (12.9%), sweet lemons (12.9%), chillis (11.2%) and others.

CHART 18: CROPPING INTENSITY



In Chart 18, it is revealed that before the intervention, 81.4% of respondents were practising less than 100% cropping intensity, as they were primarily cultivating a single crop per year.

After the intervention, this number significantly decreased to 6.4%, showing a major shift towards more diverse cropping practices.

Conversely, the percentage of respondents cultivating more than two crops per year increased from 1.9% before the intervention to 48.5% after, highlighting a substantial improvement in cropping intensity due to the efforts of the intervention.

CHART 19: YIELD OF COTTON

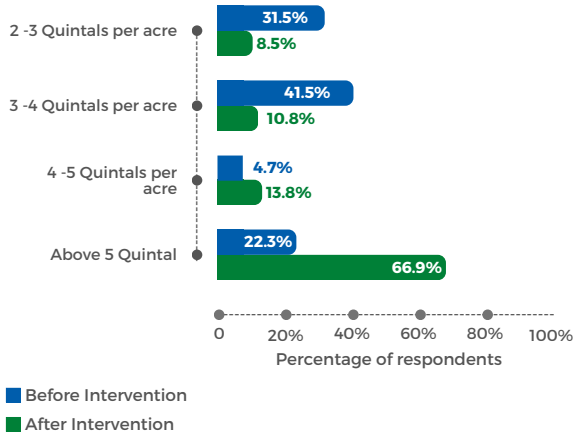


Chart 19 shows a significant improvement in cotton yields after the intervention. The percentage of respondents achieving yields above 5 quintals per acre surged from 22.3% to 66.9%, while those achieving yields between 4-5 quintals per acre increased from 4.7% to 13.8%. In contrast, 41.5% of respondents reported yields of 3-4 quintals per acre before the intervention, which dropped to 10.8%, and 31.5% reported yields of 2-3 quintals per acre, which fell to 8.5%. These decreases reflect a shift to higher yield categories as a result of the intervention.

CHART 20: YIELD OF MAIZE

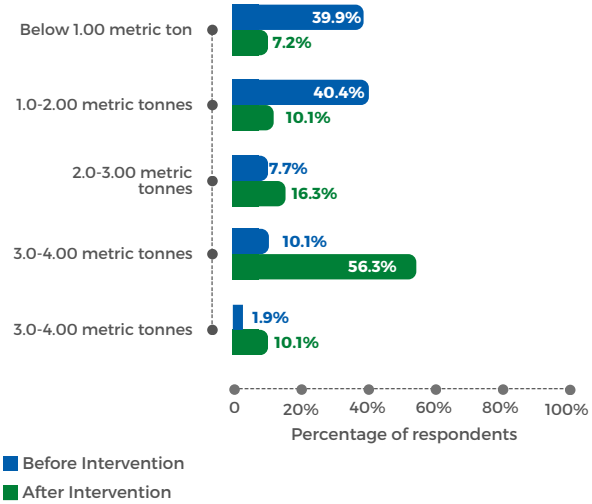


Chart 20 shows the comparisons drawn for the yield of maize before and after the intervention.

- The most notable improvement was seen in the 3.0-4.00 metric tonnes category, where the percentage rose from 10.1% before the intervention to 56.3% after.
- The trend followed through for the 2.0-3.00 metric tonnes and 4.0-5.00 metric tonnes categories, where the percentage rose from 7.7% to 16.3% and 1.9% to 10.1%, respectively.

Additionally, 39.9% of respondents initially reported yields below 1.00 metric tons, a figure that dropped to 7.2% after the intervention because of the effective cropping strategies. Similarly, 40.4% of respondents reported yields below 1.00 to 2.00 metric tonnes, which dropped to 10.1% after the intervention.

This reflects a significant enhancement in maize yield, emphasising the effectiveness of the intervention.

SOULACE TEAM DISCUSSING PROGRAM IMPACT WITH FARMER BENEFICIARY AT BUTTE WADGAON

CHART 21: AREA OF FARMLAND UNDER ORCHARD CULTIVATION

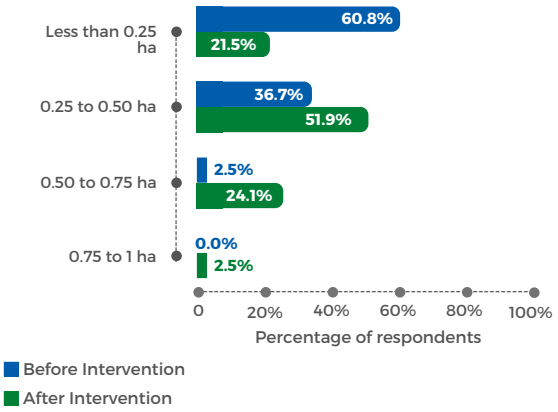
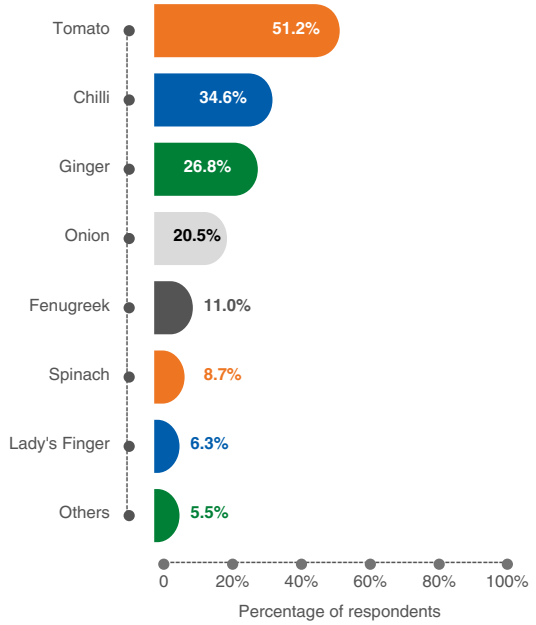


Chart 21 shows promising growth in the area of land under orchard cultivation.

Before the intervention, 60.8% of respondents cultivated less than 0.25 hectares, but this number decreased to 21.5% post-intervention.

Simultaneously, the percentage of those cultivating between 0.25 to 0.50 hectares increased from 36.7% to 51.9%. A similar trend followed for those cultivating between 0.50 to 0.75 hectares, as the percentage increased from 2.5% to 24.1%. There is also a notable increase for those cultivating between 0.75 to 1 hectare, as the percentage rose to 2.5% from 0. This shift illustrates the program's success in expanding orchard cultivation among respondents.

CHART 22: VEGETABLES CULTIVATED



This variety in vegetable cultivation in Chart 22 shows the diversity of agricultural practices adopted by respondents post-intervention and reflects a positive trend towards enhancing food security and nutritional diversity.

Among the vegetables cultivated, 51.2% of respondents reported growing tomatoes, making it the most popular choice. Other commonly cultivated vegetables included chillies (34.6%) and ginger (26.8%). Other choices of vegetables included Onions (20.5%), fenugreek (11.0%), spinach (8.7%), and lady's finger (6.3%).

ECONOMIC IMPACT OF AGRICULTURAL INCOME AFTER CSR INTERVENTION

CHART 23: INCREASE IN THE ANNUAL AGRICULTURAL INCOME

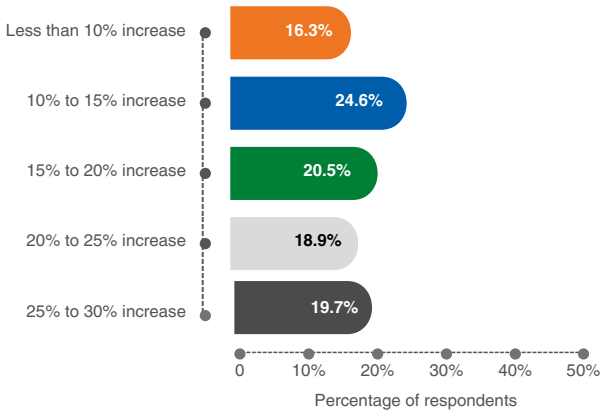


Chart 23 shows the varying levels of increase in annual agricultural income after the CSR intervention. The most common income boost was in the 10% to 15% increase category, with 24.6% of respondents experiencing this change. Additionally, 16.3% reported an increase of less than 10%, 20.5% saw an increase between 15% and 20%, 18.9% experienced an increase ranging from 20% to 25%, and 19.7% reported a rise between 25% and 30%. This distribution reflects the range of income benefits gained by the beneficiaries.

CHART 24: INCREASE IN ANNUAL INCOME FROM ORCHARD CULTIVATION

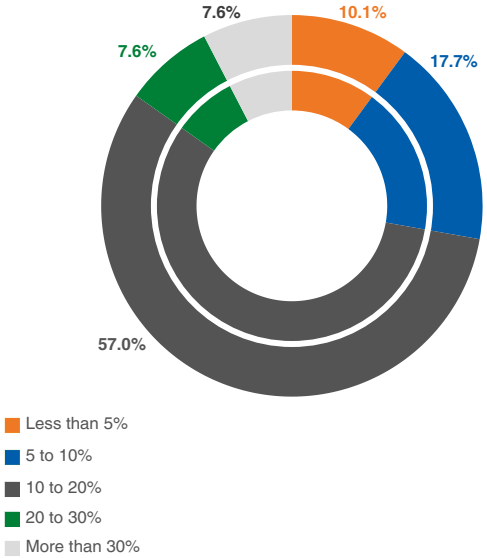


Chart 24 shows varying levels of income increase from orchard cultivation. The most significant impact was seen among 57.0% of respondents, who reported an income increase of 10% to 20%, reflecting the positive effects of improved practices and support. Additionally, 17.7% experienced an increase ranging from 5% to 10%, 10.1% reported less than a 5% increase, 7.6% saw an increase between 20% and 30%, and another 7.6% experienced an income rise of more than 30%. These results highlight the success of the intervention, particularly for orchard cultivators.

ASSESSMENT OF TRANSFORMED WATER RESOURCE AT MIRZAPUR WITH WUG MEMBERS

CASE STUDY
YOGITA JADHAV, SHG MEMBER, DEVALI

I have been part of the Laxmibai Mahila Bachat Gat for nine years. I got involved after the organisation came to our village, and I really wanted to be part of something that could help us women.

At first, it was tough to get everyone on board because many women were hesitant about joining. However, through meetings and support from AFPRO, we managed to form our group. We learned how to save money, manage loans, and keep track of our finances.

Being part of the SHG has changed my life. I now feel empowered to make decisions and support others in our community. We even started a home-based business together, which has helped us all. I have learned a lot about sheep farming and improved my agricultural practices, which has really boosted my income.

Now, I can take better care of my family and contribute to building a permanent house. Our SHG has truly made a difference in our lives.

INTERACTION WITH VDC WUG SHG

COMMUNITY ENGAGEMENT AND GOVERNANCE

CHART 25: WATER RESOURCE DEVELOPMENT ACTIVITIES IN THE COMMUNITY

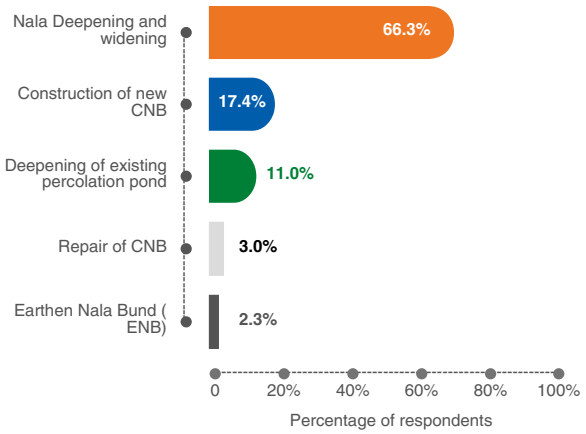


Chart 25 highlights community-led activities, including Nala deepening and CNB construction. The majority, 66.3%, reported Nala deepening and widening as the main community efforts, while 17.4% indicated the construction of new cement nala bunds (CNBs). Additionally, 11.0% noted the deepening of existing percolation ponds, 3.0% reported CNB repairs and 2.3% mentioned the use of earthen nala bunds (ENBs). These activities reflect strong community involvement in managing water resources, fostering sustainable access and local governance.

> "Our involvement with BWCP-AFPRO began when they provided vital information about water resource management in our village. We participated in the training voluntarily, learning about practical resource assessment techniques and the benefits of water retention. Through our training, we learned how to coordinate better with farmers. Our meetings focused on improving income through better water management practices, which has truly elevated our community's agricultural efforts. We hold monthly meetings to ensure everyone understands how to properly use water resource structures. This has helped clear misconceptions, and we emphasise the importance of retaining water without using motors."
>
> **— Shivaji Tivade, VDC Member, Buttewadgaon**

CHART 26: ADHERENCE TO WATER GOVERNANCE PROTOCOL

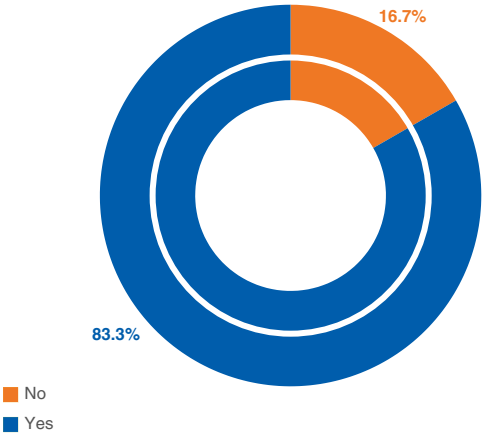


Chart 26 reveals that 83.3% of respondents follow the water governance protocols and surveillance mechanisms established by community institutions. In contrast, 16.7% of respondents reported that they do not follow these protocols. This minority indicates potential areas for further outreach and education.

CHART 27: FORMATION OF GROUPS UNDER THE PROJECT

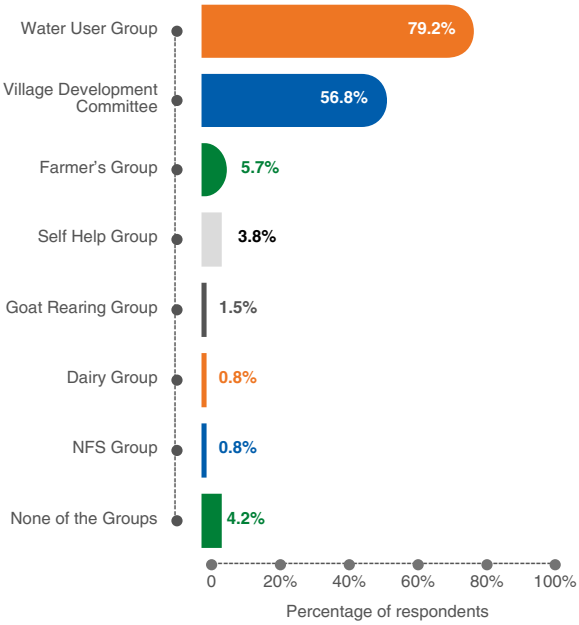


Chart 27 highlights that 79.2% of the respondents reported being part of Water User Groups, underscoring the program's success in fostering collaborative efforts for water management.

The Village Development Committee is also a prominent group, with 56.8% of respondents involved.

Other groups, such as Farmer's Groups (5.7%), Self Help Groups (3.8%), Goat Rearing Groups (1.5%), Dairy Groups (0.8%), and NFS Groups (0.8%), show the distribution of community groups in the areas. This suggests that while there are various community initiatives, the Water User Group and Village Development Committee dominate in terms of engagement.

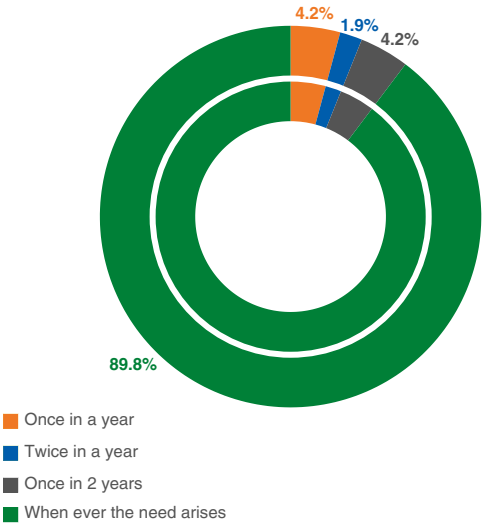
"Getting involved in the Water User Group was a big step for me. We formed the group after some meetings organised by the BWCP, where everyone in the village was encouraged to join. It felt good to see the community come together to manage our water resources.

The training we received was practical—there were exposure visits and even video screenings that really helped us understand how to maintain structures like the cement Nala bund and Gabion check dam. I learned a lot about keeping the water clean and making sure we use it wisely.

Now, we make sure everyone knows how to use the drip and sprinkler irrigation methods. It has been great! The water levels have gone up, and I can grow two crops a year instead of one. It feels good knowing we are not just relying on tankers anymore; our village is really thriving with the changes we have made. I'm proud to be part of this group and to see how much we've achieved together.

— Prabhakar Raut, WUG Member, Shiregaon"

CHART 28: MAINTENANCE OF COMMUNITY WATER SOURCES



In Chart 28, it is shown that 89.8% of respondents stated that repairs and maintenance of community water sources occur whenever the need arises, suggesting that community members are attentive to the condition of their water sources and are willing to address issues as they arise.

"As part of my role in the Gram Panchayat, I conduct maintenance checks on our water resource structures every 15 days during the rainy season. This consistent oversight is essential to ensure that everything is functioning properly. The training we received has been instrumental in equipping us with the knowledge we need to carry out these inspections effectively.

— Jyoti Gayakwad, Gram Panchayat Member, Shekta"

"Our responsibility in the Gram Panchayat includes regular maintenance of water resource structures, which we conduct every two weeks during the rainy season. The BWCP training equipped us with the necessary skills to oversee these systems effectively. This proactive approach ensures that everything is functioning properly, and we're witnessing the positive impacts of our efforts.

- Nirmala Bhagirath Jadav, Gram Panchayat Member, Shiregaon"

FINDINGS FROM FGD CONDUCTED IN SHAHPUR BANJER

Shahpur Banjer is situated in a semi-arid zone, where farming was traditionally dependent on erratic monsoons. As part of the BWCP, AFPRO introduced programs focusing on horticulture, the formation of Water User Groups (WUGs), and infrastructure for equitable water distribution.

The FGD with farmers from Shahpur Banjer addressed three themes: (1) Transition to high-value crops, (2) Community empowerment through WUGs, and (3) Structural barriers to equitable access.

TRANSITION TO HIGH-VALUE CROPS

Farmers reported a shift from rain-fed crops like jowar to high-value crops such as tomatoes, ginger, and onions. These transitions were made possible through irrigation advancements like farm ponds and micro-irrigation systems. Mango and guava orchards further contributed to increased household incomes, reflecting the impact of AFPRO's promotion of orchard cultivation as part of sustainable livelihood practices.

COMMUNITY EMPOWERMENT THROUGH WUGS

The formation of WUGs under AFPRO's training initiatives has strengthened community interaction, fostered equitable water sharing, and built confidence among farmers. These groups also served as platforms for collaborative problem-solving and ensuring efficient use of resources.

STRUCTURAL BARRIERS TO EQUITABLE ACCESS

Despite the progress, some marginal farmers expressed challenges in accessing irrigation equipment due to a lack of subsidies. Additionally, irregular maintenance of community water structures caused dissatisfaction, indicating a need for targeted interventions to ensure inclusivity and sustainability.

ASSESSMENT OF RISING GROUND WATER LEVELS IN SILEGAON

A HARVEST OF CHANGE: STORIES FROM VADAGAV RAMPURI AND SHAHPUR BANJER

In the heart of Gangapur Taluka, where farming has long been a delicate dance with the monsoons, the lives of three farmers—Raju, Vilas, and Sharad—paint a picture of transformation brought about by the Bajaj Water Conservation Project (BWCP) in partnership with AFPRO.

RAJU'S RESILIENCE: PIONEERING CHANGE IN VADAGAV RAMPURI

For Raju Pandharinath Borade, a 36-year-old farmer in Vadagav Rampuri, life was once dominated by the unpredictability of rain-fed farming. Yields fluctuated with the seasons, and his income remained stagnant. The introduction of Village Development Committees (VDCs) under BWCP changed the trajectory of his farming. With access to community-led water governance and improved irrigation systems, Raju adopted sustainable farming practices that stabilised his yields and diversified his crops.

"Earlier, my farming decisions were dictated by rainfall," Raju explains. "Now, with better water availability and training, I can plan my crops confidently."

He highlights the need for ongoing training and subsidies for irrigation tools to ensure the sustainability of these gains.

VILAS' ORCHARD OF OPPORTUNITY

In Shahpur Banjer, 39-year-old Vilas Chandrabhan Ravate discovered the potential of fruit cultivation. Before the intervention, he relied on traditional crops with limited income prospects. BWCP introduced him to mango and guava orchards, which now occupy 0.25-0.50 hectares of his land. With training in water management provided by the project, Vilas learned to maximise resources and improve yields.

"Cultivating fruit crops not only increased my income by 10-20% but also gave me a sense of security," he shares.

However, like Raju, Vilas points to gaps in financial support for orchard maintenance and irrigation equipment as barriers to long-term success.

SHARAD'S COLLECTIVE STRENGTH

For Sharad Lakshman Ravate, farming was more than just an individual struggle; it was a community challenge. The lack of coordinated water governance in Shahpur Banjer left farmers like Sharad with inconsistent irrigation and low productivity. The BWCP's emphasis on forming VDCs and Water User Groups (WUGs) introduced a new era of collaboration.

"Working together, we not only improved irrigation systems but also built a sense of trust within our community," says Sharad.

Enhanced water access and farming practices have increased his income by 10-20%. Sharad sees a future where advanced irrigation systems and frequent training ensure that these changes endure for the next generation.

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

Farmers

- Access to irrigation significantly improved, with 49.3% of the respondents reporting protective irrigation for 0.25–0.5 hectares of land during the Kharif season.
- Crop yields saw significant improvements, with cotton yields above 5 quintals per acre increased from 22.3% to 66.9%, and maize yields of 3.0–4.0 metric tons rose from 10.1% to 56.3%.
- Drip irrigation adoption improved water efficiency, enabling 48.5% c to grow more than two crops annually.

Women SHG Members

- The training empowered 1,323 women in 127 SHGs, boosting incomes through livestock and small businesses.
- Increased decision-making capacity within families and communities, with women contributing to household income and water management activities.

COMMUNITY LEVEL

- Drinking water scarcity reduced significantly to just one month annually for 79.5% of the households.
- Community-led efforts like Nala Deepening and Cement Nala Bunds created 6.46 billion litres of water storage.
- 79.2% of the farmers joined Water User Groups (WUGs), strengthening local governance and water resource management.

DISTRICT LEVEL

- Increased agricultural productivity boosted economic resilience across Gangapur Taluka.
- Enhanced land under orchard cultivation, with respondents cultivating between 0.25–0.50 hectares, increasing from 36.7% to 51.9%.
- Groundwater levels improved from 25–30 feet to 15–20 feet, benefiting 5,027 households.
- Crop resilience during dry spells increased by 15–20 days for 57.2% of the farmers.

STATE LEVEL

- The project aligned with Jalyukta Shivar Abhiyan, increasing cropping intensity and water conservation across 22 villages in Aurangabad.
- Strengthened Gram Panchayats' capacity to sustain water and agricultural management systems.

NATIONAL LEVEL

- Supported PMKSY by enhancing irrigation access across 12,669 hectares.
- Reduced dependency on water tankers and promoted scalable, climate-smart agricultural models for national adoption.

CHAPTER 8
HYDROLOGICAL ASSESSMENT

OBJECTIVES OF THE ASSESSMENT

Change in surface water holding capacity and reduction in Run-off.

Change/improvement of Groundwater table/recharge.

Change in land use pattern, agricultural productivity, and soil moisture conditions.

PROJECT LOCATIONS

The project was implemented in the Gangapur taluka of Aurangabad district. The measures that were implemented as a part of the water conservation efforts can broadly be categorised into construction and repair of Water Harvesting Structures (WHS), measures for Soil Moisture Conditions (SMC) improvement, and promoting water use efficiency. The details of the same are as below:

TABLE 1: DETAILS OF THE INTERVENTIONS

District	Aurangabad	Block	Gangapur	Area of Watershed		123.59 Sq. Km.
	Cement Nala Bund	Nala Deepening & Widening	Core Wall Gabion	Percolation Tank	Farm Pond	Recharge Shaft
Nos.	6 + 5	79	13	39	180	46
Capacity in Cubic Meter	141212.00	2243680.00	51999.00	876206.00	890402.00	33719.00

The maps below give the location of the intervention watershed in the Aurangabad district of Maharashtra and all the available locations of the various interventions across the intervention watersheds as a part of this project.

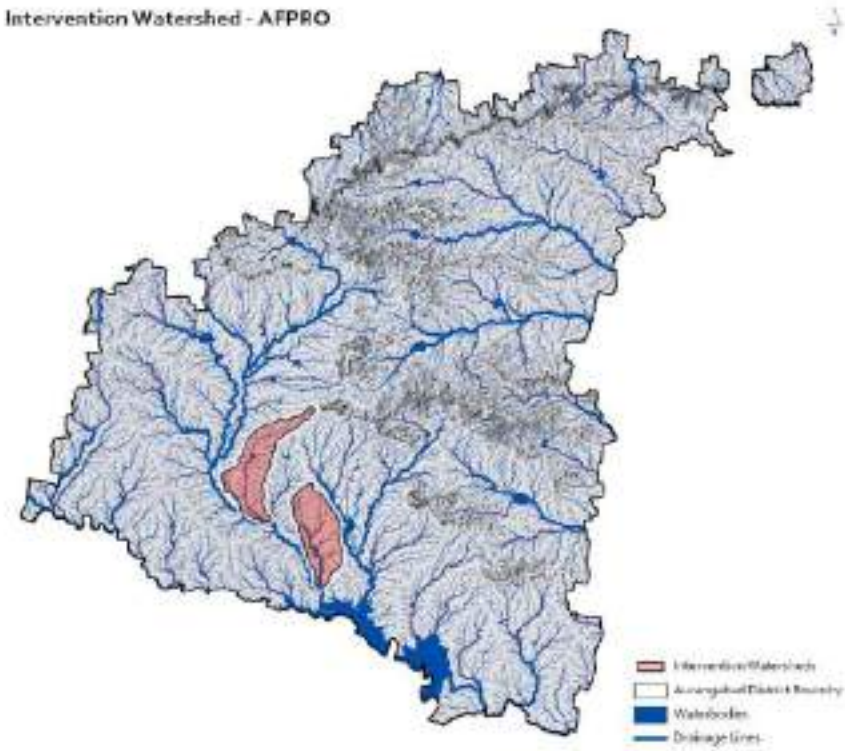


FIGURE 1: PROJECT LOCATIONS IN AURANGABAD

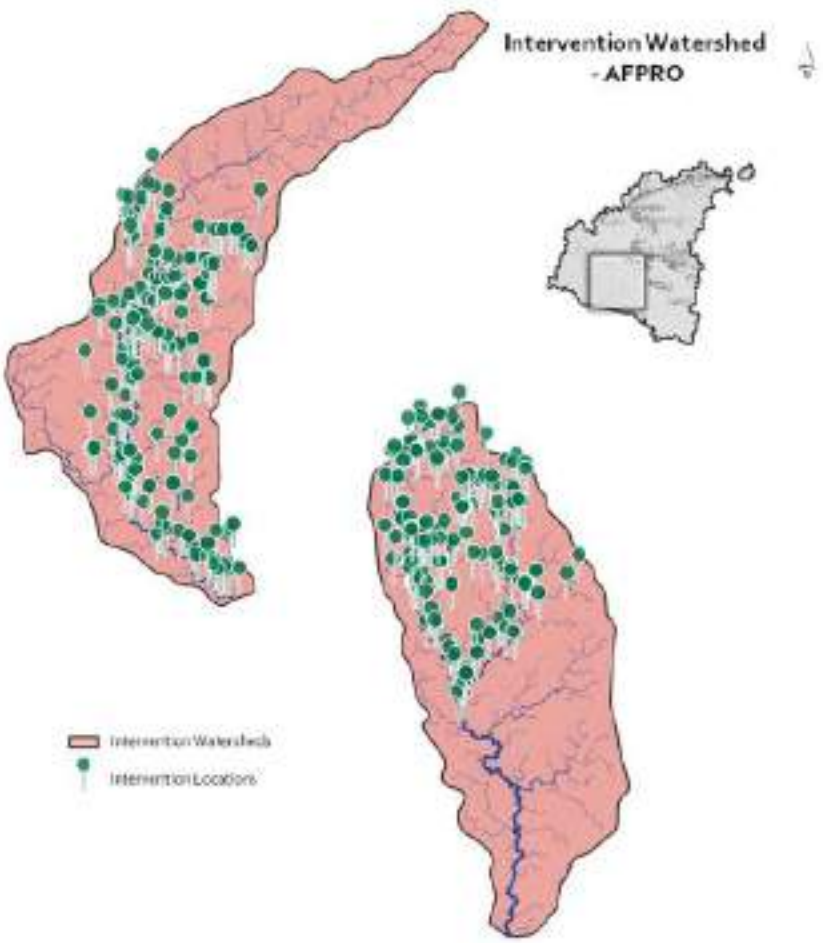


FIGURE 2: LOCATION OF PROJECT INTERVENTIONS

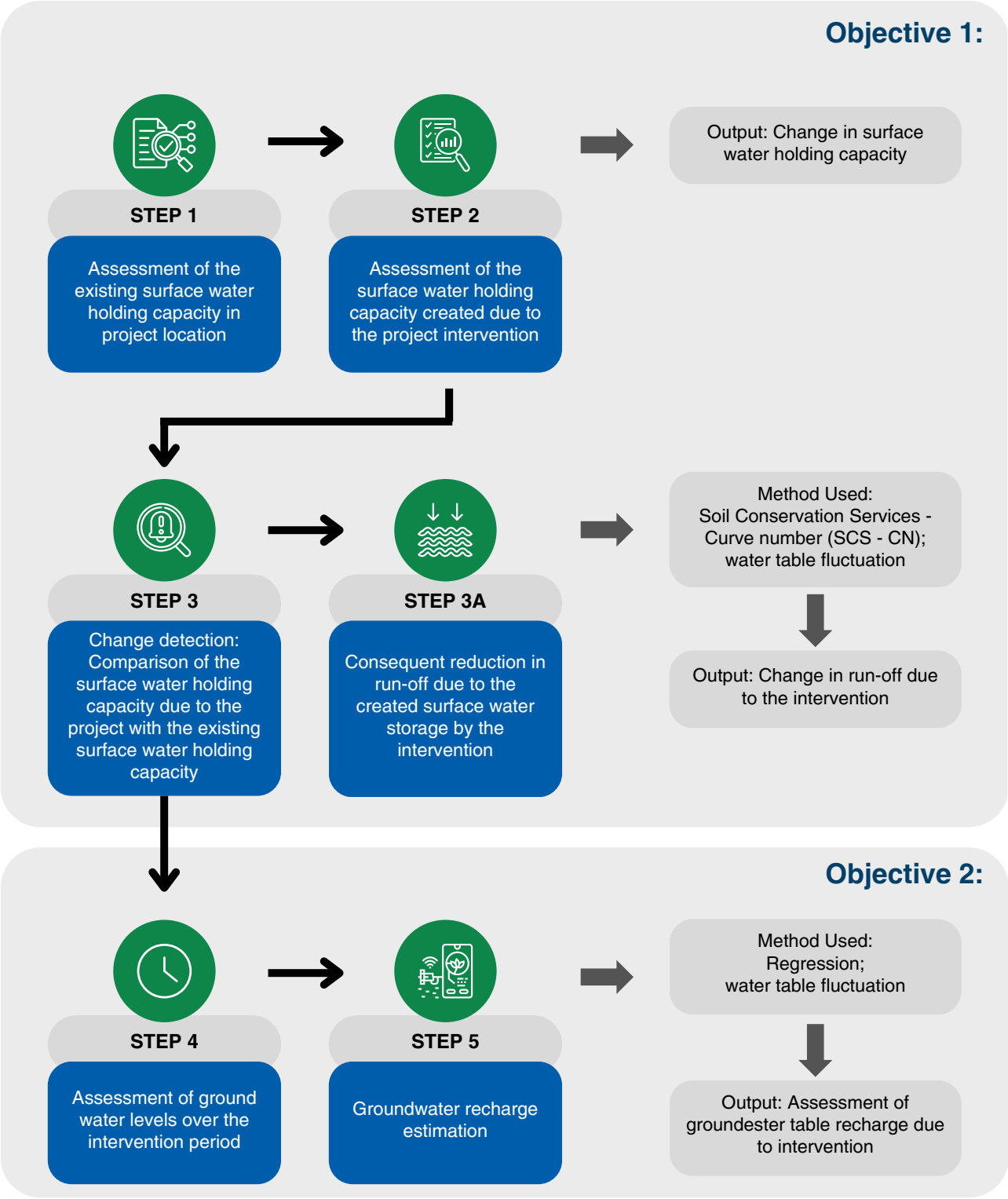
The detailed location of all the interventions covered as a part of the evaluations is provided in Annexure 1. The additional parameters that were considered are geology, hydrogeology, and soil types, and the information about the same is provided in Annexure 2.

While some of the assessments, such as the run-off estimation and the contribution of the interventions to the ground water levels, were done only considering the intervention area, some assessments, such as the rainfall and the ground water depth assessments, had to be done considering a larger area such as the entire block or the district due to the constraints faced with data availability. Care was taken to ensure that the results were represented correctly in this condition to varying assessment units.[1]

[1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

ASSESSMENT APPROACH

The assessment approach consists of various steps for each objective, as shown below:



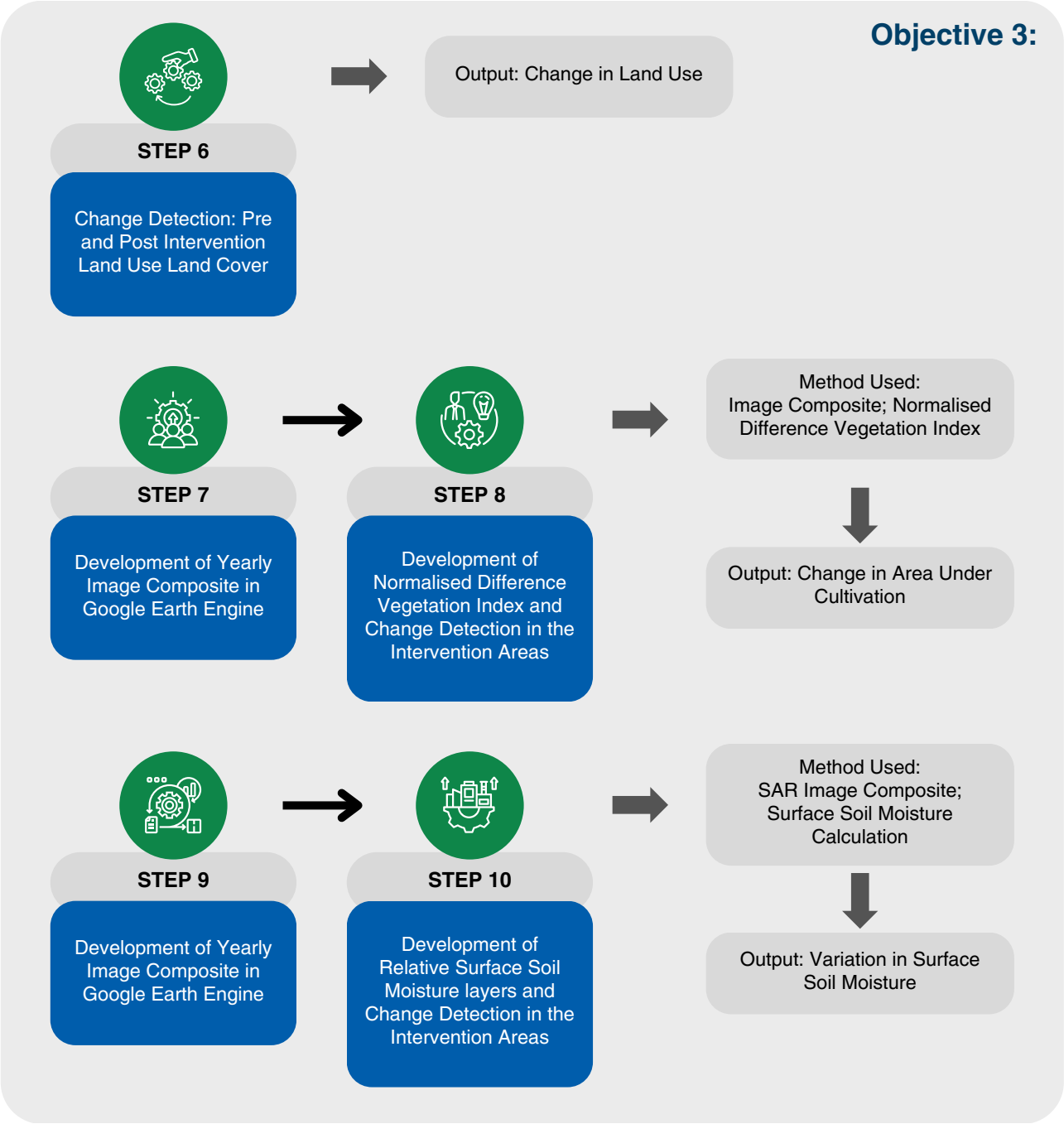


FIGURE 3: APPROACH OF THE ASSESSMENT

DATA COLLECTION

The following datasets have been collected from the field to facilitate the objectives of the study:

- All the intervention locations that were available (Annexure 1)
- Photos from the field survey (Annexure 6)

In addition to the above datasets, additional data was collected from various sources to fill in the data gaps that were present in the conduct of the assessment. These are as follows:

- Depth to water level from the NGO partners and the Central Ground Water Board (CGWB) (Annexure 3)
- Rainfall data from the Indian Meteorological Department (IMD) (Annexure 4)

Other datasets that were used in the assessment are as follows:

- Soil types from the National Remote Sensing Centre[2] (Annexure 2)
- Aquifer system from Central Ground Water Board (CGWB) (provided in Annexure 2)
- Specific Yield from Central Ground Water Board (CGWB) (provided in Annexure 2)

- Land Use Land Cover change between 2017 – 2023 from ESRI Living Atlas[3]
- Global Hydrologic Soil Groups for Run-off Estimation[4] (Annexure 2)

RESULTS

The results of the assessment to identify the impacts of the interventions on water conservation are presented in the below sections. It includes an assessment of rainfall and water level trends, an estimation of recharge due to rainfall, an assessment of surface water holding capacity and the associated run-off reduction and the estimation of recharge due to the interventions, the change in land use land cover, the changes in vegetation levels, and the changes in soil moisture conditions over the course of the intervention period.

Analysis of Rainfall Trends

Overall, the values of rainfall have shown a slight positive trend during the intervention period, with significant peaks observed during the north-east monsoon period. The graphs below show the trend in their change over time.

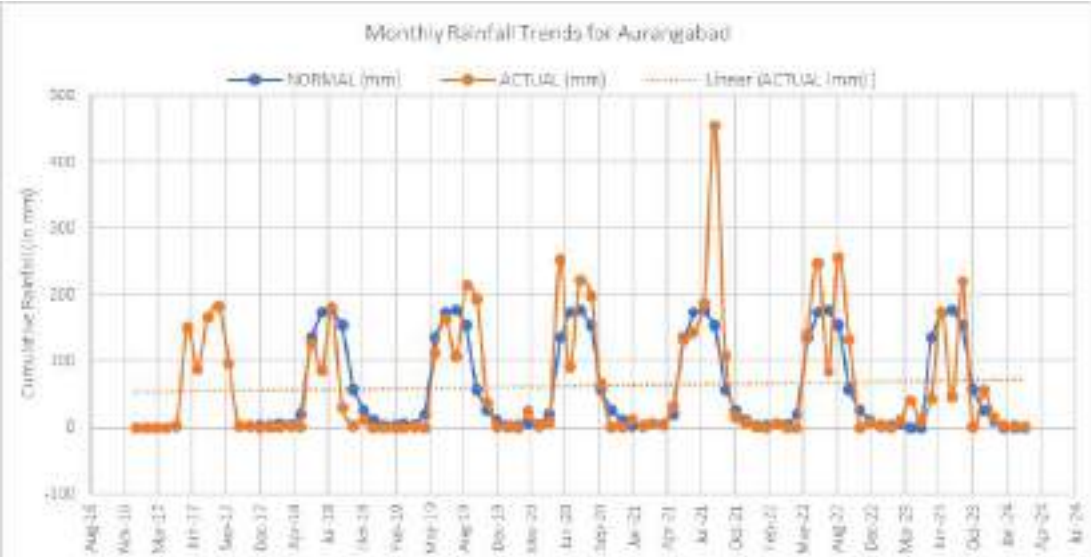


FIGURE 4: MONTHLY CUMULATIVE RAINFALL OVER THE INTERVENTION PERIOD (IN MM)

The trends of normal and actual rainfall reveal that over the intervention period, the rains have been above normal for most of the years. The slight positive trend that comes through is due to the above-normal rainfall received in June and August of most years and the unseasonal rainfall received in some of the years during the non-monsoon months.

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO
[3]Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.
[4]Ross, C.W., L. Prihodko, J.Y. Anchang, S.S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Run-off Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1566

Change in Water Level

The depth to water level data was obtained from two sources: one is the NGO partners, and the other is the annual Ground Water Year Books for Maharashtra published by the Central Ground Water Board (CGWB) for the years between 2017 and 2023. However, a complete collection of the data for the entire period from 2017 and since was not available with either source. Thus, for the final assessment, the datasets from both sources were combined after evaluating them individually and ensuring cohesion, and any missing values were filled out using statistical methods. The detailed dataset is provided in Annexure 3. The figures below show the ground water level trends in in the intervention districts:

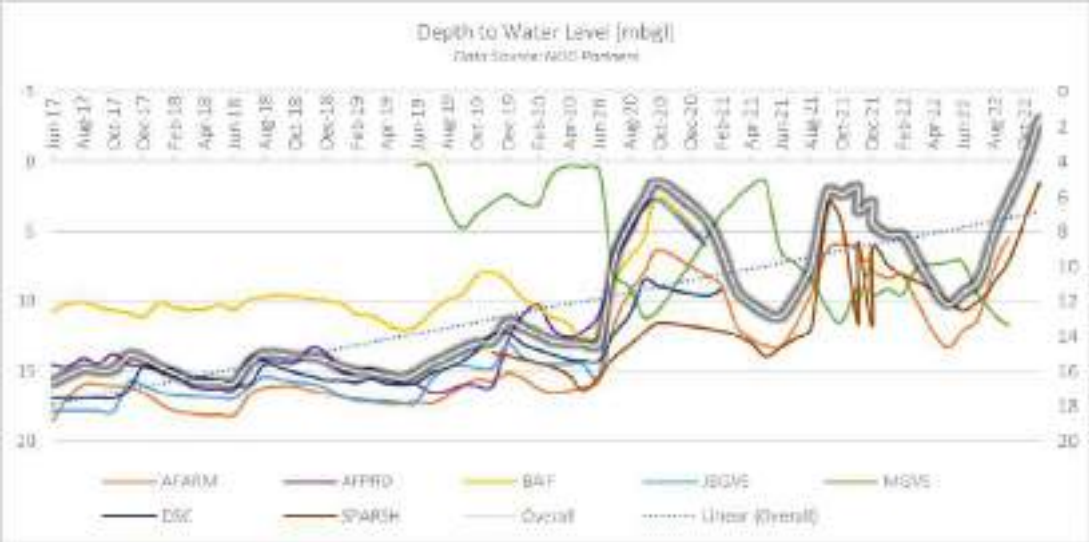


FIGURE 5: DEPTH TO WATER LEVEL (IN MBGL) – NGO PARTNERS

FIGURE 6: DEPTH TO WATER LEVEL (IN MBGL) – CGWB

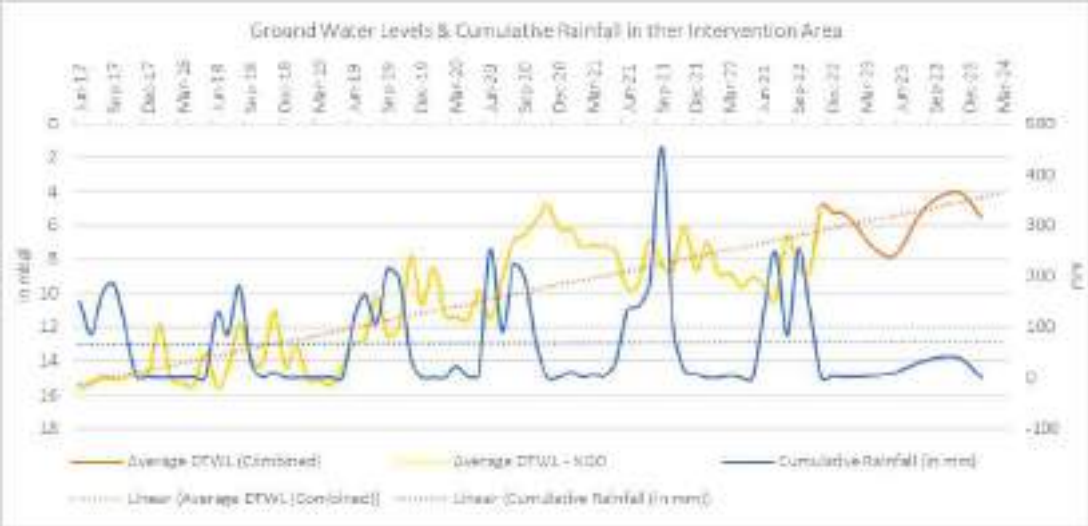


FIGURE 7: GROUND WATER LEVELS DURING AND SINCE THE INTERVENTION PERIOD (IN MBGL) COMPARED WITH MONTHLY CUMULATIVE RAINFALL (IN MM)

For this step of the assessment, the rainfall data from IMD was compared with the combined depth-to-water level data from the NGO partners and the CGWB. The rationale behind this is that rainfall is the most critical variable that determines the level of water availability below ground. Thus, by establishing the role of rainfall in the change in water levels, we would be able to identify the role of the measures implemented on the ground in augmenting the ground water levels.

A regression analysis of rainfall and depth to water level was conducted to assess the strength of the relationship between these two variables (detailed results in Annexure 4). The p-value obtained is greater than 0.05 for the intervention area, indicating no statistically significant relationship. However, the low R^2 (coefficient of determination) values obtained for the intervention area, along with the weak positive correlation established between rainfall and groundwater, suggest that while the impact of rainfall may be small, it has had its influence(although not significantly). [Here the R^2 value represents the proportion of variation in depth to water levels that can be explained by rainfall, indicating how well rainfall predicts water level changes. In this case, the low R^2 values suggest that multiple other factors also play a role. Detailed results are provided below.[5]]

This essentially means that rainfall influence on the ground water level has been to a minimal extent in the intervention areas over the period from 2017 to the relative present. However, over this period, the rainfall received has shown a very slight negative trend, while the ground water levels have shown significant positive trends. Considering the R2 values and the results of the correlation analysis, it can be understood that while the rainfall and ground water levels are not closely related, the factors such as improved water percolation and water storage mechanisms have had significant contributions in augmenting the ground water levels, supported by the rainfall trends. The ground water levels are expected to continue to rise and stabilise at a high level over the coming years and the contributions of the interventions would help in improving the ground water levels. The availability of the most recent and more local measurements will help in assessing the same more accurately.

Note: The last available data on ground water depth data is till January 2023. The data from May 2023 to the present has not been published yet. Thus, in the absence of the necessary data, statistical methods were used to project the values for this period. This projected data might not necessarily reflect the true levels of ground water levels, and the derived estimates are bound to change on the availability of official measurements of ground water depth for 2023 and 2024.

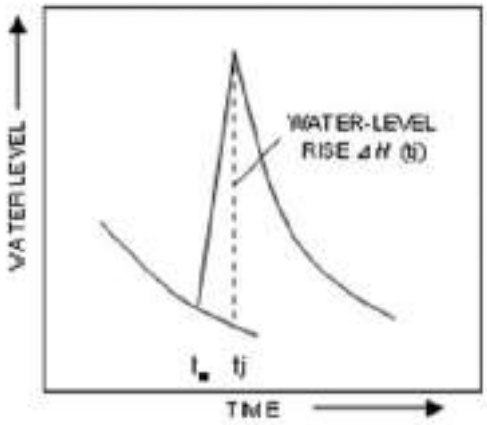
[5] The groundwater recharge calculations are based on data from NGO partners and CGWB data, are provided in the attached Excel document in sheets 9 and 10, respectively.

Estimation of Ground Water Recharge Due to Rainfall

The Water Table Fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The water-table fluctuation method is based on the premise that rises in groundwater levels in unconfined aquifers are due to recharge arriving at the water table. Recharge is calculated as the change in water level over time multiplied by the specific yield.[6]

$$R(tj) = Sy^* \Delta H(tj)$$

where R(tj) (m) is recharge occurring between times t0 and tj, Sy is specific yield (dimensionless), and ΔH(tj) is the peak water level rise attributed to the recharge period (cm).



The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology[7][8]. The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

Location	Aurangabad
Major Aquifer System	Basalt
Sy Range	0.01 – 0.03
Sy Chosen	0.02
RIF Range	0.12 – 0.14
RIF Chosen	0.13

As per the results of the method, about 13.1% of the rainfall has recharged directly to the ground in the intervention sites. The results and calculations are presented below:

TABLE 2: WATER TABLE FLUCTUATION METHOD RESULTS

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2017	687.704	1.100	0.02	0.022002477	22.002477	3.2%	2719331.275
2018	438.020	4.509	0.02	0.090184267	90.184267	20.6%	11146058.39
2019	826.440	7.633	0.02	0.152661156	152.66116	18.5%	18867705.24
2020	862.400	6.835	0.02	0.136709574	136.70957	15.9%	16896216.45
2021	1099.640	3.748	0.02	0.074956747	74.956747	6.8%	9264058.004

[6] USGS GWRP: Techniques/Methods -Water-Table Fluctuation (WTF) Method

[7]The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology.[7][8] The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

[8]Detailed Guidelines (cgwb.gov.in)

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2022	865.360	5.505	0.02	0.11010815	110.10815	12.7%	13608491.98
2023	548.052	3.844	0.02	0.076883855	76.883855	14.0%	9502233.251
Average Recharge directly due to Rainfall received						**13.1%**	**82004094.59**

Further, the groundwater recharge from Rainfall Infiltration Method (RIF) can be obtained from the following relation:
Groundwater Recharge = Geographical Area x Actual Rainfall x Infiltration Factor

TABLE 3: RAINFALL INFILTRATION METHOD

Area (in sq. m.) =			123592050
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)
2017	0.687703555	0.089401462	11049309.98
2018	0.43802	0.0569426	7037652.666
2019	0.82644	0.1074372	13278383.79
2020	0.8624	0.112112	13856151.91
2021	1.09964	0.1429532	17667879.04
2022	0.86536	0.1124968	13903710.13
2023	0.548051549	0.071246701	8805525.875
Total			**85598613.39**

Estimation of percent rainfall converted into groundwater recharge

As per GEC-1997 norms, the rainfall recharge as computed by the WTF method has been compared with that of the RIF method, and finally, the rainfall recharge is assigned a value based on set criteria to avoid unreasonably high or low estimates.

A quantity called percentage difference (PD) which is the difference between the rainfall recharge computed by the water table method (A) and the recharge by the rainfall infiltration method (B) and expressed as a percentage of the rainfall recharge by rainfall infiltration method is computed as below:

$$PD = \frac{(A - B)}{B} \times 100$$

where 'A' is the rainfall recharge by the WTF method and 'B' is the rainfall recharge by the RIF method.
The set criteria (GEC 1997) to be adopted are as follows:
(a) If PD ≥ – 20 and < + 20%, then the value of the water table fluctuation method is adopted.
(b)If PD ≤ – 20%, then the value of 0.8 × rainfall infiltration factor method is adopted.
(c)If PD ≥ + 20%, then the value of 1.2 × rainfall infiltration factor method is adopted.

By following the above criteria, ground water recharge is estimated.

Organisation	Rainfall Infiltration Method	WTF Model	Percentage Difference	Criteria	Volume of recharge due to rainfall (Cu. m.)
	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)			
AFPRO	85598613.39	82004094.59	-4.19	A	82004094.59

Over the period of 2017 to 2023 an almost 7-year period covering the interventions and their operations till the present, the amount of ground water recharge directly due to rainfall stands at 8,20,04,094.59 Cu. m. across the intervention watershed, which is about 12.45% of the total rainfall received over the intervention area.

Change in surface water holding capacity and run-off reduction

The intervention area is spread over multiple watersheds in the southern part of the state. On-site verification and satellite imagery show that the major land use in the intervention area is rangelands, followed by crops. Based on the information available from the field survey and the organisation, the volume of storage created is estimated.

The change in surface storage in the intervention area was net positive, i.e., no existing surface storage was considered in the pre-intervention period[9] and although the surface storage of about 42,37,218 cubic meters was created through the project, an intervention volume of 19,59,819 cubic meters is being considered for assessment as there might be a double accounting of the storage of nalas as it is also included in considering the storage of the check dam type of interventions.

Estimation of ground water recharge due to the interventions

Groundwater recharge due to the interventions occurs primarily through the capture and storage of surface runoff water using Cement Nala Bunds, as well as through natural processes and Groundwater Recharge Shafts.

Run-off is defined as the portion of the precipitation that makes its way towards rivers or oceans as surface or subsurface flow. After the occurrence of infiltration and other losses from the precipitation, excess rainfall flows out through the small natural channels on the land surface and into the main drainage channels. Such types of flow are called surface flows. A part of the infiltrated rainwater moves parallel to the land surface as subsurface flow and reappears on the surface at certain other points. Such flows are called interflows. Another part of the infiltrated water percolates downwards to ground water and moves laterally to emerge in depression and rivers and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

While the interventions such as the Cement Nala Bunds and the Gabion Structure capture the surface flows, both these structures and the Ground Water Recharge Shafts contribute to the recharge of the ground water in the intervention sites.

Estimation of the run-off can give us an estimate of the amount of water that has been essentially captured by the intervention structures as surface storage, and thus point towards the potential amount of water available for ground water recharge. Run-off can be estimated by various methods, such as:

- Empirical formulae and tables
- Run-off Estimation based on Land Use and Treatment
- Rational Method
- Empirical formulae for flood peak

[9] This is due to the constraints of establishing the status of all water bodies in the intervention area.

In this assessment, we are using the method of empirical formulae and tables along with run-off estimation based on land use and treatment as it has proven to be the most reliable to conduct the assessment in the absence of reliable ground water level data and access to the intervention sites on the ground.

1 BINNIE'S PERCENTAGES

It provides the relationship of run-off to rainfall with a view to express the former as a percentage of the latter. The percentages mentioned below are based on observations on two rivers in Madhya Pradesh.

TABLE 4: RUN-OFF AS A % OF THE RAINFALL RECEIVED

Annual Rainfall (mm)	Runoff (%)
500	15
600	21
700	25
800	29
900	34
1,000	38
1,100	40

2 COEFFICIENTS

The run-off 'R' in cm and rainfall 'P' in cm can be correlated as R = KP, where 'K' is the run-off coefficient. The run-off coefficient depends on factors affecting run-off. This method is applicable only for small projects such as the ones implemented as a part of this project. The usual values of K are as given below.

TABLE 5: USUAL VALUES OF RUNOFF COEFFICIENTS (K)

Type of Area	K
Urban Residential	0.3 - 0.5
Forests	0.05 - 0.2
Commercial & Industrial	0.9
Parks, farms, Pastures	0.05 - 0.3
Asphalt or concrete pavement	0.85

3 BARLOW'S TABLES

The following values of K (in percentage) for various types of catchments were developed by T.G. Barlow based on the studies of catchments mostly under 130 sq. km. in Uttar Pradesh.

TABLE 6: BARLOW'S PERCENTAGE RUNOFF COEFFICIENTS

Class	Description of Catchment	Percent runoff
A	Flat, cultivated and black cotton soils	10
B	Flat, partly cultivated-various soils	15
C	Average	20

Class	Description of Catchment	Percent runoff
D	Hills and plains with little cultivation	35
E	Very hilly and steep, with hardly any cultivation	45

These percentages are for the average type of monsoon and are to be modified by the application of the following coefficients according to the nature of the season, as shown below.

TABLE 7: BARLOW'S RUN-OFF COEFFICIENTS FOR DIFFERENT NATURES OF SEASON

Nature of Season	Class of catchments				
	A	B	C	D	E
Light rain, no heavy downpour	0.7	0.8	0.8	0.8	0.8
Average or varying rainfall, no continuous downpour	1	1	1	1	1
Continuous downpour	1.5	1.5	1.6	1.7	1.8

As part of this method, the special tropical rainfall was divided into the following four classes:

- **Negligible falls:** All rainfalls under 12 mm a day unless continuous for several days; also rainfalls 12 to 40 mm a day, when there is no rain.
- **Light falls:** All rainfalls up to 25 mm a day followed by similar or heavier falls. Steady pours of 25 to 40 mm a day, when there is no rain of similar or greater amount before or after that.
- **Medium falls:** Rainfalls from 25 to 40 mm a day when preceded or followed by any but light falls.
- **Heavy Falls:**
  - All rainfalls are over 75 mm a day or continuous falls at 50 mm a day.
  - All rainfalls of an intensity of 50 mm or more per hour.

The run-off percentages, as shown in the following table, were developed by combining the type of catchment and nature of the season.

TABLE 8: BARLOW'S RUNOFF PERCENTAGES

Nature of Rainfall	Percentage of Flow in Catchments of Different Type				
	A	B	C	D	E
Negligible falls	-	-	-	-	-
Light falls	1%	3%	5%	10%	15%
Medium falls	10%	15%	20%	25%	33%
Heavy falls	20%	33%	40%	55%	70%

4 ESTIMATION OF DIRECT RUNOFF FROM RAINFALL

In this method of run-off estimation, the effects of the surface conditions of a watershed area are evaluated by means of land use and treatment classes. Land use is the watershed cover, and it includes every kind of vegetation, litter and mulch, and fallow, as well as non-agricultural uses such as water surfaces (lakes, swamps, etc) and impervious surfaces (roads, roofs, etc.). Land treatment applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing and management practices such as grazing control or rotation of crops. The classes consist of use and treatment combinations to be found in watersheds. Land use and treatment classes are readily obtained either by observation or by measurement of plant and litter density and extent in sample areas.

4.1 Hydrological Soil Groups

There are four soil groups that are used in determining the hydrological soil cover complexes, which are used in a method for estimating the run-off from rainfall. The major characteristics of these groups are described below. The respective infiltration rates and permeability of soils in different groups are also shown below. The infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The permeability rate is the rate at which water moves in the soil, which is controlled by the nature and characteristics of soil horizons.

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.	Low	High rate
Group B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	High	Low rate

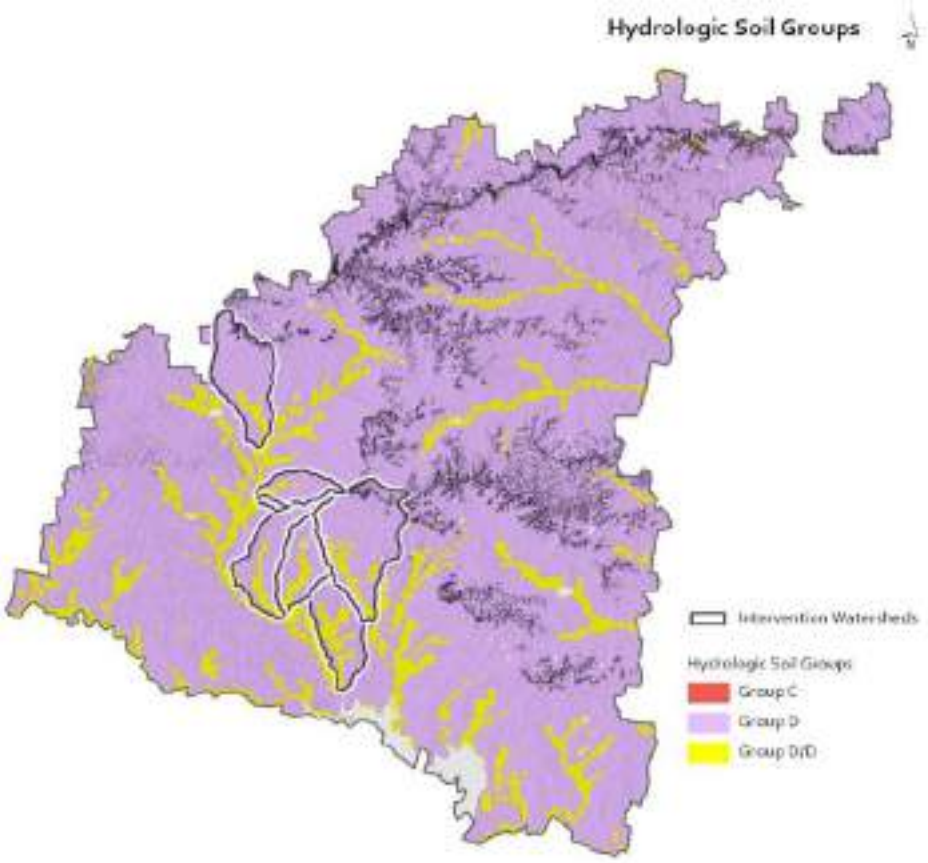


FIGURE 8: HYDROLOGIC SOIL GROUPS OF THE PROJECT WATERSHEDS

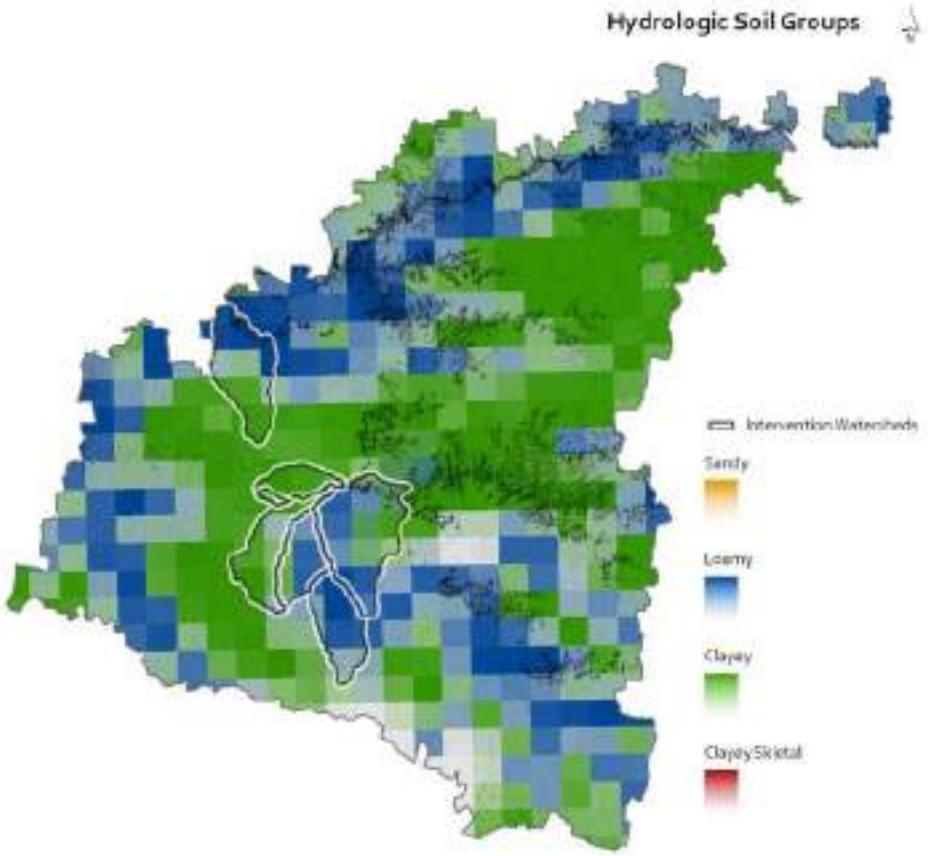


FIGURE 9: SOIL CHARACTERISTICS IN THE PROJECT WATERSHEDS

TABLE 9: INFILTRATION RATES

Class	Rates / hr in		Remarks
	Inches	Millimetres	
Very Low	Below 0.1	Below 2.5	Highly clayey soils
Low	0.1 - 0.5	2.5 - 12.5	Shallow soils, clay soils, soils low in organic matter
Medium	0.5 - 1.0	12.5 - 25.0	Sandy loams, silt loams
High	Above 1.0	Above 25.0	Deep sands, well aggregated soils

TABLE 10: RELATIVE CLASSES OF SOIL PERMEABILITY

Class	Permeability	
	Inches/ hr	mm/ hr
Slow		
Very Slow	Less than 0.05	1.3
Slow	0.05 to 0.20	1.31 to 5.00
Moderate		
Moderately Slow	0.20 to 0.30	5.01 to 20.00
Moderate	0.80 to 2.50	20.01 to 50.00
Moderately Rapid	2.50 to 5.00	50.01 to 130.00
Rapid		
Rapid	5.00 to 10.00	130.01 to 250.00
Very Rapid	Over 10.00	Over 250.00

4.2 Land Use and Treatment Classes

The commonly used land use and treatment classes are briefly described below. These classes are used in determining hydrologic soil-cover complexes, which are used in one of the methods for estimating runoff from rainfall.

- **Cultivated lands:** These include all field crops such as maize, sugarcane, paddy and wheat.
- **Fallow lands:** These are lands taken up for cultivation, but are temporarily out of cultivation for a period of not less than one year, and not more than 5 years. Current fallow lands are cropped areas kept fallow during the current year.
- **Uncultivated lands include:**
  - Permanent pastures and other grazing lands.
  - Cultivable waste, which are lands available for cultivation whether or not taken up for cultivation or abandoned after a few years for one reason or another. Land once cultivated but uncultivated for 5 years in succession shall also be included in this category.
- Forest area includes all lands classed as forest under any legal enactment dealing with forest or administered as forest whether State-owned or private and whether wooded or maintained as potential forest land.
- Tree crops include woody perennial plants that reach a mature height of at least 8 feet and have well-defined stems and a definite crown shape.
- Lands put to non-agricultural uses are areas occupied by buildings, roads, railroads, etc.
- Barren and uncultivable lands include areas covered by mountains, deserts, etc.

Based on these assessments, the following were estimated:

Surface Storage

The volume of surface storage created by the intervention = 19,59,819 m3.

Rainfall & Runoff

- Total rainfall received over the intervention period and since = 58,33,24,813.91 m3
- Total run-off generated over the intervention area = 17,49,97,444.2 m3
- Percentage of rainfall that is converted to run-off = 30%

The intervention area received enough rainfall for all the intervention structures to be at a constant capacity of 10.37% throughout the period since 2017 as a part of and due to the project Bajaj Water Conservation Project implemented by AFPRO in Aurangabad. This shall be interpreted as the intervention structures always having water and never drying since 2017 or operating at more than 50% storage filled through the dry seasons since 2017.

Runoff Reduction

- The volume of surface run-off stored by the intervention measures after considering 40% evaporation loss = 1,21,97,517.97 m3.

Which is,

- 6.97% of the total run-off generated as a part of and due to the water conservation efforts of this project (or)
- 1.06% of the total rainfall received during the project period and ever since

This means that the interventions that were created as a part of this project have contributed to a combined reduction in surface run-off by about 6.97% in the intervention area. Although this number is a conservative estimation and however, it is bound to increase over the years. Care must be taken to ensure the effective functioning of these water harvesting structures. Regular desilting and clearing of overgrowth, along with any structural repairs, are required across all the structures to ensure that their storage capacity is maintained, and the structural integrity is preserved.

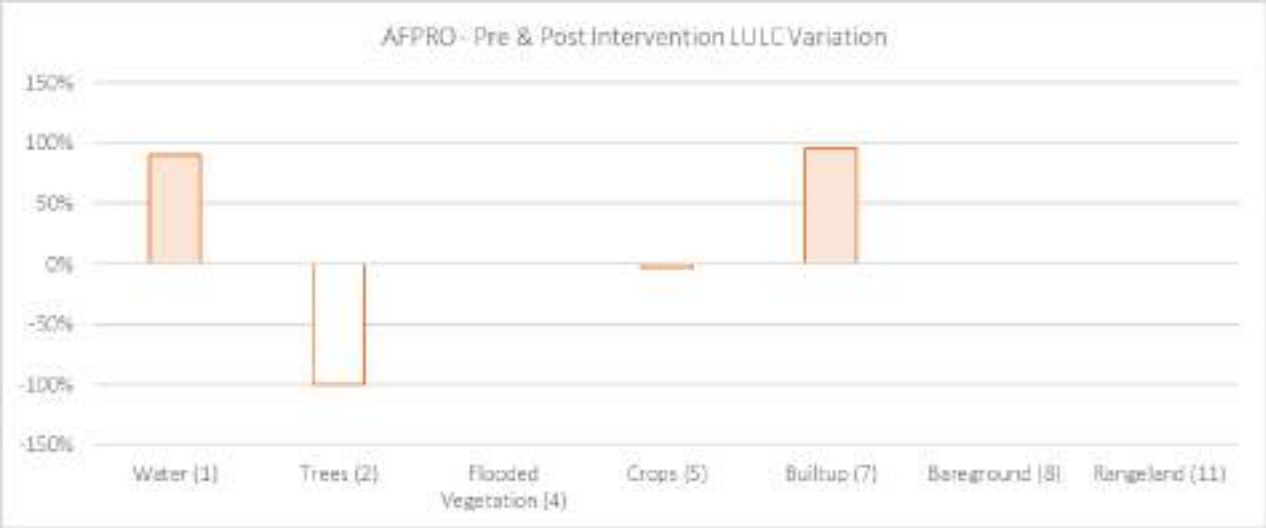
Thus, in total, 12.45% of the rainfall is converted into direct recharge, about 6.97% of the rainfall is stored in the intervention created surface storage, 40% is lost as evaporation, and the remaining 40.49% accounts for factors such as run-off that is stored in other water bodies present, run-off that is not captured, evapotranspiration, and other losses.

5 CHANGE IN LAND USE PATTERN

Land use and land cover change detection involves analyzing how land is utilized and how its physical coverage alters over time. Changes in land use patterns, such as urban expansion, deforestation, agricultural expansion, and the impacts of natural disasters, can be tracked using remote sensing techniques, satellite imagery, and geographic information systems (GIS). The land use and land cover for the intervention areas were developed through supervised classification of Sentinel-2 Full Colour Composite (FCC) imagery for both the pre- and post-intervention periods.

TABLE 11: ZONAL STATISTICS OF LULC FOR THE INTERVENTION AREA

District	Aurangabad				
Organisation	AFPRO				
Total Area of Watershed (Sq. Km.)	123.5921				
Soil Group	D				
Land Use Classes	Land Use - 2017		Land Use - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.3887	0.31	0.7396	0.60	90.28%
Trees (2)	0.0004	0.0003			-100.00%
Flooded Vegetation (4)					0.00%
Crops (5)	120.3867	97.41	117.4043	94.99	-2.48%
Built-Up (7)	2.7449	2.22	5.3769	4.35	95.89%
Bare ground (8)					0.00%
Rangeland (11)					0.00%



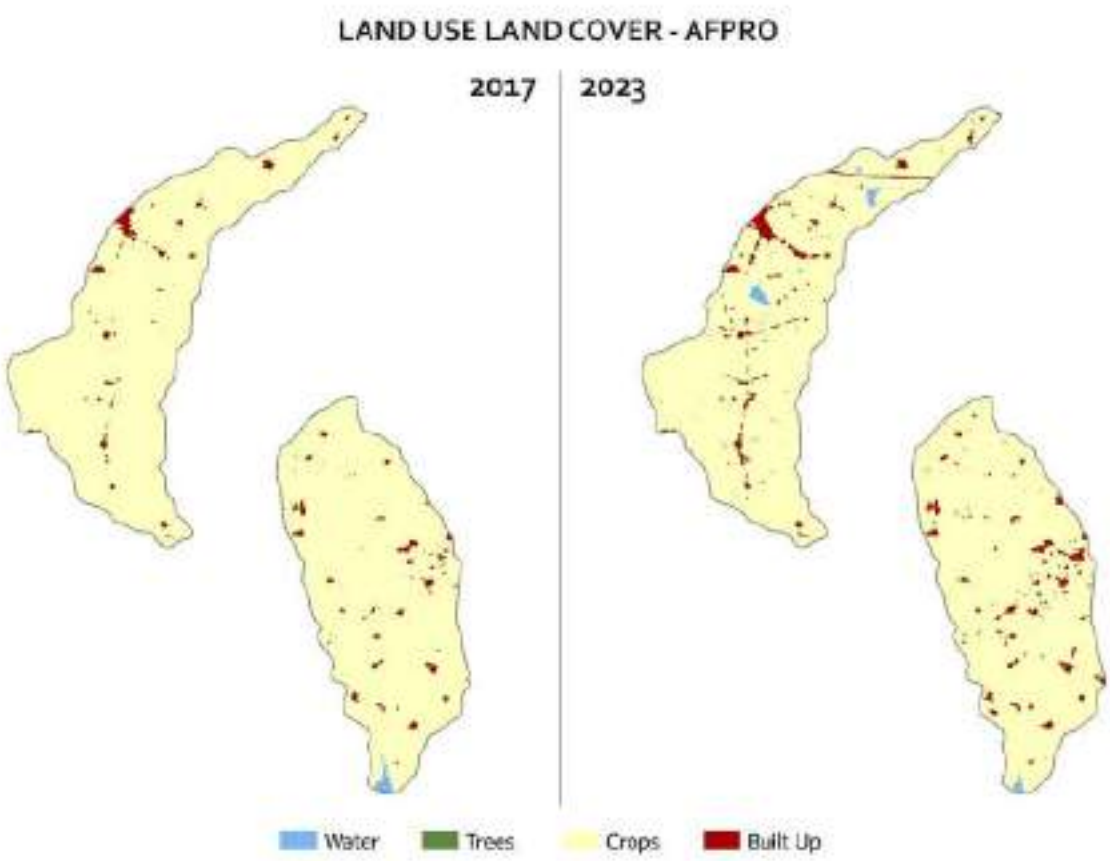


FIGURE 10: PRE- AND POST-INTERVENTION LULC OF THE INTERVENTION WATERSHED

It can be observed from the above table and charts that in terms of total area, the area under crops is the highest followed by built-up area. Looking at the changes in land use that have happened through the course of the intervention period, major changes can be observed in the growth of areas under water and built-up and the reduction in the areas under trees, while minor reduction in the area under crops can be seen. In terms of total area, the reduction in area under crops can be attributed mainly to the increase in built-up area. The following section will offer more clarity on the changes to cropping intensity.

6

VEGETATION INDEX (VI)/CROPPING INTENSITY

Vegetation Indices are combinations of surface reflectance at two or more wavelengths designed to highlight a particular property of vegetation. They are derived using the reflectance properties of vegetation. For this assessment, the Normalised Difference Vegetation Index (NDVI) is used. NDVI is an indicator that shows the greenness, density, and health of vegetation in each pixel of a satellite image. The index detects and quantifies the presence of living green vegetation using this reflected light in the visible and near-infrared bands.

The standard formula for calculating NDVI is: NDVI = (NIR – red) / (NIR + red)

NIR is the near infra-red, band 8, and red, band 4 of Sentinel-2 imagery. Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states.

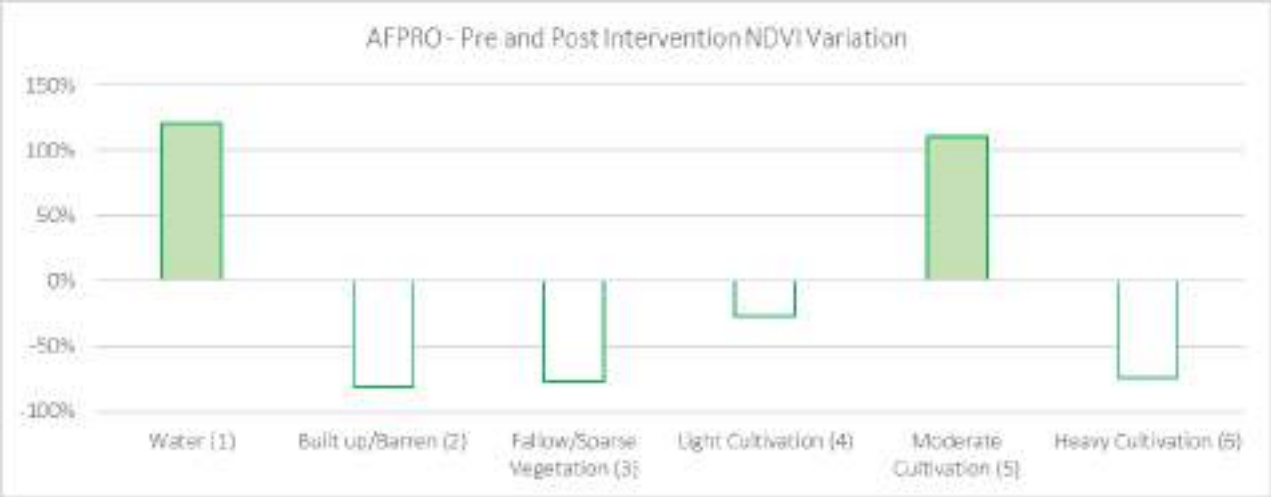
The NDVI value ranges from -1 to 1 and shows the vigour of the crop:

- **Values close to 1:** the more intense the green, the more vigorous the vegetation and vegetation cover. Considerations for the type of farming, bare soil, etc. must be made. The index also measures the vigour of the underbrush.

- **Values close to 0:** areas with very little vegetation, early stages of cultivation, bare soil, or non-productive areas.
- **Negative values:** usually associated with areas of water, snow, or clouds.

TABLE 12: ZONAL STATISTICS VALUES OF THE VEGETATION INDEX

District	Aurangabad				
Organisation	AFPRO				
Total Area of Watershed (Sq. Km.)	123.5921				
Soil Group	D				
Vegetation Index Classes	VI - 2017		VI - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.0436	0.04	0.0963	0.08	120.73%
Built up/Barren (2)	13.2158	10.69	2.5005	2.02	-81.08%
Fallow/Sparse Vegetation (3)	24.8062	20.07	5.6169	4.54	-77.36%
Light Cultivation (4)	43.9705	35.58	31.9748	25.87	-27.28%
Moderate Cultivation (5)	39.3084	31.80	82.7995	66.99	110.64%
Heavy Cultivation (6)	2.2080	1.79	0.5715	0.46	-74.12%



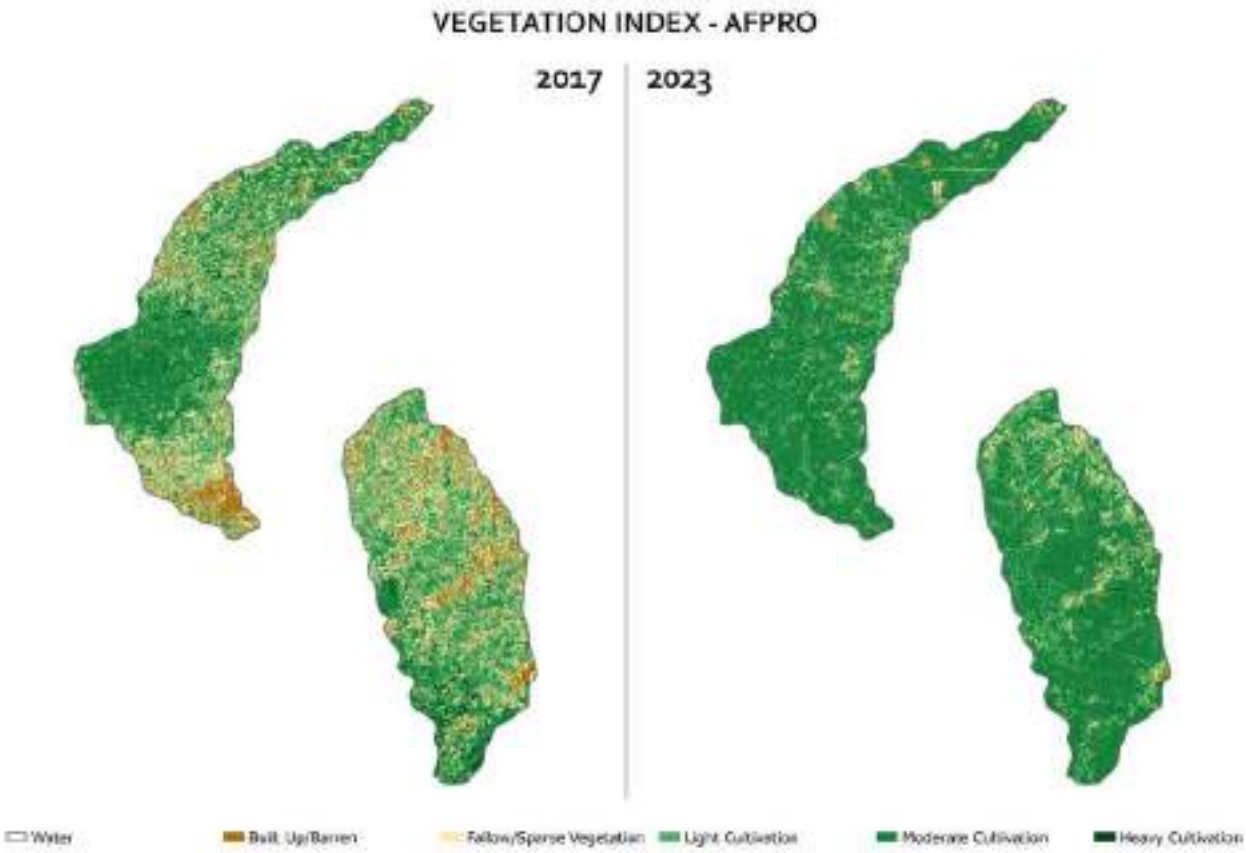


FIGURE 11: PRE- AND POST-INTERVENTION VEGETATION INDEX ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the vegetation index reveals that in the intervention watershed, the area under moderate cultivation has grown significantly along with the area under water, while the area under other classes has shrunk. With respect to the methodology applied for this analysis, it can be interpreted that the area under light cultivation corresponds to single cropping, moderate cultivation to double cropping and heavy cultivation to triple cropping. Thus, the area under double cropping has increased, indicating improved water accessibility and use, among other factors.

7 SOIL MOISTURE

Surface soil moisture (SSM), defined as the water content of the top few centimetres of soil, is a key variable that affects run-off generation, water recharge and vegetation growth. The Synthetic Aperture Radar (SAR) data from Sentinel-1 satellite is used here to study the surface soil moisture, which is in turn derived from relative soil moisture, which represents the soil moisture for a given soil column on a relative scale between soil saturation and wilting levels.

The surface soil moisture saturation is calculated as percentages using the formula[10]:

$$\mathrm{SSM}(t) = \frac{\Delta\sigma^0(\Theta, t)}{S(\Theta)} \quad [\%]$$

Where Δσ0(Θ,t) represents the change in normalized backscatter (relative to dry conditions), and S(Θ) is the sensitivity to SSM changes at the reference angle. The sensitivity is equivalent to the local backscatter dynamic range, estimated by the difference between normalized backscatter coefficients under wet and dry conditions using,

[10]Detailed methodology is provided at https://doi.org/10.1109/TGRS.2018.2858004

$$S(\Theta) = \sigma^0_{\text{wet}}(\Theta) - \sigma^0_{\text{dry}}(\Theta) \quad [\text{dB}].$$

Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states. The values range from 0 to 100 % where values close to 0 represents water and built-up areas.

TABLE 13: ZONAL STATISTICS OF SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHEDS

District	Aurangabad				
Organisation	AFPRO				
Total Area of Watershed (Sq. Km.)	123.5921				
Soil Group	D				
Soil Moisture Classes	SM - 2017		SM - 2023		% Difference
	Area	% Area	Area	% Area	
0 - 0.1 (1)	12.8132	10.37	9.6645	7.82	-24.57%
0.1 - 0.2 (2)	42.2391	34.18	21.4990	17.40	-49.10%
0.2 - 0.3 (3)	54.3115	43.94	54.3419	43.97	0.06%
0.3 - 0.4 (4)	13.3623	10.81	32.3882	26.21	142.39%
0.4 - 0.5 (5)	0.7098	0.57	5.1954	4.20	631.99%
> 0.5 (6)	0.0483	0.04	0.3911	0.32	710.41%

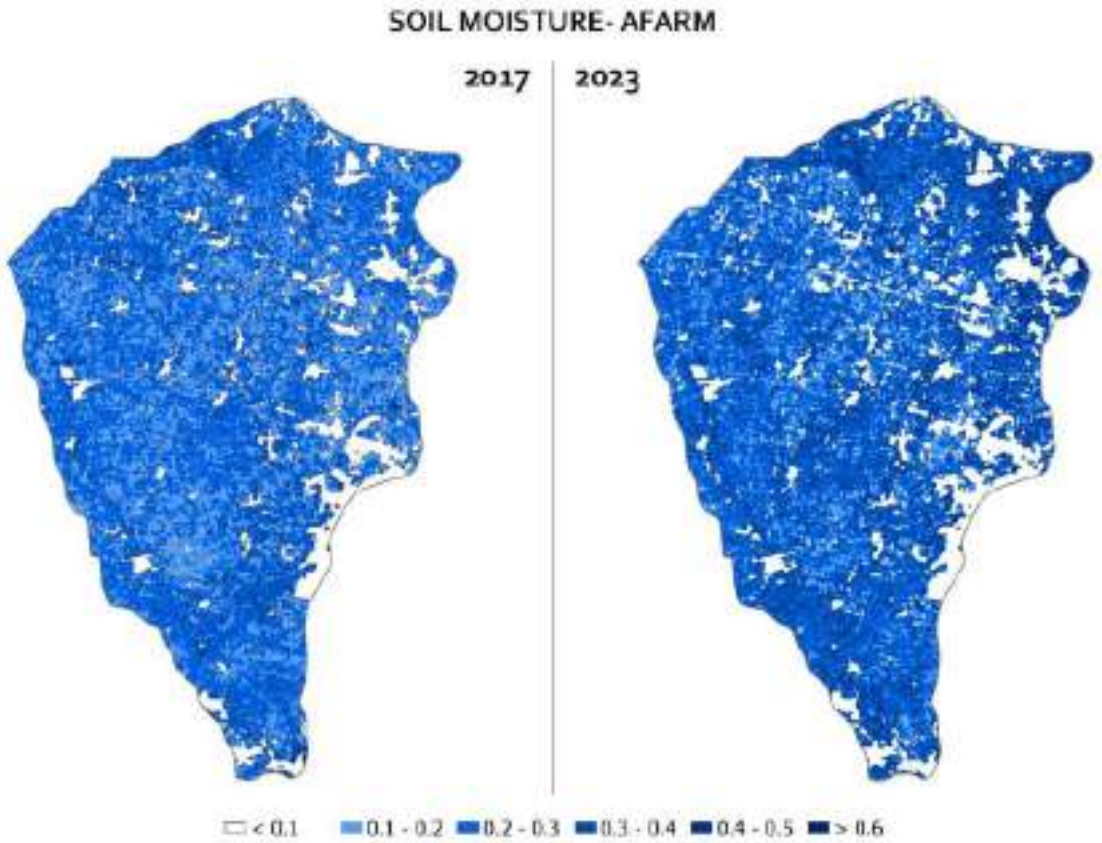
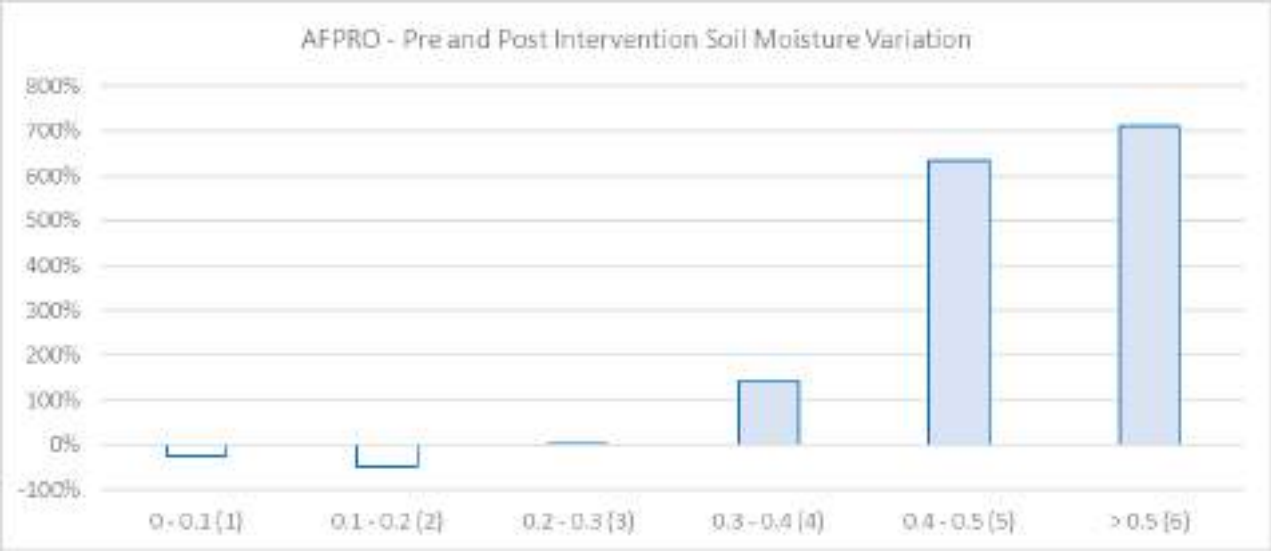


FIGURE 12: PRE AND POST INTERVENTION SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHED



The analysis, change detection and calculation of the soil moisture across the intervention watershed shows that there have been significant changes in the values of surface soil moisture over the course of the intervention period and since. The area under soil moisture values greater than 40% has seen a significant increase, while the area under low soil moisture values has reduced. This is to be interpreted because of multiple factors, such as the rainfall received, the vegetative cover, and the availability of surface and ground water, among others.

CONCLUSIONS

This section provides a summary of the key findings of the assessment and the limitations encountered in the process of the assessment. For more accurate quantification outcomes, further studies will have to be done using datasets of higher details and corroboration from the field.

KEY FINDINGS

In summation, the key findings from the above assessments are as follows:

- The total surface storage created in the intervention area due to the project is 19,59,819 cubic meters.
- The influence of rainfall on the ground water levels has not been very significant. However, a positive correlation between both was observed.
- The ground water levels in the intervention watershed have been increasing since 2017 and are presently at high values and are expected to persist at similar levels in the coming years. The availability of more recent data will shed more light on the trends that can be expected.
- Ground water recharge directly due to rainfall in the intervention area is about 12.45% of the total rainfall received.
- The volume of surface run-off stored by the intervention measures is 6.97% of the total run-off generated as a part of and due to the interventions (or) 1.06% of the total rainfall received during the period of the project intervention and ever since.
- Analysis of LULC, NDVI, and SSM reveal that there has been a marked increase in area under moderate or double cultivation while the crop cover overall has reduced slightly likely due to the increase in area under built up. The surface soil moisture has shown a remarkable change with most of the area coming under moisture content of more than 40%.

TABLE 14: SUMMARY OF FINDINGS

District		Aurangabad
Organisation		AFPRO
Total Area of Watershed (Sq. Km.)		123.59205
Soil Group		D
Volume of Storage Created (Cu. m.)		1959819
Total rainfall over intervention area (Cu. m.)		583324813.9080
Q - Total run-off over intervention area (Cu. m.)		174997444.2
Average % of fullness throughout the intervention period		10.37%
Run-off volume stored in interventions	Pre-evaporation Loss	20329196.61
	Post Evaporation Loss	12197517.97
% of run-off stored by interventions	Pre-evaporation Loss	11.62%
	Post Evaporation Loss	6.97%
% of rainfall stored by interventions	Pre-evaporation Loss	1.77%
	Post Evaporation Loss	1.06%
Surface water contribution to ground water recharge (40%) (Cu. m.)		4879007.19
Recharge only due to rainfall (Entire intervention period and since)	Cu. m.	82004094.59
	%	12.45%

LIMITATIONS

The most significant limitation faced was in terms of data availability. With the resolution of the available open-source satellite imagery being capped at 10m, 30m and 50m, the land use, vegetation index and soil moisture that can be generated, respectively, also lack resolution, especially considering the small size of the intervention area that had to be assessed. Assumptions were made to calculate the storage capacity of water harvesting structures. Owing to the limitation in the availability of data on the number of interventions, their locations and the respective dimensions, the assessments are based primarily on data from secondary sources, with the primary data being used wherever possible. Further, most of the secondary data that was available and obtained has shortcomings in one or more areas, such as the temporal coverage or the spatial resolution. Further constraints were due to the unavailability of up-to-date and reliable ground water data. With the continuous measurement of this information, the efficiency of the assessment can be improved.

ANNEXURE 1

INTERVENTIONS

Organisation	Village	Type of Activity	Latitude	Longitude
AFPRO	Buttevadgaon	NDW	19.84288	75.00215
AFPRO	Buttevadgaon	NDW	19.84571	75.00157
AFPRO	Buttevadgaon	NDW	19.84847	75.00275
AFPRO	Buttevadgaon	NDW	19.85137	75.00308
AFPRO	Buttevadgaon	NDW	19.85365	75.00305
AFPRO	Buttevadgaon	PT	19.85554	75.01135
AFPRO	Buttevadgaon	PT	19.85341	75.02388
AFPRO	Buttevadgaon	Farm Pond	19.85139	75.01916
AFPRO	Buttevadgaon	Farm Pond	19.85139	75.01916
AFPRO	Buttevadgaon	Farm Pond	19.84911	74.99860
AFPRO	Buttevadgaon	Farm Pond	19.84430	75.00285
AFPRO	Buttevadgaon	Farm Pond	19.85495	75.00319
AFPRO	Buttevadgaon	Farm Pond	19.84593	74.99863
AFPRO	Buttevadgaon	Farm Pond	19.85576	75.00346
AFPRO	Buttevadgaon	Farm Pond	19.85038	75.01487
AFPRO	Buttevadgaon	Farm Pond	19.85038	75.01487
AFPRO	Buttevadgaon	Farm Pond	19.84900	74.98558
AFPRO	Buttevadgaon	Farm Pond	19.85037	75.01544
AFPRO	Buttevadgaon	Farm Pond	19.85456	75.01499
AFPRO	Buttevadgaon	PT	19.85554	75.01135
AFPRO	Buttevadgaon	PT	19.85554	75.01135
AFPRO	Buttevadgaon	PT	19.85341	75.02388
AFPRO	Devli	Farm Pond	19.88144	75.01782
AFPRO	Devli	Farm Pond	19.88299	75.01507
AFPRO	Devli	Farm Pond	19.88075	75.03004
AFPRO	Devli	Farm Pond	19.88239	75.02366
AFPRO	Devli	Farm Pond	19.88188	75.02287
AFPRO	Devli	Farm Pond	19.89321	75.02616
AFPRO	Devli	Farm Pond	19.88222	75.02806
AFPRO	Devli	Farm Pond	19.88175	75.02852
AFPRO	Kolghar	NDW	19.78492	75.01879
AFPRO	Kolghar	NDW	19.77107	75.03441
AFPRO	Kolghar	NDW	19.77261	75.03226
AFPRO	Kolghar	NDW	19.77506	75.03155
AFPRO	Kolghar	NDW	19.77575	75.02920
AFPRO	Kolghar	NDW	19.77664	75.02591
AFPRO	Kolghar	NDW	19.77981	75.02325
AFPRO	Kolghar	NDW	19.78298	75.02258
AFPRO	Kolghar	PT	19.78026	75.02916
AFPRO	Kolghar	PT	19.77371	75.03568
AFPRO	Kolghar	PT	19.77371	75.03568
AFPRO	Borgaon	NDW	19.81772	75.10204

Organisation	Village	Type of Activity	Latitude	Longitude
AFPRO	Borgaon	NDW	19.82217	75.10547
AFPRO	Borgaon	NDW	19.82378	75.10849
AFPRO	Borgaon	NDW	19.81403	75.11185
AFPRO	Borgaon	NDW	19.81434	75.11468
AFPRO	Borgaon	NDW	19.81963	75.11722
AFPRO	Borgaon	CWG	19.81403	75.11185
AFPRO	Borgaon	Farm Pond	19.82226	75.11813
AFPRO	Borgaon	Farm Pond	19.82559	75.11150
AFPRO	Borgaon	Farm Pond	19.82927	75.10474
AFPRO	Borgaon	Farm Pond	19.81450	75.10841
AFPRO	Borgaon	Farm Pond	19.81656	75.11287
AFPRO	Borgaon	Farm Pond	19.80962	75.11067
AFPRO	Borgaon	Farm Pond	19.81943	75.12839
AFPRO	Borgaon	Farm Pond	19.82719	75.09795
AFPRO	Borgaon	Recharge Shaft	19.82656	75.11143
AFPRO	Borgaon	Recharge Shaft	19.82613	75.11131
AFPRO	Borgaon	Recharge Shaft	19.83567	75.51093
AFPRO	Borgaon	Recharge Shaft	19.82526	75.11640
AFPRO	Borgaon	Recharge Shaft	19.82498	75.10047
AFPRO	Borgaon	Recharge Shaft	19.81656	75.51026
AFPRO	Borgaon	Recharge Shaft	19.81712	75.10123
AFPRO	Borgaon	Recharge Shaft	19.81671	75.10154
AFPRO	Domegaon	PT	19.81256	75.10393
AFPRO	Domegaon	PT	19.80419	75.09397
AFPRO	Domegaon	CNB - Repair	19.80402	75.09695
AFPRO	Domegaon	CNB - Repair	19.80986	75.09860
AFPRO	Domegaon	Farm Pond	19.81101	75.11079
AFPRO	Domegaon	Farm Pond	19.81695	75.08793
AFPRO	Domegaon	Farm Pond	19.81506	75.08982
AFPRO	Domegaon	Farm Pond	19.81492	75.09568
AFPRO	Domegaon	Recharge Shaft	19.81019	75.09872
AFPRO	Domegaon	Recharge Shaft	19.80474	75.09226
AFPRO	Domegaon	Recharge Shaft	19.80414	75.09701
AFPRO	Domegaon	Recharge Shaft	19.79545	75.09840
AFPRO	Domegaon	Recharge Shaft	19.79517	75.09859
AFPRO	Domegaon	Recharge Shaft	19.81408	75.10394
AFPRO	Domegaon	Recharge Shaft	19.81400	75.10372
AFPRO	Domegaon	Recharge Shaft	19.81366	75.10361
AFPRO	Domegaon	Recharge Shaft	19.81339	75.10350
AFPRO	Jikthan	NDW	19.74629	75.12551
AFPRO	Kolghar	CNB - New	19.77107	75.03441
AFPRO	Kolghar	CNB - New	19.77647	75.02522
AFPRO	Kolghar	CNB - New	19.77511	75.03165
AFPRO	Kolghar	CNB - Repair	19.77575	75.02920
AFPRO	Kolghar	CNB - Repair	19.78298	75.02258
AFPRO	Kolghar	Farm Pond	19.75765	75.01057

Organisation	Village	Type of Activity	Latitude	Longitude
AFPRO	Kolghar	Farm Pond	19.77184	75.04034
AFPRO	Kolghar	Farm Pond	19.77234	75.03549
AFPRO	Kolghar	Farm Pond	19.78537	75.03698
AFPRO	Kolghar	Farm Pond	19.77143	75.03272
AFPRO	Kolghar	Farm Pond	19.78736	75.03830
AFPRO	Kolghar	Farm Pond	19.77332	75.03092
AFPRO	Kolghar	Farm Pond	19.78737	75.03830
AFPRO	Kolghar	Farm Pond	19.78508	75.03209
AFPRO	Kolghar	Farm Pond	19.90786	75.06796
AFPRO	Kolghar	PT	19.78026	75.02916
AFPRO	Mahamadpur	NDW	19.89234	75.03089
AFPRO	Mahamadpur	NDW	19.89218	75.03219
AFPRO	Mahamadpur	NDW	19.89244	75.03455
AFPRO	Mahamadpur	NDW	19.89232	75.03735
AFPRO	Mahamadpur	NDW	19.89218	75.03474
AFPRO	Mahamadpur	PT	19.89245	75.03969
AFPRO	Mahamadpur	Farm Pond	19.88772	75.04160
AFPRO	Mahamadpur	Farm Pond	19.88885	75.04301
AFPRO	Mahamadpur	Farm Pond	19.88590	75.04571
AFPRO	Mahamadpur	Farm Pond	19.88639	75.04476
AFPRO	Mahamadpur	PT	19.89245	75.03969
AFPRO	Shekta	PT	19.84529	75.02781
AFPRO	Shekta	Farm Pond	19.83991	75.02650
AFPRO	Shekta	Farm Pond	19.84045	75.02855
AFPRO	Shekta	Farm Pond	19.83926	75.02128
AFPRO	Shekta	Farm Pond	19.83881	75.02988
AFPRO	Shekta	Farm Pond	19.83935	75.02499
AFPRO	Shekta	PT	19.84529	75.02781
AFPRO	Shillegaon	NDW	19.85602	75.00351
AFPRO	Shillegaon	NDW	19.88046	75.00977
AFPRO	Shillegaon	NDW	19.85757	75.00101
AFPRO	Shillegaon	NDW	19.87653	75.00807
AFPRO	Shillegaon	NDW	19.85981	74.99963
AFPRO	Shillegaon	NDW	19.86582	74.99955
AFPRO	Shillegaon	NDW	19.86781	75.00052
AFPRO	Shillegaon	NDW	19.87094	75.00509
AFPRO	Shillegaon	NDW	19.90593	75.01545
AFPRO	Shillegaon	PT	19.87291	75.02655
AFPRO	Shillegaon	PT	19.87291	75.02655
AFPRO	Shillegaon	Farm Pond	19.86759	75.02902
AFPRO	Shillegaon	Farm Pond	19.86348	75.00249
AFPRO	Shillegaon	Farm Pond	19.86642	74.99901
AFPRO	Jikthan	NDW	19.76246	75.14661
AFPRO	Jikthan	NDW	19.76702	75.14273
AFPRO	Jikthan	NDW	19.77079	75.14606
AFPRO	Jikthan	NDW	19.74870	75.12964

Organisation	Village	Type of Activity	Latitude	Longitude
AFPRO	Jikthan	NDW	19.75367	75.13314
AFPRO	Jikthan	NDW	19.75760	75.13582
AFPRO	Jikthan	NDW	19.76845	75.13728
AFPRO	Jikthan	PT	19.77633	75.16128
AFPRO	Jikthan	CWG	19.74629	75.12551
AFPRO	Jikthan	CWG	19.74870	75.12964
AFPRO	Jikthan	CWG	19.74870	75.12964
AFPRO	Jikthan	CWG	19.77079	75.14606
AFPRO	Jikthan	Farm Pond	19.74914	75.13839
AFPRO	Jikthan	Farm Pond	19.75048	75.13521
AFPRO	Jikthan	Farm Pond	19.75176	75.12483
AFPRO	Jikthan	Farm Pond	19.76294	75.14683
AFPRO	Jikthan	Farm Pond	19.75614	75.13675
AFPRO	Jikthan	Farm Pond	19.76972	75.15690
AFPRO	Jikthan	Farm Pond	19.76650	75.14234
AFPRO	Jikthan	Farm Pond	19.76606	75.14205
AFPRO	Jikthan	Farm Pond	19.74866	75.13863
AFPRO	Jikthan	Farm Pond	19.74918	75.13784
AFPRO	Kalegaon Dighi	NDW	19.77507	75.09514
AFPRO	Kalegaon Dighi	NDW	19.76440	75.10768
AFPRO	Kalegaon Dighi	NDW	19.76683	75.10699
AFPRO	Kalegaon Dighi	NDW	19.77229	75.10419
AFPRO	Kalegaon Dighi	NDW	19.77395	75.10167
AFPRO	Kalegaon Dighi	NDW	19.77696	75.10392
AFPRO	Kalegaon Dighi	PT	19.76596	75.11602
AFPRO	Kalegaon Dighi	PT	19.77892	75.11578
AFPRO	Kalegaon Dighi	CWG	19.77673	75.10122
AFPRO	Kalegaon Dighi	Farm Pond	19.77905	75.10689
AFPRO	Kalegaon Dighi	Farm Pond	19.77944	75.10712
AFPRO	Kalegaon Dighi	Farm Pond	19.77108	75.10558
AFPRO	Kalegaon Dighi	Farm Pond	19.77393	75.11224
AFPRO	Kalegaon Dighi	Farm Pond	19.76759	75.08332
AFPRO	Kalegaon Dighi	Farm Pond	19.76767	75.08137
AFPRO	Kalegaon Dighi	Farm Pond	19.76747	75.08186
AFPRO	Kalegaon Dighi	Farm Pond	19.76750	75.08183
AFPRO	Kalegaon Dighi	Farm Pond	19.76998	75.08254
AFPRO	Kalegaon Dighi	Farm Pond	19.77261	75.10064
AFPRO	Kalegaon Dighi	Farm Pond	19.77208	75.10095
AFPRO	Kalegaon Dighi	Farm Pond	19.77412	75.11153
AFPRO	Kalegaon Dighi	Recharge Shaft	19.77427	75.10171
AFPRO	Kalegaon Dighi	Recharge Shaft	19.72724	75.12006
AFPRO	Kalegaon Dighi	Recharge Shaft	19.75323	75.10725
AFPRO	Kalegaon Dighi	Recharge Shaft	19.76340	75.10698
AFPRO	Kalegaon Dighi	PT	19.76596	75.11602
AFPRO	Shillegaon	Farm Pond	19.86664	74.99525
AFPRO	Shillegaon	Farm Pond	19.86544	74.99082

Organisation	Village	Type of Activity	Latitude	Longitude
AFPRO	Shillegaon	Farm Pond	19.86292	74.99067
AFPRO	Shillegaon	Farm Pond	19.86733	75.00785
AFPRO	Shillegaon	Farm Pond	19.86659	75.01013
AFPRO	Shillegaon	Farm Pond	19.87171	75.01118
AFPRO	Shillegaon	Farm Pond	19.87458	75.01083
AFPRO	Shillegaon	Farm Pond	19.87663	75.01711
AFPRO	Shillegaon	Farm Pond	19.86762	75.02906
AFPRO	Shillegaon	Farm Pond	19.87494	75.01506
AFPRO	Shillegaon	Farm Pond	19.87524	75.01732
AFPRO	Shillegaon	Farm Pond	19.86938	75.01411
AFPRO	Shillegaon	Farm Pond	19.87046	75.01934
AFPRO	Shillegaon	Farm Pond	19.87085	75.02046
AFPRO	Shillegaon	Farm Pond	19.87046	75.02085
AFPRO	Shillegaon	Farm Pond	19.86899	75.01965
AFPRO	Shillegaon	Farm Pond	19.86247	75.01981
AFPRO	Shillegaon	Farm Pond	19.87684	75.03074
AFPRO	Shillegaon	Farm Pond	19.87643	75.02941
AFPRO	Shillegaon	Farm Pond	19.85855	74.99631
AFPRO	Shillegaon	Farm Pond	19.87991	75.03000
AFPRO	Shillegaon	Farm Pond	19.86929	75.00135
AFPRO	Shillegaon	Farm Pond	19.88001	75.03141
AFPRO	Shillegaon	Farm Pond	19.86233	75.00397
AFPRO	Shillegaon	Farm Pond	19.86154	75.00604
AFPRO	Shillegaon	Farm Pond	19.85843	75.00763
AFPRO	Shillegaon	Farm Pond	19.86040	75.00272
AFPRO	Shiregaon	NDW	19.89097	75.01220
AFPRO	Shiregaon	NDW	19.89953	75.01469
AFPRO	Shiregaon	NDW	19.89678	75.01419
AFPRO	Shiregaon	NDW	19.89227	75.01274
AFPRO	Shiregaon	PT	19.89669	75.00408
AFPRO	Shiregaon	CNB - New	19.89953	75.01469
AFPRO	Shiregaon	Farm Pond	19.90716	75.01028
AFPRO	Shiregaon	Farm Pond	19.89716	75.00008
AFPRO	Shiregaon	Farm Pond	19.88792	75.00141
AFPRO	Shiregaon	Farm Pond	19.88990	75.00257
AFPRO	Shiregaon	Farm Pond	19.89874	75.00044
AFPRO	Shiregaon	Farm Pond	19.90438	74.99896
AFPRO	Shiregaon	Farm Pond	19.90532	74.99859
AFPRO	Shiregaon	Farm Pond	19.89353	75.00173
AFPRO	Shiregaon	Farm Pond	19.90032	75.00505
AFPRO	Shiregaon	Farm Pond	19.90353	75.00573
AFPRO	Shiregaon	Farm Pond	19.91853	75.00969
AFPRO	Shiregaon	Farm Pond	19.90853	75.00769
AFPRO	Shiregaon	Farm Pond	19.88413	75.01020
AFPRO	Sidhnathvadgaon	NDW	19.80766	74.99981
AFPRO	Sidhnathvadgaon	NDW	19.80962	74.99977

Organisation	Village	Type of Activity	Latitude	Longitude
AFPRO	Kalegaon Dighi	PT	19.77892	75.11578
AFPRO	Malkapur	NDW	19.80482	75.12205
AFPRO	Malkapur	NDW	19.80405	75.12670
AFPRO	Malkapur	PT	19.80116	75.12091
AFPRO	Malkapur	PT	19.79334	75.11968
AFPRO	Malkapur	PT	19.79434	75.12336
AFPRO	Malkapur	CNB - New	19.79657	75.11830
AFPRO	Malkapur	CWG	19.80482	75.12205
AFPRO	Malkapur	CWG	19.80234	75.12601
AFPRO	Malkapur	Farm Pond	19.80304	75.12570
AFPRO	Malkapur	Farm Pond	19.80406	75.12638
AFPRO	Malkapur	Farm Pond	19.80476	75.12169
AFPRO	Malkapur	Farm Pond	19.80388	75.11962
AFPRO	Malkapur	Recharge Shaft	19.79312	75.12082
AFPRO	Malkapur	Recharge Shaft	19.79326	75.12064
AFPRO	Malkapur	Recharge Shaft	19.79330	75.12033
AFPRO	Malkapur	Recharge Shaft	19.79348	75.12020
AFPRO	Malkapur	PT	19.79334	75.11968
AFPRO	Narsapur	NDW	19.75247	75.10996
AFPRO	Narsapur	NDW	19.74611	75.11422
AFPRO	Narsapur	CWG	19.75719	75.10864
AFPRO	Narsapur	Farm Pond	19.74371	75.11523
AFPRO	Narsapur	Recharge Shaft	19.75327	75.11012
AFPRO	Rajura	PT	19.78540	75.13439
AFPRO	Rajura	PT	19.79059	75.13242
AFPRO	Rajura	Farm Pond	19.79180	75.13205
AFPRO	Rajura	Farm Pond	19.78764	75.13972
AFPRO	Rajura	Farm Pond	19.77230	75.13256
AFPRO	Rajura	Farm Pond	19.77490	75.13243
AFPRO	Rajura	Farm Pond	19.77724	75.13167
AFPRO	Rajura	Farm Pond	19.77674	75.12674
AFPRO	Rajura	Farm Pond	19.77723	75.12367
AFPRO	Rajura	Recharge Shaft	19.77266	75.13711
AFPRO	Rajura	Recharge Shaft	19.77201	75.13712
AFPRO	Rajura	Recharge Shaft	19.77097	75.13718
AFPRO	Sarangpur	NDW	19.72800	75.11855
AFPRO	Sarangpur	NDW	19.73172	75.12045
AFPRO	Sarangpur	NDW	19.73618	75.12100
AFPRO	Sarangpur	NDW	19.74181	75.12485
AFPRO	Sarangpur	NDW	19.74181	75.12485
AFPRO	Sarangpur	CWG	19.74119	75.11703
AFPRO	Sarangpur	Farm Pond	19.74345	75.11499
AFPRO	Sarangpur	Farm Pond	19.73983	75.11645
AFPRO	Sarangpur	Recharge Shaft	19.74167	75.12488
AFPRO	Sarangpur	Recharge Shaft	19.73482	75.12110
AFPRO	Sarangpur	Recharge Shaft	19.73428	75.12119

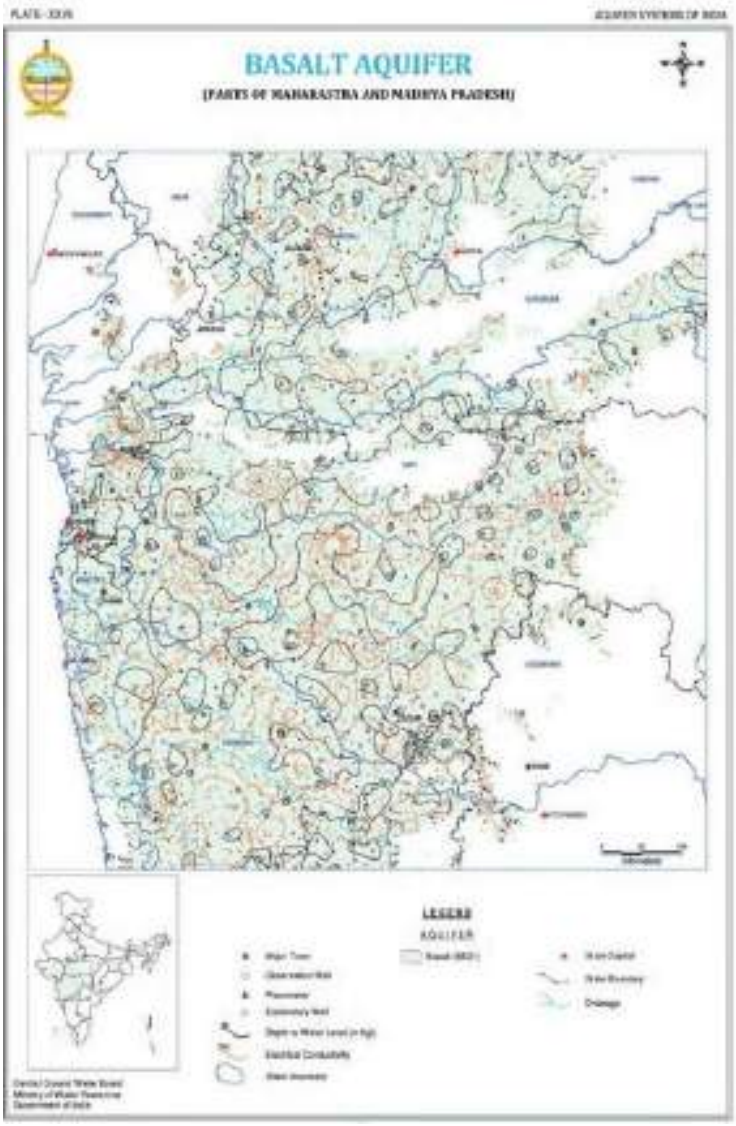
Organisation	Village	Type of Activity	Latitude	Longitude
AFPRO	Sarangpur	Recharge Shaft	19.73406	75.12106
AFPRO	Sarangpur	NDW	19.74119	75.11703
AFPRO	Sidhnathvadgaon	NDW	19.81254	75.01732
AFPRO	Sidhnathvadgaon	NDW	19.82119	75.02298
AFPRO	Sidhnathvadgaon	NDW	19.82229	75.02357
AFPRO	Sidhnathvadgaon	PT	19.81697	75.02001
AFPRO	Sidhnathvadgaon	PT	19.82761	75.01584
AFPRO	Sidhnathvadgaon	Farm Pond	19.81161	74.99960
AFPRO	Sidhnathvadgaon	Farm Pond	19.81581	74.99658
AFPRO	Sidhnathvadgaon	Farm Pond	19.81143	74.99643
AFPRO	Sidhnathvadgaon	Farm Pond	19.81067	74.99789
AFPRO	Sidhnathvadgaon	Farm Pond	19.81424	74.98759
AFPRO	Sidhnathvadgaon	Farm Pond	19.81427	74.98820
AFPRO	Sidhnathvadgaon	Farm Pond	19.81425	74.98889
AFPRO	Sidhnathvadgaon	Farm Pond	19.81212	74.99822
AFPRO	Sidhnathvadgaon	Farm Pond	19.82117	74.99533
AFPRO	Sidhnathvadgaon	Farm Pond	19.81931	75.01125
AFPRO	Sidhnathvadgaon	Farm Pond	19.80802	75.00372
AFPRO	Sidhnathvadgaon	Farm Pond	19.81081	75.00330
AFPRO	Sidhnathvadgaon	Farm Pond	19.82451	75.00237
AFPRO	Sidhnathvadgaon	Farm Pond	19.81346	75.00102
AFPRO	Sidhnathvadgaon	Farm Pond	19.81365	75.00163
AFPRO	Tandulwadi	NDW	19.78595	75.01437
AFPRO	Tandulwadi	NDW	19.78662	75.01234
AFPRO	Tandulwadi	NDW	19.79531	75.00623
AFPRO	Tandulwadi	NDW	19.79990	75.00165
AFPRO	Tandulwadi	PT	19.80182	75.01679
AFPRO	Tandulwadi	PT	19.79739	75.02216
AFPRO	Tandulwadi	CNB - New	19.78595	75.01437
AFPRO	Tandulwadi	Farm Pond	19.79839	75.00221
AFPRO	Tandulwadi	Farm Pond	19.78687	75.01297
AFPRO	Tandulwadi	Farm Pond	19.80665	75.00362
AFPRO	Tandulwadi	Farm Pond	19.80475	75.00221
AFPRO	Tandulwadi	Farm Pond	19.78363	75.01091
AFPRO	Tandulwadi	Farm Pond	19.79146	75.01310
AFPRO	Tandulwadi	Farm Pond	19.80075	75.00836
AFPRO	Tandulwadi	Farm Pond	19.80048	74.99987
AFPRO	Tandulwadi	Farm Pond	19.80665	75.00342
AFPRO	Tandulwadi	Farm Pond	19.80075	75.00836
AFPRO	Tandulwadi	Farm Pond	19.81146	75.02310
AFPRO	Tandulwadi	PT	19.80182	75.01679
AFPRO	Vajnapur	NDW	19.83314	75.00014
AFPRO	Vajnapur	NDW	19.83922	75.00235
AFPRO	Vajnapur	NDW	19.84063	75.00429

Organisation	Village	Type of Activity	Latitude	Longitude
AFPRO	Vajnapur	Farm Pond	19.82626	74.99727
AFPRO	Vajnapur	Farm Pond	19.82719	74.98726
AFPRO	Vajnapur	Farm Pond	19.82612	74.99821
AFPRO	Vajnapur	Farm Pond	19.83698	74.99479
AFPRO	Vajnapur	Farm Pond	19.82583	75.00002
AFPRO	Shirodi	PT	19.80466	75.12777
AFPRO	Shirodi	PT	19.79598	75.14137
AFPRO	Shirodi	PT	19.81024	75.13514
AFPRO	Shirodi	PT	19.81203	75.13896
AFPRO	Shirodi	Farm Pond	19.80431	75.13034
AFPRO	Shirodi	Farm Pond	19.79667	75.14002
AFPRO	Shirodi	Farm Pond	19.79583	75.13772
AFPRO	Shirodi	Farm Pond	19.80145	75.13111
AFPRO	Shirodi	Farm Pond	19.80142	75.13647
AFPRO	Shirodi	Farm Pond	19.80413	75.13043
AFPRO	Shirodi	Farm Pond	19.80939	75.13782
AFPRO	Shirodi	Farm Pond	19.80130	75.13815
AFPRO	Shirodi	Farm Pond	19.80918	75.14232
AFPRO	Shirodi	Farm Pond	19.80700	75.14249
AFPRO	Shirodi	Recharge Shaft	19.80109	75.13770
AFPRO	Shirodi	Recharge Shaft	19.79578	75.13967
AFPRO	Shirodi	Recharge Shaft	19.80002	75.13789
AFPRO	Shirodi	Recharge Shaft	19.79674	75.13800
AFPRO	Shirodi	Recharge Shaft	19.79524	75.13248
AFPRO	Shirodi	Recharge Shaft	19.79594	75.13744
AFPRO	Shirodi	Recharge Shaft	19.79507	75.13768
AFPRO	Shirodi	Recharge Shaft	19.79642	75.14020
AFPRO	Shirodi	Recharge Shaft	19.79614	75.14001
AFPRO	Shirodi	Recharge Shaft	19.79597	75.13988
AFPRO	Yesgaon	NDW	19.77996	75.11563
AFPRO	Yesgaon	NDW	19.78576	75.07516
AFPRO	Yesgaon	NDW	19.78311	75.10168
AFPRO	Yesgaon	NDW	19.78508	75.10186
AFPRO	Yesgaon	NDW	19.78578	75.11145
AFPRO	Yesgaon	NDW	19.78861	75.11349
AFPRO	Yesgaon	PT	19.78226	75.11129
AFPRO	Yesgaon	CNB - Repair	19.78311	75.10168
AFPRO	Yesgaon	CWG	19.78166	75.10848
AFPRO	Yesgaon	CWG	19.78576	75.07516
AFPRO	Yesgaon	Farm Pond	19.78169	75.11681
AFPRO	Yesgaon	Farm Pond	19.78273	75.09619
AFPRO	Yesgaon	Farm Pond	19.78117	75.10547
AFPRO	Yesgaon	Farm Pond	19.78977	75.10121
AFPRO	Yesgaon	Farm Pond	19.78679	75.10593

Organisation	Village	Type of Activity	Latitude	Longitude
AFPRO	Yesgaon	Farm Pond	19.78812	75.10723
AFPRO	Yesgaon	Farm Pond	19.78691	75.09212
AFPRO	Yesgaon	Farm Pond	19.78130	75.10490
AFPRO	Yesgaon	Farm Pond	19.78419	75.12120
AFPRO	Yesgaon	Recharge Shaft	19.78618	75.10173
AFPRO	Yesgaon	Recharge Shaft	19.78577	75.10179
AFPRO	Yesgaon	Recharge Shaft	19.78536	75.10162
AFPRO	Yesgaon	CWG	19.78106	75.10664

ANNEXURE 2

AQUIFER TYPES



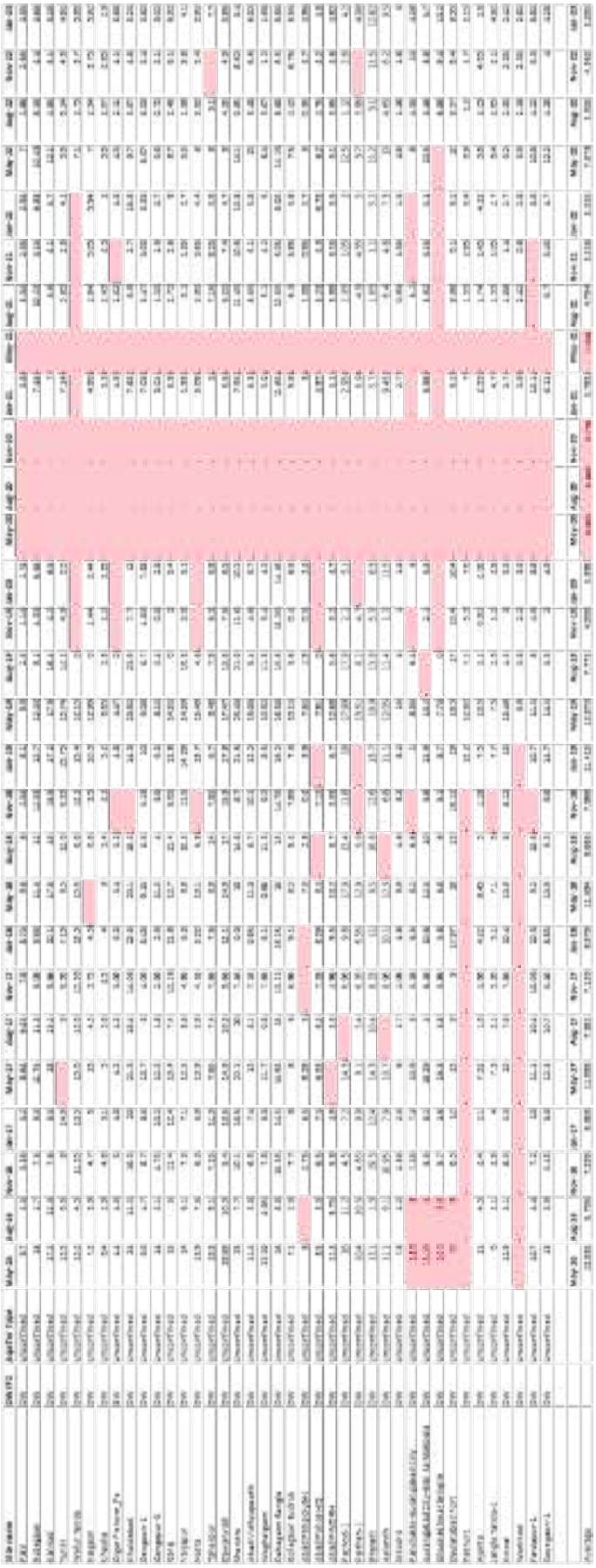
ANNEXURE 3

GROUND WATER DATA FROM NGO PARTNERS

Month	Overall	AFARM	AFPRO	BAIF	IBGVS	MGVS	DSC	SPARSH
Jun-17	16.63291	18.4859	14.58687	10.69906	17.82977		16.94432	
Jul-17	16.26051	17.0063	14.74355	10.21412	17.82977		16.94432	
Aug-17	15.89246	15.97216	14.08885	10.08629	17.82977		16.94432	
Sep-17	15.59119	15.97269	14.48917	10.42155	17.82977		16.94432	
Oct-17	15.91418	16.0541	13.77258	10.6804	17.82977		16.94432	
Nov-17	15.07909	16.14039	14.54373	10.82194	15.75072		16.36963	
Dec-17	15.28061	16.60187	14.73175	11.08952	16.01258		14.60358	
Jan-18	15.78315	17.30227	14.91724	10.10798	16.53142		15.00858	
Feb-18	16.13479	17.84025	14.97115	10.4525	16.77761		15.40358	
Mar-18	16.51477	17.97279	15.98083	10.60847	16.8196		15.50358	
Apr-18	16.62765	18.13107	16.29189	10.57028	16.86864		15.90358	
May-18	16.62098	18.08931	16.29604	10.27359	16.91076		15.75272	
Jun-18	16.68555	18.15702	16.3129	10.57145	16.95413		15.95796	
Jul-18	15.50653	16.69937	14.05222	9.815423	16.06409		15.9958	
Aug-18	15.01052	16.20999	14.20889	9.682651	15.42218		14.55531	
Sep-18	15.05036	16.07885	14.39571	9.431008	15.62165		14.78552	
Oct-18	15.16348	16.10001	14.42797	9.644355	15.78725		15.1284	
Nov-18	15.17444	16.44153	13.33897	9.762581	15.92178		15.36963	
Dec-18	15.36046	16.62517	13.66385	9.907863	16.17475		15.65383	
Jan-19	15.8186	16.82288	15.05846	10.15556	16.86138		15.67173	
Feb-19	16.04574	17.11898	15.06166	10.91272	16.98911		15.80602	
Mar-19	16.07413	17.10947	14.86218	11.01964	17.13002		15.57315	
Apr-19	16.2723	17.34318	15.35887	11.54101	17.14388		15.87414	
May-19	16.44105	17.36081	15.88693	11.99407	17.24754		15.97938	
Jun-19	16.10688	17.2031	15.93713	11.76859	17.25451	0.277391	15.85358	
Jul-19	15.56118	17.31602	16.54885	10.78345	15.61434	0.548696	15.14522	
Aug-19	15.14828	16.84152	16.44286	9.884798	14.79275	3.08915	14.80938	
Sep-19	14.7353	16.09015	16.00323	9.444355	14.64434	4.722174	14.25667	
Oct-19	14.41852	15.59718	16.04696	8.134355	14.7935	3.752174	13.4587	
Nov-19	14.2606	15.71996	16.07115	7.933548	14.79892	2.902609	12.35138	13.65
Dec-19	13.15947	15.16832	12.87619	8.591815	13.01254	2.354783	12.22696	13.86173
Jan-20	13.50751	15.523	11.01615	9.742177	14.01072	2.95913	13.06469	14.10765
Feb-20	13.92775	16.28292	10.32491	10.47444	14.5	2.95913	13.47667	14.35867

Month	Overall	AFARM	AFPRO	BAIF	IBGVS	MGVS	DSC	SPARSH
Mar-20	14.28585	16.56471	11.95991	11.11508	14.50964	0.848261	13.79852	14.71327
Apr-20	14.41205	16.43971	12.65387	11.605	14.51155	0.277391	14.1599	15.28357
May-20	14.42773	16.14196	12.15855	12.86661	14.51303	0.548696	14.2331	16.34796
Jun-20	14.38114	15.68726	11.00891	12.45274	15.42309	0.562609	14.20179	15.32653
Jul-20	9.755835	11.79976	7.473272	8.679274	6.809025	7.867826	12.33864	14.00612
Aug-20	7.548825	9.349132	5.164055	6.860806	4.173814	8.950435	10.91253	13.11888
Sep-20	6.125963	7.931561	3.3447	5.522581	2.986949	11.15043	8.431204	12.19184
Oct-20	5.247161	6.959467	2.800991	2.585645	2.846589	10.53621	8.929444	11.53724
Nov-21	5.501639	6.182822	3.348032	3.726032	3.431144	8.904783	9.05779	11.62806
Dec-21	6.33661	7.110027	4.57894	3.990645	4.446695	7.23087	9.751852	11.74082
Jan-21	7.318161	8.136332	6.028249	5.681855	5.664746	5.543933	9.541013	11.9148
Feb-21	9.135047	8.85904				5.800435	9.105494	12.11633
Mar-21	11.24193	11.52013				2.722174		12.39551
Apr-21	12.15048	12.68736				1.787391		12.96102
May-21	12.71124	13.18658				1.43087		13.91327
Jun-21	12.86181	13.2347				6.348261		13.25663
Jul-21	11.61871	11.62828				7.265652		12.61735
Aug-21	9.965919	9.479765				8.348261		11.81388
Sep-21	5.784916	6.325738				10.47		3.040816
Oct-21	5.898947	5.949663				11.43522		4.445918
Nov-21	6.860644	6.968792				10.17435		5.754082
Dec-21	7.530835	7.791698				9.47		6.258163
Jan-22	8.187613	8.372819				9.083043		7.414286
Feb-22	8.245786	8.184013				9.448261		8.152041
Mar-22	9.660788	10.16328				7.543933		8.62449
Apr-22	11.14324	12.09247				7.535237		9.140816
May-22	12.19885	13.30435				7.161304		10.00816
Jun-22	11.45931	12.10334				7.161304		10.67449
Jul-22	10.85145	11.24381				9.491739		9.973469
Aug-22	8.170429	7.784348				10.87652		8.713265
Sep-22	6.129714	5.404435				11.69828		7.035714
Oct-22	4.264286							4.264286
Nov-22	1.561224							1.561224

GROUND WATER DATA FROM CGWB



ANNEXURE 4

RAINFALL

Monthly rainfall (in mm) trends for Aurangabad from 01-Jan-2018 to 31-Mar-2024

Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)
Jan-17		0.00	Nov-18	24.8	11.03	Sep-20	153.4	197.37	Jul-22	172.8	247.29
Feb-17		0.00	Dec-18	10.3	0	Oct-20	56.9	65.44	Aug-22	175.9	84.34
Mar-17		0.00	Jan-19	2.7	0	Nov-20	24.8	1.45	Sep-22	153.4	255.34
Apr-17		0.00	Feb-19	2.5	0	Dec-20	10.3	1.33	Oct-22	56.9	132.92
May-17		2.44	Mar-19	4.6	0	Jan-21	2.7	12.03	Nov-22	24.8	0
Jun-17		149.79	Apr-19	3.5	0.94	Feb-21	2.5	2.27	Dec-22	10.3	7.04
Jul-17		86.36	May-19	18.9	0	Mar-21	4.6	5.84	Jan-23	2.7	3.14
Aug-17		165.79	Jun-19	134.6	110.63	Apr-21	3.5	4.66	Feb-23	2.5	0
Sep-17		182.62	Jul-19	172.8	162.87	May-21	18.9	30.6	Mar-23	4.6	9.83
Oct-17		95.61	Aug-19	175.9	106.42	Jun-21	134.6	132.15	Apr-23	0	39.76
Nov-17		2.83	Sep-19	153.4	213.73	Jul-21	172.8	142.21	May-23	0	9.41
Dec-17		2.27	Oct-19	56.9	193.39	Aug-21	175.9	186.88	Jun-23	134.6	43.71
Jan-18	2.7	0	Nov-19	24.8	37	Sep-21	153.4	454.42	Jul-23	172.8	173.41
Feb-18	2.5	0.72	Dec-19	10.3	1.46	Oct-21	56.9	106.39	Aug-23	175.9	46.79
Mar-18	4.6	0.53	Jan-20	2.7	0.12	Nov-21	24.8	15.3	Sep-23	153.4	220.1
Apr-18	3.5	2.01	Feb-20	2.5	0	Dec-21	10.3	6.89	Oct-23	56.9	0.85
May-18	18.9	0.17	Mar-20	4.6	22.92	Jan-22	2.7	0.2	Nov-23	24.8	54.85
Jun-18	134.6	126.39	Apr-20	3.5	2.42	Feb-22	2.5	0	Dec-23	10.3	14.13
Jul-18	172.8	85.65	May-20	18.9	6.26	Mar-22	4.6	4.91	Jan-24	0	2.44
Aug-18	175.9	180.45	Jun-20	134.6	251.86	Apr-22	3.5	0	Feb-24	0	2.25
Sep-18	153.4	29.42	Jul-20	172.8	91.32	May-22	18.9	0	Mar-24	0	0.1
Oct-18	56.9	1.65	Aug-20	175.9	221.91	Jun-22	134.6	140.36			

ANNEXURE 5

REGRESSION & CORRELATION

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.028569498
R Square	0.000816216
Adjusted R Square	-0.013457838
Standard Error	3.542306917
Observations	72

Correlation	*Column 1*	*Column 2*
Column 1	1	
Column 2	0.028569498	1

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.717513774	0.717513774	0.057181806	0.811705719
Residual	70	878.3556808	12.5479383		
Total	71	879.0731946			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.29983462	0.520525671	19.7873711	2.20591E-30	9.261678903	11.33799033	9.261678903	11.33799033
X Variable 1	0.001100177	0.004600801	0.239127175	0.811705719	-0.008075832	0.010276186	-0.008075832	0.010276186

ANNEXURE 7

PHOTOS

Latitude: 19.985046
Longitude: 74.99985
Elevation: 481.57±1.00 m
Accuracy: 14.1 m
Time: 09-24-2024 11:22:18

Latitude: 19.987318
Longitude: 75.038957
Elevation: 504.08±38 m
Accuracy: 13.2 m
Time: 09-24-2024 11:03
Note: Nala deepening and widening

बजाज जलसंधारण प्रकल्प, औरंगाबाद
Latitude: 19.962885
Longitude: 75.01475
Elevation: 473.97±1.00 m
Accuracy: 232.4 m
Time: 09-24-2024 14:56

CHAPTER 9
RECOMMENDATIONS

TAILORED TRAINING SESSIONS

Organise targeted training sessions focusing on specific challenges faced by farmers, such as drought management and effective use of new crops like Stylo hamata.

ENHANCED FOLLOW-UP MECHANISMS

Implement structured follow-up visits by agricultural experts post-training to provide guidance and support in the field.

RESOURCE ALLOCATION FOR EXPERIMENTATION

Allocate resources for pilot projects or trials of new practices, allowing farmers to experiment with Stylo hamata or soil management techniques under supervision. This hands-on approach can provide valuable insights and increase adoption rates based on observed results.

10. SUSTAINABILITY

A thorough evaluation of the project reveals that its sustainable impact is deeply rooted in environmental conservation, technological innovation, and community empowerment. These key themes are the drivers for sustainable change and resilience across the region:

Soil and Water Conservation

Soil and water conservation lies at the core of BWCP's sustainable footprint. The Bajaj Water Conservation Project (BWCP) has implemented conservation measures such as extensive tree planting (over 20,000 trees), nala bunding, and soil stabilization techniques. These initiatives increased water retention and reduced soil erosion, along with revitalising local aquifers and improving the overall micro-climate. The project has created an enduring environmental legacy by transforming the arid-degraded lands into productive fields.

Micro-Irrigation Systems

The installation of micro-irrigation systems has allowed farmers to shift from traditional and less efficient irrigation methods to water-saving techniques that ensure conservation. This shift in practice resulted in improved crop yields and crop diversification, particularly benefiting high-value crops requiring precise water application. The farmers were also supported with training sessions to impart the skills necessary to independently use and sustain the maintenance of micro-irrigation infrastructure. Findings from the study indicate that the use of micro-irrigation techniques reduced dependency on erratic rainfall, reinforcing a cycle of sustainable agricultural practices.

Community Groups and Capacity Building

The project’s focus on community empowerment and capacity building is central to the program design. Through the establishment of VDCs, WUGs, and SHGs, BWCP has institutionalised collective action in the community, resulting in local ownership over water conservation and environmental stewardship. Regular training programs in water resource management, sustainable farming practices, and maintenance of water equipment have built capacities in the community members to independently sustain these interventions. This bottom-up approach ensured improved water availability and enhanced agricultural income, promoting resilience and long-term self-sufficiency.

CHAPTER 11
CONCLUSION

In conclusion, the BWCP-AFPRO initiative has achieved remarkable progress in enhancing water conservation and agricultural productivity in the targeted villages. With comprehensive efforts including the treatment of sites for nala deepening and widening, and the desiltation of percolation tanks, water storage capacity increased by approximately 6.46 billion litres. This has significantly reduced community's reliance on water tankers. The introduction of micro-irrigation systems has also supported the cultivation of diverse crops, with farmers now growing more than two crops annually.

Furthermore, the project's emphasis on soil and water conservation has led to the planting of over 20,000 trees and the implementation of bunding techniques on more than 1,186 hectares, enabling farmers to better manage their water resources and withstand dry spells. The increased agricultural productivity is evident, with cotton yields improving significantly; 66.9% of farmers now report yields above 5 quintals per acre. Overall, these achievements not only contribute to enhanced food security and livelihoods for farmers but also promote sustainable water management practices, paving the way for resilient agricultural communities.

IMPACT ASSESSMENT REPORT

BAJAJ WATER CONSERVATION PROJECT

Implementing Partner: BAIF Institute for Sustainable Livelihoods and Development (BISLD)

Release Date: 31-12-2024

SoulAce
Path to Sustainability
SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
BAL	Bajaj Auto Limited
BWCP	Bajaj Water Conservation Project
BISLD	BAIF Institute for Sustainable Livelihoods and Development
SHG	Self Help Group
VDC	Development Committees
WUG	Water User Groups
NDW	Nala Deeping and widening
DPN	Deeping of Percolation Tank
CNB	Cement Nala Bound
CWG	Core Wall Gabion
DAC	Development Assistance Committee
NGO	Non-Government Organisation
IPC	Inter -Personal Communication
FGD	Focus Group Discussion
KII	Key Informants Interview
PRI	Panchayati Raj Institution
RKVY	Rashtriya Krishi Vikas Yojana
SMART	Specific, Measurable, Achievable, Relevant, Time-bound

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The Bajaj Water Conservation Project was designed to address the significant water scarcity in Aurangabad, Maharashtra which had led to minimal agricultural productivity and limited livelihood opportunities.

During the period December 2017 to June 2021, BAIF Institute for Sustainable Livelihoods and Development (BISLD), as a ground-level NGO, implemented this project in 14 underdeveloped villages across 8 Gram Panchayats in Gangapur Block, Aurangabad District, Maharashtra.

Through this intervention, a range of activities were implemented to support Water Resource Development. Structural measures included Nala deepening and widening (NDW), deepening of percolation tanks (DPN), repair of Cement Nala Bunds (CNB), construction of core wall gabions, and the building of new check dams. In addition, vegetative measures were carried out, such as the plantation of forest species seedlings and grass seeding, improved livelihood opportunities, and the creation, promotion, and empowerment of community-based organised groups like SHGs, VDCs, WUGs, etc., for the promotion of a sustainable environment.

Furthermore, a village development committee bank account was opened to facilitate the implementation and maintenance of the Bajaj Water Conservation project.

The present report highlights the findings of the impact assessment study across project interventions in water, agriculture, and livelihoods. It will also demonstrate the sustainability of community-based resource management mechanisms.

PROJECT DETAILS

Implementation year
FY 2017 - FY 2021

Assessment year
FY 2024 - FY 2025

Implementing Partner
BAIF Institute for Sustainable Livelihoods and Development

Project location
Aurangabad District, Maharashtra

Beneficiaries
20,000 Rural population across 2,347 households from Gangapur block

Budget
₹720 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

PROJECT STAFF RECRUITMENT AND BASELINE SURVEY

Staff recruited and trained by BAIF under BWCP. A group of 10 experienced professionals like engineers, watershed management specialists, and program personnel for social mobilisation was recruited for this project.

The household survey was conducted in 14 villages, covered 2347 households, and examined the status of wells 463 numbers to understand the groundwater status in the area.

INSTITUTION-BUILDING, TRAINING, AND CAPACITY-BUILDING COMMUNITY ENGAGEMENT

The community mobilisation started through mass awareness programs involving GP members, key persons in the village, and women. Women were contacted through existing SHG meetings. The working of SHGs, their meetings, books of records, and issues were the subjects discussed during the interaction. This was the first step in involving the community in developing institutions. The village meetings were conducted to understand the community problems and discuss probable solutions to overcome them.

3 SHGs were formed and strengthened through 13 training programs. 36 Water Users Groups formed and oriented on water resources maintenance, etc., in all 14 villages. Village development committees (VDC) were formed in all 14 villages. 16 Capacity-building training programs were organised for VDCs' development of water resources and maintenance. In all 14 villages, 14 Bank Accounts were opened for VDCs for Bajaj water Resource development and its maintenance work. 28 Exposure visits were organised for VDCs.

3 training programs were organised for Joldoot, and 7 water literacy camps were organised. Through this intervention, 8 Livelihood Trainings were also organised for the beneficiaries.

WATER RESOURCE DEVELOPMENT AND CONSERVATION

40 Nala deepening & widening work completed, deepening of existing percolation tank completed 6, Core Wall Gabion (CWG) – 2, Construction and Excavation of Open Well – 3 and investigations on the quality, quantity, effects of climate change, protection of water resources and the integrated relationship between surface water and groundwater done by Geological Survey – 4.

Plantation of forestry species (Neem seed)- 157, Grass seeding (Stylo hamata).

Efficient water use: Drip irrigation system -12 online registration covering 800 acres of land and introduced micro irrigation system.

AGRICULTURE PRODUCTIVITY ENHANCEMENT

Agriculture productivity is enhanced in all villages. As a result, 44.4% of annual agricultural income increased. 14 mass training sessions were organised to practice sustainable agriculture systems during the Kharif and Rabi seasons.

Motivated people about micro irrigation and connected them with the agriculture department for the Farm Pond scheme (Magel Tyala Shet Tale) and the same has been adopted by farmers. In this BIAF cluster of villages, 96 farmers are covered under this scheme.

Introduced diversified agriculture methods and developed horticulture initiatives.

LIVELIHOOD ENHANCEMENT

Organised 17 Livelihood trainings for 52 SHGs. Established 11 dairy units and 54 goat-rearing units and also organised 2 vaccination camps for livelihood development.

Despite various challenges like community sentiment and unknown climatic delays, they were successfully addressed through effective community engagement and awareness programs. The project serves as a model of public-private partnership, exclusively enhancing water security, increasing agricultural productivity, and upgrading the socio-economic conditions of rural communities, and also leaving a lasting and positive impact on both the environment and local livelihoods.

Key Findings

42.8%
of the respondents have an annual family income of Rs. 2.1 lakhs to 3 lakhs.

50.0%
of the respondents own land ranging from less than 1 hectare to 2 hectares.

Different groups like SHGs, UWGs, and VDGs are formed in the communities under the project intervention.

Micro-irrigation practices have been increased significantly among the farmers. Only 19.7% were practising micro-irrigation before the intervention, which increased to 60.2% post-intervention.

48.5%
of the respondents reported an increase of 0.250 to 0.500 hectares in land under protective irrigation after the intervention.

93.9%
of the respondents were dependent on water tankers for drinking water before intervention.

94.0%
of the respondents reported spending between Rs. 10,000 to Rs. 15,000 per year on water tankers for drinking water before the intervention.

Key Impact

60.0%
of the respondents reported an increase in Kharif crop yields by 15 to 19%.

62.9%
of the respondents experienced a 10 to 20% increase in annual income due to higher agricultural yields.

97.3%
of the respondents reported having sufficient water availability for their cattle.

There is a significant reduction in dependency on water tankers, with 93.3% of the respondents no longer relying on water tankers for drinking water after the project intervention.

03. OECD FRAMEWORK

RELEVANCE

Bajaj Water Conservation Project intervention was contextually designed to achieve environmental sustainability in the focused geographical location. This project intervention was highly relevant to the focused communities where water scarcity was a regular issue. The scarcity of water is interlinked with vulnerable rural livelihood conditions, especially for agricultural work. The needs of the communities were thoroughly assessed before implementation, including domestic and potable water scarcity from January to June each year, unaffordable farming due to high expenses and low income, limited irrigation facilities, lack of alternative opportunities, and weak community-based organisations.

COHERENCE

The project interventions are aligned with various government programs like the National Water Mission, National Rural Livelihood Mission, National Afforestation Programme and Green India Mission. Rashtriya Krishi Vikas Yojana (RKVY), etc. Therefore, the intervention was in line with the coherence of government sustainability programs.

EFFECTIVENESS

The project interventions were highly effective for the identified communities, as they positively changed the water scarcity situation. The findings of the study revealed a significant improvement in water availability, leading to increased agricultural productivity and the cultivation of various seasonal crops and vegetables in large quantities. Through the community-based groups, the communities were empowered and sustained in the socio-economic development process.

EFFICIENCY

The project efficiently addressed the needs of multiple villages by strengthening resource utilisation through the implementation of micro-irrigation systems, diversified cropping methods and climate-based agricultural planning. The strategies ensured sustainable use of water resources and enhanced agricultural productivity. Furthermore, the project positively raised awareness and involved local farmers in adopting sustainable practices, increasing their understanding of water conservation and sustainable farming.

IMPACT

The project created a significant impact in the communities: access to water for the whole year, upgraded irrigation practices and a substantial rise in annual income. Social groups were empowered through the formation and promotion of community organisations. The project led to socio-economic development by enhancing the quality of life, fostering a sense of community ownership of resources and promoting behaviour change.

SUSTAINABILITY

Various groups like SHGs, VDCs and WUGs were formed, promoted, and empowered through capacity-building training. These group members mobilised the community and identified long-term maintenance strategies for the water resources created through the project interventions. As a result, the communities are sustained and have made broader progress towards sustainability.

CHAPTER 4
INTRODUCTION

FDG with Project beneficiaries

Bajaj Water Conservation Project is a significant CSR initiative designed to address the acute issue of water scarcity and environmental decline while promoting sustainable livelihoods in rural communities. This innovative project was implemented from December 2017 to June 2021 in collaboration with the BAIF Institute for Sustainable Livelihoods and Development (BISLD), an NGO based in Maharashtra. It covered 14 villages within 8 Gram Panchayats in Gangapur Block of Aurangabad District, Maharashtra.

The primary objective of the project was to create a specialised water conservation infrastructure and enhance agricultural productivity to foster long-term sustainability. Key interventions consist of constructing check dams, soak pits, and farm ponds, which collectively improved water reservation capacity, recharged the groundwater levels, and expanded the irrigated area during the Rabi season by 1,570 hectares. The project also introduced the scientific method of micro-irrigation over 348 hectares to promote efficient water use and enhance crop yield. In addition to this, 55 hectares were brought under horticulture and vegetable cultivation, diversifying agricultural practices to bolster food security.

To ensure active community involvement and also to bring sustainability, the initiative established 100 Self-Help Groups (SHGs), 14 Village Development Committees (VDCs), and 142 Water User Groups (WUGs) in the project intervention area. These community-based institutions were trained and empowered to manage water resources and agricultural practices scientifically to ensure the long-term impact of the Bajaj Water Conservation project. The project also connects with government schemes and enables an additional contribution through government departments, which increased its impact in the area.

The project directly benefited over 20,000 people across 2,347 households by providing reliable water resources for domestic purposes and as well as agricultural work. Bajaj Water Conservation Project addresses huge water scarcity issues, enhances agricultural productivity, and significantly improves the socio-economic conditions of the focused communities. Through effective stakeholder engagement and advocacy, the project successfully managed challenges such as community resistance and climatic irregularity, demonstrating resilience and adaptability.

The Bajaj Water Conservation Project is one of the CSR initiatives for meaningful change in society. Through the combination of technical innovation, community empowerment, and strategic partnerships, this initiative not only addressed serious water and agricultural challenges but also established the foundation for sustainable rural development in the country. It is an ideal model of impactful collaboration between corporate and voluntary institutions to contribute significantly to the socio-economic development and bring environmental sustainability to the region.

NEED OF THE PROGRAM

The following needs were identified before the implementation of the Bajaj Water Conservation project.

Domestic water and potable water scarcity occurred during the period of January to June of the year.

Unaffordable farming because expenses were high, income was low, and there were limited irrigation facilities.

Limited opportunities for alternative livelihood and poor community-based organisations.

OBJECTIVES OF THE PROGRAM

Increase water availability for households and agriculture in the area.

Creation of a water conservation structure and mitigate seasonal water issues.

Improved Irrigation system.

Introduced diversified cropping cultivation.

Empowering community-based groups through various trainings to achieve sustainability.

Formation and promotion of community-based organisations and various groups.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT THE PROJECT IMPLEMENTATION AGENCY

The BAIF Institute for Sustainable Livelihoods and Development (BISLD) is a non-profit organisation committed to advancing and improving rural livelihoods through sustainable development. As an NGO, BISLD is implementing integrated programs like watershed management, sustainable agriculture, livestock development, rural entrepreneurship development, etc. With a multidisciplinary approach and a strong focus on community engagement, BISLD is involved with various social interventions such as poverty alleviation, environmental sustainability, and climate resilience. Through innovative solutions and capacity-building initiatives, BISLD drives long-term socio-economic transformation. Being an implementing agency for the Bajaj Water Conservation Project, BISLD has demonstrated exceptional expertise in delivering high-impact, scalable programs.

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Ltd. assigned has appointed SoulAce to conduct an impact assessment study of its CSR Initiative, Bajaj Water Conservation Project, implemented by BAIF covering 14 villages and 8 Gram Panchayats in Gangapur Block of Aurangabad, Maharashtra.

OBJECTIVES OF THE STUDY

To evaluate the effectiveness of the project interventions across water resources, agriculture, training and capacity building, etc.

To assess the project's success in improving water availability, agricultural productivity and socio-economic conditions.

To evaluate the impact of the community-based initiatives, including SHGs, VDCs and WUGs, on ownership, sustainability and beneficiary satisfaction.

This section of the report describes the methodology used for this Impact assessment. It also describes in detail the objectives and impact assessment framework introduced to the work.

PHASE 1

PARTICIPATORY QUALITATIVE ASSESSMENT

Inter-Personal Communication (IPC), Focus Group Discussion (FGD), Key Informants Interview (KII), and other participatory approaches were involved in this qualitative impact assessment of communities.

PHASE 2

QUANTITATIVE ASSESSMENT

A structured interview schedule was designed for data collection from beneficiaries and various levels of stakeholders. After the completion of data collection, proper scientific methods were applied to analyse the data and to find out the actual number and justification of the data.

PHASE 3

DATA SYNTHESIS AND TRIANGULATION

After the completion of qualitative and quantitative data analysis, a cross-verification process was adopted to validate the key findings through data synthesis and triangulation.

SOULACE TEAM ON FIELD WITH NGO REPRESENTATIVE

RESEARCH DESIGN

Name of the project

Bajaj Water Conservation Project (BWCP)

Implementing agency

BAIF Institute for Sustainable Livelihoods and Development (BISLD)

Research design used

Mixed-method research design, participatory qualitative and quantitative approaches

Sampling technique

Purposive sampling and systematic random sampling

Sample size

264 Beneficiaries

Qualitative method used

Inter-Personal Communication (IPC), open-ended interviews, semi-structured interviews, Kew Informants Interviews, Focus Group Discussion (FGD), etc.

KEY STAKEHOLDERS

- Farmers
- Project Staff
- VDC members
- WUG members
- Local PRI members
- SHG members
- Local Government authorities
- Bajaj Auto Ltd. Representatives

STUDY TOOLS

Questionnaires for primary beneficiaries –
In this questionnaire, the indicators were pre-defined area-wise.

Questioners for secondary stakeholders –
Questions were prepared based on types of stakeholders like SHGs, WUGs, VDCs, etc.

COMMITMENT TO RESEARCH ETHICS

In the present research, the researchers maintained a strong ethical framework to ensure ethical responsibility. Ensuring project participants' rights and well-being were the main priorities of this research. Participants' consent was obtained to address any questions and inform them about the purpose of the study and what benefits, risks, etc., are involved in the study process. Confidentiality was strictly maintained for data security, only accessible to authorised project staff. Participants' identity was protected through proper techniques. Participation was entirely voluntary, free from any form of force, and ensured freedom and respect for their individual choice. Participants' comfort in replying to any questions was also a priority in the research process.

FGD WITH BENEFICIARIES AT DOHEGAON

CHAPTER 6
KEY FINDINGS AND IMPACTS

CHART 1: AGE GROUPS AMONG THE RESPONDENTS

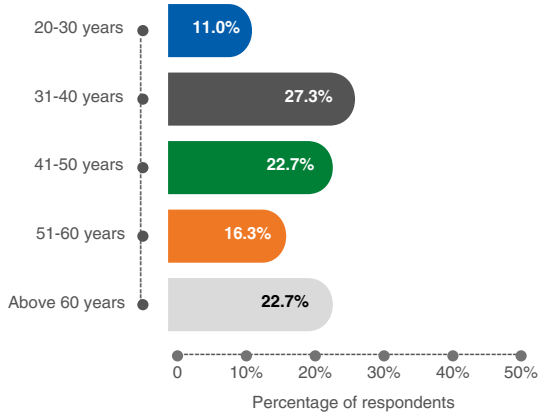


Chart 1 shows that 11% of respondents are aged 20 to 30, 27.3% are 31 to 40, 22.7% are 41 to 50, 16.3% are 51 to 60, and 22.7% are 60 and above.

CHART 2: GENDER DISTRIBUTION

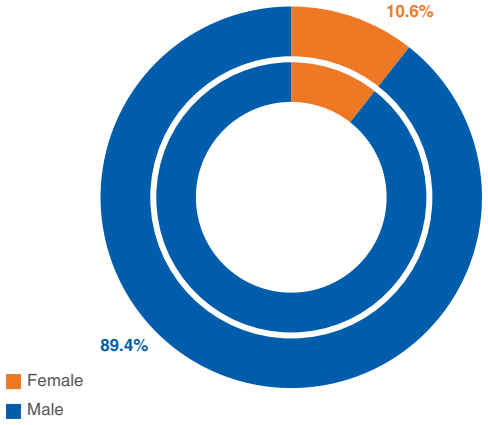


Chart 2 shows that 10.6% of respondents are female and 89.4% are male.

DAHEGAON JANKABAI JADHAV VDC PRESIDENT

CHART 3: EDUCATIONAL LEVEL

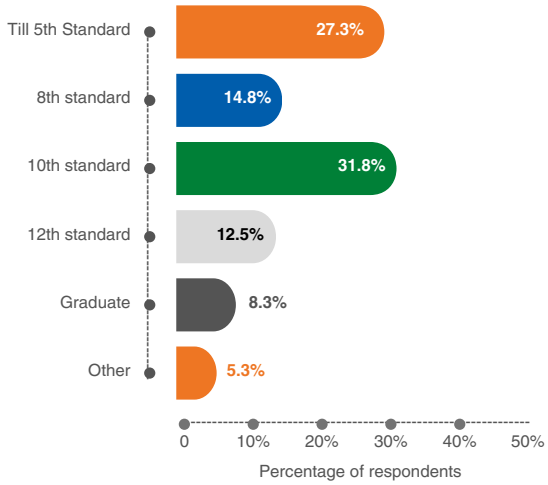


Chart 3 reveals that the majority of the respondents (73.9%) have education from 5th to 10th standard, with only 12.5% having completed 12th standard and 8.3% being graduates.

CHART 4: ANNUAL FAMILY INCOME

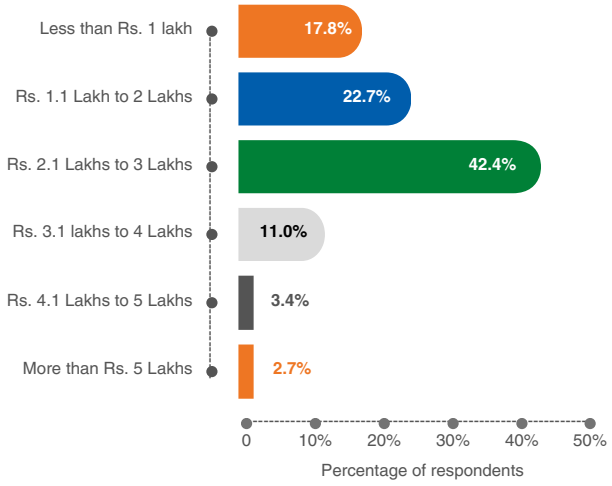


Chart 4 shows that the highest number of respondents (42.4%) have an annual family income of 2.1 lakhs to 3 lakhs. Only 17.1% of respondents have a family income of above 3 lakhs annually. Furthermore, 40.5% of respondents earn less than 1 lakh to 2 lakhs annually, making them the most economically vulnerable group.

CHART 5: AREA OF LAND OWNED

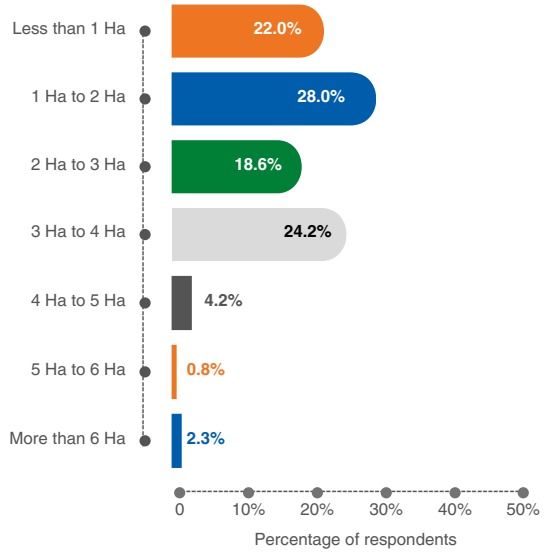


Chart 5 reveals that half of the respondents (50%) own land less than 1 Ha to 2 Ha.

CHART 6: GROUPS FORMED UNDER THE PROJECT INTERVENTION

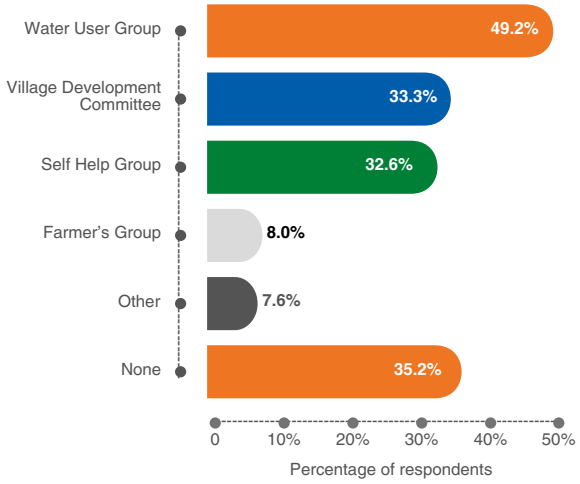


Chart 6 shows that 49.2% of respondents were involved in the Water User Group, 33.3% village development Committee, 32.6% is involved with SHGs, 8.0% were Farmers groups.

CASE STUDY 1

Sachin Pathade from Dhoregaon village represents the younger generation of beneficiaries. With a family of more than seven members, his agricultural income increased from INR 60,000 to INR 1,50,000 after the project's intervention. Previously, limited access to water and outdated farming techniques restricted his output. Through his association with Water User Groups, Sachin learned modern irrigation methods and improved his farming practices. He now advocates for deeper irrigation techniques and broader project coverage to support other young farmers in the community.

PURI HIRABAI MADHUKAR MORE EX SARPANCH

CASE STUDY 2

Anil Sulebhan Patil, Dhoregaon Village Anil Sulebhan Patil, a 47-year-old farmer from Dhoregaon village, lives with his family of seven members. Before the intervention, his annual agricultural income was approximately INR 4,00,000. This modest income was barely sufficient to meet his family's needs, with frequent water shortages hampering crop yields. After the intervention by the BAIF-Bajaj Watershed Project, his income rose to INR 10,00,000. This significant change was due to improved water resource management, training programs, and enhanced irrigation facilities. Now, Anil actively participates in community water governance and ensures adherence to the surveillance mechanisms established. Despite these advancements, he suggests focusing on clearing drainage systems for even better outcomes.

CHART 7: AREA OF LAND RECEIVED PROTECTIVE IRRIGATION DURING KHARIF SEASON AFTER THE CSR INTERVENTION (DUE TO IMPROVED WATER STORAGE AND GROUND WATER RECHARGE)

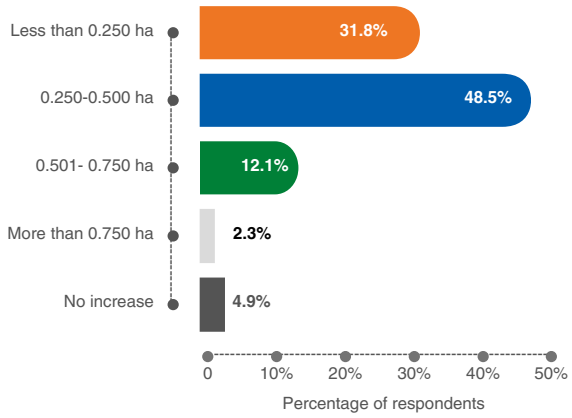


Chart 7 shows that the majority of the respondents (48.5%) reported an increase of 0.250 to 0.500 hectares in land under protective irrigation during the Kharif season, followed by 31.8% with less than 0.250 hectares, 12.1% with 0.501 to 0.750 hectares, 2.3% with more than 0.750 hectares and 4.9% reported no increase.

> "For my family, this project means stability and hope. We struggled with poor crop yields for years, but now we see a brighter future. The community's involvement in managing water resources has not only improved our income but also strengthened our bonds with neighbours."
>
> **— Pooja Kale, Farmer**

CHART 8: PERCENTAGE INCREASE IN THE YIELD OF KHARIF CROPS FOLLOWING THE CSR INTERVENTION

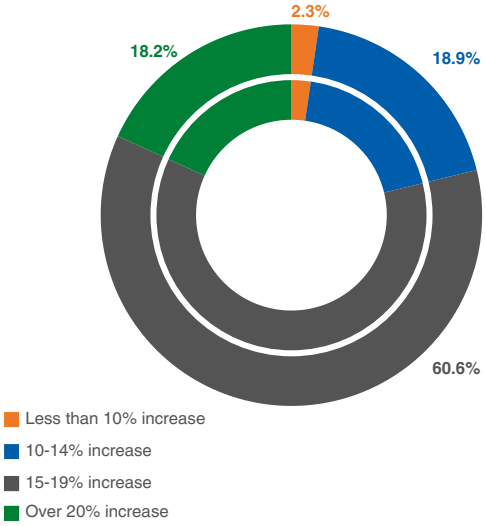


Chart 8 shows that all the respondents experienced an increase in yield in the Kharif crop with different quantities. The majority of the respondents (60.6%) reported a 15 to 19% increase, followed by 18.2% with more than 20%, 18.9% with an increase of 10 to 14%, and 2.3% reported an increase of less than 10%.

CHART 9: PERCENTAGE INCREASE IN THE ANNUAL AGRICULTURAL INCOME FOLLOWING THE CSR INTERVENTION

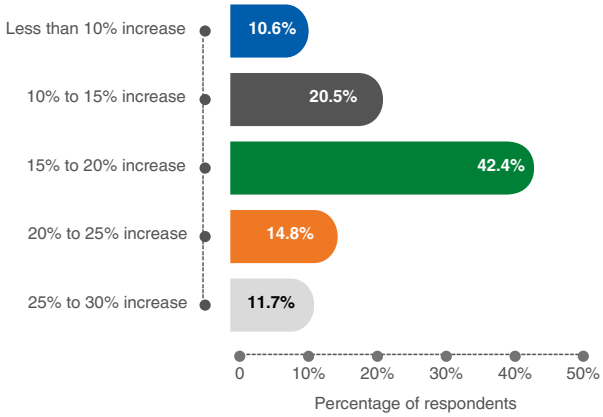


Chart 9 shows that the majority of the respondents (62.9%) experienced a 10 to 20% increase in annual income through increased yields in agriculture, followed by 14.8% with an increase of 20 to 25% and 11.7% with an increase of 25 to 30%. A few of the respondents (10.6%) experienced a low increase of less than 10% as well.

CHART 10: WHETHER DEPENDENT ON WATER TANKERS FOR GETTING DRINKING WATER - BEFORE & AFTER INTERVENTION

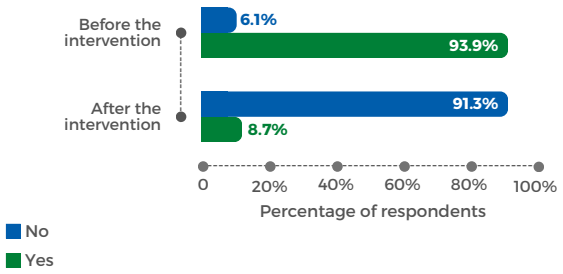
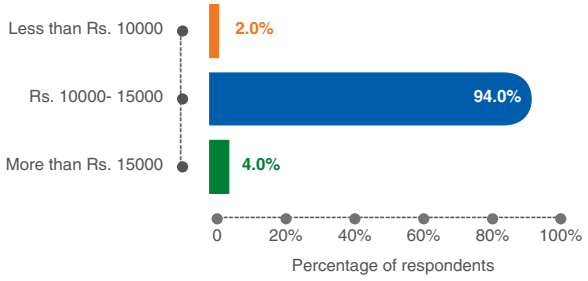


Chart 10 shows a significant reduction in dependency on water tankers for drinking water post-intervention. Before the intervention, 93.9% of the respondents relied on water tankers, which decreased to 8.7% after the intervention

CHART 11: AMOUNT SPENT IN A YEAR IN GETTING WATER FROM THE WATER TANKER BEFORE INTERVENTION



The study found that all of the respondents had to spend some amount on accessing water, with 94% reporting spending between Rs. 10,000 and Rs. 15,000 per year on drinking water from tankers before the intervention.

> The watershed project has brought a new lease on life to my farm. Before this initiative, water scarcity often led to failed crops and financial strain. Today, we have consistent water availability, and our farming output has improved significantly. The training programs have taught us better water management practices that are transforming our community.
>
> **— Ravi Pradhan, Farmer, Dhoregaon**

CHART 12: WHETHER HAVING SUFFICIENT WATER FOR CATTLE DRINKING - BEFORE & AFTER INTERVENTION

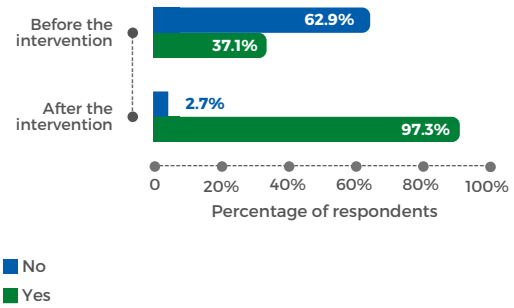


Chart 12 shows that after the project intervention, the availability of drinking water for cattle improved significantly. The respondents reporting availability of sufficient water for cattle increased from 37.1% to 97.3%, while those reporting unavailability decreased from 62.9% to 2.7%.

CHART 13: AREA OF FARM LAND UNDER HORTICULTURAL CULTIVATION- BEFORE & AFTER INTERVENTION

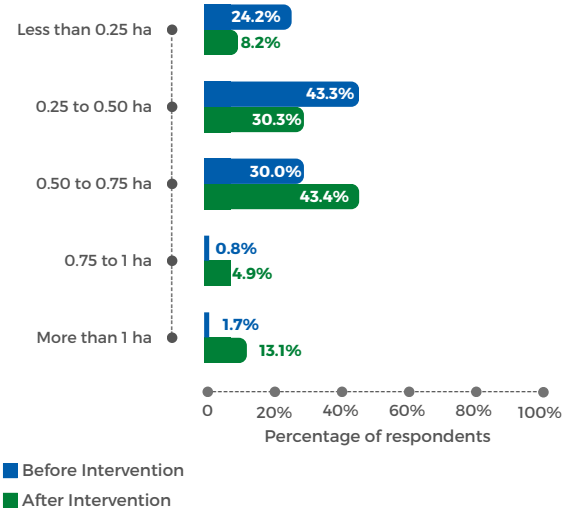


Chart 13 illustrated that the area dedicated to horticulture cultivation has increased among respondents, ranging from less than 0.25 hectares to over 1 hectare.

CHART 14: CROPPING INTENSITY- BEFORE & AFTER INTERVENTION

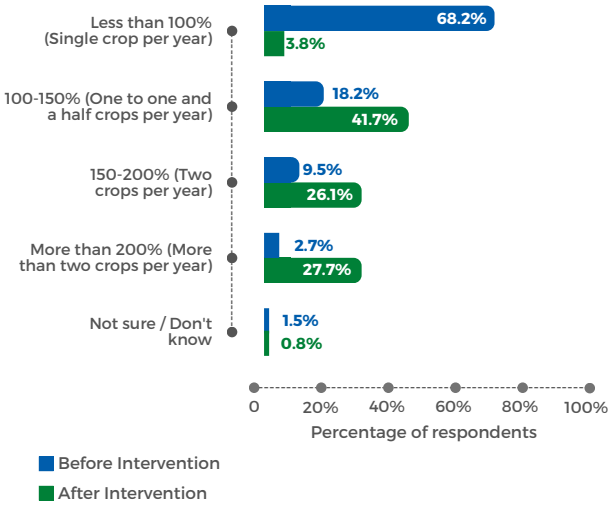


Chart 14 shows a significant improvement in cropping intensity post-intervention, as reported by respondents. The majority of the respondents (67.8%) reported a 100 to 200% increase in cropping intensity.

CHART 15: WHETHER PAY WATER USER CHARGES FOR OPERATION AND MAINTENANCE OF COMMUNITY WATER SOURCES

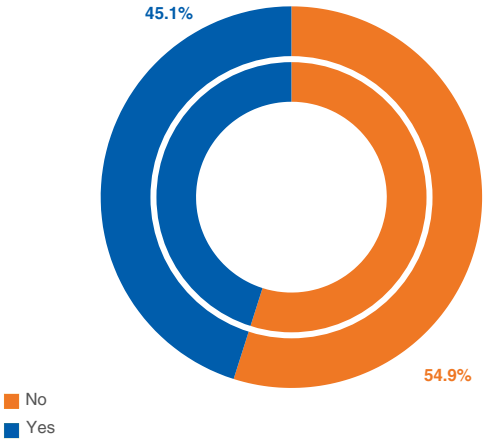


Chart 15 indicates that only half of the respondents (45.1%) reported paying water user charges for the operation and maintenance of water sources.

CASE STUDY 3

Kalyan Uttam Pathare, Dhoregaon Village Kalyan Uttam Pathare, a 42-year-old resident of Dhoregaon, supports his family of six. Initially earning INR 2,00,000 annually from agriculture, his income has more than doubled to INR 5,00,000 after adopting practices introduced through the watershed project. Before the intervention, limited water access meant inconsistent crop production and financial instability. Post-intervention, Kalyan follows water governance protocols diligently and motivates other farmers to adopt these practices. He highlights the need for periodic drain cleaning to maintain the positive outcomes of the project.

CASE STUDY 4

Alim Rasul Sheikh, Dhoregaon Village Alim Rasul Sheikh, aged 34, lives with his family of four. Before the intervention, his agricultural earnings were INR 2,00,000, and inconsistent water availability limited his farming potential. Thanks to the BAIF-Bajaj Watershed initiative, his income doubled to INR 4,00,000. Alim appreciates the project's systematic approach to water management, which ensures year-round water availability. He actively pays for maintenance services and emphasises the need for comprehensive drain cleaning to enhance water flow further.

> “Participating in Water User Groups has been a game-changer for me. I have learned how to use water judiciously and maximise crop output. My income has doubled, and I feel proud to contribute to my family and community.”
>
> — Rajesh Pawar, Farmer, Dhoregaon

CHART 16: TYPE OF WATER RESOURCE DEVELOPMENT ACTIVITY CARRIED OUT IN THE COMMUNITY

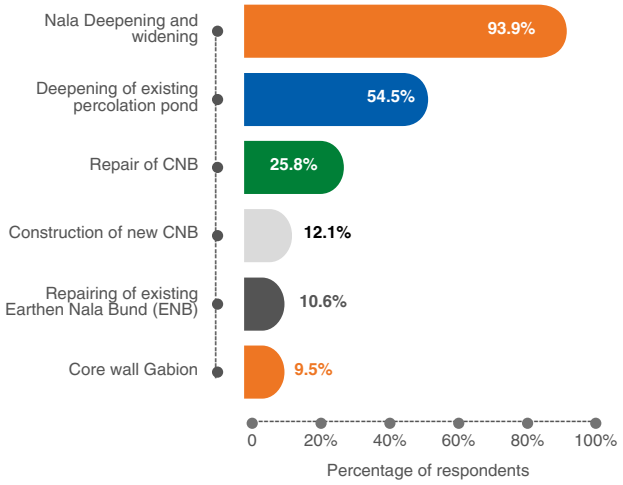


Chart 16 highlights the development of different water resource structures under the project intervention. Among respondents, 93.9% reported the implementation of Nala Deepening and widening, while 54.5% mentioned the deepening of existing percolation ponds.

CASE STUDY 5

Shameer Nabi Shaikh, 46, from dhoregaon village, experienced a remarkable shift in his agricultural practices. Before the project, his income was INR 1,50,000 annually, and his family of more than seven members often struggled to meet basic needs. With better water management and modern agricultural techniques introduced through the project, his income doubled to INR 3,00,000 annually. Additionally, Shameer's involvement in the Village Development Committees has led to efficient utilisation of water resources and community development. He acknowledges the positive impact of the project and recommends additional enhancements to address evolving agricultural challenges.

> "The project has introduced modern farming techniques that have revolutionised how we cultivate crops. Before this, we relied on outdated methods that yielded little success. Now, we have the tools and knowledge to make farming profitable."
>
> **— Sunita Yadav, Farmer, Dhoregaon**

DATA COLLECTION AT SITAPUR

FOCUS GROUP DISCUSSION

WITH VDC MEMBERS FROM BHATKI VILLAGE

Date: 22nd September 2024
Total Participants: 13
Name of village: Bhatki

INVOLVEMENT AND TRAINING

- VDC engaged due to pressing water needs and participatory approaches.
- The training covered technical aspects of water structures ("Matah to Paytha") and resource management.

RESOURCES AND SUPPORT

- Field visits, tools, and irrigation training provided by BAIF.
- Focus on water recharge, budgeting, and agricultural land development.

SKILLS AND COORDINATION

- Improved capacity for planning and implementing water projects.
- Effective in guiding cropping plans and managing water distribution.

MAINTENANCE AND MONITORING

- Structures maintained through community contributions and shramdaan.
- The participatory approach ensures monitoring and timely issue resolution.

VILLAGE IMPACT

- Increased groundwater levels and cultivated land.
- Reduced soil erosion and solved water scarcity.
- Boost in milk production and overall livelihoods.

RECOGNITION

Bhatki won 2nd prize in the Pani Foundation competition (₹5 lakhs cash award).

"Thanks to the BAIF-Bajaj Watershed Project, our village has become a model for sustainable farming. The support and guidance we received have made all the difference. Today, I can proudly say that we are thriving."

— Kavita Joshi, Farmer, Dhoregaon

FOCUS GROUP DISCUSSION

WITH MEMBERS OF SHREE GANESH SHG, HAWALDARWADI

Date: 23rd September 2024
Total Participants: 16 women
Name of village: Hawaldarwadi

INTRODUCTION TO SHG FORMATION

- Members were introduced to SHG concepts during a women's meeting conducted by BAIF.
- Prior to BAIF's involvement, they were not part of any SHG.

ROLE OF SJSM

- Played a crucial role in emphasising the importance of savings, SHG benefits, and financial independence.
- Provided guidance and facilitated the SHG formation process.

TRAINING AND SUPPORT

- Training included record-keeping, digital banking, and account handling.
- Initially, members were shy, but training boosted confidence in speaking and participating.

SHG FUNCTIONING

- Monthly meetings are held to collect savings and facilitate internal lending.
- Livelihood activities and income-generating initiatives were introduced through BAIF's support.

EMPOWERMENT AND COLLABORATION

- Members gained self-confidence and decision-making abilities, contributing to community development.
- The SHG fostered better collaboration among women, with active participation in income-boosting activities like goat rearing.

LIVELIHOOD TRAINING

- BAIF organised livelihood training programs, particularly in goat rearing, which were effective in enhancing income and skills.

IMPACT ON THE COMMUNITY

- The SHG inspired other women in the village to participate in similar initiatives.
- Improved financial independence and livelihood options for women.

CONCLUSION

Shree Ganesh SHG has become a model for empowering women and enhancing livelihoods in Hawaldarwadi, driven by BAIF's training and support.

DISCUSSION OF BWCP, VDC, AND WUG MEMBERS REVEALED THE FOLLOWING INSIGHTS:

- Nala deepening work was carried out properly, benefitting all nearby farmers.
- The farmers are now able to achieve higher yields, resulting in increased income from farming.
- The water level has increased by 5 to 10 feet, depending on the season, compared to the earlier situation.
- Beneficiaries have benefitted from goat and cow farming with increased income.
- Tanker water supply has decreased, significantly reducing the drinking water issue in the community.
- Maintenance and repair of the Nala deepening have become a major issue, according to the villagers.
- Villagers further expect more support from the NGO in the future as well.

> This initiative has taught us the power of working together. The community-driven water governance model ensures that everyone benefits. My farm's productivity has improved, and so has our quality of life.
>
> **— Arjun Rao, Farmer, Dhoregaon**

SOULACE TEAM INTERACTING WITH FARMERS GROUP

DETAILS OF STUDY FINDINGS

The impact assessment of the Bajaj Water Conservation Project, conducted through detailed data analysis, beneficiary interactions, focus group discussions with stakeholders, interviews with key informants, and a review of relevant reports, has revealed the following key findings:

IMPROVED WATER ACCESSIBILITY

The project successfully addressed the issue of water scarcity, significantly increasing household water security. Before the intervention, households spent Rs. 10,000 to 15,000 annually on drinking water. Post-intervention, these expenses were greatly reduced.

UPGRADED IRRIGATION AND INCREASED AGRICULTURE PRODUCTION

Adopted improved agricultural practices and increased productivity. Most beneficiaries reported a 100 to 200% increase in cropping intensity.

ENHANCED HORTICULTURE AND VEGETABLE CULTIVATION

The project intervention improved horticulture and vegetable farming, diversifying agriculture outputs and enhancing nutritional security and income generation opportunities.

EMPOWERING SOCIAL GROUPS

The promotion of different community-based organisations like SHGs, VDGs, WUGs, and farmers groups has proven effective in the sustenance of project interventions.

CAPACITY BUILDING AND ALTERNATIVE LIVELIHOODS

Training in modern farming techniques and alternative livelihoods like animal husbandry and horticulture empowered communities to explore new income sources.

GOAT FARMER AT PURI VILLAGE

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Farmers benefitted from improved irrigation, with 48.5% reporting an increase of 0.25–0.5 hectares under protective irrigation, enabling better crop planning.
- Kharif crop yields increased by 15–19% for 60.6% of respondents, while 62.9% experienced a 10–20% rise in annual income due to enhanced agricultural productivity.
- Adoption of micro-irrigation rose significantly, from 19.7% to 60.2%, promoting efficient water use.
- Women in 52 SHGs gained financial independence and entrepreneurial skills through 17 livelihood training programs, leading to new ventures in dairy and goat rearing.

COMMUNITY LEVEL

- Reliance on water tankers for drinking water dropped from 93.9% to 8.7%, reflecting improved water security for 2,347 households.
- Community-based water governance strengthened through the formation of 14 Village Development Committees and 142 Water User Groups, ensuring sustainable resource management.
- Sufficient water availability for cattle increased from 31.1% to 97.3%, reducing stress on community resources.
- Mass awareness campaigns and exposure visits empowered communities with skills to maintain and utilize water structures efficiently.

DISTRICT LEVEL

- Agricultural productivity improvements, such as a 100–200% rise in cropping intensity for 67.8% of farmers, contributed to regional food security and economic growth.
- Horticulture cultivation expanded significantly, with land under orchards and vegetables increasing across 55 hectares, boosting nutritional diversity and income.
- Water resource development initiatives, including 40 Nala deepening and widening projects and 6 percolation tank deepening, created a lasting impact on water availability across 14 villages.

STATE LEVEL

- The project supported Maharashtra's Magel Tyala Shet Tale scheme, enrolling 96 farmers to adopt farm ponds for improved water storage and irrigation.
- Introduced micro-irrigation systems across 348 hectares, promoting efficient water use and aligning with state priorities for sustainable agriculture.
- Strengthened linkages with state government schemes, securing ₹3.03 crores in additional funding to complement CSR efforts.

NATIONAL LEVEL

- Reduced rural poverty and hunger by fostering resilient farming practices and alternative livelihoods, benefiting 20,000 people across the intervention area.
- Set a benchmark for public-private partnerships in water conservation, showcasing effective collaboration between corporate and voluntary sectors.

CHAPTER 8
HYDROLOGICAL ASSESSMENT

OBJECTIVES OF THE ASSESSMENT

Change in surface water holding capacity and reduction in Run-off.

Change/improvement of Groundwater table/recharge.

Change in land use pattern, agricultural productivity, and soil moisture conditions.

PROJECT LOCATIONS

The project was implemented in the Gangapur taluka of Aurangabad district. The measures that were implemented as a part of the water conservation efforts can broadly be categorised into construction and repair of Water Harvesting Structures (WHS), measures for Soil Moisture Conditions (SMC) improvement, and promoting water use efficiency. The details of the same are as below:

TABLE 1: DETAILS OF THE INTERVENTIONS

District	Aurangabad	Block	Gangapur	Area of Watershed	91.83 Sq. Km.
	Cement Nala Bund	Nala Deepening & Widening	Core Wall Gabion	Percolation Tank	Farm Bund
Nos.	12 + 24	77.00		19	1185.40
Capacity in Cubic meters	40960.00	1000730.00	61330.00	601300.00	620451.54

The maps below give the location of the intervention watershed in the Aurangabad district of Maharashtra and all the available locations of the various interventions across the intervention watersheds as a part of this project.

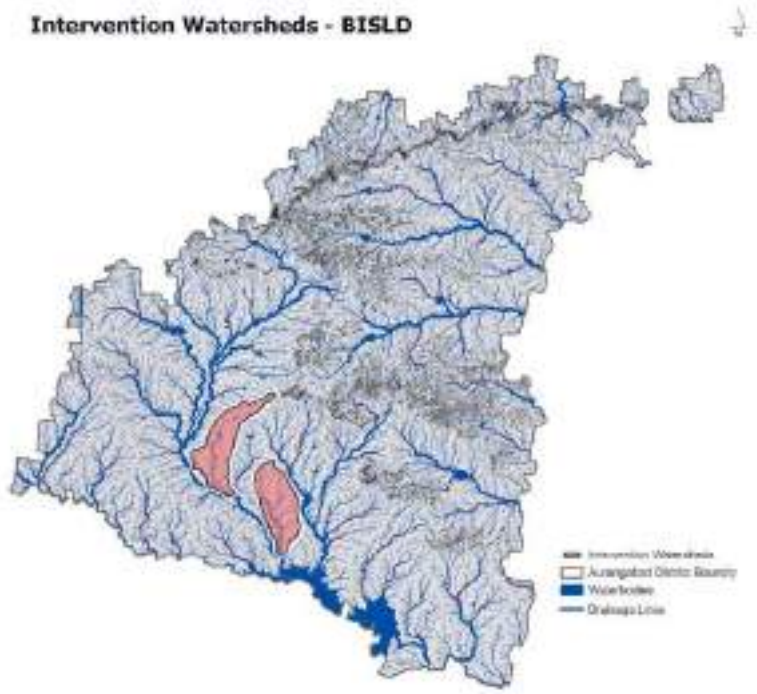


FIGURE 1: PROJECT LOCATIONS IN AURANGABAD

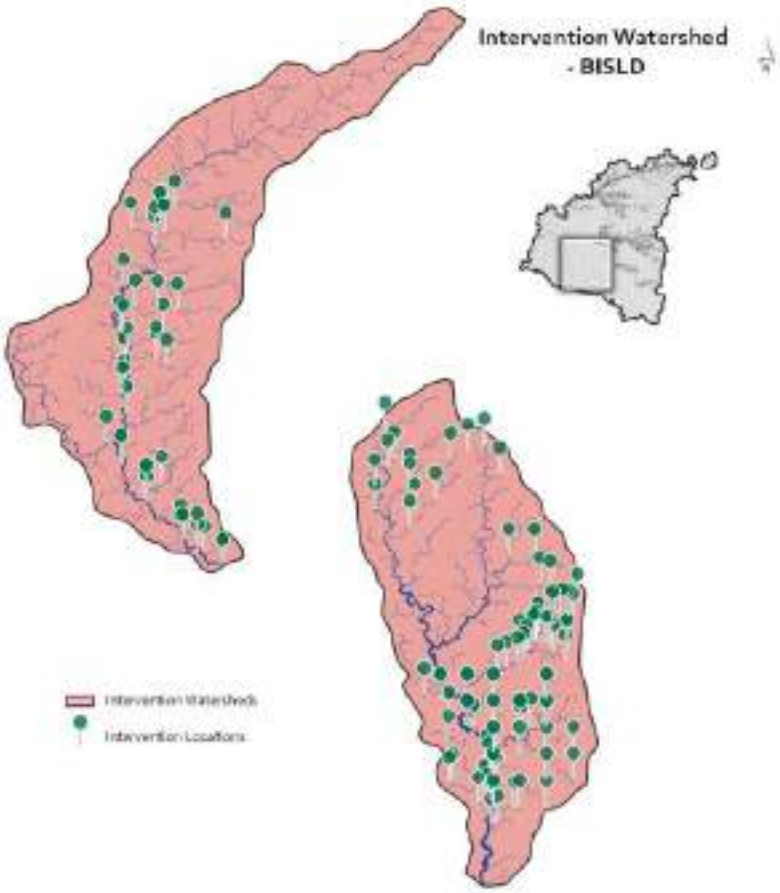


FIGURE 2: LOCATION OF PROJECT INTERVENTIONS

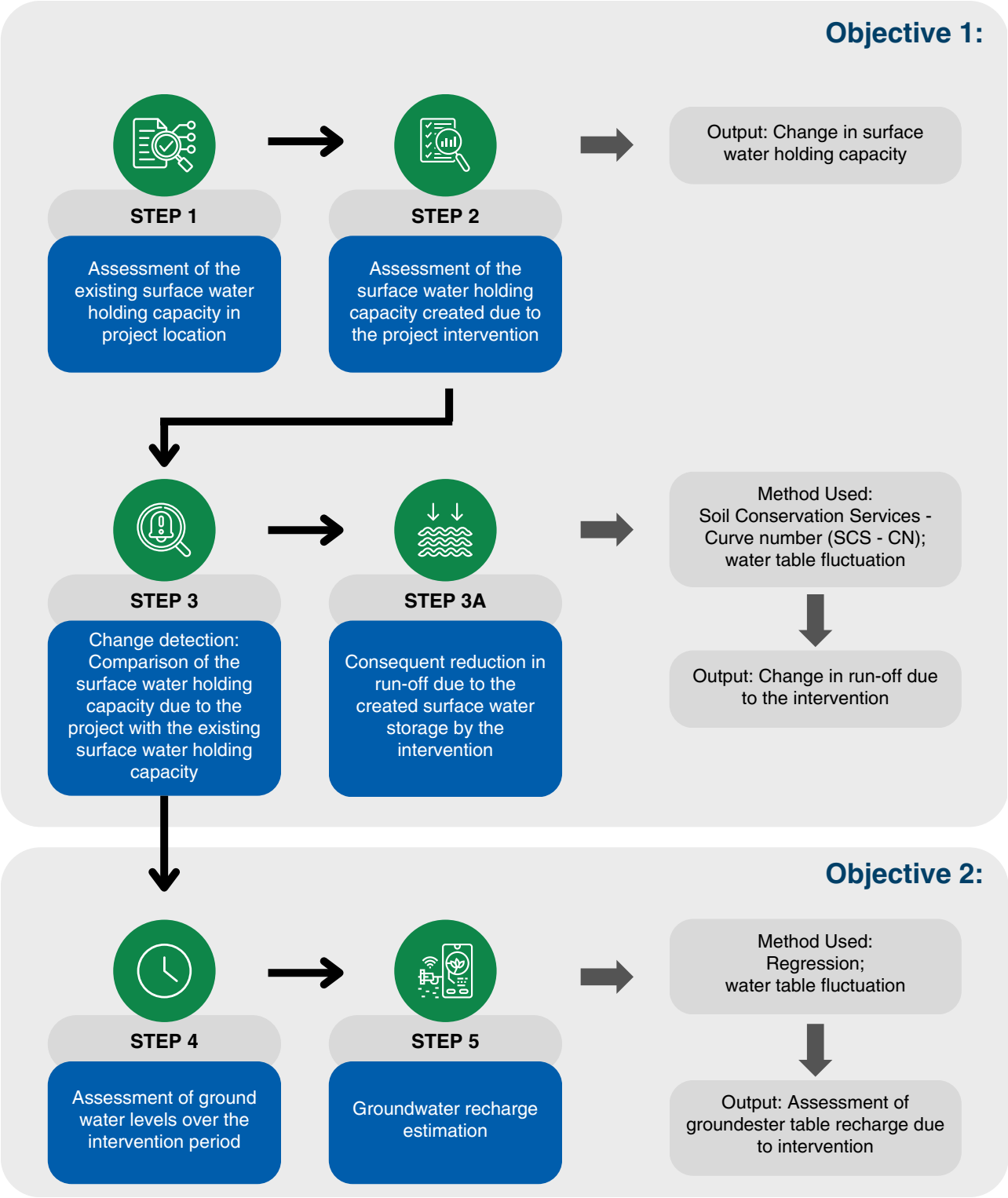
The detailed location of all the interventions covered as a part of the evaluations are provided in Annexure 1. The additional parameters that were considered are geology, hydrogeology, and soil types and the information about the same are provided in Annexure 2.

While some of the assessments, such as the run-off estimation and the contribution of the interventions to the ground water levels, were done only considering the intervention area, some assessments, such as the rainfall and the ground water depth assessments, had to be done considering a larger area such as the entire block or the district due to the constraints faced with data availability. Care was taken to ensure that the results were represented correctly in this condition to varying assessment units.[1]

[1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

ASSESSMENT APPROACH

The assessment approach consists of various steps for each objective, as shown below:



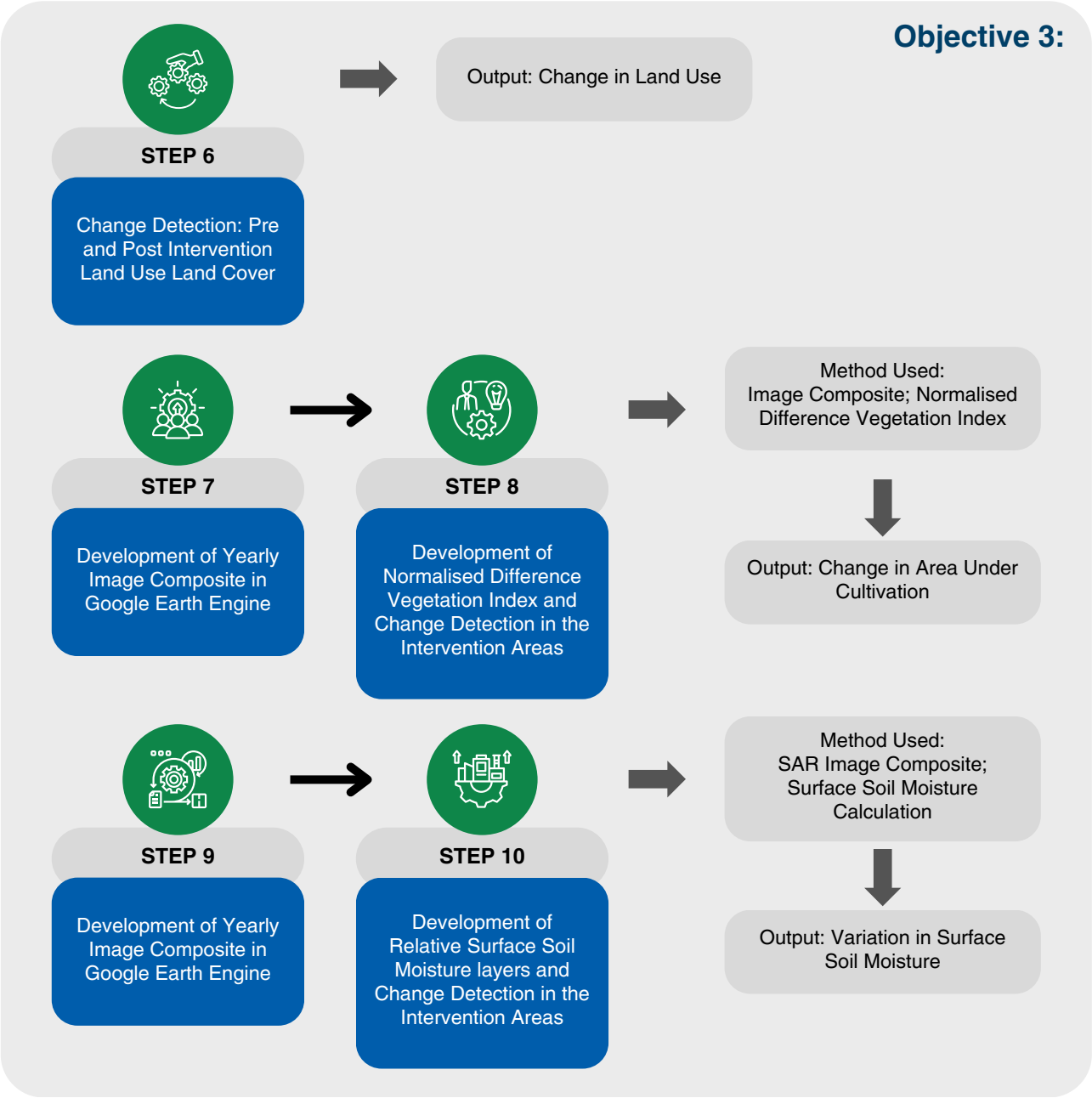


FIGURE 3: APPROACH OF THE ASSESSMENT

DATA COLLECTION

The following datasets have been collected from the field to facilitate the objectives of the study:

- All the intervention locations that were available (Annexure 1)
- Photos from the field survey (Annexure 6)

In addition to the above datasets, additional data was collected from various sources to fill in the data gaps that were present in the conduct of the assessment. These are as follows:

- Depth to water level from the NGO partners and the Central Ground Water Board (CGWB) (Annexure 3)
- Rainfall data from the Indian Meteorological Department (IMD) (Annexure 4)

Other datasets that were used in the assessment are as follows:

- Soil types from the National Remote Sensing Centre[2] (Annexure 2)
- Aquifer system from Central Ground Water Board (CGWB) (Annexure 2)
- Specific Yield from Central Ground Water Board (CGWB) (Annexure 2)

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO

- Land Use Land Cover change between 2017 – 2023 from ESRI Living Atlas[3]
- Global Hydrologic Soil Groups for Run-off Estimation[4] (Annexure 2)

RESULTS

The results of the assessment to identify the impacts of the interventions on water conservation are presented in the below sections. It includes an assessment of rainfall and water level trends, an estimation of recharge due to rainfall, an assessment of surface water holding capacity and the associated run-off reduction and the estimation of recharge due to the interventions, the change in land use land cover, the changes in vegetation levels, and the changes in soil moisture conditions over the course of the intervention period.

Analysis of Rainfall Trends

Overall, the values of rainfall have shown a slight positive trend during the intervention period, with significant peaks observed during the north-east monsoon period. The graphs below show the trend in their change over time.

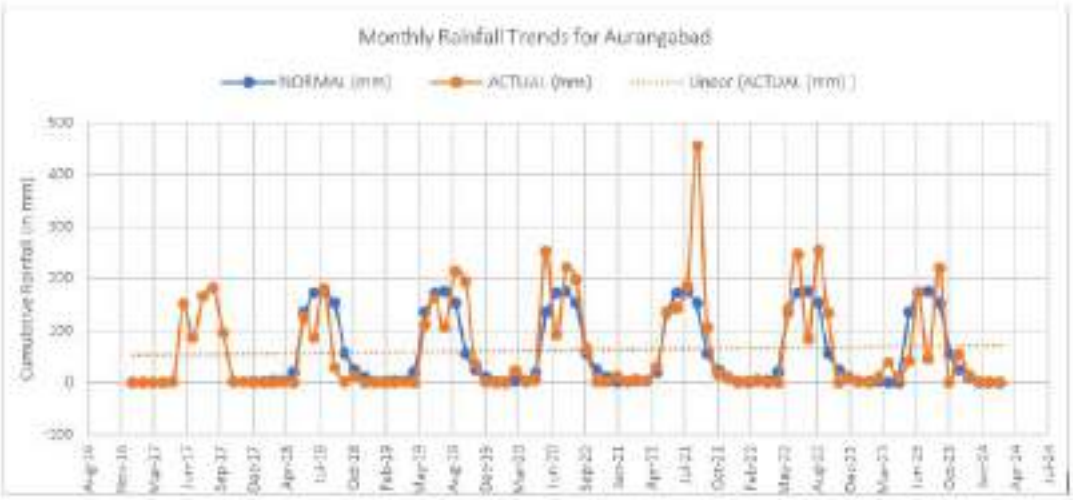


FIGURE 4: MONTHLY CUMULATIVE RAINFALL OVER THE INTERVENTION PERIOD (IN MM)

The trends of normal and actual rainfall reveal that over the intervention period, the rains have been above normal for most of the years. The slight positive trend that comes through is due to the above-normal rainfall received in June and August of most years and the unseasonal rainfall received in some of the years during the non-monsoon months.

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO

[3]Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.

[4]Ross, C.W., L. Prihodko, J.Y. Anchang, S.S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Run-off Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1566

Change in Water Level

The depth to water level data was obtained from two sources: one is the NGO partners, and the other is the annual Ground Water Year Books for Maharashtra published by the Central Ground Water Board (CGWB) for the years between 2017 and 2023. However, a complete collection of the data for the entire period from 2017 and since was not available with either source. Thus, for the final assessment, the datasets from both sources were combined after evaluating them individually and ensuring cohesion, and any missing values were filled out using statistical methods. The detailed dataset is provided in Annexure 3. The figures below show the ground water level trends in in the intervention districts:

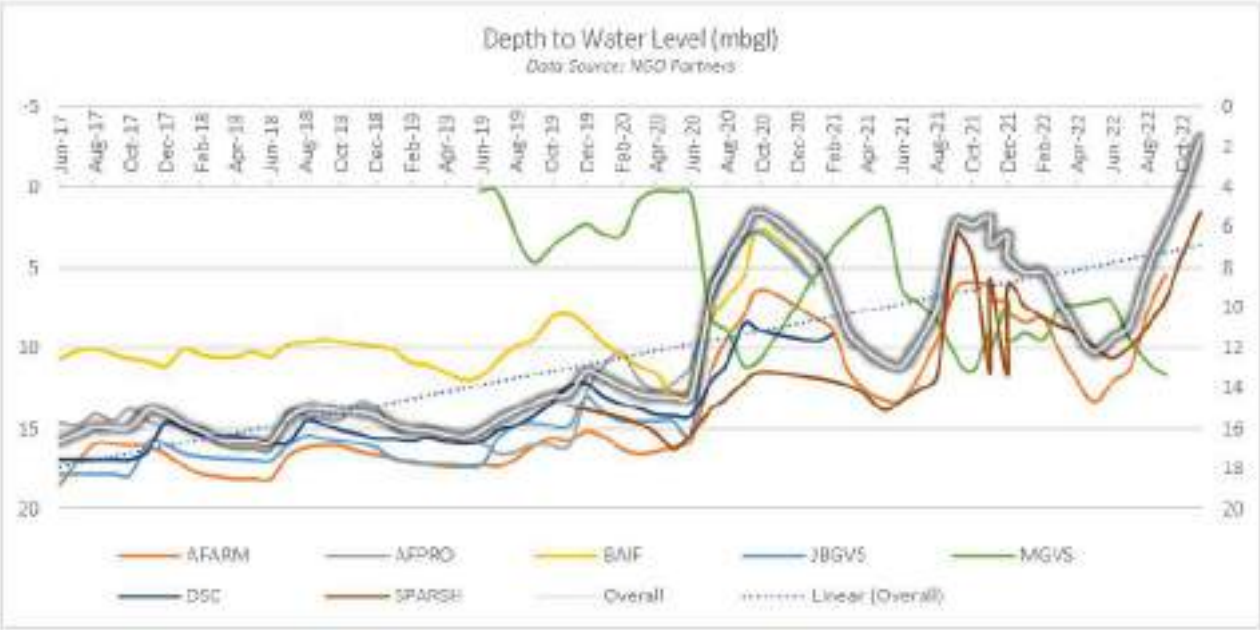


FIGURE 5: DEPTH TO WATER LEVEL (IN MBGL) – NGO PARTNERS

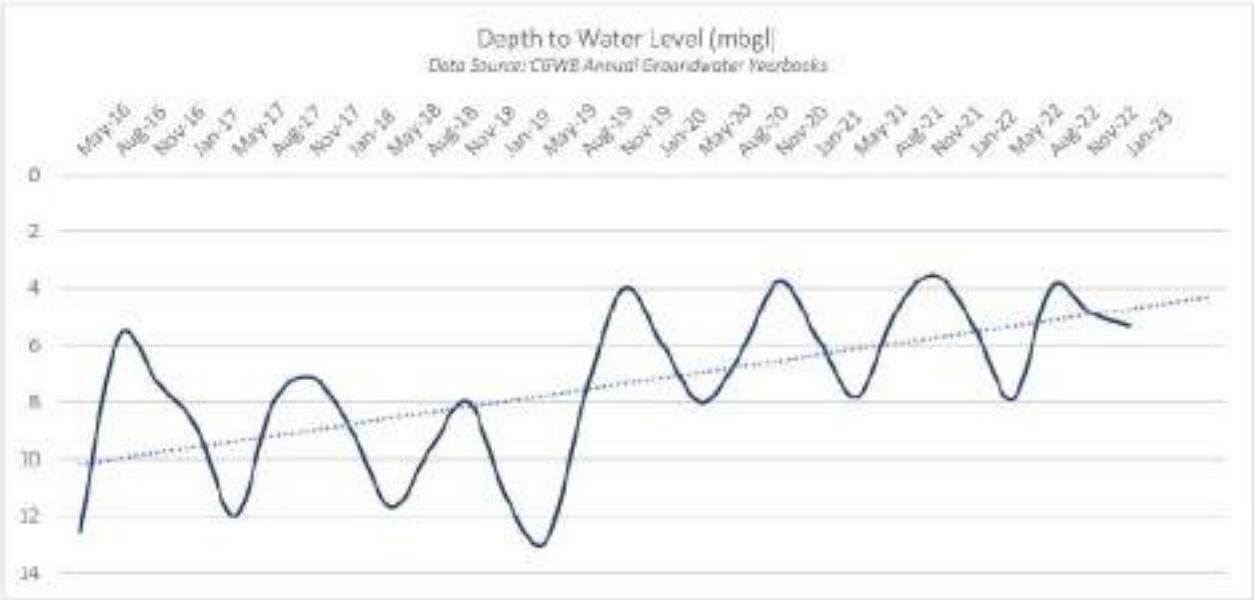


FIGURE 6: DEPTH TO WATER LEVEL (IN MBGL) – CGWB

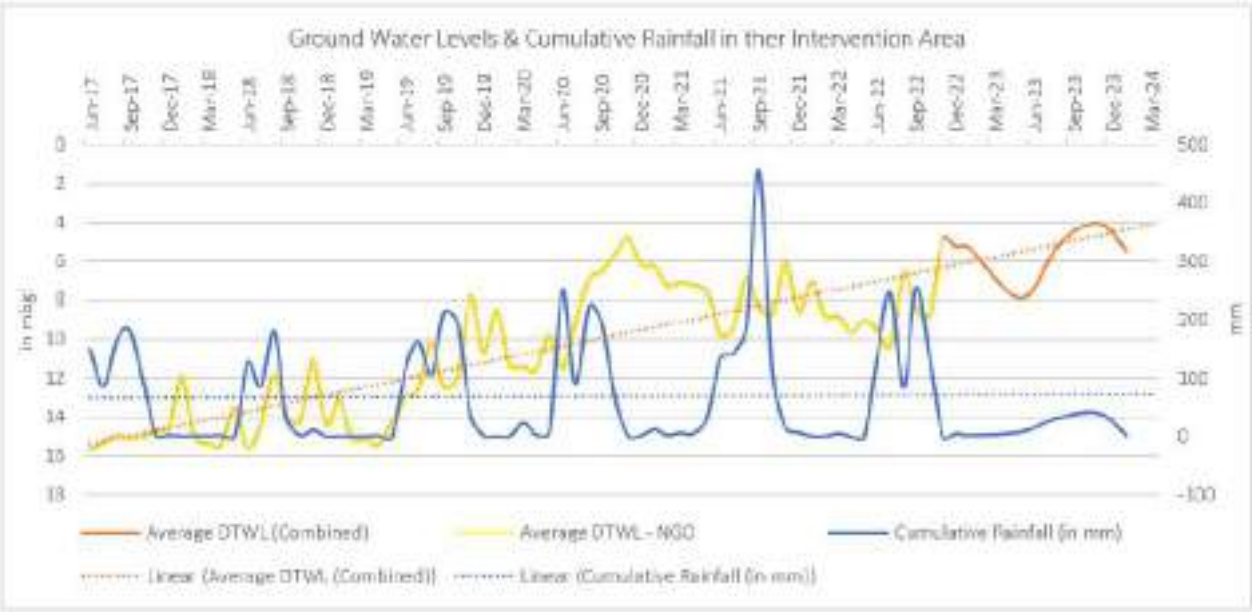


FIGURE 7: GROUND WATER LEVELS DURING AND SINCE THE INTERVENTION PERIOD (IN MBGL) COMPARED WITH MONTHLY CUMULATIVE RAINFALL (IN MM)

For this step of the assessment, the rainfall data from IMD was compared with the combined depth-to-water level data from the NGO partners and the CGWB. The rationale behind this is that rainfall is the most critical variable that determines the level of water availability below ground. Thus, by establishing the role of rainfall in the change in water levels, we would be able to identify the role of the measures implemented on the ground in augmenting the ground water levels.

A regression analysis of rainfall and depth to water level was conducted to assess the strength of the relationship between these two variables (detailed results in Annexure 4). The p-value obtained is greater than 0.05 for the intervention area, indicating no statistically significant relationship. However, the low R^2 (coefficient of determination) values obtained for the intervention area, along with the weak positive correlation established between rainfall and groundwater, suggest that while the impact of rainfall may be small, it has had its influence(although not significantly). [Here the R^2 value represents the proportion of variation in depth to water levels that can be explained by rainfall, indicating how well rainfall predicts water level changes. In this case, the low R^2 values suggest that multiple other factors also play a role. Detailed results are provided below.[5]]

This essentially means that rainfall influence on the ground water level has been to a minimal extent in the intervention areas over the period from 2017 to the relative present. However, over this period, the rainfall received has shown a very slight negative trend, while the ground water levels have shown significant positive trends. Considering the R2 values and the results of the correlation analysis, it can be understood that while the rainfall and ground water levels are not closely related, the factors such as improved water percolation and water storage mechanisms have had significant contributions in augmenting the ground water levels, supported by the rainfall trends. The ground water levels are expected to continue to rise and stabilise at a high level over the coming years, and the contributions of the interventions would help in improving the ground water levels. The availability of the most recent and more local measurements will help in assessing the same more accurately.

Note: The last available data on ground water depth data is till January 2023. The data from May 2023 to the present has not been published yet. Thus, in the absence of the necessary data, statistical methods were used to project the values for this period. This projected data might not necessarily reflect the true levels of ground water levels, and the derived estimates are bound to change on the availability of official measurements of ground water depth for 2023 and 2024.

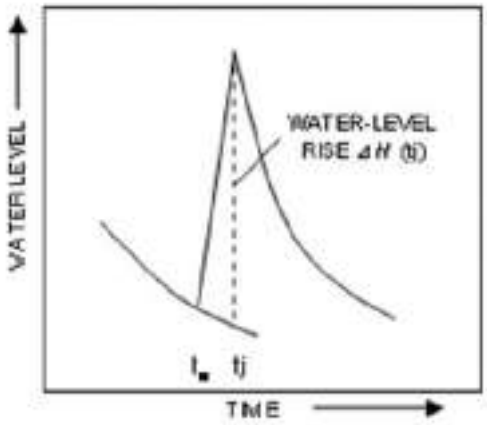
[5] The groundwater recharge calculations are based on data from NGO partners and CGWB data, are provided in the attached Excel document in sheets 9 and 10, respectively.

Estimation of Ground Water Recharge Due to Rainfall

The Water Table Fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The water-table fluctuation method is based on the premise that rises in groundwater levels in unconfined aquifers are due to recharge arriving at the water table. Recharge is calculated as the change in water level over time multiplied by the specific yield.[6]

$$R(tj) = Sy^* \Delta H(tj)$$

where R(tj) (m) is recharge occurring between times t0 and tj, Sy is specific yield (dimensionless), and ΔH(tj) is the peak water level rise attributed to the recharge period (cm).



The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology.[7] [8] The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

Location	Aurangabad
Major Aquifer System	Basalt
Sy Range	0.01 – 0.03
Sy Chosen	0.02
RIF Range	0.12 – 0.14
RIF Chosen	0.13

As per the results of the method, about 13.1% of the rainfall has recharged directly to the ground in the intervention sites. The results and calculations are presented below:

TABLE 2: WATER TABLE FLUCTUATION METHOD RESULTS

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2017	687.704	1.100	0.02	0.022002477	22.0024773	3.20%	2020518.844
2018	438.02	4.509	0.02	0.090184267	90.1842666	20.60%	8281749.715
2019	826.44	7.633	0.02	0.152661156	152.6611561	18.50%	14019091.51
2020	862.4	6.835	0.02	0.136709574	136.7095736	15.90%	12554234.95
2021	1099.64	3.748	0.02	0.074956747	74.95674684	6.80%	6883384.876

[6] USGS GWRP: Techniques/Methods -Water-Table Fluctuation (WTF) Method
[7] https://cgwb.gov.in/Documents/GEC97.pdf
[8] Detailed Guidelines (cgwb.gov.in)

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2022	865.36	5.505	0.02	0.11010815	110.10815	12.70%	10111388.32
2023	548.052	3.844	0.02	0.076883855	76.883855	14.00%	7060353.964
Average Recharge directly due to Rainfall received						**13.10%**	**60930722.18**

Further, the groundwater recharge from Rainfall Infiltration Method (RIF) can be obtained from the following relation:
Groundwater Recharge = Geographical Area x Actual Rainfall x Infiltration Factor

TABLE 3: RAINFALL INFILTRATION METHOD

Area (in sq. m.) =			91831425
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)
2017	0.687703555	0.089401462	8209863.663
2018	0.43802	0.0569426	5229120.101
2019	0.82644	0.1074372	9866111.174
2020	0.8624	0.112112	10295404.72
2021	1.09964	0.1429532	13127596.06
2022	0.86536	0.1124968	10330741.45
2023	0.548051549	0.071246701	6542686.111
Total			**63601523.28**

Estimation of per cent rainfall converted into groundwater recharge

As per GEC-1997 norms, the rainfall recharge as computed by the WTF method has been compared with that of the RIF method, and finally, the rainfall recharge is assigned a value based on set criteria to avoid unreasonably high or low estimates.

A quantity called percentage difference (PD) is the difference between the rainfall recharge computed by the water table method (A) and the recharge by the rainfall infiltration method (B) and expressed as a percentage of the rainfall recharge by rainfall infiltration method is computed as below:

$$PD = \frac{(A - B)}{B} \times 100$$

where 'A' is the rainfall recharge by the WTF method and 'B' is the rainfall recharge by the RIF method.
The set criteria (GEC 1997) to be adopted are as follows:
(a) If PD ≥ – 20 and < + 20%, then the value of the water table fluctuation method is adopted.
(b)If PD ≤ – 20%, then the value of 0.8 × rainfall infiltration factor method is adopted.
(c)If PD ≥ + 20%, then the value of 1.2 × rainfall infiltration factor method is adopted.

By following the above criteria, ground water recharge is estimated.

Organisation	Rainfall Infiltration Method	WTF Model	Percentage Difference	Criteria	Volume of recharge due to rainfall (Cu. m.)
	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)			
BISLD	63601523.28	60930722.18	-4.19	A	60930722.18

Over the period of 2017 to 2023, an almost 7-year period covering the interventions and their operations till the present, the amount of ground water recharge directly due to rainfall stands at 6,09,30,722.18 Cu. m. across the intervention watershed, which is about 12.45% of the total rainfall received over the intervention area.

Change in surface water holding capacity and run-off reduction

The intervention area is spread over multiple watersheds in the southern part of the state. On-site verification and satellite imagery show that the major land use in the intervention area is rangelands, followed by crops. Based on the information available from the field survey and the organisation, the volume of storage created is estimated.

The change in surface storage in the intervention area was net positive, i.e., no existing surface storage was considered in the pre-intervention period[9] and although the surface storage of about 23,24,771.54 cubic meters was created through the project, an intervention volume of 13,24,041.54 cubic meters is being considered for assessment as there might be a double accounting of the storage of nalas as it is also included in considering the storage of the check dam type of interventions.

Estimation of ground water recharge due to the interventions

Groundwater recharge due to the interventions occurs primarily through the capture and storage of surface runoff water using Cement Nala Bunds, as well as through natural processes and Groundwater Recharge Shafts.

Run-off is defined as the portion of the precipitation that makes its way towards rivers or oceans as surface or subsurface flow. After the occurrence of infiltration and other losses from precipitation (rainfall), excess rainfall flows out through the small natural channels on the land surface and into the main drainage channels. Such types of flow are called surface flows. A part of the infiltrated rainwater moves parallel to the land surface as subsurface flow and reappears on the surface at certain other points. Such flows are called interflows. Another part of the infiltrated water percolates downwards to ground water and moves laterally to emerge in depression and rivers and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

While the interventions such as the Cement Nala Bunds and the Gabion Structure capture the surface flows, both these structures and the Ground Water Recharge Shafts contribute to the recharge of the ground water in the intervention sites.

Estimation of the run-off can give us an estimate of the amount of water that has been essentially captured by the intervention structures as surface storage, and thus point towards the potential amount of water available for ground water recharge. Run-off can be estimated by various methods, such as:

- Empirical formulae and tables
- Run-off Estimation based on Land Use and Treatment
- Rational Method
- Empirical formulae for flood peak

[9] This is due to the constraints of establishing the status of all water bodies in the intervention area.

In this assessment, we are using the method of empirical formulae and tables along with run-off estimation based on land use and treatment, as it has proven to be the most reliable to conduct the assessment in the absence of reliable ground water level data and access to the intervention sites on the ground.

1 BINNIE'S PERCENTAGES

It provides the relationship of run-off to rainfall with a view to express the former as a percentage of the latter. The percentages mentioned below are based on observations on two rivers in Madhya Pradesh.

TABLE 4: RUN-OFF AS A % OF THE RAINFALL RECEIVED

Annual Rainfall (mm)	Runoff (%)
500	15
600	21
700	25
800	29
900	34
1,000	38
1,100	40

2 COEFFICIENTS

The run-off 'R' in cm and rainfall 'P' in cm can be correlated as R = KP, where 'K' is the run-off coefficient. The run-off coefficient depends on factors affecting run-off. This method is applicable only for small projects such as the ones implemented as a part of this project. The usual values of K are as given below.

TABLE 5: USUAL VALUES OF RUNOFF COEFFICIENTS (K)

Type of Area	K
Urban Residential	0.3 - 0.5
Forests	0.05 - 0.2
Commercial & Industrial	0.9
Parks, farms, Pastures	0.05 - 0.3
Asphalt or concrete pavement	0.85

3 BARLOW'S TABLES

The following values of K (in percentage) for various types of catchments were developed by T.G. Barlow based on the studies of catchments mostly under 130 sq. km. in Uttar Pradesh.

TABLE 6: BARLOW'S PERCENTAGE RUNOFF COEFFICIENTS

Class	Description of Catchment	Percent runoff
A	Flat, cultivated and black cotton soils	10
B	Flat, partly cultivated-various soils	15
C	Average	20
D	Hills and plains with little cultivation	35
E	Very hilly and steep, with hardly any cultivation	45

These percentages are for the average type of monsoon and are to be modified by the application of the following coefficients according to the nature of the season, as shown below.

TABLE 7: BARLOW'S RUN-OFF COEFFICIENTS FOR DIFFERENT NATURES OF SEASON

Nature of Season	Class of catchments				
	A	B	C	D	E
Light rain, no heavy downpour	0.7	0.8	0.8	0.8	0.8
Average or varying rainfall, no continuous downpour	1	1	1	1	1
Continuous downpour	1.5	1.5	1.6	1.7	1.8

As part of this method, the special tropical rainfall was divided into the following four classes:

- **Negligible falls:** All rainfalls under 12 mm a day unless continuous for several days; also rainfalls 12 to 40 mm a day, when there is no rain.
- **Light falls:** All rainfalls up to 25 mm a day followed by similar or heavier falls. Steady pours of 25 to 40 mm a day, when there is no rain of similar or greater amount before or after that.
- **Medium falls:** Rainfalls from 25 to 40 mm a day when preceded or followed by any but light falls.
- **Heavy Falls:**
  - All rainfalls are over 75 mm a day or continuous falls at 50 mm a day.
  - All rainfalls of an intensity of 50 mm or more per hour.

The run-off percentages, as shown in the following table, were developed by combining the type of catchment and nature of the season.

TABLE 8: BARLOW'S RUNOFF PERCENTAGES

Nature of Rainfall	Percentage of Flow in Catchments of Different Type				
	A	B	C	D	E
Negligible falls	-	-	-	-	-
Light falls	1%	3%	5%	10%	15%
Medium falls	10%	15%	20%	25%	33%
Heavy falls	20%	33%	40%	55%	70%

4 ESTIMATION OF DIRECT RUNOFF FROM RAINFALL

In this method of run-off estimation, the effects of the surface conditions of a watershed area are evaluated by means of land use and treatment classes. Land use is the watershed cover, and it includes every kind of vegetation, litter and mulch, and fallow, as well as non-agricultural uses such as water surfaces (lakes, swamps, etc) and impervious surfaces (roads, roofs, etc.). Land treatment applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing and management practices such as grazing control or rotation of crops. The classes consist of use and treatment combinations to be found in watersheds. Land use and treatment classes are readily obtained either by observation or by measurement of plant and litter density and extent in sample areas.

4.1 Hydrological Soil Groups

There are four soil groups that are used in determining the hydrological soil cover complexes, which are used in a method for estimating the run-off from rainfall.

The major characteristics of these groups are described below. The respective infiltration rates and permeability of soils in different groups are also shown below. The infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The permeability rate is the rate at which water moves in the soil, which is controlled by the nature and characteristics of soil horizons.

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.	Low	High rate
Group B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	High	Low rate

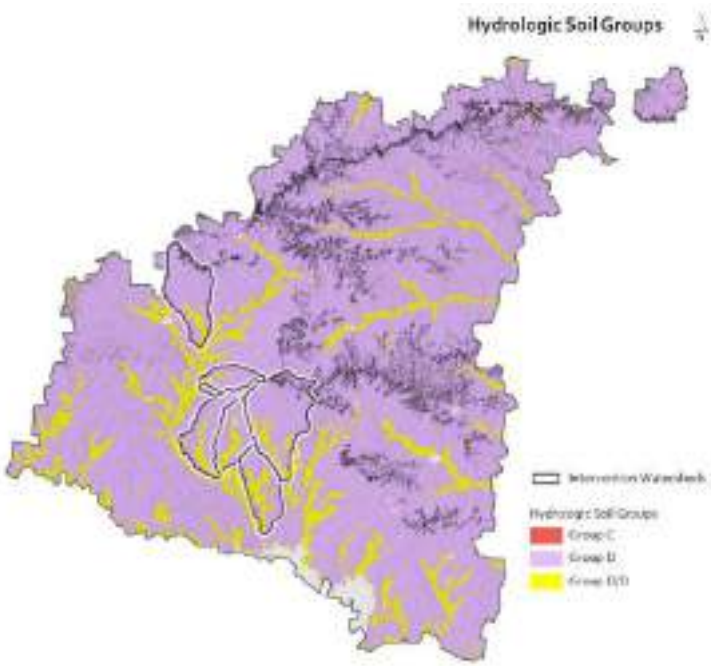


FIGURE 8: HYDROLOGIC SOIL GROUPS OF THE PROJECT WATERSHEDS

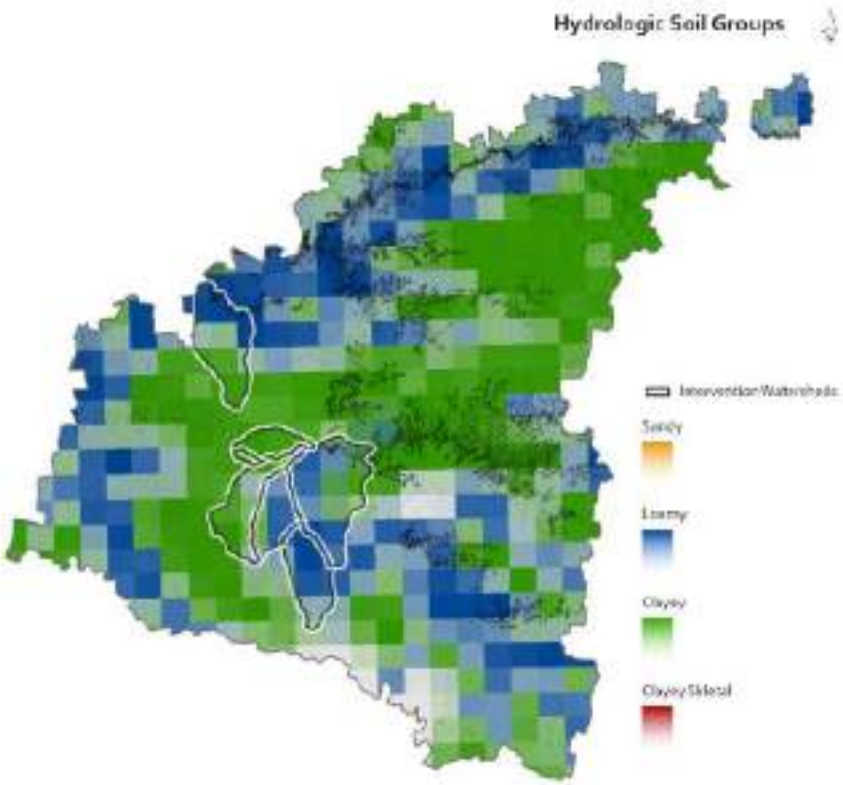


FIGURE 9: SOIL CHARACTERISTICS IN THE PROJECT WATERSHEDS

TABLE 9: INFILTRATION RATES

Class	Rates / hr in		Remarks
	Inches	Millimetres	
Very Low	Below 0.1	Below 2.5	Highly clayey soils
Low	0.1 - 0.5	2.5 - 12.5	Shallow soils, clay soils, soils low in organic matter
Medium	0.5 - 1.0	12.5 - 25.0	Sandy loams, silt loams
High	Above 1.0	Above 25.0	Deep sands, well aggregated soils

TABLE 10: RELATIVE CLASSES OF SOIL PERMEABILITY

Class	Permeability	
	Inches/ hr	mm/ hr
Slow		
Very Slow	Less than 0.05	1.3
Slow	0.05 to 0.20	1.31 to 5.00
Moderate		
Moderately Slow	0.20 to 0.30	5.01 to 20.00
Moderate	0.80 to 2.50	20.01 to 50.00
Moderately Rapid	2.50 to 5.00	50.01 to 130.00
Rapid		
Rapid	5.00 to 10.00	130.01 to 250.00
Very Rapid	Over 10.00	Over 250.00

4.2 Land Use and Treatment Classes

The commonly used land use and treatment classes are briefly described below. These classes are used in determining hydrologic soil-cover complexes, which are used in one of the methods for estimating runoff from rainfall.

- **Cultivated lands:** These include all field crops such as maize, sugarcane, paddy and wheat.
- **Fallow lands:** These are lands taken up for cultivation, but are temporarily out of cultivation for a period of not less than one year, and not more than 5 years. Current fallow lands are cropped areas kept fallow during the current year.
- **Uncultivated lands include:**
  - Permanent pastures and other grazing lands.
  - Cultivable waste, which are lands available for cultivation whether or not taken up for cultivation or abandoned after a few years for one reason or another. Land once cultivated but uncultivated for 5 years in succession shall also be included in this category.
- Forest area includes all lands classed as forest under any legal enactment dealing with forest or administered as forest whether State-owned or private and whether wooded or maintained as potential forest land.
- Tree crops include woody perennial plants that reach a mature height of at least 8 feet and have well-defined stems and a definite crown shape.
- Lands put to non-agricultural uses are areas occupied by buildings, roads, railroads, etc.
- Barren and uncultivable lands include areas covered by mountains, deserts, etc.

Based on these assessments, the following were estimated:

Surface Storage

The volume of surface storage created by the intervention = 13,24,041.54 m3

Rainfall & Runoff

- Total rainfall received over the intervention period and since = 58,33,24,813.91 m3
- Total run-off generated over the intervention area = 13,00,26,685.94 m3
- Percentage of rainfall that is converted to run-off = 30%

The intervention area received enough rainfall for all the intervention structures to be at a constant capacity of 11.37% throughout the period since 2017 as a part of and due to the project Bajaj Water Conservation Project implemented by BISLD in Aurangabad. This shall be interpreted as the intervention structures always having water and never drying since 2017 or operating at more than 50% storage filled through the dry seasons since 2017.

Runoff Reduction

- The volume of surface run-off stored by the intervention measures after considering 40% evaporation loss = 90,34,541.58 m3.

Which is,

- 6.94% of the total run-off generated as a part of and due to the water conservation efforts of this project (or)
- 0.79% of the total rainfall received during the project period and ever since

This means that the interventions that were created as a part of this project have contributed to a combined reduction in surface run-off by about 6.94% in the intervention area. Although this number is a conservative estimation and however, it is bound to increase over the years. Care must be taken to ensure the effective functioning of these water harvesting structures.

Regular desilting and clearing of overgrowth, along with any structural repairs, are required across all the structures to ensure that their storage capacity is maintained, and the structural integrity is preserved.

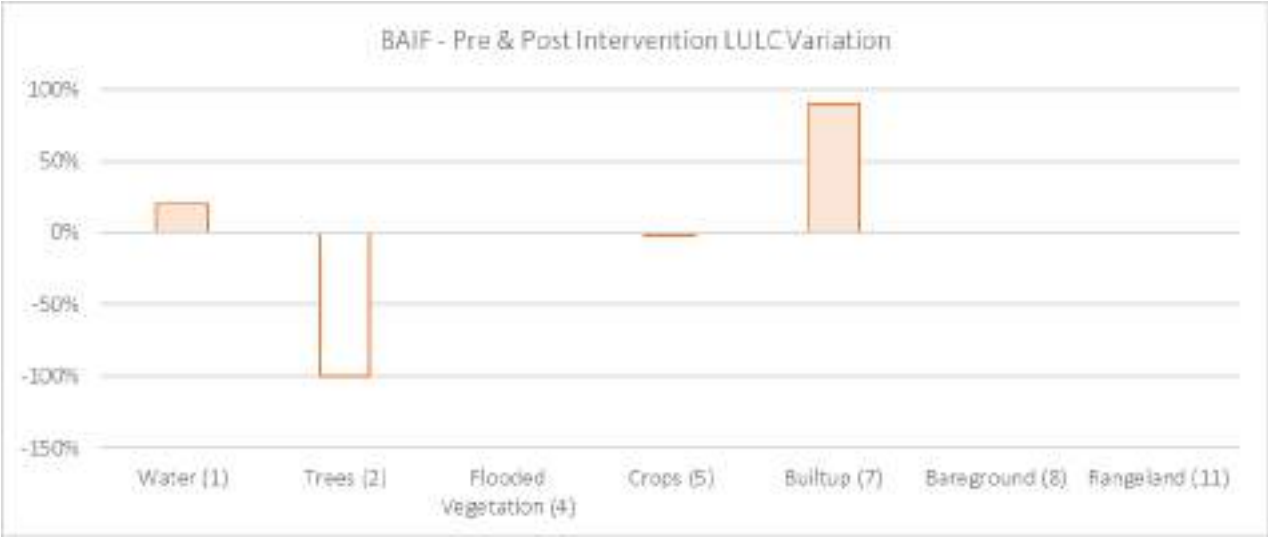
Thus, in total, 12.45% of the rainfall is converted into direct recharge, about 6.94% of the rainfall is stored in the intervention created surface storage, 40% is lost as evaporation, and the remaining 40.61% accounts for factors such as run-off that is stored in other water bodies present, run-off that is not captured, evapotranspiration, and other losses.

5 CHANGE IN LAND USE PATTERN

Land use and land cover change detection involves analyzing how land is utilized and how its physical coverage alters over time. Changes in land use patterns, such as urban expansion, deforestation, agricultural expansion, and the impacts of natural disasters, can be tracked using remote sensing techniques, satellite imagery, and geographic information systems (GIS). The land use and land cover for the intervention areas were developed through supervised classification of Sentinel-2 Full Colour Composite (FCC) imagery for both the pre- and post-intervention periods.

TABLE 11: ZONAL STATISTICS OF LULC FOR THE INTERVENTION AREA

District	Aurangabad				
Organisation	BISLD				
Total Area of Watershed (Sq. Km.)	91.831425				
Soil Group	D				
Land Use Classes	Land Use - 2017		Land Use - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.3887	0.42	0.4649	0.51	19.60%
Trees (2)	0.0004	0.0004			-100.00%
Flooded Vegetation (4)					0.00%
Crops (5)	89.3248	97.27	87.4036	95.18	-2.15%
Built up (7)	2.0524	2.23	3.8980	4.24	89.93%
Bare ground (8)					0.00%
Rangeland (11)					0.00%



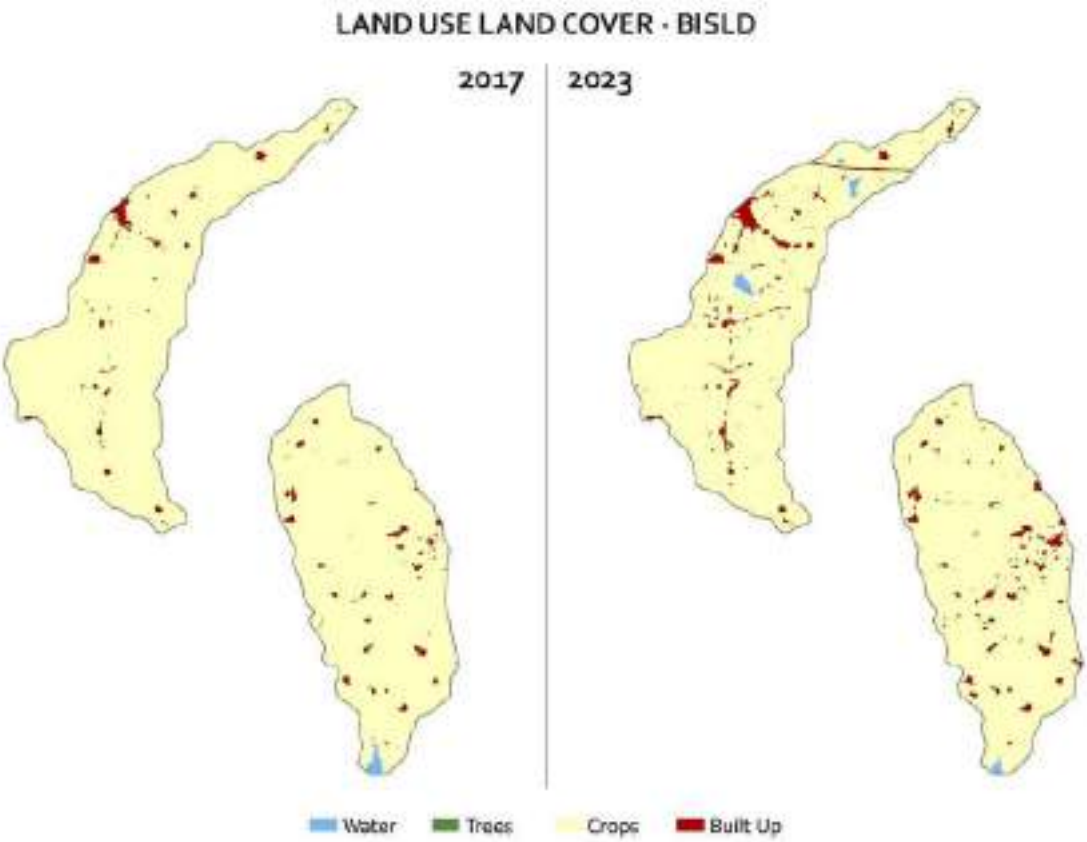


FIGURE 10: PRE- AND POST-INTERVENTION LULC OF THE INTERVENTION WATERSHED

It can be observed from the above table and charts that in terms of total area, the area under crops is the highest followed by built-up area. Looking at the changes in land use that have happened through the course of the intervention period and since, major changes can be observed in the growth of areas under water and built-up and the reduction in the areas under trees, while minor reduction in the area under crops can be seen. In terms of total area, the reduction in area under crops can be attributed mainly to the increase in built-up area. The following section will offer more clarity on the changes to cropping intensity.

6 VEGETATION INDEX (VI)/CROPPING INTENSITY

Vegetation Indices are combinations of surface reflectance at two or more wavelengths designed to highlight a particular property of vegetation. They are derived using the reflectance properties of vegetation. For this assessment, the Normalised Difference Vegetation Index (NDVI) is used. NDVI is an indicator that shows the greenness, density, and health of vegetation in each pixel of a satellite image. The index detects and quantifies the presence of living green vegetation using this reflected light in the visible and near-infrared bands.

The standard formula for calculating NDVI is: NDVI = (NIR – red) / (NIR + red)

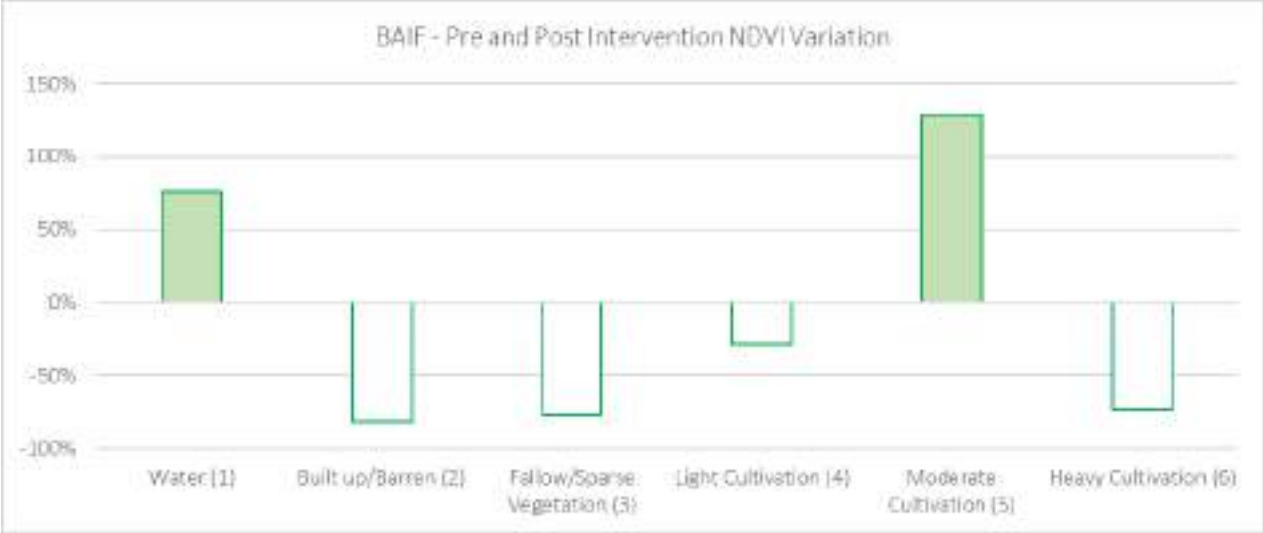
NIR is the near infra-red, band 8, and red, band 4 of Sentinel-2 imagery. Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states.

The NDVI value ranges from -1 to 1 and shows the vigour of the crop:

- **Values close to 1:** the more intense the green, the more vigorous the vegetation and vegetation cover. Considerations for the type of farming, bare soil, etc. must be made. The index also measures the vigour of the underbrush.
- **Values close to 0:** areas with very little vegetation, early stages of cultivation, bare soil, or non-productive areas.
- **Negative values:** usually associated with areas of water, snow, or clouds.

TABLE 12: ZONAL STATISTICS VALUES OF THE VEGETATION INDEX

District	Aurangabad				
Organisation	BISLD				
Total Area of Watershed (Sq. Km.)	91.831425				
Soil Group	D				
Vegetation Index Classes	VI - 2017		VI - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.0336	0.04	0.0591	0.06	76.16%
Built up/Barren (2)	10.3889	11.31	1.8965	2.07	-81.74%
Fallow/Sparse Vegetation (3)	19.4275	21.16	4.5097	4.91	-76.79%
Light Cultivation (4)	33.5309	36.51	24.0771	26.22	-28.19%
Moderate Cultivation (5)	26.6042	28.97	60.7863	66.19	128.48%
Heavy Cultivation (6)	1.8172	1.98	0.4787	0.52	-73.66%



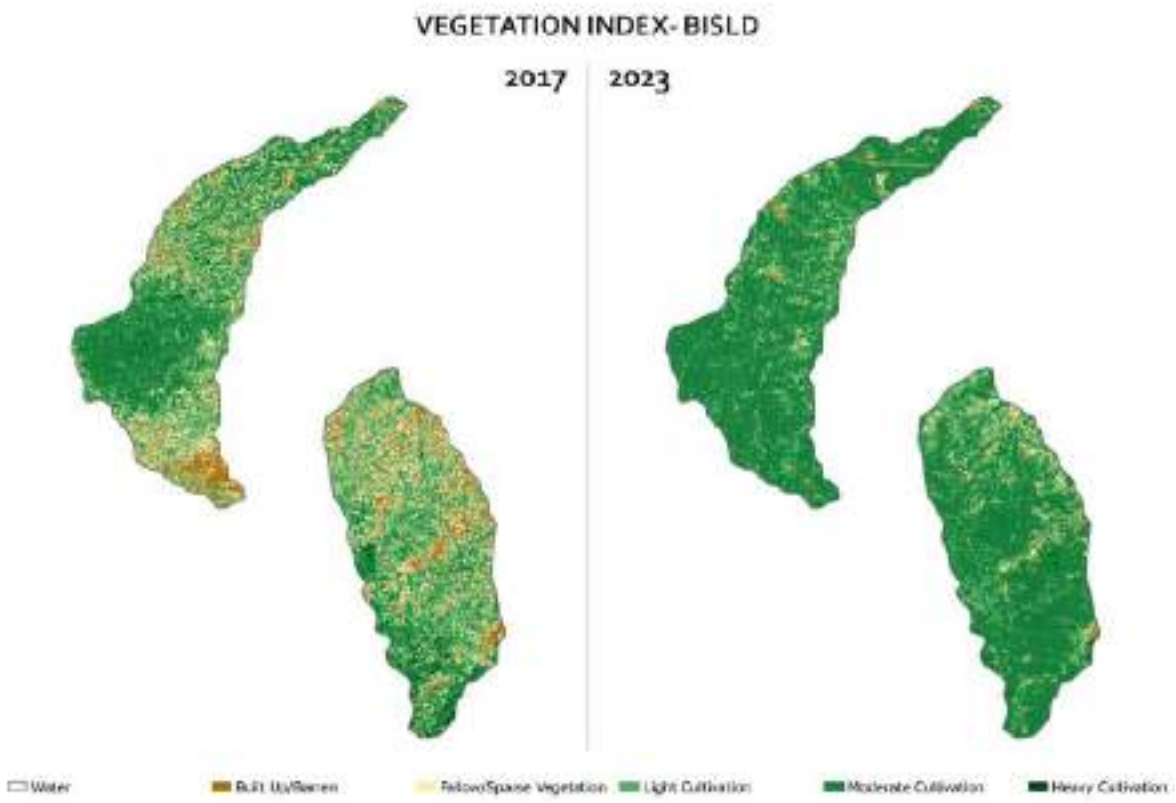


FIGURE 11: PRE- AND POST-INTERVENTION VEGETATION INDEX ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the vegetation index reveals that in the intervention watershed, the area under moderate cultivation has grown significantly along with the area under water, while the area under other classes has shrunk. With respect to the methodology applied for this analysis, it can be interpreted that the area under light cultivation corresponds to single cropping, moderate cultivation to double cropping and heavy cultivation to triple cropping. Thus, the area under double cropping has increased, indicating improved water accessibility and use, among other factors.

7

SOIL MOISTURE

Surface soil moisture (SSM), defined as the water content of the top few centimetres of soil, is a key variable that affects run-off generation, water recharge and vegetation growth. The Synthetic Aperture Radar (SAR) data from Sentinel-1 satellite is used here to study the surface soil moisture, which is in turn derived from relative soil moisture, which represents the soil moisture for a given soil column on a relative scale between soil saturation and wilting levels.

The surface soil moisture saturation is calculated as percentages using the formula[10]:

$$\mathrm{SSM}(t) = \frac{\Delta\sigma^0(\Theta, t)}{S(\Theta)} \quad [\%]$$

Where $\Delta\sigma0(\Theta,t)$ represents the change in normalized backscatter (relative to dry conditions), and $S(\Theta)$ is the sensitivity to SSM changes at the reference angle. The sensitivity is equivalent to the local backscatter dynamic range, estimated by the difference between normalized backscatter coefficients under wet and dry conditions using,

[10]Detailed methodology is provided at https://doi.org/10.1109/TGRS.2018.2858004

$$S(\Theta) = \sigma^0_{\text{wet}}(\Theta) - \sigma^0_{\text{dry}}(\Theta) \quad [\text{dB}].$$

Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states. The values range from 0 to 100 %, where values close to 0 represent water and built-up areas.

TABLE 13: ZONAL STATISTICS OF SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHEDS

District	Aurangabad				
Organisation	BISLD				
Total Area of Watershed (Sq. Km.)	91.831425				
Soil Group	D				
Soil Moisture Classes	SM - 2017		SM - 2023		% Difference
	Area	% Area	Area	% Area	
0 - 0.1 (1)	9.5365	10.38	6.8780	7.49	-27.88%
0.1 - 0.2 (2)	31.0823	33.85	15.3073	16.67	-50.75%
0.2 - 0.3 (3)	40.0388	43.60	39.2597	42.75	-1.95%
0.3 - 0.4 (4)	10.4769	11.41	25.4764	27.74	143.17%
0.4 - 0.5 (5)	0.5761	0.63	4.4654	4.86	675.09%
> 0.5 (6)	0.0397	0.04	0.3594	0.39	804.60%

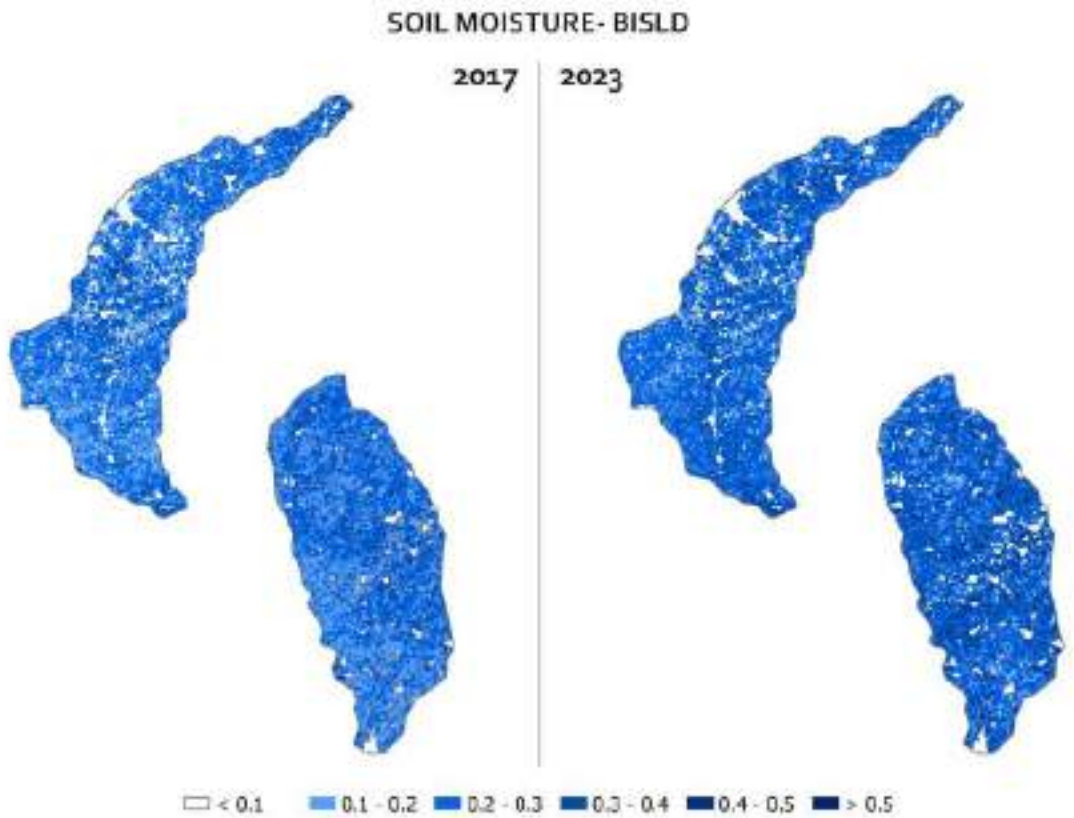
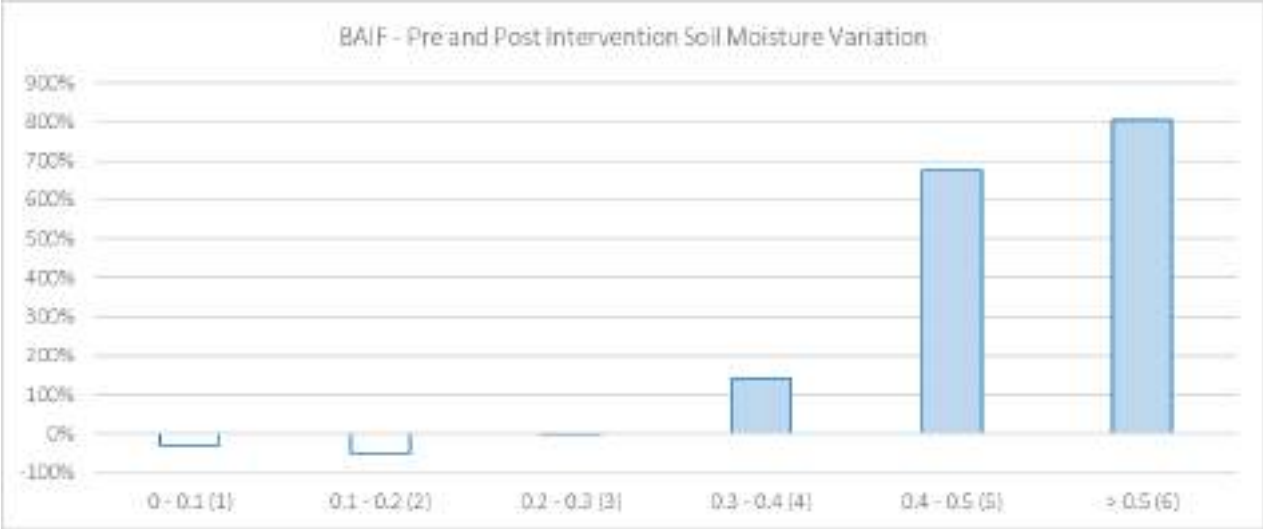


FIGURE 12: PRE AND POST INTERVENTION SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHED



The analysis, change detection and calculation of the soil moisture across the intervention watershed shows that there have been significant changes in the values of surface soil moisture over the course of the intervention period and since. The area under soil moisture values greater than 40% has seen a significant increase, while the area under low soil moisture values has reduced. This is to be interpreted because of multiple factors, such as the rainfall received, the vegetative cover, and the availability of surface and ground water, among others.

CONCLUSIONS

This section provides a summary of the key findings of the assessment and the limitations encountered in the process of the assessment. For more accurate quantification outcomes, further studies will have to be done using datasets of higher details and corroboration from the field.

KEY FINDINGS

In summation, the key findings from the above assessments are as follows:

- The total surface storage created in the intervention area due to the project is 13,24,041.54 cubic meters.
- The influence of rainfall on the ground water levels has not been very significant. However, a positive correlation between both was observed.
- The ground water levels in the intervention watershed have been increasing since 2017, are presently at high values, and are expected to persist at similar levels in the coming years. Availability of more recent data will shed more light on the trends that can be expected.
- Ground water recharge directly due to rainfall in the intervention area is about 12.45% of the total rainfall received.
- The volume of surface run-off stored by the intervention measures is 6.94% of the total run-off generated as a part of and due to the interventions (or) 0.79% of the total rainfall received during the period of the project intervention and ever since.
- Analysis of LULC, NDVI, and SSM reveal that there has been a marked increase in area under moderate or double cultivation while the crop cover overall has reduced slightly likely due to the increase in area under built up. The surface soil moisture has shown a remarkable change, with most of the area having a moisture content of more than 40%.

TABLE 14: SUMMARY OF FINDINGS

District		Aurangabad
Organisation		BAIF
Total Area of Watershed (Sq. Km.)		91.831425
Soil Group		D
Volume of Storage Created (Cu. m.)		1324041.54
Total rainfall over intervention area (Cu. m.)		433422286.4580
Q - Total run-off over intervention area (Cu. m.)		130026685.9
Average % of fullness throughout the intervention period		11.37%
Run-off volume stored in interventions	Pre-evaporation Loss	15057569.3
	Post Evaporation Loss	9034541.581
% of run-off stored by interventions	Pre-evaporation Loss	11.58%
	Post Evaporation Loss	6.94%
% of rainfall stored by interventions	Pre-evaporation Loss	1.31%
	Post Evaporation Loss	0.79%
Surface water contribution to ground water recharge (40%) (Cu. m.)		3613816.63
Recharge only due to rainfall (Entire intervention period and since)	Cu. m.	60930722.18
	%	12.45%

LIMITATIONS

The most significant limitation faced was in terms of data availability. With the resolution of the available open-source satellite imagery being capped at 10m, 30m and 50m, the land use, vegetation index and soil moisture that can be generated, respectively, also lack resolution, especially considering the small size of the intervention area that had to be assessed. Assumptions were made to calculate the storage capacity of water harvesting structures. Owing to the limitation in the availability of data on the number of interventions, their locations and the respective dimensions, the assessments are based primarily on data from secondary sources, with the primary data being used wherever possible. Further, most of the secondary data that was available and obtained has shortcomings in one or more areas, such as the temporal coverage or the spatial resolution. Further constraints were due to the unavailability of up-to-date and reliable ground water data. With the continuous measurement of this information, the efficiency of the assessment can be improved.

ANNEXURE 1

INTERVENTIONS

Organisation	Village	Type of Activity	Latitude	Longitude
BAIF	Silegaon	CNB - New	20.05944	75.05639
BAIF	Silegaon	CNB - New	20.1225	75.18361
BAIF	Silegaon	CNB - New	19.95083	75.05722
BAIF	Butte Wadgaon	CNB - New	20.03917	75.02444
BAIF	Butte Wadgaon	CNB - New	20.08611	75.04056
BAIF	Butte Wadgaon	CNB - New	19.99028	75.03111
BAIF	Butte Wadgaon	ENB	20.095	75.02444
BAIF	Kolghar	CNB - New	19.77512	75.03157
BAIF	Kolghar	CNB - New	19.77576	75.02918
BAIF	Kolghar	CNB - New	19.77976	75.02324
BAIF	Kolghar	CNB - New	19.78298	75.02261
BAIF	Devali	CNB - New	19.90083	75.01556
BAIF	Devali	CNB - New	19.90446	75.02053
BAIF	Yeshgaon	CNB - Repair	19.8025	75.10861
BAIF	Yeshgaon	CNB - Repair	19.79889	75.10861
BAIF	Yeshgaon	CNB - Repair	19.81056	75.10278
BAIF	Borgaon	CNB - Repair	19.90611	75.18944
BAIF	Domegaon	KT Weir	19.96444	75.3375
BAIF	Domegaon	KT Weir	19.8675	75.31028
BAIF	Jikthan	CNB - Repair	19.90778	75.20444
BAIF	Jikthan	CNB - Repair	19.98667	75.19639
BAIF	Jikthan	CNB - Repair	19.95361	75.31
BAIF	Jikthan	CNB - Repair	19.7875	75.29194
BAIF	Shirodi	CNB - Repair	20.01167	75.20111
BAIF	Kadim Shahapur	CNB - Repair	19.70833	75.1325
BAIF	Nandrabad	CNB - Repair	19.68861	75.14083
BAIF	Zanzardi	CNB - Repair	19.68667	75.13861
BAIF	Puri - Zanzardi	CNB - Repair	19.68556	75.13694
BAIF	Zanzardi	CNB - Repair	19.6825	75.13806
BAIF	Nandrabad	CNB - Repair	19.69167	75.13972
BAIF	Zanzardi	CNB - Repair	19.67944	75.14806
BAIF	Zanjardi-Kodaput	CNB - Repair	19.67333	75.13917
BAIF	Shahapur Kadim	CNB - Repair	19.69889	75.13972
BAIF	Nandrabad	CNB - Repair	19.69694	75.13778

Organisation	Village	Type of Activity	Latitude	Longitude
BAIF	Nandrabad	CNB - Repair	19.69389	75.13833
BAIF	Dahegaon	CNB - Repair	19.74556	75.15667
BAIF	GURUDHANORA	CNB - Repair	19.71056	75.15389
BAIF	Sultanpur	CNB - Repair	19.7075	75.15028
BAIF	Zanzardi	CNB - Repair	19.67425	75.14147
BAIF	Yesgaon	PT	19.81333	75.13028
BAIF	Yesgaon	PT	19.82056	75.32222
BAIF	Yesgaon	PT	20.03028	75.28667
BAIF	Domegaon	PT	19.83	75.14639
BAIF	Malkapur	PT	19.92861	75.15583
BAIF	Sirodi	PT	19.83	75.14639
BAIF	Sirodi	PT	19.99944	75.23611
BAIF	Siregaon	PT	19.89651	75.00401
BAIF	Tandulwad	PT	19.80122	75.01559
BAIF	Kolghar	PT	19.78022	75.02906
BAIF	Mahdpur	PT	19.89257	75.03972
BAIF	Sekta	PT	20.03833	75.20028
BAIF	Shidhanath Wadgaon	PT	19.845	75.05222
BAIF	Tembhapuri	PT	19.75	75.18
BAIF	Dhaegaon	PT	19.74	75.15
BAIF	Gurudhanora	PT	19.7	75.17
BAIF	Murshidabad	PT	19.69	75.17
BAIF	Rahimpur	PT	19.75	75.17
BAIF	Rahimpur	PT	19.71	75.14
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
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BAIF	Kolghar	NDW	19.76976	75.03885
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BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885

Organisation	Village	Type of Activity	Latitude	Longitude
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Kolghar	NDW	19.76976	75.03885
BAIF	Tandulwadi	NDW	19.77976	75.02323
BAIF	Tandulwadi	NDW	19.77976	75.02323
BAIF	Tandulwadi	NDW	19.77976	75.02323
BAIF	Tandulwadi	NDW	19.77976	75.02323
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BAIF	Tandulwadi	NDW	19.79796	75.00968
BAIF	Tandulwadi	NDW	19.79796	75.00968
BAIF	Shidhanath Wadgaon	NDW	19.80923	75.00023
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BAIF	Shidhanath Wadgaon	NDW	19.80923	75.00023
BAIF	Shidhanath Wadgaon	NDW	19.80923	75.00023
BAIF	Shidhanath Wadgaon	NDW	19.80923	75.00023
BAIF	Shidhanath Wadgaon	NDW	19.80923	75.00023
BAIF	Sekta	NDW	19.82796	75.00167
BAIF	Sekta	NDW	19.82796	75.00167
BAIF	Sekta	NDW	19.82773	75.00237
BAIF	Sekta	NDW	19.82773	75.00237
BAIF	Sekta	NDW	19.82773	75.00237
BAIF	Sekta	NDW	19.82773	75.00237

Organisation	Village	Type of Activity	Latitude	Longitude
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
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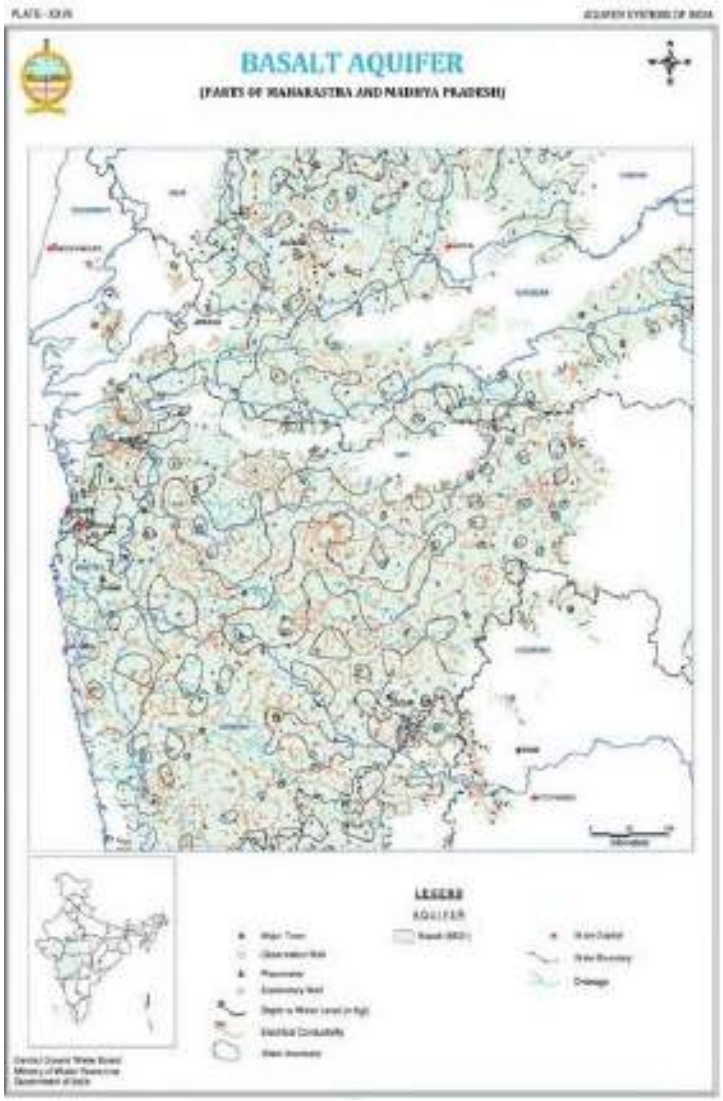
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83456	75.0011
BAIF	Wajnapur	NDW	19.83484	75.00094
BAIF	Butte Wadgaon	NDW	19.84573	75.00161
BAIF	Butte Wadgaon	NDW	19.84573	75.00161
BAIF	Butte Wadgaon	NDW	19.84573	75.00161
BAIF	Butte Wadgaon	NDW	19.84573	75.00161
BAIF	Butte Wadgaon	NDW	19.84573	75.00161
BAIF	Butte Wadgaon	NDW	19.84573	75.00161
BAIF	Butte Wadgaon	NDW	19.84573	75.00161
BAIF	Butte Wadgaon	NDW	19.84573	75.00161
BAIF	Butte Wadgaon	NDW	19.84942	75.00272
BAIF	Silegaon	NDW	19.85945	74.99983
BAIF	Silegaon	NDW	19.85945	74.99983
BAIF	Silegaon	NDW	19.85945	74.99983
BAIF	Silegaon	NDW	19.85945	74.99983
BAIF	Silegaon	NDW	19.85945	74.99983
BAIF	Silegaon	NDW	19.85945	74.99983
BAIF	Silegaon	NDW	19.85945	74.99983
BAIF	Silegaon	NDW	19.85945	74.99983
BAIF	Silegaon	NDW	19.85945	74.99983

Organisation	Village	Type of Activity	Latitude	Longitude
BAIF	Siregaon	NDW	19.85945	74.99983
BAIF	Siregaon	NDW	19.85945	74.99983
BAIF	Siregaon	NDW	19.85945	74.99983
BAIF	Siregaon	NDW	19.85945	74.99983
BAIF	Siregaon	NDW	19.85797	75.0011
BAIF	Siregaon	NDW	19.86716	75.01407
BAIF	Siregaon	NDW	19.89124	75.01281
BAIF	Siregaon	NDW	19.89124	75.01281
BAIF	Siregaon	NDW	19.89124	75.01281
BAIF	Siregaon	NDW	19.89124	75.01281
BAIF	Siregaon	NDW	19.89466	75.01276
BAIF	Devali	NDW	19.90047	75.01481
BAIF	Devali	NDW	19.90047	75.01481
BAIF	Devali	NDW	19.90047	75.01481
BAIF	Devali	NDW	19.90047	75.01481
BAIF	Devali	NDW	19.90047	75.01481
BAIF	Devali	NDW	19.90047	75.01481
BAIF	Devali	NDW	19.90047	75.01481
BAIF	Mahamdpur	NDW	19.8958	75.01648
BAIF	Mahamdpur	NDW	19.8958	75.01648
BAIF	Mahamdpur	NDW	19.8958	75.01648
BAIF	Mahamdpur	NDW	19.8958	75.01648
BAIF	Abdhulpur	NDW	19.8958	75.01648
BAIF	Abdhulpur	NDW	19.7463	75.1567
BAIF	Abdhulpur	NDW	19.74361	75.15583
BAIF	Abdhulpur	NDW	19.7463	75.1567
BAIF	Abdhulpur	NDW	19.74361	75.15583
BAIF	Abdhulpur	NDW	19.74361	75.15583
BAIF	Abdhulpur	NDW	19.73833	75.16278
BAIF	Dhaegaon	NDW	19.74194	75.15556
BAIF	Dhaegaon	NDW	19.7421	75.1551
BAIF	Dhaegaon	NDW	19.73786	75.15262
BAIF	Dhaegaon	NDW	19.7351	75.1512
BAIF	Dhaegaon	NDW	19.7336	75.1492
BAIF	Dhaegaon	NDW	19.7319	75.1447
BAIF	Dhaegaon	NDW	19.731	75.2115
BAIF	Dhaegaon	NDW	19.7307	75.1414

Organisation	Village	Type of Activity	Latitude	Longitude
BAIF	Dhaegaon	NDW	19.7403	75.1675
BAIF	Dhaegaon	NDW	19.74139	75.16139
BAIF	Dhaegaon	NDW	19.7415	75.16
BAIF	Dhaegaon	NDW	19.7403	75.1675

ANNEXURE 2

AQUIFER TYPES



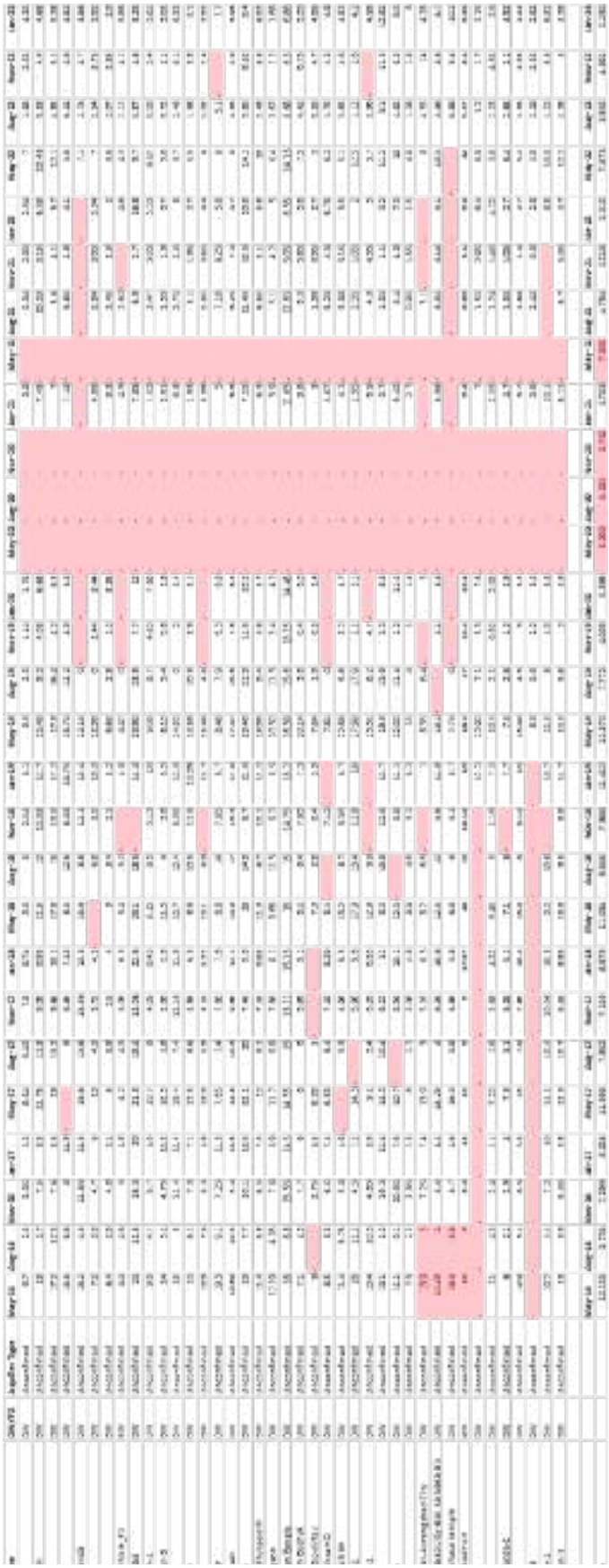
ANNEXURE 3

GROUND WATER DATA FROM NGO PARTNERS

Month	Overall	AFARM	AFPRO	BAIF	JBGVS	MGVS	DSC	SPARSH
Jun-17	16.63291	18.4899	14.58687	10.69306	17.82977		16.94432	
Jul-17	16.26051	17.0065	14.74355	10.21412	17.82977		16.94432	
Aug-17	15.88246	15.97136	14.09685	10.03629	17.82977		16.94432	
Sep-17	15.99119	15.97169	14.48917	10.42153	17.82977		16.94432	
Oct-17	15.91416	16.0541	13.77158	10.6804	17.82977		16.94432	
Nov-17	15.07609	16.14039	14.54375	10.82194	15.75972		16.36963	
Dec-17	15.28061	16.60187	14.73175	11.03952	16.01158		14.60358	
Jan-18	15.78515	17.30227	14.91724	10.10798	16.53142		15.00358	
Feb-18	16.13479	17.84025	14.97115	10.4525	16.72761		15.40358	
Mar-18	16.51477	17.97170	15.98083	10.60847	16.8196		15.50358	
Apr-18	16.62765	18.13107	16.29189	10.57028	16.86864		15.50358	
May-18	16.63098	18.09931	16.29604	10.27358	16.91076		15.73172	
Jun-18	16.60555	18.13702	16.3129	10.57146	16.95413		15.95796	
Jul-18	15.50553	16.69937	14.05122	9.815413	16.06409		15.9358	
Aug-18	15.01052	16.20899	14.20889	9.682651	15.41218		14.55531	
Sep-18	15.06038	16.07885	14.39571	9.481008	15.62163		14.78352	
Oct-18	15.16848	16.10001	14.42797	9.644355	15.78725		15.1184	
Nov-18	15.17444	16.44153	13.33897	9.762581	15.92178		15.36563	
Dec-18	15.36045	16.61517	13.66385	9.907863	16.17475		15.65383	
Jan-19	15.8136	16.82188	15.05846	10.15556	16.86138		15.67173	
Feb-19	16.04574	17.11848	15.06166	10.91272	16.96811		15.80602	
Mar-19	16.07415	17.19947	14.86318	11.01964	17.13002		15.57315	
Apr-19	16.1725	17.34318	15.35987	11.54101	17.14588		15.87414	
May-19	16.44105	17.36081	15.88693	11.99407	17.24754		15.97688	
Jun-19	16.10688	17.2031	15.93713	11.76859	17.25451	0.277391	15.85358	
Jul-19	15.56118	17.31602	16.54885	10.78343	15.61454	0.548696	15.14312	
Aug-19	15.14828	16.84152	16.44186	9.884798	14.76175	3.06913	14.80688	
Sep-19	14.7353	16.09015	16.00323	9.444355	14.64434	4.722174	14.25667	
Oct-19	14.41852	15.59718	16.04696	8.154355	14.7935	5.752174	13.4587	
Nov-19	14.2605	15.71996	16.07115	7.883548	14.76892	2.902609	12.35138	13.65
Dec-19	13.15947	15.16932	12.87619	8.591613	13.01254	2.354783	12.22696	13.86173
Jan-20	13.50751	15.523	11.01615	9.742177	14.02072	2.95913	13.06469	14.10765
Feb-20	13.91775	16.28292	10.32481	10.47444	14.5	2.95913	13.47667	14.35867

Month	Overall	AFARM	AFPRO	BAIF	JBGVS	MGVS	DSC	SPARSH
Mar-20	14.28585	16.56471	11.95991	11.11508	14.50964	0.848261	13.79852	14.71327
Apr-20	14.41205	16.43971	12.63857	11.605	14.51155	0.277391	14.1599	15.28357
May-20	14.42779	16.14156	12.15858	12.86561	14.51308	0.848696	14.1838	16.34786
Jun-20	14.38114	15.66726	11.00991	12.45274	15.42309	0.562609	14.20179	15.32653
Jul-20	9.755855	11.79976	7.475272	8.679274	6.809025	7.867826	12.33864	14.00612
Aug-20	7.548325	9.349132	5.164055	6.860806	4.173814	8.950435	10.91253	13.11888
Sep-20	6.125965	7.931561	5.3447	5.512561	2.986949	11.15043	8.451204	12.19184
Oct-20	5.247161	6.359467	2.000991	2.380645	2.646589	10.53522	8.929444	11.53724
Nov-21	5.501659	6.182822	3.349032	3.729032	3.431144	8.904785	9.05779	11.62806
Dec-21	6.33661	7.110027	4.57304	5.950645	4.446606	7.33087	9.751851	11.74082
Jan-21	7.318161	8.136332	6.028249	5.681855	5.664746	9.543913	9.541019	11.9148
Feb-21	8.119047	8.85904				9.860435	9.106494	11.11633
Mar-21	11.14108	11.52013				2.721174		11.39551
Apr-21	12.15048	11.68736				1.787391		11.96102
May-21	12.71124	11.18658				1.43087		11.81317
Jun-21	12.86181	13.2347				6.348261		13.25663
Jul-21	11.61871	11.62628				7.265652		11.61735
Aug-21	9.965919	9.478765				8.348261		11.82388
Sep-21	5.784916	6.325756				10.47		5.040816
Oct-21	5.898947	5.949665				11.43522		4.445918
Nov-21	6.860544	6.968752				10.17435		5.754082
Dec-21	7.530835	7.798096				9.47		6.258163
Jan-22	8.187615	8.372819				9.085045		7.414286
Feb-22	8.245786	8.184019				9.448261		8.152041
Mar-22	9.860786	10.16326				7.545913		8.62449
Apr-22	11.14824	11.09247				7.535217		9.140816
May-22	12.19883	13.30435				7.161304		10.00816
Jun-22	11.49981	11.10334				7.161304		10.67449
Jul-22	10.85145	11.24581				9.491739		9.973469
Aug-22	8.170419	7.784348				10.87652		8.719265
Sep-22	6.129714	5.404415				11.69826		7.085714
Oct-22	4.264286							4.264286
Nov-22	1.561224							1.561224

GROUND WATER DATA FROM CGWB



ANNEXURE 4

RAINFALL

Monthly rainfall (in mm) trends for Aurangabad from 01-Jan-2018 to 31-Mar-2024

Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)
Jan-17		0.00	Nov-18	24.8	11.09	Sep-20	153.4	197.97	Jul-22	172.8	247.29
Feb-17		0.00	Dec-18	10.3	0	Oct-20	56.9	66.44	Aug-22	175.9	84.34
Mar-17		0.00	Jan-19	2.7	0	Nov-20	24.8	1.45	Sep-22	153.4	255.34
Apr-17		0.00	Feb-19	2.5	0	Dec-20	10.3	1.33	Oct-22	56.9	132.92
May-17		2.44	Mar-19	4.6	0	Jan-21	2.7	12.03	Nov-22	24.8	0
Jun-17		149.79	Apr-19	3.5	0.94	Feb-21	2.5	2.27	Dec-22	10.3	7.04
Jul-17		86.36	May-19	18.9	0	Mar-21	4.6	5.84	Jan-23	2.7	3.14
Aug-17		165.79	Jun-19	134.6	110.63	Apr-21	3.5	4.66	Feb-23	2.5	0
Sep-17		182.62	Jul-19	172.8	162.87	May-21	18.9	30.6	Mar-23	4.6	9.83
Oct-17		95.61	Aug-19	175.9	106.42	Jun-21	134.6	132.15	Apr-23	0	39.76
Nov-17		2.83	Sep-19	153.4	213.73	Jul-21	172.8	142.21	May-23	0	9.41
Dec-17		2.27	Oct-19	56.9	193.39	Aug-21	175.9	186.88	Jun-23	134.6	43.71
Jan-18	2.7	0	Nov-19	24.8	37	Sep-21	153.4	454.42	Jul-23	172.8	173.41
Feb-18	2.5	0.72	Dec-19	10.3	1.46	Oct-21	56.9	106.39	Aug-23	175.9	46.79
Mar-18	4.6	0.53	Jan-20	2.7	0.12	Nov-21	24.8	15.3	Sep-23	153.4	220.1
Apr-18	3.5	2.01	Feb-20	2.5	0	Dec-21	10.3	6.89	Oct-23	56.9	0.85
May-18	18.9	0.17	Mar-20	4.6	22.92	Jan-22	2.7	0.2	Nov-23	24.8	54.85
Jun-18	134.6	126.39	Apr-20	3.5	2.42	Feb-22	2.5	0	Dec-23	10.3	14.13
Jul-18	172.8	85.65	May-20	18.9	6.26	Mar-22	4.6	4.91	Jan-24	0	2.44
Aug-18	175.9	180.45	Jun-20	134.6	251.86	Apr-22	3.5	0	Feb-24	0	2.25
Sep-18	153.4	29.42	Jul-20	172.8	91.32	May-22	18.9	0	Mar-24	0	0.1
Oct-18	56.9	1.65	Aug-20	175.9	221.91	Jun-22	134.6	140.36			

ANNEXURE 5

REGRESSION & CORRELATION

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.028569498
R Square	0.000816216
Adjusted R Square	-0.013457838
Standard Error	3.542306917
Observations	72

Correlation	*Column 1*	*Column 2*
Column 1	1	
Column 2	0.028569498	1

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.717513774	0.717513774	0.057181806	0.811705719
Residual	70	878.3556808	12.5479383		
Total	71	879.0731946			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.29983462	0.520525671	19.7873711	2.20591E-30	9.261678903	11.33799033	9.261678903	11.33799033
X Variable 1	0.001100177	0.004600801	0.239127175	0.811705719	-0.008075832	0.010276186	-0.008075832	0.010276186

ANNEXURE 6

PHOTOS

CHAPTER 9
RECOMMENDATIONS

Based on the findings, the following recommendations are proposed to further improve and effectiveness to bring sustainability to the Bajaj Water Conservation Project:

Creating block-level social groups to oversee the maintenance of community resources and involvement of local institutions would be an option for the long-term sustainability of the project.

Providing further technical assistance and training to farmers on sustainable practices and access to quality seeds and modern tools would be added benefits to the farmers.

10. SUSTAINABILITY

Sustainability of this initiative is evident across multiple dimensions, each contributing to long-term resilience and community empowerment. Institutional sustainability is achieved through the formation and strengthening of local groups, including water user committees, village development committees, and self-help groups. These organizations have taken ownership of water resource management, establishing protocols for the routine maintenance and monitoring of water infrastructure. Capacity building initiatives, such as targeted training sessions, exposure visits, and water literacy camps, have equipped community members with the necessary skills for autonomous resource management. Additionally, the establishment of dedicated bank accounts for these groups has promoted transparent financial management and continuous investment in resource maintenance.

Environmental sustainability is advanced through a combination of structural and vegetative interventions. Structural measures, including the repair and deepening of percolation tanks, construction and restoration of check dams, and improvements in water channels, have created efficient water harvesting and storage systems. These interventions have not only enhanced groundwater recharge but also mitigated the impacts of erratic rainfall and climate variability. Vegetative measures, such as afforestation and grass seeding, have improved soil stabilization and increased water retention, further strengthening the natural resource base that supports agriculture and ecosystem health.

Economic sustainability is reinforced by the introduction of efficient irrigation techniques like drip and micro-irrigation systems, which optimize water use and boost agricultural productivity. The resultant rise in annual agricultural income has enabled local farmers to reinvest in sustainable practices and diversify their sources of livelihood, thereby reducing dependency on single income streams.

Social sustainability is fostered through inclusive community mobilization. Involving all community segments, especially women, has ensured that decision-making is collective and responsive to local needs. This integrated approach creates a replicable model of water resource management that secures long-term benefits and promotes broader socio-economic progress. This balanced framework strengthens resilience for future.

CHAPTER 11
CONCLUSION

The impact assessment of the Bajaj Water Conservation Project indicates its transformation for addressing critical water in addressing critical water scarcity issues and implementing long-lasting development initiatives among the focused communities.

The project has successfully improved water security, enhanced agricultural production, diversification of livelihoods, and strengthened socio-economic conditions in the focus areas. The key achievements include the adoption of advanced irrigation practices, increased crop and horticulture production, formation of robust community institutions, and empowerment of beneficiaries through targeted capacity-building initiatives. The establishment of advocacy platforms and public-private partnerships further highlights the project's systemic approach to fostering sustainable development.

Through this intervention, so much progress has been made in the area, but the assessment also identifies some areas for improvement, such as specific interventions to community-specific needs to address the variability in activity outcomes and expansion of the scopes of alternative livelihoods. Considering the recommendations, the project can further incorporate its positive impacts and ensure long-term sustainability.

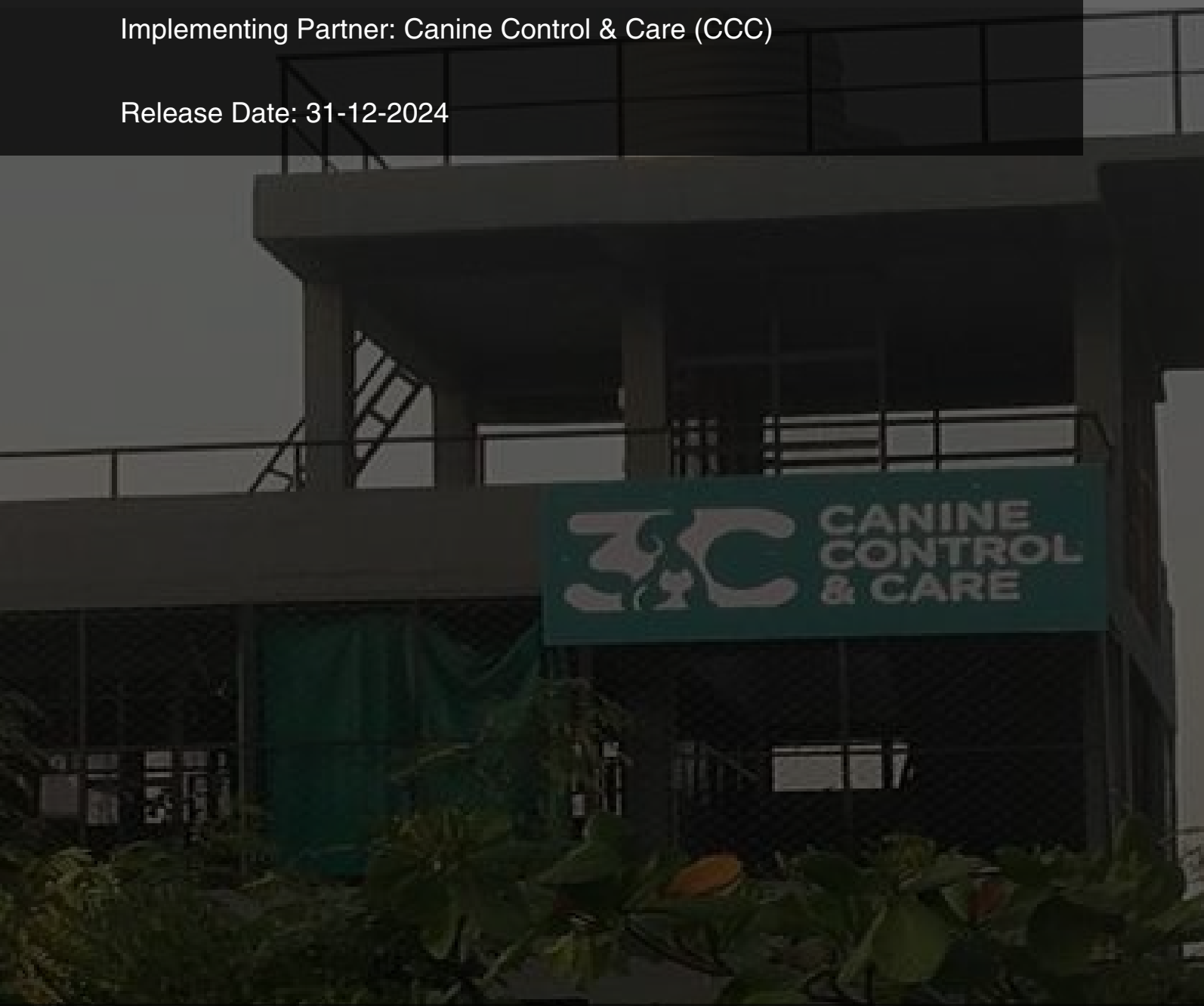
As a result, the Bajaj Water Conservation Project serves as a model for adopting sustainable community-based resource management through CSR initiatives. It highlights the importance of community empowerment in ensuring the sustainability of project outcomes. The project can be replicated in other geographies based on the needs and importance of the communities.

IMPACT ASSESSMENT REPORT

STERILISATION AND VACCINATION OF STRAY DOGS IN PUNE

Implementing Partner: Canine Control & Care (CCC)

Release Date: 31-12-2024



SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

ABC	Animal Birth Control
AWBI	Animal Welfare Board of India
CCC	Canine Control & Care
CDC	Centre for Disease Control and Prevention
CSR	Corporate Social Responsibility
FGDs	Focus group discussions
NAPRE	National Action Plan for Rabies Elimination
OECD-DAC Framework	Organisation for Economic Cooperation and Development- Development Assistance Committee
PCMC	Pimpri-Chinchwad Municipal Corporation
PMC	Pune Municipal Corporation
SDGs	Sustainable Development Goals

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The project Sterilisation and 'Vaccination of Stray Dogs' in Pune, supported by Bajaj Auto Ltd. and implemented by Canine Control & Care (CCC), addresses the pressing issue of stray dog population management and rabies prevention in Pune. Initiated to create a humane, sustainable solution, the project focuses on Animal Birth Control (ABC) procedures, anti-rabies vaccination, and community engagement to improve public health and promote animal welfare.

Since its inception, the program has achieved significant milestones, including the sterilization of 1,00,000 stray dogs. Additionally, over 16,000 stray dogs were vaccinated between FY 20 and FY 22. These efforts have resulted in a measurable reduction in stray dog overpopulation, improved canine health, and minimised instances of rabies transmission, benefiting both animals and the community. The program also emphasises adherence to the Animal Birth Control Rules, 2023, ensuring ethical practices and ecological balance.

Key impacts include declining dog-related conflicts and enhanced community awareness of stray dog management. The initiative's infrastructure, such as AWBI-compliant kennels and systematic recovery care, sets a replicable model for other cities and states in India, as well as other countries. Supported by a dedicated team of professionals and volunteers, this project underscores the importance of collaborative action in addressing urban animal welfare challenges, with a strong focus on sustainability and community welfare.

PROJECT DETAILS

Implementation year
FY 2020 - FY 2022

Assessment year
FY 2024 - FY 2025

Implementing Partner
Canine Control & Care (CCC)

Project location
Pune district, Maharashtra

Beneficiaries
Stray dogs & communities

Budget
₹270 Lakhs

Alignment with SDGs

PROJECT ACTIVITIES

COMMUNITY AWARENESS AND INVOLVEMENT

- Engaged community volunteers and feeders to locate and identify stray dogs requiring sterilisation or vaccination.
- Conducted awareness drives to educate the public about humane stray dog management, responsible care for stray dogs, and abandoned pet dogs.

INFRASTRUCTURE DEVELOPMENT

- Established AWBI-compliant kennels and expanded facilities to accommodate sterilisation, vaccination, and recovery operations.
- Partnered with municipal bodies to upgrade pounds and operational centres for greater efficiency.

STERILISATION OF STRAY DOGS

- Conducted spaying and neutering surgeries under general anaesthesia to control the stray dog population.
- Ear-notching and colour coded Tag IDs as markers for sterilised dogs.

ANTI-RABIES VACCINATION

- Administered anti-rabies vaccinations to sterilised dogs to prevent the spread of rabies in the community.

POST-OPERATIVE CARE

- Provided a comprehensive five-day recovery protocol, including nutritious diet with multiple options, pain relief medication, antibiotics, flea/tick treatment, and observation for proper healing.
- Ensured emotional stability and physical recovery before releasing dogs back to their territories.

MONITORING AND DATA MANAGEMENT

- Deployed an advanced MIS system for accurately tracking sterilised/vaccinated dogs and reporting program progress.
- Trained staff in animal protection laws and program protocols to maintain high standards.

CCC CENTRE HEAD SHOWING THE KENNEL AND MEDICAL CASE PAPERS OF THE ADMITTED DOG

Key Findings and Impact

Component	Indicators	Findings	Outcomes & Impact
Mobilisation and Selection	Outreach effectiveness, geographical coverage	**Over 16,725** stray dogs were identified, sterilised, and vaccinated across Pune during FY 2020 - FY 2022.	**Outcomes:** Successfully reached a diverse population of stray dogs across urban and suburban areas. **Impact:** Reduced stray dog population growth and improved public safety.
	Community engagement in reporting	Increased participation of residents and volunteers in reporting stray dogs for sterilisation.	**Outcomes:** Strengthened partnerships with communities. **Impact:** Fostered greater awareness on humane stray dog management.
Training and Delivery	Quality and scope of training programs	**42 staff** trained in animal birth control (ABC) protocols, including dog catchers and veterinarians.	**Outcomes:** Improved operational efficiency and adherence to humane practices. **Impact:** Enhanced overall care quality during and after sterilisation.
	Infrastructure for recovery and post-operative care	Recovery protocols ensured all sterilised dogs underwent a 5-day post-op care period in kennels.	**Outcomes:** High recovery success rates with reduced complications. **Impact:** Ensured both physical and emotional well-being of dogs.
Program Engagement	Stakeholder involvement	Active support from CCC volunteers, legal experts, and Bajaj Auto Ltd. in program activities.	**Outcomes:** Created a collaborative framework involving diverse stakeholders. **Impact:** Strengthened sustainability and scalability of the program.
	Community satisfaction	Feedback indicated improved coexistence and reduced conflicts between stray dogs and residents.	**Outcomes:** Increased community cooperation. **Impact:** Enhanced public confidence in humane solutions to stray dog issues.
Stray Dog Population	Reduction in stray dog population	Systematic waste disposal reduced breeding grounds, minimising stray dog population growth.	**Outcomes:** Safer and cleaner neighbourhoods. **Impact:** Contributed to a long-term decline in stray-related issues.
Community	Public safety and health outcomes	Significant improvement in community safety and reduction in stray dog aggression cases.	**Outcomes:** Improved community living conditions. **Impact:** Promoted a humane, organised approach to stray dog management.

03. OECD FRAMEWORK

RELEVANCE

The program addresses significant issues related to the growing stray dog population in urban areas, which poses threats to public health (through diseases like rabies) and animal welfare. The relevance of the program can be considered high, as it aligns with national and local priorities such as public health improvement, animal welfare, and sustainable urban development. The use of sterilisation and vaccination directly addresses key concerns related to rabies prevention and overpopulation of stray dogs.

COHERENCE

The project aligns closely with Sustainable Development Goals (SDGs) and national objectives by promoting humane animal welfare (SDG 15: Life on Land) and advancing public health through rabies control (SDG 3: Good Health and Well-being). It supports community awareness and engagement, fostering sustainable urban environments (SDG 11: Sustainable Cities and Communities). Additionally, its adherence to the Animal Birth Control Rules, 2023, reflects alignment with India's legal and ethical commitments to animal welfare.

EFFECTIVENESS

The program's objectives of reducing the stray dog population, preventing the spread of rabies, and improving the welfare of stray dogs have been largely met through the consistent implementation of sterilisation surgeries, anti-rabies vaccinations, and post-operative care. The program is effective, having conducted over 16,000 surgeries in FY 2020 - FY 2022 and vaccinations in multiple areas. The expansion into new regions and the addition of new volunteers also suggest that the program is progressing toward its goals. However, challenges such as the fluctuating staff strength and weather delays may slightly hinder its efficiency.

EFFICIENCY

Efficiency assesses whether the program has used its resources (time, staff, funds, etc.) in the best possible way to achieve its intended outcomes. The program's staffing, infrastructure, and logistical systems are crucial to its success. Despite challenges with staff retention and coordination with local authorities, the program has managed to perform a high volume of surgeries and vaccinations, demonstrating a reasonable use of resources.

IMPACT

The Sterilisation and 'Vaccination of Stray Dogs' project has had significant positive impacts on public health (reduction in rabies risk), animal welfare (reduced stray dog overpopulation and improved recovery care), and local communities (empowering volunteers and engaging local authorities). The program has made a substantial impact by reducing rabies transmission risks and improving the quality of life for stray dogs. Community engagement, via increased volunteer participation, also indicates a positive social impact. However, further community outreach and awareness programs could amplify these impacts in the long term.

SUSTAINABILITY

The program's sustainability is somewhat uncertain due to its dependence on external funding, staff recruitment challenges, and infrastructure needs. Additionally, external factors such as a lack of responsible pet ownership, which contributes to the growing issue of pet abandonment and increases in the stray dog population, as well as ineffective waste disposal in cities, can impact the program's efficiency. However, there is potential for sustainability if partnerships with local governments (PMC, PCMC) and NGOs (e.g., Blue Cross Society of Pune, SAW, VOSD, PFA, etc.) are strengthened and if local capacity building (through training programs and volunteer engagement) continues to grow.

CHAPTER 4
INTRODUCTION

FGD with Medical Assistant team

NEED OF THE PROGRAM

The need for sterilisation and vaccination programs for stray dogs is rooted in public health, animal welfare, and ecological balance concerns. Globally, the stray animal population has been increasing due to factors such as inadequate population control measures and the abandonment of pets. This has led to significant challenges, including overpopulation, human-animal conflicts, and the spread of zoonotic diseases like rabies.

Sterilisation programs play a vital role in controlling the population of stray animals, preventing overbreeding, and reducing instances of territorial aggression and nuisance behaviour. By vaccinating strays against diseases like rabies and distemper, such programs not only protect human communities but also improve the health and lifespan of these animals (Centres for Disease Control and Prevention [CDC], 2022).

Beyond public health, sterilisation and vaccination initiatives contribute to animal welfare by mitigating the suffering caused by unchecked reproduction and disease. These programs, when combined with community awareness and responsible pet ownership campaigns, promote coexistence between humans and animals while addressing long-term ecological challenges.

OBJECTIVE OF THE PROGRAM

To reach a manageable, controllable level of stray canine population through spaying, neutering, and other humane actions and to eradicate rabies through vaccination.

ABOUT BAJAJ AUTO LTD.

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT THE NGO PARTNER - CANINE CONTROL & CARE

Canine Control & Care (CCC) is a dedicated organisation committed to improving the welfare of stray animals through effective population control and health management initiatives. Established with a vision to address the challenges of stray animal overpopulation, CCC focuses on sterilisation, vaccination, and overall care for stray dogs and cats. By promoting humane and sustainable approaches, the organisation aims to reduce stray animal suffering and improve community well-being.

CCC collaborates with various stakeholders, including local governments, corporations, and communities, to implement large-scale Animal Birth Control (ABC) programs. These initiatives not only curb the overpopulation of strays but also minimise human-animal conflicts and the spread of zoonotic diseases. Their work extends to awareness programs advocating responsible pet ownership and compassion toward stray animals. Through its unwavering dedication, CCC plays a pivotal role in enhancing the quality of life for stray animals and fostering a harmonious coexistence with humans (Canine Control & Care, n.d.).

SOULACE TEAM OBSERVING THE CASE PAPER AND INDIVIDUAL TAG ID OF DOGS

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Ltd. assigned SoulAce to conduct a study on the work done by the Canine Control & Care (CCC) and assess the impact of its CSR initiative in the field focusing on sterilisation and vaccination of stray dogs, Animal Birth Control (ABC), zoonotic disease risks, and promoting harmonious human-animal coexistence.

OBJECTIVES OF THE STUDY

To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.

To measure the program's contribution to controlling stray animal populations, reducing zoonotic disease risks, and improving public health through sterilisation, vaccination, and enhanced community awareness in Pune City of Maharashtra.

To provide insights into the strengths and areas for improvement of the program implementation.

RESEARCH DESIGN

The qualitative research methodology for the impact assessment of the stray animal sterilisation and vaccination program is designed to provide in-depth insights into the program's effectiveness, stakeholder perceptions, and community-level outcomes. It employs a descriptive approach using interviews, focus group discussions (FGDs), and observations to gather rich qualitative data.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods offer valuable insights into the real-life experiences, perspectives, and narratives of stakeholders involved in the program, such as project implementers, veterinarians, and volunteers. By conducting in-depth interviews and focus group discussions, the following objectives are intended to be achieved:

To explore stakeholders' experiences and satisfaction with the program, including those of implementing organisations, veterinarians, volunteers, and community members.

To assess the perceived changes in the health of stray animals, population control, and human-animal interactions.

To evaluate the program's socio-cultural impact on community attitudes towards stray animals.

SURGICAL EQUIPMENTS

DESIGN SNAPSHOT

Name of the project

Sterilisation and Vaccination of Stray Dogs in Pune

Implementing agency

Canine Control & Care

Research design used

Descriptive research design

Sampling technique

Purposive sampling

Sample size

50 stakeholders

Qualitative method used

Semi-structured interviews, testimonials, and focus group discussions with beneficiaries along with key stakeholders.

KEY STAKEHOLDERS

- Canine Control & Care (CCC)- Project implementation team
- Bajaj Auto Ltd. Team
- Municipal Corporations (PMC and PCMC)
- Community Members- Animal Welfare Volunteers
- Veterinary Professionals and other collaborated NGOs

STUDY TOOLS

Questionnaires for key stakeholders:

Semi-structured questionnaires were developed, reviewing the project details for each of the focus areas. Stakeholders were identified, and focus group discussions were conducted with the project staff.

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. Adhering rigorously to ethical principles of research, the study prioritised the rights and well-being of participants throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Crucially, participation was fully voluntary, free from coercion or pressure, underscoring the importance of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

KENNELS

CHAPTER 6
ANALYSIS OF THE PROGRAM DESIGN

THE CONTEXT: ADDRESSING THE STRAY DOG ISSUE IN INDIA

In 2001, the Government of India introduced the Animal Birth Control (ABC) program to manage the stray dog population humanely. This initiative replaced earlier practices, such as the culling of stray dogs, which were deemed inhumane by the landmark Supreme Court ruling of 2001. The ruling mandated the implementation of ABC programs as a sustainable and compassionate solution.

Despite this progressive legal reform, the actual implementation of ABC programs across the country remained largely ineffective. There was no significant progress on the ground for nearly two decades, and key measures such as comprehensive dog censuses to track and estimate stray populations were missing. The gap between policy and action left the issue unresolved, with stray animals continuing to face harsh conditions and cities struggling to manage their populations.

SHARED COMMITMENT TO HUMANE SOLUTIONS

Around a decade ago, Ms. Deepa Bajaj, a passionate advocate for animal welfare, decided to take meaningful action to address the plight of stray dogs in Pune. Driven by her vision for humane stray animal management, she sought out like-minded individuals who shared her mission.

During this time, Ms. Bajaj met Ms. Dhanashree owned a farmland property and shared a similar dedication to improving the welfare of stray animals. Their partnership was timely, as the absence of effective action on the ground called for urgent measures.

FORMATION OF CCC

In 2014, Canine Control and Care (CCC) was officially established, driven by the collective vision of Ms. Bajaj and Ms. Dhanshree. The organisation set out to address gaps in the implementation of the ABC program and provide a humane, Sustainable model for stray animal management with capable guidance for compliance by Ms Lolita.

At the outset, CCC faced several challenges in scaling its operations. Starting with a small but dedicated team consisting of one veterinarian, one assistant, and one administrator, the organisation began its journey with limited resources.

FGD EXCERPT (COMMITTEE MEMBERS)

During a focus group discussion with key members, Ms. Deepa Bajaj, Ms. Dhanashree Bhisey, Ms. Lolita K. (Advocate), and Ms. Beena M. (communication and marketing consultant), it was emphasised that "There is no overnight solution to the street dog issue. However, through sterilisation, we can achieve a stable, non-breeding population that gradually decreases over time. Sterilised dogs also tend to become less aggressive, fostering a safer and more harmonious coexistence between humans and strays."

The team further highlighted, "Our team consists of skilled dog catchers, veterinary doctors, veterinary assistants, and passionate volunteers who work tirelessly to ensure the program's success. Many of our volunteers have been with CCC for over a decade, offering unparalleled commitment and compassion. Their unwavering dedication not only upholds the organisation's high standards of care for dogs but has also been instrumental in significantly controlling the stray dog population in Pune."

DISCUSSION WITH CCC MANAGEMENT TEAM

KEY EARLY MILESTONES IN CCC'S JOURNEY

One of CCC's initial milestones was the introduction of a mobile van to facilitate the sterilisation and vaccination of stray dogs. This innovative approach aimed to enhance outreach; however, logistical challenges limited its scalability and effectiveness. Recognising the need for stable infrastructure to support Animal Birth Control (ABC) procedures, Ms. Dhanashree generously offered her erstwhile boarding kennel facility for CCC's operations. This enabled the organisation to establish its first 20 kennels, providing a safe and controlled environment for stray dogs undergoing sterilisation and post-operative care. These foundational steps laid the groundwork for CCC's impactful animal welfare initiatives.

FGD EXCERPT (VETERINARY DOCTORS)

"CCC provides one of the best facilities for sterilisation surgeries," shared Dr. Vijay Suryavanshi. "The centre ensures access to top-quality medicines and exceptional care for the animals. Having performed surgeries at various locations, I can confidently assert that CCC surpasses others in terms of its facilities and dedication to animal welfare.

CENTRE HEAD EXPLAINING ADMISSION DASHBOARD

A DECADE OF HUMANE ACTION

The establishment of the CCC was a timely and necessary intervention to address the lack of effective mechanisms under the Animal Birth Control (ABC) program for managing the stray dog population. By implementing a humane and actionable model, CCC filled this critical gap.

Over the years, CCC has grown significantly, evolving from its initial 20 kennels to a robust facility with 100 kennels. This expansion reflects its ability to accommodate more stray dogs while continually refining its operational strategies to overcome logistical challenges. With a focus on scalability and effectiveness, CCC has established itself as a pioneering organisation in stray dog population management.

As CCC approaches its 10th anniversary in February 2025, it stands as a testament to the power of collective action and a shared vision. What began as a modest initiative has transformed into a vital force addressing stray dog welfare in Pune with compassion and sustainability. CCC's journey underscores the importance of collaboration, community involvement, and unwavering commitment to humane solutions, setting a benchmark for similar initiatives across India.

CURRENT IMPLEMENTATION STRATEGY AND MODEL

The Canine Control and Care (CCC) operates with a vision of creating a sustainable and humane model for stray dog welfare through collaborative efforts, robust systems, and adherence to best practices. The strategic framework encompasses capacity building, community involvement, technological innovation, and sustainable practices to achieve comprehensive animal welfare goals.

FGD EXCERPT (VETERINARY DOCTORS)

Dr. Vijay Suryavanshi added, "CCC is providing best-in-class services, and the founders are deeply involved in every aspect of the program. Even the selection process for veterinary doctors is highly rigorous. One of our founders, personally oversees the process. As part of the selection, we are required to perform surgeries in their presence and strictly adhere to CCC protocols. Only candidates who meet these high standards are selected.

CAPACITY BUILDING

Veterinary Training

CCC mandates rigorous training for its veterinary staff, including three months of hands-on experience before independently conducting surgeries. This ensures high standards of care and operational excellence.

Para-Vets Integration

Para-veterinary personnel are introduced to support operations, enhancing overall efficiency.

COMMUNITY INVOLVEMENT

Volunteer Network

Community volunteers assist in stray dog tracking, catching, and post-release care. This involvement enhances coverage and fosters trust within the community.

Awareness Programs

Coordinated efforts with local feeders and volunteers promote humane treatment and sterilisation of stray dogs.

FGD EXCERPT (COMMITTEE MEMBERS)

At its heart, the program is dedicated to the well-being of stray dogs, built on the twin pillars of compassion and high-quality care through ABC. We strategically focused on ABC as the sole approach to achieve this goal, allowing us to refine and perfect the program model over time. Through rigorous documentation and the implementation of multiple checks at every stage, we ensured that every process from dog-catching to release is accurately recorded and closely monitored. This meticulous approach leaves no room for errors and enables us to deliver effective and humane sterilization services for stray dogs seamlessly.

- Ms Deepa Bajaj

SYSTEMATIC PROCESSES

Grid-Based Mapping

Target areas are identified using grid-based systems, ensuring comprehensive and organised coverage.

Dog-Catching Protocols

Catchers are trained and incentivised on a per-dog basis. Every dog is tagged, documented, and tracked systematically from capture to release.

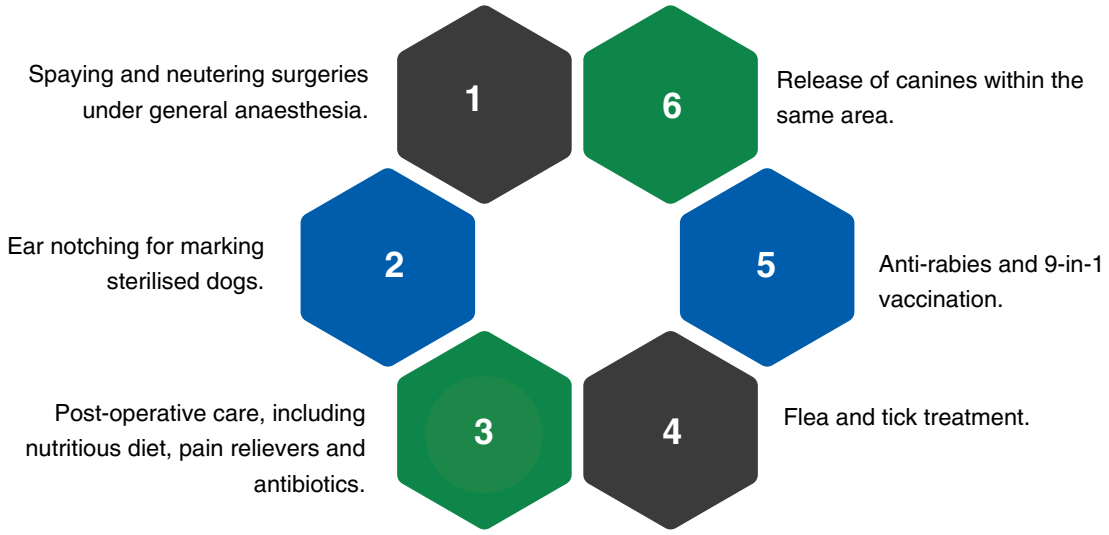
AWBI Compliance

CCC centres are fully compliant with AWBI standards, ensuring humane treatment and high-quality infrastructure.

FGD EXCERPT (CENTRE HEADS)

We ensure that every animal undergoing sterilisation surgery receives comprehensive care throughout the process. We prioritise their well-being, and no animal is released until it is fully fit and healed. In cases where an animal requires additional recovery time beyond the standard five days, we extend our care. These animals are provided with continued medical attention, nutritious food, and compassionate handling until they are ready to return to their environment.

THE DOGS BROUGHT UNDERGO THE FOLLOWING PROCESS:



This entire process takes around 5 days. Thus the YCLE is a 5 days cycle.

Source: CCC Narrative Report

HIGH-END HYDRAULIC SURGERY TABLES AND EQUIPMENTS.

FGD EXCERPT (CENTRE HEADS)

At CCC, we ensure that every canine is kept under observation for five days after surgery," explained Centre Heads Dr Heena Naikude and Maureen Raghavan. "During this period, we closely monitor their health, and if any issues arise, immediate intervention is provided. Dogs are released only once they have fully recovered. Each dog is assigned a separate kennel for their post-operative care, and all their records are meticulously maintained at the kennel itself. This systematic approach ensures the well-being of every animal and allows us to track their recovery effectively.

DISCUSSION WITH THE CENTER HEADS

STRINGENT PROTOCOLS AND RIGOROUS DOCUMENTATION

Digital and Paper-Based Documentation

Dog-catching sheets, health records, and post-surgery details are meticulously recorded and maintained, ensuring transparency and traceability.

Digital Protocols

Bio-waste management and surgical waste disposal are streamlined using digital tools for compliance and environmental safety.

FGD EXCERPT (COMMITTEE MEMBERS)

One of the main challenges we face during neutering programs is obtaining the medical history of street dogs before surgery," shared Ms. Dhanashree Bhisey. "This is especially common with stray animals, as their backgrounds are often unknown. However, we address this issue with the support of community volunteers. These volunteers play a crucial role, as they are familiar with the dogs, feed them regularly, and help provide valuable insights about their health and behaviour. Their involvement significantly enhances the safety and success of the sterilisation process.

TRANSITION TO ADVANCED MIS

The program is in the process of transitioning to an advanced CCC SMART ABC, revolutionizing data collection, reporting, and operational tracking. This integration minimizes manual errors and delays, ensuring real-time accuracy in capturing critical data. By automating processes, the system facilitates seamless tracking of key activities such as dog-catching, surgeries, and animal releases, significantly enhancing coordination and overall management.

Ms. Beena M. (communication and marketing consultant) highlighted:
The MIS system is set to transform operations. Real-time data access saves time, ensures compliance with regulations, and offers valuable insights into operational efficiency. This shift allows us to optimize resources and better meet our targets.

SUSTAINABILITY AND FUTURE PROSPECTS

Infrastructure Development

Additional kennels and surgical facilities, supported by CSR funding from Bajaj Auto and other stakeholders, expand CCC's capacity to manage stray dogs effectively. Strategic collaborations with municipal bodies like PMC and PCMC enhance coverage and scalability

Environmental Compliance

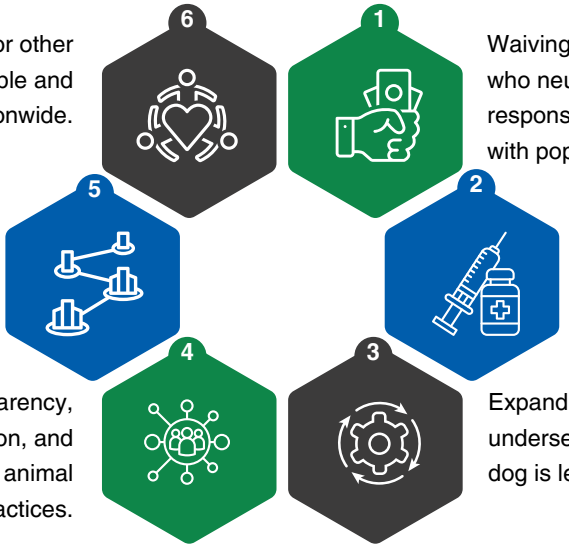
Bio-waste management protocols, in collaboration with Passco Environmental Solutions Pvt. Ltd. (PESPL), ensure eco-friendly operations.

Workforce Development

Monthly reviews, induction processes, and communication protocols led by experienced staff enhance organisational efficiency and morale.

VISION FOR THE FUTURE

CCC envisions itself as a pioneer in sustainable and humane animal welfare, with goals to:



1. Waiving registration fees for pet owners who neuter their pets promotes responsible pet ownership and aligns with population control goals.
2. Eliminate rabies through mass vaccinations and sterilisation by aligning with the National Action Plan for Rabies Elimination (NAPRE) 2030.
3. Expand operational coverage to underserved regions, ensuring no stray dog is left unattended.
4. Set new benchmarks for transparency, community collaboration, and environmental responsibility in animal welfare practices.
5. A standardised BoT model based on AWBI guidelines, will drive wider adoption, greater outreach, and enhanced impact through consistent practices and scalable operations.
6. Serve as a model for other organisations, promoting scalable and replicable practices nationwide.

With its robust strategic framework and unwavering commitment to humane practices, CCC continues to lead the way in stray dog welfare, ensuring a compassionate coexistence between communities and animals.

CHAPTER 7
ASSESSMENT OF KEY IMPACT

This chapter compiles and analyses data from multiple sources to evaluate the program's overall effectiveness and influence. It integrates various qualitative insights derived from comprehensive stakeholder engagements. The program's impact was evaluated based on its operational efficiency, community involvement, technological integration, and compliance with animal welfare regulations and standards. The chapter provides a comprehensive assessment of the program's success in meeting its objectives and fostering long-term sustainability, utilising diverse perspectives.

OPERATIONAL EFFICIENCY

The CCC humane stray dog management program has demonstrated remarkable operational efficiency through a combination of robust protocols, expanded outreach, and strategic planning.

DOG CATCHING AND NEUTERING PROCEDURE

PRE-CATCHING PROTOCOL

- Identify target areas for dog-catching using a grid-based mapping system.
- Coordinate with local feeders and volunteers to ensure community awareness and support.
- Prepare dog-catching sheets to document details such as location, date, and number of dogs targeted.

DOG-CATCHING PROCESS

- Deploy trained catchers who are paid on a per-dog basis to optimize efficiency.
- Use humane methods to catch dogs, ensuring minimal stress or harm.
- Assign a unique Tag ID to each dog immediately after catching.
- Record the following details on the dog-catching sheet:

1. Location coordinates
2. Physical description of the dog
3. Tag ID

- Community volunteers accompany the dog catchers to ensure the process is smooth and humane.
- It is critical to release the dog at the exact location where it was picked up, as per documented details. Releasing at the same spot is vital for:
  - **Territorial Familiarity:** Dogs are accustomed to specific areas, minimizing stress.
  - **Avoiding Conflict:** Prevents territorial fights with other dogs in new areas.
  - **Community Trust:** Maintains relationships with feeders and local residents.
  - **Behavioural Balance:** Prevents new unsterilized dogs from occupying the vacated space.
  - **Legal and Ethical Compliance:** Aligns with Indian laws and humane practices.

TRANSPORTATION TO CCC CENTRES

- Transport the dogs to AWBI-compliant CCC centres or municipal pounds for further processing.
- Maintain proper documentation during transportation to ensure no discrepancies in the handover.

PRE-SURGERY PROTOCOL

- Conduct a preliminary health check to assess the dog's suitability for surgery.
- Administer pre-surgery medications and prepare medical records.
- Dogs that are ill or wounded are prioritized for treatment before surgery. The stay is extended beyond the minimum five days if needed.

NEUTERING PROCEDURE

- Schedule surgeries based on the dog's health and medical assessments.
- Perform surgeries under stringent hygiene and operational protocols:
  - Male dogs: Average surgery time is 15 minutes.
  - Female dogs: Average surgery time is 30 minutes.
- Administer anti-rabies and 9-in-1 vaccines post-surgery as per AWBI guidelines.
- Document surgical details in the Surgery Register, including photographs of the procedures.
- Removed organs are photo-documented before being destroyed, ensuring accountability and transparency.
- While under general anaesthesia, the dog's ears are notched for future identification.

POST-SURGERY CARE

- Provide post-surgery care, including:
  - Feeding schedules: Morning, afternoon, and evening.
  - Monitoring recovery and administering medications.
- Minimum stay for recovery:
  - 5 days for healthy dogs.
  - 10-15 if the sutures are not healed fully or if the dog has any other post-operative complications.

RELEASE PROTOCOL

- Release dogs back to their original locations as documented on the dog-catching sheet.
- Capture, release videos and photographs for accountability.
- After recovery, the dogs are returned to their original location by CCC vans. In cases where a single stray dog was admitted by a volunteer, the volunteer is responsible for picking up the dog on the fifth day after admission. Each dog is provided with a certificate containing details of the surgery date along with vaccination stickers for the anti-rabies and 9-in-1 vaccines.

CANINE CONTROL & CARE

CERTIFICATE

Certificate No.: 53588

This is to certify that the dog/cat belonging to

28 Asmita lot-1 24/1401

From area Khadki

Name

Sex F Age Adult

Colour and markings White Breed ND

Has been neutered on 11-12-24 at Hoth

and vaccinated against rabies by

Batch Num

For Canine Control and Care

Dr. Vishal H. Rathod

Vet. Physician & Surgeon

Reg. No.: MSVC-7635

W: www.caninecontrolandcare.org | E: caninecontrolandcare@gmail.com

BIO-WASTE MANAGEMENT

- Follow paper and digital protocols for bio-waste segregation.
- Surgical waste and removed organs are handled by Passco Environmental Solutions Pvt. Ltd. (PESPL), one of India's leading Environmental and Waste Management Organizations, ensuring safe and compliant disposal.

One of the key indicators of the project is the high sterilisation success rate, achieved with less than a 2% complication rate. This success is attributed to rigorous pre-surgery evaluations, where factors like the animal's health history, heart rate, and overall fitness are carefully considered. Post-operative care includes close monitoring for five days to ensure complete recovery before release.

The program has also significantly expanded its geographic coverage, reaching to key zones like Mundhwa, Keshavnagar, and Kalyani Nagar, which were previously underserved, are now benefiting from these operations. This expansion has been possible due to the dedication of skilled dog catchers, veterinary teams, and passionate volunteers.

FGD EXCERPT (VETERINARY DOCTORS)

According to Dr. Trishul Mhaske, At CCC, we follow stringent protocols that prioritise the health and safety of the dogs. Every aspect of the procedure, from pre-surgery assessments to post-operative care, is meticulously monitored to ensure the best outcomes. "Our grid-based mapping system ensures systematic tracking of stray dogs, which not only reduces redundancy but also helps us reach every corner of the targeted areas efficiently," shared a team member.

The systematic and humane approach of the program has not only enhanced its operational efficiency but also established a benchmark in stray dog management practices.

INFRASTRUCTURE AND CAPACITY BUILDING

All CCC-operated centres adhere strictly to the standards set by the Animal Welfare Board of India (AWBI), ensuring that stray dogs receive care in hygienic, humane, and well-maintained facilities.

Recognising the gaps in municipal infrastructure, CCC took proactive steps to improve municipal pounds in the areas it serves. While many municipal facilities initially fell short of AWBI standards, CCC utilised its own resources to upgrade these spaces, creating environments that better support the humane treatment and care of stray dogs.

By prioritising infrastructure development and capacity building, CCC has created a solid foundation for sustainable and humane stray dog management.

At CCC, we are proud to go beyond basic compliance, said Dr. Trishul Mhaske, "Our centres are equipped not only to meet AWBI standards but to set an example for best practices in animal welfare.

The addition of new kennels has been a game changer, shared a CCC volunteer. "Each dog has a designated space for recovery, which not only ensures their safety but also allows us to monitor them closely. This level of care would not have been possible without the expanded facilities."

The following table outlines the number of surgeries conducted in various time frames, starting from September 2020 to August 2022. The data shows a steady increase in surgeries, with the highest number (3,170) recorded between September 2021 and January 2022. Over the entire period, a total of 16,725 surgeries were performed.

Sr. No.	Duration	Surgeries undertaken
1	September 2020 to December 2020	1830
2	1 to 15th Jan, 2021	461
3	16th Jan to 31st March 2021	2161
4	1st April to 31st August, 2021	2698
5	1st Sept. 2021 to 31st January 2022	3170
6	1st February 2022 to 10th March 2022	1371
7	11th March 2022 to 31st May 2022	2557
8	1st June 2022 to 31st August 2022	2477
9	Total	16,725

Details of phase wise surgeries undertaken
Source: CCC Report

"Akshay Jagdale (Co-ordinator Dog Catching) shared, "When I started this work, I was young and passionate about helping animals, but working with CCC has taught me a more systematic approach to animal welfare. Over the last five years, I have witnessed significant change. When I joined CCC, there was a large stray dog population in the PMC area, but now it's rare to find an unneutered dog within a 2 km radius of the areas we worked on. I'm proud to be part of such a dedicated team that works with so much care, and this experience continues to motivate me to contribute to this cause in the future."

INTERVIEW WITH DOG CATCHING CORDINATORS

COMPLIANCE WITH ANIMAL WELFARE LAWS

The program's commitment to adhering to animal welfare laws is a core aspect of its operations. It rigorously followed the Animal Birth Control (Dogs) Rules, 2023, ensuring full compliance with India's legal and ethical standards for the treatment and welfare of animals. These regulations stipulate strict guidelines for the management of stray dog populations, including sterilisation procedures, veterinary care, and the release of dogs' post-surgery. The program took these laws into account at every stage of its implementation, ensuring that its activities were both legally sound and ethically responsible.

One of the key aspects of compliance was the release of dogs at their original locations after undergoing surgery. This is a crucial requirement under the Animal Birth Control (Dogs) Rules, which stipulate that dogs must be returned to their familiar environment post-sterilisation to maintain the ecological balance and avoid disrupting local ecosystems. By adhering to this protocol, the program ensured that the sterilisation efforts would not lead to unintended consequences, such as the displacement of dogs or the imbalance of local animal populations.

> "I have been working in this sector for over 20 years and have conducted countless surgeries, but CCC's protocols are the most stringent I have encountered. Here, we must be exceptionally careful, ensuring every procedure is performed to the highest standards. Based on my experience, no other program follows such meticulous protocols, which is what sets CCC apart as a leader in humane stray dog population management."
>
> **- Dr. Vijay Suryavanshi**

TREATMENT STATUS BOARD WITH ICON

Dr, Vijay Suryavanshi emphasised, "Managing the stray dog population in a humane and organised way has led to a significant improvement in both the overall health of the dogs and the safety of the community." He further highlighted the importance of the recovery process, stating, "It ensures that the dogs are not only physically healed but also emotionally stable before being released back to their territories. Our goal is always to provide the best possible care, and the five-day recovery period is crucial to achieving this.

EMPOWERED LOCAL COMMUNITIES

By encouraging active participation and fostering a deep sense of responsibility toward the welfare of stray dogs, the program successfully **empowered local communities.** One of the program's key strategies was to engage **community volunteers** who played an essential role in the day-to-day operations. By involving local residents, the program created a sense of **ownership** and **commitment** to the welfare of stray dogs, transforming them from passive observers into active stakeholders. These volunteers helped with tasks such as identifying stray dogs, assisting with their capture, and participating in awareness campaigns, ensuring that the initiative was driven by the community it aimed to serve.

Volunteering with CCC has been both a fulfilling and transformative experience. From reporting strays to helping with post-neutering care, I've seen firsthand how impactful this program is in controlling the stray population humanely. The community's growing support shows how far we've come in raising awareness, and I'm proud to continue working with such a dedicated team. Every little effort count, and it's amazing to see the positive changes happening in our neighbourhood. I would also like to extend my heartfelt thanks to Bajaj Auto, whose generous support has made it possible for us to carry out this important work.

-Anchal Mundkur (Volunteer, Hinjewadi)

Overall, the program's approach to community involvement not only strengthened local engagement but also enhanced the effectiveness of stray dog management through improved reporting, tracking, and a shared sense of purpose.

PUBLIC HEALTH AND SAFETY

The program made significant strides in public health and safety, particularly through its focus on rabies control. One of the most impactful measures was the administration of anti-rabies vaccines to dogs immediately post-surgery. This practice played a critical role in reducing the risk of rabies transmission to both humans and animals in the region. By vaccinating the dogs as part of the sterilisation process, the program effectively broke the cycle of rabies transmission, providing a safer environment for local residents.

"Vaccination is essential alongside neutering programs," stated Dr. Trishul Mhaske. "Vaccines, particularly anti-rabies vaccines, help prevent rabies and foster herd immunity within the stray dog population, offering protection against this disease. Rabies is a highly dangerous and contagious illness that can be transmitted to humans, presenting a significant public health threat. Administering these vaccines is crucial for safeguarding both animals and humans from such lethal diseases, making it a vital component of our program."

Alongside the medical interventions, the program also focused on improving public awareness about stray dog management and rabies prevention. Through educational campaigns and community outreach, local residents were informed about the importance of vaccination, responsible pet ownership, and the benefits of sterilisation in controlling the stray dog population. These initiatives helped to shift attitudes and foster a sense of collective responsibility for both animal welfare and public health.

ENVIRONMENTAL COMPLIANCE

The program made significant strides in **environmental compliance,** particularly through its commitment to **bio-waste management.** Ensuring the safe and **environmentally compliant disposal** of surgical waste, including removed organs, was a critical aspect of the initiative. To meet this requirement, the program partnered with organisations like PASSCO**,** which specialises in the proper disposal of medical and biohazardous waste. This collaboration ensured that all surgical by-products were disposed of in a manner that adhered to environmental standards, reducing the risk of contamination and harmful effects on both public health and the surrounding ecosystem.

Through **bio-waste management** and environmentally conscious disposal practices, the program not only met **regulatory compliance** but also demonstrated a commitment to protecting the environment while providing critical services to the community.

Volunteering with the CCC program has been an enriching experience. I’ve seen firsthand how effective and humane the dog catching and neutering process is. It feels great to contribute to making our community safer for both humans and animals. The joy of seeing healthy, happy dogs in the neighbourhood is a reward in itself. I’m proud to be part of such a dedicated team that works with love and care to solve the stray dog issue. A special thanks to **Bajaj Auto** for their invaluable support, which has made this work possible.

- Digvijay Shinde (Volunteer, Sinhgad Road)

SUSTAINABILITY

COMMUNITY ENGAGEMENT AND OWNERSHIP

By actively involving local communities, including volunteers and community feeders, in the project's implementation, the program fosters a sense of ownership and responsibility. The community involvement not only strengthens the project's ongoing success but also ensures that stray dog management continues to be a collective effort even after the program concludes.

PARTNERSHIPS FOR LONG-TERM SUPPORT

Collaborations with local governments, animal welfare organisations, and other stakeholders help secure long-term funding and resources for continued stray dog management. These partnerships ensure that the program's objectives are maintained, and the infrastructure built (such as sterilisation centres and municipal pounds) can be sustained over time.

SCALABLE MODEL

The project's operational framework is designed to be scalable and replicable, allowing other regions to adopt similar strategies for stray dog management. This ensures that the successful model can be extended to other areas, increasing its impact and contributing to the long-term improvement of stray dog welfare on a broader scale.

KEY CHALLENGES AND BARRIERS

STAFF ATTRITION AND RETENTION

Many staff members had to leave to return to their villages, resulting in the need for frequent recruitment and retraining. Additionally, private veterinary clinics have been poaching skilled veterinary staff, exacerbating the problem of retaining experienced professionals.

RESOURCE CONSTRAINTS IN EXPANDING LOCATIONS

Although new pounds were added through partnerships with the Pune Municipal Corporation (PMC) and Pimpri-Chinchwad Municipal Corporation (PCMC), there were significant gaps in infrastructure. For instance, essential repairs and washroom facilities are limited to a few centres.

OPERATIONAL DELAYS DUE TO WEATHER CONDITIONS

The incessant rains during certain months caused delays in wound healing for the sterilised dogs, requiring extended post-operative care. The wet weather also made it challenging to locate and capture stray dogs, thereby slowing down the pace of operations.

COMPLIANCE WITH AWBI REGULATIONS

The new AWBI (Animal Welfare Board of India) rules, which require re-registration, added an additional layer of administrative work and compliance. The process of re-registration is ongoing and presents potential delays in ensuring full compliance.

CHAPTER 8
PROGRAM LIMITATIONS

LIMITED CAPACITY FOR POST-OPERATIVE CARE

The current protocol of keeping sterilised dogs for 5 days for post-operative care can become a limitation during peak seasons or when there is a large influx of dogs. The need for more facilities and resources for post-operative care is critical to maintaining the well-being of the dogs.

LACK OF SKILLED LABOUR

Despite efforts to hire unskilled labour and train them, there is still a shortage of workers who can meet the program's strict standards. This gap in the workforce impacts the overall efficiency of dog-catching, sterilisation, and vaccination operations.

SUSTAINABILITY CHALLENGES

The long-term sustainability of the program relies heavily on continued funding, regulatory compliance, and the successful integration of local communities into the management of stray dogs' populations. Without sustained investment in training, infrastructure, and stakeholder engagement, the program's impact may be limited in the future.

DOG CATCHER VAN

09. SWOT ANALYSIS

STRENGTH

- **Comprehensive Coverage:** The program covers a large geographic area of Pune city, including various regions such as Hadapsar, Lohegaon, Kalyani Nagar, and more, as well as expanding into the Cantonment areas of Camp and Khadki. This extensive reach ensures that a significant portion of the stray dog population benefits from sterilisation and vaccination services.
- **Partnership with Reputable Organisation:** Collaborations with well-known organisations like The Blue Cross have been instrumental in scaling up the program, offering access to expertise, resources, and an established infrastructure.
- **Structured Process:** The sterilisation and vaccination procedures are well-established and include all necessary steps—general anaesthesia, ear notching, post-operative care, flea and tick treatment, and rabies vaccination—ensuring a comprehensive and humane approach.
- **Volunteer and Community Involvement:** The integration of volunteers in the program, including support in monitoring and reporting, has allowed for enhanced community engagement and increased the workforce capacity.

WEAKNESSES

- **Staff Attrition and Recruitment:** High staff turnover, especially among veterinary surgeons and dog catchers, is a major challenge. The program struggles to retain skilled workers due to competition from private clinics and the arduous training protocols that are part of the program's stringent standards.
- **Limited Infrastructure:** Lacks essential facilities, at some centres, including washrooms and adequate operational space. These limitations prevent the program from operating at full capacity and hinder the efficiency of the operations.
- **Weather-Related Delays:** Inclement weather, particularly during the monsoon season, can slow down the process of finding stray dogs and delay the post-operative recovery of sterilised dogs. These weather-related setbacks affect the program's overall productivity and timelines.

OPPORTUNITIES

- **Expansion to New Regions:** There is significant potential for the program to expand into more areas within Pune and beyond, such as rural regions and other nearby cities. Partnerships with local governments and NGOs could facilitate this expansion.
- **Sustainability and Funding:** Securing long-term funding from various sources, such as governmental bodies, private donors, and corporate sponsors, [RP1] can ensure the sustainability of the program and allow it to scale further. Additionally, grants for animal welfare and sustainable practices could help fund infrastructure improvements.
- **Use of Technology for Monitoring and Tracking:** Implementing advanced technologies for data collection and monitoring can improve operational efficiency. The use of Management Information Systems (MIS) can streamline the tracking of sterilisation and vaccination operations, improving reporting accuracy and decision-making.

THREATS

- **Regulatory and Compliance Challenges:** The evolving regulatory landscape, particularly changes in AWBI (Animal Welfare Board of India) rules, presents a challenge for the program. Staying compliant with new rules could incur additional administrative costs and delays.
- **Political and Bureaucratic Hurdles:** Ongoing challenges in coordinating with local authorities, such as the PMC and PCMC, may delay approvals, facility upgrades, and the signing of agreements. Political instability or bureaucratic inefficiencies could further complicate efforts to expand or streamline operations.

CHAPTER 10
RECOMMENDATIONS

FOR CCC

STRENGTHEN COMMUNITY ENGAGEMENT

Actively collaborate and run regular awareness campaigns, emphasising the importance of sterilisation and vaccination of stray dogs. This could foster a deeper sense of responsibility and cooperation within the community.

ENHANCE DATA-DRIVEN DECISION-MAKING

Leverage GIS mapping technologies to identify and target high-priority zones for sterilisation and vaccination, enabling efficient allocation of resources and better results.

FOCUS ON LONG-TERM SUSTAINABILITY

Focus on diversifying funding models to diversify and stabilise funding sources.

FOR BAJAJ AUTO LTD.

SUSTAIN AND SCALE SUPPORT

Continue championing this impactful initiative by ensuring steady funding and exploring the feasibility of replicating the project in other cities or regions, thereby amplifying its positive impact.

CORPORATE COMMUNICATION AND BRANDING

Strategically showcase the project's success and Bajaj Auto's pivotal role in it through CSR reports, internal newsletters, and external marketing channels, reinforcing the brand's commitment to community welfare.

ENCOURAGE EMPLOYEE VOLUNTEERING

Actively involve employees in community-focused events, strengthening their connection to the project while bridging gaps between corporate and societal perspectives.

CHAPTER 11
CONCLUSION

The ‘Sterilisation and Vaccination of Stray Dogs’ in Pune project, implemented by Canine Control and Care (CCC) with support from Bajaj Auto Ltd., exemplifies a humane and sustainable approach to addressing the challenges posed by stray dog populations. Rooted in the principles of humane treatment and community engagement, the initiative bridges gaps left unaddressed by conventional methods, ensuring the welfare of both animals and the community.

Key findings from the impact assessment highlight the program’s success in sterilising and vaccinating a significant number of stray dogs, leading to a noticeable reduction in the stray dog population in targeted areas. Community awareness and participation have increased, with residents actively reporting strays for intervention. The focus on recovery care has improved both the physical and emotional health of treated dogs, fostering safer coexistence. Challenges such as scalability and consistent funding remain, but the project’s data-driven approach and community feedback mechanisms have laid a solid foundation for continuous improvement.

Looking ahead, the project holds immense potential for expansion, leveraging partnerships with local governments, and advanced technology to scale operations. This initiative not only sets a benchmark for stray dog management in Pune but also serves as a replicable model for humane urban animal care across India.

IMPACT ASSESSMENT REPORT

BAJAJ WATER CONSERVATION PROJECT

Implementing partner – Development Support Centre (DSC)\

Release Date: 31-12-2024

SoulAce
Path to Sustainability
SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

BWCP	Bajaj Water Conservation Project
CNB	Cement Nala bunds
CSR	Corporate Social Responsibility
DSC	Development Support Centre
ENB	Earthen Nala Bunds
NGO	Non-Governmental Organization
NRLM	National Rural Livelihoods Mission
PMKSY	Pradhan Mantri Krishi Sinchai Yojana
SDGs	Sustainable Development Goals
SHG	Self-help Group
VDC	Village Development Committee
WUGs	Water User Groups

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The Bajaj Water Conservation Project, implemented by the Development Support Centre (DSC) has significantly improved water resource management across 15 villages in Gangapur and Aurangabad Talukas of Aurangabad district, Maharashtra. Designed to address the challenges faced by agricultural communities, the project focused on constructing water conservation structures, enhancing community institutions like Self-Help Groups (SHGs) and Water User Associations, and promoting sustainable farming practices. Through training programs, farmers adopted sustainable techniques that improved soil health and boosted crop productivity. This led to enhanced agricultural yields, increased household incomes, and better food security. Additionally, the initiative reduced dependence on external water sources, promoting sustainable development and significantly improving the quality of life for participating communities.

PROJECT DETAILS

Implementation year

FY 2017 - FY 2022

Assessment year

FY 2024 - FY 2025

Implementing Partner

Development Support Centre

Project location

Aurangabad District, Maharashtra

Beneficiaries

16,335 from 15 villages from Gangapur and Aurangabad Taluka

Budget

₹1,357.19 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

The project has the following key components:

- Deepening and widening drainage channels to improve water flow and enhance drainage capacity within the community.
- Construction of new check dams to capture and store rainwater to increase water availability for irrigation and household use.
- Repairing existing water infrastructure to ensure the functionality and sustainability of water resources.
- Conducting training sessions for community members on sustainable water management practices and the maintenance of water resource structure.
- Developing orchards and kitchen gardens to boost agricultural productivity and enhance food security for local households.

Key Findings

50.2%

of the respondents were in the age group of 41-50 years, followed by 26.2% in the 31–40-year range. Additionally, 16.7% of respondents belonged to the 51–60-year age group.

31.6%

of the respondents have completed education till class 10th, followed by 26.2% who have finished the 8th class and 24.0% who completed the 12th standard.

42.6%

of the respondents own 1 to 2 hectares of land, while 32.7% possess 2 to 3 hectares. Additionally, 8.7% own 3 to 4 hectares and 7.2% have less than 1 hectare of land.

49.4%

of the respondents reported an annual family income between Rs. 21.1 lakh to 2 lakhs, followed by 27.4% with an income range of Rs.2.1 lakh to 3 lakhs. Additionally, around 9.1% of the respondents have an annual family income of less than Rs. 1 lakh.

88.6%

of the respondents reported cultivating cotton, 54.4% grow maize. Additionally, 19.8% cultivate toor pulse and 15% soybean.

Key Impact

The intervention improved the resilience of Kharif crops during dry spells, with 89.7% of the respondents indicating their crops could withstand drought for an additional 15 to 20 days, while 6.5% noted moderate improvements of 10 to 14 days.

After the intervention, fewer than 1% of the respondents experienced water scarcity for only one month, compared to 30.4% who faced over six months before, demonstrating enhanced irrigation resource availability.

The intervention reduced spending on water tankers, with non-reliance rising from 57.4% to 96.2%, demonstrating its effectiveness in cutting dependency and saving costs.

The intervention resulted in more than half (58.2%) of the respondents reporting an additional 0.250 to 0.500 hectares of cultivable land, with 28.5% gaining between 0.501 and 0.750 hectares, thereby increasing agricultural potential.

43.0%

of the respondents noted over a 20.0% increase in Kharif crop yields, and 27.4% reported a rise of 15-19%. Similarly, 57% experienced a 15-19% increase in Rabi crop yields, highlighting the intervention's positive effect on agriculture productivity.

Before the intervention, only 2.5% of the respondents cultivated two crops per year. Afterwards, this increased to 62.4%, reflecting a significant rise in crop intensity, improved agricultural productivity, and enhanced food security.

The intervention led to 42.2% of the respondents reported a 20-25% increase in annual agricultural income, while 21.7% experienced a rise of 15-20%, improving the economic status of the farming community.

Improved earnings and increased agricultural productivity have alleviated family stress, contributing to overall well-being.

The intervention has enhanced access to water for domestic use.

Increased agricultural productivity and improved water management practices have bolstered the local economy, creating opportunities for job growth and stimulating income-generating activities within the community.

Improved food security by cultivating two crops per year has reduced family stress and contributed to overall well-being.

03. OECD FRAMEWORK

RELEVANCE

The intervention led by the Development Support Centre (DSC) is highly relevant in addressing the critical challenges faced by the people in Gangapur and Aurangabad talukas in Maharashtra, particularly in terms of water scarcity and low agricultural productivity. The construction of water conservation structures and the promotion of sustainable farming practices directly enhance water availability for both irrigation and household needs, which are essential for improving agricultural output and ensuring water security in the region. Additionally, the initiative strengthens local community institutions such as Water User Groups (WUG) and Village Development Committees (VDCs), fostering greater community cohesion and empowering villagers to collectively manage their water resources.

COHERENCE

The intervention is well aligned with SDG goals:

The intervention also aligns with the Jal Jeevan Mission, Pradhan Mantri Krishi Sinchai Yojana (PMKSY) and the National Rural Livelihoods Mission (NRLM).

EFFECTIVENESS

Farmers, the primary beneficiaries of the intervention have experienced significant benefits, including improved agricultural productivity and enhanced soil health. These advancements are largely attributed to training in sustainable practices and the effective use of organic inputs. The program's effectiveness is evident in positive outcomes such as increased crop yields, better water management, and an increase in income through agriculture. By adopting organic farming techniques, farmers have cultivated healthier crops while reducing their dependence on chemical fertilisers and pesticides.

EFFICIENCY

The project has efficiently supported farmers from economically marginalized backgrounds in adopting sustainable agricultural practices. Resources have been utilised well, leading to significant improvements in crop yields and water management.

IMPACT

The intervention by the Development Support Centre (DSC), in collaboration with the Bajaj Water Conservation Project, has brought both immediate and long-term benefits to the farming community in Gangapur and Aurangabad talukas in Maharashtra. Farmers who participated in the training on sustainable agricultural practices have seen significant improvements in crop quality and yields, particularly with the adoption of climate-resilient techniques. Access to water resources has been greatly enhanced through the construction of water conservation structures like gabion check dams and cement nala bunds, coupled with the formation of Water User Groups (WUGs). These efforts have significantly increased water availability for irrigation, enabling farmers to grow more crops and reduce dependence on unreliable water sources. As a result, agricultural productivity has improved, directly boosting individual incomes and livelihoods.

SUSTAINABILITY

The intervention has laid a solid foundation for long-term sustainability by encouraging farmers to exchange knowledge and experiences, creating a community of continuous learning and mutual support. Through the establishment of Water User Groups (WUGs) and the empowerment of Self-Help Groups (SHGs), the program has instilled a sense of ownership and responsibility among local stakeholders. This active engagement ensures that farmers and community members remain involved in maintaining sustainable agricultural practices. As a result, the farming community is equipped to adapt to environmental challenges, leading to lasting benefits such as improved agricultural productivity, water management, and enhanced resilience for future generations.

CHAPTER 4
INTRODUCTION

Interaction with WUG Member at Nala Deepening Site

NEED OF THE PROGRAM

Aurangabad district in Maharashtra faces persistent challenges of water scarcity, soil erosion, and inadequate irrigation, which are compounded by erratic rainfall and limited rural infrastructure. Tehsils such as Gangapur, Vaijapur, and Paithan are among the most affected, with agricultural productivity and household livelihoods severely impacted. The situation is further exacerbated by groundwater depletion, undulated lands, and minimal access to government extension services. With the majority of the population dependent on agriculture, these issues pose a significant threat to food security and economic resilience. In these areas, only a small fraction of villages has sustainable irrigation sources, and most rely on tanker water supplies during drought periods. The lack of water affects not only Kharif and Rabi crop cultivation but also the availability of drinking water for households. Vulnerable groups, including the elderly, women, and marginalised communities, are disproportionately affected, struggling to secure livelihoods amid worsening environmental conditions and exploitative markets.

Despite years of rainfall, the absence of effective water conservation and groundwater recharge mechanisms continues to leave the region in a state of perpetual water stress.

To address these challenges, Development Support Centre (DSC), in collaboration with Jankidevi Bajaj Gram Vikas Sansthan (JBGVS) and government line departments, implemented the Bajaj Water Conservation Project across 15 villages in the Gangapur and Aurangabad tehsils. The project focuses on scaling up existing interventions in natural resource management, including water conservation, soil preservation, and sustainable irrigation practices. The goal is to build local capacity, strengthen community-based organisations like Self-Help Groups (SHGs) and Village Development Committees (VDCs), and promote self-reliance in managing water resources. Through these efforts, the project aims to ensure long-term benefits for the communities, enhancing agricultural productivity, improving water availability, and supporting sustainable livelihoods.

OBJECTIVES OF THE PROGRAM

Increase access to water for both drinking and agriculture by developing and restoring water conservation structures and improving on-farm irrigation methods.

To promote sustainable farming practices that boost crop yields, improve soil moisture retention, and help farmers adopt climate-resilient methods, enabling them to grow multiple crops per year and enhance their livelihoods.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – DEVELOPMENT SUPPORT CENTRE (DSC)

The Development Support Centre (DSC) is a non-profit organisation focused on improving the quality of life in rural India through sustainable development initiatives. They works in areas such as water and land management, livelihood enhancement, and community empowerment. Its projects aim to strengthen local governance, improve agricultural practices, and promote environmental sustainability. DSC emphasises capacity building and participatory decision-making, helping communities become self-reliant in managing natural resources, thereby improving economic resilience and ensuring long-term development for marginalised populations.

KEY ACTIVITIES

The program intervention is designed to promote water conservation and advance agricultural practices within the community. Central to this initiative is the development and enhancement of water resources, which includes activities like deepening and widening drainage channels, constructing new check dams, and repairing existing water infrastructure. To boost agricultural productivity, the program emphasises the adoption of techniques such as Amrit Jal, orchard development, and kitchen gardening, supported by targeted training and promotion efforts. Community mobilisation and capacity building form a vital part of the intervention, with training sessions and awareness campaigns equipping key stakeholders—including village development committees, jalmitra members, and gram panchayat members—with the skills and knowledge needed for sustainable water and agricultural management.

The initiative emphasises community involvement, encouraging local stakeholders to take ownership of the project, which will be facilitated through the construction of new check dams and the formation of water user groups (WUGs) in the villages. The project focused on water conservation and drainage line treatment using a participatory approach that emphasised community mobilisation. Key community institutions, including water user groups, self-help groups, and a village development committee, were formed to support and sustain the project's initiatives at the village level.

The intervention focuses on enhancing both farm and non-farm livelihoods in local communities. It provides training to help farmers shift from traditional rainfed crops to high-value cash crops like the cultivation of fruit-bearing trees such as mango, Taiwan Peru, sweet lemon, custard apple, tamarind, and Pomegranate to diversify income and improve food security. Additionally, the project supports livelihood opportunities by promoting kitchen gardens and strengthening self-help groups (SHGs) to encourage entrepreneurship and alternative income sources.

Capacity building is a vital part of the program, achieved through training sessions that equip community members—such as farmers, SHG members, and local leaders—with the skills necessary to manage and sustain the new water infrastructure effectively. Additionally, the program focuses on promoting and strengthening self-help groups (SHGs), particularly empowering women by providing training in group building, management, and kitchen gardening.

To further boost agricultural productivity, training sessions on bio-pesticide and bio-fertiliser techniques, specifically through Amrut Jal and vermicomposting, were provided. Amrut Jal, a natural bio-fertiliser, is made by combining cow dung, cow urine, and black jaggery and allowing it to ferment for three days with regular stirring. This organic approach supports healthier soil and plants, reducing reliance on chemical inputs and enhancing sustainable farming practices.

INTERACTION WITH GP MEMBER FATIYABAD

NALA DEEPENING

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited had appointed SoulAce to assess the impact of Bajaj Water Conservation Project implemented by the Development Support Centre.

OBJECTIVES OF THE STUDY

The primary objectives of the study were to:

To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.

To measure the extent to which the program has contributed to the well-being of the community.

To provide insights into the strengths and areas for improvement of the program implementation.

DEFINITION OF THE RESEARCH

Research can be described as a logical and systematic search for new and useful information on a particular subject. Social science research refers to the systematic activity of gaining new understanding by following scientific principles and methods to minimise bias and subjectivity. It is contrary to writing something based on assumptions or speculations. Though information on certain facts can also be gained through common sense and based on general observation and hearsay, those facts will not be considered valid until they have been obtained in a methodical manner, which can stand the test of time. The defining characteristics of scientific research are objectivity, ethical neutrality, reliability, testability and transparency. The identification of the research problem provides the starting point of research, which is then defined and redefined through a proper review of the literature on the problem or deliberations with research experts and knowledgeable others in the subject matter of interest. Each research problem has a multitude of perspectives and dimensions, and research cannot cover all of those in a single study.

USE OF MIXED METHODOLOGY FOR MAXIMUM INSIGHTS

This evaluation utilised a mixed-methods approach, incorporating both qualitative and quantitative research methods.

APPLICATION OF QUANTITATIVE TECHNIQUES

In quantitative research, standardised instruments such as questionnaires and interview schedules are employed to collect data. Though the information that is obtained is easily amenable to various statistical measures and tests. The quantitative methods facilitated the collection and analysis of numerical data, yielding statistical insights and identifying trends.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative research can only unravel enriched and hidden information that may not be evident on the face of it. The qualitative approach is distinguished by deeper probing and flexibility, and it can yield massive amounts of data that were not anticipated when the research was initiated. The qualitative component delved into subjective experiences and perspectives, providing a nuanced understanding of participant views.

PROJECT EVALUATION FRAMEWORK

After the collection of relevant information and perceptions through interviews, the OECD framework was followed/applied, which has six evaluation criteria - relevance, coherence, efficiency, effectiveness, impact, and sustainability for each of the indicators.

The study's research design was descriptive, aiming to present a detailed analysis and exploration of the various facets of the Bajaj-supported program.

Descriptive research is apt for creating an overview, discerning patterns, and grasping the current state of affairs. By integrating both qualitative and quantitative research methodologies within a descriptive framework, the study aimed to deliver a thorough evaluation of the program, elucidating its impact and suggesting avenues for enhancement. This methodological blend ensured a holistic examination of the subject, lending both depth and breadth to the findings and bolstering the study's credibility.

ENSURING TRIANGULATION

To enhance the reliability and validity of its findings, the study implemented various triangulation techniques. Data triangulation was achieved through gathering information from diverse sources, including field notes, interviews with beneficiaries, interactions with community members, and feedback from project volunteers. This extensive data collection facilitated a comprehensive evaluation of the program's impact. Methodological triangulation was also employed, utilising a variety of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases. Through these triangulation strategies, the study ensured a robust and dependable analysis, reinforcing the trustworthiness of its findings.

KEY STAKEHOLDERS

- Village Development Committee members
- Community members

STUDY TOOLS

Questionnaires for primary beneficiaries:
Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys.

Questionnaires for secondary beneficiaries and stakeholders :
A semi-structured questionnaire was developed for each type of sample of this group. Stakeholders were identified across the focus areas. One-on-one discussions were conducted with beneficiaries to prepare case studies.

RESEARCH DESIGN

Name of the project
Bajaj Water Conservation Project (BWCP)

Implementing agency
Development Support Centre

Research design used
Descriptive

Sampling technique
Random stratified sampling

Sample size
263 villagers

Qualitative method used
Semi-structured interviews, testimonials, and focus group discussions with key stakeholders.

ENSURING COMMITMENT TO RESEARCH ETHICS

The impact evaluation adhered to a strong ethical framework, ensuring responsible and ethical research practices. Participants' rights and well-being were prioritised at every stage of the study. Informed consent was obtained by clearly explaining the study's objectives, procedures, potential risks, and benefits, allowing participants to make fully informed decisions after addressing any questions. Confidentiality was strictly maintained, with data securely stored, accessible only to authorised personnel, and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of coercion, ensuring autonomy and respect for individual choice. Participants were consistently treated with respect, dignity, and fairness, prioritising their well-being. Support or assistance was readily available whenever needed to ensure their comfort and safety throughout the research process.

CHAPTER 6
KEY STUDY FINDINGS AND IMPACTS

The chapter explores the findings and impacts of water resource development and capacity-building activities in the community of fifteen villages of Gangapur and Aurangabad talukas, Aurangabad district.

GEOGRAPHICAL COVERAGE

The program was implemented in fifteen villages in Gangapur and Aurangabad Talukas, Aurangabad district in Maharashtra.

OUTREACH AND INCLUSIVITY

Primary beneficiaries were communities from the selected villages.

DEMOGRAPHY OF BENEFICIARY POPULATION

CHART 1: AGE GROUP DISTRIBUTION

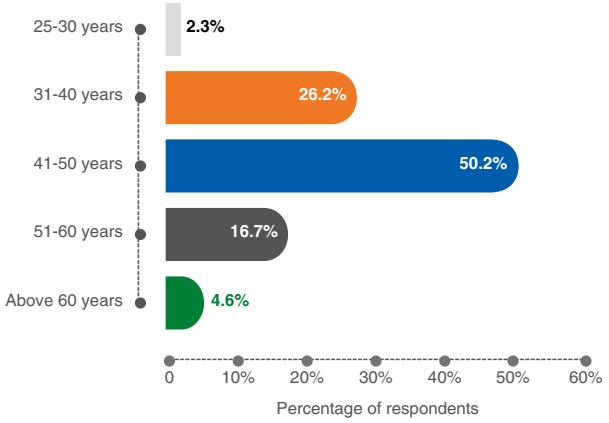


Chart 1 shows that half (50.2%) of the respondents belonged to the age group of 41-50 years, while 26.2% of them were between 31-40 years. 4.6% of them were senior citizens above 60 years of age.

CHART 2: GENDER-WISE DISTRIBUTION OF RESPONDENTS

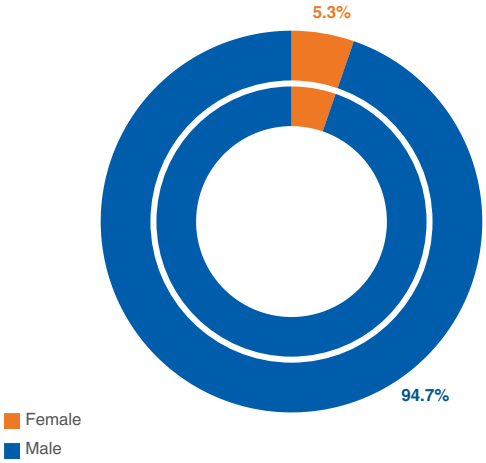
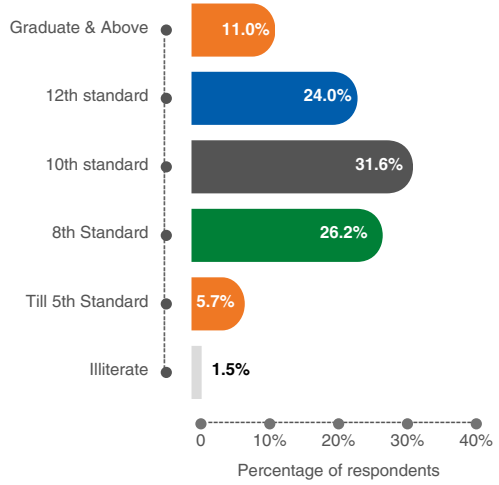


Chart 2 shows that 94.7% of the total respondents were male, while females made up 5.3% of the respondents.

CNB AT PEKALVADI VILLAGE

CHART 3: EDUCATION LEVEL OF RESPONDENTS



As per the findings of Chart 3, 31.6% of respondents have completed education till class 10th. This is followed by 26.2% who have finished the class 8th and 24% who completed the 12th standard. Additionally, 5.7% of respondents have completed primary schooling.

INTERACTION WITH THE BENEFICIARY

ECONOMIC PROFILE OF THE RESPONDENTS

CHART 4: AREA OF LAND OWNED

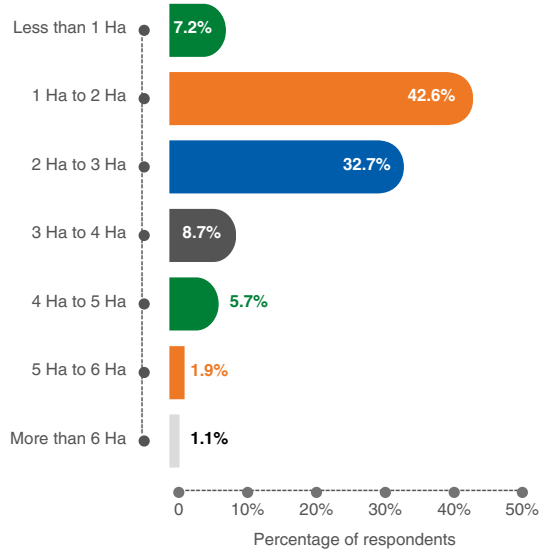


Chart 4 shows that 42.6% own between 1 to 2 hectares of land, while 32.7% possess 2 to 3 hectares. Furthermore, 8.7% have 3 to 4 hectares, and 7.2% own less than 1 hectare of land.

CHART 5: ANNUAL FAMILY INCOME

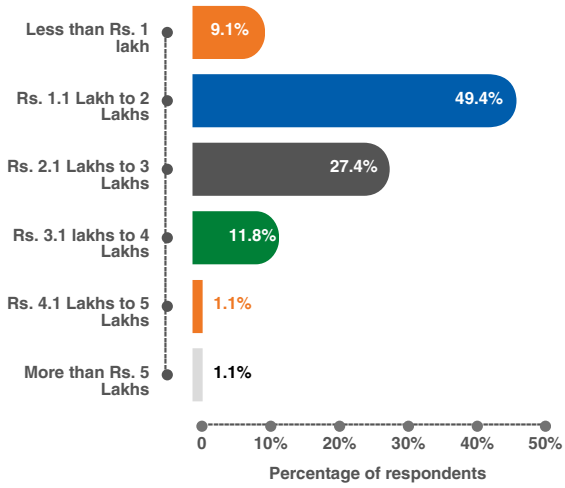


Chart 5 shows that close to half (49.4%) of respondents reported an annual family income between Rs. 1.1 lakhs to 2 lakhs. This is followed by 27.4% of respondents who fall within the income range of Rs. 2.1 lakh to 3 lakhs. Additionally, around 9.1% of respondents have an annual family income of less than Rs. 1 lakh.

CHART 6: MAJOR CROPS CULTIVATED

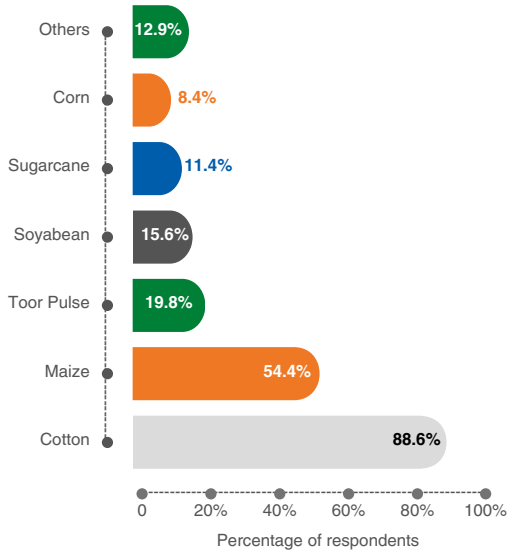


Chart 6 shows that a significant majority of respondents (88.6%) cultivate cotton, while 54.4% grow maize. Additionally, 19.8% grow toor pulse, and 15.6% cultivate soybeans. Another 12.9% cultivate other crops such as ginger, jowar, fenugreek, and sweet lemon.

CULTIVABLE AREA (PRE-INTERVENTION)

CHART 7: PERCENTAGE OF CULTIVABLE LAND AREA GOT ASSURED IRRIGATION BEFORE THE INTERVENTION

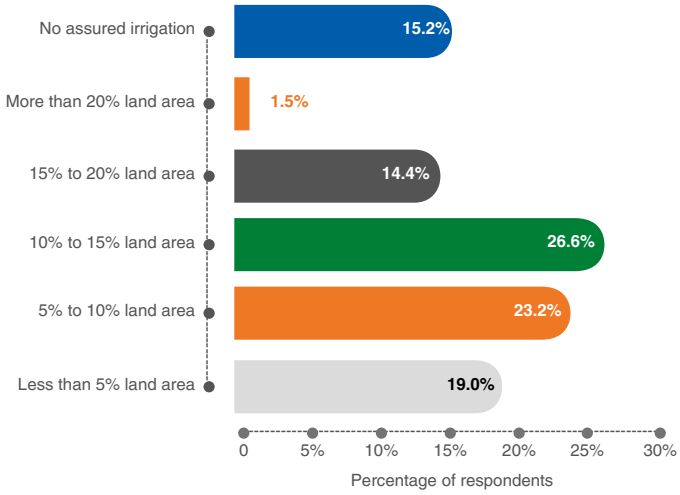


Chart 7 shows that more than one-fourth (26.6%) of respondents had between 10% to 15% of their land area irrigated before the intervention. Additionally, 23.2% of respondents reported having 5% to 10% of their land with assured irrigation. 15.2% of respondents reported no assured irrigation. Only a small percentage (1.5%) indicated that more than 20% of their land area was under assured irrigation.

INTERACTION WITH WUG

DEPENDENCE ON WATER TANKERS (PRE AND POST-INTERVENTION)

CHART 8: NO. OF MONTHS IN A YEAR RESPONDENTS ARE DEPENDENT ON WATER TANKERS FOR DRINKING WATER

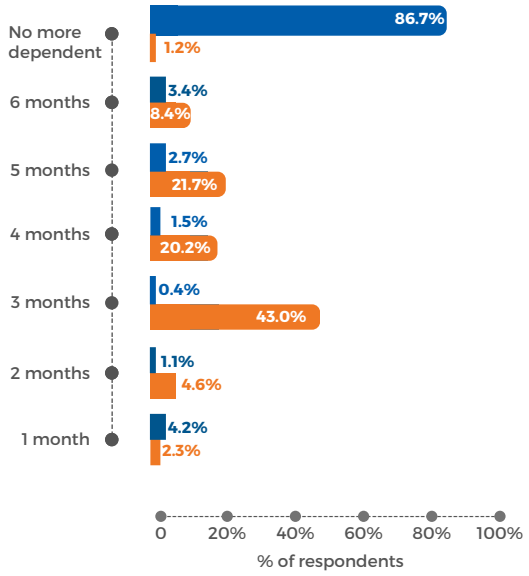


Chart 8 shows that before the intervention, almost (43%) relied on water tankers for their water supply for three months a year. 21.7% relied on water tankers for 5 months.

> The intervention has transformed our community's water situation. Structures like cement nala bunds and gabion check dams have increased water storage, improved recharge, and raised the water table. Drip irrigation and better water management now allow us to grow two crops annually, boosting productivity. Water is available year-round, and its quality has improved significantly. With tap water in the village, we are now a tank-free community, ensuring a sustainable and secure future for all.
>
> **- Sharad Ravte, 36 years male, Shahpur Banjar village**

STATUS OF WATER SCARCITY (PRE-INTERVENTION)

CHART 9: NO. OF MONTHS IN A YEAR, RESPONDENTS EXPERIENCED SCARCITY OF DRINKING WATER BEFORE THE INTERVENTION

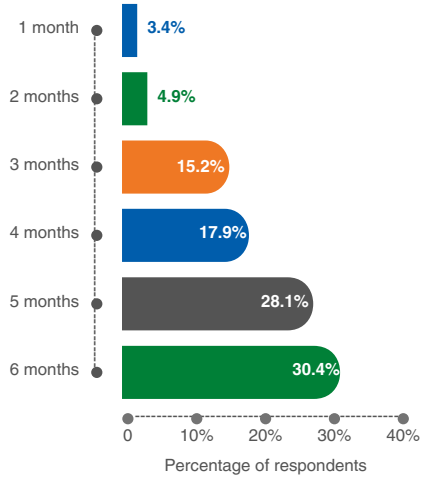
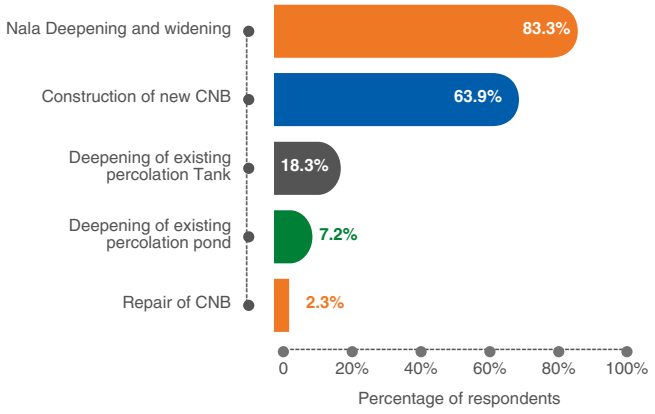


Chart 9 shows that 30.4% of respondents reported facing water scarcity for six months before the intervention, while 28.1% experienced it for five months. Approximately 18% endured water scarcity for four months.

Qualitative discussions revealed that the community faced considerable water-related challenges prior to the intervention. Inefficient irrigation methods led to an unreliable water supply, severely impacting the productivity of key crops, particularly vegetables. Additionally, the lack of proper water management structures meant that many households had to rely on water tankers for drinking water, highlighting a critical shortage of accessible and clean water sources.

ACTIVITIES CARRIED OUT IN THE COMMUNITY

CHART 10: TYPE OF WATER RESOURCE DEVELOPMENT ACTIVITY CARRIED OUT IN THE COMMUNITY



The activities carried out in the community include Nala deepening and widening, with 83.3% of respondents reporting that this activity is taking place. Additionally, 63.9% of respondents reported the construction of cement nala bunds (CNB), while 2.3% indicated that repairs to newly constructed CNBs are taking place. Other significant activities include the deepening of existing percolation tanks, as reported by 18.3% of respondents.

ACTIVITIES CARRIED OUT IN THE COMMUNITY

CHART 11: AREAS OF CLIMATE-RESILIENT CROPPING IN WHICH RESPONDENTS GAINED KNOWLEDGE THROUGH TRAINING

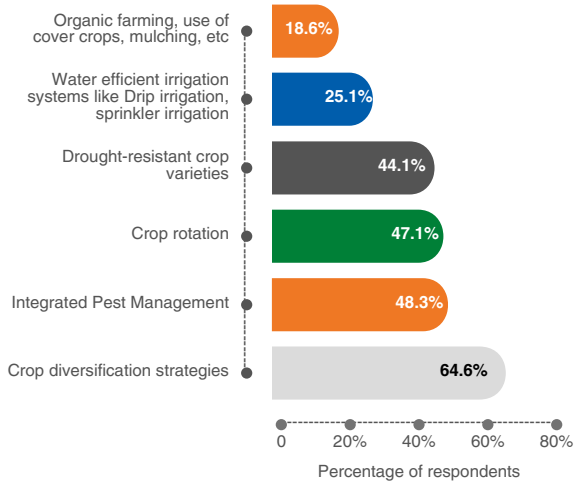


Chart 11 shows the specific areas of climate-resilient cropping in which respondents gained knowledge through training. Notably, 64.6% of respondents reported receiving training on crop diversification strategies. Additionally, closer to half (48.3%) received training on integrated pest management, while 47.1% were educated about crop rotation. Furthermore, less than half (44.1%) of respondents received training in drought-resistant crop varieties, and one-fourth (25.1%) of the respondents reported having training in efficient irrigation systems.

CNB AT WADGAO RAMPURI VILLAGE

WATER RESOURCE MANAGEMENT AND SUSTAINABLE PRACTICES

1. GRAM PANCHAYAT MEMBERS

Discussions with Gram Panchayat members during FGDs revealed that the training provided to them was instrumental in enhancing their capacity to manage and maintain water resource structures effectively.
The training sessions offered detailed insights into the maintenance and surveillance of these structures, which were communicated during village meetings and Gram Sabha gatherings to ensure transparency and community participation.

The key focus areas included water conservation, efficient leadership, and the consequences of water overuse, enabling members to adopt sustainable practices. The Panchayat members actively shared their knowledge with peers and the wider community, organising meetings to educate villagers about the benefits and proper usage of the water resource structures.

Qualitative discussions have reported that the efforts have led to significant improvements in the community, including changes in irrigation methods that have boosted agricultural productivity, particularly in vegetable cultivation.

The adoption of drip irrigation and better water management has not only increased the water table but also enhanced water storage capacity and availability for irrigation. This has enabled the cultivation of two crops annually, further supporting food security and livelihoods. Additionally, the intervention has drastically reduced dependence on water tankers for drinking water, transforming the village into a tank-free community.

"The introduction of water management techniques has transformed our farming practices. With a focus on efficient water use, we have achieved greater productivity in our major crops compared to traditional methods, ensuring sustainable agriculture. The implementation of water resource structures has significantly increased water storage capacity and raised the water table, enhancing irrigation availability. These improvements have allowed us to cultivate more effectively, leading to higher crop yields and a better future for our community."

- Ankush Mule, 42 years, Maliwada village

INTERACTION WITH VILLAGERS

2. WATER USER GROUPS (WUGS)

Water User Groups (WUGs) were established as a community-driven effort to improve water resource management and sustainability in the village. Membership was voluntary, with individuals chosen based on their enthusiasm and dedication to supporting local agriculture and water availability. Stakeholder discussions emphasised the value of training in enhancing their roles. The training covered the fundamentals of water structures, including their purpose, function, and maintenance, equipping participants with practical knowledge of water conservation techniques. WUG members reported that the training helped them acquire the necessary skills to properly use and maintain these structures, leading to better water management in their communities. They have since applied this knowledge to improve irrigation practices, ensuring more efficient water use for agriculture. The group manages water structures such as cement nala bunds and check dams to support irrigation and other needs, focusing on both drinking water availability and the promotion of efficient irrigation techniques like drip and sprinkler systems. To ensure long-term sustainability, the WUG follows best practices such as preventing over-extraction of water, planning for drought-resistant crops, and regularly monitoring the upkeep of these structures. Participants expressed confidence that the water systems are effectively meeting the agricultural community's demand for water, contributing to increased income, expanded fruit orchards, and the ability to grow two crops per year.

"We ensure the regular maintenance of water structures by holding meetings through the Gram Sabha and convening emergency meetings if any issues arise. The water structures have proven to be highly effective in addressing our agricultural needs. With their support, our income has increased, fruit orchards have expanded, and we are now able to grow two crops annually. Since the installation and proper use of these structures, we've seen a noticeable increase in water availability, improved irrigation practices, and higher crop yields, leading to greater income for our community."

- Shaikh Torab Fatru, 62 years, Khojewadi village

SOULACE MEMBER INTERACTING WITH LOCAL COMMUNITY MEMBERS

3. VILLAGE DEVELOPMENT COMMITTEE

The Village Development Committee (VDC) members took part in water resource management training to enhance the village's infrastructure and address water scarcity. The training included various interactive methods, such as exposure visits, video presentations, and poster displays, which equipped VDC members with the knowledge needed to actively contribute to the planning and development of water management infrastructure. Through the training, they improved their ability to guide and coordinate development efforts, leading to successful coordination with farmers and an increase in income. The members emphasised the value of this training in empowering them to tackle water challenges effectively within the community.

The focus group discussions (FGDs) revealed that the water structures have significantly addressed the village's water issues. One key achievement is that, 90% of the village is now tank-free, reducing the reliance on external water sources. Additionally, soil quality has improved, leading to better agricultural practices and greater sustainability. The implementation of efficient irrigation methods, like drip and sprinkler systems, has brought substantial benefits, including increased income for farmers and improved living standards for the community. These changes in water management have contributed to enhanced water conservation, more effective irrigation, and overall development in the village.

"The VDC monitors the effectiveness of these water structures by regularly assessing their impact on farming practices, especially as we transition from rainfed to irrigated farming. If any issues arise, we take immediate action through community meetings to address them. These water structures have addressed key water challenges in our village—90% of the village is now tank-free, and soil quality has improved significantly. The changes in irrigation methods, including the use of drip and sprinkler systems, have led to increased economic income and improved living standards for the community. Overall, the installation and maintenance of these structures have been transformative for both water conservation and agricultural productivity."

- Raju Borade. 36 years, Rampuri Village

DISCUSSION WITH WUG MEMBERS

KITCHEN GARDENING

WOMEN AND KITCHEN GARDEN BENEFICIARIES

Focus group discussions (FGDs) with women and kitchen garden beneficiaries in the community revealed that kitchen gardening was introduced through a series of initial meetings organised by a local organisation. The organisation provided essential support, including introductory training on the advantages of kitchen gardening and the provision of seeds to help participants diversify their crops. This support allowed community members to start and maintain their own kitchen gardens.

Participants reported growing a variety of crops, such as gilke (bitter gourd), mirchi (chilli), simla mirchi (bell pepper), and wangi (brinjal), which contributed to a steady supply of fresh produce for their households. They noted that maintaining the gardens required minimal effort, with some tending to them only once a week. The gardens were largely sustained using kitchen wastewater, reducing the need for extensive care. While the kitchen gardens provided fresh vegetables, participants mentioned that they could only cultivate crops 2-3 times a year, making the contribution to their overall food supply modest. Despite this, some beneficiaries reported a slight reduction in grocery expenses due to the availability of homegrown produce.

"We received introductory training on the benefits of kitchen gardening, along with seeds to get started. In our garden, we've grown gilke, mirchi, and Simla mirchi. However, since we can only cultivate 2-3 times a year, it hasn't significantly contributed to our food supply, and we still need to buy groceries. While I believe kitchen gardening is sustainable, I'm unsure about its impact on nutrition. I haven't noticed health or economic improvements, but it has made me feel a bit more self-reliant."

- Parigabai Baban Gawali, Shahpur Banjar village

MANGO PLANTATION BY FARMER AT KHOJEVADI

CHAPTER 7
KEY IMPACTS OF THE PROGRAM

IMPROVED WATER AVAILABILITY FOR AGRICULTURAL PURPOSE

CHART 12: LEVEL OF IMPROVEMENT OBSERVED IN THE RESILIENCE OF KHARIF CROPS DURING DRY SPELLS

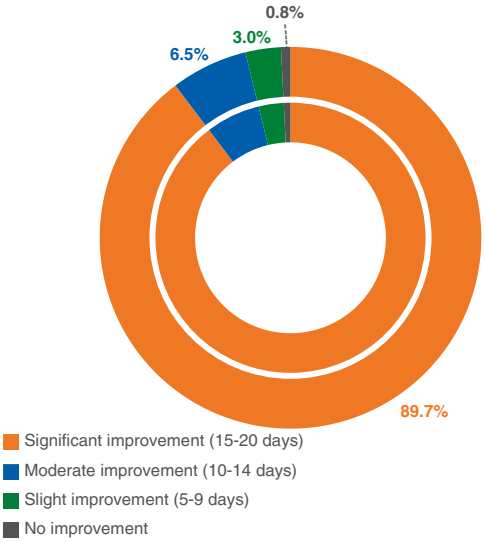


Chart 12 shows that a vast majority of respondents (89.7%) observed significant improvements, enabling their crops to endure an additional 15 to 20 days without rainfall, thereby enhancing drought resilience. Meanwhile, 6.5% of respondents reported moderate improvements, with their crops surviving an extra 10 to 14 days during dry spells. These findings underscore the positive effects of the intervention on crop resilience, equipping farmers to better navigate the challenges of irregular rainfall and extended periods of dryness.

This quantitative data is further supported by the qualitative insights from the FGDs, where farmers highlighted the effectiveness of rainwater harvesting structures and Cement Nala Bunds (CNBs) in improving water retention. These structures ensured better water availability during dry spells, which allowed for the successful cultivation of high-water-demand crops and reduced dependency on external water supplies and water tankers. While there was initial resistance to the interventions, leading to delays in their full implementation, community participation in water conservation efforts gradually increased.

> "Although maintenance is still difficult, we have observed improved water availability as a result of the Cement Nala Bund and water conservation initiatives. Thanks to the project, we have been able to diversify our crops and boost agricultural productivity. The community anticipates ongoing assistance to guarantee the long-term viability of these projects."
>
> **- Nemichand Mahajan Jarwal, 45 years male, Fatiyabad village**

CNB

FOR DRINKING PURPOSE

CHART 13: NO. OF MONTHS IN A YEAR RESPONDENTS EXPERIENCED SCARCITY FOR IRRIGATION PURPOSES AFTER THE INTERVENTION

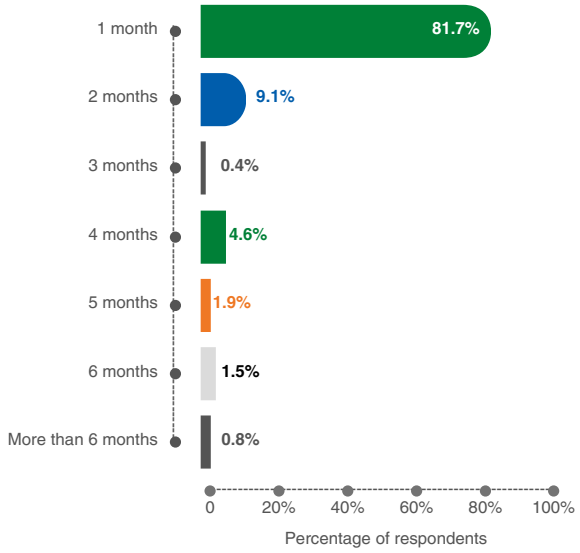


Chart 13 shows that 81.7% of respondents experienced irrigation water scarcity for just one month after the intervention, while fewer than 1% faced shortages lasting over six months. Prior to the intervention, however, 30.4% reported enduring water scarcity for six months. These figures reflect a notable enhancement in water availability for farming, showcasing improved access to irrigation resources. This advancement has played a crucial role in boosting agricultural productivity and fostering greater stability in farming practices across the community.

CHART 14: HEIGHT OF WATER LEVEL FROM SURFACE LEVEL DURING THE SUMMER SEASON IN WELL- BEFORE AND AFTER INTERVENTION

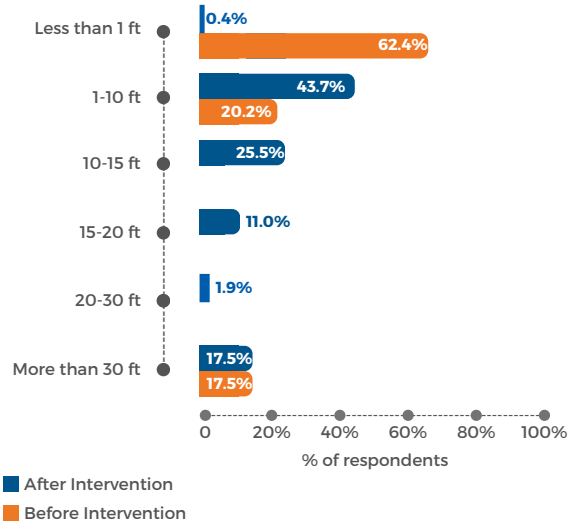


Chart 14 highlights a significant rise in well water levels during the summer season after the intervention. Previously, 62.4% of respondents reported critically low water levels of less than 1 foot, reflecting severe scarcity. Post-intervention, this dropped to less than 1%, marking a dramatic improvement. Additionally, 43.7% of respondents observed water levels increasing to between 1 and 10 feet, signalling improved water availability. Furthermore, 25.5% reported a rise of 10 to 15 feet, indicating enhanced water availability and better resource management resulting from the intervention.

INTERACTION WITH GP MEMBERS AT BARGIPUR

CHART 15: AMOUNT OF MONEY SPENT IN A YEAR ON GETTING WATER FROM THE WATER TANKER

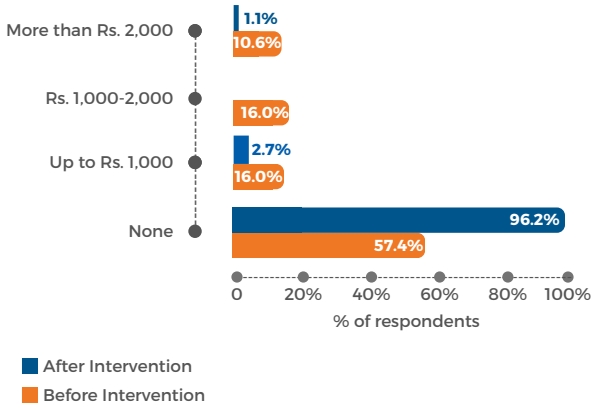


Chart 15 shows that the majority of respondents (96.2%) reported not spending any money on water from tankers after the intervention, a notable increase from 57.4% before the intervention. On the other hand, the percentage of respondents spending up to Rs. 1000 dropped from 16.0% before the intervention to 2.7% afterwards. Similarly, the proportion of respondents spending between Rs. 1000-2000 fell from 16.0% to none, while those spending more than Rs. 2000 decreased from 10.6% to just 1.1%. This reflects the positive impact of the intervention in minimising reliance on water tanker services, resulting in significant savings for the respondents.

Qualitative discussions with stakeholders have further echoed the savings on water, with respondents mentioning that the majority of the village is now tank-free. Stakeholders reported substantial savings on water costs, as families no longer need to rely on expensive tanker services for their daily water needs. This shift has been seen as a major improvement, significantly easing the financial burden on households and contributing to more sustainable water management practices within the community.

> 90% of our village is now free from relying on water tankers, which has made a huge difference in our daily lives. The elimination of costly tanker services has resulted in significant savings for families. Improved water access has also allowed us to manage our resources more efficiently and sustainably.
>
> **- Lankabai Bhusare, 45 years female, Toki village**

IMPROVED AGRICULTURAL PRODUCTIVITY

CHART 16: LAND AREA MADE CULTIVABLE AFTER PROJECT INTERVENTION

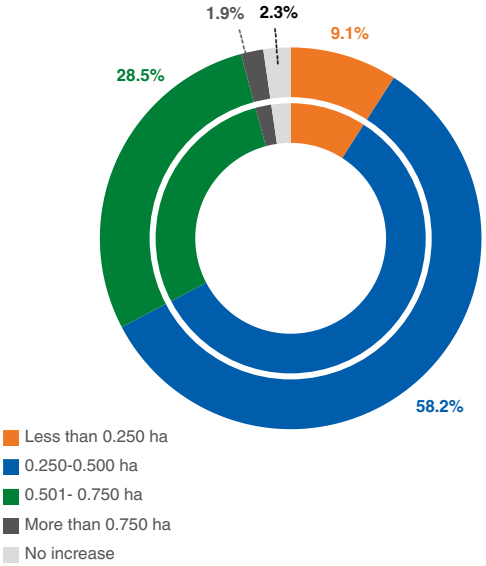


Chart 16 shows that the project intervention has successfully increased the cultivable land area for many respondents. More than half (58.2%) reported that an additional 0.250 to 0.500 hectares of land became cultivable. Additionally, 28.5% indicated that they gained between 0.501 and 0.750 hectares of arable land, while 9.1% were able to cultivate an extra area of less than 0.250 hectares. These enhancements demonstrate the project's effectiveness in improving land usability and boosting agricultural productivity by making more land available for cultivation.

SOULACE TEAM WITH GP MEMBERS AT CNB SITE

CHART 17: PERCENTAGE INCREASE IN YIELD OF KHARIF CROP FOLLOWING CSR INTERVENTION

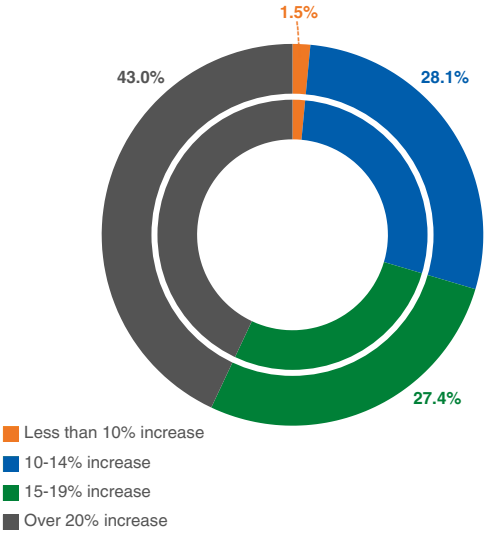


Chart 17 shows that the CSR intervention resulted in significant improvements in Kharif crop yields among respondents. Notably, 43% of respondents reported an increase of over 20% in their crop yields, while 28.1% experienced a rise of 10-14%. Additionally, 27.4% of respondents reported an increase of 15-19%.

CHART 18: PERCENTAGE INCREASE IN YIELD OF RABI CROP FOLLOWING CSR INTERVENTION

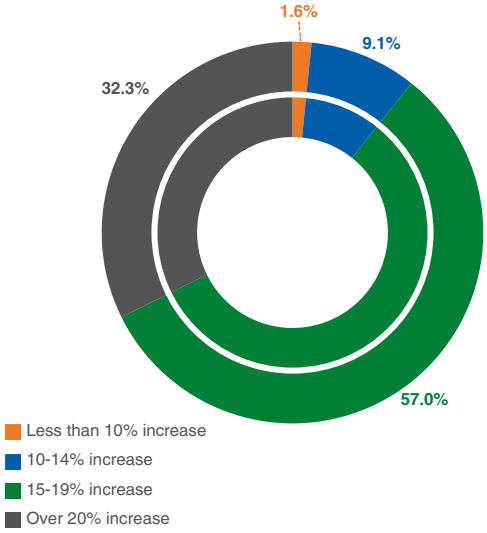


Chart 18 shows that 57% of respondents observed an increase in Rabi crop yields by 15-19% following the intervention, while 32.3% reported an increase over 20%. These results underscore the intervention's effectiveness in boosting agricultural productivity, demonstrating its positive influence on farmers' livelihoods and contributing to enhanced food production in the region.

CHART 19: CROPPING INTENSITY- BEFORE AND AFTER INTERVENTION

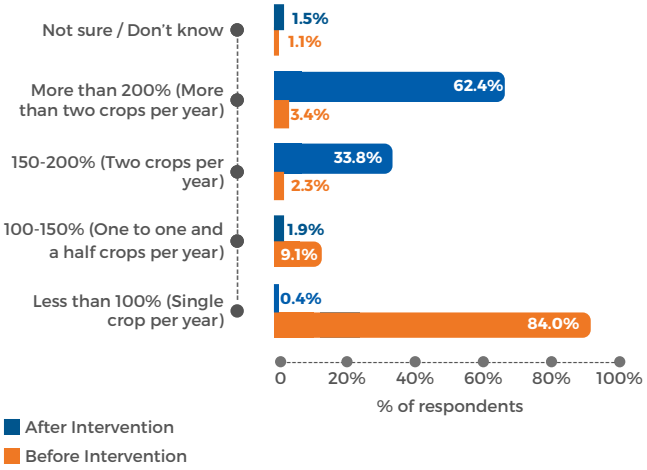


Chart 19 shows that before the intervention, 84% of respondents reported being able to cultivate only a single crop per year, while only 2.5% were able to cultivate two crops annually. After the intervention, the percentage of respondents growing two crops per year increased significantly to 33.8%. Furthermore, 62.4% of respondents were able to cultivate more than two crops annually, compared to just 3.4% before the intervention. This demonstrates a clear increase in crop intensity, with more people now able to grow additional crops, thereby enhancing agricultural productivity and improving overall food security.

Qualitative discussions with stakeholders have reported significant improvements in agricultural practices following the intervention. They noted that the rise in the water table and the introduction of reliable water resource structures have enabled farmers to access water more easily, which is crucial for crop cultivation. The qualitative feedback aligns with the quantitative data, indicating a shift in farming practices and crop intensity.

"The installation and proper use of the water structures have enabled me to grow crops with much less water. The availability of water has improved significantly, and as a result, my crop yields have increased remarkably. My irrigation practices have become much more efficient, allowing me to utilise water resources wisely. This transformation has made my agriculture more sustainable and less dependent on unpredictable rainfall, ensuring that I can cultivate my land effectively throughout the year."

- Lalchand Ghusinge, Maliwada village

CHART 20: AREA OF FARMLAND UNDER ORCHARD CULTIVATION-BEFORE AND AFTER INTERVENTION

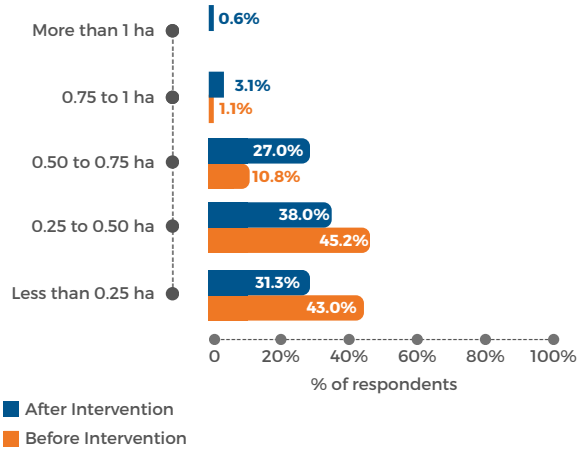


Chart 20 shows that before the intervention, 10.8% of respondents were cultivating between 0.50 to 0.75 hectares. After the intervention, this number increased significantly to 27%. Similarly, while only 1.1% of respondents were cultivating between 0.75 to 1 hectare before the intervention, this percentage rose to 3.1% following the intervention.

Qualitative discussions have reported that many farmers have shifted towards cultivating fruit orchards, which not only thrive with the available water resources but also contribute to increased productivity.

CHART 21: AREA OF FARMLAND UNDER VEGETABLE CULTIVATION-BEFORE AND AFTER INTERVENTION

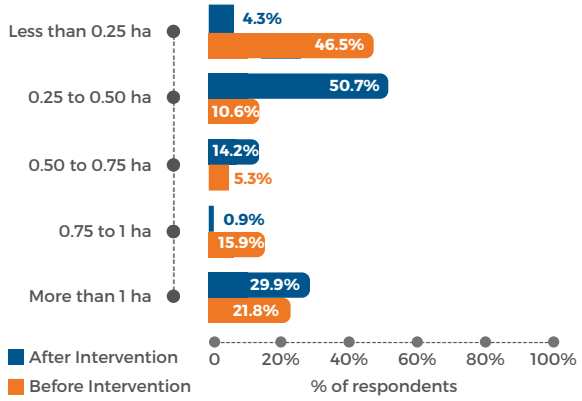


Chart 21 shows the significant impact of the intervention on land cultivation practices within the community. Before the intervention, only 10.6% of respondents were cultivating between 0.25 to 0.50 hectares. However, this figure surged to 50.7% after the intervention, indicating a remarkable increase in the area of land being utilised for agriculture. Similarly, the percentage of respondents cultivating between 0.50 to 0.75 hectares rose from a mere 5.3% to 14.2% following the intervention. This substantial growth in land cultivation not only reflects an increase in agricultural activity but also suggests that farmers are now more empowered to expand their operations, likely due to improved water availability and management practices.

CHART 22: YIELD OF COTTON IN THE FIELD -BEFORE AND AFTER INTERVENTION

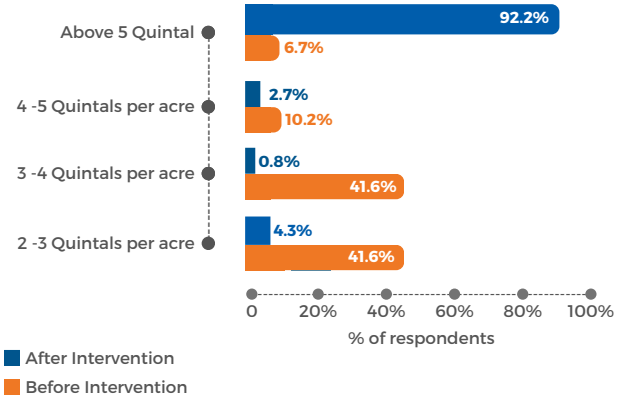


Chart 22 shows a significant improvement in cotton cultivation yields before and after the intervention. There was a remarkable increase in higher yields, with 92.2% of respondents now achieving yields above 5 quintals per acre, up from just 6.7% before the intervention. This growth in cotton yields highlights the positive impact of the intervention on agricultural productivity, contributing to improved income and food security for farmers.

Discussions with the members of the Water User Group (WUG) and Village Development Committee (VDC) affirmed that enhanced water availability, facilitated by structures such as gabion check dams and cement nala bunds, empowered farmers to broaden their agricultural activities. Improved water management, especially during dry periods, enabled the cultivation of larger areas, fostered greater crop diversity, and led to increased yields. These changes have played a key role in driving the village's overall development and economic growth.

INCREASED INCOME OF THE COMMUNITY MEMBERS

CHART 23: PERCENTAGE INCREASE IN ANNUAL AGRICULTURAL INCOME INTERVENTION

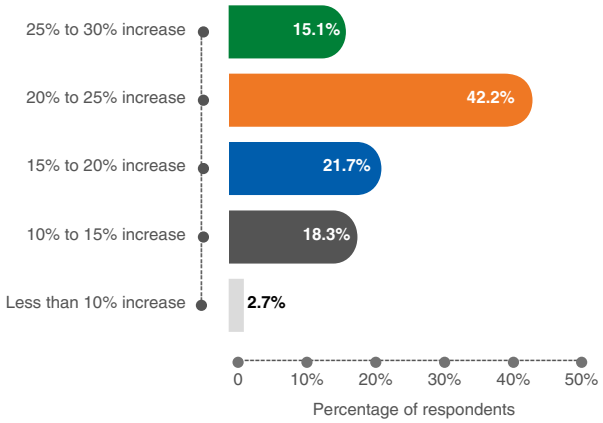


Chart 23 shows that the intervention had a major impact on annual agricultural income, with 42.2% of respondents reporting an increase of 20% to 25%. Additionally, 21.7% experienced a rise of 15-20%%. Nearly 15.1% of respondents reported an increase in their annual agricultural income by 25-30%. This indicates that the intervention effectively enhanced the economic well-being of farmers, contributing to improved livelihoods in the region.

Discussions during FGDs further support these findings, revealing how the introduction of new vegetables such as tomatoes, spinach (palak), and fenugreek (methi) was widely appreciated by farmers. These crops not only provided additional nutritional value but also opened up new market opportunities, diversifying income sources. Many farmers shared that the improved yields from these vegetables, along with traditional crops like tur and cotton, led to a 10-15% increase in their annual income.

"I've seen big changes in our community's farming since we put in the water resource structures. Now, we can grow vegetables and fruits and even manage to plant two crops each year. With the new tap water system, our village is tank-free, which means we don't have to rely on water tankers anymore. The Cement Nala Bund and Gabion Check Dam have helped bring our water reservoirs back to life, solving about 80% of our water problems. Because of this, our crop productivity has really improved, and we're getting higher yields than ever before."

- Jubeda Salim Shaikh, 27 years, Khojewadi village

"The water structures have truly transformed the way we manage water in our farming community. Since they were put in place, we've seen a remarkable increase in both our production and income. One of the biggest changes has been the adoption of drip irrigation, which allows us to grow crops using much less water. This shift has not only made us more efficient with our water use but has also resulted in higher crop yields. These structures have had a profound impact on our farming practices, and it's amazing to see how much we've been able to grow."

- Jamma Khan, 45 years, Ambelohal village

"**We have greatly benefited from the work of the CSR project. Before the intervention, we experienced annual water shortages of up to five months. Because of the new irrigation systems and water management techniques, we no longer have shortages lasting more than a month and are no longer dependent on water tankers. Our productivity and income have significantly increased to new crops like palak and tomatoes.**

- Phulchand Khanderao Parad,41 years old farmer, Khojewadi village

CASE STUDY 1

Lankabai Ambadas Bhusare, a 45-year-old member of the Village Development Committee (VDC) from Toki Village, has played a key role in improving the village's water management. After receiving information about training opportunities, she took the initiative to participate, motivated by her desire to contribute to her community. The training, led by BWCP-DSC, included exposure visits, video presentations, and poster displays, which helped Lankabai, and other community members learn how to manage and maintain water resource structures such as check dams and water retention systems. This knowledge equipped her with the tools to participate in the planning and development of sustainable water infrastructure in the village, with a focus on proper water usage and conservation practices.

Since the training, Lankabai has been actively involved in ensuring the effective use and maintenance of the water structures in Toki. The VDC, with her guidance, implemented rules for the community, ensuring the proper care and management of these resources. Regular inspections and community meetings have been essential in monitoring the effectiveness of these structures. The increased availability of water has significantly improved agricultural productivity, reduced soil erosion and enhancing soil quality. As a result, Toki village has seen higher crop yields, improved living standards, and increased income. Through her efforts, Lankabai has helped foster a more resilient and sustainable community, demonstrating the positive impact of effective water management on rural development.

CASE STUDY 2

Govardhan Damodar Chare, a 48-year-old male farmer from the village of Ambelohol in the Gangapur Gram Panchayat, has experienced significant changes in his agricultural practices and economic stability due to a CSR intervention focused on water management and crop diversification. Prior to this intervention, Govardhan faced numerous challenges, including poor water availability, which forced him to rely heavily on traditional rain-fed farming methods. This reliance not only limited his crop variety but also resulted in low income and economic instability for his family. Additionally, the lack of organised community action for water management exacerbated these issues, leaving farmers like Govardhan struggling to sustain their livelihoods.

The CSR initiative aimed to address these challenges by creating water user groups and assisting farmers with improved irrigation techniques. This intervention has proven to be transformative for Govardhan and his community. The formation of water user groups has fostered better coordination and equitable water allocation among farmers, ensuring that everyone has access to the necessary resources for successful farming. Furthermore, the introduction of vegetable farming has significantly increased income levels for Govardhan and his fellow farmers. Improved water retention practices have also reduced their dependency on unpredictable rainfall, making farming more reliable and predictable.

Govardhan suggests that the CSR initiative could be further enhanced by providing more technical advice on managing new crop varieties and improving water management practices. He believes that frequent awareness campaigns would engage more community members in the water user groups, thereby amplifying the impact of the initiative.

08. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Farmers have experienced significant improvements in water availability through well-maintained water structures, enabling them to cultivate two to three crops per year, which has boosted crop yield and income.
- Increased water storage has allowed farmers to plan and execute more consistent irrigation schedules, reducing crop vulnerability during dry spells and improving crop health.
- The intervention has also increased the annual family income of the farmers, leading to a better quality of life.

HOUSEHOLDS LEVEL

- Improved earnings and increased agricultural productivity have alleviated family stress, contributing to overall well-being.
- The intervention has enhanced access to water for domestic use, significantly reducing the time and money spent on water collection.
- Higher agricultural productivity has led to increased household incomes, allowing families to invest in education, nutrition, and other essential needs, thereby improving their overall quality of life.
- Training in sustainable farming practices has empowered families to adopt eco-friendly methods, fostering a more self-sufficient and resilient household economy.

COMMUNITY LEVEL

- The construction and maintenance of water structures, such as recharge shafts and storage systems, have increased water availability across the community, ensuring that both households and farms have a more reliable water supply, even during dry seasons.
- With higher agricultural productivity, farmers have more surplus produce to sell, boosting the local economy. Increased income among farming households has led to higher spending in the community, supporting local businesses and contributing to overall economic resilience.

STATE LEVEL

- The intervention has positively influenced state-level agricultural policies and practices by demonstrating successful sustainable farming methods, increasing overall agricultural productivity, and contributing to food security.
- Enhanced agricultural output also boosts the state's economy, supports rural development initiatives, and promotes eco-friendly practices that align with state sustainability goals.

NATIONAL LEVEL

- The intervention aligns with national initiatives aimed at improving rural livelihoods, such as the Jal Jeevan mission, Pradhan Mantri Krishi Sinchai Yojana (PMKSY) and the National Rural Livelihoods Mission (NRLM).

CHAPTER 9
HYDROLOGICAL ASSESSMENT

OBJECTIVES OF THE ASSESSMENT

Change in surface water holding capacity and reduction in run-off.

Change/improvement of groundwater table/recharge.

Change in land use pattern, agricultural productivity, and soil moisture conditions.

PROJECT LOCATIONS

The project was implemented in the Gangapur taluka of Aurangabad district. The measures that were implemented as a part of the water conservation efforts can broadly be categorised into construction and repair of Water Harvesting Structures (WHS), measures for Soil Moisture Conditions (SMC) improvement, and promoting water use efficiency. The details of the same are as below:

TABLE 1: DETAILS OF THE INTERVENTIONS

District	Aurangabad		Block	Gangapur		Area of Watershed		243.3654 Sq. Km.
	CNB	Recharge Shaft	Check Dam	Nala Deepening	Percolation Tank	Farm Bund	Farm Pond	Recharge Well
Nos.	4	7	8	28	6		137	191
Capacity in Cubic Meter	43,200	12,600	92,400	1,17,600	45,000	2,30,056	2,39,750	8,097

The maps below give the location of the intervention watershed in the Aurangabad district of Maharashtra and all the available locations of the various interventions across the intervention watersheds as a part of this project.

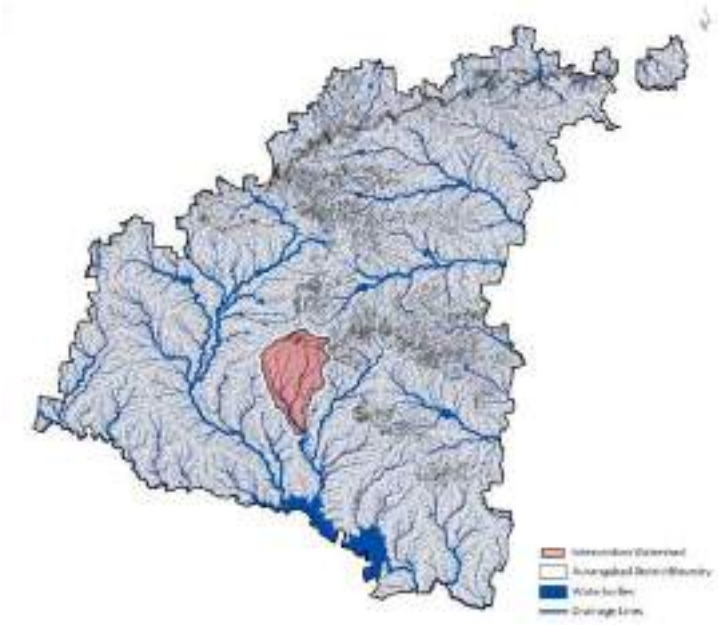


FIGURE 1: PROJECT LOCATIONS IN IN AURANGABAD

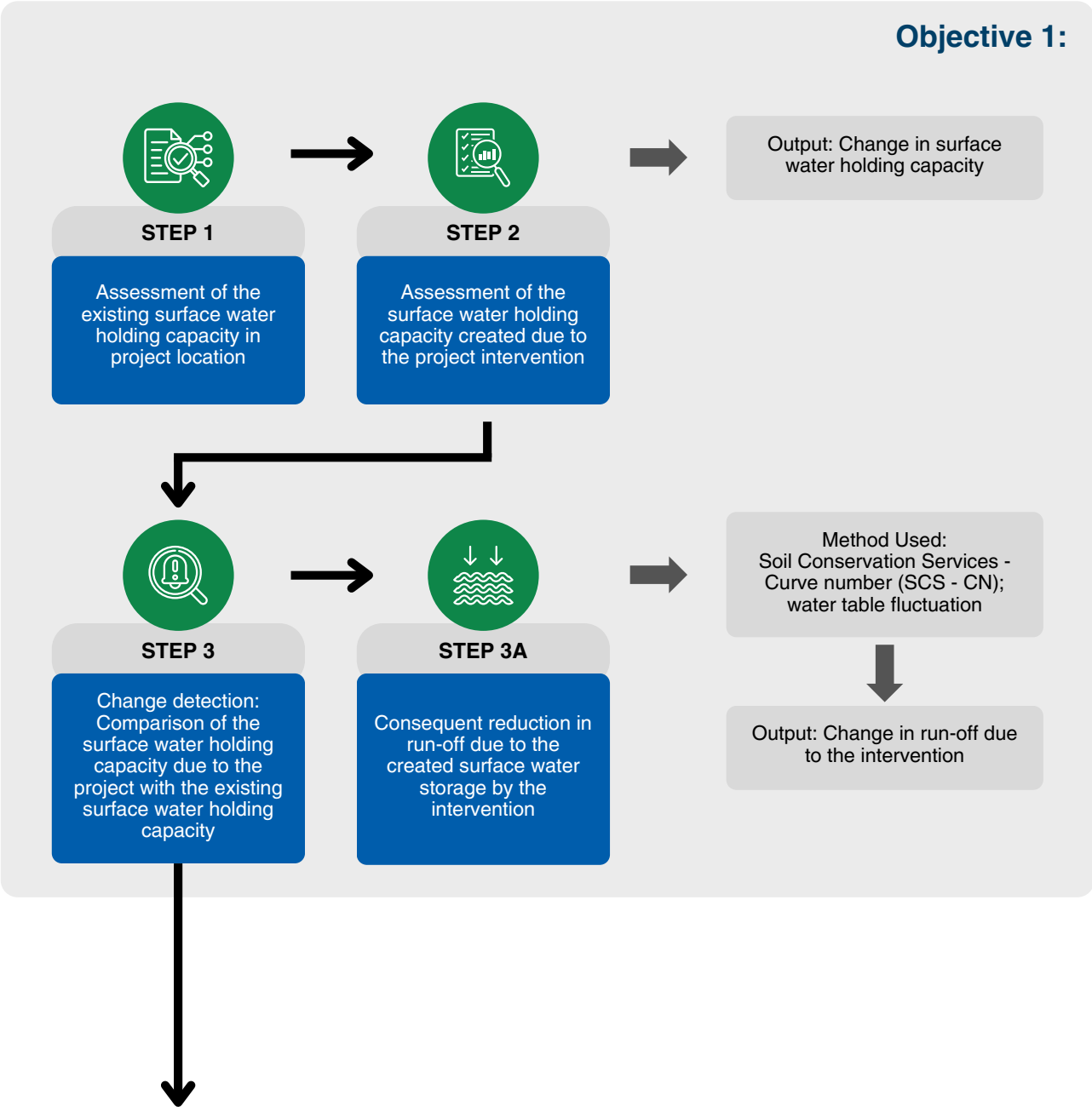
The additional parameters that were considered are geology, hydrogeology, and soil types and the information about the same is provided in Annexure 1.

While some of the assessments, such as the run-off estimation and the contribution of the interventions to the ground water levels, were done only considering the intervention area, some assessments, such as the rainfall and the ground water depth assessments, had to be done considering a larger area such as the entire block or the district due to the constraints faced with data availability. Care was taken to ensure that the results were represented correctly in this condition to varying assessment units.[1]

[1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

ASSESSMENT APPROACH

The assessment approach consists of various steps for each objective, as shown below:



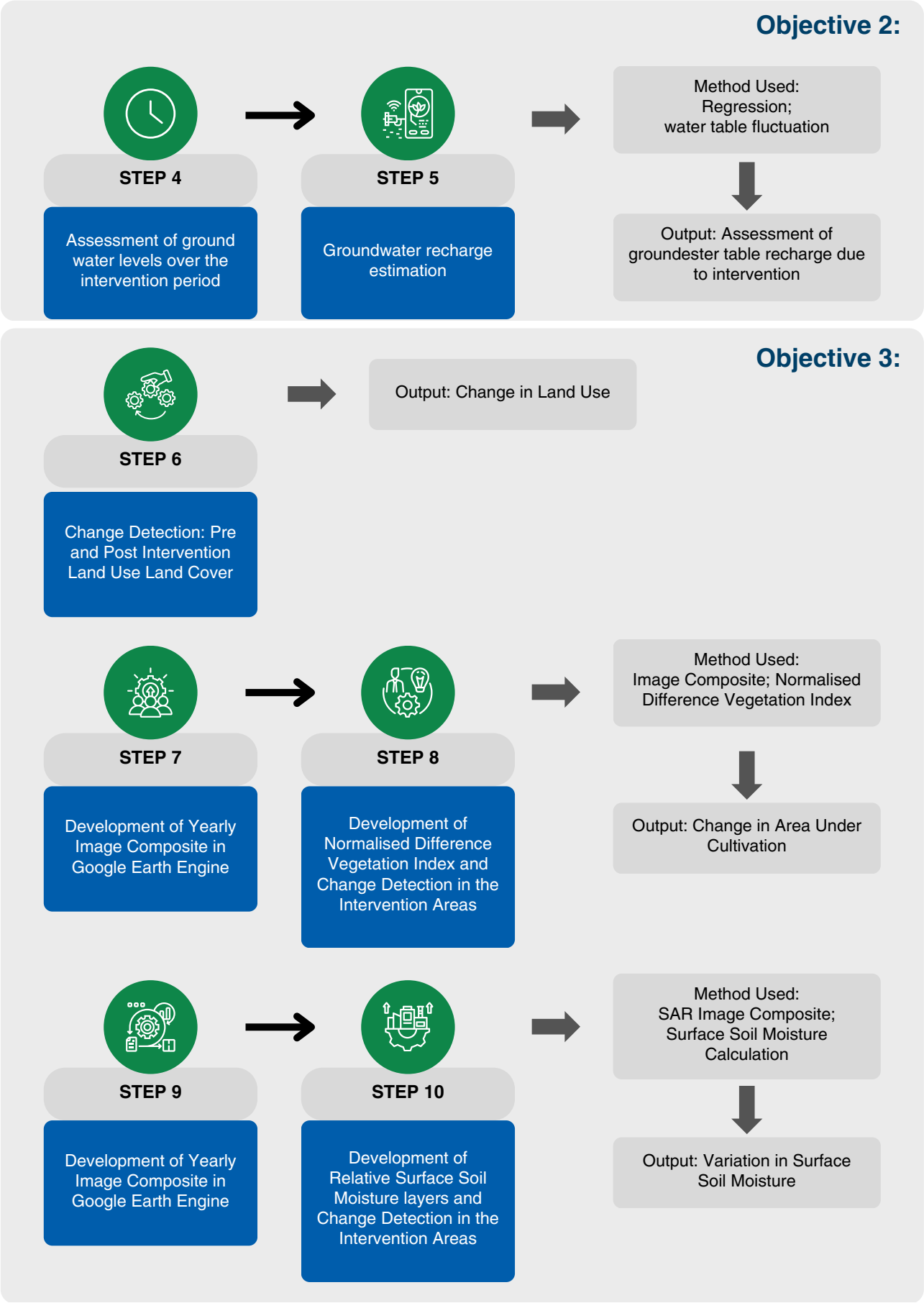


FIGURE 2: APPROACH OF THE ASSESSMENT

DATA COLLECTION

The following datasets have been collected from the field to facilitate the objectives of the study:

- Photos from the field survey (Annexure 5)

In addition to the above datasets, additional data was collected from various sources to fill in the data gaps that were present in the conduct of the assessment. These are as follows:

- Depth to water level from the NGO partners & the Central Ground Water Board (CGWB) (Annexure 2)
- Rainfall data from Indian Meteorological Department (IMD) (Annexure 3)

Other datasets that were used in the assessment are as follows:

- Soil types from National Remote Sensing Centre[2] (Annexure 1)
- Aquifer system from Central Ground Water Board (CGWB) (Annexure 1)
- Specific Yield from Central Ground Water Board (CGWB) (Annexure 1)
- Land Use Land Cover change between 2017 – 2023 from ESRI Living Atlas[3]
- Global Hydrologic Soil Groups for Runoff Estimation[4] (Annexure 1)

RESULTS

The results of the assessment to identify the impacts of the interventions on water conservation are presented in the below sections. It includes an assessment of rainfall and water level trends, an estimation of recharge due to rainfall, an assessment of surface water holding capacity and the associated run-off reduction and the estimation of recharge due to the interventions, the change in land use land cover, the changes in vegetation levels, and the changes in soil moisture conditions over the course of the intervention period.

Analysis of Rainfall Trends

Overall, while the values of rainfall have shown a slight positive trend during the intervention period, with significant peaks observed during the north-east monsoon period. The graphs below show the trend in their change over time.

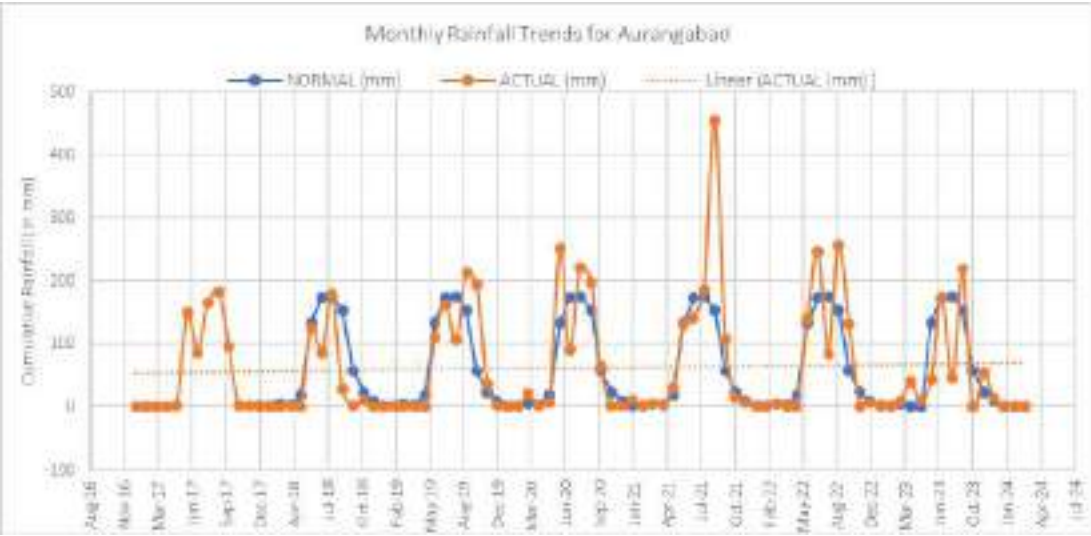


FIGURE 3: MONTHLY CUMULATIVE RAINFALL OVER THE INTERVENTION PERIOD (IN MM)

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO
[3]Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.
[4]Ross, C.W., L. Prihodko, J.Y. Anchang, S.S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Runoff Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. [1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

The trends of normal and actual rainfall reveal that over the intervention period, the rains have been above normal for most of the years. The slight positive trend that comes through is due to the above-normal rainfall received in June and August of most years and the unseasonal rainfall received in some of the years during the non-monsoon months.

Change in Water Level

The depth to water level data was obtained from two sources: one is the NGO partners, and the other is the annual Ground Water Year Books for Maharashtra published by the Central Ground Water Board (CGWB) for the years between 2017 and 2023. However, a complete collection of the data for the entire period from 2017 and since was not available with either source. Thus, for the final assessment, the datasets from both sources were combined after evaluating them individually and ensuring cohesion, and any missing values were filled out using statistical methods. The detailed dataset is provided in Annexure 2. The figures below show the ground water level trends in in the intervention districts:

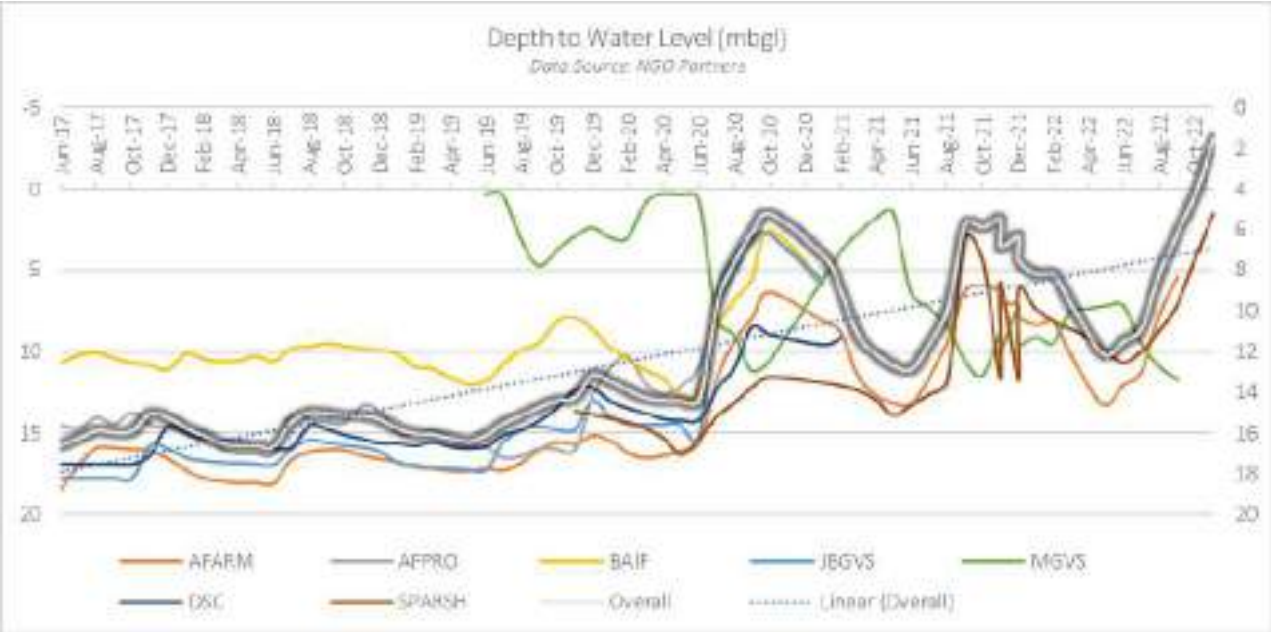


FIGURE 4: DEPTH TO WATER LEVEL (IN MBGL) – NGO PARTNERS

FIGURE 5: DEPTH TO WATER LEVEL (IN MBGL) – CGWB

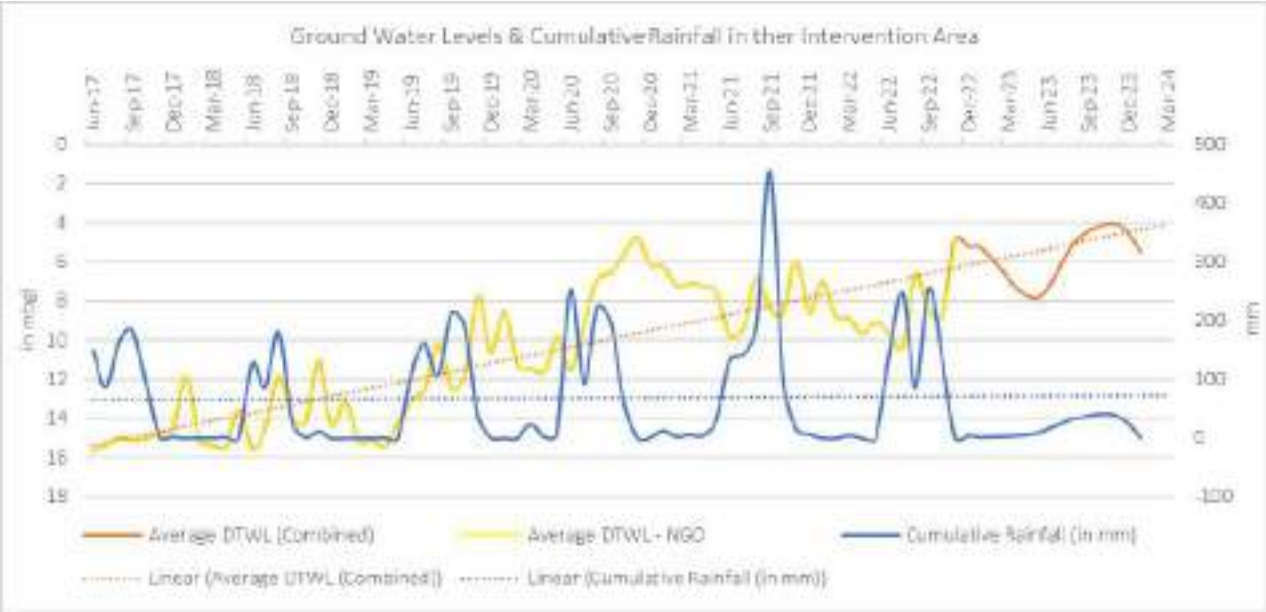


FIGURE 6: GROUND WATER LEVELS DURING AND SINCE THE INTERVENTION PERIOD (IN MBGL) COMPARED WITH MONTHLY CUMULATIVE RAINFALL (IN MM)

For this step of the assessment, the rainfall data from IMD was compared with the combined depth-to-water level data from the NGO partners and the CGWB. The rationale behind this is that rainfall is the most critical variable that determines the level of water availability below ground. Thus, by establishing the role of rainfall in the change in water levels, we would be able to identify the role of the measures implemented on the ground in augmenting the ground water levels.

A regression analysis of rainfall and depth to water level was conducted to assess the strength of the relationship between these two variables (detailed results in Annexure 4). The p-value obtained is greater than 0.05 for the intervention area, indicating no statistically significant relationship. However, the low R^2 (coefficient of determination) values obtained for the intervention area, along with the weak positive correlation established between rainfall and groundwater, suggest that while the impact of rainfall may be small, it has had its influence(although not significantly). [Here the R^2 value represents the proportion of variation in depth to water levels that can be explained by rainfall, indicating how well rainfall predicts water level changes. In this case, the low R^2 values suggest that multiple other factors also play a role. Detailed results are provided below.[5]

This essentially means that rainfall influence on the ground water level has been to a minimal extent in the intervention areas over the period from 2017 to the relative present. However, over this period, the rainfall received has shown a very slight negative trend, while the ground water levels have shown significant positive trends. Considering the R2 values and the results of the correlation analysis, it can be understood that while the rainfall and ground water levels are not closely related, the factors such as improved water percolation and water storage mechanisms have had significant contributions in augmenting the ground water levels, supported by the rainfall trends. The ground water levels are expected to continue to rise and stabilise at a high level over the coming years, and the contributions of the interventions would help in improving the ground water levels. The availability of the most recent and more local measurements will help in assessing the same more accurately.

Note: The last available data on ground water depth data is till January 2023. The data from May 2023 to the present has not been published yet. Thus, in the absence of the necessary data, statistical methods were used to project the values for this period. This projected data might not necessarily reflect the true levels of ground water levels and the derived estimates are bound to change on the availability of official measurements of ground water depth for 2023 and 2024.

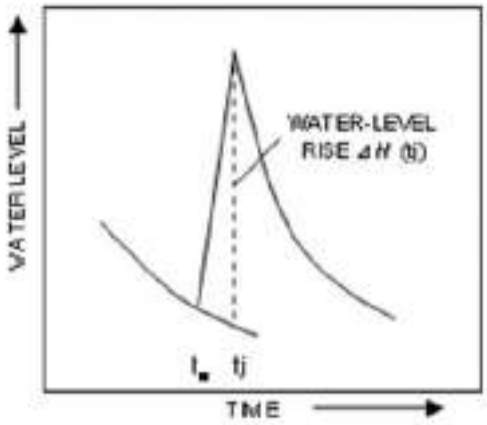
[5] The groundwater recharge calculations are based on data from NGO partners and CGWB data, are provided in the attached Excel document in sheets 9 and 10, respectively.

Estimation of Ground Water Recharge Due to Rainfall

The Water Table Fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The water-table fluctuation method is based on the premise that rises in groundwater levels in unconfined aquifers are due to recharge arriving at the water table. Recharge is calculated as the change in water level over time multiplied by specific yield[6].

$$R(tj) = Sy^* \Delta H(tj)$$

where R(tj) (m) is recharge occurring between times t0 and tj, Sy is specific yield (dimensionless), and ΔH(tj) is the peak water level rise attributed to the recharge period (cm).



The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology.[7] [8] The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

Location	Aurangabad
Major Aquifer System	Basalt
Sy Range	0.01 – 0.03
Sy Chosen	0.02
RIF Range	0.12 – 0.14
RIF Chosen	0.13

As per the results of the method, about 13.1% of the rainfall has recharged directly to the ground in the intervention sites. The results and calculations are presented below:

TABLE 2: WATER TABLE FLUCTUATION METHOD RESULTS

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2017	687.704	1.100	0.02	0.022002477	22.0024773	3.2%	5354641.69
2018	438.020	4.509	0.02	0.090184267	90.1842666	20.6%	21947730.12
2019	826.440	7.633	0.02	0.152661156	152.6611561	18.5%	37152443.32
2020	862.400	6.835	0.02	0.136709574	136.7095736	15.9%	33270380.06
2021	1099.640	3.748	0.02	0.074956747	74.95674684	6.8%	18241878.68

[6]USGS GWRP: Techniques/Methods -Water-Table Fluctuation (WTF) Method
[7]The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology[7][7]. The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:
[8]Detailed Guidelines (cgwb.gov.in)

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2022	865.360	5.505	0.02	0.11010815	110.10815	12.7%	26796513.96
2023	548.052	3.844	0.02	0.076883855	76.883855	14.0%	18710870.13
Average Recharge directly due to Rainfall received						**13.1%**	**161474457.95**

Further, the groundwater recharge from Rainfall Infiltration Method (RIF) can be obtained from the following relation:
Groundwater Recharge = Geographical Area x Actual Rainfall x Infiltration Factor

TABLE 3: RAINFALL INFILTRATION METHOD

Area (in sq. m.) =			243365400
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)
2017	0.687703555	0.089401462	21757222.59
2018	0.43802	0.0569426	13857858.63
2019	0.82644	0.1074372	26146497.15
2020	0.8624	0.112112	27284181.72
2021	1.09964	0.1429532	34789862.7
2022	0.86536	0.1124968	27377828.73
2023	0.548051549	0.071246701	17338981.97
Total			**168552433.5**

Estimation of percent rainfall converted into groundwater recharge

As per GEC-1997 norms, the rainfall recharge as computed by WTF method has been compared with that of RIF method, and finally, the rainfall recharge is assigned a value based on set criteria to avoid unreasonably high or low estimates.

A quantity called percentage difference (PD) which is the difference between the rainfall recharge computed by the water table method (A) and the recharge by the rainfall infiltration method (B) and expressed as a percentage of the rainfall recharge by rainfall infiltration method is computed as below:

$$PD = \frac{(A - B)}{B} \times 100$$

where 'A' is the rainfall recharge by the WTF method and 'B' is the rainfall recharge by the RIF method.
The set criteria (GEC 1997) to be adopted are as follows:
(a) If PD ≥ – 20 and < + 20%, then the value of the water table fluctuation method is adopted.
(b)If PD ≤ – 20%, then the value of 0.8 × rainfall infiltration factor method is adopted.
(c)If PD ≥ + 20%, then the value of 1.2 × rainfall infiltration factor method is adopted.

By following the above criteria, groundwater recharge is estimated.

Organisation	Rainfall Infiltration Method	WTF Model	Percentage Difference	Criteria	Volume of recharge due to rainfall (Cu. m.)
	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)			
DSC	168552433.5	161474457.95	-4.19	A	161474457.95

Over the period of 2017 to 2023 an almost 7-year period covering the interventions and their operations till the present, the amount of ground water recharge directly due to rainfall stands at 16,14,74,457.95 Cu. m. across the intervention watershed, which is about 12.45% of the total rainfall received over the intervention area.

Change in surface water holding capacity and run-off reduction

The intervention area is spread over multiple watersheds in the southern part of the state. On-site verification and satellite imagery show that the major land use in the intervention area is rangelands, followed by crops. Based on the information available from the field survey and the organisation, the volume of storage created is estimated.

The change in surface storage in the intervention area was net positive, i.e., no existing surface storage was considered in the pre-intervention period[9] and although the surface storage of about 1,28,67,972 cubic meters created through the project, an intervention volume of 29,43,110 cubic meters is being considered for assessment as there might be a double accounting of the storage of nalas as it is also included in considering the storage of the check dam type of interventions.

Estimation of ground water recharge due to the interventions

Groundwater recharge due to the interventions occurs primarily through the capture and storage of surface runoff water using Cement Nala Bunds, as well as through natural processes and Groundwater Recharge Shafts.

Run-off is defined as the portion of the precipitation that makes its way towards rivers or oceans as surface or subsurface flow. After the occurrence of infiltration and other losses from precipitation (rainfall), excess rainfall flows out through the small natural channels on the land surface and into the main drainage channels. Such types of flow are called surface flows. A part of the infiltrated rainwater moves parallel to the land surface as subsurface flow and reappears on the surface at certain other points. Such flows are called interflows. Another part of the infiltrated water percolates downwards to ground water and moves laterally to emerge in depression and rivers and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

While interventions such as the Cement Nala Bunds and the Gabion Structure capture the surface flows, both these structures and the Ground Water Recharge Shafts contribute to the recharge of the ground water in the intervention sites.

Estimation of the run-off can give us an estimate of the amount of water that has been essentially captured by the intervention structures as surface storage and thus point towards the potential amount of water available for ground water recharge. Run-off can be estimated by various methods, such as:

- Empirical formulae and tables
- Run-off Estimation based on Land Use and Treatment
- Rational Method
- Empirical formulae for flood peak

[9] This is due to the constraints of establishing the status of all water bodies in the intervention area.

In this assessment, we are using the method of empirical formulae and tables along with run-off estimation based on land use and treatment, as it has proven to be the most reliable to conduct the assessment in the absence of reliable ground water level data and access to the intervention sites on the ground.

1 BINNIE'S PERCENTAGES

It provides the relationship of run-off to rainfall with a view to express the former as a percentage of the latter. The percentages mentioned below are based on observations on two rivers in Madhya Pradesh.

TABLE 4: RUN-OFF AS A % OF THE RAINFALL RECEIVED

Annual Rainfall (mm)	Runoff (%)
500	15
600	21
700	25
800	29
900	34
1,000	38
1,100	40

2 COEFFICIENTS

The run-off 'R' in cm and rainfall 'P' in cm can be correlated as R = KP, where 'K' is the run-off coefficient. The run-off coefficient depends on factors affecting run-off. This method is applicable only for small projects such as the ones implemented as a part of this project. The usual values of K are as given below.

TABLE 5: USUAL VALUES OF RUNOFF COEFFICIENTS (K)

Type of Area	K
Urban Residential	0.3 - 0.5
Forests	0.05 - 0.2
Commercial & Industrial	0.9
Parks, farms, Pastures	0.05 - 0.3
Asphalt or concrete pavement	0.85

3 BARLOW'S TABLES

The following values of K (in percentage) for various types of catchments were developed by T.G. Barlow based on the studies of catchments mostly under 130 sq. km. in Uttar Pradesh.

TABLE 6: BARLOW'S PERCENTAGE RUNOFF COEFFICIENTS

Class	Description of Catchment	Percent runoff
A	Flat, cultivated and black cotton soils	10
B	Flat, partly cultivated-various soils	15
C	Average	20
D	Hills and plains with little cultivation	35
E	Very hilly and steep, with hardly any cultivation	45

These percentages are for the average type of monsoon and are to be modified by the application of the following coefficients according to the nature of the season as shown below.

TABLE 7: BARLOW'S RUN-OFF COEFFICIENTS FOR DIFFERENT NATURES OF SEASON

Nature of Season	Class of catchments				
	A	B	C	D	E
Light rain, no heavy downpour	0.7	0.8	0.8	0.8	0.8
Average or varying rainfall, no continuous downpour	1	1	1	1	1
Continuous downpour	1.5	1.5	1.6	1.7	1.8

As the part of this method, the special tropical rainfall was divided into the following four classes:

- **Negligible falls:** All rainfalls under 12 mm a day unless continuous for several days; also rainfalls 12 to 40 mm a day, when there is no rain.
- **Light falls:** All rainfalls up to 25 mm a day followed by similar or heavier falls. Steady pours of 25 to 40 mm a day, when there is no rain of similar or greater amount before or after that.
- **Medium falls:** Rainfalls from 25 to 40 mm a day when preceded or followed by any but light falls.
- **Heavy Falls:**
  - All rainfalls are over 75 mm a day or continuous falls at 50 mm a day.
  - All rainfalls of an intensity of 50 mm or more per hour.

The run-off percentages, as shown in the following table, were developed by combining the type of catchment and nature of the season.

TABLE 8: BARLOW'S RUNOFF PERCENTAGES

Nature of Rainfall	Percentage of Flow in Catchments of Different Type				
	A	B	C	D	E
Negligible falls	-	-	-	-	-
Light falls	1%	3%	5%	10%	15%
Medium falls	10%	15%	20%	25%	33%
Heavy falls	20%	33%	40%	55%	70%

4 ESTIMATION OF DIRECT RUNOFF FROM RAINFALL

In this method of run-off estimation, the effects of the surface conditions of a watershed area are evaluated by means of land use and treatment classes. Land use is the watershed cover, and it includes every kind of vegetation, litter and mulch, and fallow, as well as non-agricultural uses such as water surfaces (lakes, swamps, etc) and impervious surfaces (roads, roofs, etc.). Land treatment applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing and management practices such as grazing control or rotation of crops. The classes consist of use and treatment combinations to be found in watersheds. Land use and treatment classes are readily obtained either by observation or by measurement of plant and litter density and extent in sample areas.

4.1 Hydrological Soil Groups

There are four soil groups that are used in determining the hydrological soil cover complexes, which are used in a method for estimating the run-off from rainfall.

The major characteristics of these groups are described below. The respective infiltration rates and permeability of soils in different groups are also shown below. The infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The permeability rate is the rate at which water moves in the soil, which is controlled by the nature and characteristics of soil horizons.

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.	Low	High rate
Group B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	High	Low rate

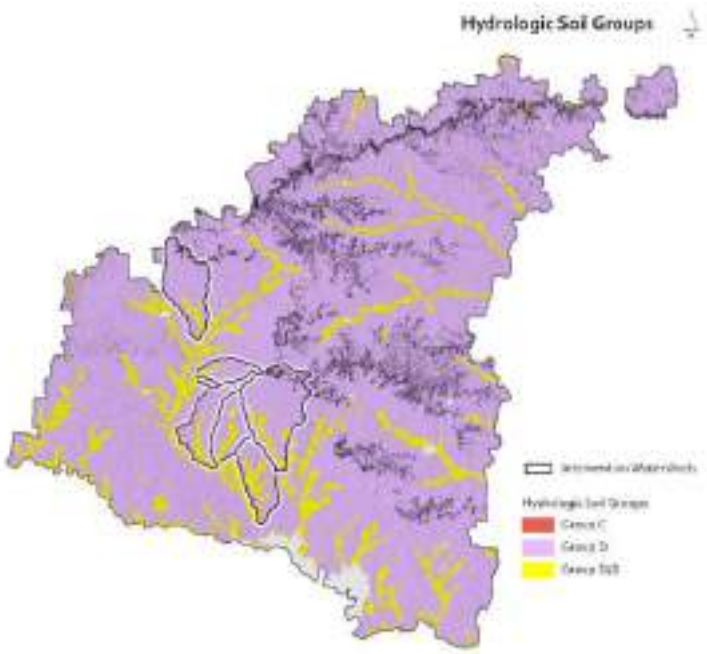


FIGURE 7: HYDROLOGIC SOIL GROUPS OF THE PROJECT WATERSHEDS

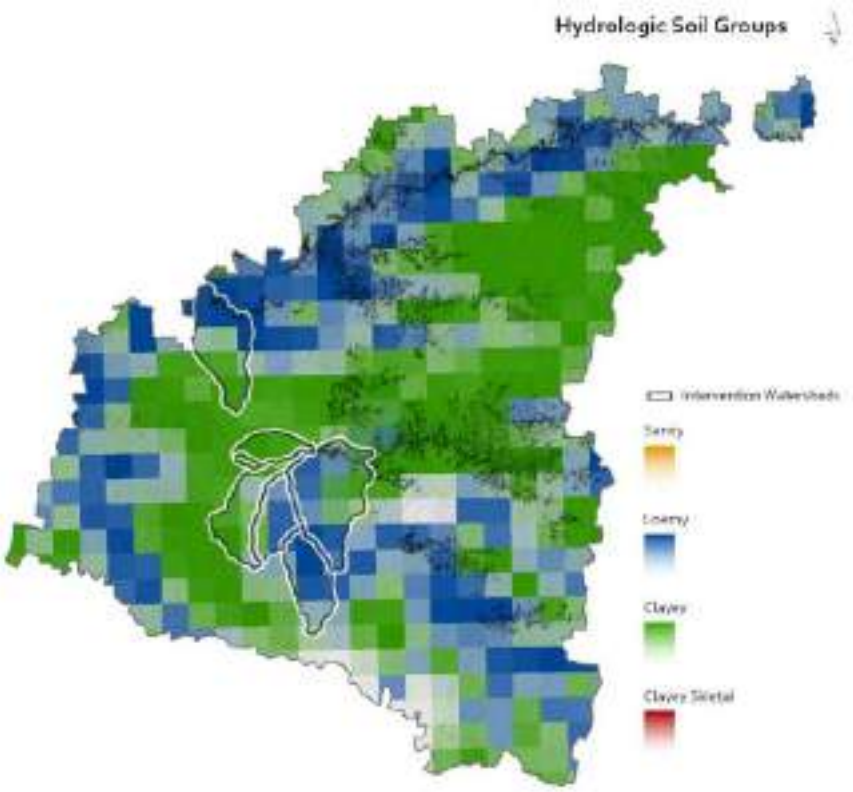


FIGURE 8: SOIL CHARACTERISTICS IN THE PROJECT WATERSHEDS

TABLE 9: INFILTRATION RATES

Class	Rates / hr in		Remarks
	Inches	Millimetres	
Very Low	Below 0.1	Below 2.5	Highly clayey soils
Low	0.1 - 0.5	2.5 - 12.5	Shallow soils, clay soils, soils low in organic matter
Medium	0.5 - 1.0	12.5 - 25.0	Sandy loams, silt loams
High	Above 1.0	Above 25.0	Deep sands, well aggregated soils

TABLE 10: RELATIVE CLASSES OF SOIL PERMEABILITY

Class	Permeability	
	Inches/ hr	mm/ hr
Slow		
Very Slow	Less than 0.05	1.3
Slow	0.05 to 0.20	1.31 to 5.00
Moderate		
Moderately Slow	0.20 to 0.30	5.01 to 20.00
Moderate	0.80 to 2.50	20.01 to 50.00
Moderately Rapid	2.50 to 5.00	50.01 to 130.00
Rapid		
Rapid	5.00 to 10.00	130.01 to 250.00
Very Rapid	Over 10.00	Over 250.00

4.2 Land Use and Treatment Classes

The commonly used land use and treatment classes are briefly described below. These classes are used in determining hydrologic soil-cover complexes, which are used in one of the methods for estimating runoff from rainfall.

- **Cultivated lands:** These include all field crops such as maize, sugarcane, paddy and wheat.
- **Fallow lands:** These are lands taken up for cultivation, but are temporarily out of cultivation for a period of not less than one year, and not more than 5 years. Current fallow lands are cropped areas kept fallow during the current year.
- **Uncultivated lands include:**
  - Permanent pastures and other grazing lands.
  - Cultivable waste, which are lands available for cultivation whether or not taken up for cultivation or abandoned after a few years for one reason or another. Land once cultivated but uncultivated for 5 years in succession shall also be included in this category.
- Forest area includes all lands classed as forest under any legal enactment dealing with forest or administered as forest whether State-owned or private and whether wooded or maintained as potential forest land.
- Tree crops include woody perennial plants that reach a mature height of at least 8 feet and have well-defined stems and a definite crown shape.
- Lands put to non-agricultural uses are areas occupied by buildings, roads, railroads, etc.
- Barren and uncultivable lands include areas covered by mountains, deserts, etc.

Based on these assessments, the following were estimated:

Surface Storage

The volume of surface storage created by the intervention = 7,88,703 m3

Rainfall & Runoff

- Total rainfall received over the intervention period and since = 1,14,86,26,280 m3
- Total runoff generated over the intervention area = 34,45,87,884.1 m3
- Percentage of rainfall that is converted to runoff = 30%

The intervention area received enough rainfall for all the intervention structures to be at a constant capacity of 35.78% throughout the period since 2017 as a part of and due to the project Bajaj Water Conservation Project implemented by DSC in Aurangabad. This shall be interpreted as the intervention structures always having water and never drying since 2017 or operating at more than 50% storage filled through the dry seasons since 2017.

Runoff Reduction

- The volume of surface runoff stored by the intervention measures after considering 40% evaporation loss = 1,69,29,951.73 m3.

Which is,

- 4.91% of the total runoff generated as a part of and due to the water conservation efforts of this project (or)
- 1.47% of the total rainfall received during the project period and ever since

This means that the interventions that were created as a part of this project have contributed to a combined reduction in surface run-off by about 4.91% in the intervention area. Although this number is a conservative estimation and however, it is bound to increase over the years. Care must be taken to ensure the effective functioning of these water harvesting structures.

Regular desilting and clearing of overgrowth, along with any structural repairs, are required across all the structures to ensure that their storage capacity is maintained, and the structural integrity is preserved.

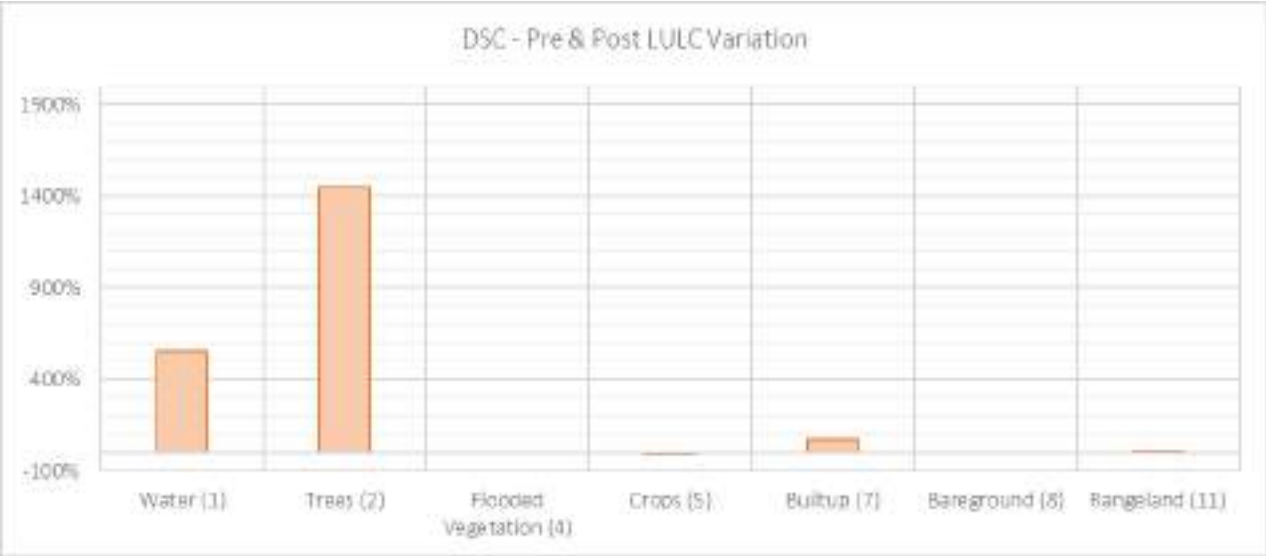
Thus, in total, 12.45% of the rainfall is converted into direct recharge, about 4.91% of the rainfall is stored in the intervention-created surface storage, 40% is lost as evaporation, and the remaining 42.64% accounts for factors such as run-off that is stored in other water bodies present, run-off that is not captured evapotranspiration, and other losses.

5 CHANGE IN LAND USE PATTERN

Land use and land cover change detection involves analyzing how land is utilized and how its physical coverage alters over time. Changes in land use patterns, such as urban expansion, deforestation, agricultural expansion, and the impacts of natural disasters, can be tracked using remote sensing techniques, satellite imagery, and geographic information systems (GIS). The land use and land cover for the intervention areas were developed through supervised classification of Sentinel-2 Full Colour Composite (FCC) imagery for both the pre- and post-intervention periods.

TABLE 11: ZONAL STATISTICS OF LULC FOR THE INTERVENTION AREA

Organization	DSC				
Total Area of Watershed (Sq. Km.)	243.3654				
Soil Group	D				
Land use Classes	Land use - 2017		Land use - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.4358	0.18	2.8502	1.17	553.95%
Trees (2)	0.1839	0.08	2.8502	1.17	1449.75%
Flooded Vegetation (4)					0.00%
Crops (5)	209.0662	85.91	196.2171	80.63	-6.15%
Built up (7)	13.4602	5.53	23.2563	9.56	72.78%
Bare ground (8)			0.0019		0.00%
Rangeland (11)	20.2023	8.30	20.7269	8.52	2.60%



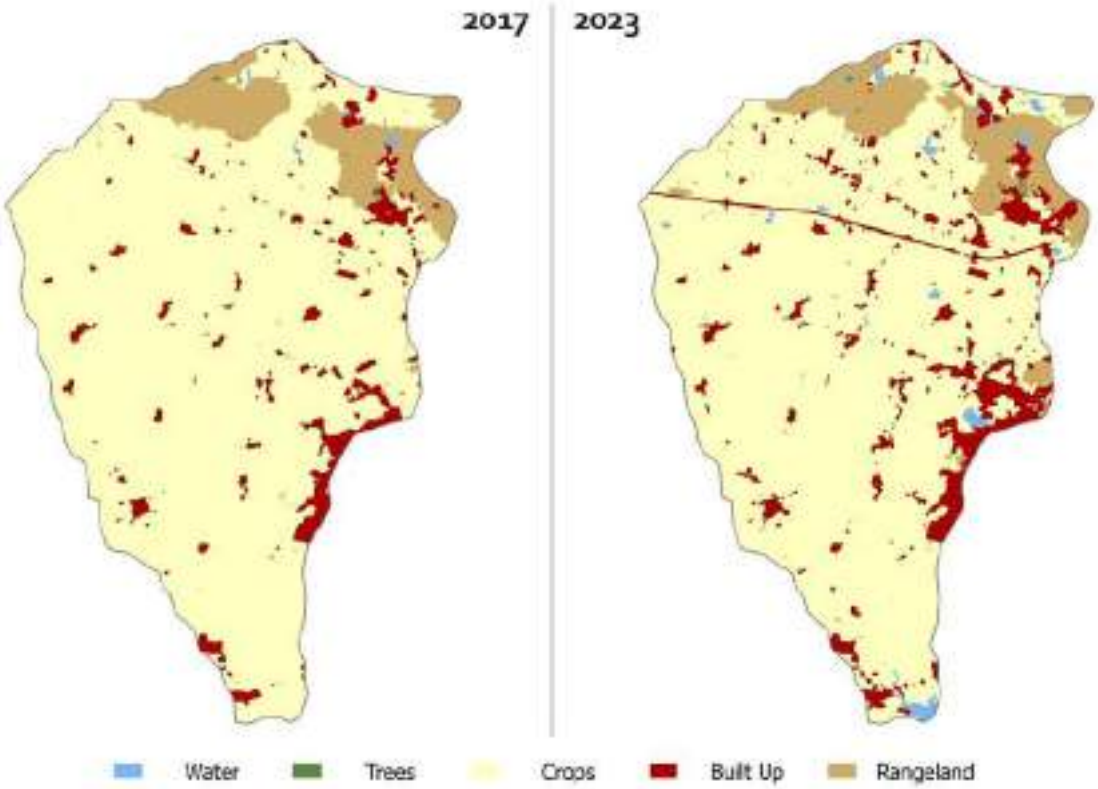


FIGURE 9: PRE AND POST INTERVENTION LULC OF THE INTERVENTION WATERSHED

It can be observed from the above table and charts that in terms of total area, the area under crops is the highest, followed by similar values for built-up areas and rangelands. Looking at the changes in land use that have happened through the course of the intervention period and since, major changes can be observed in the growth of areas under water and trees, minor reduction in the area under crops and minor growth in the area built up and rangelands. In terms of total area, the reduction in area under crops can be attributed mainly to the increase in built-up area. The following section will offer more clarity on the changes to cropping intensity.

6

VEGETATION INDEX (VI)/CROPPING INTENSITY

Vegetation Indices are combinations of surface reflectance at two or more wavelengths designed to highlight a particular property of vegetation. They are derived using the reflectance properties of vegetation. For this assessment, the Normalised Difference Vegetation Index (NDVI) is used. NDVI is an indicator that shows the greenness, density, and health of vegetation in each pixel of a satellite image. The index detects and quantifies the presence of living green vegetation using this reflected light in the visible and near-infrared bands.

The standard formula for calculating NDVI is: NDVI = (NIR – red) / (NIR + red)

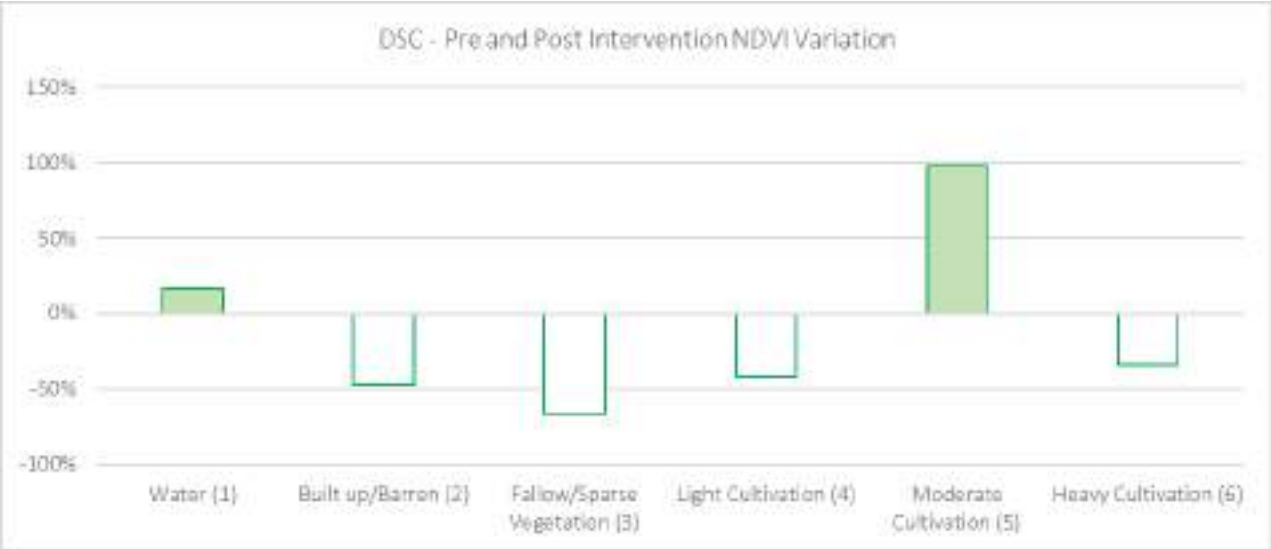
NIR is the near infra-red, band 8, and red, band 4 of Sentinel-2 imagery. Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states.

The NDVI value ranges from -1 to 1 and shows the vigour of the crop:

- **Values close to 1:** the more intense the green, the more vigorous the vegetation and vegetation cover. Considerations for the type of farming, bare soil, etc. must be made. The index also measures the vigour of the underbrush.
- **Values close to 0:** areas with very little vegetation, early stages of cultivation, bare soil, or non-productive areas.
- **Negative values:** usually associated with areas of water, snow, or clouds.

TABLE 12: ZONAL STATISTICS VALUES OF THE VEGETATION INDEX

District	Aurangabad				
Organization	DSC				
Total Area of Watershed (Sq. Km.)	243.3654				
Soil Group	D				
Vegetation Index Classes	VI - 2017		VI - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.4690	0.19	0.5489	0.23	17.04%
Built up/Barren (2)	26.8816	11.05	14.3175	5.88	-46.74%
Fallow/Sparse Vegetation (3)	42.0204	17.27	14.3308	5.89	-65.90%
Light Cultivation (4)	88.4024	36.32	51.4868	21.16	-41.76%
Moderate Cultivation (5)	80.8450	33.22	159.5403	65.56	97.34%
Heavy Cultivation (6)	4.7071	1.93	3.1048	1.28	-34.04%



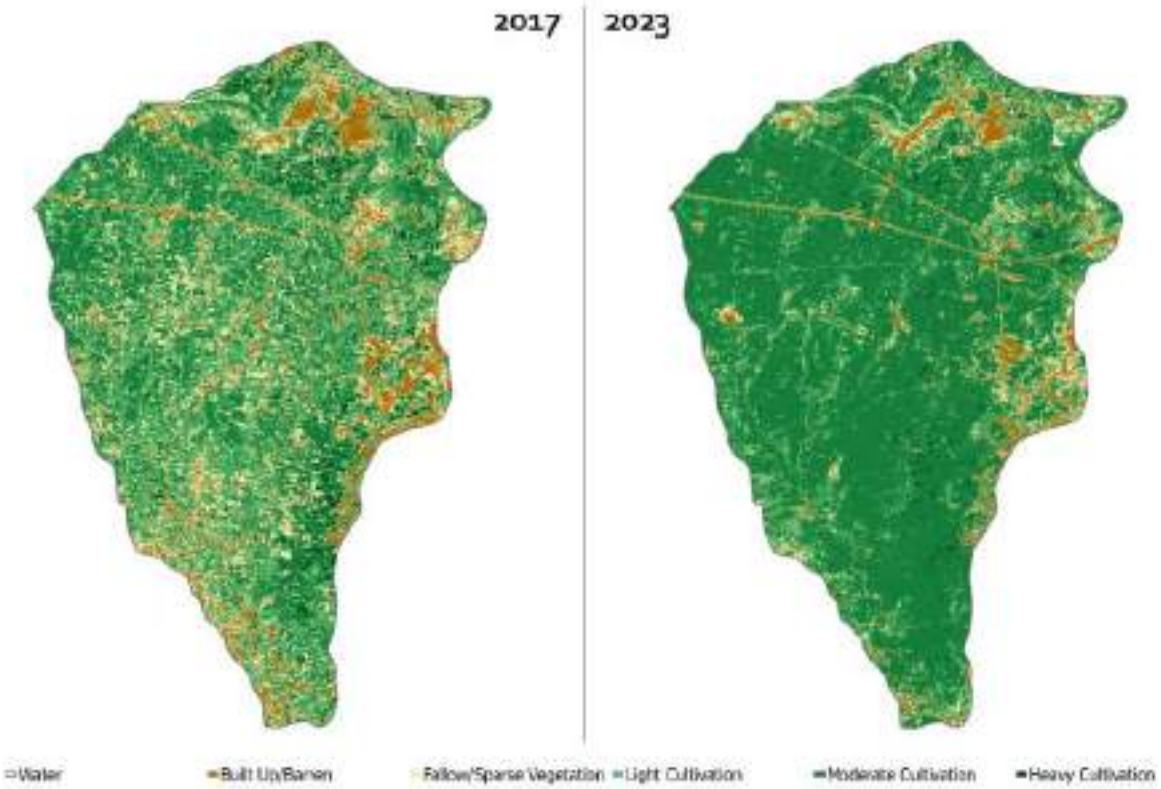


FIGURE 10: PRE AND POST INTERVENTION VEGETATION INDEX ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the vegetation index reveals that in the intervention watershed, the area under moderate cultivation has grown significantly along with the area under water, while the area under other classes has shrunk. With respect to the methodology applied for this analysis, it can be interpreted that the area under light cultivation corresponds to single cropping, moderate cultivation to double cropping and heavy cultivation to triple cropping. Thus, the area under double cropping has increased, indicating improved water accessibility and use, among other factors.

7

SOIL MOISTURE

Surface soil moisture (SSM), defined as the water content of the top few centimetres of soil, is a key variable that affects run-off generation, water recharge and vegetation growth. The Synthetic Aperture Radar (SAR) data from Sentinel-1 satellite is used here to study the surface soil moisture, which is in turn derived from relative soil moisture, which represents the soil moisture for a given soil column on a relative scale between soil saturation and wilting levels.

The surface soil moisture saturation is calculated as percentages using the formula[11]:

$$\mathrm{SSM}(t) = \frac{\Delta\sigma^0(\Theta, t)}{S(\Theta)} \quad [\%]$$

Where Δσ0(Θ,t) represents the change in normalized backscatter (relative to dry conditions), and S(Θ) is the sensitivity to SSM changes at the reference angle. The sensitivity is equivalent to the local backscatter dynamic range, estimated by the difference between normalized backscatter coefficients under wet and dry conditions using,

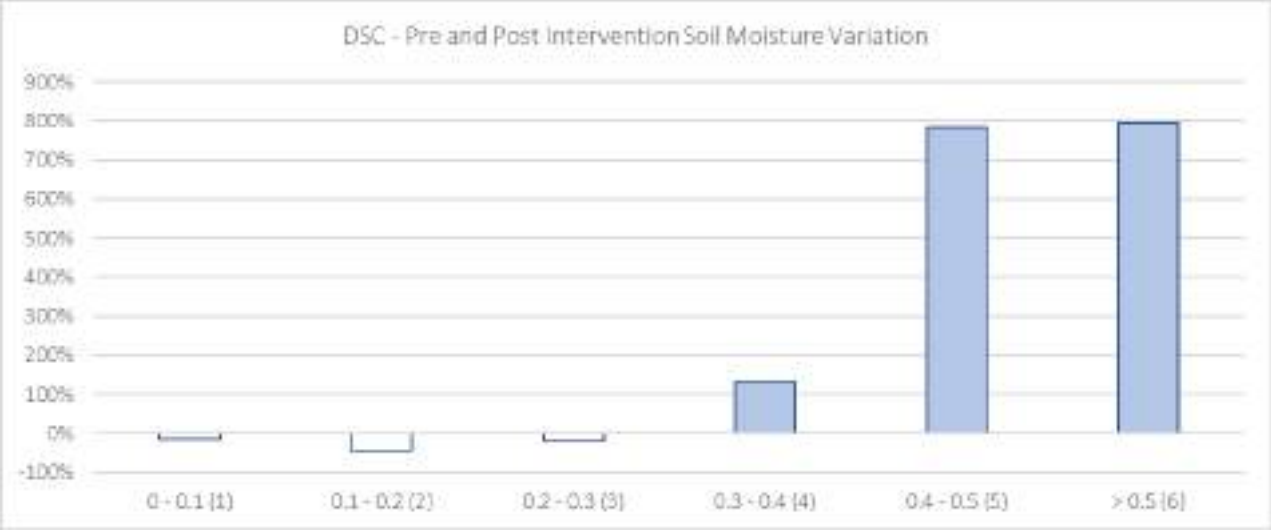
$$S(\Theta) = \sigma^0_{\mathrm{wet}}(\Theta) - \sigma^0_{\mathrm{dry}}(\Theta) \quad [\mathrm{dB}].$$

Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states. The values range from 0 to 100 % where values close to 0 represents water and built-up areas.

TABLE 13: ZONAL STATISTICS OF SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHEDS

District	Aurangabad				
Organization	DSC				
Total Area of Watershed (Sq. Km.)	243.3654				
Soil Group	D				
Soil Moisture Classes	SM - 2017		SM - 2023		% Difference
	Area	% Area	Area	% Area	
0 - 0.1 (1)	38.2169	15.70	33.2725	13.67	-12.94%
0.1 - 0.2 (2)	63.2528	25.99	34.6515	14.24	-45.22%
0.2 - 0.3 (3)	109.8822	45.15	88.8593	36.51	-19.13%
0.3 - 0.4 (4)	29.9928	12.32	69.6398	28.62	132.19%
0.4 - 0.5 (5)	1.7148	0.70	15.1290	6.22	782.25%
> 0.5 (6)	0.1897	0.08	1.6982	0.70	795.04%

[11]Detailed methodology is provided at https://doi.org/10.1109/TGRS.2018.2858004



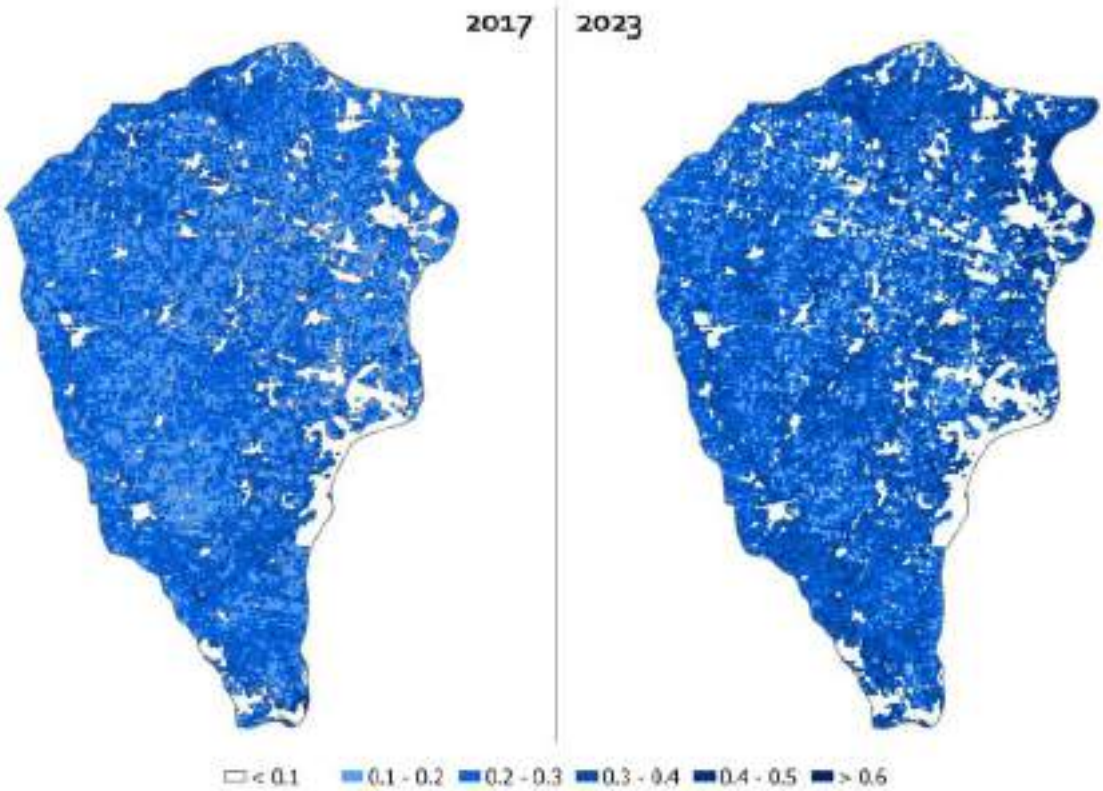


FIGURE 11: PRE AND POST INTERVENTION SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the soil moisture across the intervention watershed shows that there have been significant changes in the values of surface soil moisture over the course of the intervention period and since. The area under soil moisture values greater than 40% has seen a significant increase, while the area under low soil moisture values has reduced. This is to be interpreted because of multiple factors, such as the rainfall received, the vegetative cover, and the availability of surface and ground water, among others.

CONCLUSIONS

This section provides a summary of the key findings of the assessment and the limitations encountered in the process of the assessment. For more accurate quantification outcomes, further studies will have to be done using datasets of higher details and corroboration from the field.

[11] Detailed methodology is provided in https://doi.org/10.1109/TGRS.2018.2858004

KEY FINDINGS

In summation, the key findings from the above assessments are as follows:

- The total surface storage created in the intervention area due to the project is 7,88,703 cubic meters.
- The influence of rainfall on the ground water levels has not been very significant. However, a positive correlation between both was observed.
- The ground water levels in the intervention watershed have been increasing since 2017 and are presently at high values and are expected to persist at similar levels in the coming years. The availability of more recent data will shed more light on the trends that can be expected.
- Ground water recharge directly due to rainfall in the intervention area is about 12.45% of the total rainfall received.
- The volume of surface runoff stored by the intervention measures is 4.91% of the total runoff generated as a part of and due to the interventions (or) 1.47% of the total rainfall received during the period of the project intervention and ever since.
- Analysis of LULC, NDVI, and SSM reveal that there has been a marked increase in area under moderate or double cultivation while the crop cover overall has reduced slightly likely due to the increase in area under built up. The surface soil moisture has shown a remarkable change with most of the area coming under moisture content of more than 40%.

TABLE 14: SUMMARY OF FINDINGS

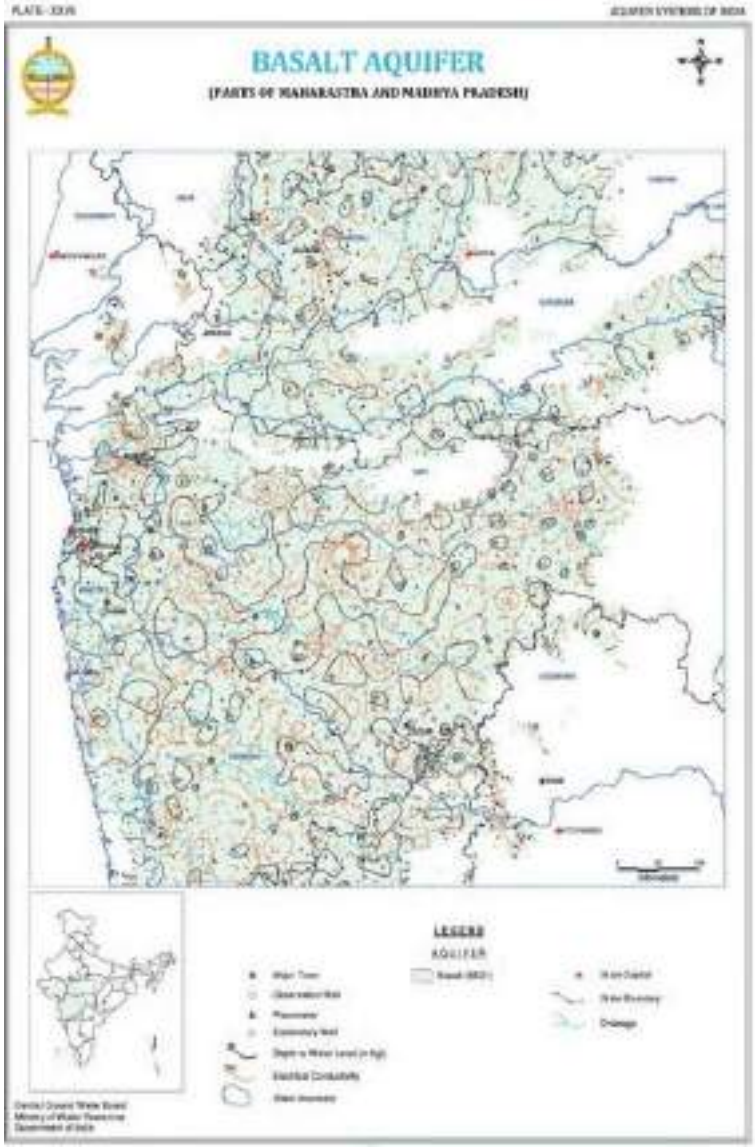
District		Aurangabad
Organization		DSC
Total Area of Watershed (Sq. Km.)		243.3654
Soil Group		D
Volume of Storage Created (Cu. m.)		788703
Total rainfall over intervention area (Cu. m.)		1148626280
Q - Total runoff over intervention area (Cu. m.)		344587884.1
Average % of fullness throughout the intervention period		35.78%
Runoff volume stored in interventions	Pre-evaporation Loss	28216586.21
	Post Evaporation Loss	16929951.73
% of runoff stored by interventions	Pre-evaporation Loss	8.19%
	Post Evaporation Loss	4.91%
% of rainfall stored by interventions	Pre-evaporation Loss	2.46%
	Post Evaporation Loss	1.47%
Surface water contribution to ground water recharge (40%) (Cu. m.)		6771980.69
Recharge only due to rainfall (Entire intervention period and since)	Cu. m.	161474457.9
	%	12.45%

LIMITATIONS

The most significant limitation faced were in terms of data availability. With the resolution of the available open-source satellite imagery being capped at 10m, 30m and 50m, the land use, vegetation index and soil moisture that can be generated respectively also lacks in resolution especially considering the small size of the intervention area that had to be assessed. Assumptions were made to calculate the storage capacity of water harvesting structures. Owing to the limitation in the availability of data on the number of interventions, their locations and the respective dimensions, the assessments are based primarily on data from secondary sources, with the primary data being used wherever possible. Further, most of the secondary data that was available and obtained has shortcomings in one or more areas such as the temporal coverage or the spatial resolution. Further constraints were due to the unavailability of up to date and reliable ground water data. With the continuous measurement of these information the efficiency of the assessment can be improved.

ANNEXURE 1

AQUIFER TYPES



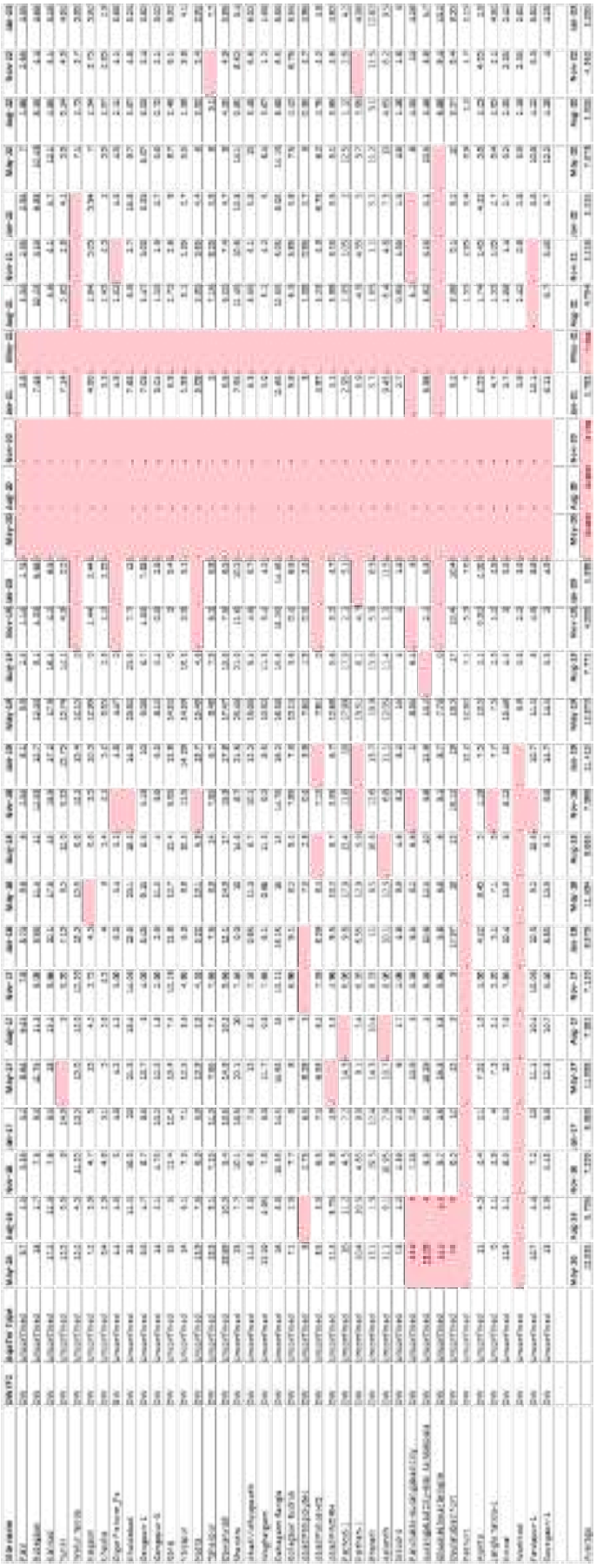
ANNEXURE 2

GROUND WATER DATA FROM NGO PARTNERS

Month	Overall	AFARM	AFPRO	BAIF	JBGVS	MGVS	DSC	SPARSH
Jun-17	16.63291	18.4859	14.58687	10.69306	17.82977		16.94432	
Jul-17	16.26051	17.0063	14.74355	10.21412	17.82977		16.94432	
Aug-17	15.89246	15.97236	14.09885	10.08629	17.82977		16.94432	
Sep-17	15.99119	15.97280	14.48917	10.42155	17.82977		16.94432	
Oct-17	15.91418	16.0541	13.77258	10.6804	17.82977		16.94432	
Nov-17	15.07609	16.14039	14.54373	10.82194	15.75072		16.36963	
Dec-17	15.28061	16.60187	14.73175	11.08952	16.01258		14.60358	
Jan-18	15.78015	17.30227	14.91724	10.10798	16.53142		15.00358	
Feb-18	16.13479	17.84025	14.97115	10.4525	16.72761		15.40358	
Mar-18	16.51477	17.97279	15.38083	10.60847	16.8196		15.50358	
Apr-18	16.62765	18.13107	16.19189	10.57028	16.86864		15.50358	
May-18	16.62098	18.09931	16.19604	10.27359	16.91076		15.73272	
Jun-18	16.89555	18.13702	16.3129	10.57145	16.95413		15.95796	
Jul-18	15.90553	16.68937	14.06222	9.815423	16.06409		15.9358	
Aug-18	15.01052	16.20999	14.10889	9.682651	15.42218		14.55531	
Sep-18	15.05038	16.07885	14.39571	9.481008	15.62163		14.78352	
Oct-18	15.16348	16.10001	14.42797	9.644355	15.78725		15.3284	
Nov-18	15.17444	16.44153	13.33897	9.762581	15.92178		15.36963	
Dec-18	15.36046	16.62517	13.66385	9.907863	16.17475		15.65383	
Jan-19	15.8186	16.82288	15.05846	10.15556	16.86138		15.67173	
Feb-19	16.04574	17.11898	15.06166	10.91272	16.98911		15.80602	
Mar-19	16.07413	17.19947	14.86218	11.01964	17.13002		15.57315	
Apr-19	16.2723	17.34318	15.35987	11.54101	17.14388		15.87414	
May-19	16.44105	17.36081	15.88693	11.99407	17.24754		15.97938	
Jun-19	16.10688	17.2031	15.95713	11.76859	17.25451	0.277391	15.85158	
Jul-19	15.56118	17.31602	16.54885	10.78343	15.61434	0.348696	15.14322	
Aug-19	15.14828	16.84152	16.44286	9.884798	14.79275	3.09913	14.80938	
Sep-19	14.7953	16.09015	16.00323	9.444355	14.64434	4.722174	14.25667	
Oct-19	14.41852	15.59718	16.04696	8.134355	14.7935	3.752174	13.4587	
Nov-19	14.2605	15.71996	16.07115	7.933548	14.79892	2.902609	12.35138	13.85
Dec-19	13.15947	15.16932	12.87619	8.591613	13.02254	2.364783	12.22696	13.86173
Jan-20	13.50751	15.523	11.01615	9.742177	14.02072	2.99913	13.06468	14.10765
Feb-20	13.92775	16.28292	10.32493	10.47444	14.5	2.99913	13.47667	14.35867

Month	Overall	AFARM	AFPRO	BAIF	JBGVS	MGVS	DSC	SPARSH
Mar-20	14.28585	16.56471	11.93991	11.11508	14.50964	0.848261	13.79852	14.71327
Apr-20	14.41209	16.43971	12.63387	11.605	14.51195	0.277391	14.1599	15.18357
May-20	14.42773	16.14196	12.15853	12.86661	14.51303	0.348696	14.2333	16.34796
Jun-20	14.38114	15.66728	11.00691	12.45274	15.42309	0.562609	14.20179	15.32655
Jul-20	9.755855	11.79976	7.473272	8.679274	6.809025	7.867826	12.33864	14.00612
Aug-20	7.548825	9.349132	5.164055	6.860800	4.175814	8.950435	10.91253	13.11888
Sep-20	6.125963	7.931561	3.3447	5.522581	2.989949	11.15043	8.431204	12.19184
Oct-20	5.247161	6.359467	2.800991	2.585645	2.846589	10.53522	8.919444	11.53724
Nov-21	5.501639	6.182822	3.349032	3.729032	3.431144	8.904783	9.05779	11.62806
Dec-21	6.33661	7.110027	4.57894	3.950645	4.446695	7.23087	9.751852	11.74082
Jan-21	7.318161	8.136332	6.028249	5.681855	5.664746	5.543913	9.541019	11.9148
Feb-21	9.133047	8.85904				3.800435	9.106494	12.11633
Mar-21	11.24193	11.52013				2.722174		12.39551
Apr-21	12.19048	12.68736				1.787391		12.96102
May-21	12.71124	13.18658				1.43087		13.91327
Jun-21	12.86181	13.2347				6.348261		13.25663
Jul-21	11.61871	11.62628				7.265652		12.61735
Aug-21	9.965919	9.479765				8.348261		11.82388
Sep-21	5.784916	6.325738				10.47		3.040816
Oct-21	5.898947	5.949663				11.43522		4.445918
Nov-21	6.860644	6.968792				10.17435		5.754082
Dec-21	7.530835	7.799698				9.47		6.258163
Jan-22	8.187615	8.572819				9.083043		7.414286
Feb-22	8.245786	8.184013				9.448261		8.152041
Mar-22	9.660788	10.16328				7.543913		8.62449
Apr-22	11.14324	12.09147				7.335217		9.140816
May-22	12.19883	13.30435				7.161304		10.00816
Jun-22	11.49931	12.10334				7.161304		10.67449
Jul-22	10.85145	11.24381				9.491739		9.973469
Aug-22	8.170429	7.784348				10.87653		8.713265
Sep-22	6.129714	5.404415				11.69826		7.035714
Oct-22	4.264286							4.264286
Nov-22	1.561224							1.561224

GROUND WATER DATA FROM CGWB



ANNEXURE 3
RAINFALL

Monthly rainfall (in mm) trends for Aurangabad from 01-Jan-2018 to 31-Mar-2024

Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)
Jan-17		0.00	Nov-18	24.8	11.03	Sep-20	153.4	197.37	Jul-22	172.8	247.29
Feb-17		0.00	Dec-18	10.3	0	Oct-20	56.9	65.44	Aug-22	175.9	84.34
Mar-17		0.00	Jan-19	2.7	0	Nov-20	24.8	1.45	Sep-22	153.4	255.34
Apr-17		0.00	Feb-19	2.5	0	Dec-20	10.3	1.33	Oct-22	56.9	132.92
May-17		2.44	Mar-19	4.6	0	Jan-21	2.7	12.03	Nov-22	24.8	0
Jun-17		149.79	Apr-19	3.5	0.94	Feb-21	2.5	2.27	Dec-22	10.3	7.04
Jul-17		86.36	May-19	18.9	0	Mar-21	4.6	5.84	Jan-23	2.7	3.14
Aug-17		165.79	Jun-19	134.6	110.63	Apr-21	3.5	4.66	Feb-23	2.5	0
Sep-17		182.62	Jul-19	172.8	162.87	May-21	18.9	30.6	Mar-23	4.6	9.83
Oct-17		95.61	Aug-19	175.9	106.42	Jun-21	134.6	132.15	Apr-23	0	39.76
Nov-17		2.83	Sep-19	153.4	213.73	Jul-21	172.8	142.21	May-23	0	9.41
Dec-17		2.27	Oct-19	56.9	193.39	Aug-21	175.9	186.88	Jun-23	134.6	43.71
Jan-18	2.7	0	Nov-19	24.8	37	Sep-21	153.4	454.42	Jul-23	172.8	173.41
Feb-18	2.5	0.72	Dec-19	10.3	1.46	Oct-21	56.9	106.39	Aug-23	175.9	46.79
Mar-18	4.6	0.53	Jan-20	2.7	0.12	Nov-21	24.8	15.3	Sep-23	153.4	220.1
Apr-18	3.5	2.01	Feb-20	2.5	0	Dec-21	10.3	6.89	Oct-23	56.9	0.85
May-18	18.9	0.17	Mar-20	4.6	22.92	Jan-22	2.7	0.2	Nov-23	24.8	54.85
Jun-18	134.6	126.39	Apr-20	3.5	2.42	Feb-22	2.5	0	Dec-23	10.3	14.13
Jul-18	172.8	85.65	May-20	18.9	6.26	Mar-22	4.6	4.91	Jan-24	0	2.44
Aug-18	175.9	180.45	Jun-20	134.6	251.86	Apr-22	3.5	0	Feb-24	0	2.25
Sep-18	153.4	29.42	Jul-20	172.8	91.32	May-22	18.9	0	Mar-24	0	0.1
Oct-18	56.9	1.65	Aug-20	175.9	221.91	Jun-22	134.6	140.36			

ANNEXURE 4

REGRESSION & CORRELATION

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.028569498
R Square	0.000816216
Adjusted R Square	-0.013457838
Standard Error	3.542306917
Observations	72

Correlation	*Column 1*	*Column 2*
Column 1	1	
Column 2	0.028569498	1

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.717513774	0.717513774	0.057181806	0.811705719
Residual	70	878.3556808	12.5479383		
Total	71	879.0731946			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.29983462	0.520525671	19.7873711	2.20591E-30	9.261678903	11.33799033	9.261678903	11.33799033
X Variable 1	0.001100177	0.004600801	0.239127175	0.811705719	-0.008075832	0.010276186	-0.008075832	0.010276186

ANNEXURE 5

PHOTOS

Latitude: 19.861071
Longitude: 75.141703
Elevation: 464.41±54 m
Accuracy: 5.6 m
Time: 10-04-2024 17:06
Note: ibrahimpur/ bargipur
Powered by NoteCam

GPS Map Camera
Ambelohal, Maharashtra, India
R4QQ+WMM, Ambelohal, Rampuri, Maharashtra 431002, India
Lat 19.841617°
Long 75.138872°
05/10/24 11:25 AM GMT +05:30
Google

GPS Map Camera
Ambelohal, Maharashtra, India
R4QQ+WMM, Ambelohal, Rampuri, Maharashtra 431002, India
Lat 19.841617°
Long 75.138872°
05/10/24 11:25 AM GMT +05:30
Google

GPS Map Camera
Chhatrapati Sambhajinagar (Aurangabad), Maharashtra, India
W5GJ+59M, Chhatrapati Sambhajinagar (Aurangabad), Pekalwadi, Maharashtra
431602, India
Lat 19.92585°
Long 75.181143°
06/10/24 11:13 AM GMT +05:30
Google

CHAPTER 9
RECOMMENDATIONS

STRENGTHEN MARKET LINKAGES

Establishing stronger market linkages is essential to build on the increased agricultural productivity and income achieved through this intervention. Enhancing access to both local and regional markets will ensure farmers receive fair prices for their produce and increase profitability. Collaboration with government agencies, agribusinesses, and cooperatives can expand market reach and support sustainable livelihoods.

ENCOURAGE KNOWLEDGE SHARING AND PEER LEARNING

Encourage farmers to share knowledge through peer learning networks. Setting up community groups, organising farm visits, and hosting hands-on workshops can help farmers learn from each other's successes and challenges, build community bonds, and make it easier to adopt new techniques.

10. SUSTAINABILITY

The long-term success of any development initiative relies on its sustainability, and the Bajaj Water Conservation Project (BWCP), implemented by the Development Support Centre (DSC), exemplifies a strong commitment to sustainability across institutional, environmental, economic, and social dimensions.

The long-term success of any development initiative relied on its sustainability, and the Bajaj Water Conservation Project (BWCP), implemented by the Development Support Centre (DSC), demonstrated a strong commitment to sustainability across institutional, environmental, economic, and social dimensions. Institutionally, the project fostered sustainability through community ownership and participation by establishing and strengthening Village Development Committees (VDCs) and Water User Groups (WUGs), ensuring local involvement in maintaining water resources. Additionally, capacity-building initiatives equipped farmers with essential skills in sustainable agricultural practices, fostering long-term knowledge transfer. The collaboration between DSC, Bajaj Auto Limited, and local government bodies enhanced project longevity by providing continued support and access to resources.

From an environmental perspective, the BWCP promoted water conservation through the construction of recharge shafts, check dams, and community water tanks, which improved groundwater levels and reduced reliance on water tankers. The adoption of organic farming methods and micro-irrigation techniques further contributed to sustainability by enhancing soil health and water-use efficiency. Economically, the project led to increased agricultural productivity, enabling farmers to cultivate multiple crops annually, thus boosting their income and overall economic resilience. Reduced dependency on costly water tankers translated into financial savings, while the rise in agricultural activity created employment opportunities. Socially, the project improved livelihoods by increasing household income, enhancing food security, and alleviating financial stress. The involvement of women in self-help groups (SHGs) and VDCs suggested a potential increase in their empowerment and decision-making roles, although further research was needed to assess gender-specific impacts. Strengthened community cohesion through collective water resource management also contributed to long-term sustainability.

However, certain challenges posed risks to sustainability, including the long-term maintenance of water conservation infrastructure, the uncertainty of rainfall due to climate change, and potential market fluctuations affecting farmers' income.

CHAPTER 11
CONCLUSION

The intervention by the Development Support Centre (DSC), in partnership with the Bajaj Water Conservation Project, has profoundly impacted the agricultural communities in the fifteen villages in Gangapur and Aurangabad talukas of Maharashtra. Through a multifaceted approach that included the construction of water conservation structures, the promotion of sustainable farming techniques, and the strengthening of community-based organisations such as Water User Groups (WUGs) and Self-Help Groups (SHGs), the program has addressed critical challenges of water scarcity and low agricultural productivity.

The outcomes of this intervention are significant, with improved access to water for irrigation and drinking purposes, higher crop yields, and enhanced income levels for farmers. Additionally, the promotion of sustainable agricultural practices has contributed to long-term resilience by fostering a self-reliant and resource-efficient farming community. The success of the project highlights the importance of a community-driven approach in overcoming environmental and economic challenges, ensuring not only immediate benefits but also lasting improvements in agricultural productivity and rural livelihoods.

IMPACT ASSESSMENT REPORT

DOOSRA DASHAK

Implementing Partner: Foundation for Education and Development

Release Date: 31-12-2024

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CEC	Continuing Education Center
FED	Foundation for Education and Development
LSE	Life Skills Education
NEP	National Policy on Education
NGO	Non-Governmental Organisation
NRLM	National Rural Livelihoods Mission
PRI	Panchayati Raj Institution
SDGs	Sustainable Development Goals
SDMC	School Development and Monitoring Committee
SMC	School Management Committee
SSA	Sarva Shiksha Abhiyan

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The project, implemented by the Foundation for Education and Development supported by Bajaj Auto Limited, aimed to support adolescents in rural areas through the Doosra Dashak program. The initiative focused on building an educational support system in villages to help children continue their education and improve their future prospects.The activities included conducting awareness campaigns and collecting data on out-of-school children in the community. The program also organised residential camps for literacy and numeracy lessons, arts and crafts and science education.

PROJECT DETAILS

Implementation year

FY 2019 - FY 2022

Assessment year

FY 2024 - FY 2025

Implementing Partner

Foundation for Education and Development

Project location

Sirohi, Rajasthan

Beneficiaries

6,374 Children and adolescents and local communities from 20 villages

Budget

₹168.88 lakhs

Alignment with SDGs

Alignment with National Policies

- National Policy on Education
- Sarva Shiksha Abhiyan
- Beti Bachao Beti Padhao
- National Policy for the Empowerment of Women
- National Rural Livelihoods Mission

PROJECT ACTIVITY

The Doosra Dashak program focused on improving the educational opportunities and life skills of adolescents aged 15-20 in rural areas. The project aimed to reintegrate out-of-school adolescents through open school preparation camps and residential camps. The Ikhvelo - Continuing Education Center (CEC) was established to support ongoing education. The key activities included life skills training, vocational preparedness and financial literacy training for young girls and women. The program also emphasised sexual and reproductive health and rights education along with capacity building for anganwadi workers, SMC members, PRI members and government teachers.The staff members received technology-mediated training and capacity building to ensure effective implementation. The community mobilisers played a vital role in promoting school and Anganwadi enrolment. Regular review and planning meetings were conducted to assess progress and ensure the sustainability of the project.

Key Findings

99.2%
of the respondents were taught reading and writing in the residential program.

97.5%
of the respondents received numeracy lessons in the residential program.

92.5% & 66.7%
of the respondents were engaged in arts and crafts and studied science, respectively.

85.0%
of the respondents learned to recognise and read new words.

71.7%
of the respondents practised reading aloud with correct pronunciation in reading practice.

87.5%
of the respondents learned to recognise and write numbers in numeracy class.

76.7%
of the respondents practised addition and subtraction in numeracy class.

99.2%
of the respondents identified the risk of theft while keeping money at home.

97.5%
of the respondents preferred saving in banks for security and access to other services.

Key Impacts

100%
of the respondents became confident in both reading and numeracy skills.

98.3%
of the respondents found school studies very interesting after the residential program.

95.8%
of the respondents experienced increased knowledge of reproductive health during adolescence.

95.8% & 95.0%
of the respondents understood emotional changes as mood swings and social changes as increased peer influence, respectively.

96.7%
of the respondents used hygienic materials during menstrual hygiene practices.

96.7%
of the respondents expressed creativity through drawing or painting and believed effective communication was speaking clearly and confidently.

03. OECD FRAMEWORK

RELEVANCE

The program was relevant to the specific needs of adolescents in rural areas, particularly those who had limited access to formal education. It addressed the challenges faced by these adolescents, such as long distances to schools, the need to work, and a lack of awareness about reproductive health. The program's focus on literacy, numeracy, life skills, and vocational preparedness ensured that it met the educational and developmental needs of the youth, providing them with tools to become more self-reliant.

COHERENCE

The project aligned well with global and national goals. Nationally, the program was consistent with policies like the National Policy on Education, Sarva Shiksha Abhiyan, Beti Bachao Beti Padhao, the National Policy for the Empowerment of Women, and the National Rural Livelihoods Mission, focusing on education, empowerment, and livelihood opportunities for adolescents in rural areas. The project was also well aligned with the following SDGs:

EFFECTIVENESS

The project proved effective in achieving its goals, as evidenced by the high percentage of participants who gained confidence in literacy and numeracy skills. The program successfully reintegrated many adolescents into educational activities and increased awareness of critical issues like menstrual hygiene and reproductive health. The training of teachers, community workers, and families further enhanced the program's effectiveness by ensuring ongoing support for the participants, leading to improved learning outcomes and greater community involvement in education.

EFFICIENCY

The project utilised resources efficiently by organising residential camps that provided a structured learning environment for adolescents. The limited availability of resources such as laptops and external academic support was a challenge; however, the use of local teachers and community workers ensured that the program could continue with minimal external dependence. Regular review and planning meetings helped in streamlining activities and addressing any gaps in implementation, which contributed to the efficient running of the project.

IMPACT

The Doosra Dashak program had a significant impact on both the participants and the community. Adolescents who had previously struggled with basic literacy and numeracy gained confidence and found school studies more interesting. The focus on financial literacy and reproductive health education also equipped the participants with essential life skills. At the family and community levels, the program encouraged greater support for education, improved health practices, and strengthened financial planning, creating a positive ripple effect across different levels of society.

SUSTAINABILITY

The program was designed with sustainability in mind by building capacity at the community level through the training of teachers, anganwadi workers, and community mobilisers. The involvement of local institutions and regular monitoring ensured that the educational and health benefits of the program could be maintained beyond its initial implementation. The continued investment in residential camps and learning centres across the state also contributed to the program's long-term sustainability, providing ongoing support for adolescents and their families.

CHAPTER 4
INTRODUCTION

FGD with Panchayat Body, Parents & SMC members

BACKGROUND AND NEED OF THE PROGRAM

The Doosra Dashak residential program was designed to address the educational challenges experienced by children in rural areas.A significant proportion of participants had either never attended school or had received only limited schooling, often due to factors such as the long distance to schools and the need to work or assist with household chores. The program catered to a diverse group—primarily adolescents—with a strong emphasis on literacy and numeracy, as many had limited exposure to formal education. The program catered to a diverse group, primarily adolescents, with a strong focus on literacy and numeracy, as many respondents had limited exposure to formal education. The need for such a program was evident, as most participants struggled with basic reading, writing, and comprehension skills. Reading practice sessions which emphasised recognising new words, correct pronunciation and understanding stories were essential to bridge educational gaps. Other foundational subjects helped with the learning experience while also meeting the needs of the children at different academic levels. The program thus provided the necessary learning support along with a structured learning environment for children who had previously been deprived of consistent schooling.

OBJECTIVES OF THE PROGRAM

To provide a second chance of education to out-of-school adolescents through residential camps, offering continuous learning opportunities for children, adolescents, and local communities.

To impart life and work skills to adolescents through demand-driven, short-duration camps, ensuring access to education and essential life skills.

To create a safe, supportive, and conducive residential environment that fosters holistic development, focusing on literacy, numeracy, and creative skills.

To facilitate overall growth through structured programs, including sessions on financial literacy, reproductive health, and essential life skills.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT THE NGO

Foundation for Education and Development is a public charitable trust established in 2000 by five distinguished educationists. In June 2001, FED launched its field initiative Doosra Dashak, which means "the second decade." Initially supported by the Tata Education Trust, the program began in two blocks of Rajasthan, Jodhpur and Baran. Since then, it has expanded to 1143 revenue villages across 238 panchayats in 9 blocks within 7 districts of Rajasthan, reaching over 1,11,209 adolescents. FED is governed by a Board of Trustees consisting of respected academicians, administrators, and educationists. The board has formed an Executive Committee to manage the Doosra Dashak project, granting it full administrative and financial authority. The Managing Trustee, who chairs the Executive Committee, oversees the policies and programs of the project.

FGD WITH STUDENTS AT UPLAGARH

CHAPTER 5
RESEARCH METHODOLOGY

This chapter explores the objectives and methodology of the study, focusing on assessing the impact of training programs on the education and developmental skills of the children. It examines the problems faced by children in attending school before joining the residential program, the effectiveness of the program in improving literacy and numeracy, and how teaching methods influence learning. The study also looks at how financial literacy promoted responsible saving habits, the challenges students encountered during puberty and the importance of life skills in building self-awareness and communication abilities.

OBJECTIVES OF THE STUDY

- To assess the impact of educational barriers on the attendance of the children before joining the residential program.
- To examine the effectiveness of the residential program in enhancing literacy and numeracy skills.
- To evaluate how teaching practices improve reading comprehension and numeracy among students.
- To analyse the role of financial literacy education in fostering responsible savings and financial planning.
- To identify challenges faced by students during puberty regarding emotional and reproductive health.
- To review the significance of life skills education in developing self-awareness and communication skills.

USE OF MIXED METHOD APPROACH

The evaluation used a mixed methods approach that combined qualitative and quantitative research techniques. The qualitative part focused on gathering the opinions and experiences of key stakeholders to better understand their views. On the other hand, the quantitative methods collected and analysed numerical data from respondents to reveal statistical insights and trends.

By combining these two methods, the evaluation gained both detailed personal stories and data-driven insights, providing a complete view of the progress and results of the project.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques offer an objective way to assess the project and its impact through data analysis. Surveys and questionnaires gather numerical information from beneficiaries on various indicators. Comparing this data before and after the intervention helps identify the effects and improvements of the project. These methods provide a clear and measurable way to evaluate the success of the project using statistical evidence.

APPLICATION OF QUALITATIVE TECHNIQUES

Interviews were held with key stakeholders involved in the project to gain a detailed understanding of the initiative. These discussions captured their insights, experiences, and perspectives, providing valuable context about the implementation and impact of the project. This approach allowed for a deeper exploration of the challenges, successes, and outcomes of those directly engaged in the initiative.

ENSURING TRIANGULATION

The study used several strategies to make sure the findings were trustworthy and correct. Information was gathered from different sources, including field observations, interviews with participants, community discussions, and feedback from project volunteers. This organised approach helped clarify the outcomes of the program. A combination of research methods, like interviews and case studies, was used to check the data against each other, reducing bias. These methods strengthened the analysis and made the conclusions more reliable.

DATA QUALITY CONTROL AND ANALYSIS

The study used a centralised dashboard and an internal app to monitor data in real time, which helped ensure accuracy and allow for quick corrective actions when necessary. It also used different descriptive statistical methods and visual tools to organise and understand data patterns, highlighting various features and trends.

SAMPLING FRAMEWORK

The study used a stratified random sampling method to secure a wide representation of different sub-groups within the target population. For qualitative engagement, purposive sampling was applied to specifically include key stakeholders in the discussions.

Stratified random sampling involves categorising the population into distinct subgroups and then randomly selecting participants from each group to capture a diverse and representative sample.

Purposive sampling, on the other hand, is a targeted method where individuals or groups are deliberately chosen based on their specific traits or expertise, offering in-depth and focused insights on the research subject.

STANDARDISED FRAMEWORK FOR EVALUATION

The research study followed the OECD DAC framework to meet international standards and maintain a consistent evaluation of the impact of the project. This framework improved the credibility and relevance of the findings, providing a strong basis for assessing the outcomes.

DESIGN SNAPSHOT

Name of the project

Doosra Dashak

Implementing agency

Foundation for Education and Development

Research design used

Descriptive research design

Sampling technique

Random Stratified sampling

Sample size

150

KEY STAKEHOLDERS

Principals

Teachers

SMC, AWW and PRI members

UPHOLDING RESEARCH ETHICS

The impact assessment study followed strict ethical standards at all stages of the process.

INFORMED CONSENT

Participants received detailed information about the objectives, methods, potential risks and benefits of the study before agreeing to join. They took part voluntarily and understood the purpose of the research.

CONFIDENTIALITY

Information pertaining to participants was carefully safeguarded, developing a sense of trust.

DATA SECURITY AND ANONYMITY

The confidentiality and privacy of personal data were carefully maintained during the research. All collected information was securely stored and only accessible to authorised personnel.

Any shared data were anonymised to protect privacy.

NON-MALEFICENCE

The well-being of participants was prioritised, ensuring that no harm resulted from the research activities.

INTEGRITY

The research maintained high credibility by using clear and honest methods.

JUSTICE

All participants were treated equitably, ensuring fairness and impartiality throughout the research process.

GROUP INTERACTION WITH STAKEHOLDERS

CHAPTER 6
KEY STUDY FINDINGS AND IMPACT

The chapter explores the findings and impact of the residential program aimed at helping children attend school. It looks at reasons for dropping out, subjects taught, and skills learned. The chapter shows the increased confidence of the children in reading and math, their interest in continuing their education and their understanding of life skills and financial literacy, demonstrating the effectiveness of the program in supporting their growth.

GEOGRAPHICAL COVERAGE

The study covered the sample size from four villages (Nichlagarh, Uplagarh, Raada and Uplakhejda) of Abu Road Block, Sirohi District, Southern Rajasthan.

OUTREACH AND INCLUSIVITY

The primary beneficiaries of the program were adolescents coming from underprivileged and marginalised communities.

RESIDENTIAL PROGRAM BENEFICIARIES

KEY FINDINGS

SOCIO-ECONOMIC AND DEMOGRAPHIC PROFILE OF THE POPULATION

CHART 1: AGE-WISE DISTRIBUTION OF THE RESPONDENTS

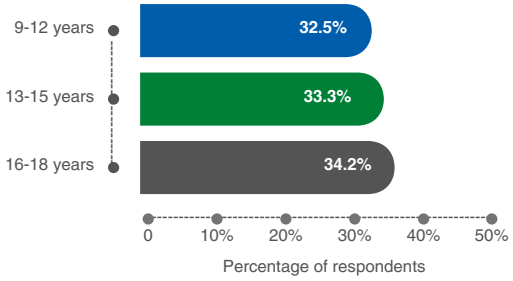


CHART 2: GENDER DISTRIBUTION

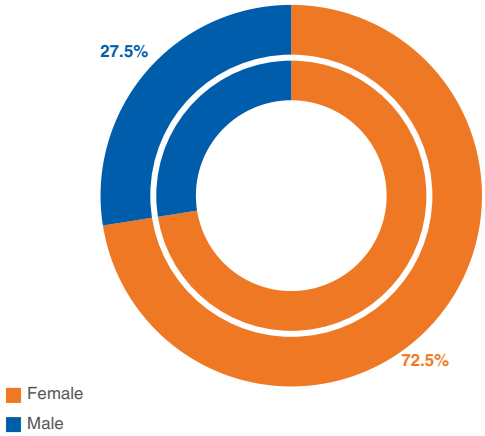
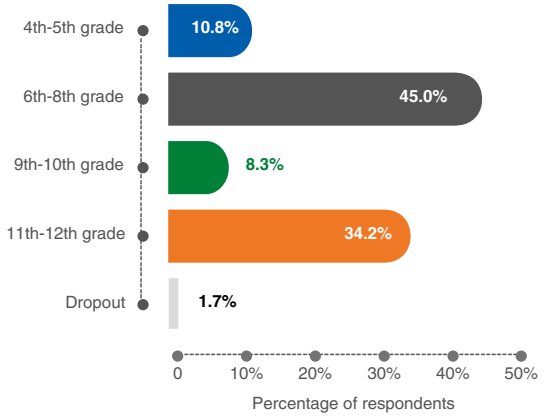


CHART 3: GRADE STUDYING AT PRESENT



- One-third of the respondents were aged between 16 and 18 years, with a similar number in the 13 to 15 years of age group, and nearly the same proportion of respondents belonged to the 9 to 12 years of age group.
- A vast majority of the respondents were female.
- A large majority of the respondents were studying in the 6th to 8th grade, and a substantial number of respondents were in the 11th to 12th grade.

FGD WITH SCHOOL STUDENTS AT UPLAGARH

CHART 4: EDUCATIONAL LEVEL PRIOR TO JOINING THE DOOSRA DASHAK RESIDENTIAL PROGRAM

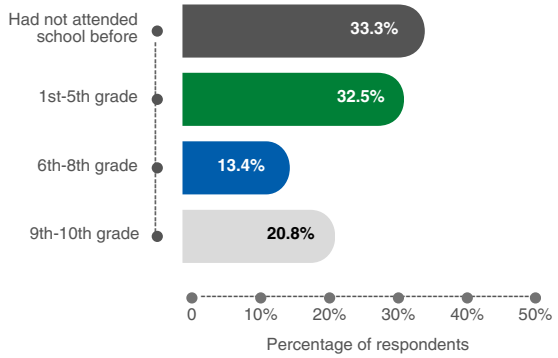
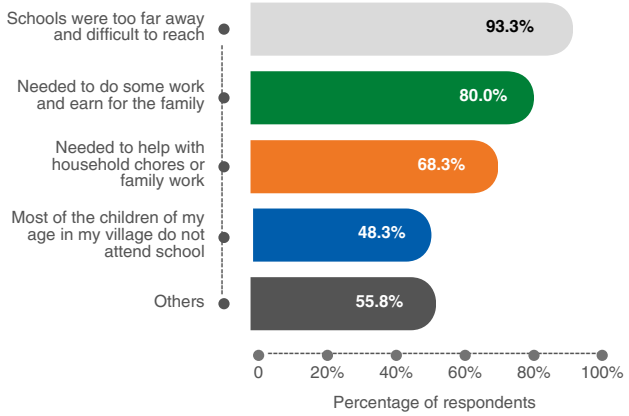
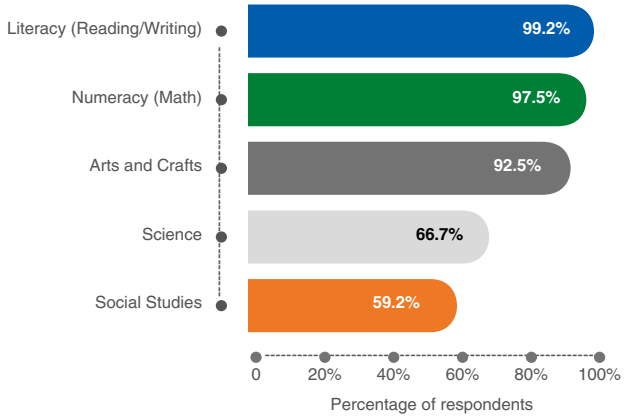


CHART 5: REASON FOR LEAVING SCHOOL BEFORE JOINING DOOSRA DASHAK



- One-third of the respondents had not attended school before joining the residential program. A similar number of respondents had studied up to the 1st to 5th grade. A smaller group had completed their education up to the 9th to 10th grade.
- The vast majority 93.3% of the respondents reported that schools were too far away and difficult to reach as a reason for not being able to go to school/ dropping out of school prior to admission in the residential program of Doosra Dashak. A large majority (80.0%) stated they needed to do some work to earn money for their family; a considerable number (68.3%) of the respondents said they needed to help with household chores or family work. A substantial majority of the respondents (55.8%) mentioned various other reasons for the dropping out.

CHART 6: SUBJECTS PRIMARILY TAUGHT IN THE RESIDENTIAL PROGRAM



Almost all of the respondents mentioned participating in basic literacy reading and writing instruction in the residential program. The vast majority (97.5%) of the respondents also engaged in numeracy. A similarly significant number (92.5%) of the respondents took part in arts and crafts. Science education was included for a moderate proportion (66.7%) of participants. Also, a smaller group (59.2%) of the respondents studied social studies primarily taught in the residential program.

> "In the residential program we learned a lot about reading and writing and then practiced mathematics also in a creative way. We also studied science and social studies. But I liked arts and crafts, and it was exciting because we made things with our hands. Also, the teachers were nice and helped us understand the concepts better. It made my learning easier and supported my study. I learned not only from books and teachers but also from my friends."
>
> **Savli Kumari, Nichlagarh**

INTERVIEW: REKHA DEVI, SARPANCH OF GRAM PANCHAYAT NICHLAGARH

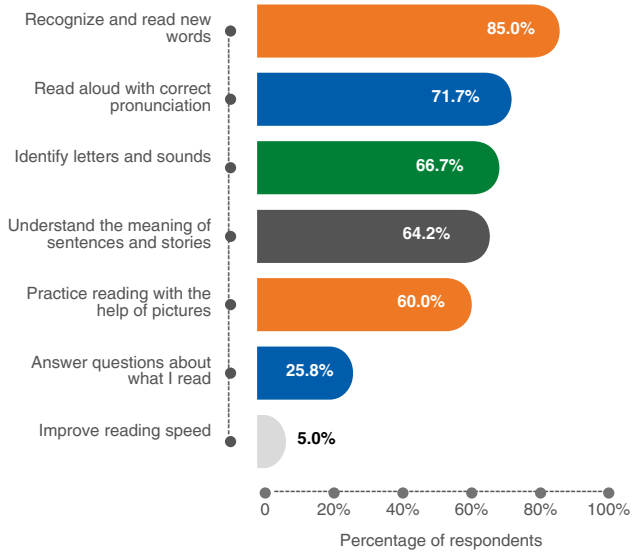
Rekha was the Sarpanch of Gram Panchayat Nichlagarh and had a journey filled with hope and dreams. Born into a family of five, with her father being the only earning member, she had to face many challenges and gave up her own dreams to help her family. While her siblings attended school, Rekha took care of the household but never stopped wanting to study. Her life changed when she heard about a residential camp under Doosra Dashak that provided academic support.

After four months in the camp, she joined the 4th class at a government school. However, due to the distance and other circumstances, she had to drop out, but her desire to learn only grew stronger. Rekha later got another chance to join a residential camp for out-of-school girls in Pindwara Block again through Doosra Dashak. This time, she successfully enrolled in the 8th class and continued her education until she completed the 12th class. After finishing school, she worked as a teacher at a residential camp for four months. Later, she became a preschool teacher with Bodh Siksha Samiti for one and a half years. She also worked as a Cluster Coordinator for the Rajivika Self-Help Group. Her dedication and hard work led her to run for Sarpanch, and she won, becoming the Sarpanch of Nichlagarh Gram Panchayat. Recently, she was honoured by President Draupadi Murmu with the Adigramotthan Gourav Award for her excellent work in carrying out government schemes related to health, education and cleanliness. The story of Rekha Devi is an example of how determination can overcome challenges, and her journey inspired many in her community.

REKHA DEVI WAS HONORED BY THE PRESIDENT OF INDIA, DRAUPADI MURMU, WITH THE ADIGRAMOTTHAN GOURAV AWARD

GROUP ACTIVITIES WITH SUPPORT FROM REKHA DEVI, SARPANCH, NICHLAGARH

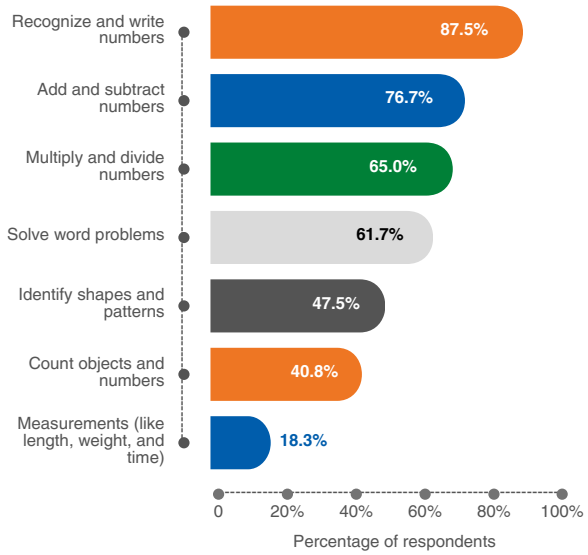
CHART 7: THINGS TAUGHT DURING READING PRACTICE



A large majority of the respondents focused on recognising and reading new words during reading practice. A large number (71.7%) of the respondents practised reading aloud with correct pronunciation, while a significant portion (66.7%) learned to identify letters and sounds. Many respondents (64.2%) worked on understanding sentences and stories, a smaller group practised reading with pictures and a considerable portion of the respondents either engaged in answering questions about what they read or improved their reading speed.

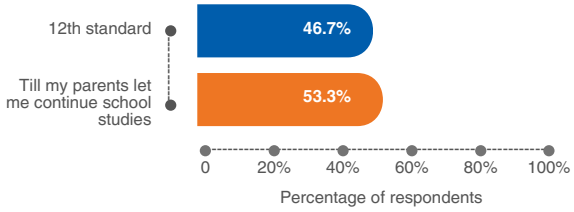
> I witnessed the impact of child marriage on my friend. She had to give up her education when she got married at a young age. It became difficult for her to continue learning and stay in school. After her marriage, she faced serious health problems that affected her well-being. She wasn't prepared for the responsibilities of being a wife and mother. I understand that child marriage is illegal and that these laws exist to safeguard children and ensure they have a brighter future. No child should have to experience this.
>
> **Somi Kumari, Uplagarh**

CHART 8: THINGS TAUGHT DURING NUMERACY CLASS



Majority of the respondents (87.5%) mentioned that they were taught to recognise and write numbers during numeracy class, followed by a significant majority (76.7%) who learned how to add and subtract, and 65.0% were taught multiplication and division. A slightly lower percentage (61.7%) stated they learned how to solve word problems, and a notable majority were taught to identify shapes and patterns, while a considerable portion practised counting objects and numbers.

CHART 9: STANDARD TILL WHICH THE RESPONDENTS WISH TO STUDY



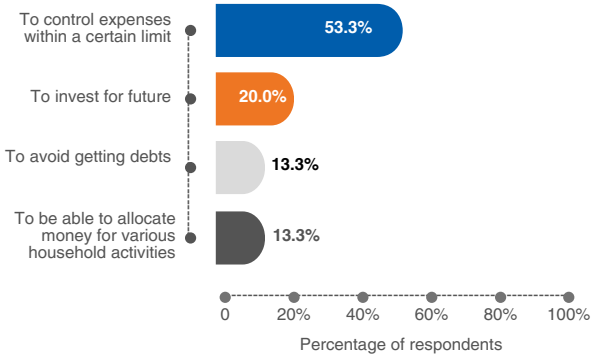
Slightly more than half (53.3%) of the respondents plan to continue their education as long as their parents permit, while nearly half (46.7%) of the respondents aim to study until the 12th standard.

SUCCESS STORY: BREAKING THE STEREOTYPE, CHANDAN KUMAR AND BABURAM

Chandan Kumar and Baburam are two boys who had to leave school for different reasons. At first, they were not sure about joining the program because it was mainly designed for girls, and they felt it was not the right fit for them and would not benefit them in any manner. However, after realizing how important this opportunity could be for their future, they decided to take the chance and enrol. Their determination and hard work paid off when they successfully passed their 10th exams. Now, they have rejoined school as regular students at the Government School in Nichlagarh to continue their education just like any other student. Their journey is an example of how they broke stereotypes and grabbed a second chance to build a brighter future. Despite the initial hesitation, they did not let doubts stop them, showing that anyone can achieve their goals with the right mindset and opportunities.

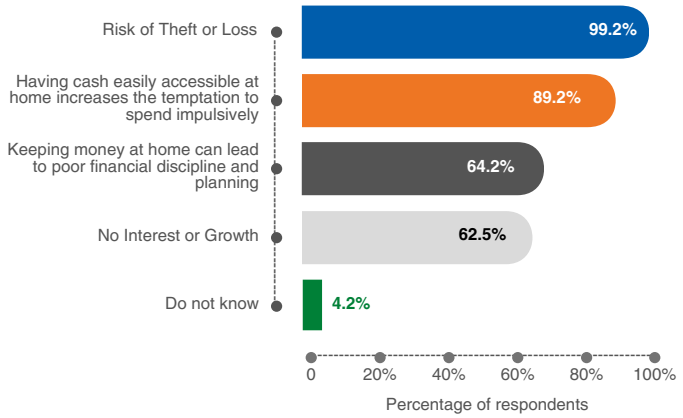
FINANCIAL LITERACY

CHART 10: IMPORTANCE OF PLANNING ABOUT THE MONTHLY EXPENSES AND SAVINGS



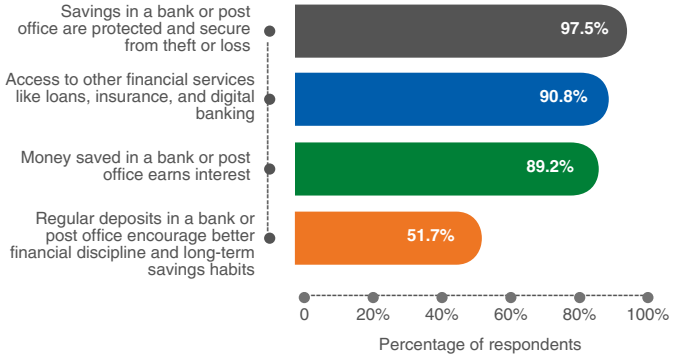
More than half of the respondents (53.3%) felt that planning monthly expenses and savings is important to control expenses within a certain limit, while a notable portion believed it is crucial to invest in the future. A considerable portion of the respondents mentioned either avoiding getting into debt or being able to allocate money for various household activities.

CHART 11: DRAWBACKS OF KEEPING MONEY AT HOME VS. SAVING IN A BANK



Nearly all of the respondents pointed out that one disadvantage of keeping money at home is the risk of theft or loss, while a large majority of the respondents (89.2%) noted that having cash easily accessible can increase the temptation to spend impulsively. 64.2% of the respondents also mentioned that keeping money at home can also lead to poor financial discipline and planning, while 62.5% said that there is no interest or growth in money kept at home.

CHART 12: BENEFITS OF SAVING IN A BANK OR POST OFFICE



Almost all of the respondents reported that saving in a bank or post office is protected and secure from theft or loss, while a majority of the respondents (90.8%) mentioned that it provides access to other financial services like loans, insurance and digital banking. Also, a significant number (89.2%) noted that money saved in a bank or post office earns interest. Slightly more than half (51.7%) of the respondents stated that regular deposits in a bank or post office encourage better financial discipline and long-term savings habits.

SOULACE TEAM MEMBER INTERACTING WITH HEAD TEACHER, RAADA VILLAGE

AWARENESS OF REPRODUCTIVE SEXUAL HEALTH AND RIGHTS

CHART 13: PHYSICAL CHANGES THAT OCCUR DURING ADOLESCENCE

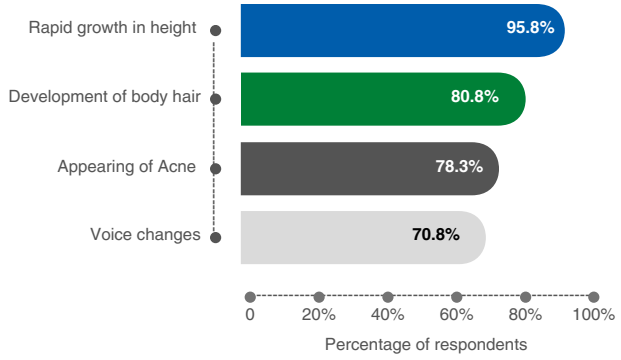
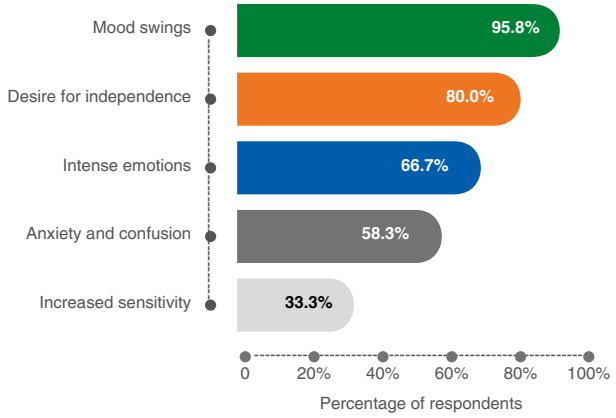
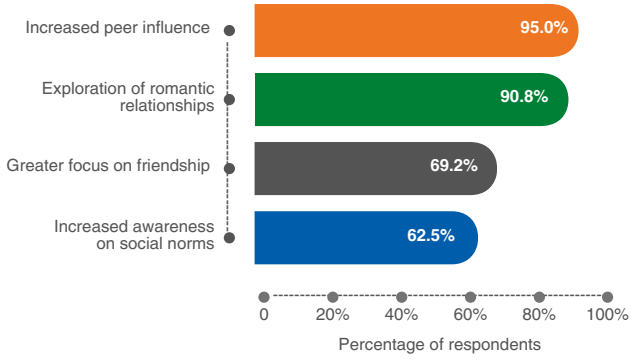


CHART 14: EMOTIONAL CHANGES THAT HAPPEN DURING PUBERTY



> I have been teaching for 21 years and have worked at Nichlagarh School for 17 years. During this time, I have seen the Doosra Dashak program closely. As a teacher, I have taught students about reproductive health and the importance of understanding good and bad touch. The students in the program were disciplined and quick learners, which made teaching enjoyable. I hope the program continues to support children and make a positive difference in their lives and in the community.
>
> **Chogaramji, Teacher at Nichlagarh School**

CHART 15: SOCIAL CHANGES THAT HAPPEN DURING PUBERTY



- 95.8% of the respondents reported experiencing rapid growth in height during adolescence, while 80.8% of the respondents noted the development of body hair in physical changes. Also, a significant majority of the respondents (78.3%) mentioned the appearance of acne in adolescents, and a considerable majority (70.8%) observed changes in their voices during this period.
- 95.8% of the respondents reported experiencing mood swings during puberty, and a large portion (80.0%) of the respondents expressed a desire for independence, while a significant majority of the respondents (66.7%) mentioned feeling intense emotions. More than half (58.3%) of the respondents experienced anxiety and confusion, and a considerable portion noted increased sensitivity during this phase of emotional changes in puberty.
- Nearly all of the respondents said that they experienced increased peer influence during puberty, while a vast majority of the respondents (90.8%) reported exploring romantic relationships. Also, a significant number of the respondents (69.2%) mentioned a greater focus on friendship, and a notable number of the respondents stated an increased awareness of social norms during this developmental stage.

INTERVIEW: GANGA DEVI, ASHA WORKER

Ganga is a 30-year-old Asha worker with great strength and determination. Since 2011, she worked to improve healthcare in her community while promoting girls' education. Her journey was filled with personal struggles and challenges. She was married young and had to leave school in ninth grade due to family responsibilities. She found an academic support program for state open exams, worked hard, passed her 10th grade, and was close to finishing her 12th with just one exam left. As an Asha worker, Ganga made sure women got the medical help they needed and pushed for girls' education. Her belief in gender equality grew from her own experiences. She even enrolled her sister, who had never gone to school in a residential camp, and now her sister is studying for an ANM diploma in medical college with Ganga paying for her education. Her story showed how determination could change lives, inspire others and create a better future for the community.

CHART 16: REASONS FOR AVOIDING CHILD MARRIAGES

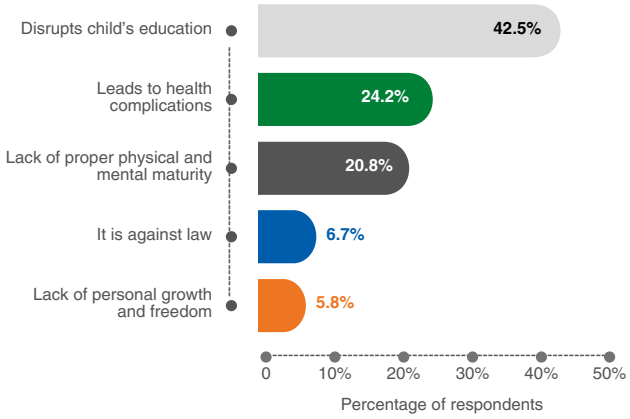
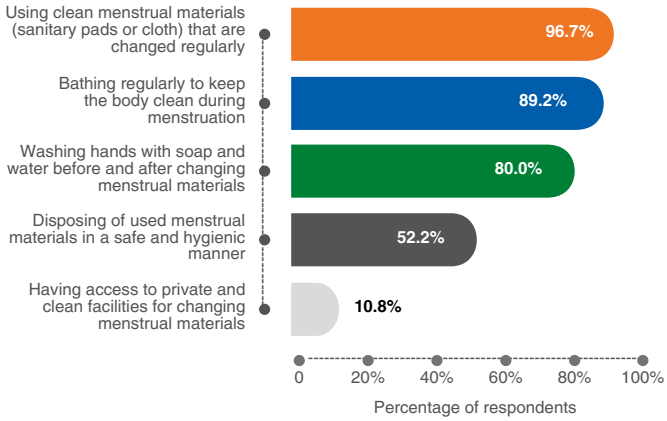


CHART 17: PRACTICES THAT CAN HELP GIRLS MAINTAIN MENSTRUAL HYGIENE



42.5%

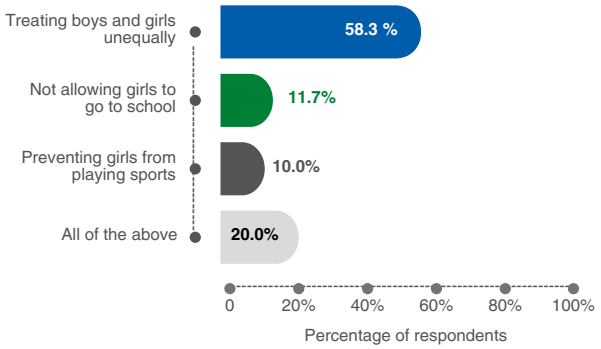
of the respondents stated that avoiding child marriages is important because it disrupts the education of a child. While a notable majority (33.3%) of the respondents gave reasons to avoid child marriage were either a lack of proper physical and mental maturity, lack of personal growth and freedom or one reason which says child marriage is against the law. Also, a considerable portion (24.2%) of the respondents said that it leads to health complications.

Majority of the respondents emphasised the importance of using clean menstrual materials such as sanitary pads or cloth that are changed regularly to maintain menstrual hygiene, while (89.2%) stated the need for bathing regularly to keep the body clean during menstruation. Then, on the one hand, a large majority (80.0%) stressed the importance of washing hands with soap and water before and after changing menstrual materials; on the other hand, slightly more than half (52.2%) of the respondents mentioned the need to dispose of used menstrual materials in a safe and hygienic manner.

> "I saw how child marriage affected my friend. She had to stop her education early because she got married. It was hard for her to keep up with school and learn new things. After the marriage, she had serious health issues that affected her health. She was not ready for the responsibilities of being a wife and mother. Watching her lose her freedom and dreams made me sad. I know that child marriage is against the law meant to protect children and help them have a better life."
>
> **Dharmi, Nichlagarh**

> "Before the residential program, I had no idea about menstrual hygiene but after that I understood why bathing regularly during menstruation is good and when I followed this, I felt more clean and fresh. Disposing of used materials safely is also important. I can access private and clean places for changing my materials makes me feel comfortable and secure."
>
> **Manta Kumari, Uplagarh**

CHART 18: EXAMPLE OF GENDER-BASED DISCRIMINATION

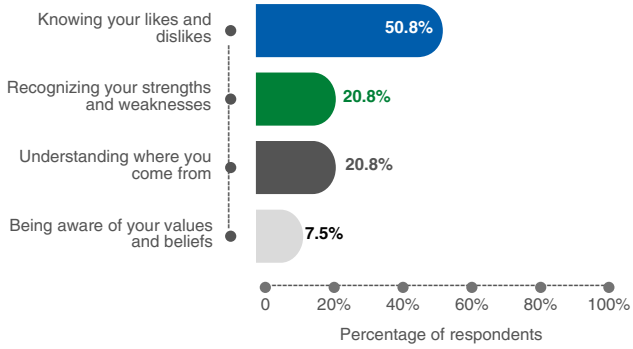


A significant majority of the respondents identified treating boys and girls unequally as an example of gender-based discrimination, while a small portion acknowledged that all the mentioned options were instances of such discrimination.

FGD WITH PANCHAYAT BODY, PARENTS AND SMC MEMBER

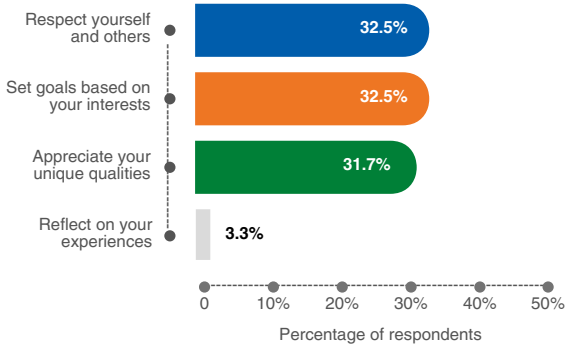
LIFE SKILLS EDUCATION

CHART 19: THINGS THAT HELP UNDERSTAND ONE'S IDENTITY



Slightly more than half (50.8%) of the respondents believed that knowing your likes and dislikes helps to understand one's identity, whereas a considerable portion (20.8%) either said that recognising their strengths and weaknesses contributes to this understanding or noted that understanding where they come from is important.

CHART 20: PRACTICES TO DEVELOP A POSITIVE IDENTITY

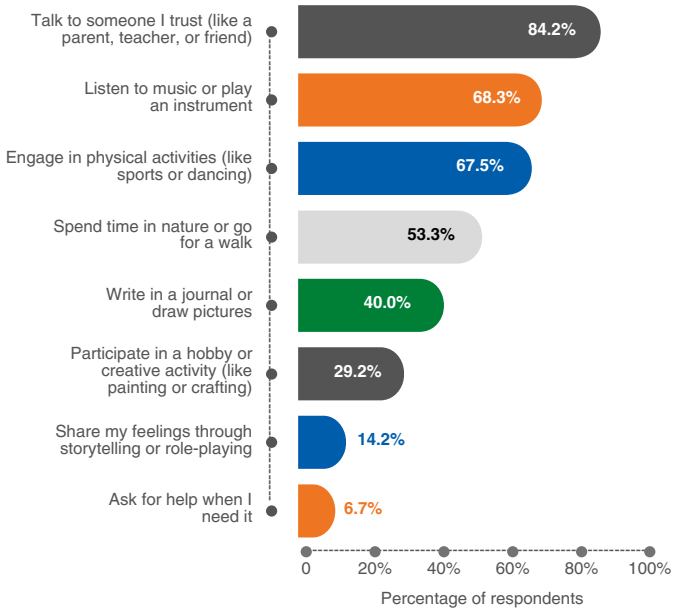


32.5%

of the respondents stated that developing a positive identity requires either self-respect and respect for others or setting goals aligned with personal interests. While nearly the same (31.7%) number of the respondents noted the importance of appreciating their unique qualities.

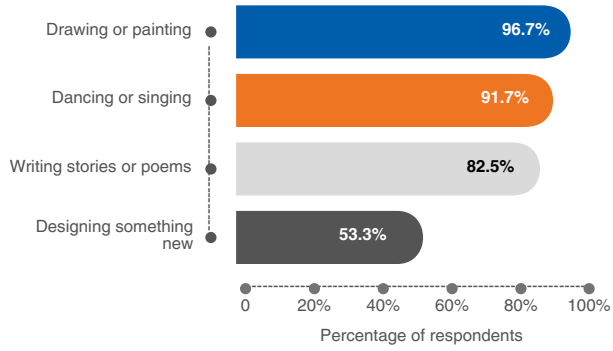
> In the residential program, I learned how to express my feelings in a healthy way. I speak to people I trust like my teachers and friends when I felt sad or happy. I also wrote in a journal and drew pictures to show how I felt. Sometimes I played sports or danced to feel better. These ways helped me understand my feelings more and feel-good inside.
>
> **Rinku Kumari, Nichlagarh**

CHART 21: WAYS TO EXPRESS FEELINGS IN A HEALTHY WAY



A large majority of the respondents (84.2%) indicated that talking to someone they trust, such as a parent, teacher, or friend, is a healthy way to express their feelings. Listening to music or playing an instrument was also commonly mentioned (68.3%), along with engaging in physical activities like sports or dancing (67.5%). Additionally, spending time in nature or going for a walk was recognised by 53.3% of respondents as an effective method for emotional expression. Some of the respondents (40.0%) found writing in a journal or drawing pictures to be beneficial. While fewer participants engaged in hobbies or creative activities like painting or crafting, there were still respondents who shared their feelings through story-telling or role-playing. A smaller number (6.7%) indicated that they would ask for help when needed.

CHART 22: WAYS TO EXPRESS CREATIVITY

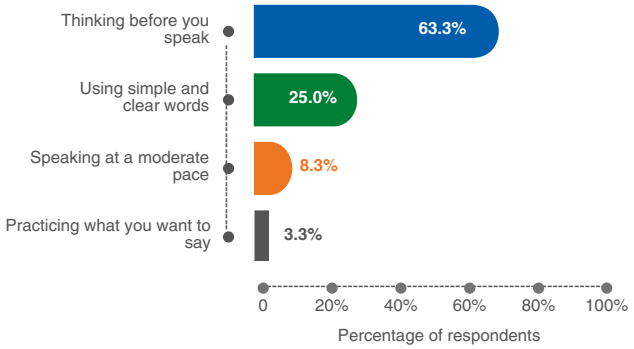


Almost all of the respondents expressed that drawing or painting is a way to show creativity. Dancing or singing was also popular, with a vast majority of the respondents (91.7%) mentioning it as a creative expression. Writing stories or poems was noted by a significant majority of the respondents (82.5%) as another way to express creativity. Also, slightly more than half (53.3%) of the respondents said that designing something new is a form of creative expression.

TEACHER INTERVENTION WITH STUDENTS AT RAADA

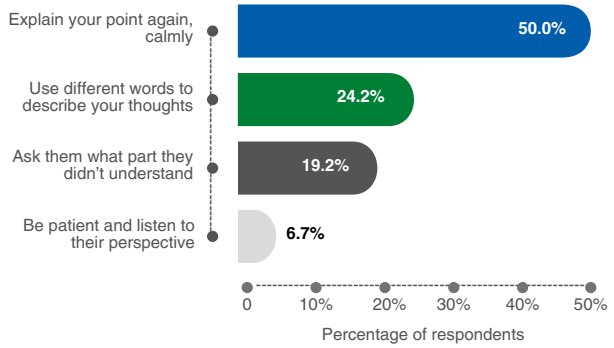
NEED-BASED TRAINING

CHART 23: PRACTICES THAT CAN HELP TO ARTICULATE THE THOUGHTS CLEARLY



A strong majority (63.3%) of the respondents said that thinking before speaking helps articulate thoughts clearly. 25% of the respondents said using simple and clear words facilitates the same.

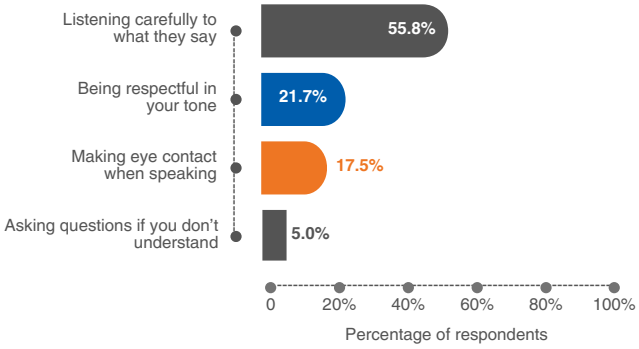
CHART 24: STEPS TAKEN WHEN NOT UNDERSTOOD BY OTHERS



Exactly half of the respondents (50.0%) reported that when someone does not understand what they are saying, they explain their point again calmly. 24.2% of the respondents reported either using different words to describe their thoughts or asking the others what part of the conversation they did not understand.

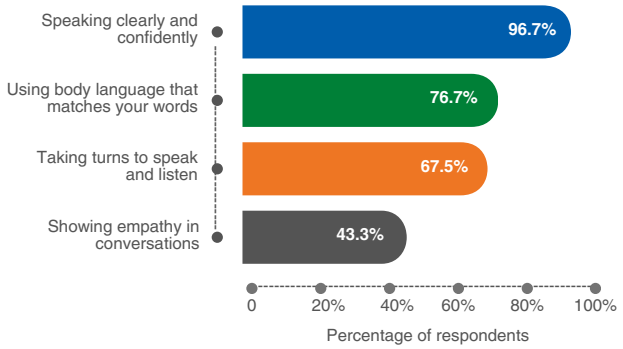
> "In the residential program I learned a lot about myself. I understood the concept of my likes and dislikes, my strengths and weaknesses. I also understood what my family believed which helped me to form my identity. To feel good about myself and to develop a positive identity, I understood how important it to identify special qualities of oneself and respecting family and my friends. After the program, I set goals based on what I liked and thought about my experiences. This made me feel happy about who I am."
>
> **Rekha, Nichlagarh**

CHART 25: GOOD WAYS TO COMMUNICATE WITH OTHERS



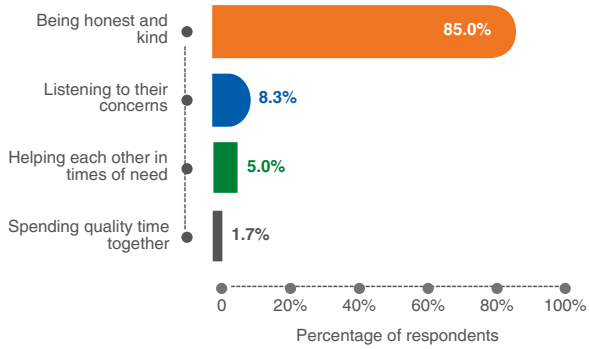
More than half of the majority indicated that a good way to communicate with others is to listen carefully to what they say. Being respectful in tone was noted by a considerable proportion of respondents.

CHART 26: EFFECTIVE COMMUNICATION SKILLS



Almost a complete majority of the respondents identified speaking clearly and confidently as an effective communication skill, and a large portion (76.7%) noted that using body language that matches one's words is important. A considerable number of respondents (43.3%) learned to show empathy in their conversations. Taking turns to speak and listen was recognised by a significant number (67.5%) of the respondents.

CHART 27: WAYS TO BUILD STRONG RELATIONSHIPS



A large majority of the respondents said that being honest and kind is essential for building strong relationships. Another important aspect was listening to the concerns of the others, which was mentioned by a small fraction of the respondents.

> In the residential program, I learned how to talk and listen better. I practised speaking clearly and confidently so others could understand me. I also learned to use my body language, like smiling or nodding, to show how I felt. Taking turns to talk and listen helped me have good conversations with my friends and teachers. I tried to understand how others felt, which made them feel important. These skills helped me connect with people and share my ideas.
>
> **Roshna Kumari, Uplagarh**

FGD AT IKHVELO CENTRE DUSRA DASHAK NICHLAGARH

KEY IMPACT

CHART 28: CONFIDENCE IN READING AND NUMERACY POST-PROGRAM

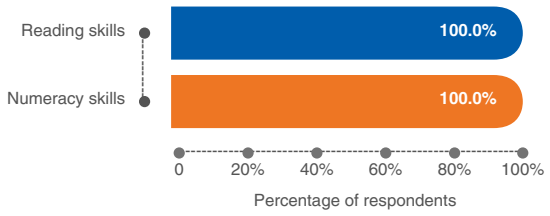
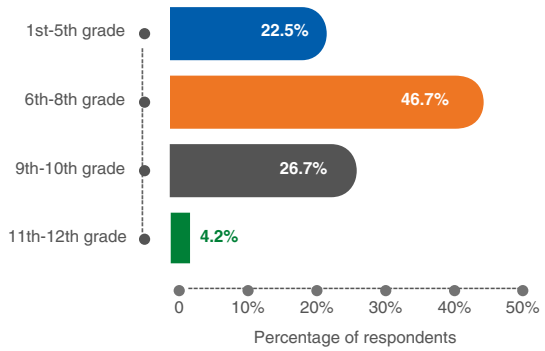


CHART 29: GRADE JOINED AFTER COMPLETING THE RESIDENTIAL PROGRAM



- All of the respondents reported becoming confident in both their reading and numeracy skills after completing the residential program.
- The large majority of the respondents (69.2%) joined 1st to 8th grade and a considerable portion joined 9th to 12th grade after completing the residential program.

> "Before joining the residential program, I was not confident about my reading and math skills. I was having problems with words and numbers. But after attending the program, I noticed a big change and now I can read stories better and understand them more easily. My math skills have also improved, and I do not feel scared of numbers or word problems anymore. The program really helped me with important subjects, and now I feel that I can easily continue my studies. Also, I feel more confident now."
>
> **Surta, Nichlagarh**

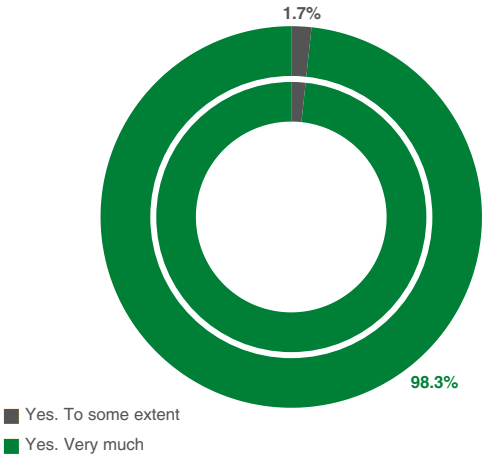
FGD WITH PANCHAYAT BODY AT NICHLAGARH

SUCCESS STORY: SANJAY KUMAR

The journey of Sanjay Kumar showed how self-learning, and hard work could change a life. His journey started in seventh grade when he went to a life skills camp that taught him the importance of personal growth and practical skills. During his school years, Sanjay often visited the Ikhvelo Centre, where he spoke with teachers and staff. These talks made him interested in teaching and led him to join the Yuva Manch forum by Doosra Dashak, which helped spread awareness about government programs. Wanting to continue his education, Sanjay got a job as an office helper at Doosra Dashak. This job gave him free housing and a small income to help with his studies. He also learnt important computer skills like using MS Word, Excel and PowerPoint.

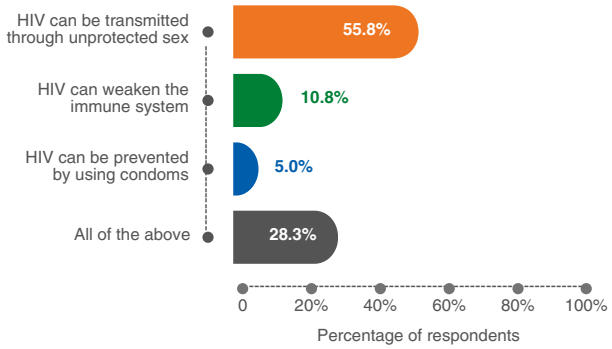
Following his dream of becoming a teacher, he finished his Bachelor of Education degree. He later became the in-charge of the Ikhvelo Centre in Nichlagarh, where he worked with dedication. His story inspired many, showing that with hard work and the right support, anyone can achieve their goals and overcome challenges.

CHART 30: WHETHER FIND SCHOOL STUDIES INTERESTING



Almost all the respondents stated they find school studies very interesting barring an insignificant 1.7%.

CHART 31: TRUE STATEMENTS ABOUT HIV/AIDS



More than half of the majority of the respondents correctly stated that HIV can be transmitted through unprotected sex, and a considerable portion recognised that all the provided statements regarding HIV/AIDS were true. Meanwhile, a small group of the respondents understood that HIV can weaken the immune system.

STUDENT INTERACTION AT UPLAGARH

> The Residential Programme and the State Open Academic Support Programme have made positive changes in our community. We have seen more children and adolescents receiving academic support, helping them continue their education. These initiatives have also encouraged hope and ambition among the youth. Parents are becoming more involved, and the community is supporting these efforts to create a better future.
>
> **Chinaramji, Up-Sarpanch, Nichlagarh Panchayat**

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Strengthened literacy and numeracy skills, boosting confidence in learning.
- Improved financial awareness, promoting safer money-saving habits.
- Heightened awareness of reproductive health, enhancing self-care practices.

FAMILY LEVEL

- Increased support for continued education through enhanced learning opportunities.
- Improved health practices within families, especially related to menstrual hygiene.
- Strengthened family involvement in financial planning and literacy.

STATE LEVEL

- Improved educational outcomes contribute to state-level literacy and numeracy goals.
- Brought adolescent health education into the spotlight, reinforcing support for state-run programs.
- Increased investment in residential camps and learning centres across the state.

NATIONAL LEVEL

- Contributed to national goals for quality education and gender equality.
- Strengthened national programs for adolescent health and financial literacy.
- Supported national initiatives for improving youth education and empowerment.

CHAPTER 8
RECOMMENDATIONS

Provision of laptops was limited, with only 1-2 laptops available, which was insufficient for the number of students. If more laptops were provided, skill training could have been given in smaller groups, thus further enhancing the effectiveness.

Currently, there is only one centre running the residential program. If more centres like this could be established, the program could reach out to and benefit a larger number of adolescent girls.

09. SUSTAINABILITY

The Doosra Dashak program, supported by Bajaj Auto Limited and implemented by the Foundation for Education and Development (FED), demonstrates a strong foundation for long-term sustainability. A key aspect contributing to its endurance is the program's emphasis on capacity building at the grassroots level. By equipping local stakeholders—including Anganwadi workers, government teachers, PRI members, and community mobilisers—with training and tools, the initiative fosters local ownership and ensures that the benefits of the program extend beyond its direct intervention.

Additionally, the integration of life skills, financial literacy, and reproductive health education into the curriculum empowers adolescents with critical knowledge that supports lifelong learning and behavior change. The establishment of Continuing Education Centers (CECs) further strengthens the ecosystem by offering ongoing academic and personal development opportunities.

The program's alignment with national policies (such as NEP, NRLM, and Beti Bachao Beti Padhao) and Sustainable Development Goals (SDGs) enhances its relevance and positions it well for government support and replication. Regular monitoring and planning meetings, combined with a data-driven approach to implementation, reinforce its adaptability and responsiveness to community needs. Collectively, these factors underscore the program's capacity to sustain and scale its impact across the region over time.

CHAPTER 10
CONCLUSION

The program supported positively influenced the lives of rural adolescents.This initiative has enabled many young people who had previously dropped out of school to resume their education while also gaining practical skills. FED provided a space for these youth to learn essential skills from basic literacy to vocational training, helping them become more self-reliant. The program also raised awareness about health issues like menstrual hygiene and reproductive care. The ongoing involvement with teachers, community workers, and families led to greater engagement in education and supported more children in staying in school. The collaboration successfully addressed the challenges, bringing long-term benefits to adolescents and the wider community.

IMPACT ASSESSMENT REPORT

AUGMENTING CONSERVATION OF WATER FOR IMPROVING RESILIENCE OF AGRICULTURE IN RAIN-FED AREAS

Implementing partner – Foundation for Ecological Security

Release Date: 31-12-2024

SoulAce
Path to Sustainability
SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

ACWIRARA	Augmenting Conservation of Water for Improving Resilience of Agriculture in Rain-fed Areas
CRP'S	Community Resource Persons
FES	Foundation for Ecological Security
HHs	Households
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MJSY	Mukhyamantri Jal Swavalamban Yojana
NAPCC	National Action Plan on Climate Change
NGO	Non-Governmental Organisation
NRDWP	National Rural Drinking Water Programme
PRI	Panchayati Raj Institution
SDGs	Sustainable Development Goals
VI	Village Institutions
WRD	Water Resource Development

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The project "Augmenting Conservation of Water for Improving Agriculture in Rainfed Areas" (ACWIRARA) was implemented from 2017 to 2023. It covered seven blocks in five districts of Rajasthan, focusing on areas like Peepalkhunt in Pratapgarh, Sayra in Udaipur, Begun in Chittorgarh, Deogarh in Rajsamand, and Asind, Jahazpur and Kotri in Bhilwara. The project worked to address the water and land conservation in these rainfed areas, working with local communities and village institutions to improve natural resource management through various interventions.

PROJECT DETAILS

Implementation year

FY 2017 - FY 2022

Assessment year

FY 2024 - FY 2025

Implementing Partner

Foundation of Ecological Security

Project location

Bhilwara, Udaipur, Chittaurgarh, Rajsamand, Pratapgarh, Rajasthan

Beneficiaries

350 habitations across 7 blocks

Budget

₹2,622 lakhs

Alignment with SDGs

Alignment with National and State Policies and Programs

- Mahatma Gandhi National Rural Employment Guarantee Act,
- National Action Plan on Climate Change,
- National Water Policy,
- National Rural Drinking Water Programme,
- Swachh Bharat Abhiyan,
- Mukhyamantri Jal Swavalamban Yojana

PROJECT ACTIVITY

The project involved forming habitation-level institutions, regenerating common lands, constructing and renovating water harvesting structures and implementing soil and water conservation measures. Extensive training programs were conducted to build the capacity of participants and village institutions on water conservation, MGNREGA provisions, and community governance. The project also focused on leveraging funds from MGNREGA and strengthening local governance institutions for resource management.

Key Findings

WATER RESOURCE DEVELOPMENT

87.4%
of the respondents understood the use of vegetative barriers for water resource development.

97.2%
of the respondents reported not paying water user charges for the operation and maintenance of water sources.

CAPACITY BUILDING PROGRAM

100%
of the respondents attended training on commons, land conservation, and MGNREGA provisions in exposure visits.

96.0%
of the respondents were trained in water management and conservation.

98.0%
of the respondents learned about community resource management, water conservation methods and re-vegetation.

94.0%
of the respondents learned practices for implementing MGNREGA projects.

90.0%
of the respondents gained knowledge on establishing and maintaining a Suposhan Vatika.

92.0%
of the respondents learned about capacity-building programs through the NGO's community mobilisation efforts.

Key Impacts

WATER RESOURCE DEVELOPMENT

99.5%
of the respondents reported an increase in cultivable land area on their farm during the Rabi season.

90.2% & 88.4%
of the respondents reported experiencing no water scarcity for irrigation and drinking after the intervention, respectively.

100%
of the respondents reported having sufficient drinking water and green fodder for cattle after the intervention.

CAPACITY BUILDING PROGRAM

100%
of the respondents reported improved farming techniques benefiting their households.

96.0%
of the respondents gained skills in digital monitoring tools and strengthening local institutions.

98.0%
of the respondents confirmed that the training programs strengthened their understanding of MGNREGS.

96.0%
of the respondents experienced better management of water resources and enhanced conservation of local land.

03. OECD FRAMEWORK

RELEVANCE

The project directly addressed the critical issues of water scarcity and land degradation in the rainfed agricultural regions of Rajasthan. With a pressing need for sustainable practices, the project targeted specific areas—such as Udaipur, Rajsamand and Bhilwara—where farmers faced difficulties due to inconsistent water sources. By engaging local communities and establishing habitat-level institutions, the project ensured that its objectives aligned closely with the needs of the population, advancing local ownership and relevance in resource management. The training provided on MGNREGA provisions and land conservation techniques further emphasised the commitment of the project to empowering communities to tackle their unique challenges.

COHERENCE

The project aligns strongly with the Sustainable Development Goals (SDGs) and national policies by enhancing water conservation and agricultural practices in rainfed areas. It supported clean water management that contributes to SDG 6 (Clean Water and Sanitation). It addresses climate change impacts aligning with SDG 13 (Climate Action) and SDG 15 (Life on Land). The objectives of the project aligned well with national policies such as the Mahatma Gandhi National Rural Employment Guarantee Act and the National Water Policy, promoting efficient water management and community resource governance. This coherence enhanced the effectiveness of the project in achieving local and national development goals.

EFFECTIVENESS

The effectiveness of the project was evident through the high levels of participation in training programs and the positive feedback received from respondents. All participants attended training on water conservation and MGNREGA provisions, showcasing the program's successful outreach efforts. The introduction of practical exposure visits further enhanced the learning experience, and participants gained valuable insights into land conservation techniques. The notable increase in cultivable land area and improved water management practices following the intervention demonstrate that the project effectively met its objectives, resulting in tangible benefits for local farmers.

EFFICIENCY

The project was highly efficient, reaching numerous habitations across multiple blocks in Rajasthan and making the most of the resources available within the large catchment area. By restoring and constructing water harvesting structures, it effectively supported water conservation efforts, ensuring sustainable availability for agriculture, livestock, and drinking purposes. The strategy of combining natural and assisted vegetation regeneration was successful, increasing subsurface water flows and extending the duration of water availability. Collaboration with district governments efficiently leveraged funds from major government programs, aligning public investments with local ecological conditions and community priorities. This coordinated approach optimised resource use and maximised impact, strengthening the resilience and livelihoods of the communities involved.

IMPACT

The long-term impact of the project can be seen in various dimensions, including agricultural productivity, water security and community empowerment. The substantial number of respondents who cultivated major crops like wheat and maize reflects improved agricultural practices and yields. The reduction in water scarcity for drinking and irrigation, alongside the increased availability of water for cattle, shows the positive influence of the project on local livelihoods. Moreover, the training programs equipped the participants to efficiently manage resources, enabling them to sustain these benefits beyond the duration of the project.

SUSTAINABILITY

The project laid a solid foundation for sustainability by supporting local governance and community ownership of resource management practices. The active participation of respondents in following water governance protocols indicates a commitment to maintaining the improvements achieved. The training on digital monitoring tools and the establishment of local institutions further ensure that the benefits of the project can be sustained in the long run. By embedding sustainable practices within community frameworks, the project not only addressed immediate needs but also empowered local stakeholders to continue enhancing their agricultural practices and resource management.

CHAPTER 4
INTRODUCTION

Water Development Structure

NEED OF THE PROGRAM

Rajasthan, with its rainfed agricultural regions, faced ongoing barriers to water availability and land degradation. The lack of access to reliable water sources and poor land management practices made agriculture difficult for local farmers. There was an immediate need to enhance soil and water conservation efforts in the region. The program addressed these difficulties by regenerating common land, improving water storage, and empowering communities to govern their resources more effectively through local institutions. The initiative responded to the need for sustainable practices that could support agriculture and local livelihoods.

The project aimed to reach 350 habitations across seven blocks in Rajasthan: Jahajpur, Kotri, and Asind in Bhilwara; Sayra in Udaipur; Begun in Chittaurgarh; Deogarh in Rajsamand; and Pipalkhunt in Pratapgarh. In the catchment area, which spanned over 65,000 hectares, the initiative focused on soil and water conservation measures aimed at enhancing water recharge and conservation. A total of 350 water harvesting structures were aimed at either be restored or to be newly constructed to support water conservation efforts. By promoting both natural and assisted vegetation regeneration in these areas, the project increased subsurface water flows and extended the period of water availability.

This improved the resilience of the communities dependent on these resources by enhancing water and moisture availability for agriculture, as well as providing drinking water and fodder for livestock. The project team also collaborated with district governments to secure funding from major government programs (such as MGNREGS and MJSY) and ensured that public investments were scientifically sound and aligned with local ecological conditions and community visions.

OBJECTIVES OF THE PROGRAM

To construct check dams and ensure the availability of water for drinking and irrigation.

To provide training on capacity building, commons, land conservation, and MGNREGA provisions.

To educate soil and water conservation techniques and introduce re-vegetation measures.

To facilitate exposure visits for practical examples of land conservation and community resource management.

To conduct digital training on soil and water conservation and sustainable farming methods.

ABOUT THE CSR FIRM

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – FOUNDATION FOR ECOLOGICAL SECURITY (FES)

The Foundation for Ecological Security (FES), established in 2001, is dedicated to ecological restoration in India through various projects across the country. FES emphasises integrating ecological concerns with economic growth, advocating for conservation and social justice. By decentralising environmental management FES empowers local communities to leverage their knowledge for effective management of shared resources. The organisation focuses on three key areas: ecological restoration, strengthening local governance and securing livelihoods linked to natural resources. FES promotes the concept of Commons as a tool for local governance, enhancing collective action in managing natural resources and improving village life. By collaborating with community institutions, civil society and government bodies FES aims to restore ecosystems while ensuring the interests of marginalised populations are safeguarded.

CHAPTER 5
RESEARCH METHODOLOGY

This chapter explores the objectives and methodology of the study, focusing on assessing the impact of training programs on water conservation and agricultural practices in rainfed areas. It outlines the use of a mixed methods approach that combines qualitative and quantitative techniques to evaluate community engagement, project effectiveness and alignment with national policies.

OBJECTIVES OF THE STUDY

- To assess the impact of training programs on water conservation and agricultural practices in rainfed areas.
- To examine the relationship between improved water management practices and crop yield in local farming communities.
- To evaluate the effectiveness of community engagement in implementing sustainable land management strategies.
- To analyse the role of the Mahatma Gandhi National Rural Employment Guarantee Act in supporting project initiatives.
- To identify challenges faced by local farmers in adopting new water conservation techniques.
- To review the sustainability aspects of the program model and formulate strategic recommendations.

USE OF MIXED METHOD APPROACH

The evaluation employed a mixed-methods approach that blended qualitative and quantitative research techniques. The qualitative part focused on gathering the views and experiences of key stakeholders to provide a richer understanding of their perspectives. Meanwhile, the quantitative methods involved collecting and analysing numerical data from respondents to reveal statistical insights and trends. By combining these two approaches, the evaluation benefited from both in-depth personal accounts and data-driven insights, creating a comprehensive view of the progress and outcomes of the project and offering a complete and varied assessment.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques provide an objective way to evaluate the project and its impact by analysing data. Surveys and questionnaires collect numerical information from beneficiaries across different indicators. Comparing this data before and after the intervention helps determine the effects and improvements of the project. These methods offer a clear and measurable way to assess the success of the project through statistical evidence.

APPLICATION OF QUALITATIVE TECHNIQUES

Interviews were conducted with key stakeholders involved in the project to gain a thorough understanding of the initiative. These discussions helped capture their insights, experiences and perspectives, providing valuable context about the implementation and impact of the project. This approach enabled a deeper exploration of the hardships, successes and outcomes from those directly engaged with the initiative.

ENSURING TRIANGULATION

The study used multiple triangulation strategies to ensure the findings were both reliable and accurate. Various sources were tapped for information, such as field observations, interviews with participants, community discussions and reviews from project volunteers.

This structured approach enabled a clear understanding of the outcomes of the program. Additionally, a mix of research methods, including interviews and case studies, was utilised for methodological triangulation. This allowed for data cross-referencing, minimising bias. These approaches enhanced the robustness of the analysis, making the conclusions more dependable.

DATA QUALITY CONTROL & ANALYSIS

The study utilised a centralised dashboard and an internal app for real-time data monitoring, ensuring data accuracy and enabling swift corrective measures when needed. The analysis employed various descriptive statistical methods and visual tools to organise and interpret data patterns, effectively drawing attention to important characteristics and emerging trends.

SAMPLING FRAMEWORK

The study employed a stratified random sampling approach to ensure broad representation across different sub-groups within the target population. For qualitative engagement, purposive sampling was used to include key stakeholders in the discussions specifically.

Stratified random sampling involves categorising the population into distinct subgroups and then randomly selecting participants from each group to capture a diverse and representative sample.

Purposive sampling, on the other hand, is a targeted method where individuals or groups are deliberately chosen based on their specific traits or expertise, offering in-depth and focused insights on the research subject.

STANDARDISED FRAMEWORK FOR EVALUATION

The research study utilised the OECD DAC framework to adhere to international standards, ensuring a consistent approach to evaluating the impact of the project. This framework enhanced the credibility and relevance of the research findings, providing a solid foundation for assessing the outcomes.

DESIGN SNAPSHOT

Name of the project

Augmenting Conservation of Water for Improving Resilience of Agriculture in Rain-Fed Areas

Implementing agency

Foundation for Ecological Security

Research design used

Descriptive research design

Sampling technique

Purposive random sampling

Sample size

265

KEY STAKEHOLDERS

- Community Resource Persons
- Village Institution members
- PRI members

UPHOLDING RESEARCH ETHICS

The impact assessment study adhered to rigorous ethical standards at every stage of the process.

INFORMED CONSENT

Participants were thoroughly briefed on the objectives of the study, methodologies, potential risks, and benefits before they agreed to take part. They participated voluntarily and were fully aware of the research intentions.

CONFIDENTIALITY

Information pertaining to participants was carefully safeguarded, developing a sense of trust.

DATA SECURITY AND ANONYMITY

The confidentiality and privacy of personal data were diligently upheld throughout the research. All gathered information was securely stored and accessible only to authorised individuals. Any data shared were anonymised to ensure privacy protection

NON-MALEFICENCE

The well-being of participants was prioritised, ensuring that no harm resulted from the research activities.

INTEGRITY

The research upheld high standards of credibility through transparent and honest methodologies.

JUSTICE

All participants were treated equitably, ensuring fairness and impartiality throughout the research process.

GREEN FODDER PLANTATION AREA

CHAPTER 6
KEY STUDY FINDINGS AND IMPACTS

The chapter explores the findings and impacts of water resource development and capacity-building activities in the community. It discusses how training programs focused on land conservation, water management, and sustainable farming practices engaged participants and enhanced their skills. The initiatives led to the construction of check dams and the implementation of vegetative barriers, improving irrigation methods and ensuring sufficient water supply for agriculture. These efforts strengthened local institutions and positively impacted the livelihoods of community members.

GEOGRAPHICAL COVERAGE

The study covered 3 Blocks of 3 districts of Rajasthan: Sayra of Udaipur district, Deogarh of Rajsamand district and Asind of Bhilwara District.

3 BLOCKS → **3 DISTRICTS**

OUTREACH AND INCLUSIVITY

The primary beneficiaries of the program were marginal and small-scale farmers of the rural community where the study was conducted.

PROJECT BRANDING

KEY FINDINGS

PROGRAM ACTIVITY 1: WATER RESOURCE DEVELOPMENT

SOCIO-ECONOMIC AND DEMOGRAPHIC PROFILE OF THE POPULATION

CHART 1: AGE GROUP DISTRIBUTION

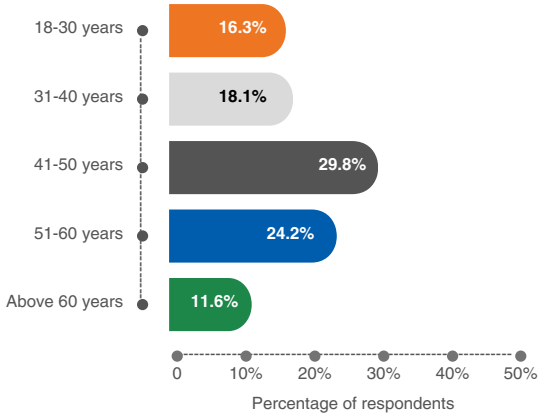


CHART 2: GENDER-WISE DISTRIBUTION

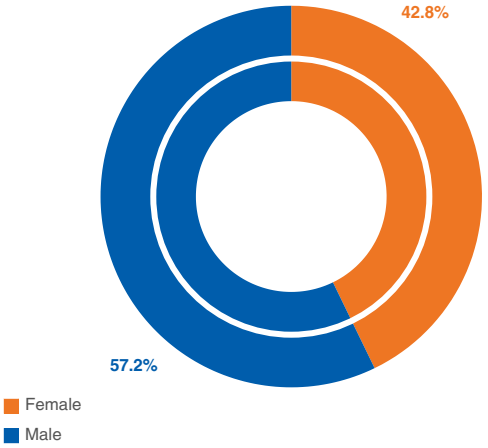


CHART 3: EDUCATIONAL LEVEL-WISE DISTRIBUTION

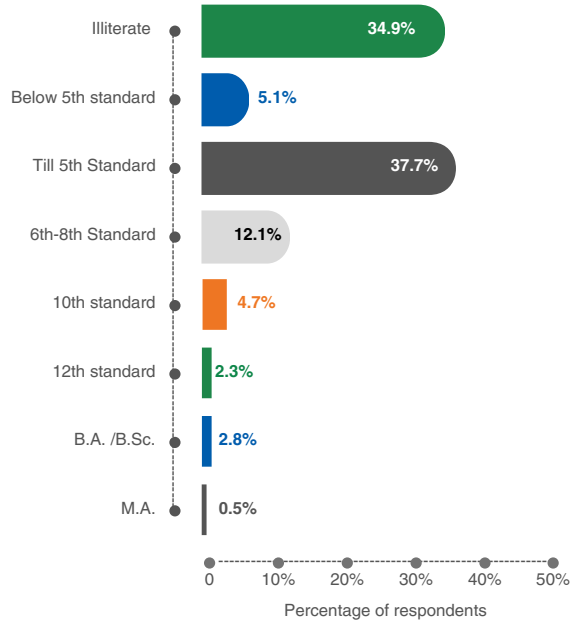
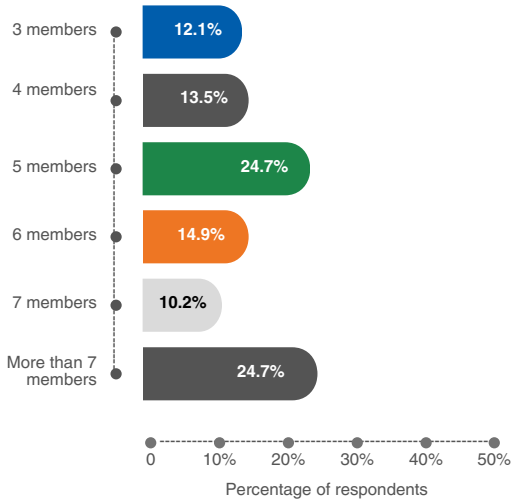


CHART 4(A): TOTAL FAMILY MEMBER'S DISTRIBUTION



INTERACTION WITH PROJECT BENEFICIAIRES

CHART 4(B): ANNUAL FAMILY INCOME

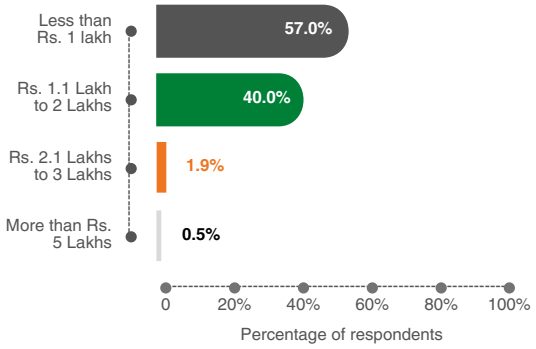
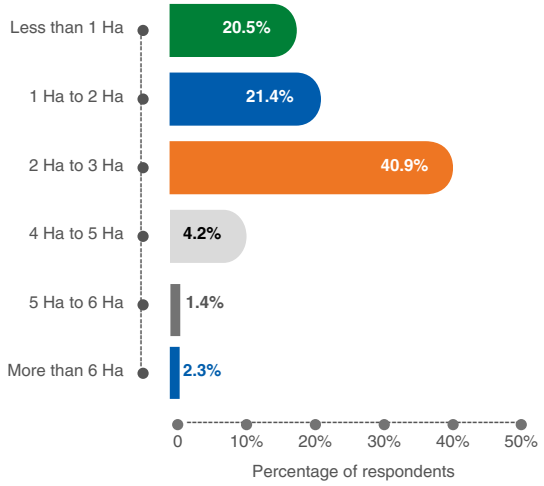


CHART 5: AREA OF LAND OWNED



- A significant majority of the respondents were between 41 and 50 years of age, followed by a smaller group between 51 and 60 years and then those between 31 and 40 years.
- A little more than half of the respondents were males, and the rest were females.

34.9%

of the respondents were illiterate while the vast majority of the respondents had education up to the fifth standard.

- The majority of the population had between 5 and more than 7 members in their family.
- More than half of the respondents reported an annual family income of less than ₹ 1 lakh, followed by those with incomes ranging between ₹ 1.1 lakh and ₹ 2 lakhs.
- A significant majority of respondents owned between 2 to 3 hectares of land, while a smaller portion owned 1 to 2 hectares.

CHART 6: CULTIVATED CROP

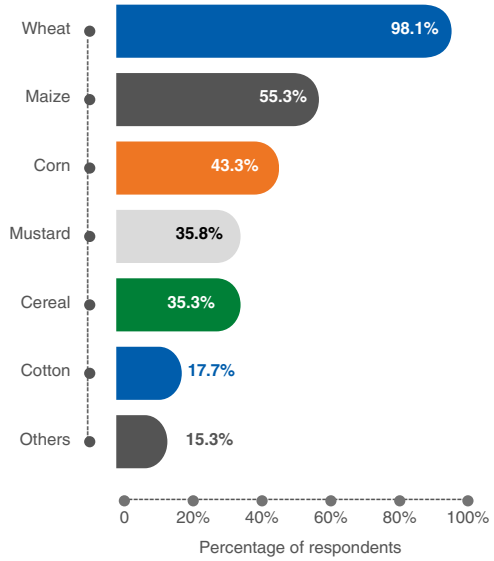
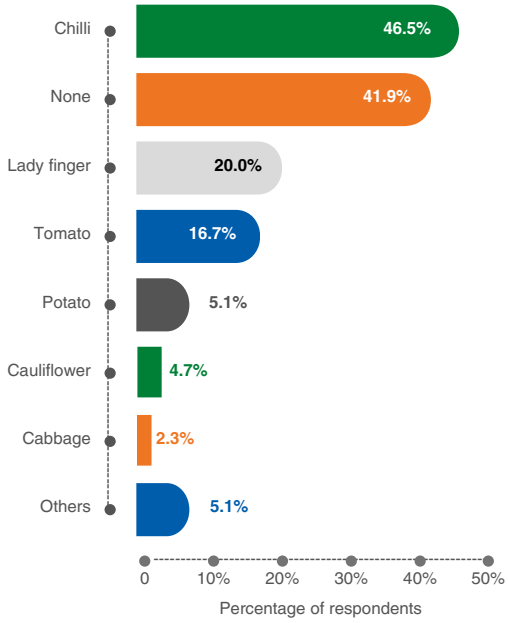
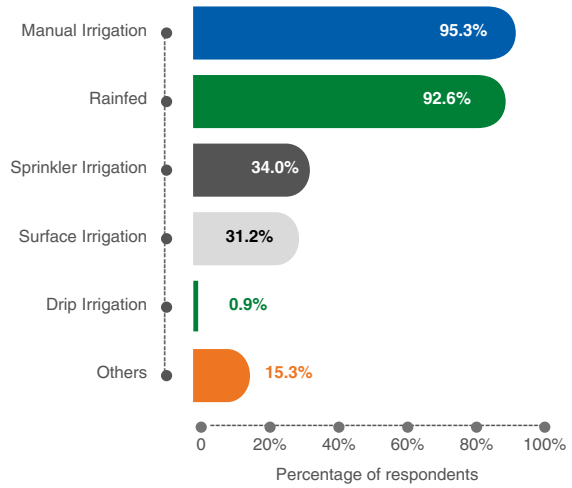


CHART 7: CULTIVATED VEGETABLES



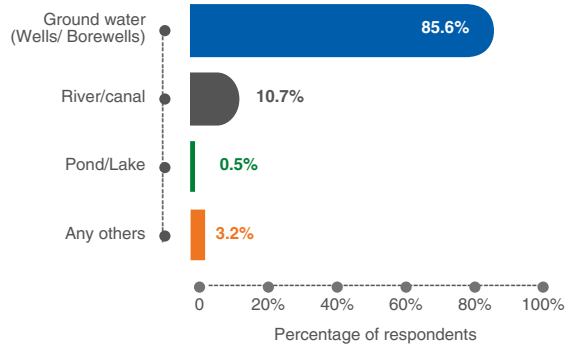
- Almost all the respondents grew wheat, while slightly over half also cultivated maize. Smaller percentages grew corn, mustard, cereal and cotton, with other crops making up a limited share.
- Almost half of the respondents cultivated chillies. A significant portion of respondents reported not cultivating any vegetables. Ladies' fingers were grown by a smaller group (20.0%), followed by tomatoes (16.7%).

CHART 8: PRIMARY METHOD OF IRRIGATION



Almost the complete majority used manual irrigation as their primary method, while a significant majority (92.6%) used rainfed irrigation. Smaller portions utilised sprinklers (34.0%) and surface irrigation methods (31.2%), with very few using drip irrigation.

CHART 9: SOURCE OF WATER IRRIGATION



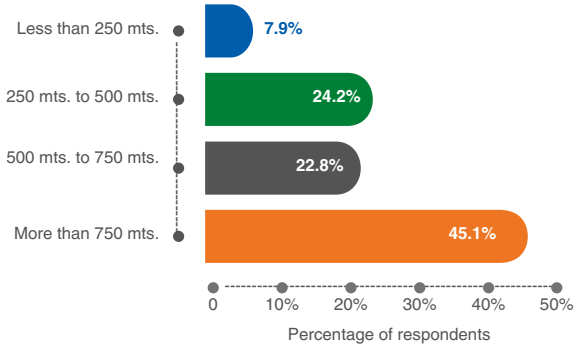
A significant majority of the respondents used groundwater (wells/borewells) as a source of water for irrigation. The data demonstrated the need for groundwater for irrigation, marking potential concerns regarding sustainability and the need for alternative water sources to ensure long-term agricultural viability.

FOCUSED GROUP DISCUSSION

"She had been associated with the project from the beginning and witnessed the efforts of the Foundation for Ecological Security (FES), supported by Bajaj Auto Ltd. FES had conducted mobilisation meetings to discuss issues related to water scarcity and lack of fodder for the cattle, which was one of the major problems for the village. FES collaborated with the panchayat and involved community members in creating plantations on common land. Women and others from the village dug trenches and pits for water storage, which helped the plants grow and ensured the sustainability of the initiative. The community had also set up fencing to protect the growing plants, which improved cattle grazing. The collaboration between FES, the panchayat, and the villagers has led to long-term benefits like better groundwater levels, well repair, and irrigation improvements. She felt that the project had helped the community gain ownership over resources that had ultimately enhanced their livelihood."

- Ratan Kunwar, Deogarh

CHART 10: DISTANCE OF THE FARMLAND FROM THE NEAREST WATERSHED STRUCTURES



Nearly half of the respondents had their farmland more than 750 meters from the nearest watershed structures. A notable portion (47.0%) of the respondents had their farmland between 250 to 750 meters.

> In our community, we worked on several water resource development activities. I saw the construction of check dams and gabion structures. Repairs were also done on check dams and Nala Bunds. Other efforts included building recharge pits and earthen dams. These activities have helped improve water management and made a difference in our community's water resources.
>
> **- Saruoa Ram, Tirol, Sayra**

> Before the intervention, I used water tankers for drinking water along with many others in my community. Most people had to spend money to get water, although some got it for free. I used to spend rupees each year on getting water. After the intervention, I no longer need to depend on water tankers for drinking water, and this has reduced my expenses.
>
> - Pushpa Devi Singh, Guman, Sayra

CHART 11: WHETHER DEPENDENT ON WATER TANKERS FOR GETTING DRINKING WATER BEFORE THE INTERVENTION

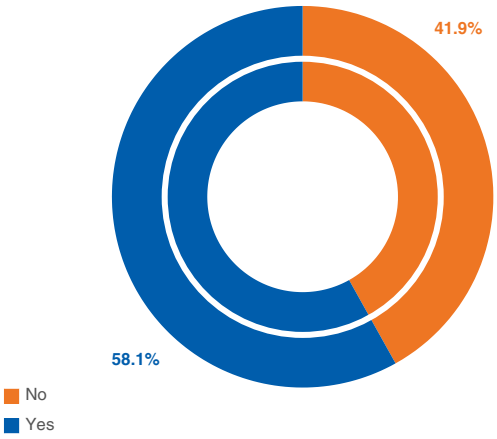
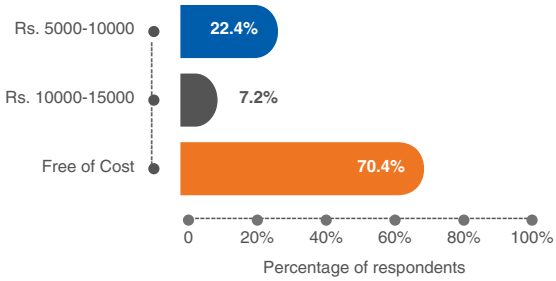


CHART 12: AMOUNT SPENT IN A YEAR IN GETTING WATER FROM THE WATER TANKER



Slightly more than half of the respondents reported dependency on water tankers for getting drinking water before the intervention. While a little less than half of the majority were not dependent on water tankers.

29.6%

of the respondents spent between five thousand to fifteen thousand rupees signifying some financial burden. A significant majority of respondents used water from tankers free of cost.

CHART 13: NO. OF HOURS THE MOTOR OF THE BOREWELL IS RUN DURING NON-RAINY SEASON FOR IRRIGATION PURPOSES IN A DAY - BEFORE & AFTER INTERVENTION

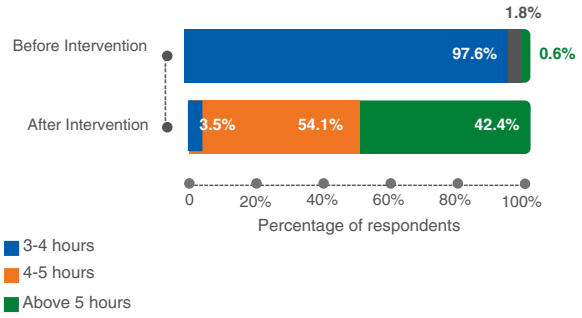
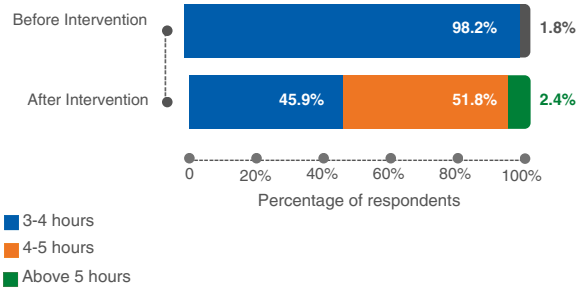


CHART 14: NO. OF HOURS THE MOTOR OF THE BOREWELL IS RUN DURING RAINY SEASON FOR IRRIGATION PURPOSES IN A DAY - BEFORE & AFTER INTERVENTION



97.6%

of the respondents, before the intervention reported running borewell motors for irrigation for 3-4 hours daily, illustrating the use of limited water resources during the non-rainy season. After the intervention, slightly more than half of the respondents increased the daily operation to 4-5 hours, demonstrating improved irrigation practices and more efficient use of water resources.

In the rainy season, before the intervention, the use of water resources was limited, with most respondents running their borewell motors for only 3-4 hours daily, indicating restricted irrigation. After the intervention, more than 50% of respondents increased their borewell motor usage to 4-5 hours daily, reflecting a significant improvement in water utilization.

> "Before the intervention, I used a borewell motor for irrigation for 3 to 4 hours a day during the dry season, which was similar to most people in my area. After the intervention, the running time increased for many of us, and now we use it for more time, about 4 to 5 hours a day. Similarly, in the rainy season, we used to run the motor for 3 to 4 hours a day, but after the intervention, increased the time to more than 5 hours daily."
>
> **- Laxman Salvi, Mefliyas, Asind**

WATER DEVELOPMENT STRUCTURE

CHART 15: WHETHER FOLLOW THE WATER GOVERNANCE PROTOCOLS AND SURVEILLANCE MECHANISMS ESTABLISHED BY THE COMMUNITY INSTITUTIONS

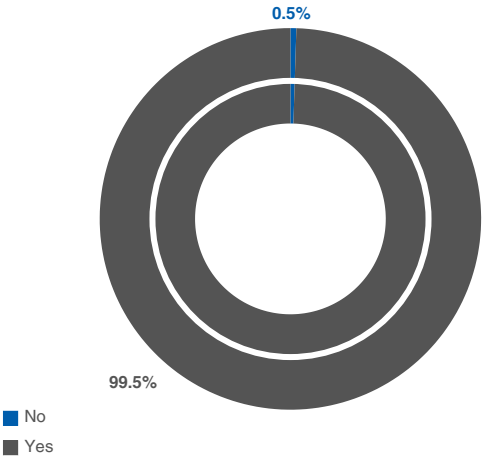
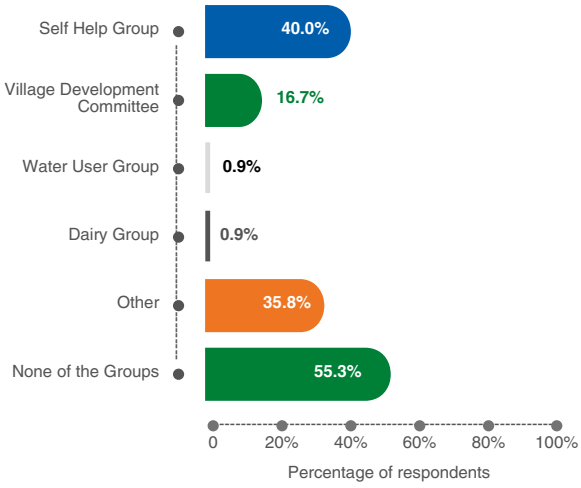


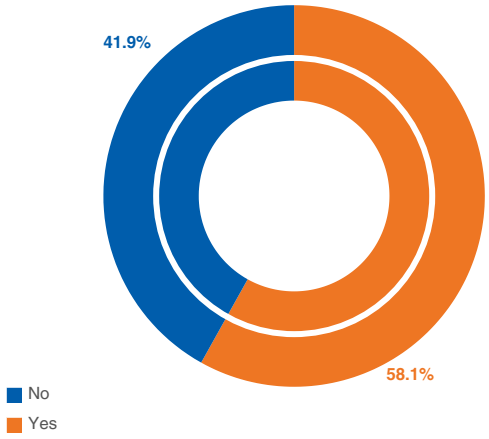
CHART 16: GROUPS FORMED UNDER THE PROJECT INTERVENTION, EITHER THE RESPONDENTS OR THEIR FAMILY MEMBER IS ASSOCIATED WITH



"She had become involved with the village institution for managing land and water resources through meetings held by FES and the panchayat. The project aimed to address water scarcity and fodder issues for cattle, which were common challenges in the village. The community had worked together to plant trees in common pastures and trenches had been built to ensure proper water flow to the plants. She stated that the plants had grown without needing constant watering, and the community developed a sense of ownership of the resources. Fencing had also been developed to protect the plantations from grazing animals until they had reached maturity. She noted that the initiative had a positive impact on the village as the water structures helped recharge groundwater and improved irrigation. This reduced the need for villagers to leave for work, allowing them to focus on livestock care and improve their circumstances."

- Asha Bai, Asind, Bhilwara

CHART 17: WHETHER ANY FEMALE MEMBER OF THE HOUSEHOLD ASSOCIATED WITH WATER USER GROUP



- Nearly all respondents adhered to the water governance protocols and surveillance mechanisms established by the community institutions, illustrating a strong commitment to collaborative water management.
- More than half of the respondents reported no association with any groups. While little less than half of the respondents or their family members participated in Self Help Groups.
- More than half of female household members (58.1%) belonged to the water user group, showcasing tangible progress in engaging women in water management initiatives.

"During the interview, she mentioned that becoming a CRP allowed her to work closely with Village Institutions in planning and carrying out important activities. She stated that she used the MGNREGS MIS system to monitor the progress of their soil conservation and water management efforts, adding that it was useful for keeping records. However, she felt that easier access to local data could further improve the system. She explained that to engage the community, she visited various households and shared relatable stories, such as how earlier conservation projects had boosted crop yields and water availability. She also worked with Panchayat members and local officials, building strong relationships that helped secure extra support for their projects. She acknowledged that at first, some villagers were finding it difficult to trust, but regular follow-ups and open discussions gradually gained their trust. Over time, she observed positive changes like wells containing more water during the dry season and healthier crops in the fields. She was proud to see the community becoming stronger and staying committed together.

- Ishwari Gujjar, CRP – Mehfliyas Village, Asind"

CHART 18: WHETHER PAY WATER USER CHARGES FOR OPERATION AND MAINTENANCE OF COMMUNITY WATER SOURCES

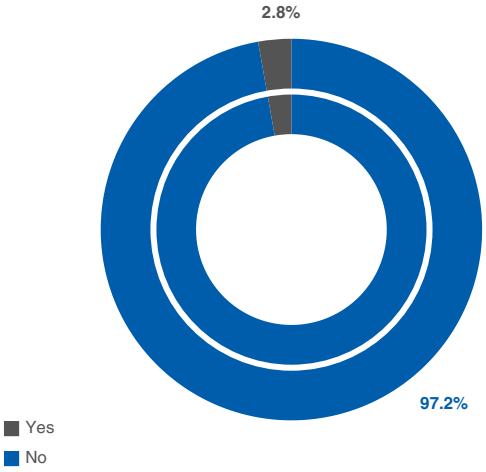
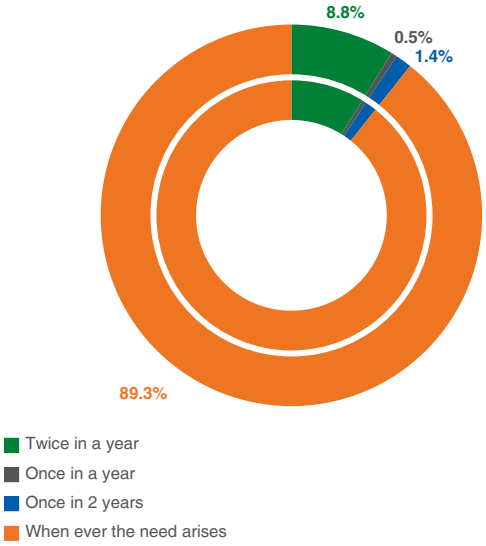


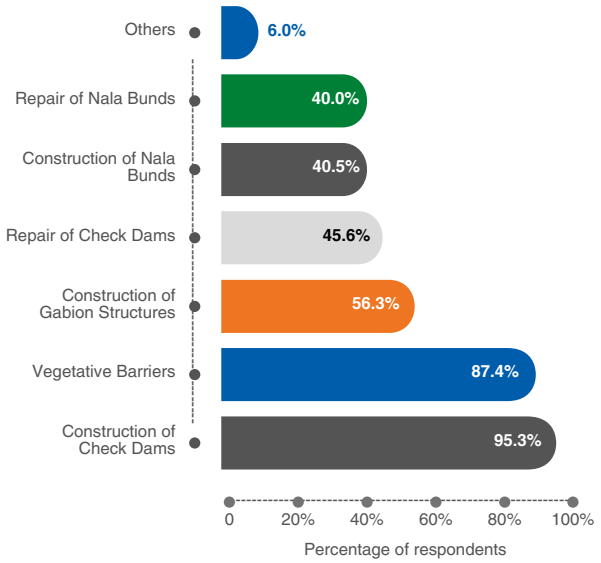
CHART 19: FREQUENCY OF REPAIRING & MAINTAINING COMMUNITY WATER SOURCES



- A vast majority of respondents did not pay water user charges for the operation and maintenance of community water sources, while a fraction of the respondents reported paying the charges.
- A significant majority of the respondents reported that repairs and maintenance of community water sources were conducted whenever needed, while a small group said that the maintenance occurs twice a year.

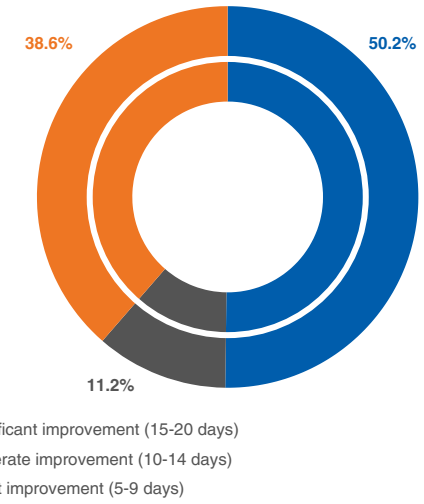
KEY IMPACTS

CHART 20: PARTICIPATION OF RESPONDENTS IN THE WATER RESOURCE DEVELOPMENT ACTIVITY



The above data showed the participation of respondents in the water resource development activity. Almost all of the respondents (95.3%) participated in the construction of check dams. A significant majority (87.4%) also engaged in creating vegetative barriers. Slightly more than half (56.3%) of the respondents were involved in constructing gabion structures, while fewer participated in the repair of check dams (45.6%) and the construction of nala bunds (40.5%).

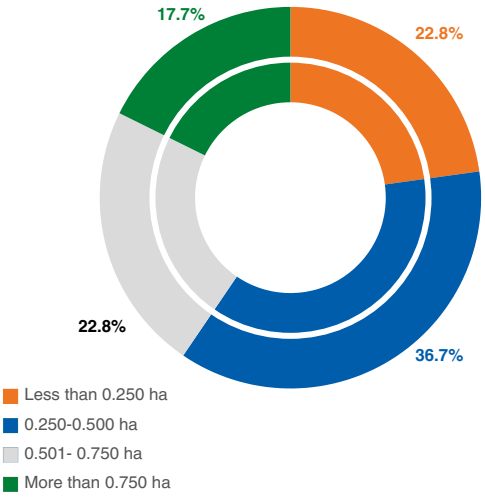
CHART 21: LEVEL OF IMPROVEMENT OBSERVED IN THE RESILIENCE OF THE KHARIF CROPS DURING DRY SPELLS



About half of the respondents reported significant improvement in the resilience of Kharif crops during dry spells. A smaller group (38.6%) observed slight improvements, while very few noted moderate improvements. The data reflects the effectiveness of implemented practices in enhancing crop resilience.

FOCUSED GROUP DISCUSSIONS WITH BENEFICIARIES

CHART 22: AREA OF LAND RECEIVED PROTECTIVE IRRIGATION DURING KHARIF SEASON AFTER THE CSR INTERVENTION (DUE TO IMPROVED WATER STORAGE AND GROUND WATER RECHARGE)



A substantial proportion reported receiving protective irrigation on land between 0.250 and 0.500 hectares, exhibiting the positive impact of CSR interventions on water storage and groundwater recharge. While a small number of respondents (22.8%) cited receiving irrigation at less than 0.250 hectares and between 0.501 and 0.750 hectares. This data focused on the effectiveness of the project in expanding irrigation coverage.

> Since the intervention, I have noticed that our Kharif crops are doing better during dry spells. Some crops have lasted longer without water, while others have improved a little. More land in our area has also been irrigated during the Kharif season because of the better water storage and groundwater recharge. This has helped keep our crops safer during challenging times.
>
> **- Madan Lohar, Jhalra, Raghunathpura**

CHART 23: PERCENTAGE OF CULTIVABLE LAND WITH ASSURED IRRIGATION BEFORE CSR INTERVENTION

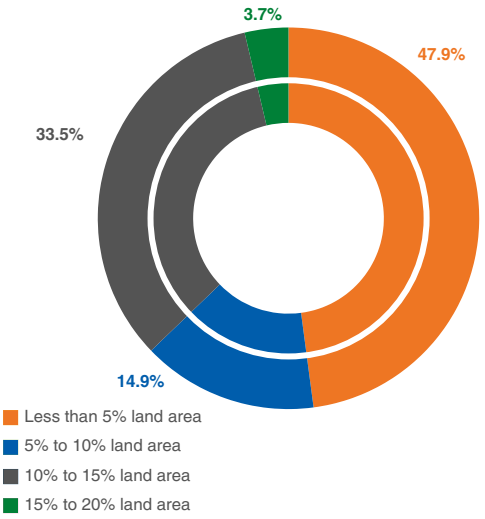
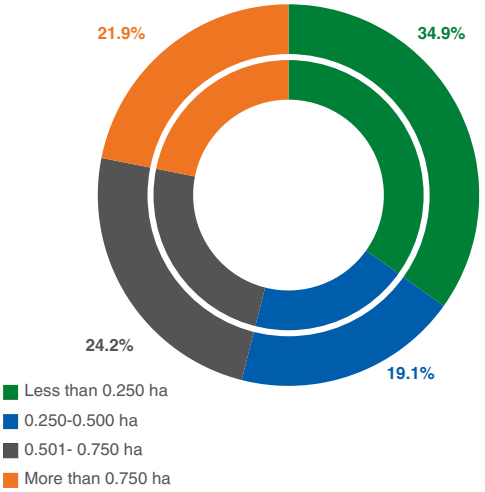


CHART 24: ADDITIONAL LAND AREA THAT HAS BEEN MADE CULTIVABLE AFTER THE PROJECT INTERVENTION



Almost half of the respondents reported that less than 5.0% of their cultivable land received assured irrigation before the CSR intervention. A small group represented that between 10.0% to 15.0% of their land received irrigation, while a smaller group had between 5.0% to 10.0%.

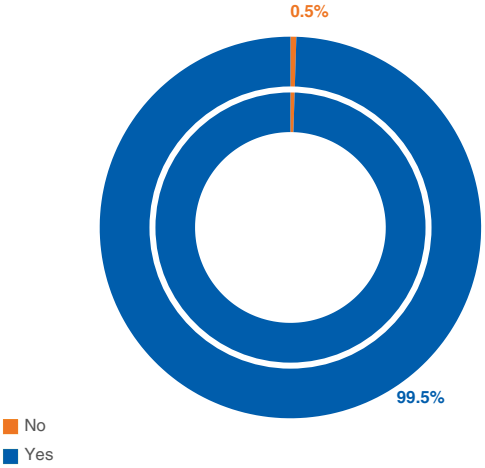
43.3%

of the respondents, which is nearly half, reported that between 0.250 to 0.750 hectares of additional land became cultivable after the project intervention. Some respondents noted that less than 0.250 hectares of land was made cultivable.

"Before the project, only a small part of my land had access to irrigation, and farming was difficult. After the intervention, more of my land became cultivable, which really helped improve my farming efforts. I am able to use more of my land effectively, and it has made a noticeable difference in how I manage my crops.

- Durga Bai Bheel, Bagmali, Ruppura"

CHART 25: WHETHER THERE IS ANY INCREASE IN CULTIVABLE LAND AREA DURING RABI SEASON IN THE FARM LAND

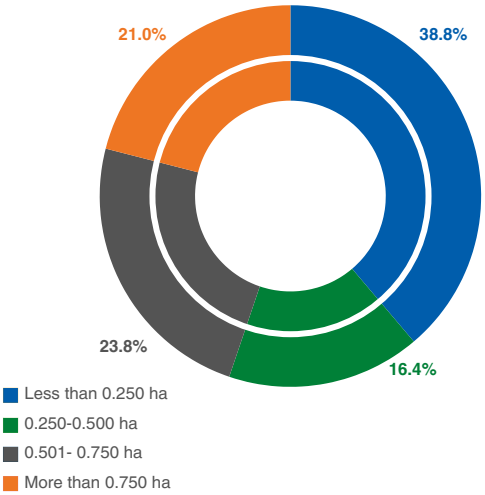


"Being part of this initiative has been a transformative experience for me and our village. Through FES-led meetings, I understood the urgent need to tackle water scarcity and fodder shortages. I actively participated in efforts to improve our land, working alongside other women to dig trenches and plant trees on common land. These trenches collected rainwater, helping the plants survive, while fencing protected them from cattle until they matured. The project also introduced check dams, which helped store rainwater and recharge our wells, significantly improving water availability. Beyond just the environmental benefits, this initiative empowered our community by involving us in the long-term care of the plantations, which now provide better grazing options for our cattle. It has not only addressed key challenges but also strengthened our livelihoods and brought lasting change to our village.

- Lehri Bai, Tirol, Sayra, Udaipur"

WATER DEVELOPMENT STRUCTURE

CHART 26: INCREASE IN THE CULTIVABLE LAND AREA DURING THE RABI SEASON

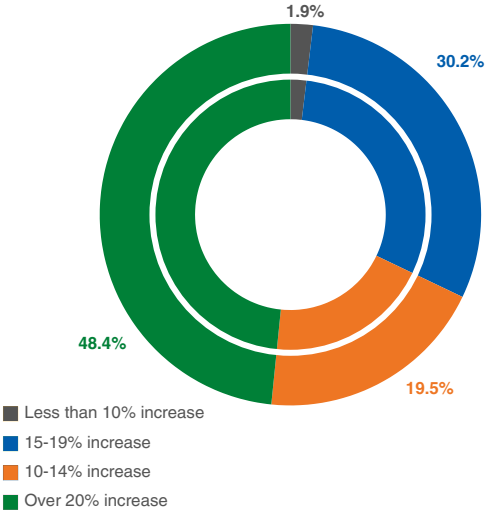


A vast majority of the respondents reported an increase in cultivable land area during the Rabi season, with only a few respondents detailing no increase.

40.2%

of the respondents, which is a substantial majority reported an increase in the cultivable land area during the Rabi season, seeing an increase between 0.250 to 0.750 ha. While a considerable portion experienced an increase of less than 0.250 ha.

CHART 27: PERCENTAGE INCREASE IN KHARIF CROP YIELD FOLLOWING CSR INTERVENTION

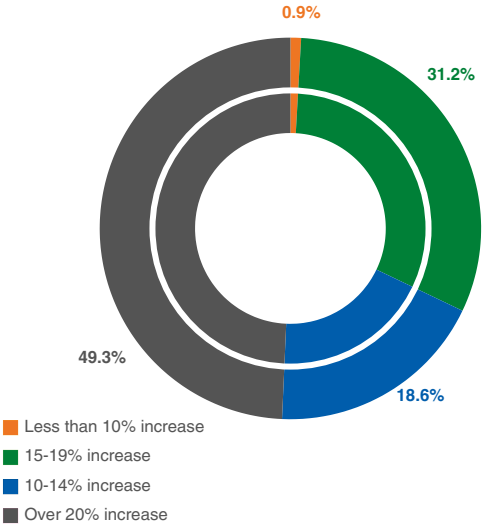


Around half of the respondents observed an increase in the yield of Kharif crops by over 20%.

A smaller portion experienced a moderate increase between 15% and 19%, while fewer respondents saw an increase of 10% to 14%.

> "In the interview, Heeralal mentioned that he was chosen as a CRP due to his active involvement in the project. He stated that his role involved overseeing soil and moisture conservation activities, such as planting and managing vegetation to reduce soil erosion. He explained that the training he received was detailed and covered methods for biomass estimation and the practical use of water management tools, which helped him feel prepared for the role. He said he monitored these activities regularly, using simple techniques he learned, like measuring plant growth and water levels. He added that he collaborated with the panchayat and village elders to ensure their actions met the needs of the people. He acknowledged that while convincing some members was initially challenging, he organised informal gatherings at community centres and spoke directly with families, explaining how these efforts would improve their farmland and water supply. He shared that, gradually, more people began participating. He concluded by saying that seeing the increase in green cover and improved water retention reassured the community of the benefits of their conservation work."
>
> **- Heeralal Seewana – CRP, Dhol Village**

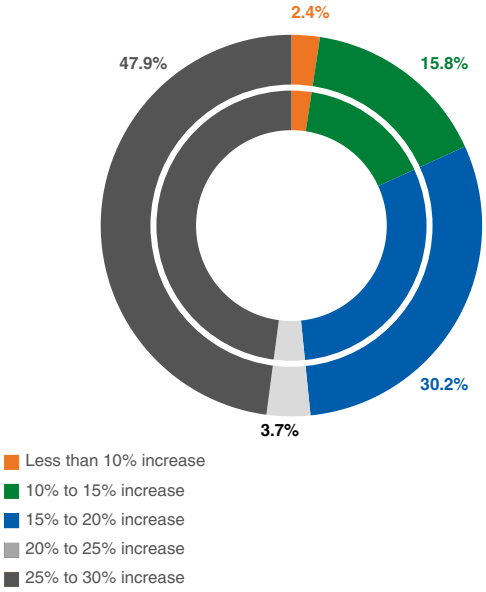
CHART 28: PERCENTAGE INCREASE IN THE YIELD OF RABI CROPS FOLLOWING THE CSR INTERVENTION



Roughly half of the respondents reported an increase in Rabi crop yield of over 20%. A smaller group experienced an increase between 15.0% and 19.0%, while a smaller number of respondents saw increases ranging from 10.0% to 14.0%.

> After the project began, I saw that I could farm more land during the Rabi season than before. My crops also improved in both the Kharif and Rabi seasons, leading to better harvests. The extra land and increased crop yield have also helped me make the most out of my farming. This has made a big difference for me and my family, as we now have more food and better income from the land.
>
> **- Babu Lal Kalal, Ghati, Deogarh**

CHART 29: PERCENTAGE INCREASE IN THE ANNUAL AGRICULTURAL INCOME FOLLOWING THE CSR INTERVENTION



Almost half of the respondents reported an increase in annual agricultural income of 25% to 30% following the CSR intervention. A smaller group (30.2%) saw their income increase between 15.0% and 20.0%, while a few experienced a rise between 10.0% and 15.0%. The data signified notable improvements in agricultural income.

CHART 30: NO. OF MONTHS IN A YEAR THE RESPONDENTS EXPERIENCED SCARCITY FOR DRINKING WATER BEFORE THE INTERVENTION

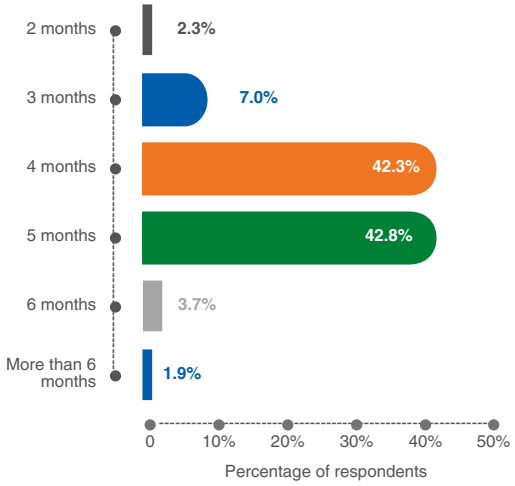
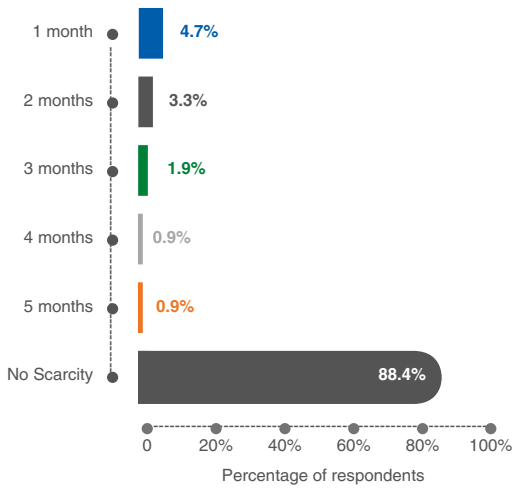


CHART 31: NO. OF MONTHS IN A YEAR THE RESPONDENTS ARE EXPERIENCING SCARCITY FOR DRINKING WATER AFTER THE INTERVENTION



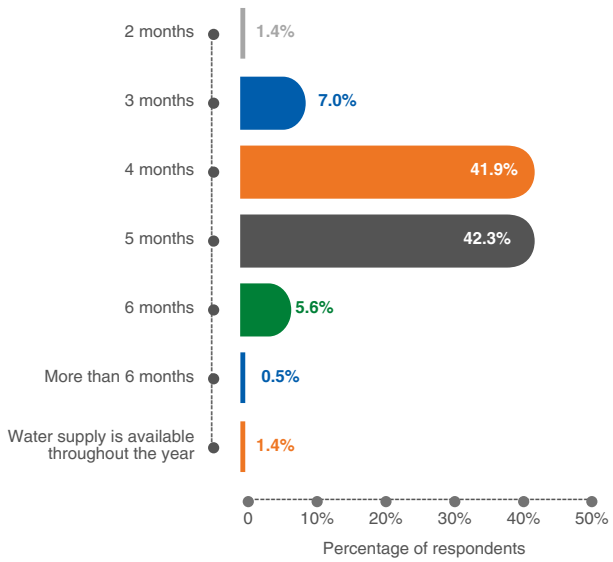
Before the intervention, the vast majority of the respondents faced water scarcity for about 4 to 5 months. This reflected widespread complexities in water availability during a major part of the year.

9.9%

of the respondents, which amounts to a smaller group are still facing shortages for 1 to 3 months after intervention. A significant majority of the respondents reported no scarcity at all.

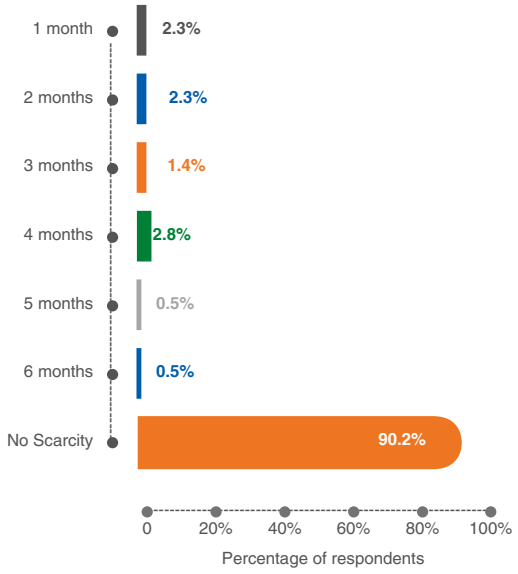
> Before the intervention, we faced water shortages for several months each year, making it hard to irrigate our crops. After the intervention, the situation improved, and we now experience much less water scarcity for irrigation. This change has made it easier to grow crops, leading to better yields and more stable farming. We are less worried about water availability for our crops.
>
> **- Kesar Singh, Deogarh**

CHART 32: NO. OF MONTHS IN A YEAR THE RESPONDENTS EXPERIENCED SCARCITY OF WATER FOR IRRIGATION PURPOSES BEFORE THE INTERVENTION



> Pushpa Devi first learned about the project through a panchayat meeting. Though she wasn't involved in the initial planning, she participated in community discussions. The village institutions took charge of implementation while she observed the management committee, ensuring smooth operations. She felt her voice was heard during decision-making. The project focused on activities like bunding and trenching, which helped improve the land and water retention. She participated in the project and contributed through digging trenches. The community also worked on water harvesting structures like ponds, which improved water availability. Pushpa believed the project brought long-term benefits to their farming and the village environment.
>
> **- Pushpa Devi Bheel, Guman, Sayara**

CHART 33: NO. OF MONTHS IN A YEAR THE RESPONDENTS EXPERIENCED SCARCITY OF WATER FOR IRRIGATION PURPOSES AFTER THE INTERVENTION



- Before the intervention, a large majority 84.2 of the respondents experienced water scarcity for about 4-5 months. only a small fraction reported year-round water supply.
- After the intervention, the vast majority 90.2% of the respondents reported no scarcity at all, revealing a marked improvement in water availability for irrigation. A few respondents still experienced minor shortages.

CHART 34: WHETHER HAD SUFFICIENT DRINKING WATER FOR CATTLE - BEFORE & AFTER INTERVENTION

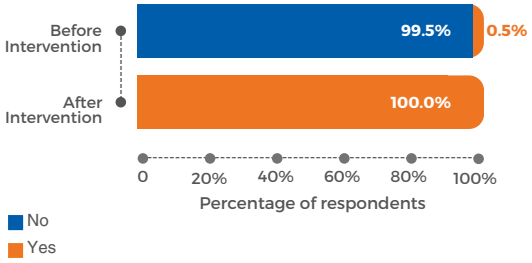
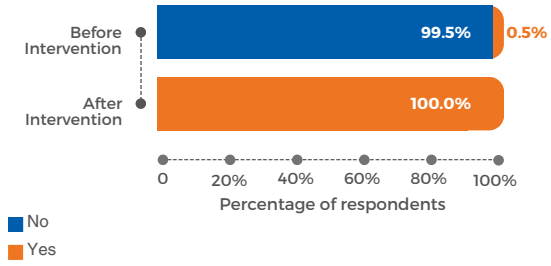
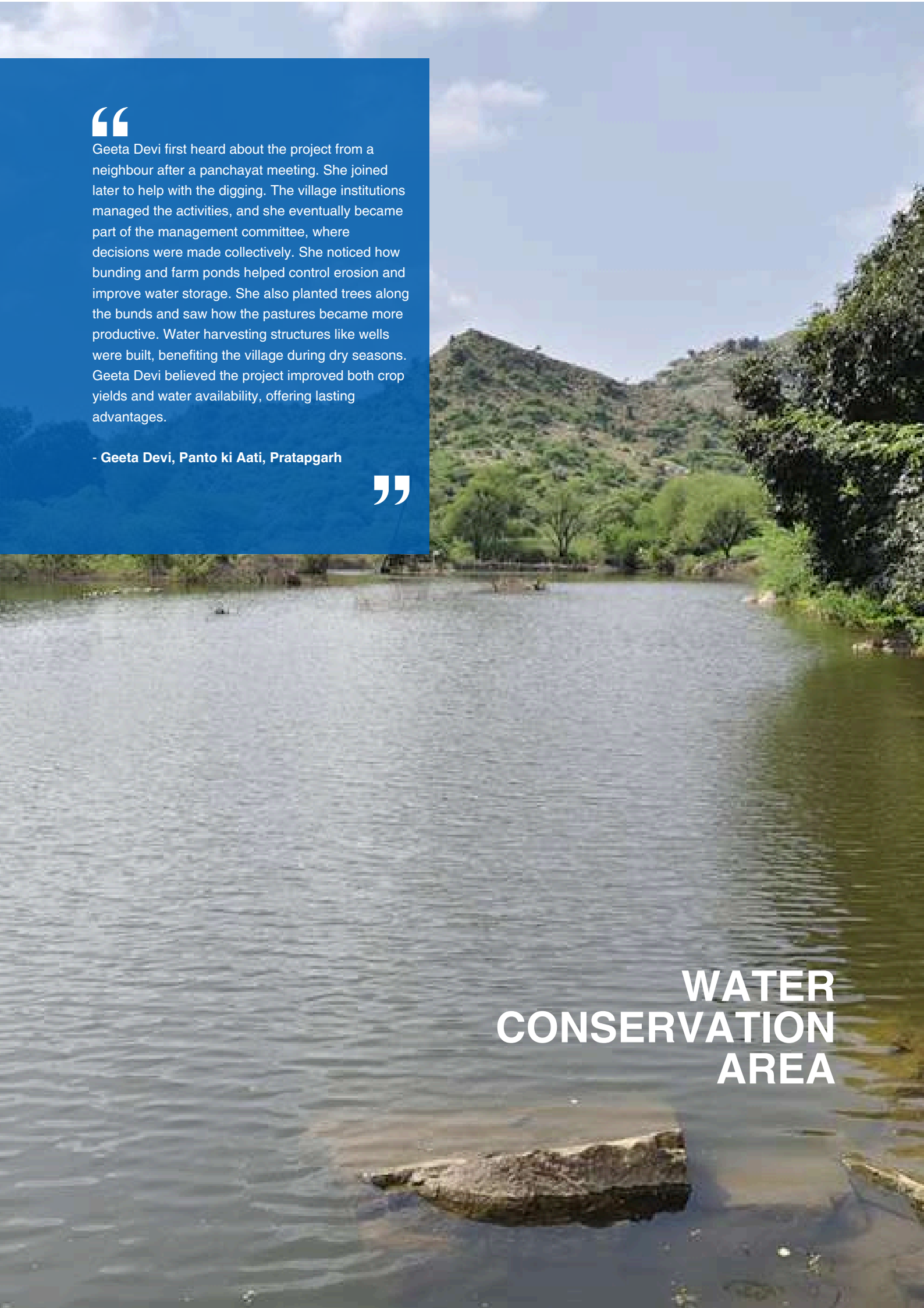


CHART 35: WHETHER THE CATTLE HAVING SUFFICIENT GREEN FODDER



- Before the intervention, almost all respondents faced challenges in providing sufficient drinking water for their cattle. After the intervention, all of the respondents reported having sufficient water for their cattle.
- Before the intervention, nearly all respondents struggled to provide adequate green fodder for their cattle. Following the intervention, the complete majority mentioned that their cattle had access to enough green fodder.

FOCUSED GROUP DISCUSSION



"Geeta Devi first heard about the project from a neighbour after a panchayat meeting. She joined later to help with the digging. The village institutions managed the activities, and she eventually became part of the management committee, where decisions were made collectively. She noticed how bunding and farm ponds helped control erosion and improve water storage. She also planted trees along the bunds and saw how the pastures became more productive. Water harvesting structures like wells were built, benefiting the village during dry seasons. Geeta Devi believed the project improved both crop yields and water availability, offering lasting advantages."

- Geeta Devi, Panto ki Aati, Pratapgarh

WATER CONSERVATION AREA

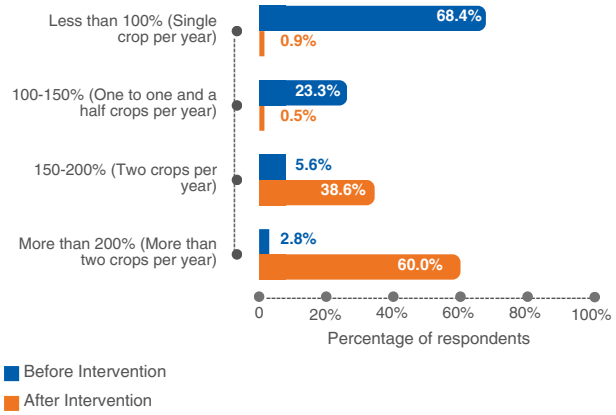
"Before the intervention, my cattle did not have enough water to drink, which was a big concern. But after the intervention, things changed, and now my cattle always have enough water. The same goes for green fodder, too, but now I do not face that problem anymore. For my cattle, there is sufficient green fodder available. The changes have made a difference in keeping my cattle healthy.

- Jagrup Ji, Mefliyas, Asind

"Radha has been associated with the project since its inception and started participating in the project activities after interacting with the project team. The Pasture Management Committee oversaw the project while Radha participated in clearing land and planting. The project focused on building trenches and ponds, improving soil and water availability. She noticed the regeneration of common pastures and how water storage structures, like tanks and check dams, ensured a steady supply. Radha felt the project had a significant impact on farming and believed it would continue benefiting the village in the long run.

- Radha Rawat, Ghati, Deogarh

CHART 36: CROPPING INTENSITY- BEFORE & AFTER INTERVENTION



98.6%

of the respondents after the intervention practised two or more two crops per year, representing a significant improvement in cropping intensity. Before the intervention, a significant majority of respondents practised single cropping, with only a small number achieving multiple crops.

"Before the intervention, I was only able to grow one crop per year. After the intervention, I started growing two crops per year. This support helped me use my land more effectively and has improved my farming activities. Now, I have more crops throughout the year, which helps me with my farming. I am getting more crops out of my land compared to before.

- Govind Singh, Jhalra, Raghunathpura

CHART 37: HEIGHT OF WATER LEVEL FROM THE SURFACE LEVEL DURING SUMMER SEASON IN WELL - BEFORE & AFTER INTERVENTION

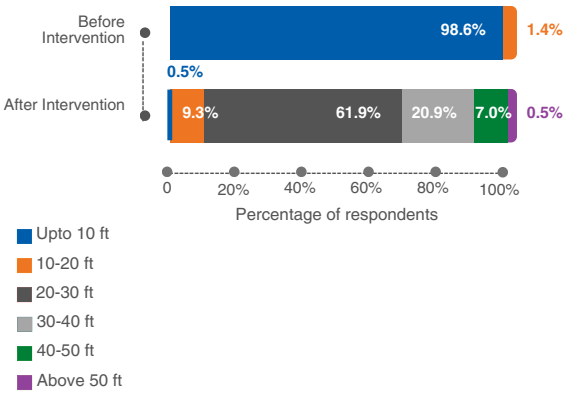
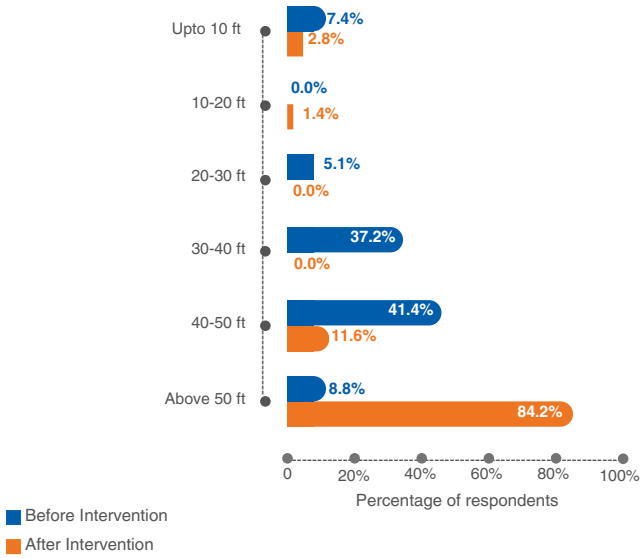


CHART 38: HEIGHT OF WATER LEVEL FROM THE SURFACE LEVEL DURING RAINY SEASON IN WELL - BEFORE & AFTER INTERVENTION



82.8%

of the respondents which comprises a majority, after the intervention, noted an increase in water level between 20 to 40 feet. Before the intervention, almost all of the respondents reported water levels within 10 feet in wells during the summer displaying severe scarcity.

78.6%

of the respondents which comprises a significant majority reported height of water levels between 30 and 50 feet in wells during the rainy season, limiting access to groundwater before the intervention. After the intervention, the vast majority 84.2 experienced water levels above 50 feet.

KEY FINDINGS

PROGRAM ACTIVITY 2: CAPACITY BUILDING PROGRAM

CHART 39: AGE GROUP DISTRIBUTION

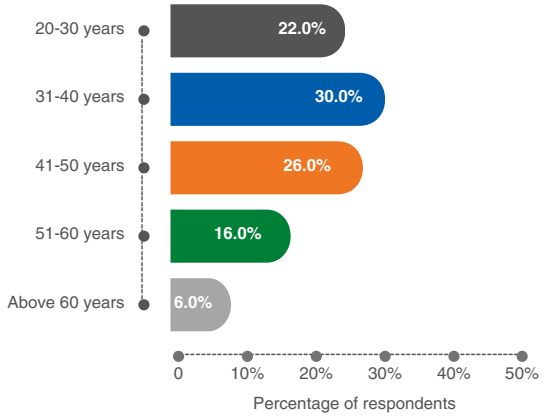


CHART 40: GENDER DISTRIBUTION

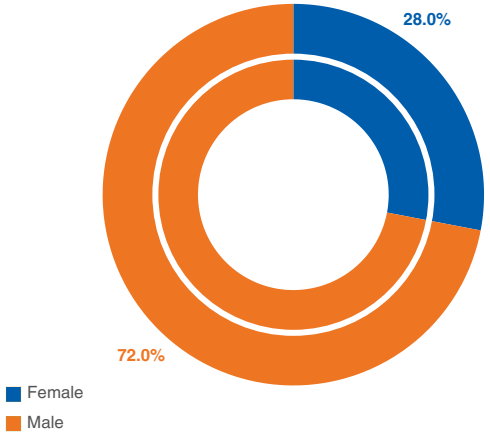


CHART 41: EDUCATIONAL LEVEL

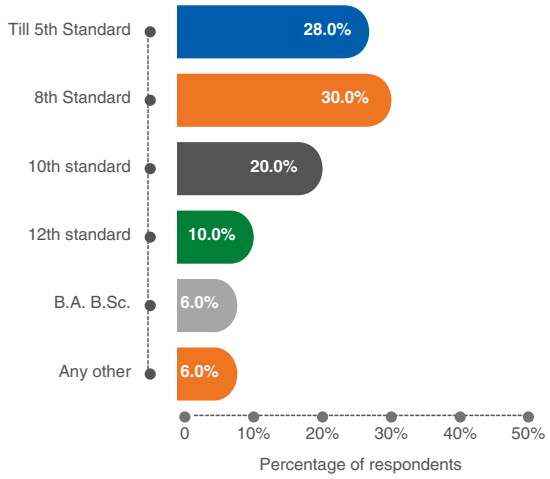


CHART 42: NO. OF FAMILY MEMBERS

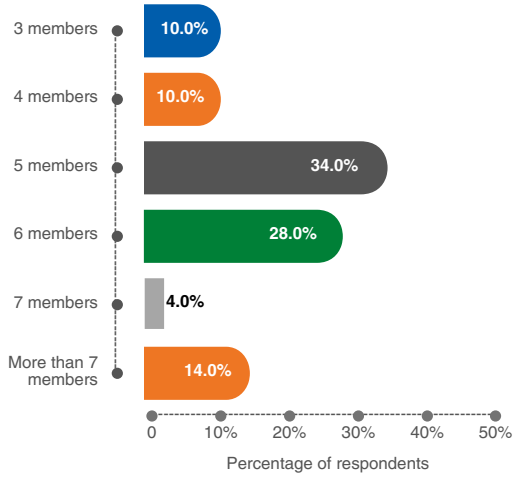


CHART 43: ANNUAL FAMILY INCOME

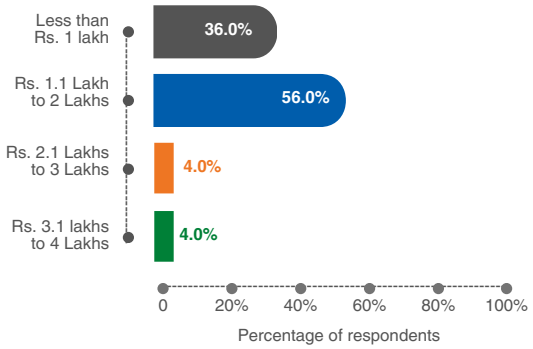
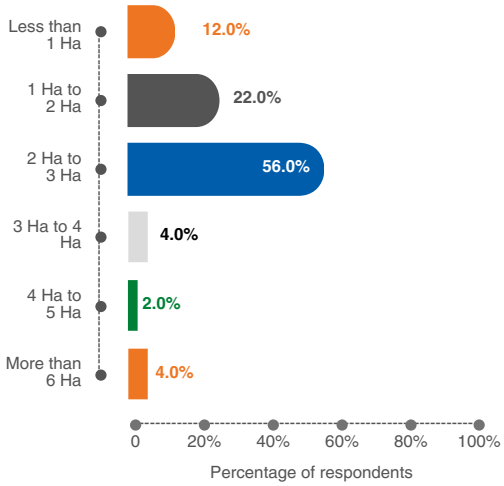


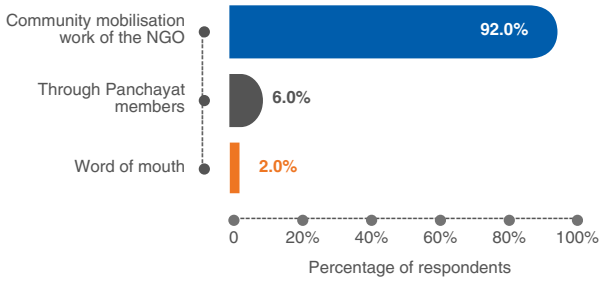
CHART 44: AREA OF LAND OWNED



- A significant majority of the respondents were between 31 and 40 years of age, followed by a group between 41 and 60 years and then those between 20 and 30 years.

- The majority of the population consisted of males.
- The majority of the respondents had education up to the 8th standard.
- The majority of the population had 5 members in their family, followed by those with 6 members.
- Most respondents reported an annual family income ranging between ₹ 1.1 lakh and ₹ 2 lakhs.
- A significant majority of respondents owned between 2 to 3 hectares of land, while a smaller portion (34.0%) owned 1 to 2 hectares or less than 1 ha.

CHART 45: SOURCE OF KNOWLEDGE ABOUT THE CAPACITY BUILDING PROGRAMS IN THE VILLAGE



A large majority of the respondents learned about the capacity-building programs through the community mobilisation work of the NGO, while a smaller number (8.0%) found out either through Panchayat members or word of mouth. The data showed that the NGO's efforts were the main source; people in the village heard about these programs.

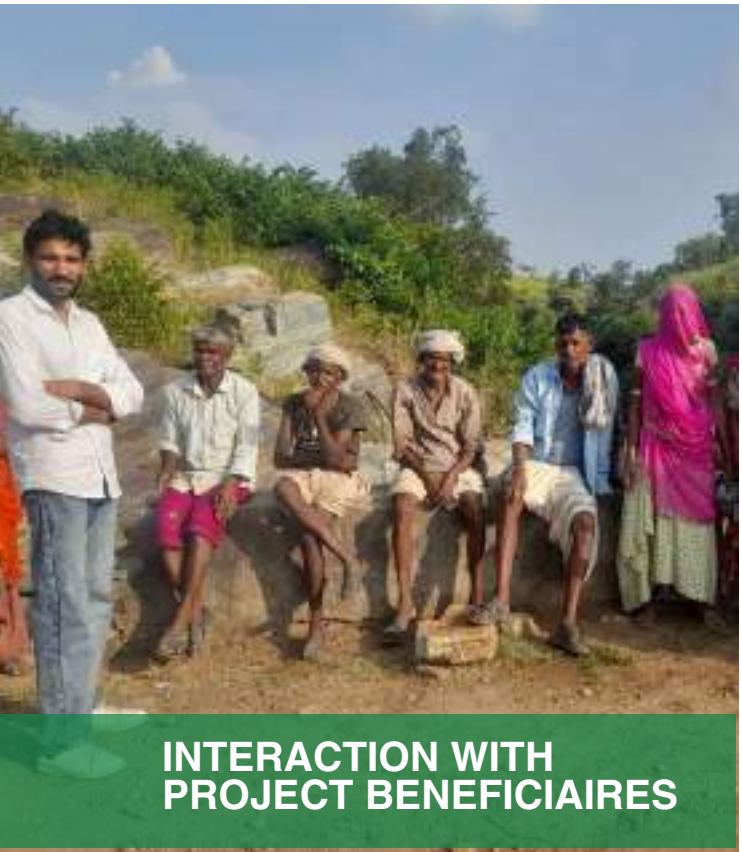
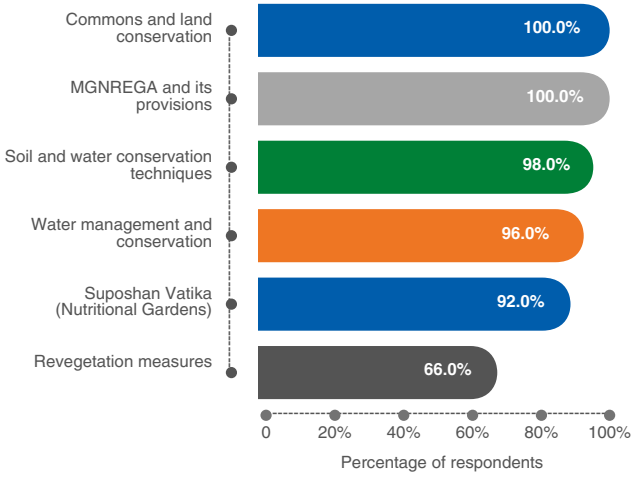


CHART 46: TOPICS COVERED DURING THE TRAINING SESSIONS



All respondents reported that the training sessions covered topics like commons and land conservation as well as MGNREGA and its provisions. The vast majority of the respondents learned about soil and water conservation techniques and water management with 98.0% and 96.0%, respectively. The data stated a strong focus on land and water conservation practices during the training.

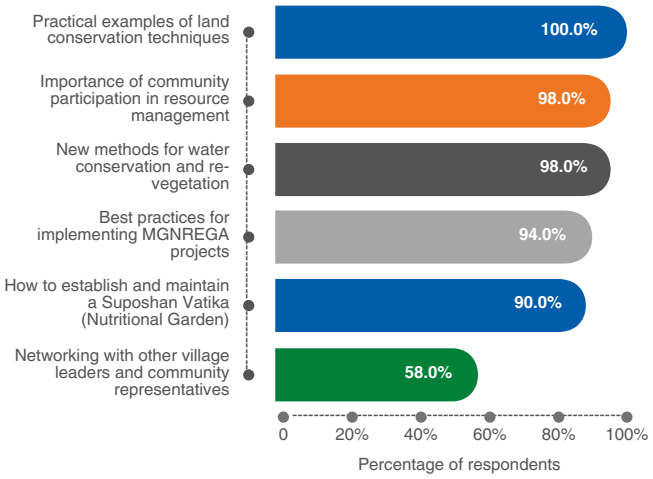
> "The training sessions in the capacity building program gave me a better understanding of how to conserve land and water in my community. I learned techniques for soil and water conservation that have helped me improve our farming practices. The session on water management taught me how to manage water resources more efficiently. The information on MGNREGA plans was particularly useful. I now feel confident about how to use these government programs to benefit our village."
>
> **- Sima Devi, Asind, Bhilwara**

“During the exposure visits, I learned practical examples of land conservation techniques and new methods for water conservation and re-vegetation. I also learned how to set up and maintain a Suposhan Vatika. The visits helped me understand the importance of community participation in managing resources. Learning the best practices for MGNREGA projects was very useful. Networking with other village leaders and community representatives gave me a chance to share ideas and experiences.

- Chagan Lal Gurjar, Tirol, Sayra”

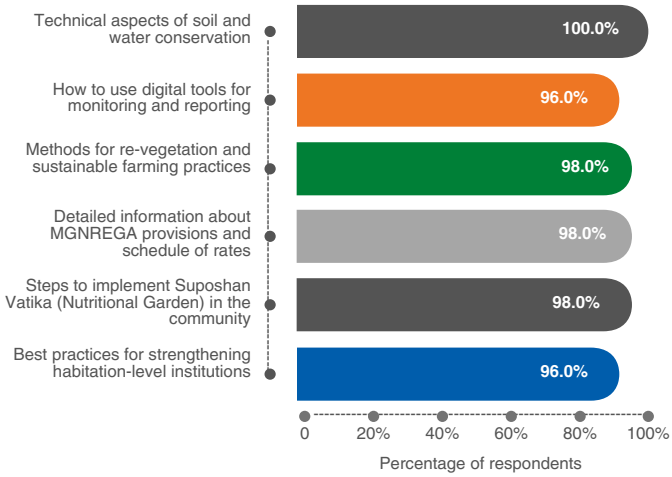
KEY IMPACTS

CHART 47: THINGS LEARNT FROM THE EXPOSURE VISITS



All the respondents learned practical land conservation techniques during the exposure visits. A large majority of the respondents learned the importance of community participation in resource management and new methods for water conservation and re-vegetation, gained insights into best practices for MGNREGA projects and established Suposhan Vatika. The visits provided valuable hands-on knowledge and strengthened connections among village leaders and community representatives.

CHART 48: THINGS LEARNT FROM THE DIGITAL TRAINING PROGRAMS



All the respondents learned about the technical aspects of soil and water conservation during the digital training programs. A large portion (98.0%) gained knowledge on re-vegetation methods, sustainable farming practices, MGNREGA provisions, and steps to implement Suposhan Vatika in the community. Almost all (96.0%) participants learned to use digital tools for monitoring and reporting. The data confirmed that the training programs offered essential knowledge for community development and effective resource management.

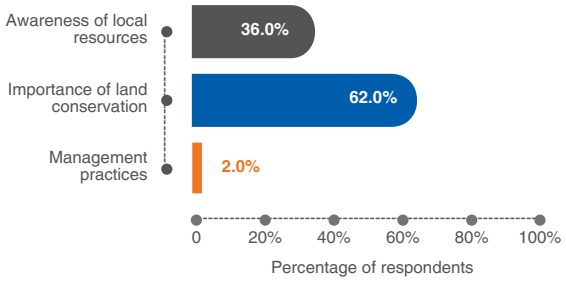
"During the interview with MGNREGA, worker Kamla Devi explained that after the construction, the community took care of the long-term maintenance. If anything got damaged, the villagers and community members fixed it. It had been five years since the check dams and gabion structures were made, and they were still working well in the village. The panchayat and community worked together for the maintenance which is why these structures stayed strong. Both men and women worked on the project. The women mostly helped wherever needed. This project benefits everyone in the village, whether they are farmers or doing other jobs. The FES team helped them in meetings by explaining water resources and how they would help in the long run. They told us how the structures would improve groundwater and help our cattle. The worker also said that the coordination between FES, MGNREGA and the community workers was good throughout."

"The digital training programs helped me learn technical aspects of soil and water conservation and methods for re-vegetation and sustainable farming. I also gained information about MGNREGA and how to use digital tools for monitoring and reporting. The sessions covered the steps to implement a Suposhan Vatika in the community and taught me the best practices for strengthening habitation-level institutions."

- Jagdish Das, Jhalra, Raghunathpura

GREEN FODDER TREE PLANTATION AREA

CHART 49: NEW KNOWLEDGE GAINED FROM THE TRAINING'S ON COMMONS AND LAND CONSERVATION PROCESSES



The training on commons and land conservation processes revealed that a significant portion of respondents (62.0%) gained awareness of the importance of land conservation. A considerable portion of respondents surveyed (36.0%) reported becoming aware of local resources, illustrating an understanding of their environment. The data showed that the training effectively enhanced knowledge related to land conservation and resource management.

Bali Bai, Negadiya, Mefliyas

Bali shared her experience as an MGNREGA worker, where she mentioned being involved in building check dams and gabion structures. Her tasks included bringing stones, digging, levelling the ground and participating in masonry work. She mentioned that the team members provided proper guidance on how the construction should be done, and they frequently visited the site to supervise and guide the workers, making the construction process easier. The local community and the panchayat jointly decided where the WRD structures would be built, and meetings were conducted to finalise the locations. She mentioned that after reviewing the locations, the Panchayat provided NOC in a timely manner, and following that, construction work began. She stated that she did not face any difficulties during the work, and the structures brought significant improvements. Water availability increased, irrigation practices improved, and there were positive changes in livestock management. Household water needs were also met. She noted that the project had a positive impact at the local community level and helped increase community ownership and leadership.

GREEN FODDER TREE PLANTATION AREA

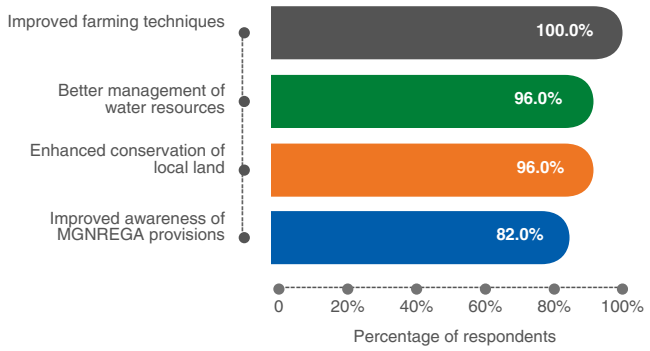
"

IIn the interview, Mangal shared that his primary responsibility as a Community Resource Person (CRP) was organizing habitation-level meetings where villagers could discuss their concerns and needs. He emphasized that these meetings were crucial for prioritizing activities such as soil conservation and water management, based on the community's inputs. Mangal stated that he took up the role of a CRP because he wanted to bring positive change to his community and believed this position would give him the opportunity to do so. He found the training sessions particularly helpful, especially those focused on water conservation techniques and the use of simple tools to assess soil health. He shared this knowledge during the meetings, guiding the community on practical steps they could take. For instance, during tree plantation drives, he explained how such activities would improve soil quality and benefit crops in the long term. To mobilize the community, he organized awareness campaigns and engaged directly with families to ensure they understood the benefits of the project. He concluded by saying that this participatory approach contributed to the success of the initiative and helped build a sense of unity within the community.

- Mangal, CRP, Solankiyo ka Guda

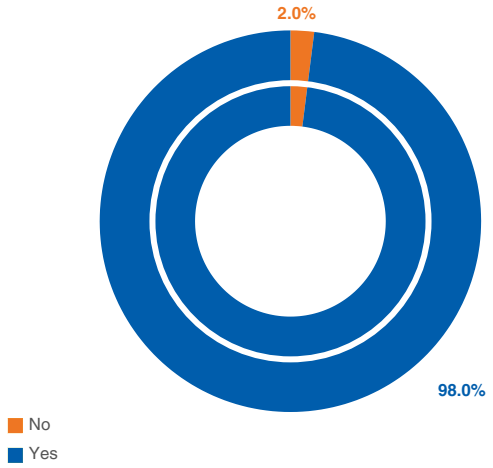
"

CHART 50: IMPACT OF TRAINING KNOWLEDGE ON HOUSEHOLD OR COMMUNITY



All of the respondents reported improved farming techniques. A vast majority (96.0%) stated that improved management of water resources and local land conservation showed the effectiveness of the program in promoting sustainability, and a substantial majority of the respondents also gained awareness of MGNREGA provisions, leading to better resource use in their households and communities.

CHART 51: IMPACT OF TRAINING PROGRAMS ON UNDERSTANDING MGNREGS



Nearly all respondents reported that the training programs significantly strengthened their understanding of MGNREGS. This data demonstrated the effectiveness of the training in enhancing awareness and comprehension of MGNREGS, which contributed positively to the ability of the participants to utilise this resource in their communities.

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Enhanced crop resilience during dry spells, leading to improved agricultural yields.
- Increased access to assured irrigation results in higher crop productivity.
- Adoption of diverse cropping patterns promoting food security and income stability.

FAMILY LEVEL

- Improved agricultural income, enhancing family livelihoods and overall well-being.
- Greater access to water resources for livestock, contributing to better livestock health.
- Strengthened family engagement in community water management practices.

DISTRICT LEVEL

- Increased cultivable land area, supporting local agricultural development.
- Enhanced water management infrastructure, promoting sustainable farming practices.
- Improved collaboration among farmers, nurturing community resilience and support networks.

STATE LEVEL

- Strengthened policy frameworks for water resource management, promoting sustainable agricultural practices.
- Increased state-level investment in irrigation and water management projects.
- Improved data collection and analysis on agricultural practices, informing future interventions.

NATIONAL LEVEL

- Contributed to national goals for food security and sustainable development.
- Enhanced awareness and adoption of water-efficient agricultural practices across regions.
- Supported national initiatives for climate-resilient agriculture and rural development.

CHAPTER 8

AUGMENTING CONSERVATION OF WATER FOR IMPROVING RESILIENCE OF AGRICULTURE IN RAIN FED AREAS (ACWIRARA)

OBJECTIVES OF THE ASSESSMENT

Change in surface water holding capacity and reduction in Run-off.

Change/improvement of Groundwater table/recharge.

Change in land use pattern, agricultural productivity, and soil moisture conditions.

PROJECT LOCATIONS

The projects were implemented in seven blocks across five districts of Rajasthan. The measures that were implemented as a part of the water conservation efforts can be categorised into construction and repair of Water Harvesting Structures (WHS), measures for Soil Moisture Conditions (SMC) improvement, and Pastureland Development (PD). The details of the same are as below:

TABLE 1: DETAILS OF THE INTERVENTIONS

District	Block	Area of Watershed (Sq. Km)	WHS (Nos.)	WHS (Cu. m.)	SMC (Ha)	PD (Ha)
Pratapgarh	Peepalkhoont	164.5541	31	38,000	4081.611381	2230.663906
Udaipur	Gogunda	209.4299	20	24,750	5194.713856	2838.991667
Chittorgarh	Begun	137.5077	19	23,625	3410.750587	1864.02808
Rajsamnd	Deogarh	50.40289	4	5,000	1250.196801	683.2519363
Bhilwara	Asind	194.851	37	90,400	4833.097802	2641.362887
	Jahazpur	196.34121	15	18,750	4870.061075	2661.563889
	Kotri	135.081401	23	28,750	3350.568498	1831.137635
Total		**1088.168201**	**149**	**2,29,275**	**26991**	**14751**

The maps give the locations of all the intervention watersheds across the five districts of Rajasthan and all the available locations of the various interventions across the intervention watersheds as a part of this project.

FIGURE 1: PROJECT LOCATIONS IN IN RAJASTHAN

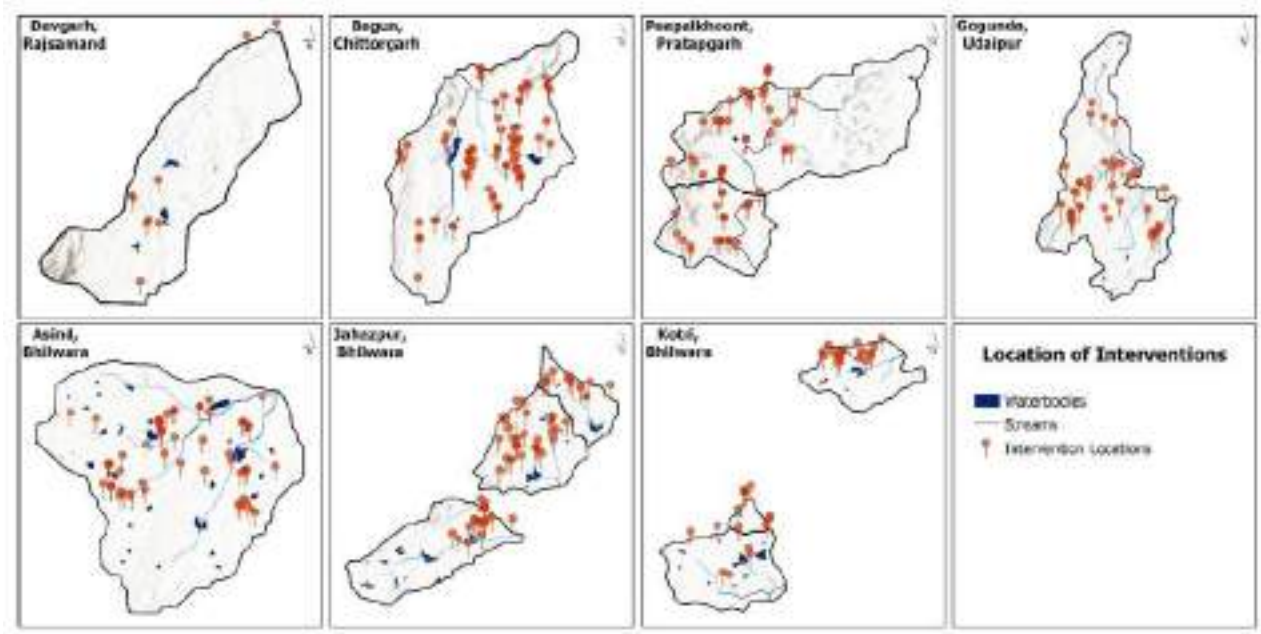


FIGURE 2: LOCATION OF ALL PROJECT INTERVENTIONS

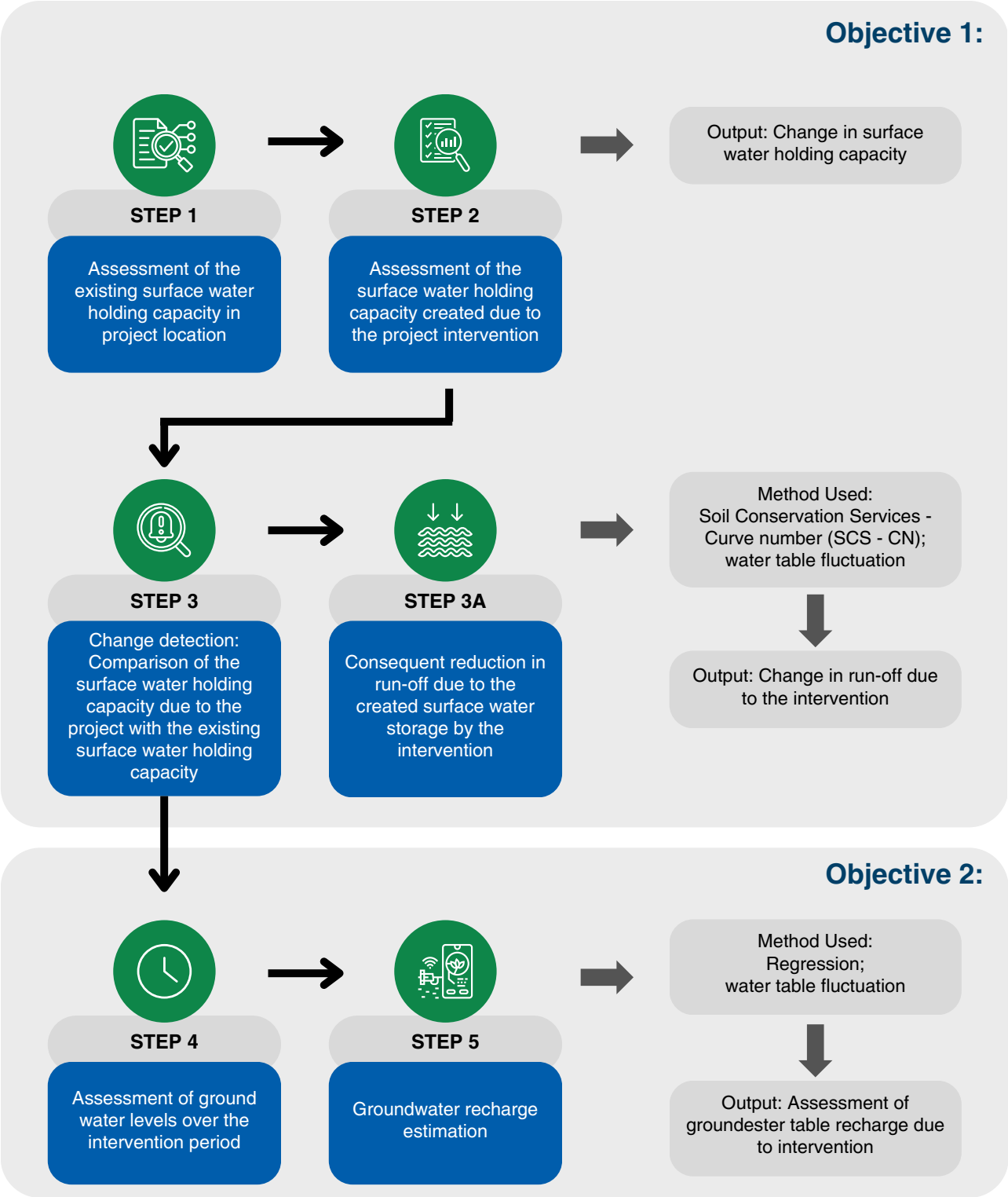
The detailed location of all the interventions covered as a part of the evaluations are provided in Annexure 1. The additional parameters that were considered are geology, hydrogeology, and soil types and the information about the same are provided in Annexure 2.

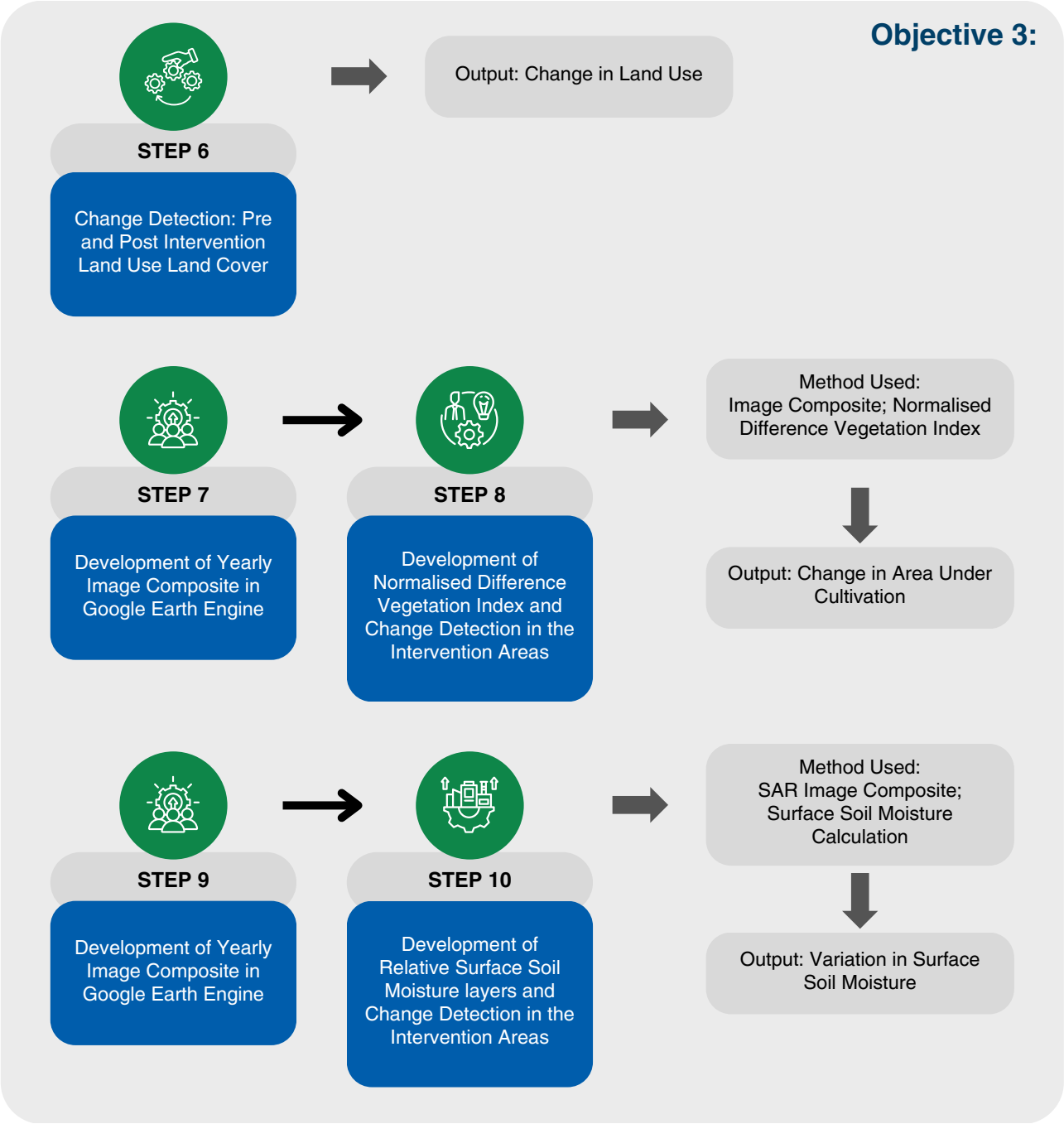
While some of the assessments such as the runoff estimation and the contribution of the interventions to the ground water levels were done only considering the intervention area, some assessments such as the rainfall and the ground water depth assessments had to be done considering a larger area such as the entire district due to the constraints faced with data availability. Care was taken to ensure that the results are not misrepresented in this condition to varying assessment units.[1]

[1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

ASSESSMENT APPROACH

The assessment approach consists of various steps for each objective as shown below:





DATA COLLECTION

The following datasets have been collected from the field to facilitate the objectives of the study:

- Representative sample of the interventions that were done, their locations, dimensions, and their current condition (Annexure 1)
- Photos from the field survey (Annexure 6)

In addition to the above datasets, additional data was collected from various sources to fill in the data gaps that were present in the conduct of the assessment. These are as follows:

- Depth to water level from Central Ground Water Board (CGWB) (provided in Annexure 3)
- Rainfall data from Indian Meteorological Department (IMD) (provided in Annexure 4)

Other datasets that were used in the assessment are as follows:

- Soil types from National Remote Sensing Centre[2] (provided in Annexure 2)
- Aquifer system from Central Ground Water Board (CGWB) (provided in Annexure 2)
- Specific Yield from Central Ground Water Board (CGWB) (provided in Annexure 2)

- Land Use Land Cover change between 2017 – 2023 from ESRI Living Atlas[3]
- Global Hydrologic Soil Groups for Runoff Estimation[4] (Annexure 2)

RESULTS

The results of the assessment to identify the impacts of the interventions on water conservation are presented in the below sections. It includes assessment of surface water holding capacity and the associated run-off reduction, rainfall and water level trends, estimation of recharge due to rainfall, the estimation of recharge due to the interventions, the change in land use land cover, the changes in vegetation levels, and the changes in soil moisture conditions over the course of the intervention period.

Change in surface water holding capacity and run-off reduction

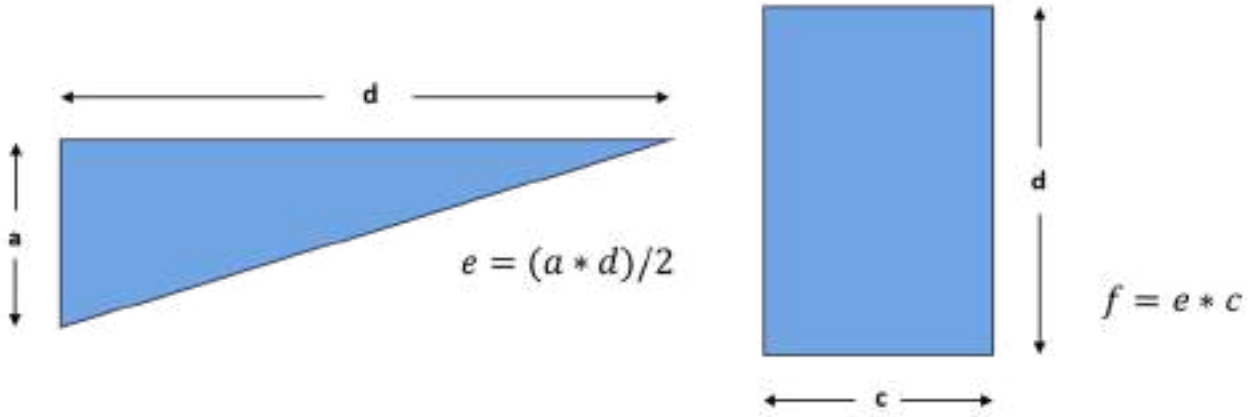
The intervention area is spread over multiple watersheds in the southern part of the state. On-site verification and satellite imagery show that the major land use in the intervention area is rangelands followed by crops. Based on the information available from the field survey and the organization, the volume of storage created is estimated.

The change in surface storage in the intervention area was net positive, i.e., no existing surface storage was considered in the pre-intervention period[5] and the surface storage of about 2,29,275 cubic meters created through the project[6] was considered across all the intervention sites as the storage post-intervention. The table below shows the measurement parameters that were considered for calculating the storage volume created due to the construction and repair of various water harvesting measures.

TABLE 2: DIMENSIONS OF THE WATER HARVESTING INTERVENTIONS

WHS Types	Height	Length	Weight	Backwater Distance	Area	Volume/ Unit (Cu. m.)	No. of Units	Total Volume (Cu. m.)
	a	b	c	d	e	f	g	h
Anicut - Construction & Repair	2.5	NA	10	100	500	1,250	112	1,40,000
Small Anicut – Construction	2	NA	8	100	400	800	8	6,400
Nadi Works	1.5	150	5	NA	NA	1,125	27	30,375
Talab	3.5	100	75	0	NA	26,250	2	52,500

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO
[3]Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.
[4]Ross, C.W., L. Prihodko, J.Y. Anchang, S.S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Runoff Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. [1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.
[5] This is due to the constraints of establishing the status of all water bodies in the intervention area.
[6] Annexure 1



Measurement	Source
d = Backwater Distance (in m)	Remotely Sensed Measurement
a = Height of Structure (in m)	Field Observation based Estimations
e = Area of Water Column (in sq. m.)	Calculated
c = Width/Length of Structure (in m)	Remotely Sensed Measurement & Field Observation
h = Volume of Water Stored (in cu. m.)	Calculated

Analysis of Rainfall Trends

Overall, while the values of rainfall have shown a slight positive trend, the depth to water level has shown a significant negative trend during the intervention period and has shown stable levels with seasonal variations since then. The graphs below show the trend in their change over time.

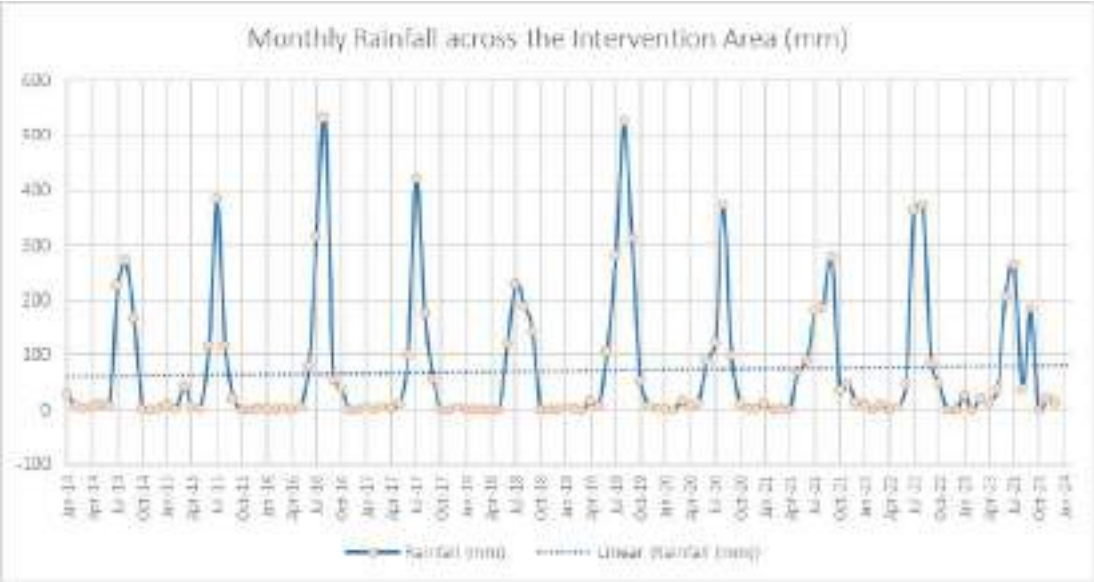


FIGURE 4: MONTHLY CUMULATIVE RAINFALL OVER THE INTERVENTION PERIOD (IN MM)

The trends of normal and actual rainfall reveal that over the intervention period, the rains have been above normal for most of the years. The slight positive trend that comes through is due to the above normal rainfall received in June and August of most years and the unseasonal rainfall received in some of the years, during the non-monsoon months.

Change in Water Level

The depth to water level data was obtained from the annual Ground Water Year Books for Rajasthan published by the Central Ground Water Board (CGWB) for the years between 2014 and 2023. However, the data that was available was not complete and regression models were used to fill in the missing values. The detailed dataset is provided in Annexure 3. The figure below shows the ground water level trends in in the intervention districts:

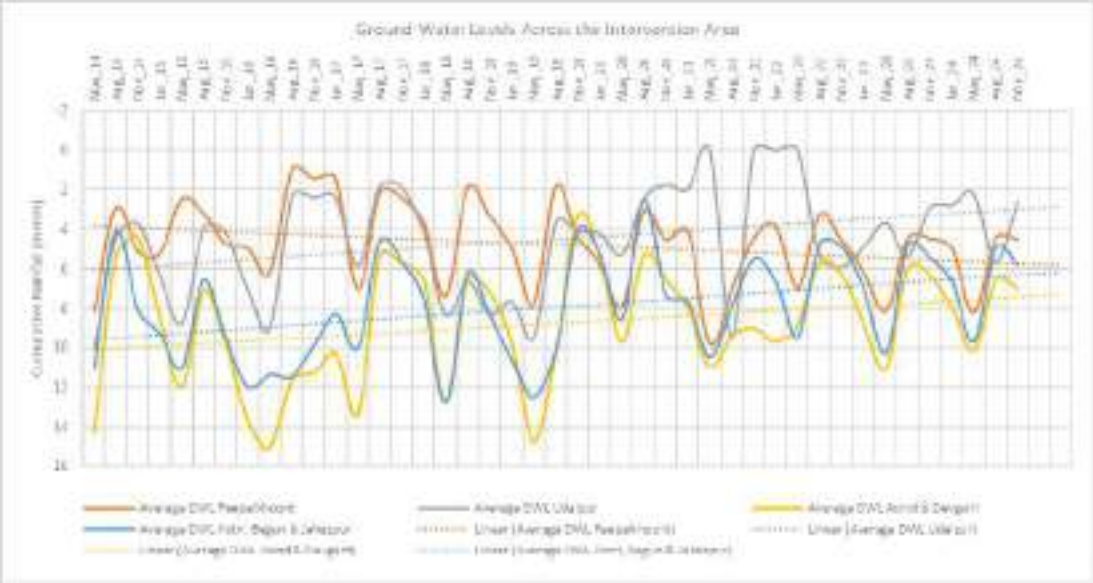


FIGURE 5: DEPTH TO WATER LEVEL (IN MBGL)

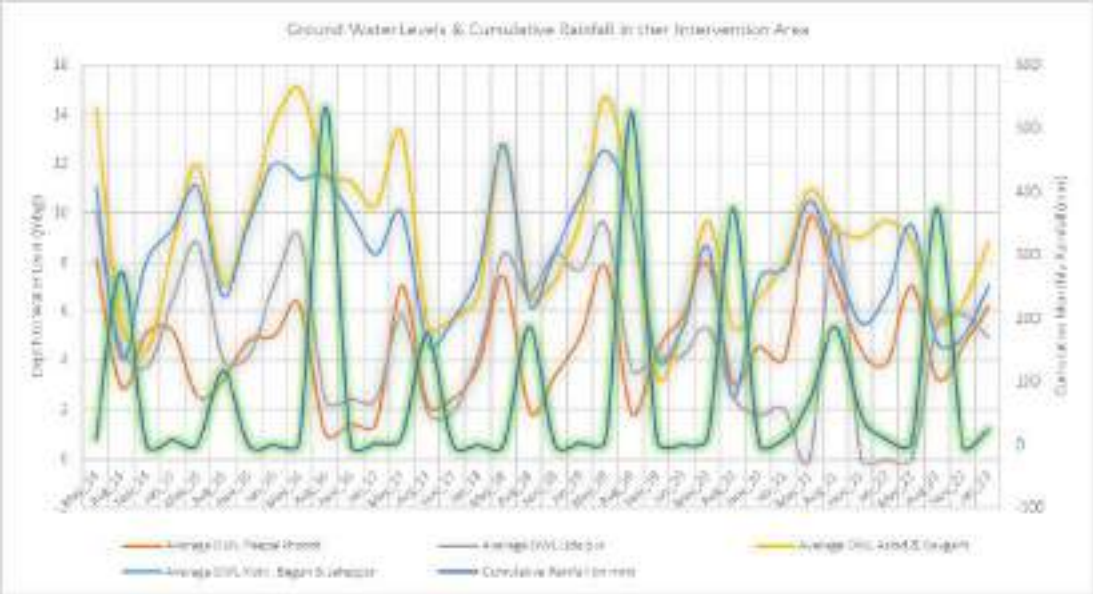


FIGURE 6: GROUND WATER LEVELS DURING AND AFTER THE INTERVENTION PERIOD (IN MBGL) COMPARED WITH MONTHLY CUMULATIVE RAINFALL (IN MM)

For this step of the assessment, the rainfall data from IMD was compared with the depth to water level data from the CGWB. The rationale behind this is that rainfall is the most critical variable that determines the level of water availability below ground. Thus, by establishing the role of rainfall in the change in water levels, we would be able to identify the role of the measures implemented on ground in augmenting the ground water levels.

A regression analysis of rainfall and depth to water level was done for the same effect to understand the strength of the relationship between these two variables. The p value obtained is greater than 0.05 for Peepalkhoont, and less than 0.05 for other areas, signifying a good strength of correlation in Peepalkhoont and not so in the other areas. Further, the low R2 values obtained for all intervention areas, along with the weak negative correlation established between rainfall and ground water points to the fact that among the factors that influence ground water levels, rainfall has had minimal influence. Detailed results are provided in Annexure 5.

This essentially means that rainfall influence on the ground water level has been to a minimal extent in the intervention areas over the period from 2017 to the relative present. However, over this period, the rainfall received and the ground water levels have both shown positive trends. Considering the R2 (coefficient of determination) values and the results of the correlation analysis, it can be understood that while the rainfall and ground water levels are not closely related, the factors such as improved water percolation and water storage mechanisms have had significant contributions in augmenting the ground water levels, supported by increasing rainfall trends. Relative stability in the increasing ground water levels is expected to continue over the coming years and the contributions of the interventions would help in improving the ground water levels. The availability of the most recent and more local measurements will help in assessing the same more accurately.

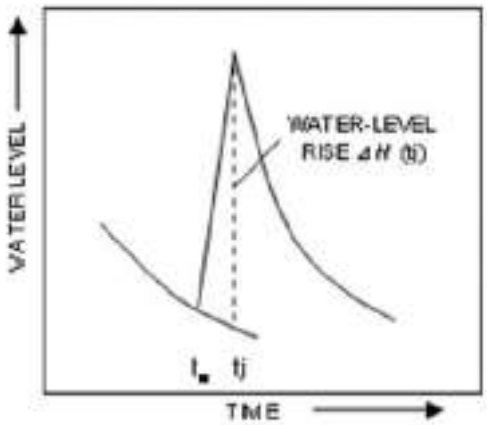
Note: The last available data on ground water depth data is till January 2023. The data from May 2023 to the present has not been published yet. Thus, in the absence of the necessary data, statistical methods were used to project the values for this period. This projected data might not necessarily reflect the true levels of ground water levels and the derived estimates are bound to change on the availability of official measurements of ground water depth for 2023 and 2024.

Estimation of Ground Water Recharge Due to Rainfall

The Water Table Fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The water-table fluctuation method is based on the premise that rises in groundwater levels in unconfined aquifers are due to recharge arriving at the water table. Recharge is calculated as the change in water level over time multiplied by specific yield[7].

$$R(tj) = Sy^* \Delta H(tj)$$

where R(tj) (m) is recharge occurring between times t0 and tj, Sy is specific yield (dimensionless), and ΔH(tj) is the peak water level rise attributed to the recharge period (cm).



The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology[8][9]. The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

Location	Peepalkhoont	Udaipur	Asind & Devgarh	Kotri, Begun & Jahazpur
Major Aquifer System	Basalt	Schist	Gneiss & Schist	Schist (1) Sandstone, limestone, BGC (2)
Sy Range	0.01 – 0.03	0.01 – 0.02	0.01 – 0.02	0.01 – 0.02, 0.01 – 0.05, 0.01 – 0.03, 0.01 – 0.02

[7] USGS GWRP: Techniques/Methods -Water-Table Fluctuation (WTF) Method
[8]The specific yield values were obtained from the Groundwater Estimation Commission's report on groundwater resource estimation methodology[9][10]. As per the report, specific yield values of 0.16 were used for the intervention site based on the aquifer types of sandstones observed in these regions[11].
[9]Detailed Guidelines (cgwb.gov.in)

Sy Chosen	0.02	0.015	0.015	0.02
RIF Range	0.12 – 0.14	0.05 – 0.09	0.05 – 0.09	0.05 – 0.09, 0.1 – 0.14, 0.05 – 0.07, 0.01 – 0.03
RIF Chosen	0.13	0.07	7	7

As per the results of the method, about 82.5% of the rainfall has recharged directly to the ground in the intervention sites. The results and calculations are presented below:

TABLE 3: WATER TABLE FLUCTUATION METHOD RESULTS

Average Recharge directly due to Rainfall received (since 2014)		
Location	**Recharge as % of Precipitation**	**Volume of Recharge (Cu. m.)**
Peepalkhoont	11.8%	146673759.99
Udaipur	9.9%	159758363.47
Asind	11.0%	161973790.77
Devgarh	11.0%	41898410.37
Kotri	13.3%	184734502.55
Begun	13.3%	62018971.64
Jahazpur	13.3%	194504956.85
Average Recharge directly due to Rainfall received (intervention period)		
Location	**Recharge as % of Precipitation**	**Volume of Recharge (Cu. m.)**
Peepalkhoont	11.8%	115261919.35
Udaipur	8.6%	111187642.85
Asind	10.2%	122562253.26
Devgarh	10.2%	31703669.82
Kotri	13.8%	161835697.98
Begun	13.8%	41862689.35
Jahazpur	13.8%	163073408.72

Further, the groundwater recharge from Rainfall Infiltration Method (RIF) can be obtained from the following relation:
Groundwater Recharge = Geographical Area x Actual Rainfall x Infiltration Factor

Location	Rainfall Infiltration Method
	Volume of recharge (in cu. m.)
Peepalkhoont	131659464.9
Udaipur	90227048.55
Asind	83946134.9
Devgarh	21714683.54
Kotri	58196065.26
Begun	59241368.71
Jahazpur	84588150.44

Estimation of percent rainfall converted into groundwater recharge

As per GEC-1997 norms, the rainfall recharge as computed by WTF method has been compared with that of RIF method, and finally, the rainfall recharge is assigned a value based on set criteria to avoid unreasonably high or low estimates.

A quantity called percentage difference (PD) which is the difference between the rainfall recharge computed by the water table method (A) and the recharge by the rainfall infiltration method (B) and expressed as a percentage of the rainfall recharge by rainfall infiltration method is computed as below:

$$PD = \frac{(A - B)}{B} \times 100$$

where 'A' is the rainfall recharge by the WTF method and 'B' is the rainfall recharge by the RIF method. The set criteria (GEC 1997) to be adopted are as follows:

(a) If PD ≥ – 20 and < + 20%, then the value of the water table fluctuation method is adopted.

(b)If PD ≤ – 20%, then the value of 0.8 × rainfall infiltration factor method is adopted.

(c)If PD ≥ + 20%, then the value of 1.2 × rainfall infiltration factor method is adopted.

By following the above criteria, groundwater recharge is estimated.

Location	Rainfall Infiltration Method	WTF Model	Percentage Difference	Criteria	Volume of recharge due to rainfall (Cu. m.)
	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)			
Peepalkhoont	131659464.9	115261919.35	-12.454	A	115261919.35
Udaipur	90227048.55	111187642.85	23.230	C	108272458.3
Asind	83946134.9	122562253.26	46.001	C	100735361.9
Devgarh	21714683.54	31703669.82	46.001	C	26057620.25
Kotri	58196065.26	161835697.98	178.087	C	69835278.31
Begun	59241368.71	41862689.35	-29.335	B	47393094.97
Jahazpur	84588150.44	163073408.72	92.785	C	101505780.5

Over the period of 2017 to 2024, an almost 8-year period covering the interventions and their operations till the present, the amount of ground water recharge directly due to rainfall stands at 56,90,61,513.55 Cu. m. across all the intervention watersheds.

Estimation of Ground Water Recharge Due to The Interventions

Ground water recharge due to the interventions occur mainly from the capture and storage of surface run-off water through Cement Nala Bunds and recharge through natural means and through the Ground Water Recharge Shafts.

Runoff is defined as the portion of the precipitation that makes its way towards rivers or oceans as surface or subsurface flow. After the occurrence of infiltration and other loses from the precipitation (rainfall), the excess rainfall flows out through the small natural channels on the land surface to the main drainage channels. Such types of flow are called surface flows. A part of the infiltrated rainwater moves parallel to the land surface as subsurface flow, and reappears on the surface at certain other points. Such flows are called interflows. Another part of the infiltrated water percolates downwards to ground water and moves laterally to emerge in depression and rivers and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

While interventions such as the Cement Nala Bunds and the Gabion Structure capture the surface flows, both these structures and the Ground Water Recharge Shafts contribute to the recharge of the ground water in the intervention sites.

Estimation of the runoff can give us an estimate of the amount of water that has been essentially captured by the intervention structures as surface storage, and thus point towards the potential amount of water available for ground water recharge. Runoff can be estimated by various methods such as:

- Empirical formulae and tables
- Runoff Estimation based on Land Use and Treatment
- Rational Method
- Empirical formulae for flood peak

In this assessment, we are using the method of empirical formulae and tables along with runoff estimation based on land use and treatment as it has proven to be the most reliable to conduct the assessment in the absence of reliable ground water level data and access to the intervention sites on the ground.

1 BINNIE'S PERCENTAGES

It provides the relationship of runoff to rainfall with a view to express the former as a percentage of the latter. The percentages mentioned below are based on observations on two rivers in Madhya Pradesh.

TABLE 4: RUNOFF AS A % OF THE RAINFALL RECIEVED

Annual Rainfall (mm)	Runoff (%)
500	15
600	21
700	25
800	29
900	34
1,000	38
1,100	40

2 COEFFICIENTS

The runoff ‘R’ in cm and rainfall ‘P’ in cm can be correlated as R = KP, where ‘K’ is the runoff coefficient. The runoff coefficient depends on factors affecting runoff. This method is applicable only for small projects such as the ones implemented as a part of this project. The usual values of K are as given.

TABLE 5: USUAL VALUES OF RUNOFF COEFFICIENTS (K)

Type of Area	K
Urban Residential	0.3 - 0.5
Forests	0.05 - 0.2
Commercial & Industrial	0.9
Parks, farms, Pastures	0.05 - 0.3
Asphalt or concrete pavement	0.85

3

BARLOW'S TABLES

The following values of K (in percentage) for various types of catchments was developed by T.G. Barlow based on the studies of catchments mostly under 130 sq. km. in Uttar Pradesh.

TABLE 6: BARLOW'S PERCENTAGE RUNOFF COEFFICIENTS

Class	Description of Catchment	Percent runoff
A	Flat, cultivated and black cotton soils	10
B	Flat, partly cultivated-various soils	15
C	Average	20
D	Hills and plains with little cultivation	35
E	Very hilly and steep, with hardly any cultivation	45

These percentages are for the average type of monsoon and are to be modified by the application of the following coefficients according to the nature of the season as shown below.

TABLE 7: BARLOW'S RUNOFF COEFFICIENTS FOR DIFFERENT NATURES OF SEASON

Nature of Season	Class of catchments				
	A	B	C	D	E
Light rain, no heavy downpour	0.7	0.8	0.8	0.8	0.8
Average or varying rainfall, no continuous downpour	1	1	1	1	1
Continuous downpour	1.5	1.5	1.6	1.7	1.8

As part of this method, the special tropical rainfall was divided into the following four classes:

- **Negligible falls:** All rainfalls under 12 mm a day unless continuous for several days; also rainfalls 12 to 40 mm a day, when there is no rain.
- **Light falls:** All rainfalls up to 25 mm a day followed by similar or heavier falls. Steady pours of 25 to 40 mm a day, when there is no rain of similar or greater amount before or after that.
- **Medium falls:** Rainfalls from 25 to 40 mm a day when preceded or followed by any but light falls.
- **Heavy Falls:**
  - All rainfalls are over 75 mm a day or continuous falls at 50 mm a day.
  - b.All rainfalls of an intensity of 50 mm or more per hour.

The runoff percentages as shown in the following table were developed by combining the type of catchment and nature of the season.

TABLE 8: BARLOW'S RUNOFF PERCENTAGES

Nature of Rainfall	Percentage of Flow in Catchments of Different Type				
	A	B	C	D	E
Negligible falls	-	-	-	-	-
Light falls	1	3	5	10	15
Medium falls	10	15	20	25	33
Heavy falls	20	33	40	55	70

4 ESTIMATION OF DIRECT RUNOFF FROM RAINFALL

In this method of runoff estimation, the effects of the surface conditions of a watershed area are evaluated by means of land use and treatment classes. Land use is the watershed cover and it includes every kind of vegetation, litter and mulch, and fallow as well as non-agricultural uses such as water surfaces (lakes, swamps, etc) and impervious surfaces (roads, roofs, etc.). Land treatment applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing and management practices such as grazing control or rotation of crops. The classes consist of use and treatment combinations to be found on watersheds. Land use and treatment classes are readily obtained either by observation or by measurement of plant and litter density and extent on sample areas.

4.1 Hydrological Soil Groups

There are four soil groups that are used in determining the hydrological soil cover complexes, which are used in a method for estimating the runoff from rainfall. Major characteristics of these groups are described below. The respective infiltration rates and permeability of soils in different groups are also shown below. Infiltration rate is the rate at which water enters the soil at the surface and which is controlled by surface conditions and permeability rate is the rate at which water moves in the soil, which is controlled by the nature and characteristics of soil horizons.

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.	Low	High rate
Group B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	High	Low rate

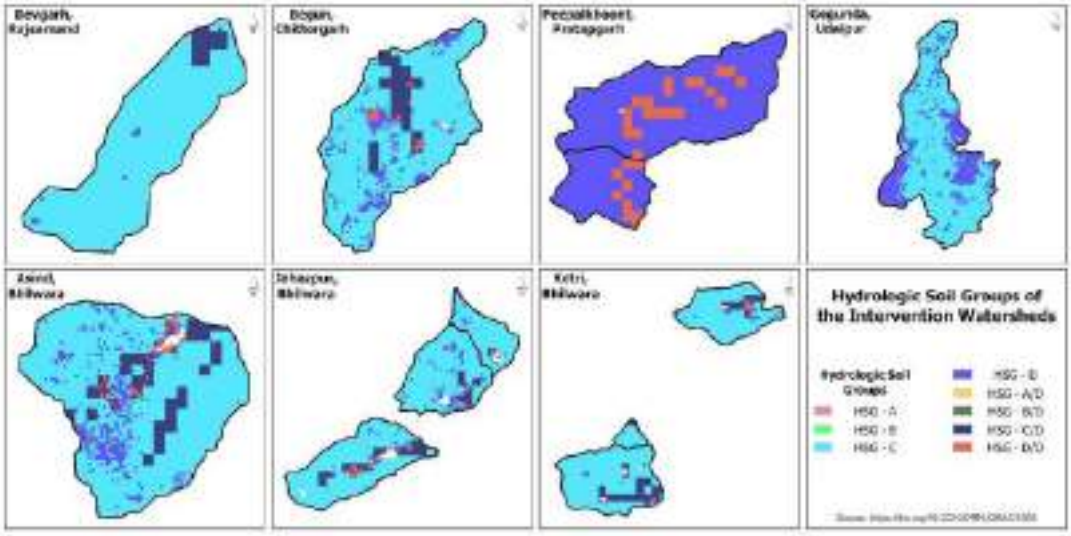


FIGURE 7: HYDROLOGIC SOIL GROUPS OF THE PROJECT WATERSHEDS

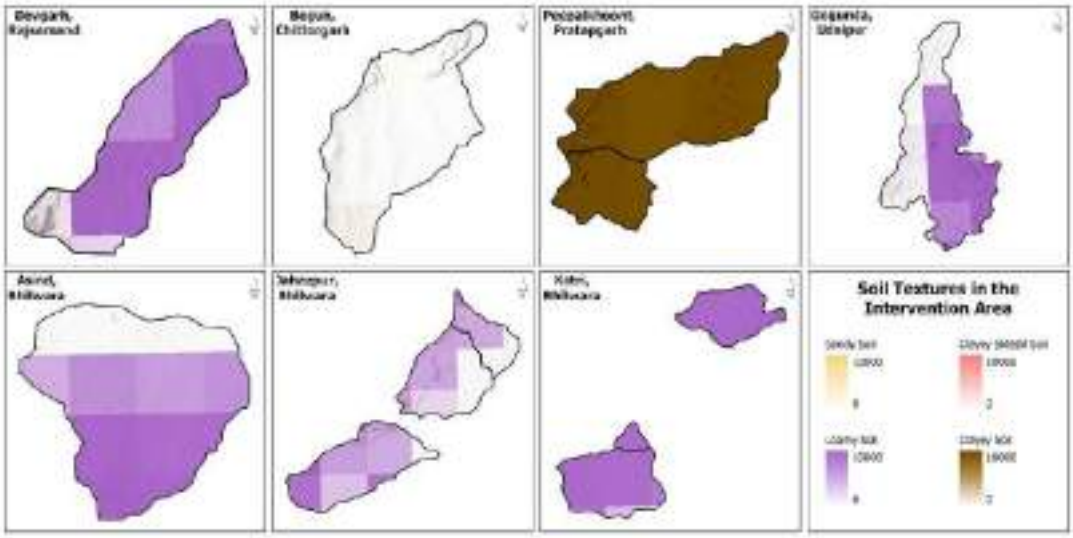


FIGURE 8: SOIL CHARACTERISTICS IN THE PROJECT WATERSHEDS

TABLE 9: INFILTRATION RATES

Class	Rates / hr in		Remarks
	Inches	Millimetres	
Very Low	Below 0.1	Below 2.5	Highly clayey soils
Low	0.1 - 0.5	2.5 - 12.5	Shallow soils, clay soils, soils low in organic matter
Medium	0.5 - 1.0	12.5 - 25.0	Sandy loams, silt loams
High	Above 1.0	Above 25.0	Deep sands, well aggregated soils

TABLE 10: RELATIVE CLASSES OF SOIL PERMEABILITY

Class	Permeability	
	Inches/ hr	mm/ hr
Slow		
Very Slow	Less than 0.05	1.3
Slow	0.05 to 0.20	1.31 to 5.00
Moderate		
Moderately Slow	0.20 to 0.30	5.01 to 20.00
Moderate	0.80 to 2.50	20.01 to 50.00
Moderately Rapid	2.50 to 5.00	50.01 to 130.00
Rapid		
Rapid	5.00 to 10.00	130.01 to 250.00
Very Rapid	Over 10.00	Over 250.00

4.2 Land Use and Treatment Classes

The commonly used land use and treatment classes are briefly described below. These classes are used in determining hydrologic soil-cover complexes, which are used in one of the methods for estimating runoff from rainfall.

- **Cultivated lands:** These include all field crops such as maize, sugarcane, paddy and wheat.
- **Fallow lands:** These are lands taken up for cultivation, but are temporarily out of cultivation for a period of not less than one year, and not more than 5 years. Current fallow lands are cropped areas kept fallow during the current year.
- **Uncultivated lands include:**
  - Permanent pastures and other grazing lands.
  - Cultivable waste, which are lands available for cultivation whether or not taken up for cultivation or abandoned after a few years for one reason or another. Land once cultivated but uncultivated for 5 years in succession shall also be included in this category.
- Forest area includes all lands classed as forest under any legal enactment dealing with forest or administered as forest whether State-owned or private and whether wooded or maintained as potential forest land.
- Tree crops include woody perennial plants that reach a mature height of at least 8 feet and have well-defined stems and a definite crown shape.
- Lands put to non-agricultural uses are areas occupied by buildings, roads, railroads, etc.
- Barren and uncultivable lands include areas covered by mountains, deserts, etc.

Based on these assessments, the following were estimated:

Surface Storage

The volume of surface storage created by the intervention[10] = 2,29,275 m3

[10] Detailed calculations are provided in the above sections

Rainfall & Runoff

- Total rainfall received over the intervention period and since = 6,11,06,71,181.4958 m3
- Total runoff generated over the intervention area = 1833201354.4488 m3
- Percentage of rainfall that is converted to runoff = 30%

The intervention area received enough rainfall to completely fill the surface storage structures 5,147.16 times as a part of and due to the project Augmenting Conservation of Water for Improving Resilience of Agriculture in Rainfed Areas (ACWIRARA) in Rajasthan. This shall be interpreted as the number of days that the Water Harvesting Structures have filled since the implementation of the interventions and ever since.

Runoff Reduction

- The volume of surface runoff stored by the intervention measures after considering 40% evaporation loss = 9,65,60,943.32 m3.

Which is,

- 5.0175% of the total runoff generated as a part of and due to the water conservation efforts of this project (or)
- 1.58% of the total rainfall received during the project period and ever since

A BLOCK WISE BREAK DOWN OF THE ABOVE FIGURES IS PRESENTED IN THE TABLE BELOW:

District		Pratapgarh	Udaipur	Chittorgarh	Rajsamand	Bhilwara			Totals
Block		Peepalkhoont	Gogunda	Begun	Deogarh	Asind	Jahazpur	Kotri	
Total Area of Watershed (Sq.Km.)		164.55	209.43	137.51	50.40	194.86	196.34	135.08	[illegible]
Soil Group		D	C/D	C/D	C	C/D	C	C	-
Volume of Storage Created (Cu.m.)		38000	24750	23625	5000	80400	18750	26750	[illegible]
Q - Total runoff over intervention area (cu.m.)		277218008.71	352819698.27	231654721.81	84911099.19	328259102.58	330789610.59	227567215.29	[illegible]
No. of times of intervention storage filling		715.50	766.60	739.85	779.46	641.16	782.19	722.39	[illegible]
Runoff volume stored in interventions	Pre Evaporation Loss	27188095.80	18973442.63	17478954.62	3897304.41	57981285.31	14866116.21	20768756.54	160934905.54
	Post Evaporation loss	16313421.48	11384065.58	10487372.77	1338382.66	34776771.19	8799675.72	12461253.92	[illegible]
% of runoff stored by interventions	Pre Evaporation Loss	9.81	5.38	7.55	4.59	17.66	4.43	9.13	8.30
	Post Evaporation loss	5.88	3.23	4.53	2.75	10.59	2.66	5.48	[illegible]
% of rainfall stored by interventions	Pre Evaporation Loss	0.44	0.31	0.29	0.06	0.95	0.24	0.34	2.63
	Post Evaporation loss	0.27	0.19	0.17	0.04	0.57	0.14	0.20	[illegible]

This means that the interventions that were created as a part of both phases of this project have contributed to a combined reduction in surface runoff by about 5.02% in the intervention area. Although this number is bound to increase over the years. Care must be taken to ensure the effective functioning of these water harvesting structures. Regular desilting and clearing of overgrowth along with any structural repairs are required across all the structures to ensure that their storage capacity is maintained and the structural integrity is preserved.

Thus, in total, 9.31% of the rainfall is converted into direct recharge, about 5.02% of the rainfall is stored in the intervention-created surface storage, 40% is lost as evaporation, and the remaining 54.3% accounts for factors such as runoff that is stored in other water bodies present, runoff that is not captured evapotranspiration, and other losses.

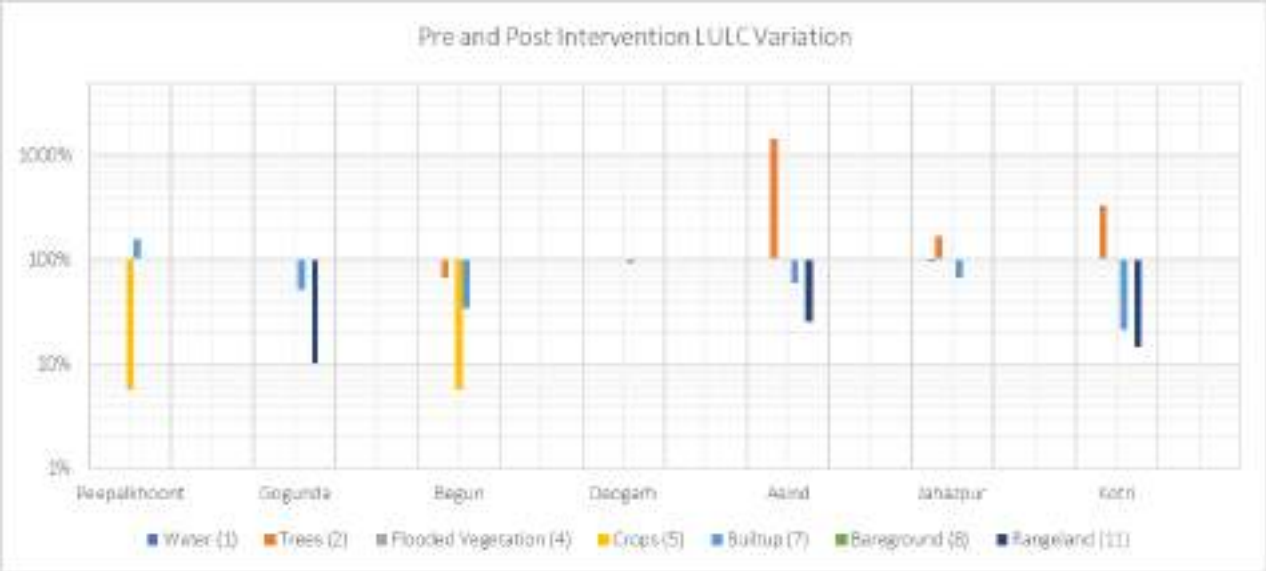
5

CHANGE IN LAND USE PATTERN

Land use and land cover change detection involves the analysis of changes in the way land is utilized and the alterations in its physical coverage over time. Changes in land use patterns, such as urban expansion, deforestation, agricultural expansion, and natural disaster impacts can be tracked by employing remote sensing techniques, satellite imagery, and geographic information systems (GIS). The land uses land cover for the intervention areas was developed through supervised classification of the Sentinel-2 Full Colour Composite (FCC) imagery for both the pre- and post-intervention periods.

TABLE 11: ZONAL STATISTICS OF LULC FOR THE INTERVENTION AREAS

District	Pratapgarh		Udaipur		Chittorgarh		Rajsamnd		Bhilwara					
Block	Peepalkhoont		Gogunda		Begun		Deogarh		Asind		Jahazpur		Kotri	
Total Area of Watershed (Sq.Km.)	164.5541		208.4299		137.5077		50.40289		194.851		196.34121		135.081401	
Soil Group	D		C/D		C/D		C		C/D		C		C	
Landuse (2017)	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area
Water (1)	0.9852	0.60	0.9302	0.44	1.4498	1.05	0.4833	0.96	2.6884	1.38	1.5306	0.78	1.1130	0.82
Trees (2)	7.3620	4.47	0.5434	0.26	4.8309	3.51	0.3210	0.64	0.0037	0.00	0.6609	0.34	0.0272	0.02
Flooded Vegetation (4)	0.0000	0.00	0.0003	0.00	0.0000	0.00	0.0128	0.03	0.0000	0.00	0.0000	0.00	0.0000	0.00
Crops (5)	119.2306	72.46	56.7033	27.08	66.5247	48.38	18.0624	35.84	96.9695	49.77	114.4917	58.31	104.3859	77.28
Builtup (7)	1.0930	0.66	10.7789	5.15	4.0419	2.94	3.0867	6.92	8.0593	4.13	6.5042	3.31	0.5418	3.21
Bareground (8)	0.0000	0.00	0.0024	0.00	0.0010	0.00	0.0000	0.00	0.0170	0.01	0.0162	0.01	0.0120	0.01
Rangeland (11)	35.7448	21.72	140.4265	67.05	60.5471	44.03	28.0073	55.57	86.9905	44.65	72.9775	37.17	25.0864	18.57
Landuse (2020)	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area
Water (1)	0.6607	0.40	0.8765	0.42	0.8632	0.63	0.1879	0.37	0.0126	0.01	2.9903	1.52	0.7850	0.58
Trees (2)	4.2914	2.61	0.2399	0.11	8.0863	5.88	0.0017	0.00	0.0565	0.03	1.7996	0.90	0.1367	0.09
Flooded Vegetation (4)	0.0000	0.00	0.0072	0.00	0.0000	0.00	0.0069	0.01	0.0000	0.00	0.0000	0.00	0.0058	0.00
Crops (5)	125.9829	76.56	36.9348	17.64	70.2730	51.10	15.6074	30.97	72.6900	37.31	113.6043	57.86	100.6742	74.08
Builtup (7)	2.8048	1.70	16.3098	7.79	5.4150	3.94	6.7616	13.42	12.8687	6.60	10.7816	5.49	5.2726	3.90
Bareground (8)	0.0000	0.00	0.0000	0.00	0.0050	0.00	0.0000	0.00	0.0020	0.00	0.0169	0.01	0.0000	0.00
Rangeland (11)	30.6748	18.64	155.0160	74.02	52.7525	38.36	27.7927	55.14	109.0008	55.90	67.0157	34.13	28.7139	21.26
% Difference	Peepalkhoont		Gogunda		Begun		Deogarh		Asind		Jahazpur		Kotri	
Water (1)	-32.94%		-5.71%		-40.06%		-61.11%		-99.53%		95.13%		-29.46%	
Trees (2)	-41.71%		-55.86%		67.39%		-99.47%		1438.13%		167.70%		320.87%	
Flooded Vegetation (4)	0.00%		0.00%		0.00%		0.00%		0.00%		0.00%		0.00%	
Crops (5)	5.60%		-34.86%		5.63%		-13.59%		-25.04%		-0.78%		-4.13%	
Builtup (7)	157.09%		51.31%		33.97%		93.93%		60.07%		65.77%		21.44%	
Bareground (8)	0.00%		100.00%		0.00%		0.00%		0.00%		0.00%		0.00%	
Rangeland (11)	-14.18%		10.39%		12.87%		-0.77%		25.40%		-8.13%		14.49%	



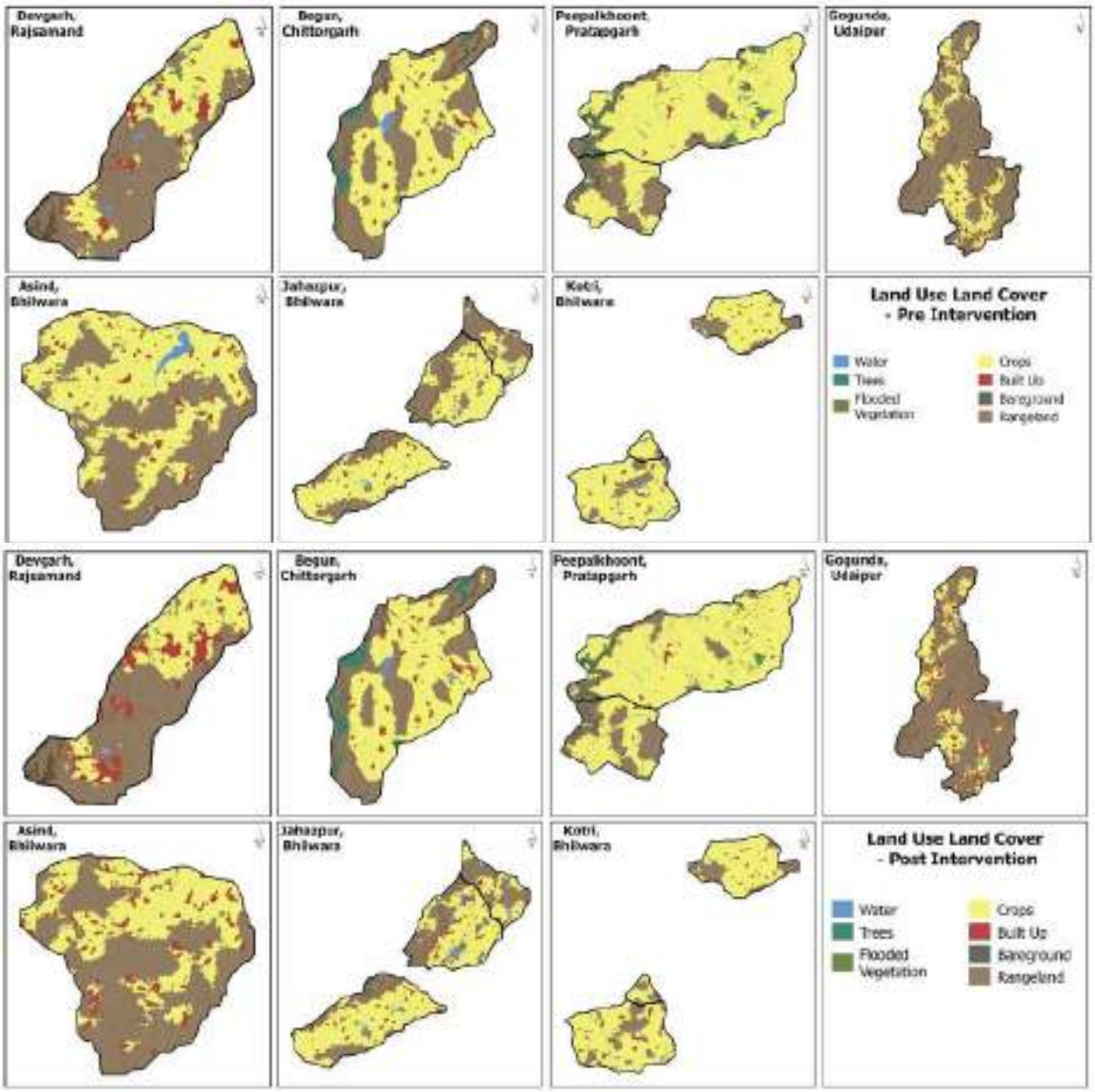


FIGURE 9: PRE AND POST INTERVENTION LULC OF THE INTERVENTION WATERSHEDS

It can be observed from the above table and charts, that in terms of total area, the area under crops and rangelands are the highest. Looking at the changes in land use that has happened through the course of the intervention period and since, the area under built up has increased in all intervention watersheds. Areas where the rangeland has reduced across all intervention watersheds. The reduction in crop land is significant in Gogunda block, however, the increase in rangeland is to be noted as well. The area under rangeland includes areas covered with low density cropping of cereals & pulses, and grazing lands as well. The following section will offer more clarity on the changes to cropping intensity.

6

VEGETATION INDEX (VI)/CROPPING INTENSITY

Vegetation Indices are combinations of surface reflectance at two or more wavelengths designed to highlight a particular property of vegetation. They are derived using the reflectance properties of vegetation. For this assessment, the Normalized Difference Vegetation Index (NDVI) is used. NDVI is an indicator that shows the greenness, density, and health of vegetation in each pixel of a satellite image. The index detects and quantifies the presence of living green vegetation using this reflected light in the visible and near-infrared bands.

The standard formula for calculating NDVI is: NDVI = (NIR – red) / (NIR + red)

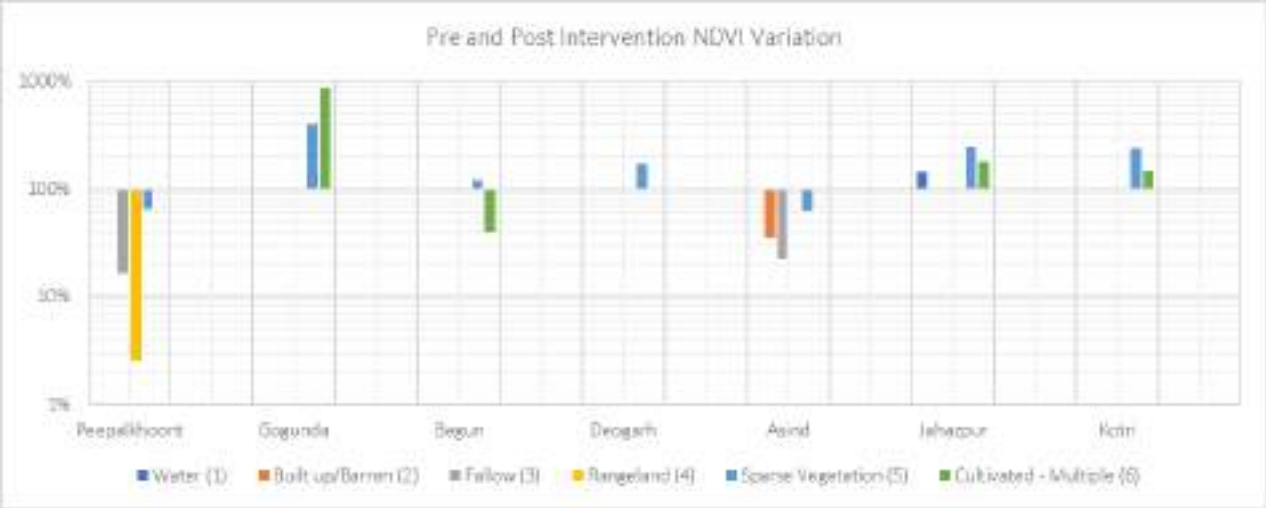
NIR is the near infra-red, band 8, and red, band 4 of Sentinel-2 imagery. Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states.

The NDVI value ranges from -1 to 1 and shows the vigour of the crop:

- **Values close to 1:** the more intense the green, the more vigorous the vegetation and vegetation cover. Considerations for the type of farming, bare soil, etc. must be made. The index also measures the vigour of the underbrush.
- **Values close to 0:** areas with very little vegetation, early stages of cultivation, bare soil, or non-productive areas.
- **Negative values:** usually associated with areas of water, snow, or clouds.

TABLE 12: ZONAL STATISTICS VALUES OF THE VEGETATION INDEX

District	Pratapgarh		Udaipur		Chittorgarh		Rajsamand		Bhilwara					
Block	Pasupalkhurd		Sagunda		Bagun		Deogarh		Asind		Jahazpur		Kotri	
Total Area of Watershed (Sq.Km.)	164.5541		209.4209		137.5077		50.40289		194.851		196.34121		135.081401	
Soil Group	D		C/D		C/D		C		C/D		C		C	
NDVI (2017/18)	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area
Water (1)	0.4137	0.25	0.2044	0.10	0.5700	0.41	0.0863	0.17	1.4093	0.72	0.5076	0.26	0.2219	0.16
Barren (2)	29.8552	18.14	6.3339	3.02	7.6655	5.57	4.3020	8.54	19.3533	9.93	23.1173	11.77	3.7314	2.76
Fallow (3)	47.9689	29.14	95.7588	45.72	37.1672	27.03	20.9577	41.58	76.5507	39.29	81.5877	41.55	52.3579	38.76
Rangeland (4)	39.4848	24.00	92.5579	44.20	52.2946	38.03	19.2716	38.24	77.2884	39.67	70.8755	36.10	57.8881	42.86
Sparse Vegetation (5)	15.6774	9.53	9.8812	4.72	15.2630	11.10	2.6244	5.21	9.9986	5.10	13.5059	5.88	11.0551	8.18
Cultivated - Multiple (6)	31.0921	18.89	4.6169	2.20	24.5001	17.82	3.1255	6.20	10.2542	5.26	8.6600	4.41	9.7437	7.21
NDVI (2023)	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area
Water (1)	0.0406	0.03	0.1481	0.07	0.4550	0.33	0.0025	0.00	0.0088	0.00	1.2456	0.63	0.0432	0.03
Barren (2)	15.1259	9.19	2.3520	1.12	5.2789	3.84	3.3330	6.61	26.2318	13.46	13.8252	7.04	3.5919	2.66
Fallow (3)	55.9563	34.00	31.4780	15.03	27.1577	19.74	18.2979	36.30	93.5329	48.00	88.5623	45.12	20.5946	15.25
Rangeland (4)	40.5009	24.61	80.5993	38.49	36.5495	26.58	18.4187	36.54	53.1156	27.26	68.5722	34.93	49.1843	36.41
Sparse Vegetation (5)	25.8768	15.73	49.8773	23.82	33.8455	24.61	7.2060	14.30	16.1651	8.30	39.5379	20.14	37.4115	27.70
Cultivated - Multiple (6)	36.9714	16.39	44.8905	21.43	36.1898	24.86	3.1060	6.16	5.7826	2.94	24.5201	12.49	24.1752	17.90
% Difference														
Water (1)	-88.15%		-27.55%		-20.14%		-97.29%		-99.37%		145.88%		-80.52%	
Barren (2)	-49.34%		-62.87%		-31.13%		-22.50%		35.54%		-40.20%		-3.74%	
Fallow (3)	16.66%		-67.13%		-26.98%		-12.69%		21.18%		-41.50%		-60.87%	
Rangeland (4)	2.57%		-12.92%		-30.11%		-4.40%		-31.20%		-3.25%		-15.00%	
Sparse Vegetation (5)	65.01%		404.77%		121.25%		174.37%		61.65%		245.62%		238.41%	
Cultivated - Multiple (6)	-13.25%		872.11%		39.53%		0.62%		-44.10%		183.14%		148.31%	



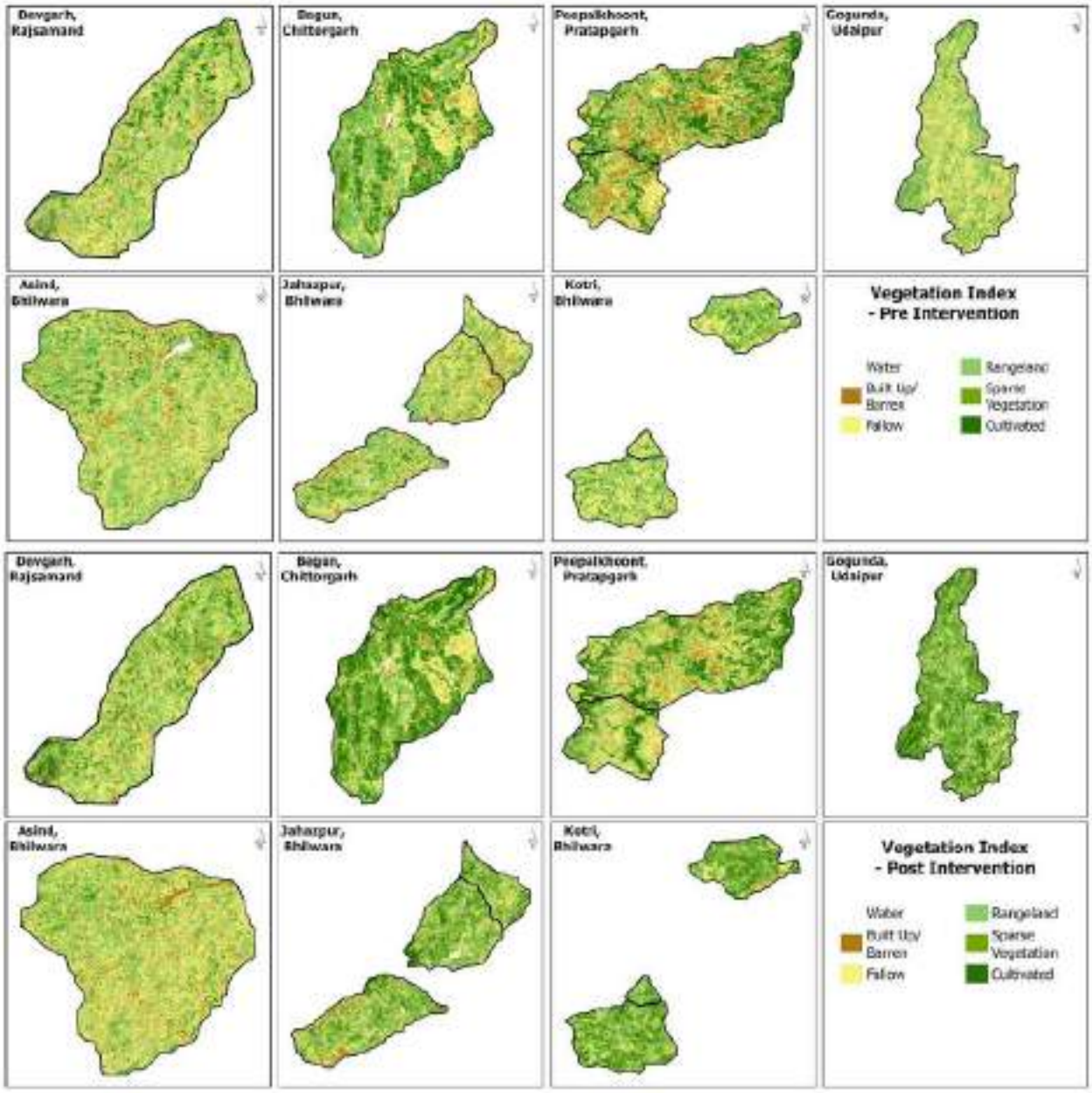


FIGURE 10: PRE AND POST INTERVENTION VEGETATION INDEX ACROSS THE INTERVENTION WATERSHED

The calculation, analysis, and change detection of the vegetation index reveals that in all the intervention watersheds, sparse vegetation has increased area under intense cultivation. The increase in sparse cultivation and in some areas, rangelands, reveals the impact of water conservation and pasture land development. At the same time, the area under the fallow and baren land in the intervention areas has also seen a notable reduction.

7

SOIL MOISTURE

Surface soil moisture (SSM), defined as the water content of the top few centimetres soil is a key variable that affects runoff generation, water recharge and vegetation growth. The Synthetic Aperture Radar (SAR) data from Sentinel-1 satellite is used here to study the surface soil moisture which is in turn derived from relative soil moisture, which represents the soil moisture for a given soil column on a relative scale between soil saturation and wilting levels.

The surface soil moisture saturation is calculated as percentages using the formula[11]:

$$\mathrm{SSM}(t) = \frac{\Delta\sigma^0(\Theta, t)}{S(\Theta)} \quad [\%]$$

Where Δσ0(Θ,t) represents the change in normalized backscatter (relative to dry conditions), and S(Θ) is the sensitivity to SSM changes at the reference angle. The sensitivity is equivalent to the local backscatter dynamic range, estimated by the difference between normalized backscatter coefficients under wet and dry conditions using,

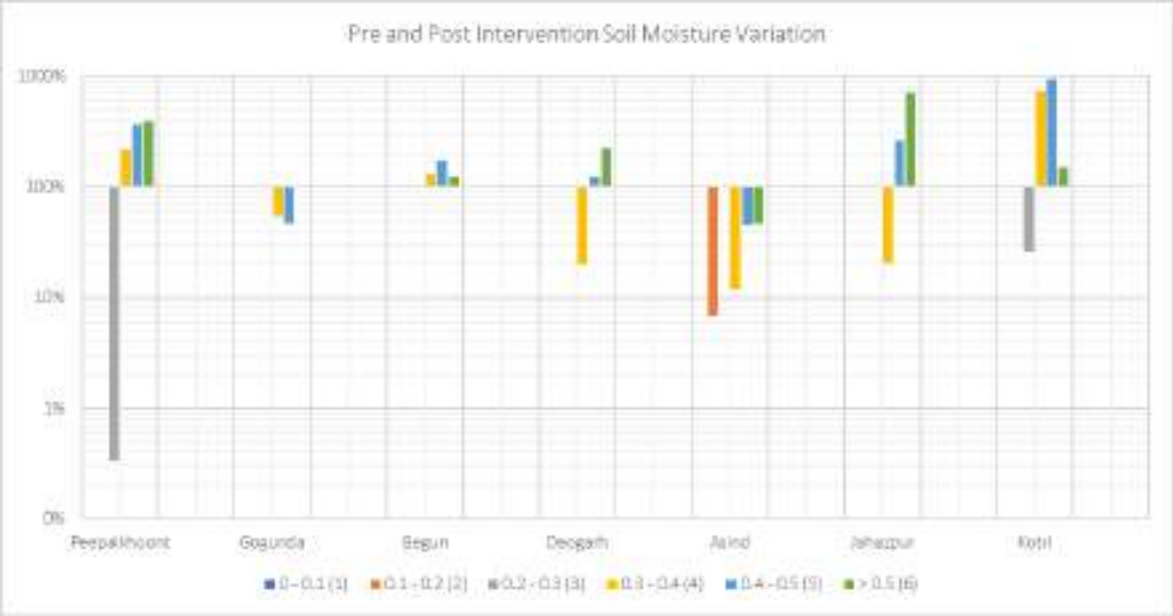
$$S(\Theta) = \sigma^0_{\mathrm{wet}}(\Theta) - \sigma^0_{\mathrm{dry}}(\Theta) \quad [\mathrm{dB}].$$

Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states. The values range from 0 to 100 % where values close to 0 represents water and built-up areas.

TABLE 13: ZONAL STATISTICS OF SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHEDS

District	Pratapgarh		Udaipur		Chittorgarh		Rajsamand		Bhilwara					
Block	Peepalkhunt		Gogunda		Begun		Deogarh		Asind		Jahazpur		Kotri	
Total Area of Watershed (Sq.Km.)	164.5541		200.4209		137.5077		50.40269		194.851		196.34121		135.081401	
Soil Group	D		C/D		C/D		C		C/D		C		C	
Soil Moisture (2017)	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area
0 - 0.1 (1)	7.0044	4.26	17.0367	8.13	8.3018	6.04	6.6833	13.26	22.9312	11.77	19.4335	9.90	10.1352	7.50
0.1 - 0.2 (2)	53.0102	32.21	9.4074	4.49	32.2595	23.46	2.2680	4.50	18.5191	9.50	22.6577	11.56	64.4673	47.72
0.2 - 0.3 (3)	88.2039	53.60	98.7549	47.15	74.1606	53.93	21.7595	43.09	84.2009	43.21	96.1630	48.98	55.4926	41.08
0.3 - 0.4 (4)	16.6777	8.92	66.9088	31.95	20.2200	14.70	16.5422	32.82	50.9857	26.17	65.9206	33.59	6.6448	4.46
0.4 - 0.5 (5)	1.4100	0.86	14.5717	6.96	2.2004	1.60	2.8778	5.71	15.6582	8.04	10.3800	5.29	0.2487	0.18
> 0.5 (6)	0.1774	0.11	2.9172	1.39	0.3225	0.23	0.2868	0.57	2.5114	1.29	1.6505	0.84	0.0364	0.01
Soil Moisture (2023)	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area	Area	% Area
0 - 0.1 (1)	5.3473	3.25	16.8538	8.05	7.0039	5.09	6.5666	13.03	22.5912	11.59	18.8279	9.59	7.2368	5.34
0.1 - 0.2 (2)	16.4488	10.00	5.6478	2.70	12.9092	9.39	1.4684	2.91	19.7793	10.15	19.2902	9.82	16.6565	12.33
0.2 - 0.3 (3)	88.5017	53.78	61.1561	29.20	63.9521	46.51	15.1293	30.02	68.8562	35.34	51.9013	26.43	70.1135	51.90
0.3 - 0.4 (4)	46.7608	28.42	103.4957	49.42	46.9073	34.11	19.8559	39.39	57.0582	29.28	55.2014	28.12	38.3751	28.41
0.4 - 0.5 (5)	6.5468	3.98	21.0234	10.04	5.9731	4.34	6.4275	12.75	22.8487	11.73	37.8050	19.25	2.5982	1.92
> 0.5 (6)	0.8768	0.53	1.2208	0.58	0.7183	0.52	0.9298	1.84	3.6821	1.89	13.2503	6.75	0.0408	0.03
% Difference														
0 - 0.1 (1)	-23.89%		-1.07%		-15.65%		-1.71%		-1.40%		-3.12%		-28.77%	
0.1 - 0.2 (2)	-38.97%		39.94%		59.98%		35.16%		6.77%		15.01%		74.16%	
0.2 - 0.3 (3)	0.34%		-38.07%		-13.77%		-30.34%		-38.22%		-46.01%		26.34%	
0.3 - 0.4 (4)	235.38%		54.69%		131.98%		20.03%		11.90%		29.21%		726.28%	
0.4 - 0.5 (5)	364.32%		46.23%		171.40%		123.35%		46.03%		264.21%		944.81%	
> 0.5 (6)	394.39%		-58.17%		122.72%		224.18%		46.63%		714.39%		346.07%	

[11] Detailed methodology is provided in https://doi.org/10.1109/TGRS.2018.2858004



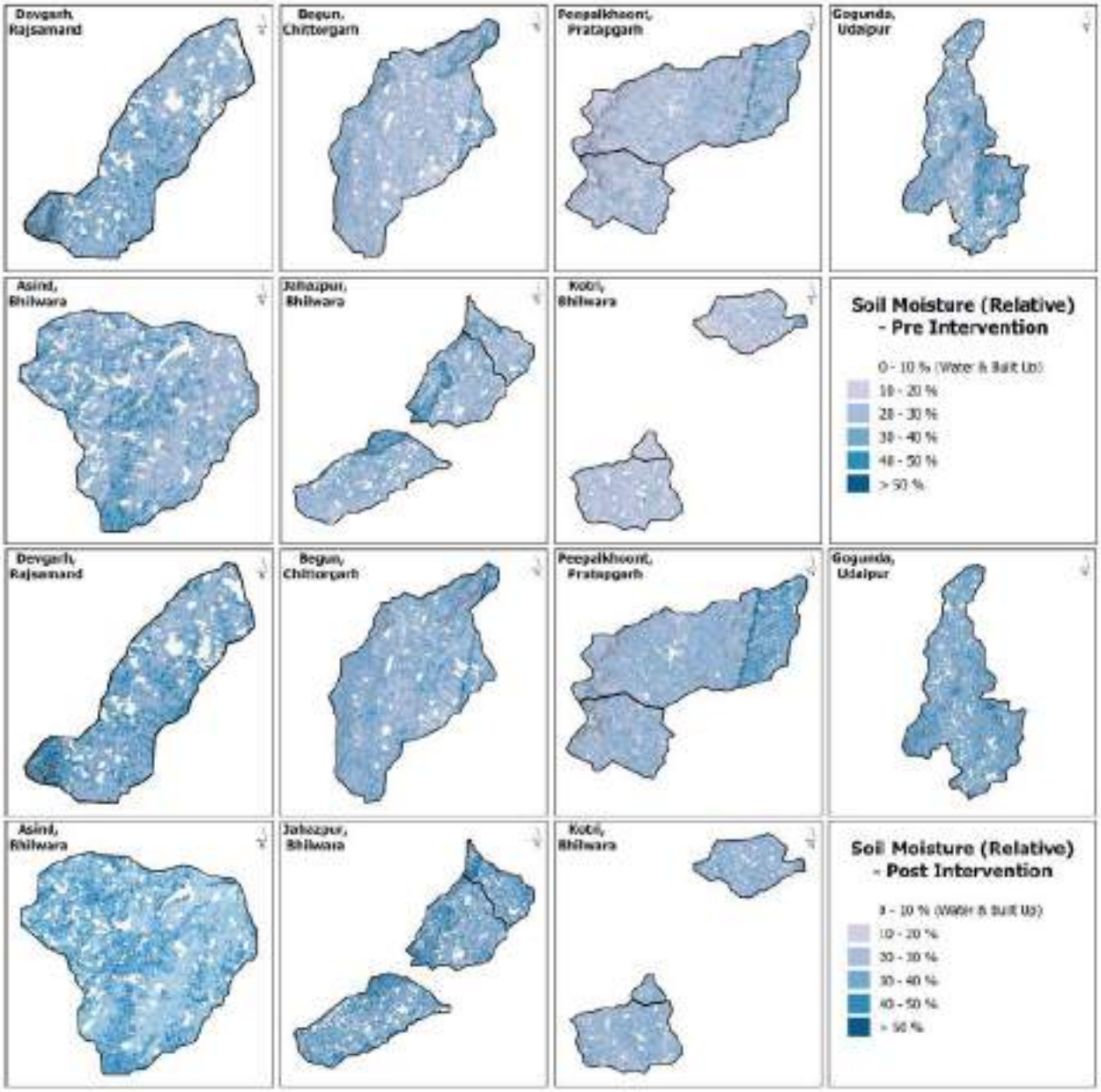


FIGURE 11: PRE AND POST INTERVENTION SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHED

The calculation, analysis, and change detection show that there have been significant changes in the values of surface soil moisture over the course of the intervention period and since. The area under soil moisture values greater than 20% has seen a significant increase. This is to be interpreted as a consequence of multiple factors such as the rainfall received, the vegetative cover, availability of surface and ground water and so on.

CONCLUSIONS

This section provides the summary of the key findings of the assessment and the limitations encountered in the process of the assessment. For a more accurate quantification outcomes, further studies will have to be done using datasets of higher details and corroboration from the field.

KEY FINDINGS

In summation, the key findings from the above assessments are as follows:

- The total surface storage created in the intervention area due to the project is 2,29,275 cubic meters.
- The influence of rainfall on the ground water levels has been significant and has contributed enough to support the observed levels of ground water.
- Nominal negative correlation between the rainfall and ground water depth. The ground water levels in the intervention districts have been increasing except for Pratapgarh. The availability of more recent data will reveal the trends that can be expected.
- Ground water recharge directly due to rainfall in the intervention area is about 9.31% of the total rainfall received.
- The volume of surface runoff stored by the intervention measures is 5.02% of the total runoff generated as a part of and due to the interventions (or) 1.58% of the total rainfall received during the period of the project intervention and ever since.
- Analysis of LULC, NDVI, and SSM reveals that there has been a marked increase in various types of vegetative cover comprising rangelands, sparse vegetation, and croplands. However, the pace of increase in the area under built-up points to increasing urban pressures and the fluctuation in the area under surface water is marked.

TABLE 14: SUMMARY OF FINDINGS

District		Pratapgarh	Udaipur	Chittorgarh	Rajsamnd	Bhilwara			Totals
Block		Peepalkhoont	Gogunda	Begun	Durgarh	Asind	Jahazpur	Kotri	
Total Area of Watershed (Sq.Km.)		164.51	209.43	137.51	92.40	194.85	196.24	126.08	1088.17
Soil Group		D	C/D	C/D	C	C/D	C	C	-
Volume of Storage Created (Cu.m.)		38000	24750	23625	5000	50400	18750	18750	229275
Q - Total runoff over intervention area (cu.m.)		2772188006.71	3612013698.27	2216047211.81	840120969.19	2282592102.58	2307569610.69	2279667218.29	18332201204.46
No. of times of intervention storage filling		715.50	766.60	799.85	779.46	641.16	782.19	722.39	5147.17
Runoff volume stored in interventions	Pre Evaporation Loss	17189035.80	18573442.63	17478954.62	3697304.43	57561285.31	14866126.21	20758756.54	150684905.54
	Post Evaporation Loss	16913421.48	11984065.58	10487972.77	2338382.66	34776771.19	8795675.72	12461263.92	96560948.32
% of runoff stored by interventions	Pre Evaporation Loss	9.81%	5.38%	7.55%	4.55%	17.66%	4.43%	9.13%	8.36%
	Post Evaporation Loss	9.68%	3.23%	4.53%	2.75%	10.59%	2.66%	5.48%	5.02%
% of rainfall stored by interventions	Pre Evaporation Loss	0.44%	0.31%	0.29%	0.06%	0.95%	0.24%	0.34%	2.63%
	Post Evaporation Loss	0.27%	0.19%	0.17%	0.04%	0.57%	0.14%	0.20%	1.58%
Surface water contribution to ground water recharge (40%) (Cu.m.) =		6525368.59	4553126.25	4194949.11	933355.06	13910708.47	3515870.25	4984501.57	38622477.35
Recharge only due to rainfall	Cu.m.	115261919.4	108272458.3	100785361.9	26057609.25	69835178.31	47393094.97	101505780.5	569061513.6
	%	1.89%	1.77%	1.65%	0.43%	1.14%	0.78%	1.66%	9.31%

LIMITATIONS

The most significant limitation faced was in terms of data availability. With the resolution of the available open-source satellite imagery being capped at 10m, the land use that can be generated also lacks in resolution especially considering the small size of the intervention area that had to be assessed. Assumptions were made to calculate the storage capacity of water harvesting structures. Owing to the limitation in the availability of primary data, the assessments are based primarily on data from secondary sources, with the primary data being used wherever possible. Further, most of the secondary data that was available and obtained has shortcomings in one or more areas such as the temporal coverage or the spatial resolution. Further constraints were due to the unavailability of up-to-date and reliable ground water data. With the continuous measurement of this information the efficiency of the assessment can be improved.

ANNEXURE 1

INTERVENTIONS

District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Udiapur	Gogunda	Bansliya	Teerol	WHS	Anicut	Jahar ka talab	24.847	73.4828	No	1
Udiapur	Gogunda	Bansliya	Teerol	PD	Pasture land Development	Kharadiya magra	24.5256	73.75395	Ha	15
Udiapur	Gogunda	Bhimji Ka Gurah	Teerol	WHS	Anicut	Vaga ji ka khadra	24.831064	73.49402	No	1
Udiapur	Gogunda	Bhimji Ka Gurah	Teerol	PD	Pasture land Development	Babdaliya Magra	24.8238167	73.4900833	Ha	20
Udiapur	Gogunda	Guman	Teerol	WHS	Anicut	Jogiya ka talab Pipali ke niche	24.88061	73.46395	No	1
Udiapur	Gogunda	Guman	Teerol	WHS	Anicut	Kanach khali	24.88406667	73.47081667	No	1
Udiapur	Gogunda	Guman	Teerol	PD	Pasture land Development	Hada Chapar	24.8923833	73.4564	Ha	40
Udiapur	Gogunda	Teerol	Teerol	PD	Pasture land Development	Samarmal	24.8668667	73.501	Ha	20
Udiapur	Gogunda	Dhol	Dhol	WHS	Anicut	Pavti ka jok jokri amba	24.849893	73.43592	No	1
Udiapur	Gogunda	Dhol	Dhol	PD	Pasture land Development	Gadmaliya	24.8715233	73.446275	Ha	20
Udiapur	Gogunda	Dhol	Dhol	PD	Pasture land Development	Dhana Chapher	24.8555667	73.4532333	Ha	30
Udiapur	Gogunda	Umrod	Dhol	WHS	Anicut	Umbar wala nala	24.87143333	73.41975	No	1
Udiapur	Gogunda	Umrod	Dhol	WHS	Nadi Reparir	Bora magara	24.87583	73.411666	Ha	30
Udiapur	Gogunda	Umrod	Dhol	WHS	Anicut	Jar Mahadev	24.8791	73.42126	Ha	37
Udiapur	Gogunda	Badgoan	Dhol	PD	Pasture land Development	Mama dev	24.87554	73.40989	Ha	20
Udiapur	Gogunda	Makvan ka guda	Dhol	PD	Pasture land Development	Aakhya mathara	24.8895782	73.4468162	Ha	20
Udiapur	Gogunda	Nahro Ka Guda	Suwaton ka Guda	SMC	Loose bolder check dam	Amal Mata Charagaha	24.8391	73.4409333	Ha	10
Udiapur	Gogunda	Punawali	Punawali	WHS	Anicut	Charagah mai	24.867222	73.40388	No	1
Udiapur	Gogunda	Punawali	Punawali	PD	Pasture land Development	Waloliya Valo dharam talai	24.865712	73.405936	Ha	20
Udiapur	Gogunda	Dalpatpura	Punawali	WHS	Anicut	Gogri khadri kemchawas	24.82421667	73.40375	No	1
Udiapur	Gogunda	Dalpatpura	Punawali	WHS	Anicut	Dada ka khet	24.82807	73.40202	No	1
Udiapur	Gogunda	Palidana	Punawali	WHS	Anicut repair	Samsan ke paas	24.839166	73.412222	No	1
Udiapur	Gogunda	Palidana	Punawali	WHS	Anicut wall	Samsan ke paas	24.8383	73.41305	No	1

District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Udiapur	Gogunda	Palidana	Punawali	WHS	Renovation of Anicut	Chamand mata Aniut	24.83273	73.4020532	No	1
Udiapur	Gogunda	Palidana	Punawali	SMC	CCT & Loose bolder check dam	Mata Ji Ka Magra	24.8334833	73.4024667	Ha	60
Udiapur	Gogunda	Baguni	Punawali	WHS	Renovation of Nadi	Kundal Bargad pe dke pas	24.84179	73.39195	No	1
Udiapur	Gogunda	Tarmela	Padrada	WHS	Anicut	Dholi mathari (Tarmela fala)	24.89038	73.38163	No	1
Udiapur	Gogunda	Gariyaw as	Nandeshma	WHS	Anicut	Mahadev ji ki khadri	24.82469	73.48758	No	1
Udiapur	Gogunda	Gariyaw as	Nandeshma	SMC	Loose bolder check dam	Bija wala Charagaha	24.8205	73.487	Ha	80
Udiapur	Gogunda	Jemli	Jemli	WHS	Anicut	Mandka Khadar	24.9392	73.43898333	No	1
Udiapur	Gogunda	Jemli	Jemli	PD	Pasture land Development	Panji ka mathara	24.9331167	73.4507167	Ha	18
Udiapur	Gogunda	Kanji Ka Guda	Jemli	WHS	Anicut	Paba ka Rehat Uliya ke paas	24.94235	73.424632	No	1
Udiapur	Gogunda	Kanji Ka Guda	Jemli	PD	Pasture land Development	BadaBhara kwal 1st	24.9530967	73.4266197	Ha	10.5
Udiapur	Gogunda	Borawali Madri	Kamol	WHS	Anicut	Patiyar ki bandh	24.8943	73.43818333	No	1
Udiapur	Gogunda	Borawali Madri	Kamol	PD	Pasture land Development	Bodla charagah	24.8947	73.4491814	Ha	30
Rajsamnd	Devgarh	Pata ki aati	Pata ki aati	WHS	Anicut	Pata ka aati anicut	25.563098	73.939759	No	1
Rajsamnd	Devgarh	Pata ki aati	Pata ki aati	SMC	Soil moisture Activity	Gabion	25.568514	73.951864	Ha	1
Rajsamnd	Devgarh	Ghati	Ghatil	PD	Pasture land Development	Ghati	25.547843	73. 976121	Ha	1
Rajsamnd	Devgarh	Swadari A	Swaadri I	WHS	Anicut Repaire work	Simar anicut	25.483047	73.894886	No	1
Rajsamnd	Devgarh	Swadari A	Swadari A	SMC	Soil moisture activity	Charagah m chekdem kary	25.483976	73.894118	Ha	150
Rajsamnd	Devgarh	Swadari A	Swadari A	WHS	Anicut	Dho ka Dhara Anicut	25.49069	73.904912	No	1
Rajsamnd	Devgarh	Solankiy o ka guda	Solankiyo ka guda	PD	Pasture land Development	Road side nursary	25.449151	73.897794	Ha	15
Rajsamnd	Devgarh	Swadari B	Swadari B	PD	Pasture land Development	Samraji Smarak	25.474312	73.900966	Ha	20
Rajsamnd	Devgarh	Swadari B	Swadari	WHS	Anicut	Shamshan k Pass	25.472912	73.900326	No	1
Rajsamnd	Devgarh	Swadari B	Swadai b	SMC	Gabion	Chitdai Chouraha Gabion	25.472911	73.905235	No	1

District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Bhilwara	Kotri	Ama	Ama	PD	PD	Charagah me	25.2207	75.7127	Ha	
Bhilwara	Kotri	Badliyas	Badliyas	WHS	Anicut	Charagah me	25.2221	74.8561	No	1
Bhilwara	Kotri	Badliyas	Badliyas	PD	PD	Charagah me	25.2297	74.8595	Ha	
Bhilwara	Kotri	Badliyas	Badliyas	WHS	Anicut	Charagah	25.2274	74.8589	No	1
Bhilwara	Kotri	Bhakliya	Gandliya	WHS	Anicut	Patti vala Anicut	25.2507	74.8471	No	1
Bhilwara	Kotri	Bhakliya	Gandliya	SMC	Gabion	Khalli Par I	25.2523	74.8458	No	1
Bhilwara	Kotri	Bhakliya	Gandliya	SMC	Gabion	Khalli Par II	25.2534	74.8455	No	1
Bhilwara	Kotri	Bhakliya	Gandliya	WHS	Anicut	Mata ji ke Pas	25.2574	74.8522	No	1
Bhilwara	Kotri	Birmiyas	Mansha	WHS	Anicut	Charagah me Danda	25.3664	74.9164	No	1
Bhilwara	Kotri	Birmiyas	Mansha	WHS	Anicut	Ramprasad ke Khet ke Pas	25.3686	74.9324	No	1
Bhilwara	Kotri	Birmiyas	Mansha	SMC	Gabion	Kheto ke beech me	25.3677	74.9323	No	1
Bhilwara	Kotri	Chodhariyas	Suthepa	WHS	Anicut	Mohan lal ke khet ke pas	25.1925	74.8487	No	1
Bhilwara	Kotri	Chodhariyas	Suthepa	WHS	Anicut	Jato ke Khet ke Pas	25.1872	74.85	No	1
Bhilwara	Kotri	Devriya	Mansha	WHS	Anicut	Mandir Pachalo	25.3705	74.9131	No	1
Bhilwara	Kotri	Devriya	Mansha	WHS	Anicut	Bilola	25.3905	74.93	No	1
Bhilwara	Kotri	Devriya	Mansha	WHS	Anicut	Rampal Bhil ke khet ke Pas	25.3823	74.9461	No	1
Bhilwara	Kotri	Devriya	Mansha	SMC	Gabion	Redwas Sima Par	25.3631	74.9123	No	1
Bhilwara	Kotri	Devriya	Mansha	WHS	Anicut	Mangu ji ke khet ke Pas	25.3734	74.9164	No	1
Bhilwara	Kotri	Devriya	Mansha	PD	PD	Charagah	25.3674	74.9134	Ha	
Bhilwara	Kotri	Dhayalon ka khera	Kotri	WHS	Anicut	Charagah me	25.3725	74.9082	No	1
Bhilwara	Kotri	Dhayalon ka khera	Kotri	WHS	Anicut	Devnarayan mandir ke pas	25.3686	74.8991	No	1
Bhilwara	Kotri	Dhayalon ka khera	Kotri	WHS	Anicut	Grid ke pas	25.3737	74.8949	No	1
Bhilwara	Kotri	Gora ka khera	Mansha	WHS	Anicut	Patti vala Anicut	25.3801	74.9526	No	1
Bhilwara	Kotri	Gora ka khera	Mansha	SMC	Gabion	Khalli Par	25.9798	74.952	No	1
Bhilwara	Kotri	Jitya	Suthepa	WHS	Anicut	Charagah me	25.2363	74.8406	No	1
Bhilwara	Kotri	Jitya	Suthepa	PD	PD	Charagah me	25.1355	74.845	Ha	

District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Bhilwara	Kotri	Mansha	Mansha	WHS	Anicut	Charagah me	25.4115	74.9252	No	1
Bhilwara	Kotri	Renwas	Gandliya	WHS	Anicut	Bhilo ki nadi	25.2202	74.821	No	1
Bhilwara	Kotri	Singh ji ka khera	Mansha	WHS	Anicut	Bheru ji sen ke khet ke pas	25.391	74.9581	No	1
Bhilwara	Kotri	Singh ji ka khera	Mansha	WHS	Anicut	Samsaan ghat ke pas	25.3983	74.9656	No	1
Bhilwara	Kotri	Udaliyas	Suthepa	WHS	Anicut	Dori ki Dang	25.1647	74.8288	No	1
Bhilwara	Kotri	Udaliyas	Suthepa	WHS	Anicut	Agriya Anicut	25.1665	74.823	No	1
Bhilwara	Jahazpur	Bhav Ka Gurha	Itunda	WHS	Anicut	Mandi mahadev ke pas	25.580058	75.387446	No	1
Bhilwara	Jahazpur	Bijetha	Itunda	WHS	Anicut	Ganesh ji ke pas	25.598779	75.37099	No	1
Bhilwara	Jahazpur	Khaneriya	Baroda	WHS	Anicut	Charagah me	25.527032	75.345353	No	1
Bhilwara	Jahazpur	Tola	Dhor	WHS	Anicut	Datya ke pas	25.541068	75.356913	No	1
Bhilwara	Jahazpur	Nathoon	Dhor	WHS	Anicut	Reytiya ke pas	25.521294	75.317001	No	1
Bhilwara	Jahazpur	Dhor	Dhor	WHS	Anicut	Futi pal ke pas	25.535328	75.321904	No	1
Bhilwara	Jahazpur	Rajpura	Dhor	WHS	Anicut	Charagah ke pas	25.5326668	75.3397222	No	1
Bhilwara	Jahazpur	Braj ki doongri	Shakkargarh	WHS	Anicut	Devla ke pas	25.476507	75.313413	No	1
Bhilwara	Jahazpur	Braj ki doongri	Shakkargarh	WHS	Anicut	Mal ki Jhopdiyon me	25.464071	75.306242	No	1
Bhilwara	Jahazpur	Jojhar	Shakkargarh	WHS	Anicut	Khaniya Khal me	25.436523	75.297477	No	1
Bhilwara	Jahazpur	Shakkargarh	Shakkargarh	WHS	Anicut	Mandiya Mahadev	25.465322	75.340255	No	1
Bhilwara	Jahazpur	Bijetha	Itunda	WHS	Renovation of Anicut	Road ke pas	25.596182	75.371395	No	1
Bhilwara	Jahazpur	Jojhar	Shakkargarh	WHS	Renovation of Anicut	Hari sagar anicut repair	25.441458	75.291654	No	1
Bhilwara	Jahazpur	Shakkargarh	Shakkargarh	WHS	Renovation of Anicut	Bhuteshwar anicut repair	25.4642989	75.3151174	No	1
Bhilwara	Jahazpur	Mediyan	Biletha	WHS	Renovation of Anicut	Sagas ji ke pas anicut ren	25.5568708	75.3535235	No	1
Bhilwara	Jahazpur	Bhav Ka Gurha	Itunda	SMC	Stone Slab Patti Structure	Nadi me	25.579945	75.387485	No	1
Bhilwara	Jahazpur	Bhav Ka Gurha	Itunda	SMC	Stone Slab Patti Structure	Devji ke samne	25.587969	75.381896	No	1
Bhilwara	Jahazpur	Bijetha	Itunda	SMC	Stone Slab Patti Structure	Nadi me	25.592897	75.373868	No	1
Bhilwara	Jahazpur	Shakkargarh	Shakkargarh	SMC	Stone Slab Patti Structure	Bhilo ke khet ke pas	25.447792	75.30796	No	1
Bhilwara	Jahazpur	Shakkargarh	Shakkargarh	SMC	Stone Slab Patti Structure	Agariya Nale me	25.450766	75.319615	No	1
Bhilwara	Jahazpur	Mediyan	Biletha	SMC	Stone Slab Patti Structure	Bheru ji ke khal	25.561428	75.3554145	No	1
Bhilwara	Jahazpur	Itunda	Itunda	SMC	Gabion	Charagah me	25.608722	75.409032	No	1

District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Bhilwara	Jahazpur	Goga ka khera	Dhor	SMC	Stone Slab Patti Structure (smc)	Goga ka khera me	25.550787	75.315555	No	1
Bhilwara	Jahazpur	Bhav Ka Gurha	Itunda	SMC	Gabion	Charagah me	25.594317	75.390806	No	1
Bhilwara	Jahazpur	Bijetha	Itunda	SMC	Gabion	Syali ke pass	25.604095	75.356366	No	1
Bhilwara	Jahazpur	Bijetha	Itunda	SMC	Gabion	Charagah me	25.597983	75.350887	No	1
Bhilwara	Jahazpur	Jheekli	Dhor	SMC	Gabion	Jheekli Charagah me	25.545604	75.329601	No	1
Bhilwara	Jahazpur	Jheekli	Dhor	SMC	Gabion	Jheekli ke nale me	25.539883	75.342165	No	1
Bhilwara	Jahazpur	Tola	Dhor	SMC	Gabion	Charagah me	25.564938	75.331501	No	1
Bhilwara	Jahazpur	Goga ka khera	Dhor	SMC	Gabion	Teekhi charagah me	25.561128	75.310002	No	1
Bhilwara	Jahazpur	Goga ka khera	Dhor	SMC	Gabion	Charagah me	25.541016	75.306312	No	1
Bhilwara	Jahazpur	Nathoon	Dhor	SMC	Gabion	Road ke pas	25.521335	75.31707	No	1
Bhilwara	Jahazpur	Nathoon	Dhor	SMC	Gabion	Tejaji ke pas	25.522945	75.313173	No	1
Bhilwara	Jahazpur	Dhor	Dhor	SMC	Gabion	Dargar ke kuyen ke pas	25.52522	75.32706	No	1
Bhilwara	Jahazpur	Dhor	Dhor	SMC	Gabion	Dhor Mahadev ji ke pas	25.54164	75.31915	No	1
Bhilwara	Jahazpur	Dhor	Dhor	SMC	Gabion	Shamshan ke pas	25.534182	75.322353	No	1
Bhilwara	Jahazpur	Dhor	Dhor	SMC	Gabion	Kumharon ke pas	25.542361	75.32254	No	1
Bhilwara	Jahazpur	Rajpura	Dhor	SMC	Gabion	Sagas baba ke pas	25.533563	75.340819	No	1
Bhilwara	Jahazpur	Rama ka khera	Dhor	SMC	Gabion	Gora khal me	25.506621	75.310887	No	1
Bhilwara	Jahazpur	Braj ki doongri	Shakkargarh	SMC	Gabion	Bakhera ki khal me	25.48423	75.310752	No	1
Bhilwara	Jahazpur	Braj ki doongri	Shakkargarh	SMC	Gabion	Devla khal me	25.476213	75.313963	No	1
Bhilwara	Jahazpur	Jojhar	Shakkargarh	SMC	Gabion	Ringad da balaji ke peeche	25.432285	75.3064490	No	1
Bhilwara	Jahazpur	Shakkar garh	Shakkargarh	SMC	Gabion	Purani Charagah me	25.43936	75.3187480	No	1
Bhilwara	Jahazpur	Shakkar garh	Shakkargarh	SMC	Gabion	Mali ki jhupdi Charagah me	25.464382	75.3047220	No	1

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Bhilwara	Jahazpur	Shakkargarh	Shakkargarh	SMC	Gabion	Devnarayan Anicut ke upar	25.476213	75.313963	No	1
Bhilwara	Jahazpur	Shakkargarh	Shakkargarh	SMC	Gabion	Khal baba ke pas (toll ke pas)	25.48095	75.314723	No	1
Bhilwara	Jahazpur	Shakkargarh	Shakkargarh	SMC	Gabion	Purane Road me	25.466502	75.320905	No	1
Bhilwara	Jahazpur	Jojar	Shakkargarh	SMC	Gabion	Dharmo ki Nadi me	25.450855	75.321716	No	1
Bhilwara	Jahazpur	Mediyan	Biletha	SMC	Gabion	Bheru ji ke pas	25.561527	75.3554133	No	1
Bhilwara	Jahazpur	Mediyan	Biletha	SMC	Gabion	Sakram ji ke khet ke pas	25.546844	75.355139	No	1
Bhilwara	Jahazpur	Mediyan	Biletha	SMC	Gabion	Bagli ka nala	25.5498287	75.3588983	No	1
Bhilwara	Jahazpur	Mediyan	Biletha	SMC	Gabion	Neher ke pas	25.556701	75.369292	No	1
Bhilwara	Jahazpur	Biletha	Biletha	SMC	Gabion	Charagah me	25.593045	75.347937	No	1
Bhilwara	Jahazpur	Beeramata	Biletha	SMC	Gabion	Fool chand meena ke khet ke pas	25.576527	75.3225379	No	1
Bhilwara	Jahazpur	Beeramata	Biletha	SMC	Gabion	Mal ki Jhopdiyon ke pas	25.5755854	75.3288981	No	1
Bhilwara	Jahazpur	Bijetha	Itunda	PD	Pasture land Development	PD	25.593107	75.350705	Ha	
Bhilwara	Jahazpur	Goga ka khera	Dhor	PD	Pasture land Development	PD	25.55814	75.312763	Ha	
Bhilwara	Jahazpur	Rajpura	Dhor	PD	Pasture land Development	Rajpura pd	25.531114	75.342395	Ha	
Bhilwara	Jahazpur	Shakkargarh	Shakkargarh	PD	Pasture land Development	Shakkagrah pd	25.45154	75.317121	Ha	1
Chittorgarh	Begun	Banoda	Jainagar	WHS	Anicut Repair	Charagah me anicut renovation	25.039722	74.9661238	No	1
Chittorgarh	Begun	Shivpura	Madhopur	WHS	Anicut Repair	Samsan ke pass anicut renovation	25.03445	74.92091	No	1
Chittorgarh	Begun	Katunda	Katunda	WHS	Anicut Repair	Garid ke pass anicut renovation	25.04297	75.01316	No	1
Chittorgarh	Begun	Gunta	Jainagar	WHS	Anicut	Charagah me anicut nirman	25.03166	74.96699	No	1
Chittorgarh	Begun	Tumba	Suwaniya	WHS	Anicut	Bhadkiya ki khal me anicut nirman	25.07909	75.00353	No	1

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Chittorgarh	Begun	Nandwai	Nandwai	WHS	Anicut	Bhadevri charagah me anicut nirman	25.014278	74.938	No	1
Chittorgarh	Begun	Chachpur	Jainagar	WHS	Anicut Repair	Badi nun ka anicut renovation	25.007635	74.963062	No	1
Chittorgarh	Begun	Muroli	Madhopur	WHS	Anicut Repair	Anicut renovation muroli	25.044048	74.924861	No	1
Chittorgarh	Begun	Sonagar	Jainagar	WHS	Anicut Repair	Modi ka anicut renovation	25.018364	74.966009	No	1
Chittorgarh	Begun	Narsingpura	Madhopur	WHS	Anicut Repair	Charagah me anicut renovation	25.026158	74.955113	No	1
Chittorgarh	Begun	Nimoda	Katunda	WHS	Anicut	Rod ke pass anicut nirman karye	25.07246	74.99629	No	1
Chittorgarh	Begun	Anoppura	Anoppura	WHS	Anicut Repair	Sildiya vala anicut anoppura	24.9593851	74.903605	No	1
Chittorgarh	Begun	Gurha	Khedi	WHS	Anicut	Rod ke pass anicut nirman karye	25.061051	74.959249	No	1
Chittorgarh	Begun	Amalda	Nandwai	WHS	Anicut Repair	Mean rod ke pass anicut renovation	24.999094	74.94907	No	1
Chittorgarh	Begun	Mandawri	Mandawri	WHS	Nadi New	Charagah me nadi nirman karye	24.98673	74.9669	No	1
Chittorgarh	Begun	Fathepura	Anoppura	WHS	Anicut Repair	Near forest land	24.94399	74.917852	No	1
Chittorgarh	Begun	Amalda	Amalda	WHS	Anicut	Near anoppura road	24.99386	74.95203	No	1
Chittorgarh	Begun	Sonagar	Jainagar	WHS	Anicut	Near playground	25.0125422	74.967006	No	1
Chittorgarh	Begun	Nal	Khedi	WHS	Anicut Repair	Modi vala anicut renovation	25.0735178	74.9437374	No	1
Chittorgarh	Begun	Nal	Khedi	SMC	Gabion	Shmsan ke pass gabion	25.0782406	74.9439631	No	1
Chittorgarh	Begun	Nal	Khedi	SMC	Gabion	School ke pass gabion	25.078646	74.9436841	No	1
Chittorgarh	Begun	Nandwai	Nandwai	SMC	Gabion	Bhatewri charagah me Gabion	25.0186866	74.938903	No	1

District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Chittorgarh	Begun	Madhopur	Madhopur	SMC	Gabion	Ganve ke pass gabion	25.0258071	74.938356	No	1
Chittorgarh	Begun	Jainagar	Jainagar	SMC	Gabion	Charagah me gabion	25.0216376	74.9672904	No	1
Chittorgarh	Begun	Banoda	Jainagar	SMC	Gabion	Charagah me gabion	25.0403596	74.9675089	No	1
Chittorgarh	Begun	Gunta	Jainagar	SMC	Gabion	Charagah ke pass gabion	25.0334109	74.9635833	No	1
Chittorgarh	Begun	Umarthuna	Nandwai	SMC	Gabion	Shmsan ke pass gabion	25.0282271	74.8952044	No	1
Chittorgarh	Begun	Umarthuna	Nandwai	SMC	Gabion	Bande ke nale me gabion	25.0192092	74.8920633	No	1
Chittorgarh	Begun	Bhilo ki bethk	Mandawari	SMC	Opan CCT	Bhilo ki bethak charagah me CCT work	24.96452	74.940865	Ha	1
Chittorgarh	Begun	Chachpur	Jainagar	SMC	Opan CCT	Charagah me CCT work	25.006654	74.961896	Ha	1
Chittorgarh	Begun	Tumba	Suwaniya	SMC	Opan CCT	Charagah me CCT work	25.0756666	75.00078666	Ha	1
Chittorgarh	Begun	Katunda	Katunda	SMC	Opan CCT	Suwaniya road pe charagah me CCT WORK	25.0827976	75.0173704	Ha	1
Chittorgarh	Begun	Kuratiya	Katunda	SMC	Opan CCT	Charagah me CCT work	25.05718	74.96917	Ha	1
Chittorgarh	Begun	Madhopur	Madhopur	SMC	Opan CCT	Shivpura road charagah me CCT work	25.02375	74.93606	Ha	1
Chittorgarh	Begun	Nandwai	Nandwai	SMC	Opan CCT	Bhatewri charagah me CCT work	25.018	74.93567	Ha	1
Chittorgarh	Begun	Sonagar	Jainagar	SMC	Opan CCT	CCT work Near plygraound PD plot	25.01459	74.9608	Ha	1
Chittorgarh	Begun	Tiroli ki jopdiya	Katunda	SMC	Opan CCT	Katunda talab ke upper wale Plot me CCT work	25.0423058	74.9995034	Ha	1
Chittorgarh	Begun	Banoda	Jainagar	SMC	Opan CCT	Nandwai road ke pass charagah me CCT Work	25.04636	74.95536	Ha	1
Chittorgarh	Begun	Banoda	Jainagar	PD	Pasture land Development	Banoda charagah	25.039722	74.9661237	Ha	
Chittorgarh	Begun	Gurha	Khedi	PD	Pasture land Development	Rupa rail dem ke pass charagah	25.05628	74.95393	Ha	
Chittorgarh	Begun	jalampura	Mandawari	PD	Pasture land Development	Kakriya chod ka charagah	24.972605	74.92678	Ha	

District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Chittorgarh	Begun	Amalda	Nandwai	SMC	Loose Boulder Check Dam	Anicut wale nale me LBCD work	24.993889	74.9525	No	1
Chittorgarh	Begun	Anoppura	Anoppura	SMC	Loose Boulder Check Dam	Javdiya road pe charagah me LBCD work	24.949048	74.9036681	No	1
Chittorgarh	Begun	Madhopur	Madhopur	SMC	Loose Boulder Check Dam	Charagah ke nale me LBCD work	25.0258071	74.938356	No	1
Chittorgarh	Begun	Nandwai	Nandwai	SMC	Loose Boulder Check Dam	Piplaj mata ke pass wale nale me LBCD work	25.009444	74.933889	No	1
Chittorgarh	Begun	Narsinghpura	Madhopur	SMC	Loose Boulder Check Dam	Dhokde wali charagah me LBCD work	25.021389	74.954444	No	1
Chittorgarh	Begun	Sonagar	Jainagar	SMC	Loose Boulder Check Dam	Samudaai Bhawan Ke Pass Wala nala	25.0128	74.96817	No	1
Chittorgarh	Begun	Chachpur	Jainagar	SMC	Loose Boulder Check Dam	Badi nun ke nale me LBCD work	25.006654	74.961896	No	1
Chittorgarh	Begun	Chachpur	Jainagar	PD	Grass&Tree seeding	Charagah	25.006654	74.961896	Ha	
Chittorgarh	Begun	Anoppura	Anoppura	PD	Plantation/ grass&Tree seeding	Charagah	24.949048	74.9036681	Ha	
Chittorgarh	Begun	Banoda	Jainagar	PD	Plantation/ grass&Tree seeding	Bajaj Charagah	25.039722	74.9661238	Ha	
Chittorgarh	Begun	Banoda	Jainagar	PD	Plantation/ grass &Tree seeding	MGNREGA PD plot	25.038569	74.957756	Ha	
Chittorgarh	Begun	Bhilo ki bethk	Mandawari	PD	Grass & Tree seeding	Charagah	24.96452	74.940865	Ha	
Chittorgarh	Begun	Gunta	Jainagar	PD	Plantation/ grass &Tree seeding	Charagah plot	25.02947	74.96628	Ha	
Chittorgarh	Begun	Gurha	Khedi	PD	Plantation/ grass &Tree seeding	Charagah plot	25.05628	74.95393	Ha	
Chittorgarh	Begun	Jhadol	Suwaniya	PD	Grass &Tree seeding	Charagah plot	25.0756666	75.00078666	Ha	
Chittorgarh	Begun	Jalampura	Mandawari	PD	Plantation/ grass &Tree seeding	Charagah plot	24.972605	74.92678	Ha	
Chittorgarh	Begun	Katunda	Katunda	PD	Plantation/ grass &Tree seeding	Charagah plot	25.04899	74.99566	Ha	

District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Chittorgarh	Begun	Kuratiya	Katunda	PD	Grass &Tree seeding	Charagah plot	25.05718	74.96917	Ha	
Chittorgarh	Begun	Madhopur	Madhopur	PD	Plantation/ grass &Tree seeding	Charagah plot	25.02375	74.93606	Ha	
Chittorgarh	Begun	Nandwai	Nandwai	PD	Plantation/ grass &Tree seeding	Charagah plot	25.006813	74.93498	Ha	
Chittorgarh	Begun	Nandwai	Nandwai	PD	Grass &Tree seeding	Charagah plot	25.018	74.93567	Ha	
Chittorgarh	Begun	Narsinghpura	Madhopur	PD	Plantation/ grass &Tree seeding	Charagah plot	25.026158	74.955113	Ha	
Chittorgarh	Begun	Neemoda	Katunda	PD	Grass &Tree seeding	Charagah plot	25.0695992	74.9975303	Ha	
Chittorgarh	Begun	Sonagar	Jainagar	PD	Grass &Tree seeding	Charagah plot	25.01459	74.96079	Ha	
Chittorgarh	Begun	Tumba	Suwaniya	PD	Grass &Tree seeding	Charagah plot	25.0784	75.00587	Ha	
Chittorgarh	Begun	Jaynagar	Jainagar	PD	Grass &Tree seeding	Charagah plot	25.02539	74.96421	Ha	
Chittorgarh	Begun	Khermaliya	Jainagar	PD	Grass &Tree seeding	Charagah plot	25.0292312	74.9895	Ha	
Chittorgarh	Begun	Mandawri	Mandawari	PD	Plantation/ grass &Tree seeding	Charagah plot	24.9867545	74.9672936	Ha	
Chittorgarh	Begun	Umarthuna	Madhopur	PD	Grass &Tree seeding	Charagah plot	25.02358	74.89029	Ha	
Chittorgarh	Begun	Shivpura	Madhopur	PD	Plantation/ grass&Tree seeding	Charagah plot	25.03114	74.91976	Ha	
Bhilwara	Asind	Jhalra	Ragunathpura	WHS	Anicut	Jai singh ke kue ke pass anicut	25.647046	74.235773	No	1
Bhilwara	Asind	Jhalra	Ragunathpura	WHS	Anicut	Jogi bhata repair anicut	25.641598	74.227097	No	1
Bhilwara	Asind	Jhalra	Ragunathpura	WHS	Nadi	Bhopaji ke nadi ke upr nala m	25.641664	74.227151	No	1
Bhilwara	Asind	Barethpura	Dantra	WHS	Nadi	Kala bhata ke pass nadi	25.678171	74.284863	No	1
Bhilwara	Asind	Papriya	Jalriya	WHS	Anicut	Bida main anicut	25.63721	74.314221	No	1
Bhilwara	Asind	Ragunathpura	Ragunathpura	WHS	Nadi	Charagha main nadi	25.654	74.251	No	1
Bhilwara	Asind	Ragunathpura	Ragunathpura	WHS	Anicut	Dhora ke pass anicut repair	25.6424517	74.272808	No	1
Bhilwara	Asind	Ragunathpura	Ragunathpura	WHS	Low cost masonry str,	Bhanwer g ke khet ke pass nale m	25.6362742	75.688414	No	1

District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Bhilwara	Asind	Mefliyas	Negdiya	WHS	Anicut	Bheru g ke mndir ke pass anicut	25.669592	74.259114	No	1
Bhilwara	Asind	Mefliyas	Negdiya	WHS	Low cost masonry str,	Gungariya bala main	25.6499545	75.2733589	No	1
Bhilwara	Asind	Bagta ka kheda	Ragunathpura	WHS	Anicut	Charagha main anicut karye	25.6239381	74.2345063	No	1
Bhilwara	Asind	Baghmali	Rooppura	WHS	Anicut	Chita kaker ke pass anicut	25.619525	74.313029	No	1
Bhilwara	Asind	Mefliyas	Negdiya	WHS	Anicut	Bheru g ke mndir ke piche anicut deepening	25.668755	74.258132	No	1
Bhilwara	Asind	Barethpura	Dantra	WHS	Gabion	Anjna bhata ke pass	25.678171	74.284863	No	1
Bhilwara	Asind	Barethpura	Dantra	PD	PD and LBCD	Charagha road ke pass	25.678183	74.285058	Ha	
Bhilwara	Asind	Khokhla ka kheda	Dantra	PD	PD and LBCD	Charagha and common land	25.675706	74.269299	Ha	
Bhilwara	Asind	Mefliyas	Negdiya	PD	PD and LBCD	Charagha	25.662871	74.26001	Ha	
Bhilwara	Asind	Mefliyas	Negdiya	SMC	Gabion	Bheru g ke pass	25.668245	74.259973	No	1
Bhilwara	Asind	Ragunathp ura	Ragunathpura	PD	PD and LBCD	Charagha	25.648116	74.262735	Ha	
Bhilwara	Asind	Jhalra	Ragunathpura	PD	PD and LBCD	Jogi bhata charagha	25.641545	74.228005	Ha	
Bhilwara	Asind	Jhalra	Ragunathpura	PD	PD and LBCD	Bhopa ji vala charagha	25.641669	74.227158	Ha	
Bhilwara	Asind	Bagta ka kheda	Ragunathpura	PD	PD and LBCD	Road ke pass charagha	25.621105	74.234257	Ha	
Bhilwara	Asind	Bhanas	Ragunathpura	PD	PD and LBCD	Charagha	25.637547	74.288392	Ha	
Bhilwara	Asind	Papriya	Jalriya	SMC	Gabion	Khla bhata ke pass gabion	25.640181	74.332881	No	1
Bhilwara	Asind	Papriya	Jalriya	SMC	Gabion	Bhilo ki devli ke pass	25.638022	74.314266	No	1
Bhilwara	Asind	Papriya	Jalriya	PD	PD and LBCD	Charagha	25.638025	74.314086	Ha	
Bhilwara	Asind	Baghmali	Rooppura	PD	PD and LBCD	Charagha	25.616078	74.30971	Ha	
Bhilwara	Asind	Baghmali	Rooppura	SMC	Gabion	Charagha main gabion	25.61497	74.310902	No	1
Bhilwara	Asind	Mohro ka kheda	Negdiya	PD	LBCD	Charagha and common land	25.644159	74.305031	Ha	
Bhilwara	Asind	Sakad ka badiya	Katar	PD	PD and LBCD	Charagha	25.674323	74.203032	Ha	
Bhilwara	Asind	Nayatalab ka badiya	Katar	PD	LBCD	Charagha	25.670344	74.219079	Ha	
Bhilwara	Asind	Sulwara	Barana	PD	PD and LBCD	Charagha	25.684062	74.324787	Ha	

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Bhilwara	Asind	Mefliyas	Negdiya	WHS	Talab	Road ke pass talab ghrikaran	25.674937	74.290958	No	1
Bhilwara	Asind	Mefliyas	Negdiya	WHS	Nadi	New nadi nirman mefliyas	25.656887	74.287091	No	1
Bhilwara	Asind	Mefliyas	Negdiya	WHS	Nadi	Road ke pass nadi	25.658876	74.269181	No	1
Bhilwara	Asind	Baghmali	Rooppura	WHS	Face Wall	Talab ke aage facewall	25.612806	74.317448	No	1
Bhilwara	Asind	Baghmali	Rooppura	WHS	Talab	Naya talab ki mitti khudai and geghrai karya	25.61092	74.320071	No	1
Bhilwara	Asind	Baghmali	Rooppura	WHS	Nadi	Charagha main nadi	25.616644	74.314858	No	1
Bhilwara	Asind	Jhalra	Ragunathpura	WHS	Nadi	Charagah me Nadi	25.637161	74.234257	No	1
Bhilwara	Asind	Khokala ka badiya	Dantra	WHS	Nadi	Charagah me Nadi Kudai	25.675791	74.268345	No	1
Bhilwara	Asind	Khokala ka badiya	Dantra	WHS	Nadi	Charagah me Nadi Samshan Raste	25.673305	74.264242	No	1
Bhilwara	Asind	Mefliyas	Negdiya	WHS	Nadi	Charagah me Nadi Kudai	25.662423	74.260759	No	1
Bhilwara	Asind	Mohra ka kheda	Jalriya	WHS	Nadi	Nadi Nirman karya	25.647909	74.303805	No	1
Bhilwara	Asind	Papriya	Jalriya	WHS	Nadi	Charagah me Nadi	25.635943	74.310984	No	1
Bhilwara	Asind	Bagta ka kheda	Ragunathpura	WHS	Nadi	Road ke pass nadi	25.625251	74.250396	No	1
Bhilwara	Asind	Bagta ka kheda	Ragunathpura	WHS	Nadi	Charagha ke pass nadi	25.622535	74.237272	No	1
Bhilwara	Asind	Nuwaliya	Jalriya	WHS	Nadi	Nadi Nirman karya	25.665332	74.316175	No	1
Bhilwara	Asind	Nuwaliya	Jalriya	WHS	Nadi	New nadi nirman	25.682338	74.291129	No	1
Bhilwara	Asind	Nuwaliya	Jalriya	WHS	Nadi	Tutdiya anicut repair	25.668318	74.312892	No	1
Bhilwara	Asind	Nuwaliya	Jalriya	WHS	Nadi	Talai ka gehrikaran	25.6677857	74.3122336	No	1
Bhilwara	Asind	Jhalra	Ragunathpura	WHS	MPT	Jhalra sima ke pass	25.628977	74.223796	No	1
Bhilwara	Asind	Jhalra	Ragunathpura	WHS	MPT	Chargha main	25.62792	74.229012	No	1
Bhilwara	Asind	Bagta ka kheda	Ragunathpura	WHS	MPT	Road ke pass	25.622518	74.241777	No	1
Bhilwara	Asind	Bagta ka kheda	Ragunathpura	WHS	MPT	Charagha main nadi	25.626977	74.22897	No	1
Bhilwara	Asind	Bagta ka kheda	Ragunathpura	WHS	MPT	Ganv ke pass	25.621416	74.241203	No	1
Pratapgarh	Peepalkhunt	Kaliyakund	Semliya	PD	Pasture land Development	Bhurji wala magri	23.83416667	74.67116667	Ha	

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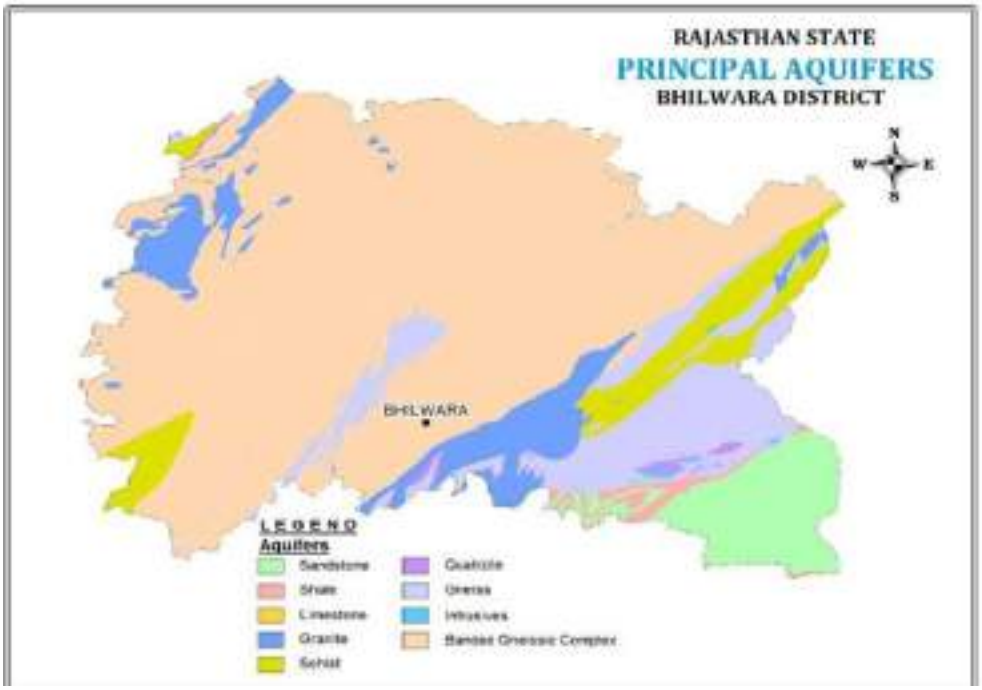
Pratapgarh	Peepalkhunt	Kaliyakund	Semliya	PD	Plantation	Bhurji wala magri	23.83416667	74.67116667	Ha	
Pratapgarh	Peepalkhun	Kaliyakund	Semliya	WHS	Renovation of Nadi	Near Kaliya/Deva home	23.832786	74.682266	No	1
Pratapgarh	Peepalkhunt	Kataro ka kheda B	Sodalpur	PD	Pasture land Development	Near Maiin Road	23.85066667	74.67333333	Ha	
Pratapgarh	Peepalkhunt	Kataro ka kheda B	Sodalpur	PD	Plantation	Near Maiin Road	23.85066667	74.67333333	Ha	
Pratapgarh	Peepalkhunt	Kataro ka kheda A	Semliya	WHS	Renovation of Anicut	Near Khora pada	23.8535004	74.63966667	No	1
Pratapgarh	Peepalkhunt	Bakhatpura	Semliya	PD	Pasture land Development	Mata ka Bada	23.86733333	74.67216667	Ha	
Pratapgarh	Peepalkhunt	Bakhatpura	Semliya	PD	Plantation	Mata ka Bada	23.86733333	74.67216667	Ha	
Pratapgarh	Peepalkhunt	Lamba Dabra	Chharee	WHS	Anicut	Near Lakshman deva farm	23.83450001	74.64483333	No	1
Pratapgarh	Peepalkhunt	Lamba Dabra	Chharee	WHS	Anicut	Near Samshan ghat	23.8390001	74.64066667	No	1
Pratapgarh	Peepalkhunt	Lamba Dabra	Chharee	WHS	Renovation of Anicut	Umri wali khori	23.83116667	74.65016667	No	1
Pratapgarh	Peepalkhunt	Lamba Dabra	Chharee	WHS	Renovation of Anicut	Anicut reparing richadi pada	23.8280179	74.6504238	No	1
Pratapgarh	Peepalkhunt	Kundal Ganawa	Semliya	PD	Pasture land Development	Near shantila bhan ji farm	23.8595001	74.69033333	Ha	
Pratapgarh	Peepalkhunt	Kundal Ganawa	Semliya	PD	Plantation	Near shantila bhan ji farm	23.8595003	74.69033333	Ha	
Pratapgarh	Peepalkhunt	Kundal Ganawa	Semliya	WHS	Renovation of Anicut	Anicut reparing	23.868199	74.698085	No	1
Pratapgarh	Peepalkhunt	SURAJPUR A	Semliya	PD	Pasture land Development	In charagah	23.88366667	74.67233333	Ha	
Pratapgarh	Peepalkhunt	SURAJPUR A	Semliya	PD	Plantation	In charagah	23.88366667	74.67233333	Ha	
Pratapgarh	Peepalkhunt	SURAJPUR A	Semliya	WHS	Renovation of Nadi	In charagah	23.9175007	74.66983333	No	1
Pratapgarh	Peepalkhunt	SURAJPUR A	Semliya	WHS	Nadi	In charagah	23.880001	74.65883333	No	1
Pratapgarh	Peepalkhunt	SEMLIYA	Semliya	PD	Pasture land Development	Near bhadur jiwa farm	23.8805006	74.67116667	Ha	
Pratapgarh	Peepalkhunt	SEMLIYA	Semliya	PD	Plantation	Near bhadur jiwa farm	23.880501	74.67116667	Ha	
Pratapgarh	Peepalkhunt	SEMLIYA	Semliya	WHS	Nadi	Near bhadur jiwa farm	23.88366667	74.67233333	No	1
Pratapgarh	Peepalkhunt	Sandni	Veerpur	WHS	Renovation of Anicut	Mangilal ke khet ke pass	23.93333333	74.69216667	No	1
Pratapgarh	Peepalkhunt	Sandni	Veerpur	WHS	Renovation of Anicut	Vavedikhera	23.89216667	74.65066667	No	1
Pratapgarh	Peepalkhunt	Sandni	Veerpur	WHS	Renovation of Anicut	Khatu ram amra ke ghar ke pass	23.88933333	74.65266667	No	1
Pratapgarh	Peepalkhunt	Sandni	Veerpur	PD	Plantation	In charagah	23.88973333	74.63651333	Ha	

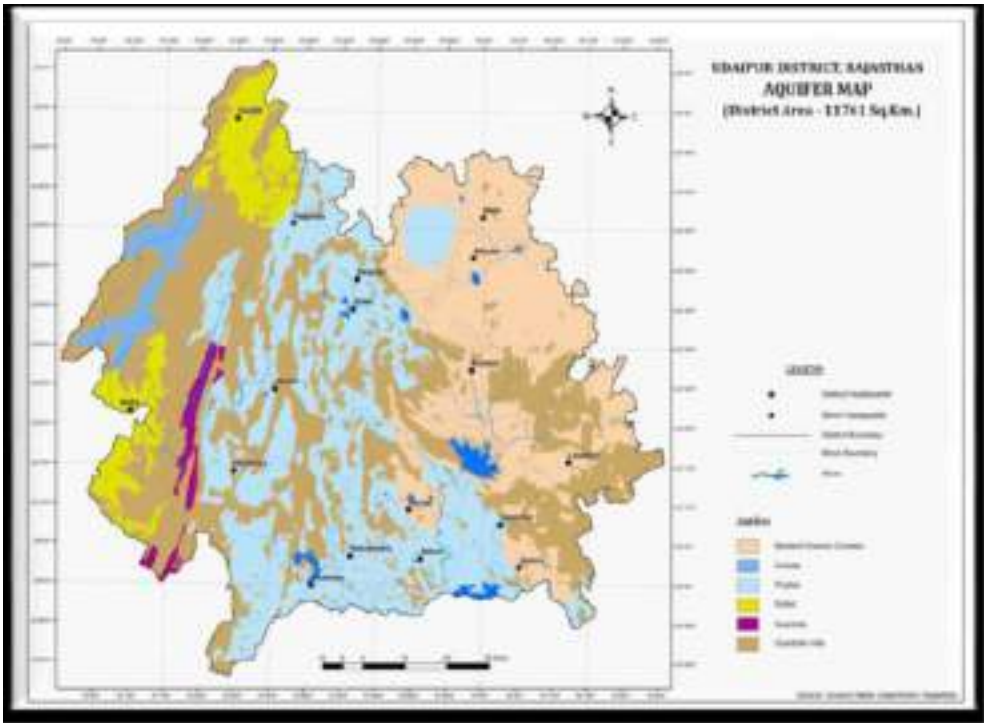
District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Overall Plan
Pratapgarh	Peepalkhunt	Phoolda	Veerpur	WHS	Renovation of Anicut	Near Rakma/ Makna	23.85833333	74.68816667	No	1
Pratapgarh	Peepalkhunt	Pateliya	Veerpur	WHS	Renovation of Anicut	Tejram farm	23.9175003	74.66816667	No	1
Pratapgarh	Peepalkhunt	Pateliya	Veerpur	WHS	Renovation of Anicut	Ratan /pyara farm	23.91733333	74.67016667	No	1
Pratapgarh	Peepalkhunt	Pateliya	Veerpur	WHS	Renovation of Anicut	Near Jaiprakash farm	23.91683333	74.6715	No	1
Pratapgarh	Peepalkhunt	Bhachediya	Veerpur	PD	Plantation	In charagah	23.91701333	74.65898	Ha	
Pratapgarh	Peepalkhunt	CHHOTA MAYNGA	Suhagpura	WHS	Renovation of Anicut	Bildi Nala Par	23.935585	74.72391667	No	1
Pratapgarh	Peepalkhunt	MOTA MAYNGA	Suhagpura	PD	Pasture land Development	Near Temple	23.95033333	74.70333333	Ha	
Pratapgarh	Peepalkhunt	MOTA MAYNGA	Suhagpura	WHS	Renovation of Anicut	Anicut reparing prika meena k khet k paas	23.939515	74.70163667	No	1
Pratapgarh	Peepalkhunt	Anoppura	Suhagpura	PD	Pasture land Development	Near Main Road	23.904501	74.688218	Ha	
Pratapgarh	Peepalkhunt	Anoppura	Suhagpura	PD	Plantation	Near Main Road	23.904501	74.688218	Ha	
Pratapgarh	Peepalkhunt	Gotamagri	Semliya	PD	Pasture land Development	Near Bchhda wala magri	23.83433333	74.67683333	Ha	
Pratapgarh	Peepalkhunt	Gotamagri	Semliya	PD	Plantation	Near Bchhda wala magri	23.83433333	74.67683333	Ha	
Pratapgarh	Peepalkhunt	Sakhtal	Kachotiya	PD	Pasture land Development	Near village temple	23.95283333	74.704	Ha	
Pratapgarh	Peepalkhunt	Sakhtal	Kachotiya	PD	Plantation	Near village temple	23.95283333	74.704	Ha	
Pratapgarh	Peepalkhunt	Baloriya	Suhagpura	WHS	Nadi	Mahadev Mandir ke pass	23.93733	74.68883	No	1
Pratapgarh	Peepalkhunt	Baloriya	Suhagpura	PD	Plantation	In charagah	23.938465	74.68594833	Ha	
Pratapgarh	Peepalkhunt	Chhayan	Suhagpura	WHS	Nadi	Baloriya road, Anganvadi k pass	23.925	74.70467	No	1
Pratapgarh	Peepalkhunt	Chhayan	Suhagpura	PD	Plantation	In charagah	23.93589333	74.70037833	Ha	
Pratapgarh	Peepalkhunt	Renda	Sodalpur	PD	Plantation	In charagah	23.8343333	74.66798667	Ha	
Pratapgarh	Peepalkhunt	Somawato ka kheda	Veerpur	PD	Plantation	In charagah	23.91740333	74.67657333	Ha	
Pratapgarh	Peepalkhunt	Veerpur	Veerpur	WHS	Renovation of Anicut	Bhanji Teja ke khet k pas	23.93542	74.690607	No	1
Pratapgarh	Peepalkhunt	Veerpur	Veerpur	WHS	Renovation of Anicut	Ruplal Teja ke ghar k pass	23.933443	74.692253	No	1
Pratapgarh	Peepalkhunt	Veerpur	Veerpur	WHS	Renovation of Anicut	Bherulal Chokhaji k ghar ke pass	23.916187	74.709523	No	1

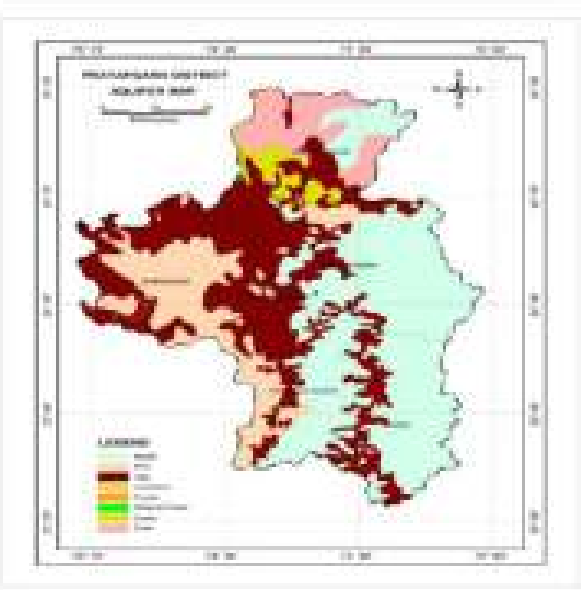
District	Block	Village	Panchayat	Activity Class	Type of activity	Location name/ Site name	Latitude	Longitude	Unit	Over all Plan
Pratapgarh	Peepalkhunt	Veerpur	Veerpur	WHS	Renovation of Anicut	Devji Nagji ke khet ke pass	23.930919	74.677789	No	1
Pratapgarh	Peepalkhunt	Semliya khurd	Veerpur	SMC	Gabion	Rojdi falla, Deva Padma k khet ke pass	23.93333333	74.69216667	No	1
Pratapgarh	Peepalkhunt	Suhagpura	Suhagpura	WHS	Renovation of Anicut	Vaveliya Anicut gaharikaran	23.908135	74.70510167	No	1
Pratapgarh	Peepalkhunt	Dozra	Suhagpura	WHS	Renovation of Anicut	Anicut Repairing, Pirji k khet k pass	23.897721	74.7152909	No	1
Pratapgarh	Peepalkhunt	Dozra	Suhagpura	WHS	Renovation of Anicut	WHS Repairing , Mahudi khora Talab	23.8975964	74.7198906	No	1
Pratapgarh	Peepalkhunt	Dozra	Suhagpura	WHS	Renovation of Anicut	Anicut Repairing , Kailash Nagji kkhet k pass	23.8961581	74.7154671	No	1
Pratapgarh	Peepalkhunt	Panavla	Suhagpura	WHS	Renovation of Anicut	Anicut Repairing, Prakash Gamana k khet k pass	23.92334344	74.72139	No	1
Pratapgarh	Peepalkhunt	Mata ka Bada	Semliya	WHS	Renovation of Anicut	Manuram ke khet ke pas	24.4270006	75.1245	No	1

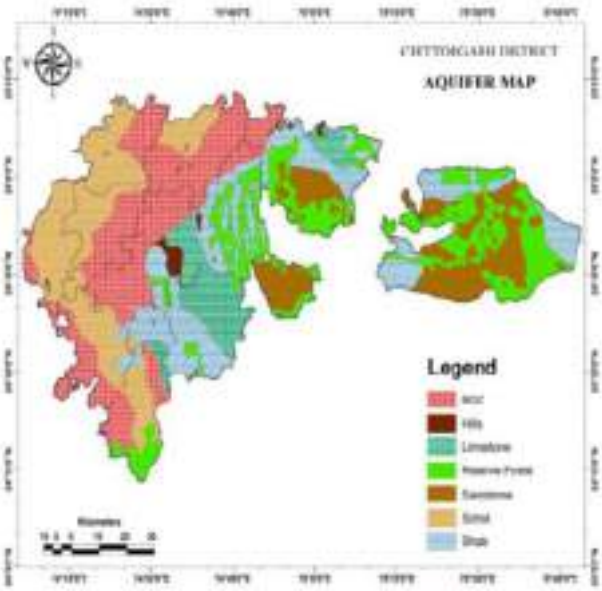
ANNEXURE 2

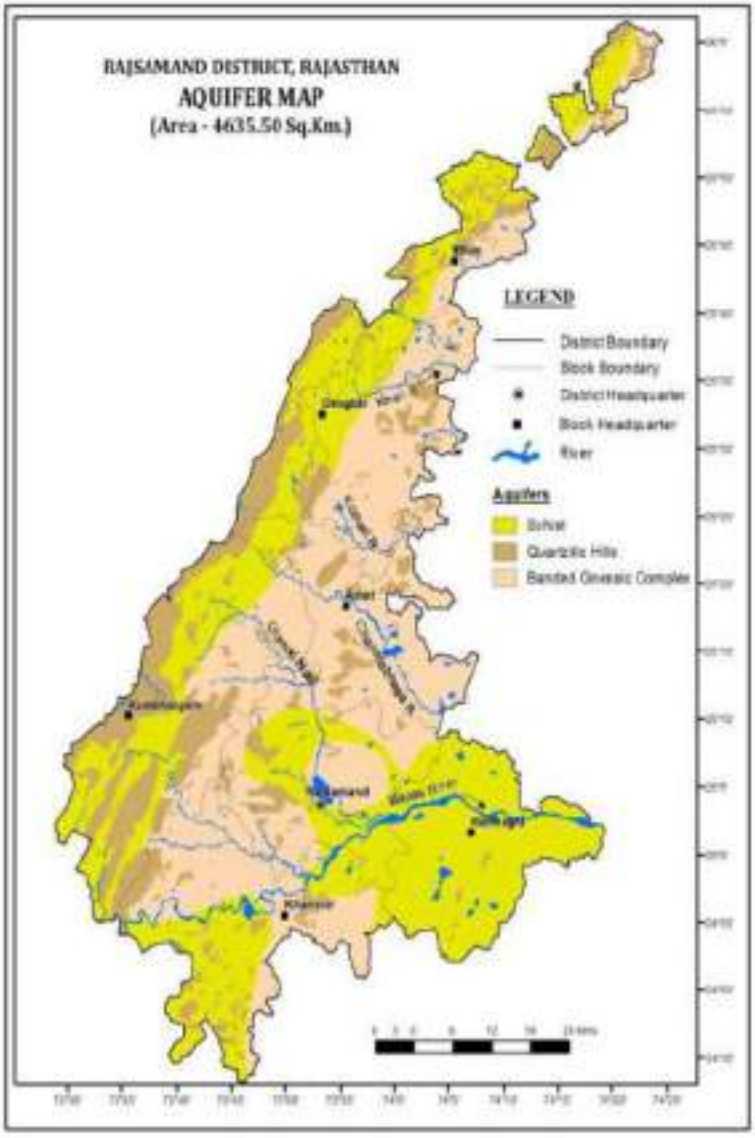
AQUIFER TYPES








AQUIFER MAP
Legend


RAJSAMAND DISTRICT, RAJASTHAN
AQUIFER MAP
(Area - 4635.50 Sq.Km.)
LEGEND
District Boundary
Block Boundary
District Headquarter
Block Headquarter
River
Aquifers
Soil
Quartzite Hills
Banded Gneissic Complex

ANNEXURE 3

GROUND WATER DATA

ANNEXURE 4

RAINFALL

Year Month	Monthly Rainfall in mm									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
January	26.55	7.69	0.48	2.487797	0	2.879839	0.323124	9.398457	8.686835	24.35151
February	7.19	0.72	0.01	0	0	0.369941	0	0	0	0
March	0.28	41.58	1.30	5.41446	0	0	15.31104	0.572487	8.073826	19.53493
April	7.23	4.62	0.00	0.825899	0.091595	15.45871	5.156962	0.014128	0	14.03758
May	9.68	1.72	3.84	11.45598	0.108686	7.386496	11.47615	70.55682	3.652026	36.57482
June	5.97	116.01	79.34	99.26116	119.2582	105.975	89.1747	89.99169	47.34342	206.0046
July	225.93	384.88	315.97	419.5999	228.9126	280.419	122.3289	179.5991	363.2761	263.9094
August	271.89	116.50	531.90	174.9637	187.947	525.5733	372.4746	186.206	372.9386	38.01737
September	165.91	18.58	53.99	56.16571	142.6157	312.9455	98.70512	277.63	83.92393	184.7859
October	1.24	0.13	37.65	0.07012	0.071548	51.70225	9.375304	33.37743	47.60711	0
November	0.02	0.00	0.07	0	0	6.64961	1.875024	47.57917	0.01688	19.10423
December	0.43	0.23	0.00	2.083309	0.004834	1.499896	1.57718	13.90905	0.009203	13.94425
Total	**722.32**	**692.66**	**1024.55**	**772.328**	**679.0103**	**1310.859**	**727.7781**	**908.8343**	**935.5279**	**820.2646**

ANNEXURE 5

WTF & RIF METHODS

WATER TABLE FLUCTUATION MODEL CALCULATIONS

Location	Peepalkhoont						
Major Aquifer System	Basalt						
Year	Precipitation	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2014	722.32	5.24	0.02	0.10	104.77	14.50%	17240568.13
2015	692.66	2.72	0.02	0.05	54.40	7.85%	8951743.04
2016	1024.55	5.26	0.02	0.11	105.14	10.26%	17300964.91
2017	772.33	5.61	0.02	0.11	112.29	14.54%	18478159.63
2018	679.01	5.47	0.02	0.11	109.46	16.12%	18012344.95
2019	1310.86	5.99	0.02	0.12	119.75	9.14%	19705986.38
2020	727.78	4.81	0.02	0.10	96.17	13.21%	15825041.22
2021	908.83	5.70	0.02	0.11	113.97	12.54%	18754104.20
2022	935.53	3.77	0.02	0.08	75.38	8.06%	12404847.54
2023	820.26	3.67	0.02	0.07	73.42	8.95%	12081435.44

Location	Udaipur						
Major Aquifer System	Schist						
Year	Precipitation	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2014	722.32	6.43	0.02	0.10	96.38	13%	20183806.61
2015	692.66	4.78	0.02	0.07	71.63	10%	15000416.59
2016	1024.55	6.70	0.02	0.10	100.50	10%	21047704.95
2017	772.33	3.99	0.02	0.06	59.78	8%	12518672.27
2018	679.01	4.13	0.02	0.06	61.88	9%	12958475.06
2019	1310.86	5.88	0.02	0.09	88.13	7%	18456009.94
2020	727.78	3.53	0.02	0.05	52.95	7%	11089313.21
2021	908.83	9.55	0.02	0.14	143.18	16%	29985125.93
2022	935.53	5.90	0.02	0.09	88.43	9%	18518838.91
2023	820.26	2.44	0.02	0.04	36.58	4%	7661207.53

Location	Asind & Devgarh							
Major Aquifer System	Gneiss & Schist							
Year	Precipitation	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.) - Asind	Volume of recharge (in cu. m.) - Devgarh
2014	722.32	9.93	0.02	0.15	148.95	20.62%	29023056.45	7507510.47
2015	692.66	4.88	0.02	0.07	73.20	10.57%	14263093.20	3689491.55
2016	1024.55	3.79	0.02	0.06	56.81	5.54%	11069485.31	2863388.18
2017	772.33	7.93	0.02	0.12	118.98	15.41%	23183371.98	5996935.85
2018	679.01	6.19	0.02	0.09	92.88	13.68%	18097760.88	4681420.42
2019	1310.86	11.41	0.02	0.17	171.08	13.05%	33335109.08	8622926.42
2020	727.78	4.34	0.02	0.07	65.12	8.95%	12688697.12	3282236.20
2021	908.83	2.94	0.02	0.04	44.15	4.86%	8602671.65	2225287.59
2022	935.53	4.01	0.02	0.06	60.10	6.42%	11710545.10	3029213.69
2023	820.26	5.11	0.02	0.08	76.70	9.35%	14944097.45	3865649.65

Location	Kotri, Begun & Jahazpur								
Major Aquifer System	Schist (1) Sandstone, limestone, BCG (2)								
Year	Precipitation	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.) - Kotri	Volume of recharge (in cu. m.) - Begun	Volume of recharge (in cu. m.) - Jahazpur
2014	722.32	6.94	0.02	0.14	138.77	19.21%	18745142.11	19081837.75	27246118.68
2015	692.66	4.44	0.02	0.09	88.82	12.82%	17305766.51	476552.06	17438120.08
2016	1024.55	2.06	0.02	0.04	41.26	4.03%	8038885.03	2079450.65	8100365.99
2017	772.33	5.36	0.02	0.11	107.28	13.89%	20904369.54	5407417.15	21064245.04
2018	679.01	6.51	0.02	0.13	130.25	19.18%	25378399.92	6564732.54	25572492.56
2019	1310.86	8.44	0.02	0.17	168.88	12.88%	32907191.14	8512235.17	33158863.58
2020	727.78	6.06	0.02	0.12	121.12	16.64%	23600855.96	6104928.11	23781354.04
2021	908.83	4.94	0.02	0.10	98.84	10.88%	19258821.42	4981756.61	19406111.85
2022	935.53	4.77	0.02	0.10	95.43	10.20%	18595070.92	4810061.61	18737285.02
2023	820.26	5.44	0.02	0.11	108.75	13.26%	21190989.08	5481558.17	21353056.63

RAINFALL INFILTRATION METHOD CALCULATIONS

Location		Rainfall Infiltration Method		WTF Model
		Peepalkhoont		
Area (in sq. m.) =		164554100		
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)
2014	0.722319973	0.093901596	15451892.7	17240568.13
2015	0.692662293	0.090046098	14817454.62	8951743.04
2016	1.024546047	0.133190986	21917122.86	17300964.91
2017	0.772328007	0.100402641	16521666.21	18478159.63
2018	0.679010269	0.088271335	14525410.08	18012344.95
2019	1.310859494	0.170411734	28041949.56	19705986.38
2020	0.727778119	0.094611156	15568653.55	15825041.22
2021	0.908834319	0.118148461	19441813.74	18754104.2
2022	0.935527927	0.121618631	20012844.29	12404847.54
2023	0.820264605	0.106634399	17547127.51	12081435.44

Location		Rainfall Infiltration Method		WTF Model
		Gogunda, Udaipur		
Area (in sq. m.) =		209429900		
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)
2014	0.722319973	0.050562398	10589277.98	20183806.61
2015	0.692662293	0.04848636	10154493.63	15000416.59
2016	1.024546047	0.071718223	15019940.34	21047704.95
2017	0.772328007	0.05406296	11322400.41	12518672.27
2018	0.679010269	0.047530719	9954353.692	12958475.06
2019	1.310859494	0.091760165	19217322.09	18456009.94
2020	0.727778119	0.050944468	10669294.91	11089313.21
2021	0.908834319	0.063618402	13323595.63	29985125.93
2022	0.935527927	0.065486955	13714926.41	18518838.91
2023	0.820264605	0.057418522	12025155.4	7661207.529

Location		Rainfall Infiltration Method		WTF Model
		Asind		
Area (in sq. m.) =		194851000		
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)
2014	0.722319973	0.050562398	9852133.832	29023056.45
2015	0.692662293	0.04848636	9447615.827	14263093.2
2016	1.024546047	0.071718223	13974367.53	11069485.31
2017	0.772328007	0.05406296	10534221.92	23183371.98
2018	0.679010269	0.047530719	9261408.095	18097760.88
2019	1.310859494	0.091760165	17879559.83	33335109.08
2020	0.727778119	0.050944468	9926580.604	12688697.12
2021	0.908834319	0.063618402	12396109.31	8602671.65
2022	0.935527927	0.065486955	12760198.65	11710545.1
2023	0.820264605	0.057418522	11188056.5	14944097.45

Location		Rainfall Infiltration Method		WTF Model
		Deogarh		
Area (in sq. m.) =		50402890		
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)
2014	0.722319973	0.050562398	2548490.989	7507510.466
2015	0.692662293	0.04848636	2443852.694	3689491.548
2016	1.024546047	0.071718223	3614805.721	2863388.181
2017	0.772328007	0.05406296	2724929.451	5996935.852
2018	0.679010269	0.047530719	2395685.593	4681420.423
2019	1.310859494	0.091760165	4624977.482	8622926.421
2020	0.727778119	0.050944468	2567748.435	3282236.197
2021	0.908834319	0.063618402	3206551.333	2225287.594
2022	0.935527927	0.065486955	3300731.784	3029213.689
2023	0.820264605	0.057418522	2894059.467	3865649.649

Location		Rainfall Infiltration Method		WTF Model
		Kotri		
Area (in sq. m.) =		135081401		
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)
2014	0.722319973	0.050562398	6830039.573	18745142.11
2015	0.692662293	0.04848636	6549605.504	17305766.51
2016	1.024546047	0.071718223	9687798.083	8038885.028
2017	0.772328007	0.05406296	7302900.446	20904369.54
2018	0.679010269	0.047530719	6420516.09	25378399.92
2019	1.310859494	0.091760165	12395091.59	32907191.14
2020	0.727778119	0.050944468	6881650.159	23600855.96
2021	0.908834319	0.063618402	8593662.913	19258821.42
2022	0.935527927	0.065486955	8846069.613	18595070.92
2023	0.820264605	0.057418522	7756174.446	21190989.08

Location		Rainfall Infiltration Method		WTF Model
		Begun		
Area (in sq. m.) =		137507700		
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)
2014	0.722319973	0.050562398	6952719.069	19081837.75
2015	0.692662293	0.04848636	6667247.912	4476552.061
2016	1.024546047	0.071718223	9861807.936	2079450.646
2017	0.772328007	0.05406296	7434073.353	5407417.147
2018	0.679010269	0.047530719	6535839.826	6564732.538
2019	1.310859494	0.091760165	12617729.18	8512235.171
2020	0.727778119	0.050944468	7005256.671	6104928.109
2021	0.908834319	0.063618402	8748020.179	4981756.612
2022	0.935527927	0.065486955	9004960.546	4810061.606
2023	0.820264605	0.057418522	7895488.949	5481558.172

Location		Rainfall Infiltration Method		WTF Model
		Jahazpur		
Area (in sq. m.) =		196341210		
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)
2014	0.722319973	0.050562398	9927482.423	27246118.68
2015	0.692662293	0.04848636	9519870.686	17438120.08
2016	1.024546047	0.071718223	14081242.74	8100365.99
2017	0.772328007	0.05406296	10614787.08	21064245.04
2018	0.679010269	0.047530719	9332238.847	25572492.56
2019	1.310859494	0.091760165	18016301.75	33158863.58
2020	0.727778119	0.050944468	10002498.56	23781354.04
2021	0.908834319	0.063618402	12490914.09	19406111.85
2022	0.935527927	0.065486955	12857787.96	18737285.02
2023	0.820264605	0.057418522	11273622.16	21353056.63

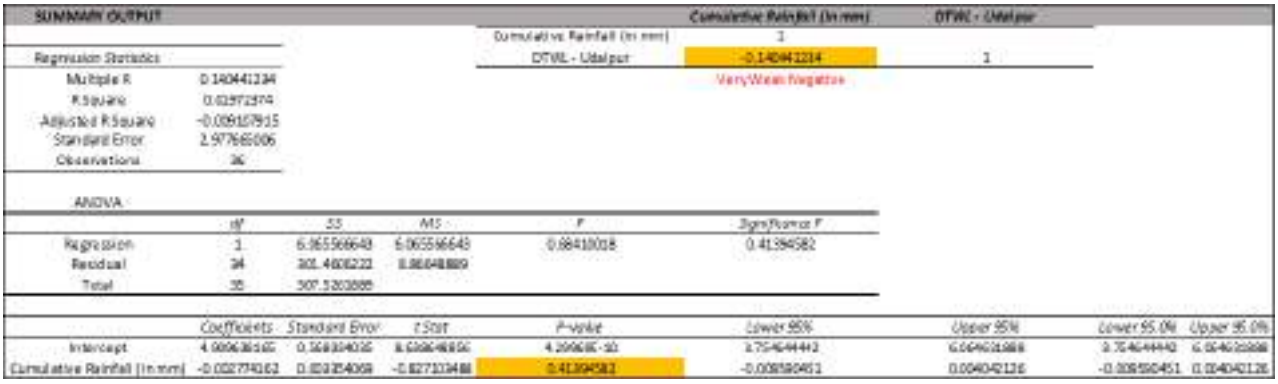
ANNEXURE 6

REGRESSION & CORRELATION

Month	Cumulative Rainfall (in mm)	Average DTWL			
		Peepalkhoont	Udaipur	Asind & Devgarh	Kotri, Begun & Jahazpur
May_14	9.676652354	8.170	10.120	14.278	11.045
Aug_14	271.8931312	2.931	4.445	5.404	4.107
Nov_14	0.022334453	5.103	3.695	4.348	8.055
Jan_15	7.685793933	5.234	6.395	8.492	9.290
May_15	1.723992429	2.514	8.770	11.970	11.040
Aug_15	116.5010715	3.214	3.995	7.090	6.599
Nov_15	0	4.784	4.205	9.822	9.579
Jan_16	0.48040871	4.986	7.050	13.600	11.972
May_16	3.844322779	6.246	9.050	15.045	11.375
Aug_16	531.8964202	0.989	2.350	11.623	11.468
Nov_16	0.068243949	1.443	2.415	11.257	9.909
Jan_17	2.487796803	1.439	2.410	10.268	8.298
May_17	11.45598427	7.054	5.860	13.305	10.019
Aug_17	174.9636956	2.180	1.875	5.373	4.655
Nov_17	0	2.428	1.880	5.695	5.643
Jan_18	0	3.770	4.220	6.586	7.601
May_18	0.108686107	7.411	8.345	12.778	12.769
Aug_18	187.9470381	1.938	6.645	6.596	6.257
Nov_18	0	3.386	8.345	7.223	8.389
Jan_19	2.879838675	4.959	7.665	9.690	10.608
May_19	7.386496213	7.828	9.520	14.753	12.518
Aug_19	525.5732807	1.841	3.645	10.173	10.103
Nov_19	6.6496101	4.399	4.120	3.347	4.074
Jan_20	0.323123688	5.787	4.200	5.330	5.268
May_20	11.47614593	7.934	5.300	9.671	8.590
Aug_20	372.4746246	3.125	2.495	5.338	2.534
Nov_20	1.875024241	4.572	1.770	6.496	7.303
Jan_21	9.398457167	4.104	1.995	7.989	7.677
May_21	70.55682221	9.802	0.000	10.933	10.455
Aug_21	186.2060335	7.125	9.545	9.395	7.976
Nov_21	47.57916592	4.448	0.000	8.982	5.513
Jan_22	8.686835473	3.879	0.000	9.666	6.640

Month	Cumulative Rainfall (in mm)	Average DTWL			
		Peepalkhoont	Udaipur	Asind & Devgarh	Kotri, Begun & Jahazpur
May_22	3.652026317	7.033	0.000	8.835	9.502
Aug_22	372.9385815	3.264	5.380	5.659	4.731
Nov_22	0.016880305	4.572	5.895	6.278	4.897
Jan_23	24.35151155	6.195	4.900	8.789	7.008
May_23	23.268	8.149	3.705	11.048	10.266
Aug_23	234.567	4.478	5.385	5.935	4.829
Nov_23	14.030	4.498	2.946	6.276	5.447
Jan_24	10.690	4.991	2.774	7.944	6.648
May_24	27.238	8.230	2.251	10.122	9.703
Aug_24	291.547	4.498	5.701	6.582	5.017
Nov_24	15.875	4.523	2.653	7.008	5.790

SUMMARY OUTPUT								
					Cumulative Rainfall (in mm)	DTWL - Peepalkhoont		
				Cumulative Rainfall (in mm)	1			
Regression Statistics				Peepalkhoont	-0.420159194	1		
Multiple R	0.420159194				Moderate Negative			
R Square	0.176626887							
Adjusted R Square	0.26373856							
Standard Error	2.012215401							
Observations	36							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	31.79562651	31.79562651	7.852688935	0.008017878			
Residual	34	137.6663679	4.049010882					
Total	35	169.4619944						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.166910734	0.384062847	13.37610716	4.16726-15	4.387601513	5.946020346	4.387601139	5.946020346
Cumulative Rainfall (in mm)	-0.006351552	0.002268578	-2.802205344	0.008017878	-0.010957792	-0.001745312	-0.010957792	-0.001745312



SUMMARY OUTPUT								
					Cumulative Rainfall (in mm)	DTWL - Udaipur		
				Cumulative Rainfall (in mm)	1			
Regression Statistics				DTWL - Udaipur	-0.140441234	1		
Multiple R	0.140441234				Very/Weak Negative			
R Square	0.019721374							
Adjusted R Square	-0.009157915							
Standard Error	2.977666006							
Observations	36							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	6.365566643	6.365566643	0.68410038	0.41394582			
Residual	34	301.4906222	8.866488889					
Total	35	307.5202888						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.906636165	0.568304035	8.636048850	4.29968E-10	3.754644442	6.064631888	3.754644442	6.064631888
Cumulative Rainfall (in mm)	-0.022774162	0.027354069	-0.827103488	0.41394582	-0.008580451	0.004042126	-0.008580451	0.004042126

SUMMARY OUTPUT										
						Cumulative Rainfall (in mm)	DTWL - Asind & Devgarh			
					Cumulative Rainfall (in mm)	1				
Regression Statistics					DTWL - Asind & Devgarh	-0.145171287	1			
Multiple R	0.145171287					Very Weak Negative				
R Square	0.021074996									
Adjusted R Square	-0.007708816									
Standard Error	3.143261783									
Observations	36									
ANOVA										
	df	SS	MS	F	Significance F					
Regression	1	7.232009913	7.232009913	0.731976259	0.398232605					
Residual	34	335.9236451	9.880137209							
Total	35	343.155649								
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%		
Intercept	8.196751570	0.589841157	13.89963366	7.767245-17	7.977468456	10.4156427	7.977468456	10.4156427		
Cumulative Rainfall (in mm)	-0.008029183	0.009540601	-0.855556131	0.398232605	-0.03022455	0.004166184	-0.03022455	0.004166184		

SUMMARY OUTPUT										
						Cumulative Rainfall (in mm)	DTWL - Kotri, Begun & Jahazpur			
					Cumulative Rainfall (in mm)	1				
Regression Statistics					DTWL - Kotri, Begun & Jahazpur	-0.19670188	1			
Multiple R	0.19670188					Very Weak Negative				
R Square	0.038681435									
Adjusted R Square	0.01417652									
Standard Error	2.667988257									
Observations	36									
ANOVA										
	df	SS	MS	F	Significance F					
Regression	1	9.740899706	9.740899706	1.368456255	0.250212579					
Residual	34	242.0178669	7.118348673							
Total	35	251.7588668								
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%		
Intercept	8.492164846	0.509217562	16.67807384	7.353035-18	7.407566613	9.477036668	7.407566613	9.477036668		
Cumulative Rainfall (in mm)	-0.00853557	0.004605247	-1.169830305	0.250212579	-0.009622967	0.002501828	-0.009622967	0.002501828		

ANNEXURE 7

PHOTOS

CHAPTER 9
RECOMMENDATIONS

The program could support ventures, such as poultry, goat farming, and dairy, to build an additional source of income.

The program could be expanded to include the neighbouring villages based on the interest and demand created through its positive outcomes.

10. SUSTAINABILITY

The project has laid a strong foundation for long-term sustainability by fostering community-led governance and resource management systems. By strengthening village institutions and promoting participatory decision-making, the project ensures that communities remain at the center of governance and implementation, particularly in managing common land and water resources. The development of village-specific rules and regulations enhances local self-governance, ensuring transparency, accountability, and equitable access to resources, with a special focus on empowering marginalized groups.

A key factor in ensuring sustainability is the establishment of institutional mechanisms for monitoring, repair, and maintenance of assets even after the project's conclusion. Village institutions have been equipped with the necessary knowledge and processes to maintain these assets, ensuring their continued functionality and impact. Additionally, the capacitation of habitation-level institutions has enabled them to take ownership of long-term resource stewardship, planning, and review functions, further strengthening local governance structures.

The project's emphasis on human resource development has resulted in the creation of a trained cadre of over 1,000 local resource persons who continue to support village institutions. These trained individuals serve as a critical knowledge base within the community, guiding the planning and implementation of restoration activities while also assisting in leveraging public funds for maintaining and restoring water bodies and common lands. Their continued presence ensures that technical and administrative expertise remains embedded within the region, reducing dependence on external support.

Multi-actor platforms and federations have been established to facilitate collective decision-making and conflict resolution across villages. These structures play a vital role in ensuring landscape-level improvements and fostering collaboration among different stakeholders. The long-term presence of institutional support further reinforces community resilience and adaptability to emerging challenges in resource management.

A significant achievement of the project is the active participation of community members in following water governance protocols. This engagement reflects a deep-rooted commitment to sustaining the improvements achieved through the project. The integration of digital monitoring tools and structured training programs has empowered local institutions to track progress, ensure compliance with governance norms, and maintain transparency in decision-making.

To further strengthen the sustainability of the project, extensive capacity-building programs have been conducted. These programs have enhanced the technical knowledge and management skills of village representatives, community resource persons, and local leaders. Training initiatives have covered essential aspects such as soil and water conservation, financial management, documentation, and the effective implementation of public schemes like MGNREGA. Exposure visits have provided opportunities for cross-learning, reinforcing best practices in conservation and resource management.

By embedding sustainable practices within community frameworks, the project has gone beyond addressing immediate needs—it has empowered local stakeholders with the skills, knowledge, and institutional mechanisms to drive long-term improvements in agricultural practices, water conservation, and land management.

CHAPTER 11
CONCLUSION

Bajaj Auto Limited, in collaboration with the Foundation for Ecological Security (FES), made a significant impact in addressing water scarcity and land degradation trouble spots in rainfed areas of Rajasthan. By empowering local communities and institutions, the project improved resource management through practices like soil and water conservation, regeneration of common lands and building water harvesting structures. Capacity-building efforts, training programs and exposure visits helped participants adopt effective conservation methods and governance models, which improved their ability to manage natural resources. The support from Bajaj Auto Limited in ecological restoration, along with the expertise of the Foundation for Ecological Security in local governance, contributed to enhancing agricultural practices and livelihoods in the region. The project demonstrated the value of collaboration between industry and ecological organisations in promoting environmental health and improving the quality of life for local communities.

IMPACT ASSESSMENT REPORT

BAJAJ WATER CONSERVATION PROJECT (BWCP)

Implementing partner – Jankidevi Bajaj Gram Vikas Sanstha

Release Date: 31-12-2024

SoulAce
Path to Sustainability
SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

BWCP	Bajaj Water Conservation Project
CNB	Cement Nala Bunds
CSR	Corporate Social Responsibility
ENB	Earthen Nala Bunds
JBGVS	Jankidevi Bajaj Gram Vikas Sanstha
NGO	Non-Governmental Organisation
NRLM	National Rural Livelihoods Mission
PMKSY	Pradhan Mantri Krishi Sinchai Yojana
SDGs	Sustainable Development Goals
SHG	Self-Help Group
VDC	Village Development Committee
WUGs	Water User Groups

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The collaborative intervention by Jankidevi Bajaj Gram Vikas Sanstha (JBGVS) with support from Bajaj Auto Limited on the Water Conservation Project has significantly transformed water resource management across thirty-one villages in Gangapur Taluka, Aurangabad district, Maharashtra, benefiting agricultural communities. The initiative prioritised the construction of water conservation structures and the strengthening of community institutions, such as Self-Help Groups (SHGs) and Water User Associations. Through hands-on training in sustainable farming practices, including the use of organic inputs like Amrit Jal and vermicompost, farmers improved soil health and increased crop productivity. This shift not only enhanced agricultural yields but also elevated household incomes, contributing to an overall better quality of life.

PROJECT DETAILS

Implementation year

FY 2017 - FY 2022

Assessment year

FY 2024 - FY 2025

Implementing Partner

Jankidevi Bajaj Gram Vikas Sanstha

Project location

Aurangabad District, Maharashtra

Beneficiaries

25,000

Budget

₹3,249 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

The project has the following key components:

- Development of recharge shafts, check dams, and community water tanks to enhance water availability for irrigation and household use.
- Formation and capacity building of Village Development Committees, Self Help Groups (SHGs) and Water User Groups to promote community-led water management.
- Conducting hands-on training sessions on preparing and applying organic inputs, such as Amrit Jal and vermicompost, to enhance soil fertility and crop health.
- Providing training on utilising micro-irrigation systems to optimise water use and improve irrigation efficiency.
- Organising and strengthening existing SHGs, focusing on empowering women through training in group management and developing livelihood skills.
- Encouraging farmers to diversify their crops to improve resilience against market fluctuations and climate variability.

Key Findings

28.0%

of the respondents were in the age group of 31-40 years, followed by 24.2% in the 41–50-year range. Additionally, 17% of respondents belonged to the 20–30-year age group.

30.7%

of the respondents have completed primary education, while 20.8% finished the 12th standard and 20.5% completed the 10th standard.

50.4%

of the respondents own between 2 to 3 hectares of land, while 23.9% possess 1 to 2 hectares. Additionally, 14.4% own 3 to 4 hectares and 3.8% have less than 1 hectare of land.

54.9%

of the respondents reported an annual family income between Rs. 2.1 to 3 lakhs, followed by 21.6% with an income range of Rs. 1.1 lakh to 2 lakhs. Additionally, around 2.0% of the respondents have an annual family income of less than Rs. 1 lakh.

A significant majority of the respondents (94.3%) reported cultivating cotton, while an even higher percentage (96.6%) grew maize. Additionally, 42.8% cultivate toor pulse, with lower percentages for other crops like wheat, groundnut, and soybean, at around 2.0%.

Before the intervention, majority (99.2%) of the respondents were not utilising micro-irrigation techniques in their agricultural practices. After the intervention, this increased dramatically, with 98.8% of the respondents adopting micro-irrigation.

Key Impact

87.0%

of the respondents reported a 20.0% reduction in water usage, with an additional 11.8% observing a reduction of 20-30%, indicating significant water conservation and improved moisture retention in the soil.

The intervention improved the resilience of Kharif crops during dry spells, with 44.7% of the respondents indicating their crops could withstand drought for an additional 15 to 20 days, while 50.8% noted moderate improvements of 10 to 14 days.

After the intervention, 69.8% of the respondents experienced water scarcity for only two months, compared to 47.7% who faced over six months of scarcity before, demonstrating enhanced irrigation resource availability.

Prior to the intervention, nearly all of the respondents (99.6%) reported insufficient water for livestock. Post-intervention, 98.9% confirmed adequate water supply for their cattle, highlighting improved livestock welfare.

After the intervention, 95.1% of the respondents experienced drinking water scarcity for just one month, a substantial reduction from 79.1% who faced scarcity for over six months prior to the intervention, indicating enhanced community well-being.

The intervention resulted in more than half (56.1%) of the respondents reporting an additional 0.250 to 0.500 hectares of cultivable land, with 35.6% gaining between 0.501 and 0.750 hectares, thereby increasing agricultural potential.

62.5%

of the respondents noted over a 20.0% increase in Kharif crop yields, and 29.9% reported a rise of 15-19%. Similarly, 21.2% experienced over a 20.0% increase in Rabi crop yields, highlighting the intervention's positive effect on agriculture productivity.

The intervention led to 44.3% of the respondents reporting a 10.0-15.0% increase in annual agricultural income, while 30.3% experienced a rise of 20-25%, improving the economic status of the farming community.

Improved earnings and increased agricultural productivity have alleviated family stress, contributing to overall well-being.

The intervention has enhanced access to water for domestic use.

Increased agricultural productivity and improved water management practices have bolstered the local economy, creating opportunities for job growth and stimulating income-generating activities within the community.

03. OECD FRAMEWORK

RELEVANCE

The intervention conducted by Jankidevi Bajaj Gram Vikas Sanstha, is highly relevant in addressing critical challenges faced by rural communities in Maharashtra, particularly concerning water scarcity and low agricultural productivity. By constructing water conservation structures and promoting sustainable farming practices, the program significantly improves water availability for irrigation and household needs. Moreover, the initiative strengthens community institutions like Self-Help Groups (SHGs), fostering women's empowerment and addressing gender disparities in agricultural practices.

COHERENCE

The intervention is well aligned with SDG goals:

The intervention also aligns with the Pradhan Mantri Krishi Sinchai Yojana (PMKSY) and the National Rural Livelihoods Mission (NRLM).

EFFECTIVENESS

Farmers, the primary beneficiaries of the intervention led by Jankidevi Bajaj Gram Vikas Sanstha and the Bajaj Water Conservation Project, have experienced significant benefits, including improved agricultural productivity and enhanced soil health. These advancements are largely attributed to training in sustainable practices and the effective use of organic inputs. The program's effectiveness is evident in positive outcomes such as increased crop yields, better water management, and enhanced resilience to climate-related challenges. By adopting organic farming techniques, farmers have cultivated healthier crops while reducing their dependence on chemical fertilisers and pesticides.

The project has efficiently supported farmers from economically marginalised backgrounds in adopting sustainable agricultural practices. Resources have been utilised well, leading to significant improvements in crop yields and water management.

IMPACT

The intervention by Jankidevi Bajaj Gram Vikas Sanstha, has created both immediate and long-term impacts on the farming community in Gangapur Taluka, Aurangabad district in the state of Maharashtra. Farmers who received training in sustainable agricultural practices have reported substantial improvements in crop quality and yields. Improved access to water resources through the construction of water conservation structures and the formation of Water User Groups (WUGs) has further enhanced agricultural productivity. These positive changes have not only elevated individual livelihoods but also bolstered community resilience by fostering economic stability.

SUSTAINABILITY

The intervention has established a strong foundation for sustainability by encouraging farmers to share their knowledge and experiences with one another, fostering a community of continuous learning and mutual support. By forming Water User Groups (WUGs) and empowering Self-Help Groups (SHGs), the program has cultivated a sense of ownership among stakeholders. This active involvement ensures ongoing participation from farmers and community members in sustainable agricultural practices, ultimately leading to long-term benefits for the farming community and enhancing overall resilience in the face of environmental challenges.

CHAPTER 4
INTRODUCTION

SoulAce member interacting with local community members

NEED OF THE PROGRAM

In rural Aurangabad district, Maharashtra, communities face severe challenges due to water scarcity, unpredictable rainfall, and limited irrigation infrastructure. These issues significantly impact agricultural productivity and jeopardise the livelihood security of farming households. Frequent droughts often force communities to depend on tanker water supplies for drinking and irrigation, making it difficult for farmers to sustain both Kharif and Rabi crops. Furthermore, high input costs, low agricultural returns, few alternative livelihood options, and weak community organisation further restrict economic opportunities for rural households.

To address these issues, Jankidevi Bajaj Gram Vikas Sansthan (JBGVS), Pune, with support from Bajaj Auto Limited, launched a comprehensive Water Conservation and Rural Development Program across thirty-one villages of Gangapur Taluka.

The program is designed to create a sustainable model of community-led water conservation and management, focusing on building local capacity and fostering community self-reliance in managing water resources. The overarching goal is to ensure long-term benefits for local stakeholders through strengthened community involvement and resource management.

OBJECTIVES OF THE PROGRAM

Increase access to water for both drinking and agriculture by developing and restoring water conservation structures and improving on-farm irrigation methods.

To promote sustainable agricultural practices that increase crop yields and ensure better soil moisture retention, enabling farmers to cultivate two crops annually.

KEY ACTIVITIES

The program intervention aims to enhance water conservation and improve agricultural practices within the community. Key components include widening and deepening streams to increase water levels in bore and open wells, along with the construction of field bunds, earthen check dams, and gulley plugs to combat soil erosion and promote groundwater recharge. The initiative emphasises community involvement, encouraging local stakeholders to take ownership of the project, which will be facilitated through the construction of open wells and well-recharging structures at farmers' fields and the formation of water user groups (WUGs) in the villages. The project focused on water conservation and drainage line treatment using a participatory approach that emphasised community mobilisation. Key community institutions, including water user groups, self-help groups, and a village development committee, were formed to support and sustain the project's initiatives at the village level.

Another key activity of the intervention is the implementation of vegetative measures aimed at improving soil fertility and preventing soil erosion. This initiative involves the procurement and planting of grass and neem seeds to foster sustainable land management and boost agricultural productivity in the project area. By planting grass, the soil is stabilised, water runoff is reduced, and soil quality is enhanced, which supports sustainable farming practices. Neem trees, known for their natural pest control and soil-improving properties, were also planted. Farmers and community members received training on the proper planting and maintenance techniques to ensure the success of these vegetative measures.

Discussions during FGDs have revealed that the vegetative measures implemented for soil conservation have not achieved the expected outcomes. Grass seeding was done on the mud accumulated along the banks of the water-deepening area, and while some initial growth was seen, inadequate care and maintenance resulted in poor development. Furthermore, several plantations were washed away by strong water currents, hindering their regrowth.

The intervention focuses on enhancing both farm and non-farm livelihoods in local communities. It provides training to help farmers shift from traditional rainfed crops to high-value cash crops like cultivation of fruit-bearing trees such as mango, banana, sweet lemon, blackberry, and orange to diversify income and improve food security. Additionally, the project supports non-farm livelihood opportunities by establishing small-scale processing units and strengthening self-help groups (SHGs) to encourage entrepreneurship and alternative income sources.

Capacity building is a vital part of the program, achieved through training sessions that equip community members such as farmers, SHG members, and local leaders with the skills necessary to manage and sustain the new water infrastructure effectively. Additionally, the program focuses on promoting and strengthening self-help groups (SHGs), particularly empowering women by providing training in group building, management, financial inclusion, and record-keeping. Additionally, SHGs frequently receive orientation on community resource management, such as water conservation practices, helping members contribute to the sustainable management of shared resources.

Contingency planning is a key activity in the initiative, designed to strengthen community resilience and promote sustainable water resource management. The project ensures adherence to water governance protocols, demonstrating strong community participation in monitoring and surveillance efforts. By establishing Self-Help Groups and Farmer's Groups, a solid network for collective action is formed, allowing for quick mobilisation during emergencies. The active involvement of women in these groups fosters inclusive decision-making and resource management. Additionally, the community's commitment to paying water user charges underscores their dedication to maintaining water sources, which is vital during periods of water scarcity. Ongoing repairs and maintenance reflect a proactive approach to resource management.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – JANKIDEVI BAJAJ GRAM VIKAS SANSTHA, PUNE

Jankidevi Bajaj Gram Vikas Sansthan (JBGVS) is a non-profit organisation established by the Bajaj Group, dedicated to rural development and community empowerment in Maharashtra. Named after Jankidevi Bajaj, a prominent freedom fighter and social reformer, JBGVS focuses on sustainable development to enhance the quality of life and foster self-reliance among rural communities. The organisation focuses on women empowerment and has worked in various key areas, including water conservation and management, where it implements projects like rainwater harvesting and check dams to combat water scarcity. JBGVS also promotes sustainable agricultural practices to improve productivity and food security, provides education and vocational training to empower youth and women, and enhances healthcare and sanitation through awareness programs and infrastructure improvements.

SOULACE TEAM

CHAPTER 5
RESEARCH METHODOLOGY

The Bajaj Auto Limited had appointed SoulAce to assess the impact of its Bajaj Water Conservation Project implemented by Jankidevi Bajaj Gram Vikas Sanstha.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

- To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.
- To measure the extent to which the program has contributed to the well-being of the community.
- To provide insights into the strengths and areas for improvement of the program implementation.

DEFINITION OF THE RESEARCH

Research can be described as a logical and systematic search for new and useful information on a particular subject. Social science research refers to the systematic activity of gaining new understanding by following scientific principles and methods to minimise bias and subjectivity. It is contrary to writing something based on assumptions or speculations. Though information on certain facts can also be gained through common sense and based on general observation and hearsay, those facts will not be considered valid until they have been obtained in a methodical manner, which can stand the test of time. The defining characteristics of scientific research are objectivity, ethical neutrality, reliability, testability and transparency. The identification of the research problem provides the starting point of research, which is then defined and redefined through a proper review of the literature on the problem or deliberations with research experts and knowledgeable others in the subject matter of interest. Each research problem has a multitude of perspectives and dimensions, and research cannot cover all of those in a single study.

USE OF MIXED METHODOLOGY FOR MAXIMUM INSIGHTS

This evaluation utilised a mixed-methods approach, incorporating both qualitative and quantitative research methods.

APPLICATION OF QUANTITATIVE TECHNIQUES

In quantitative research, standardised instruments such as questionnaires and interview schedules are employed to collect data. However, the information that is obtained is easily amenable to various statistical measures and tests. The quantitative methods facilitated the collection and analysis of numerical data, yielding statistical insights and identifying trends.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative research can only unravel enriched and hidden information that may not be evident on the face of it. The qualitative approach is distinguished by deeper probing and flexibility, and it can yield massive amounts of data that were not anticipated when the research was initiated. The qualitative component delved into subjective experiences and perspectives, providing a nuanced understanding of participant views.

ENSURING TRIANGULATION

To enhance the reliability and validity of its findings, the study implemented various triangulation techniques. Data triangulation was achieved through gathering information from diverse sources, including field notes, interviews with beneficiaries, interactions with community members, and feedback from project volunteers. This extensive data collection facilitated a comprehensive evaluation of the program's impact. Methodological triangulation was also employed, utilising a variety of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases.

Through these triangulation strategies, the study ensured a robust and dependable analysis, reinforcing the trustworthiness of its findings.

PROJECT EVALUATION FRAMEWORK

After the collection of relevant information and perceptions through interviews, the OECD framework was followed/applied, which has six evaluation criteria - relevance, coherence, efficiency, effectiveness, impact, and sustainability for each of the indicators.

The study's research design was descriptive, aiming to present a detailed analysis and exploration of the various facets of the Bajaj-supported program. Descriptive research is apt for creating an overview, discerning patterns, and grasping the current state of affairs. By integrating both qualitative and quantitative research methodologies within a descriptive framework, the study aimed to deliver a thorough evaluation of the program, elucidating its impact and suggesting avenues for enhancement. This methodological blend ensured a holistic examination of the subject, lending both depth and breadth to the findings and bolstering the study's credibility.

DESIGN SNAPSHOT

Name of the project

Bajaj Water Conservation Project (BWCP)

Implementing agency

Jankidevi Bajaj Gram Vikas Sanstha

Research design used

Descriptive research design

Sampling technique

Random stratified sampling

Sample size

264 villagers

Qualitative method used

Semi-structured interviews, testimonials, and focus group discussions with key stakeholders

KEY STAKEHOLDERS

- Village Development Committee members
- Community members

STUDY TOOLS

Questionnaires for primary beneficiaries:
Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys.

Questionnaires for secondary beneficiaries and stakeholders :
A semi-structured questionnaire was developed for each type of sample of this group. Stakeholders were identified across the focus areas. One-on-one discussions were conducted with beneficiaries to prepare case studies.

ENSURING COMMITMENT TO RESEARCH ETHICS

The impact evaluation adhered to a strong ethical framework, ensuring responsible and ethical research practices. Participants' rights and well-being were prioritised at every stage of the study. Informed consent was obtained by clearly explaining the study's objectives, procedures, potential risks, and benefits, allowing participants to make fully informed decisions after addressing any questions. Confidentiality was strictly maintained, with data securely stored, accessible only to authorised personnel, and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of coercion, ensuring autonomy and respect for individual choice. Participants were consistently treated with respect, dignity, and fairness, prioritising their well-being. Support or assistance was readily available whenever needed to ensure their comfort and safety throughout the research process.

CHAPTER 6
KEY STUDY FINDINGS AND IMPACTS

This chapter explores the partnership between Bajaj Auto Limited and Jankidevi Bajaj Gram Vikas Sanstha through the Bajaj Water Conservation Project, aimed at improving water availability and agricultural productivity in thirty-one villages of Gangapur talukas, Aurangabad district.

GEOGRAPHICAL COVERAGE

The intervention was implemented in thirty-one villages of Gangapur taluka, Aurangabad district in Maharashtra.

OUTREACH AND INCLUSIVITY

Primary beneficiaries were communities from the selected villages.

DEMOGRAPHY OF BENEFICIARY POPULATION

CHART 1: AGE GROUP DISTRIBUTION

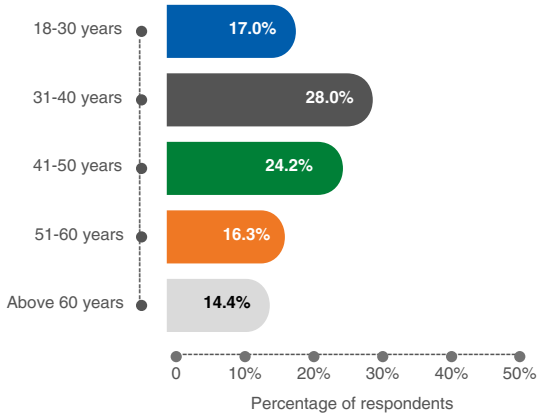


Chart 1 shows the age distribution of respondents. 28% of the respondents were in the age group of 31-40 years, while 24.2% fall within the 41–50-year age range. Furthermore, 17% of respondents belong to the 18–30-year age group.

CHART 2: GENDER-WISE DISTRIBUTION OF RESPONDENTS

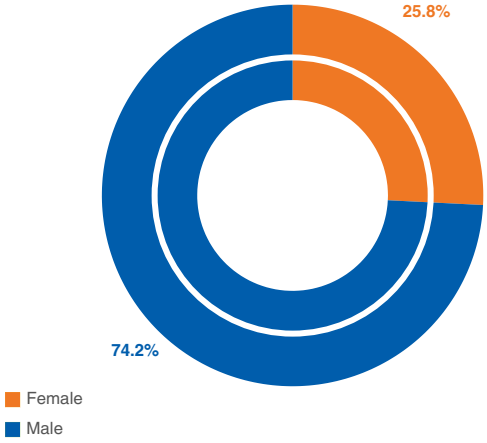
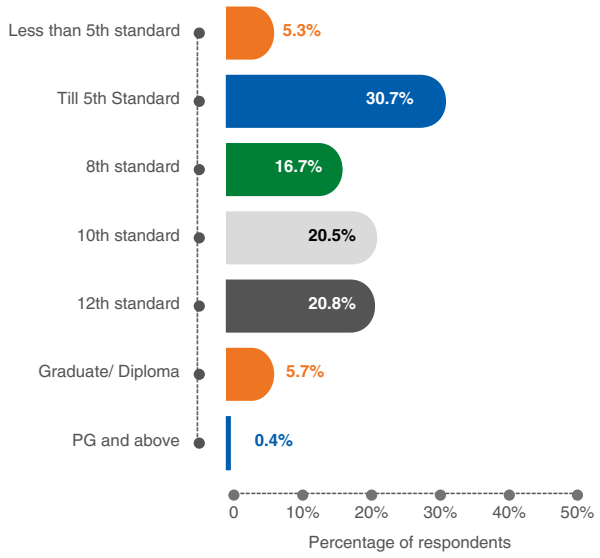


Chart 2 shows that males comprised approximately three-fourths (74.2%) of the total respondents, whereas females represent 25.8%.

INTERACTION WITH WATER USER COMMITTEE

CHART 3: EDUCATION LEVEL OF RESPONDENTS



The educational status of the respondents is poor. As per the findings of Chart 3, only 30.7% of respondents have completed primary education. This is followed by 20.8% who have finished the 12th standard and 20.5% who completed the 10th standard. Additionally, 5.3% of respondents have not attended primary school.

CHART 4: AREA OF LAND OWNED

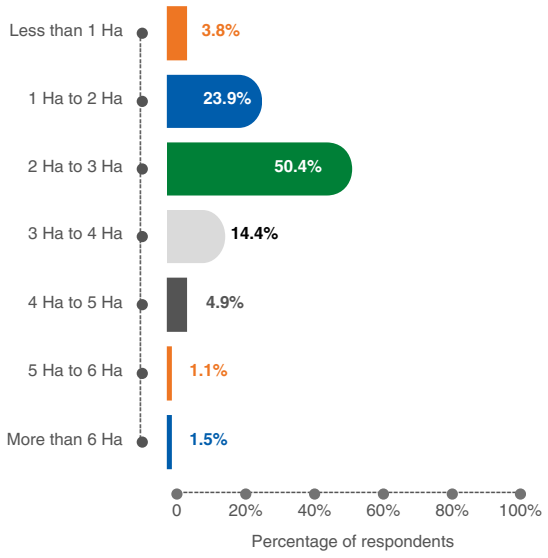


Chart 4 shows that 50.4% own between 2 to 3 hectares of land, while 23.9% possess 1 to 2 hectares. Furthermore, 14.4% have 3 to 4 hectares, and 3.8% own less than 1 hectare of land.

CHART 5: ANNUAL FAMILY INCOME

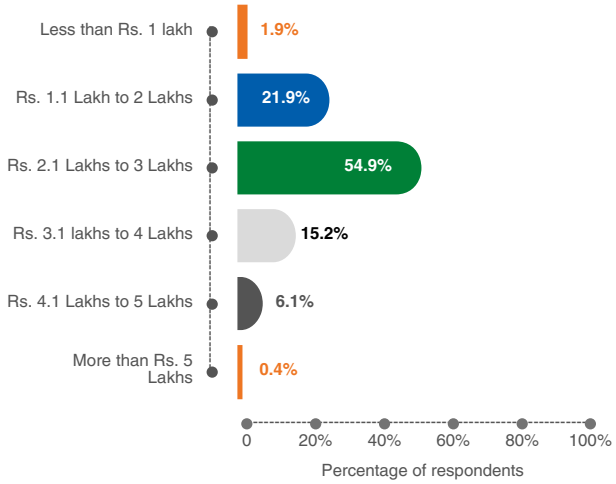


Chart 5 shows that more than half (54.9%) of respondents reported an annual family income between Rs. 2.1 to 3 lakhs. This is followed by 21.9% of respondents who fall within the income range of Rs. 1.1 lakh to 2 lakhs. Additionally, around 2% of respondents have an annual family income of less than Rs. 1 lakh.

CHART 6: MAJOR CROPS CULTIVATED

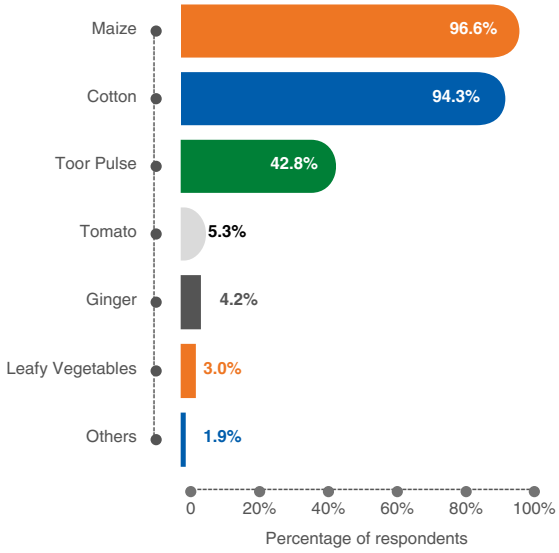


Chart 6 shows that a significant majority of respondents (94.3%) reported cultivating cotton, while an even higher percentage (96.6%) grew maize. In addition, less than half of the respondents (42.8%) cultivate toor pulse, and the percentage of those growing other crops, such as wheat, groundnut, and soybean, is notably lower, at around 2%.

PRE-INTERVENTION STATUS

Pre-assessment survey of respondents in the villages has unveiled the intervention status of the program:

CHART 7: WHETHER PRACTISING MICRO IRRIGATION- BEFORE AND AFTER THE INTERVENTION

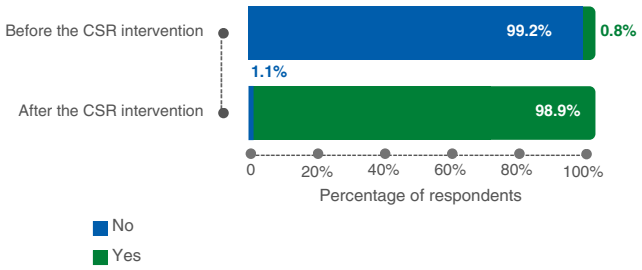


CHART 8: WHETHER DEPENDENT ON WATER TANKERS FOR GETTING DRINKING WATER BEFORE THE INTERVENTION

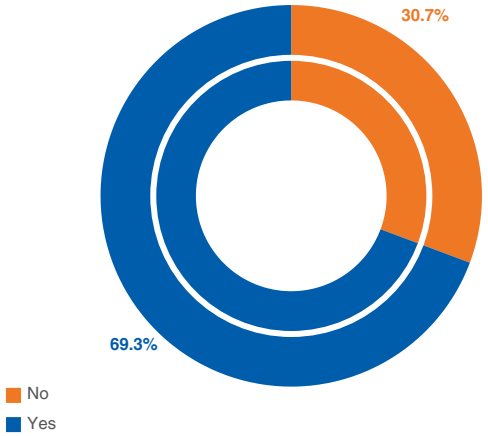


CHART 9: PERCENTAGE OF CULTIVABLE LAND AREA GOT ASSURED IRRIGATION BEFORE THE INTERVENTION

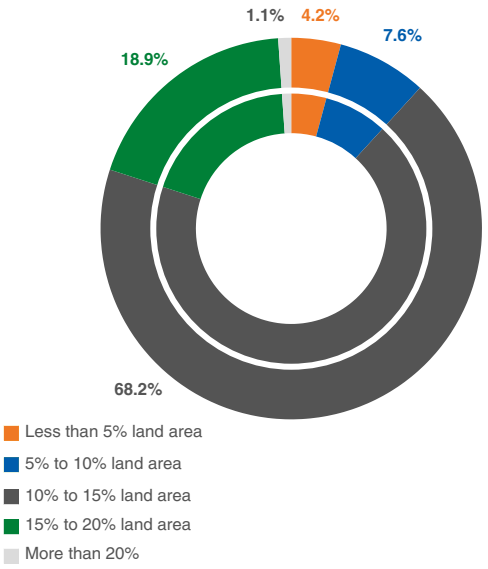
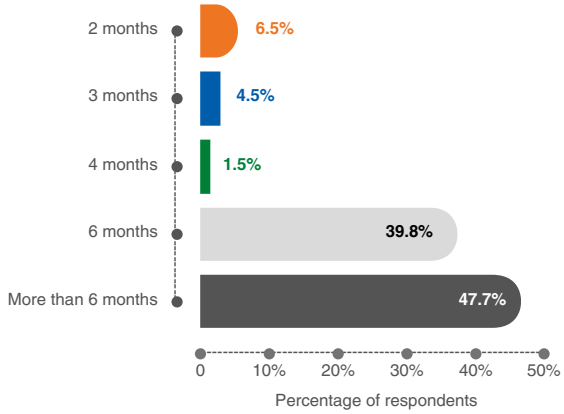


CHART 10: NO. OF MONTHS IN A YEAR RESPONDENTS EXPERIENCED SCARCITY OF DRINKING WATER BEFORE THE INTERVENTION



- Chart 7 shows that a large majority of respondents (99.2%) were not utilising micro-irrigation techniques in their agricultural practices.
- Chart 8 shows that before the intervention, the majority of the respondents (69.3%) relied on water tankers for their drinking water supply.
- Chart 9 shows that a significant portion of respondents (68.2%) had between 10% to 15% of their land area irrigated before the intervention. Additionally, 18.9% of respondents reported having 15% to 20% of their land with assured irrigation. Only a small percentage (1.1%) indicated that more than 20% of their land area was under assured irrigation.
- Chart 10 shows that nearly half of the respondents (47.7%) reported experiencing over six months of water scarcity before the intervention, while 39.8% reported experiencing six months of water scarcity.

CHART 11: TYPE OF WATER RESOURCE DEVELOPMENT ACTIVITY CARRIED OUT IN THE COMMUNITY

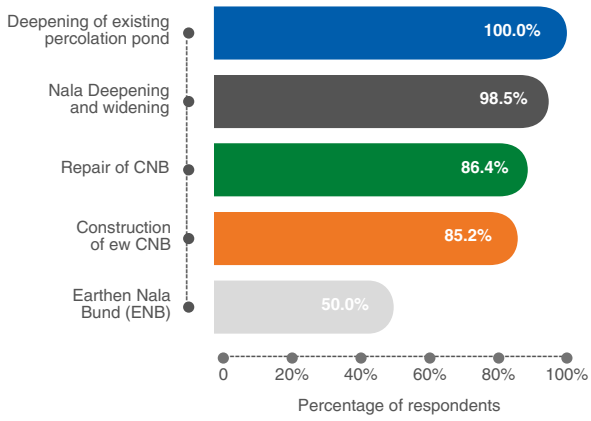


Chart 11 shows different types of water resource development activity carried out in the community. All respondents reported the deepening of existing percolation ponds, while a significant 98.5% noted the activities of deepening and widening of Nala channels. Additionally, 86.4% of respondents mentioned the repair of cement nala bunds (CNBs), and 85.2% indicated that new CNBs are currently being constructed. Half of the respondents also reported the construction of earthen nala bunds (ENBs) as one of the key activities carried out under the intervention.

FGDs with stakeholders have also revealed that the project introduced significant changes in crop patterns compared to traditional farming methods, with an emphasis on improving water usage efficiency. New irrigation practices were implemented, allowing for the use of less water while achieving higher yields, and the agricultural cycle was regularised. The nala widening and deepening work was carried out effectively to enhance water storage for the benefit of the village. Additionally, the excess soil removed during this work was repurposed by farmers to level their own fields, contributing to improved agricultural productivity.

PROJECT BRANDING AT WATER RESERVOIR

CAPACITY BUILDING

CHART 12: AREAS OF CLIMATE-RESILIENT CROPPING IN WHICH RESPONDENTS GAINED KNOWLEDGE THROUGH TRAINING

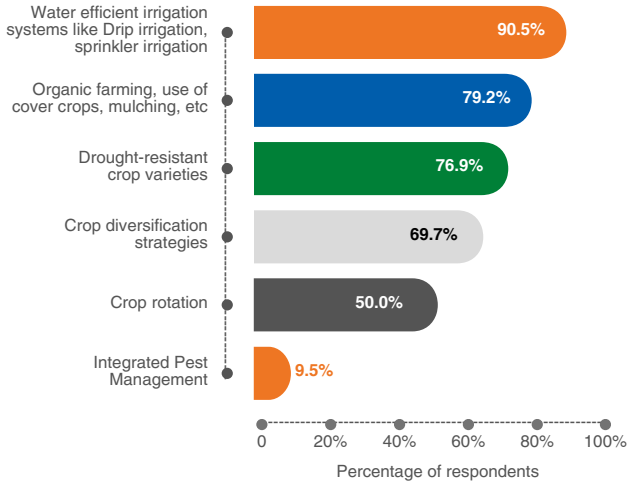


Chart 12 shows the specific areas of climate-resilient cropping in which respondents gained knowledge through training. Notably, 90.5% of respondents reported receiving training on water-efficient irrigation systems, including drip and sprinkler irrigation. Additionally, 79.2% received training on organic farming techniques, such as the use of cover crops and mulching, while 76.9% were educated about drought-resistant crop varieties. Furthermore, more than two-thirds of respondents (69.7%) received training in crop diversification strategies, and half of the respondents reported having training in crop rotation methods. The training programs of the Bajaj Water Conservation Project (BWCP) implemented by JBGVS indicate a strong emphasis on equipping respondents with essential skills and knowledge related to climate-resilient agricultural practices.

DISCUSSION WITH SHG MEMBERS

INSIGHTS FROM FGDS

WATER USER **GROUPS** (WUGS)

WUGs were formed as a community-led initiative to enhance water resource management and sustainability within the village. Members joined voluntarily, selected based on their interest and commitment to benefiting local agriculture and water availability. Focus Group Discussions (FGDs) with WUGs in Vairagadh and Maliwadgoan highlighted the importance of training in supporting their roles. Members received clear, hands-on training in building, using, and maintaining water structures like cement nala bunds and gabion check dams, along with essential concepts from the Integrated Watershed Management Programme (IWMP) to deepen their water conservation knowledge. WUG members have also reported gaining valuable practical skills through the training, allowing them to apply sustainable practices like crop and irrigation management to improve water efficiency.

"The training was presented clearly and simply, making it easy for everyone to understand the concepts of water resource management. This helped my fellow participants, and I appreciate the importance of effective water conservation techniques. One of the biggest benefits of the training was learning about the Integrated Watershed Management Program (IWMP). This knowledge has given me the skills to manage our water resources better and improve farming practices in our community."

Varsha Ghanshyam Dahal, 46 years female, WUG member, Dinwada village

"The training on water management and crop rotation has been invaluable. It highlighted key techniques like water diversion and land levelling, which are essential for improving our farming. This training helped me understand the project's value and enabled me to explain it to the villagers, empowering us to manage our water resources more sustainably."

Walmik Ekanath Jadhav, 53 years male, Gajgaon village

FGDS WITH **VDC MEMBERS**

The Village Development Committee (VDC) members got involved in water resource management training as part of their collective effort to enhance the village's infrastructure and tackle water scarcity. In the FGDs, VDC members emphasised the value of the training, particularly in understanding the IWMP. They found the training to be both practical and straightforward, equipping them with crucial knowledge on sustainable water management practices, such as the construction and maintenance of cement nala bunds (CNBs) and gabion check dams (GCDs).

Additionally, members noted that the training strengthened their ability to work together with the community, ensuring that the water structures were properly maintained. The FGDs indicated that the training not only improved their understanding but also boosted their confidence, enabling them to take a more proactive role in overseeing and managing water resources in the village.

FGDS WITH **SHG MEMBERS**

Discussions with SHG members revealed that the training provided on various aspects, including livelihood activities, SHG functioning, and water resource maintenance, has had a transformative impact on their lives. The training on SHG management, including savings, loans, and bookkeeping, helped members gain a clear understanding of financial practices, empowering them to handle the SHG's operations independently. Training on the maintenance of water resource structures, such as cement nala bunds and check dams, also played a crucial role. SHG members shared that the knowledge gained during this training enabled them to actively participate in maintaining these structures, which has led to improved water availability for farming.

SOULACE TEAM NOTING BENEFICIARY DETAILS

KEY IMPACTS

IMPROVED WATER AVAILABILITY

FOR AGRICULTURAL PURPOSE

CHART 13: PERCENTAGE OF REDUCTION IN WATER USAGE FOLLOWING MICRO-IRRIGATION

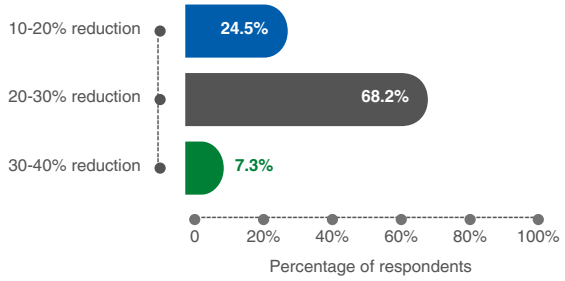


Chart 13 shows that after the implementation of micro-irrigation systems, over two-thirds of respondents (68.2%) experienced a reduction in water usage by 20-30%. Additionally, nearly one-fourth of respondents (24.5%) reported a reduction of 10-20%, while 7.3% noted a decrease of 30-40%. This suggests that the micro-irrigation systems have effectively contributed to significant water savings within the community, enhancing overall water conservation efforts.

CHART 14: LEVEL OF IMPROVEMENT OBSERVED IN THE RESILIENCE OF KHARIF CROPS DURING DRY SPELLS

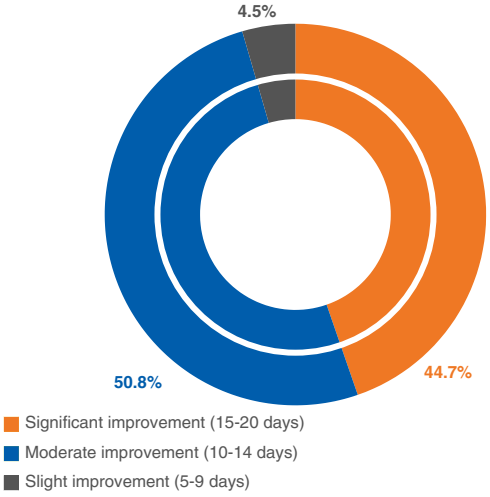


Chart 14 shows that the intervention significantly improved the resilience of Kharif crops during critical dry spells, which are essential for agricultural productivity. Less than half of the respondents (44.7%) reported substantial improvements, enabling their crops to withstand periods without rainfall for an additional 15 to 20 days, thereby providing greater security against drought conditions. More than half of the respondents (50.8%) noted moderate improvements, allowing their crops to survive dry spells for an extra 10 to 14 days. This highlights the positive impact of the intervention on crop resilience, ensuring that farmers are better equipped to manage the challenges posed by erratic rainfall and prolonged dry periods.

CHART 15: NO OF MONTHS IN A YEAR RESPONDENTS EXPERIENCED SCARCITY FOR IRRIGATION PURPOSES AFTER THE INTERVENTION

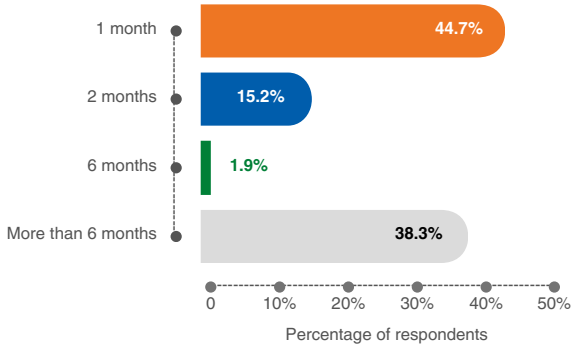


Chart 15 shows that less than half (44.7%) reported experiencing water scarcity for irrigation purposes for only one month after the intervention, with 38.3% facing scarcity for more than 6 months. In contrast, before the intervention, 47.7% indicated that they experienced water scarcity for over six months. This demonstrates an improvement in water availability for agriculture following the intervention, highlighting enhanced access to irrigation resources. This has significantly contributed to increased agricultural productivity and greater overall stability in farming operations within the community.

FGDS WITH **VDC MEMBERS**

FGDs with VDC members revealed that many participants observed considerable improvements in water availability, particularly during the dry season, leading to increased crop yields. Additionally, there was a noticeable shift toward off-season cropping, with some farmers exploring new crop patterns thanks to the enhanced water supply.

> "Since the water structures were constructed, we've seen a substantial improvement in water availability, especially during the dry season. The storage has allowed us to grow off-season crops, boosting our yields and income. The training and the new water systems have transformed our farming practices and improved our livelihoods."
>
> Manohar Babaurao Patil, 46 years old male, Derda village

DISCUSSION WITH SHG MEMBERS

CHART 16: WHETHER HAVING SUFFICIENT WATER FOR CATTLE DRINKING

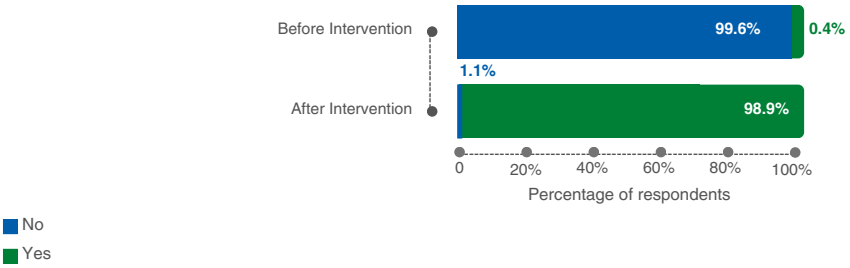


Chart 16 shows a significant improvement in water availability for cattle drinking following the intervention. Before the intervention, nearly all respondents (99.6%) reported not having sufficient water for their cattle. In contrast, after the intervention, a substantial majority of respondents (98.9%) confirmed that they now have adequate water for their cattle. This shift highlights the positive impact of the intervention on livestock water supply, enhancing the overall well-being of both the cattle and the farmers relying on them.

FOR DRINKING PURPOSE

CHART 17: NO OF MONTHS IN A YEAR RESPONDENTS EXPERIENCED SCARCITY OF DRINKING WATER AFTER THE INTERVENTION

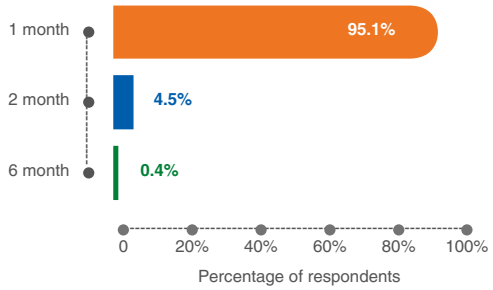


Chart 17 shows that after the intervention, the majority of the respondents (95.1%) reported experiencing drinking water scarcity for just one month, while less than 5% faced scarcity for two months. A small fraction, 0.4%, indicated they experienced scarcity for more than six months. This represents a significant improvement compared to before the intervention, when 79.1% of respondents faced water scarcity for over six months. This reduction in the duration of water scarcity contributed to improving the quality of life for the respondents and ensured the overall well-being of the community.

CHART 18: HEIGHT OF WATER LEVEL FROM SURFACE LEVEL DURING THE SUMMER SEASON IN WELL- BEFORE AND AFTER INTERVENTION

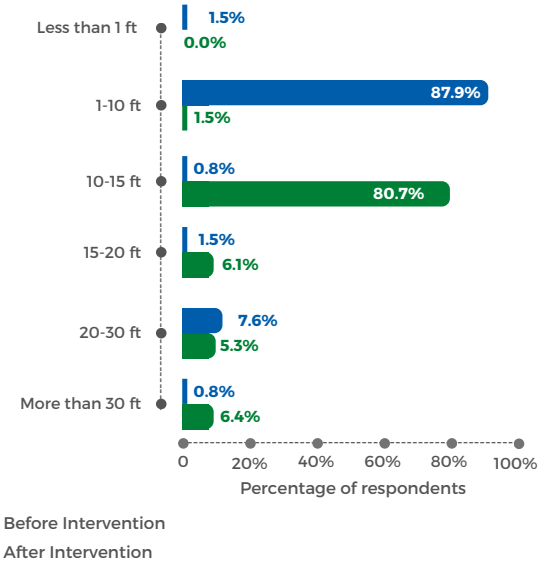


Chart 18 shows a significant improvement in water levels from the surface in wells during the summer season following the intervention. Before the intervention, the majority of the respondents (87.9%) reported water levels of up to 10 feet, indicating severe scarcity. After the intervention, only 1.5% reported the same shallow water level. In contrast, a substantial 80.7% of respondents indicated that the water level had risen to between 10 and 15 feet, indicating enhanced water availability and better resource management resulting from the intervention.

INSIGHTS FROM COMMUNITY **MEMBERS IN FGDS**

In terms of water availability, the enhanced access to water for both irrigation and livestock was a central theme in the FGDs. Community members highlighted the increased reliability of water sources, which allowed them to better manage their agricultural activities and ensure livestock had access to water year-round.

IMPROVED AGRICULTURAL PRODUCTIVITY

CHART 19: LAND AREA MADE CULTIVABLE AFTER PROJECT INTERVENTION

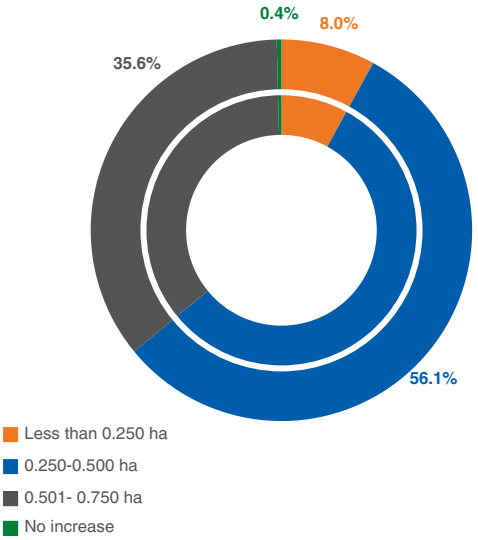


Chart 19 shows that the project intervention has successfully increased the cultivable land area for many respondents. More than half (56.1%) reported that an additional 0.250 to 0.500 hectares of land became cultivable. Additionally, 35.6% indicated that they gained between 0.501 and 0.750 hectares of arable land, while 8% were able to cultivate an extra area of less than 0.250 hectares. These enhancements demonstrate the project's effectiveness in improving land usability and boosting agricultural productivity by making more land available for cultivation.

CHART 20: PERCENTAGE INCREASE IN YIELD OF KHARIF CROP FOLLOWING CSR INTERVENTION

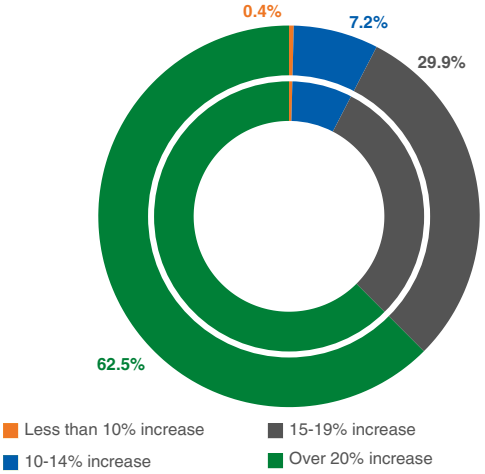
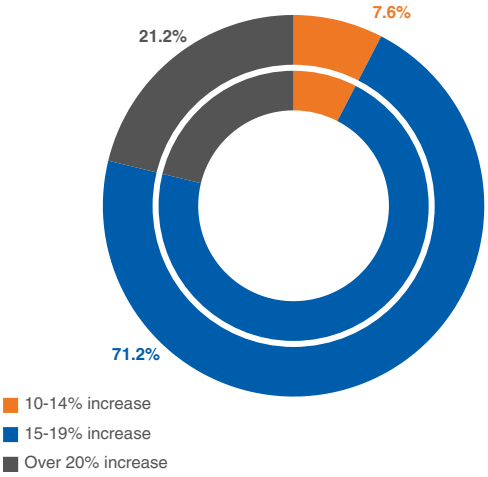


CHART 21: PERCENTAGE INCREASE IN YIELD OF RABI CROP FOLLOWING CSR INTERVENTION



- Chart 20 shows that the CSR intervention resulted in significant improvements in Kharif crop yields among respondents. Notably, 62.5% of respondents reported an increase of over 20% in their crop yields, while 29.9% experienced a rise of 15-19%.
- Chart 21 shows that 71.2% of respondents observed an increase in Rabi crop yields by 15-19% following the intervention, while 21.2% reported an increase of over 20%. These results underscore the intervention's effectiveness in boosting agricultural productivity, demonstrating its positive influence on farmers' livelihoods and contributing to enhanced food production in the region.

FGD WITH BENEFICIARIES

CHART 22: AREA OF FARMLAND UNDER ORCHARD CULTIVATION-BEFORE AND AFTER INTERVENTION

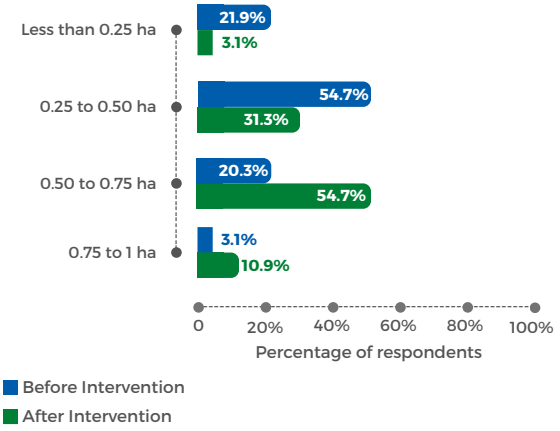


Chart 22 shows that prior to the intervention, 20.3% of respondents were cultivating between 0.50 to 0.75 hectares. After the intervention, this number increased significantly to 54.7%. Similarly, while only 3.1% of respondents were cultivating between 0.75 to 1 hectare before the intervention, this percentage rose to 10.9% following the intervention.

CHART 23: YIELD OF COTTON IN THE FIELD -BEFORE AND AFTER INTERVENTION

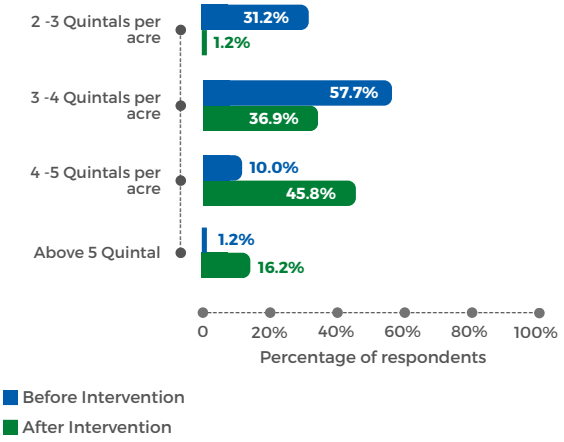


Chart 23 shows a shift in cotton cultivation yields before and after the intervention. Prior to the intervention, over half (57.7%) of respondents reported yields of 3-4 quintals per acre, with only 10% achieving 4-5 quintals per acre. Following the intervention, there was a notable increase in productivity: nearly half (45.8%) of respondents are now cultivating 4-5 quintals per acre, and 16.2% have reached yields above 5 quintals per acre. This growth in cotton yields has contributed to enhanced food security and increased income for farmers, reflecting the intervention's positive impact on both agricultural productivity and rural livelihoods.

CHART 24: YIELD OF MAIZE IN THE FIELD -BEFORE AND AFTER INTERVENTION

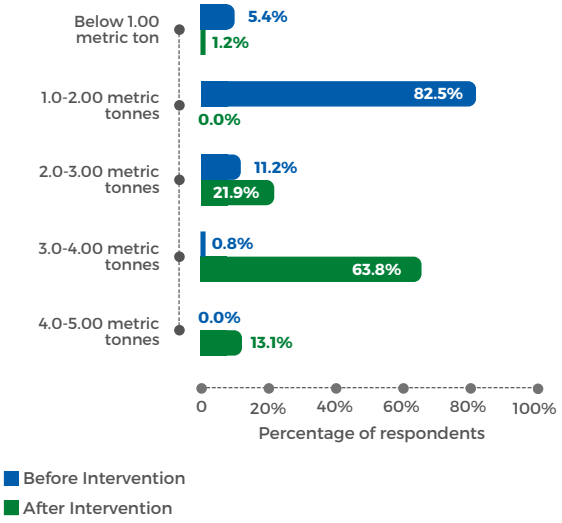


Chart 24 shows a significant improvement in maize production following the intervention. Before the intervention, a majority of respondents (82.7%) produced only 1-2 metric tonnes of maize, with no one able to exceed 3 metric tonnes. After the intervention, however, nearly two-thirds (63.8%) of respondents reported yields of 3-4 metric tonnes, and an additional 21.9% produced 2-3 metric tonnes. Furthermore, while respondents reported no maize yields in the 4-5 metric tonne range before the intervention, this increased to 13.1% after the intervention. This shift indicates that the intervention substantially boosted maize yields, helping farmers achieve greater productivity and likely contributing to enhanced food security and increased income within the community.

FGD WITH PROJECT BENEFICIARIES

DISCUSSIONS WITH **SHG**

Discussions with SHG, WUG, and VDC members confirmed that improved water availability through structures like gabion check dams and cement nala bunds enabled farmers to expand their agricultural activities. Better water management practices, particularly during dry seasons, allowed for the cultivation of more land, increased crop diversification, and higher yields, all of which contributed to the overall development of the village.

"Being part of the SHG has really improved my life. The training on chemical-free farming and using natural resources has helped us improve our farming practices. At first, we had trouble selling our products and speaking with confidence, but with the training, we've grown our business and our farming skills. Maintaining water structures like cement nala bunds and check dams has helped us get more water for our crops, which has made a big difference in our work. The SHG has helped us become more confident and support each other better. Our economic situation is better now, and we are thankful for the training."

Rubana Raju Shaikh, 35 years old female, Gajgaon village

DISCUSSION WITH SHG MEMBERS

INCREASED INCOME OF THE COMMUNITY MEMBERS

CHART 25: PERCENTAGE INCREASE IN ANNUAL AGRICULTURAL INCOME INTERVENTION

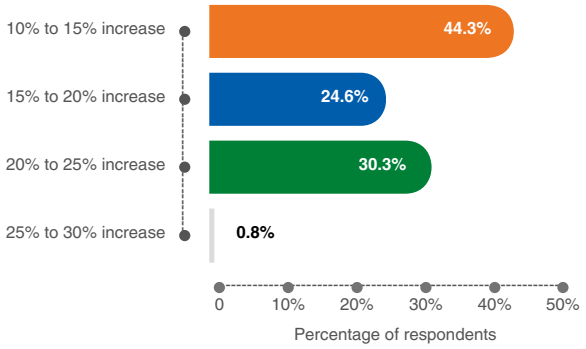


Chart 25 shows that the intervention had a major impact on annual agricultural income, with 44.3% of respondents reporting an increase of 10% to 15%. Additionally, 30.3% experienced a rise of 20-25%. Nearly one-fourth (24.6%) of respondents reported an increase in their annual agricultural income by 15-20%. This indicates that the intervention effectively enhanced the economic well-being of farmers, contributing to improved livelihoods in the region.

FGD WITH VILLAGE DEVELOPMENT COMMITTEE

"Since the installation of the water structures, our village has seen a remarkable transformation. Water scarcity, once a major challenge, has been significantly reduced due to the project's impact. These water structures not only conserve water but also prevent soil erosion, making our lands more fertile and productive. As a result, many of us are now able to grow two to three crops each year, which was unimaginable before. This has increased our income, improved food security, and strengthened our community's resilience. The project has truly uplifted our village, contributing to sustainable development and giving us hope for a more prosperous future."

Ramnath Uttamrao Patil, 52 years male, Sarpanch, Gajgaon village

"Our Self-Help Group (SHG) has played a vital role in maintaining the water structures in our village, and we take this responsibility seriously. Keeping a vigilant eye on the water resources has allowed us to extend water availability throughout the year, which has greatly improved our agricultural productivity and, in turn, our livelihoods. With the support of our fellow villagers, maintaining these structures has become a shared goal, and we have been able to address any challenges effectively. Above all, the most significant change has been in our confidence."

Koyal Haribahu Dhumal, 34 years old female, Khadgaon village

CASE STUDY

Bhimrao Jadhav, a 65-year-old farmer from the village of Maliwadgoan, embodies the spirit of community in managing water resources. With years of experience, he understands the challenges posed by water scarcity. When the Water User Group (WUG) was formed in his village, Bhimrao and his neighbours united to address their water-related issues. They organised community meetings to share their needs and decided to take action. Bhimrao valued the training sessions they received, as these taught them how to maintain crucial structures like check dams and water retention systems.

The community dedicated themselves to building and caring for these structures. Regular meetings allowed them to share ideas and tackle challenges together. Bhimrao actively participated in checking the water systems to ensure everything was functioning properly.

Over time, Bhimrao observed noticeable improvements. Water availability increased, resulting in better crop yields. This progress brought renewed confidence to the farmers, reinforcing the idea that working together can effectively tackle water problems and benefit the entire community

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Farmers have experienced significant improvements in water availability through well-maintained water structures, enabling them to cultivate two to three crops per year, which has boosted crop yield and income.
- Increased water storage has allowed farmers to plan and execute more consistent irrigation schedules, reducing crop vulnerability during dry spells and improving crop health.
- The intervention has also increased the annual family income of the farmers, leading to a better quality of life.

HOUSEHOLD LEVEL

- Improved earnings and increased agricultural productivity have alleviated family stress, contributing to overall well-being.
- The intervention has enhanced access to water for domestic use, significantly reducing the time and effort spent on water collection.
- Higher agricultural productivity has led to increased household incomes, allowing families to invest in education, nutrition, and other essential needs, thereby improving their overall quality of life.
- Training in sustainable farming practices has empowered families to adopt eco-friendly methods, fostering a more self-sufficient and resilient household economy.

COMMUNITY LEVEL

- SHG members, especially women, have gained valuable skills in water resource management and sustainable agricultural practices, leading to a stronger sense of community involvement and shared responsibility.
- The construction and maintenance of water structures, such as recharge shafts and storage systems, have increased water availability across the community, ensuring that both households and farms have a more reliable water supply, even during dry seasons.
- With higher agricultural productivity, farmers have more surplus produce to sell, boosting the local economy. Increased income among farming households has led to higher spending in the community, supporting local businesses and contributing to overall economic resilience.

STATE LEVEL

- The intervention has positively influenced state-level agricultural policies and practices by demonstrating successful sustainable farming methods, increasing overall agricultural productivity, and contributing to food security.
- Enhanced agricultural output also boosts the state's economy, supports rural development initiatives, and promotes eco-friendly practices that align with state sustainability goals.

NATIONAL LEVEL

- The intervention aligns with national initiatives aimed at improving rural livelihoods, such as the Jal Jeevan mission, Pradhan Mantri Krishi Sinchai Yojana (PMKSY) and the National Rural Livelihoods Mission (NRLM).

CHAPTER 8
HYDROLOGICAL ASSESSMENT

OBJECTIVES OF THE ASSESSMENT

Change in surface water holding capacity and reduction in Run-off.

Change/improvement of Groundwater table/recharge.

Change in land use pattern, agricultural productivity, and soil moisture conditions.

PROJECT LOCATIONS

The project was implemented in the Gangapur taluka of Aurangabad district. The measures that were implemented as a part of the water conservation efforts can broadly be categorised into construction and repair of Water Harvesting Structures (WHS), measures for Soil Moisture Conditions (SMC) improvement, and promoting water use efficiency. The details of the same are as:

TABLE 1: DETAILS OF THE INTERVENTIONS

District	Aurangabad	Area of Watershed
Block	Gangapur	193.503861
	Cement Nala Bund	Core Wall Gabion
Nos.	119	58
Capacity	696724.00	141288.00

The maps below give the location of the intervention watershed in the Aurangabad district of Maharashtra and all the available locations of the various interventions across the intervention watersheds as a part of this project.

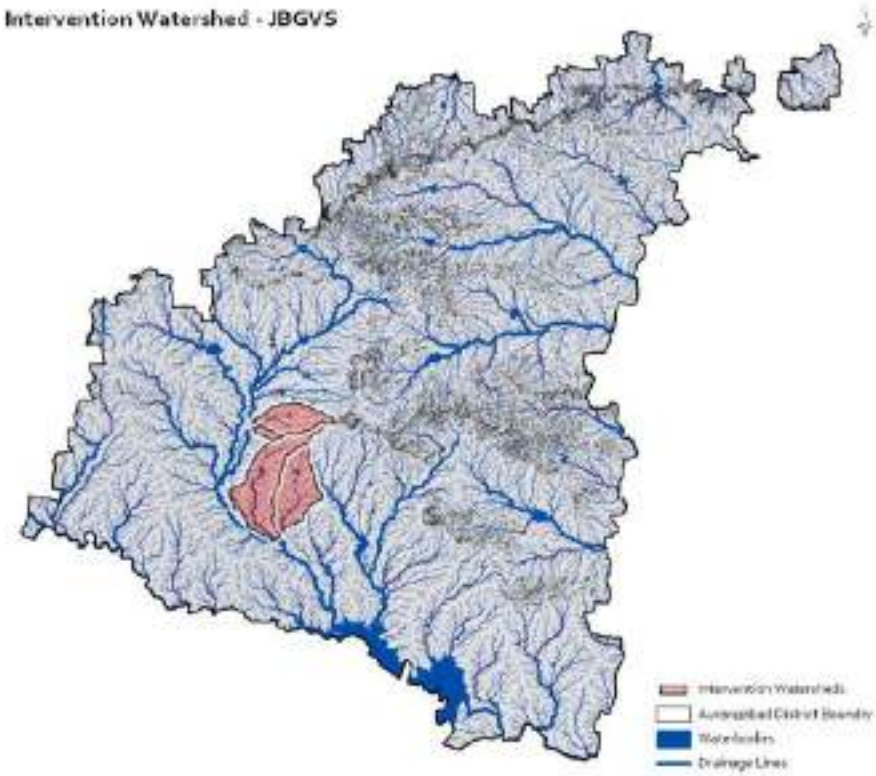


FIGURE 1: PROJECT LOCATIONS IN AURANGABAD

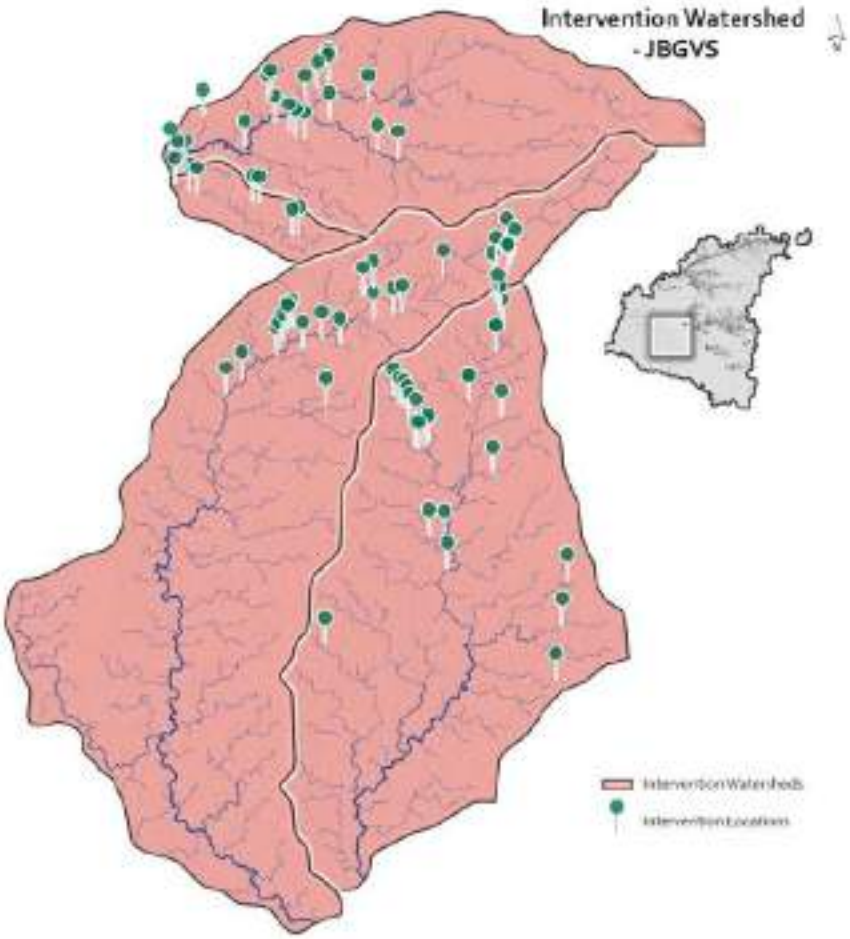


FIGURE 2: LOCATION OF PROJECT INTERVENTIONS

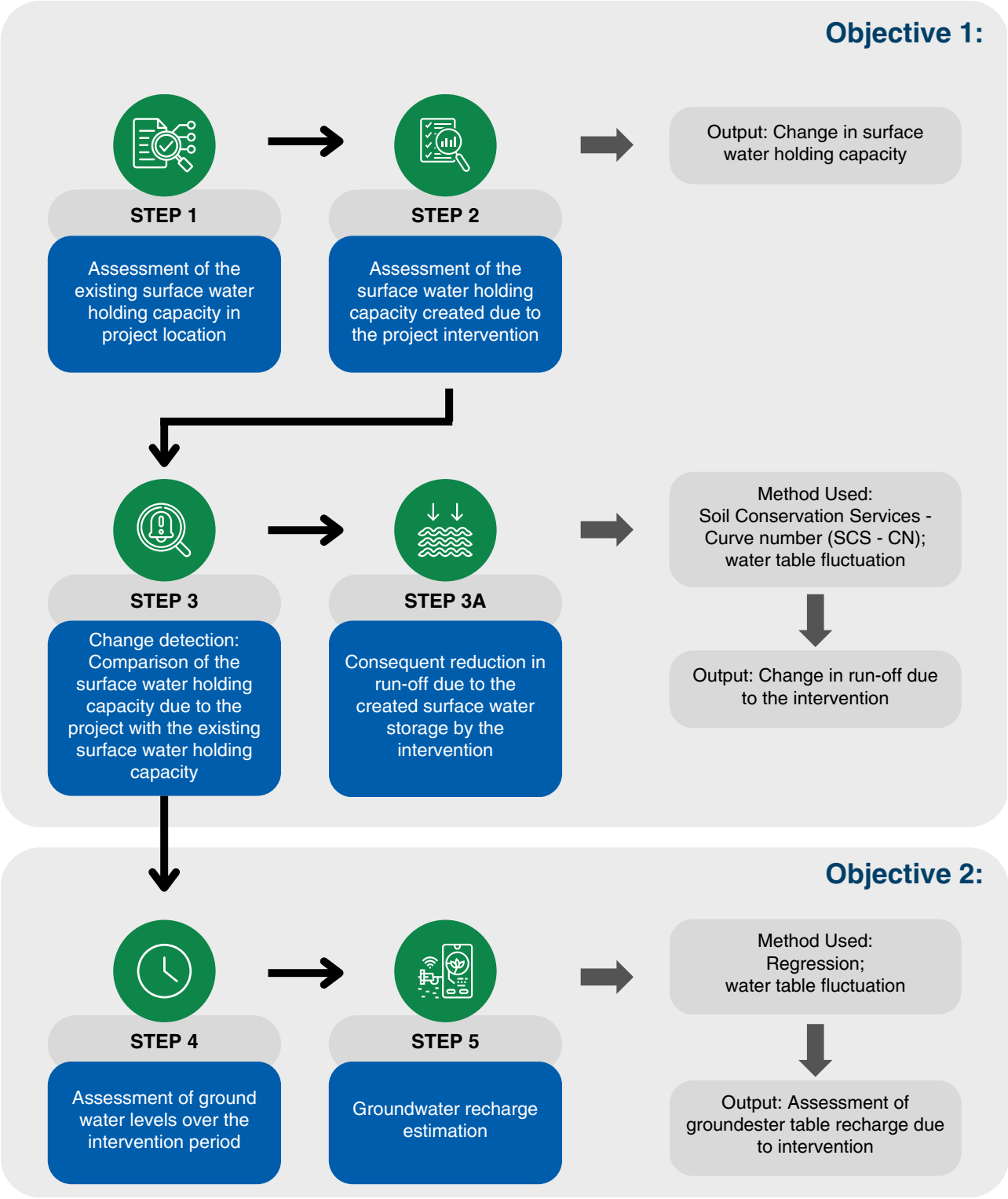
The detailed location of all the interventions covered as a part of the evaluations is provided in Annexure 1. The additional parameters that were considered are geology, hydrogeology, and soil types, and the information about the same is provided in Annexure 2.

While some of the assessments, such as the run-off estimation and the contribution of the interventions to the ground water levels, were done only considering the intervention area, some assessments, such as the rainfall and the ground water depth assessments, had to be done considering a larger area such as the entire block or the district due to the constraints faced with data availability. Care was taken to ensure that the results were represented correctly in this condition to varying assessment units.[1]

[1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

ASSESSMENT APPROACH

The assessment approach consists of various steps for each objective, as shown below:



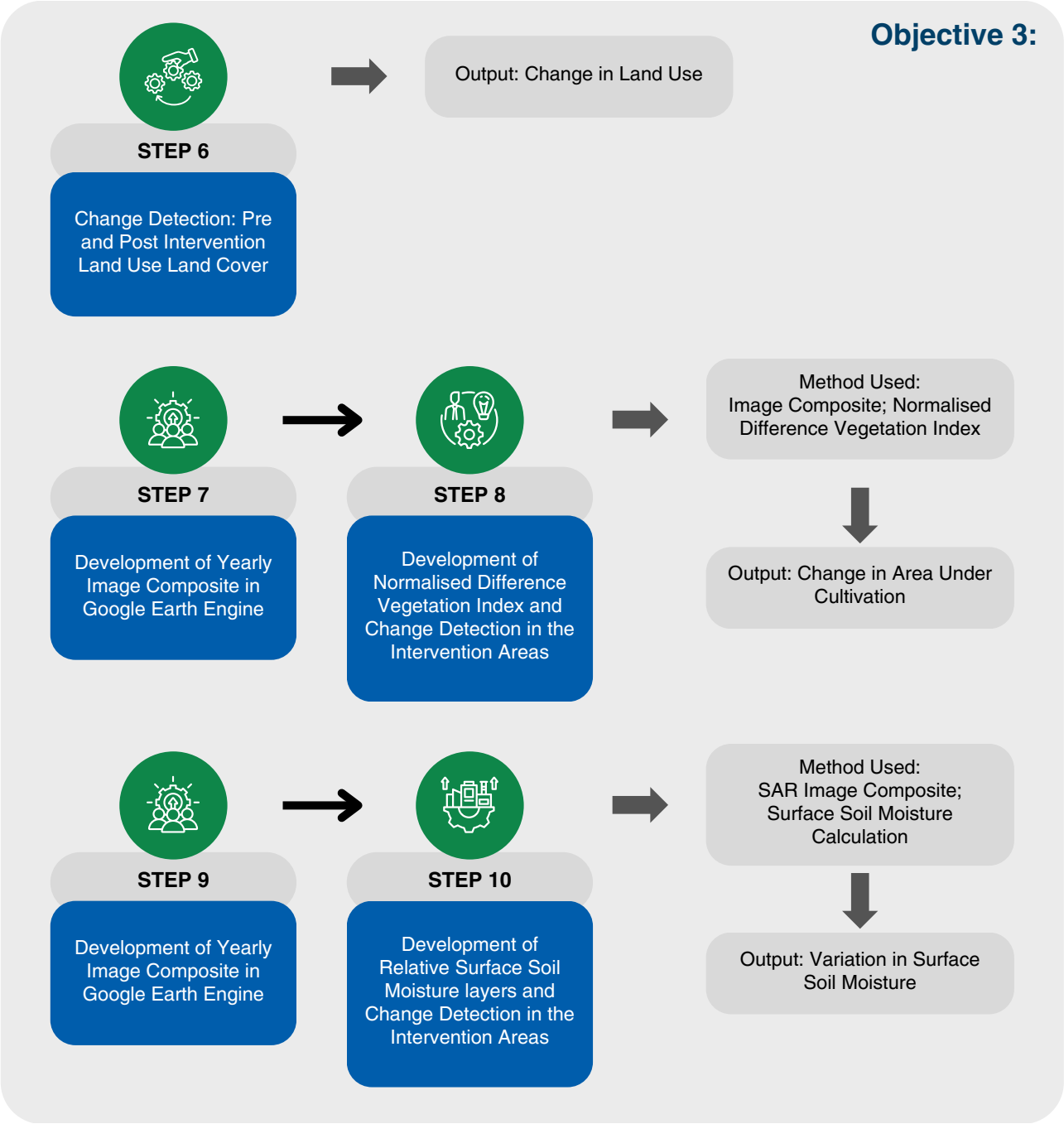


FIGURE 3: APPROACH OF THE ASSESSMENT

DATA COLLECTION

The following datasets have been collected from the field to facilitate the objectives of the study:

- All the intervention locations that were available (Annexure 1)
- Photos from the field survey (Annexure 6)

In addition to the above datasets, additional data was collected from various sources to fill in the data gaps that were present in the conduct of the assessment. These are as follows:

- Depth to water level from the NGO partners and the Central Ground Water Board (CGWB) (Annexure 3)
- Rainfall data from the Indian Meteorological Department (IMD) (Annexure 4)

Other datasets that were used in the assessment are as follows:

- Soil types from National Remote Sensing Centre[2] (provided in Annexure 2)
- Aquifer system from Central Ground Water Board (CGWB) (provided in Annexure 2)
- Specific Yield from Central Ground Water Board (CGWB) (provided in Annexure 2)

- Land Use Land Cover change between 2017 – 2023 from ESRI Living Atlas[3]
- Global Hydrologic Soil Groups for Runoff Estimation[4] (Annexure 2)

RESULTS

The results of the assessment to identify the impacts of the interventions on water conservation are presented in the below sections. It includes an assessment of rainfall and water level trends, an estimation of recharge due to rainfall, an assessment of surface water holding capacity and the associated run-off reduction and the estimation of recharge due to the interventions, the change in land use land cover, the changes in vegetation levels, and the changes in soil moisture conditions over the course of the intervention period.

Analysis of Rainfall Trends

Overall, while the values of rainfall have shown a slight positive trend during the intervention period, with significant peaks observed during the north-east monsoon period. The graphs below show the trend in their change over time.

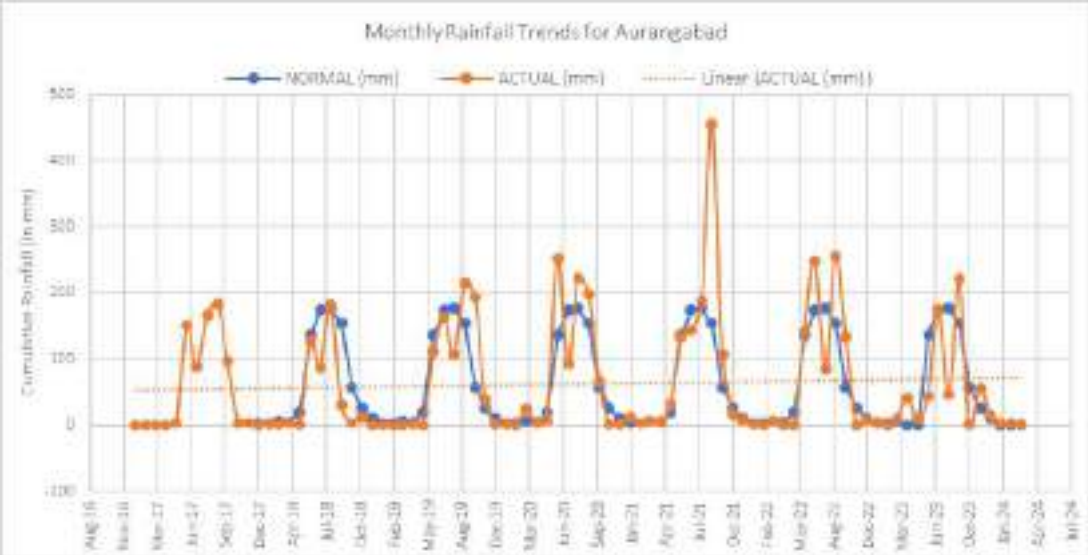


FIGURE 4: MONTHLY CUMULATIVE RAINFALL OVER THE INTERVENTION PERIOD (IN MM)

The trends of normal and actual rainfall reveal that over the intervention period, the rains have been above normal for most of the years. The slight positive trend that comes through is due to the above-normal rainfall received in June and August of most years and the unseasonal rainfall received in some of the years during the non-monsoon months.

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO
[3]Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.
[4] Ross, C.W., L. Prihodko, J.Y. Anchang, S.S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Run-off Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1566

Change in Water Level

The depth to water level data was obtained from two sources: one is the NGO partners, and the other is the annual Ground Water Year Books for Maharashtra published by the Central Ground Water Board (CGWB) for the years between 2017 and 2023. However, a complete collection of the data for the entire period from 2017 and since was not available with either source. Thus, for the final assessment, the datasets from both sources were combined after evaluating them individually and ensuring cohesion, and any missing values were filled out using statistical methods. The detailed dataset is provided in Annexure 3. The figures below show the ground water level trends in in the intervention districts:

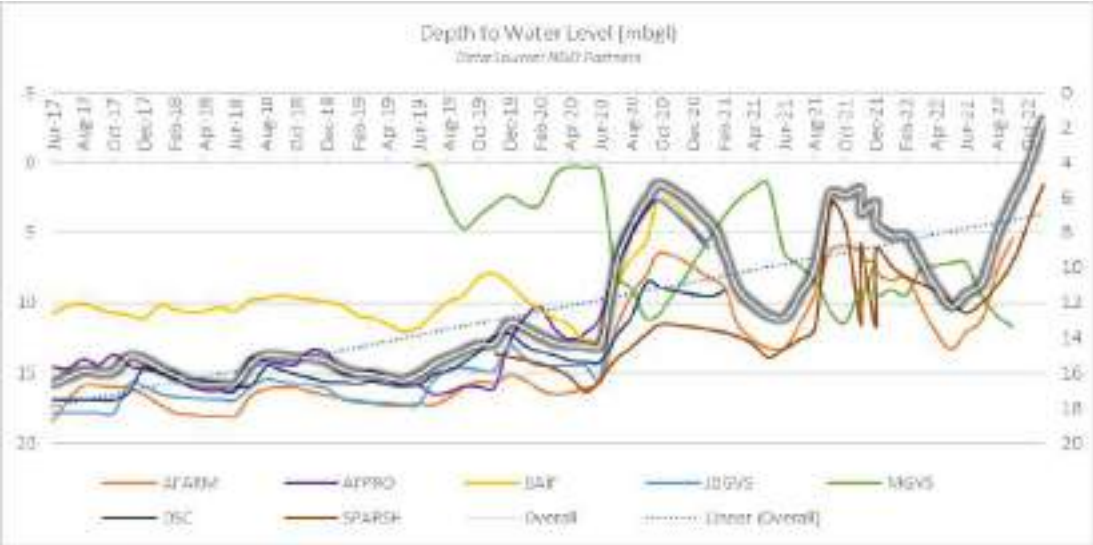


FIGURE 5: DEPTH TO WATER LEVEL (IN MBGL) – NGO PARTNERS

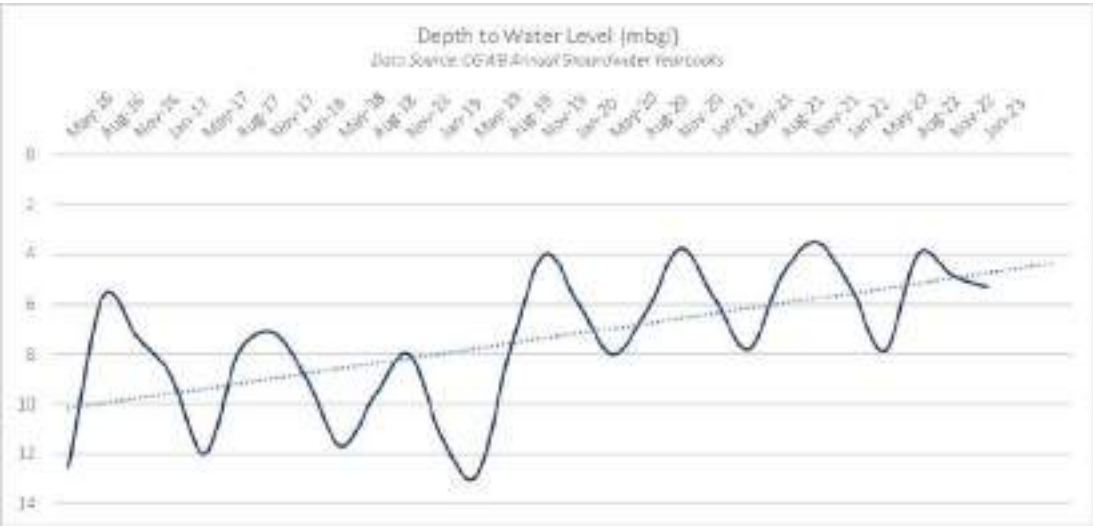


FIGURE 6: DEPTH TO WATER LEVEL (IN MBGL) – CGWB

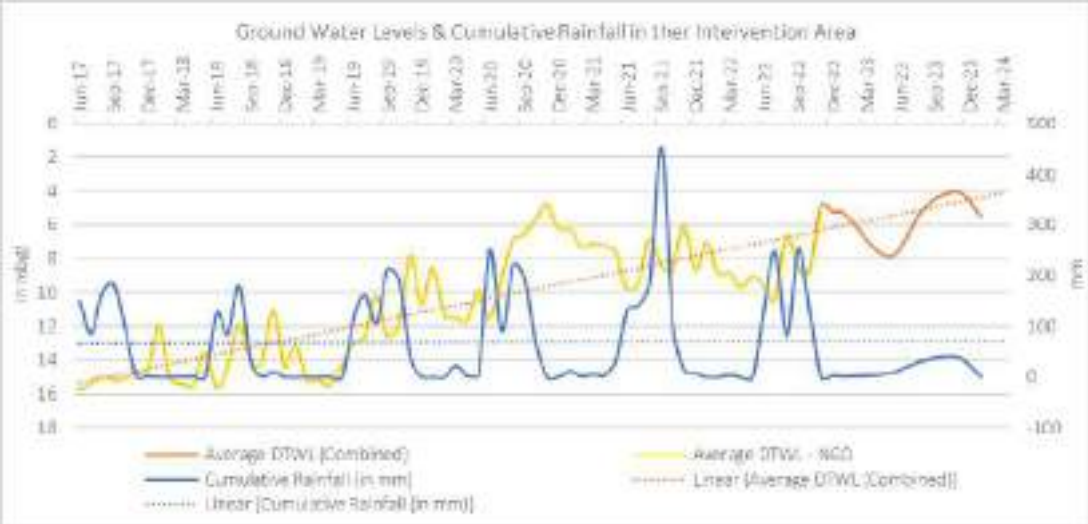


FIGURE 7: GROUND WATER LEVELS DURING AND SINCE THE INTERVENTION PERIOD (IN MBGL) COMPARED WITH MONTHLY CUMULATIVE RAINFALL (IN MM)

For this step of the assessment, the rainfall data from IMD was compared with the combined depth-to-water level data from the NGO partners and the CGWB. The rationale behind this is that rainfall is the most critical variable that determines the level of water availability below ground. Thus, by establishing the role of rainfall in the change in water levels, we would be able to identify the role of the measures implemented on the ground in augmenting the ground water levels.

A regression analysis of rainfall and depth to water level was conducted to assess the strength of the relationship between these two variables (detailed results in Annexure 4). The p-value obtained is greater than 0.05 for the intervention area, indicating no statistically significant relationship. However, the low R^2 (coefficient of determination) values obtained for the intervention area, along with the weak positive correlation established between rainfall and groundwater, suggest that while the impact of rainfall may be small, it has had its influence(although not significantly). [Here the R^2 value represents the proportion of variation in depth to water levels that can be explained by rainfall, indicating how well rainfall predicts water level changes. In this case, the low R^2 values suggest that multiple other factors also play a role. Detailed results are provided below.[5]]

This essentially means that rainfall influence on the ground water level has been to a minimal extent in the intervention areas over the period from 2017 to the relative present. However, over this period, the rainfall received has shown a very slight negative trend, while the ground water levels have shown significant positive trends. Considering the R2 values and the results of the correlation analysis, it can be understood that while the rainfall and ground water levels are not closely related, the factors such as improved water percolation and water storage mechanisms have had significant contributions in augmenting the ground water levels, supported by the rainfall trends. The ground water levels are expected to continue to rise and stabilise at a high level over the coming years, and the contributions of the interventions would help in improving the ground water levels. The availability of the most recent and more local measurements will help in assessing the same more accurately.

Note: The last available data on ground water depth data is till January 2023. The data from May 2023 to the present has not been published yet. Thus, in the absence of the necessary data, statistical methods were used to project the values for this period. This projected data might not necessarily reflect the true levels of ground water levels, and the derived estimates are bound to change on the availability of official measurements of ground water depth for 2023 and 2024.

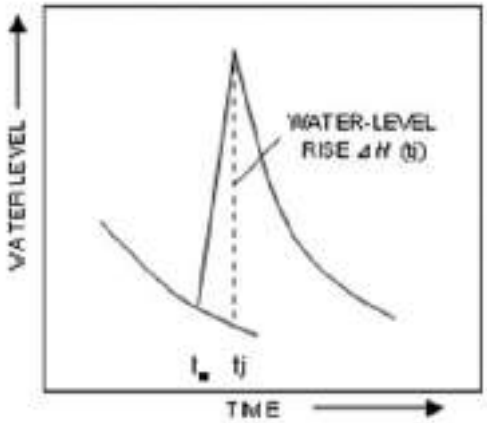
[5] The groundwater recharge calculations are based on data from NGO partners and CGWB data, are provided in the attached Excel document in sheets 9 and 10, respectively.

Estimation of Ground Water Recharge Due to Rainfall

The Water Table Fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The water-table fluctuation method is based on the premise that rises in groundwater levels in unconfined aquifers are due to recharge arriving at the water table. Recharge is calculated as the change in water level over time multiplied by the specific yield.[6]

$$R(tj) = Sy^* \Delta H(tj)$$

where R(tj) (m) is recharge occurring between times t0 and tj, Sy is specific yield (dimensionless), and ΔH(tj) is the peak water level rise attributed to the recharge period (cm).



The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology[7][8]. The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

Location	Aurangabad
Major Aquifer System	Basalt
Sy Range	0.01 – 0.03
Sy Chosen	0.02
RIF Range	0.12 – 0.14
RIF Chosen	0.13

As per the results of the method, about 13.1% of the rainfall has recharged directly to the ground in the intervention sites. The results and calculations are presented below:

TABLE 2: WATER TABLE FLUCTUATION METHOD RESULTS

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2017	687.704	1.100	0.02	0.022002477	22.002477	3.2%	4257564.309
2018	438.020	4.509	0.02	0.090184267	90.184267	20.6%	17451003.79
2019	826.440	7.633	0.02	0.152661156	152.66116	18.5%	29540523.13

[6]USGS GWRP: Techniques/Methods -Water-Table Fluctuation (WTF) Method
[7]The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology[8][8]. The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:
[2]Detailed Guidelines (cgwb.gov.in)

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2020	862.400	6.835	0.02	0.136709574	136.70957	15.9%	26453830.32
2021	1099.640	3.748	0.02	0.074956747	74.956747	6.8%	14504419.92
2022	865.360	5.505	0.02	0.11010815	110.10815	12.7%	21306352.15
2023	548.052	3.844	0.02	0.076883855	76.883855	14.0%	14877322.79
Average Recharge directly due to Rainfall received (intervention period)						**13.1%**	**128391016.41**

Further, the groundwater recharge from Rainfall Infiltration Method (RIF) can be obtained from the following relation:
Groundwater Recharge = Geographical Area x Actual Rainfall x Infiltration Factor

TABLE 3: RAINFALL INFILTRATION METHOD

Area (in sq. m.) =			193503861
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)
2017	0.687703555	0.089401462	17299528.1
2018	0.43802	0.0569426	11018612.96
2019	0.82644	0.1074372	20789513.02
2020	0.8624	0.112112	21694104.86
2021	1.09964	0.1429532	27661996.14
2022	0.86536	0.1124968	21768565.15
2023	0.548051549	0.071246701	13786511.79
Total			134018832

Estimation of percent rainfall converted into groundwater recharge

As per GEC-1997 norms, the rainfall recharge as computed by the WTF method has been compared with that of the RIF method, and finally, the rainfall recharge is assigned a value based on set criteria to avoid unreasonably high or low estimates.

A quantity called percentage difference (PD) is the difference between the rainfall recharge computed by the water table method (A) and the recharge by the rainfall infiltration method (B) and expressed as a percentage of the rainfall recharge by rainfall infiltration method is computed as below:

$$PD = \frac{(A - B)}{B} \times 100$$

Where 'A' is the rainfall recharge by the WTF method and 'B' is the rainfall recharge by the RIF method.
The set criteria (GEC 1997) to be adopted are as follows:
(a) If PD ≥ – 20 and < + 20%, then the value of the water table fluctuation method is adopted.

(b)If PD ≤ – 20%, then the value of 0.8 × rainfall infiltration factor method is adopted.
(c)If PD ≥ + 20%, then the value of 1.2 × rainfall infiltration factor method is adopted.

By following the above criteria, ground water recharge is estimated.

Organisation	Rainfall Infiltration Method	WTF Model	Percentage Difference	Criteria	Volume of recharge due to rainfall (Cu. m.)
	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)			
JBGVS	134018832	128391016.41	-4.19	A	128391016.41

Over the period of 2017 to 2023, an almost 7-year period covering the interventions and their operations till the present, the amount of ground water recharge directly due to rainfall stands at 12,83,91,016.41 Cu. m. across the intervention watershed, which is about 12.45% of the total rainfall received over the intervention area.

Change in surface water holding capacity and run-off reduction

The intervention area is spread over multiple watersheds in the southern part of the state. On-site verification and satellite imagery show that the major land use in the intervention area is rangelands, followed by crops. Based on the information available from the field survey and the organisation, the volume of storage created is estimated.

The change in surface storage in the intervention area was net positive, i.e., no existing surface storage was considered in the pre-intervention period.[9] An intervention volume of 8,38,012 cubic meters created through the project is being considered for assessment as there might be a double accounting of the storage of nalas, which is also included in considering the storage of the check dam type of interventions.

Estimation of ground water recharge due to the interventions

Groundwater recharge due to the interventions occurs primarily through the capture and storage of surface runoff water using Cement Nala Bunds, as well as through natural processes and Groundwater Recharge Shafts.

Run-off is defined as the portion of the precipitation that makes its way towards rivers or oceans as surface or subsurface flow. After the occurrence of infiltration and other losses from the precipitation, excess rainfall flows out through the small natural channels on the land surface and into the main drainage channels. Such types of flow are called surface flows. A part of the infiltrated rainwater moves parallel to the land surface as subsurface flow and reappears on the surface at certain other points. Such flows are called interflows. Another part of the infiltrated water percolates downwards to ground water and moves laterally to emerge in depression and rivers and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

While the interventions such as the Cement Nala Bunds and the Gabion Structure capture the surface flows, both these structures and the Ground Water Recharge Shafts contribute to the recharge of the ground water in the intervention sites.

[9] This is due to the constraints of establishing the status of all water bodies in the intervention area.

Estimation of the run-off can give us an estimate of the amount of water that has been essentially captured by the intervention structures as surface storage, and thus point towards the potential amount of water available for ground water recharge. Run-off can be estimated by various methods, such as:

- Empirical formulae and tables
- Run-off Estimation based on Land Use and Treatment
- Rational Method
- Empirical formulae for flood peak

In this assessment, we are using the method of empirical formulae and tables along with run-off estimation based on land use and treatment, as it has proven to be the most reliable to conduct the assessment in the absence of reliable ground water level data and access to the intervention sites on the ground.

1 BINNIE'S PERCENTAGES

1. It provides the relationship of run-off to rainfall with a view to express the former as a percentage of the latter. The percentages mentioned below are based on observations on two rivers in Madhya Pradesh.

TABLE 4: RUN-OFF AS A % OF THE RAINFALL RECEIVED

Annual Rainfall (mm)	Runoff (%)
500	15
600	21
700	25
800	29
900	34
1,000	38
1,100	40

2 COEFFICIENTS

The run-off 'R' in cm and rainfall 'P' in cm can be correlated as R = KP, where 'K' is the run-off coefficient. The run-off coefficient depends on factors affecting run-off. This method is applicable only for small projects such as the ones implemented as a part of this project. The usual values of K are as given below.

TABLE 5: USUAL VALUES OF RUNOFF COEFFICIENTS (K)

Type of Area	K
Urban Residential	0.3 - 0.5
Forests	0.05 - 0.2
Commercial & Industrial	0.9
Parks, farms, Pastures	0.05 - 0.3
Asphalt or concrete pavement	0.85

3

BARLOW'S TABLES

The following values of K (in percentage) for various types of catchments were developed by T.G. Barlow based on the studies of catchments mostly under 130 sq. km. in Uttar Pradesh.

TABLE 6: BARLOW'S PERCENTAGE RUNOFF COEFFICIENTS

Class	Description of Catchment	Percent runoff
A	Flat, cultivated and black cotton soils	10
B	Flat, partly cultivated-various soils	15
C	Average	20
D	Hills and plains with little cultivation	35
E	Very hilly and steep, with hardly any cultivation	45

These percentages are for the average type of monsoon and are to be modified by the application of the following coefficients according to the nature of the season, as shown below.

TABLE 7: BARLOW'S RUN-OFF COEFFICIENTS FOR DIFFERENT NATURES OF SEASON

Nature of Season	Class of catchments				
	A	B	C	D	E
Light rain, no heavy downpour	0.7%	0.8%	0.8%	0.8%	0.8%
Average or varying rainfall, no continuous downpour	1%	1%	1%	1%	1%
Continuous downpour	1.5%	1.5%	1.6%	1.7%	1.8%

As part of this method, the special tropical rainfall was divided into the following four classes:

- **Negligible falls:** All rainfalls under 12 mm a day unless continuous for several days; also rainfalls 12 to 40 mm a day, when there is no rain.
- **Light falls:** All rainfalls up to 25 mm a day followed by similar or heavier falls. Steady pours of 25 to 40 mm a day, when there is no rain of similar or greater amount before or after that.
- **Medium falls:** Rainfalls from 25 to 40 mm a day when preceded or followed by any but light falls.
- **Heavy Falls:**
  - All rainfalls are over 75 mm a day or continuous falls at 50 mm a day.
  - All rainfalls of an intensity of 50 mm or more per hour.

The run-off percentages, as shown in the following table, were developed by combining the type of catchment and nature of the season.

TABLE 8: BARLOW'S RUNOFF PERCENTAGES

Nature of Rainfall	Percentage of Flow in Catchments of Different Type				
	A	B	C	D	E
Negligible falls	-	-	-	-	-
Light falls	1	3	5	10	15
Medium falls	10	15	20	25	33
Heavy falls	20	33	40	55	70

4 ESTIMATION OF DIRECT RUNOFF FROM RAINFALL

In this method of run-off estimation, the effects of the surface conditions of a watershed area are evaluated by means of land use and treatment classes. Land use is the watershed cover, and it includes every kind of vegetation, litter and mulch, and fallow, as well as non-agricultural uses such as water surfaces (lakes, swamps, etc) and impervious surfaces (roads, roofs, etc.). Land treatment applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing and management practices such as grazing control or rotation of crops. The classes consist of use and treatment combinations to be found in watersheds. Land use and treatment classes are readily obtained either by observation or by measurement of plant and litter density and extent in sample areas.

4.1 Hydrological Soil Groups

There are four soil groups that are used in determining the hydrological soil cover complexes, which are used in a method for estimating the run-off from rainfall. The major characteristics of these groups are described below. The respective infiltration rates and permeability of soils in different groups are also shown below. The infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The permeability rate is the rate at which water moves in the soil, which is controlled by the nature and characteristics of soil horizons.

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.	Low	High rate
Group B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	High	Low rate

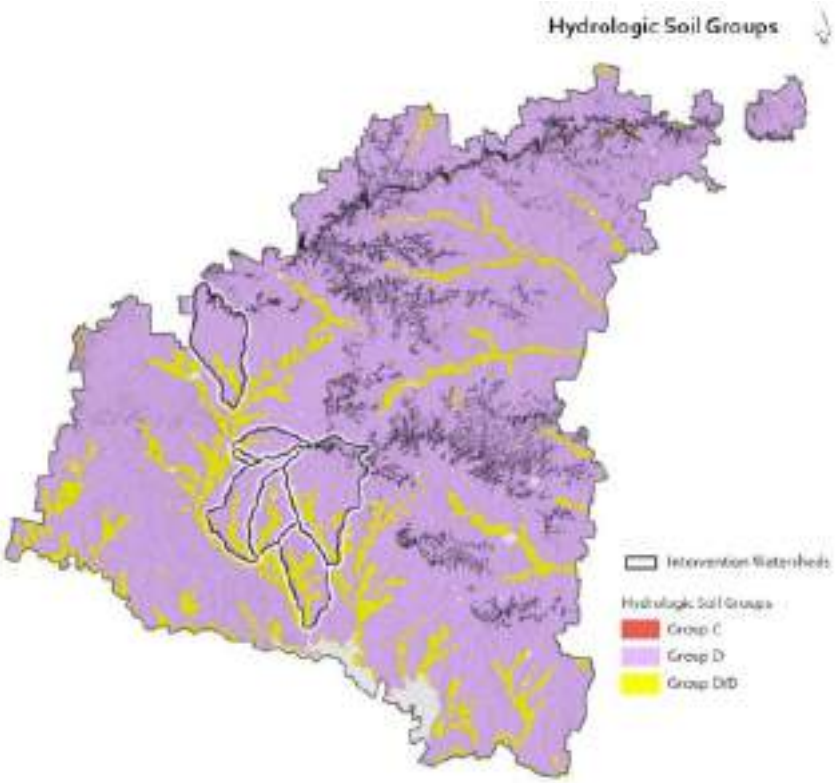


FIGURE 8: HYDROLOGIC SOIL GROUPS OF THE PROJECT WATERSHEDS

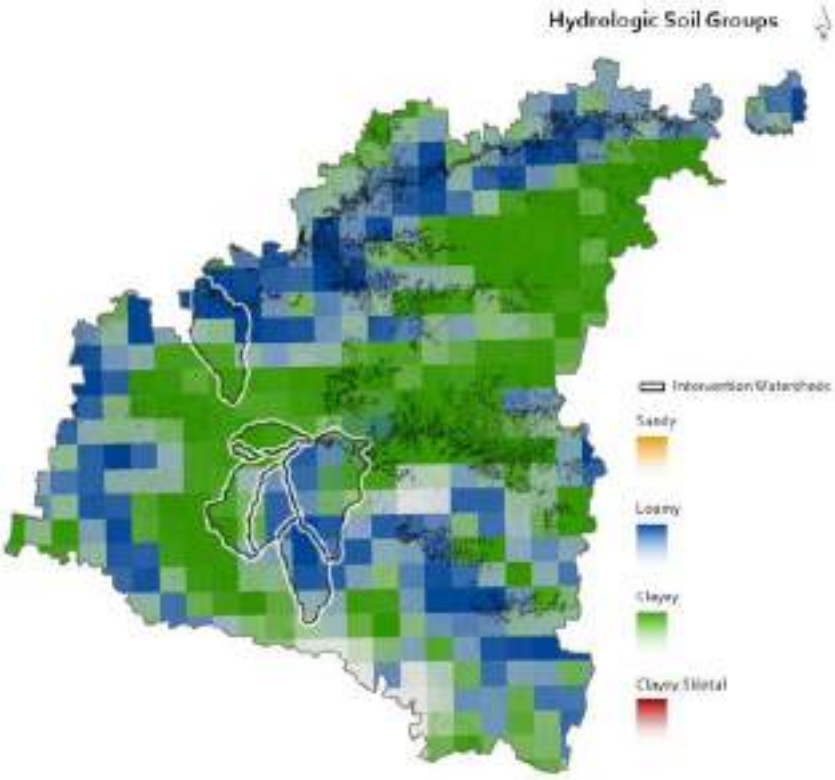


FIGURE 9: SOIL CHARACTERISTICS IN THE PROJECT WATERSHEDS

TABLE 9: INFILTRATION RATES

Class	Rates / hr in		Remarks
	Inches	Millimetres	
Very Low	Below 0.1	Below 2.5	Highly clayey soils
Low	0.1 - 0.5	2.5 - 12.5	Shallow soils, clay soils, soils low in organic matter
Medium	0.5 - 1.0	12.5 - 25.0	Sandy loams, silt loams
High	Above 1.0	Above 25.0	Deep sands, well aggregated soils

TABLE 10: RELATIVE CLASSES OF SOIL PERMEABILITY

Class	Permeability	
	Inches/ hr	mm/ hr
Slow		
Very Slow	Less than 0.05	1.3
Slow	0.05 to 0.20	1.31 to 5.00
Moderate		
Moderately Slow	0.20 to 0.30	5.01 to 20.00
Moderate	0.80 to 2.50	20.01 to 50.00
Moderately Rapid	2.50 to 5.00	50.01 to 130.00
Rapid		
Rapid	5.00 to 10.00	130.01 to 250.00
Very Rapid	Over 10.00	Over 250.00

4.2 Land Use and Treatment Classes

The commonly used land use and treatment classes are briefly described below. These classes are used in determining hydrologic soil-cover complexes, which are used in one of the methods for estimating runoff from rainfall.

- **Cultivated lands:** These include all field crops such as maize, sugarcane, paddy and wheat.
- **Fallow lands:** These are lands taken up for cultivation, but are temporarily out of cultivation for a period of not less than one year, and not more than 5 years. Current fallow lands are cropped areas kept fallow during the current year.
- **Uncultivated lands include:**
  - Permanent pastures and other grazing lands.
  - Cultivable waste, which are lands available for cultivation whether or not taken up for cultivation or abandoned after a few years for one reason or another. Land once cultivated but uncultivated for 5 years in succession shall also be included in this category.
- Forest area includes all lands classed as forest under any legal enactment dealing with forest or administered as forest whether State-owned or private and whether wooded or maintained as potential forest land.
- Tree crops include woody perennial plants that reach a mature height of at least 8 feet and have well-defined stems and a definite crown shape.

- Lands put to non-agricultural uses are areas occupied by buildings, roads, railroads, etc.
- Barren and uncultivable lands include areas covered by mountains, deserts, etc.

Based on these assessments, the following were estimated:

Surface Storage

The volume of surface storage created by the intervention = 8,38,012 m3

Rainfall & Runoff

- Total rainfall received over the intervention period and since = 91,32,91,782.99 m3
- Total run-off generated over the intervention area = 27,39,87,534.9 m3
- Percentage of rainfall that is converted to runoff = 30%

The intervention area received enough rainfall for all the intervention structures to be at a constant capacity of 30.24% throughout the period since 2017 as a part of and due to the project Bajaj Water Conservation Project implemented by JBGVS in Aurangabad. This shall be interpreted as the intervention structures always having water and never drying since 2017 or operating at more than 50% storage filled through the dry seasons since 2017.

Runoff Reduction

- The volume of surface run-off stored by the intervention measures after considering 40% evaporation loss = 1,52,02,844.39 m3.

Which is,

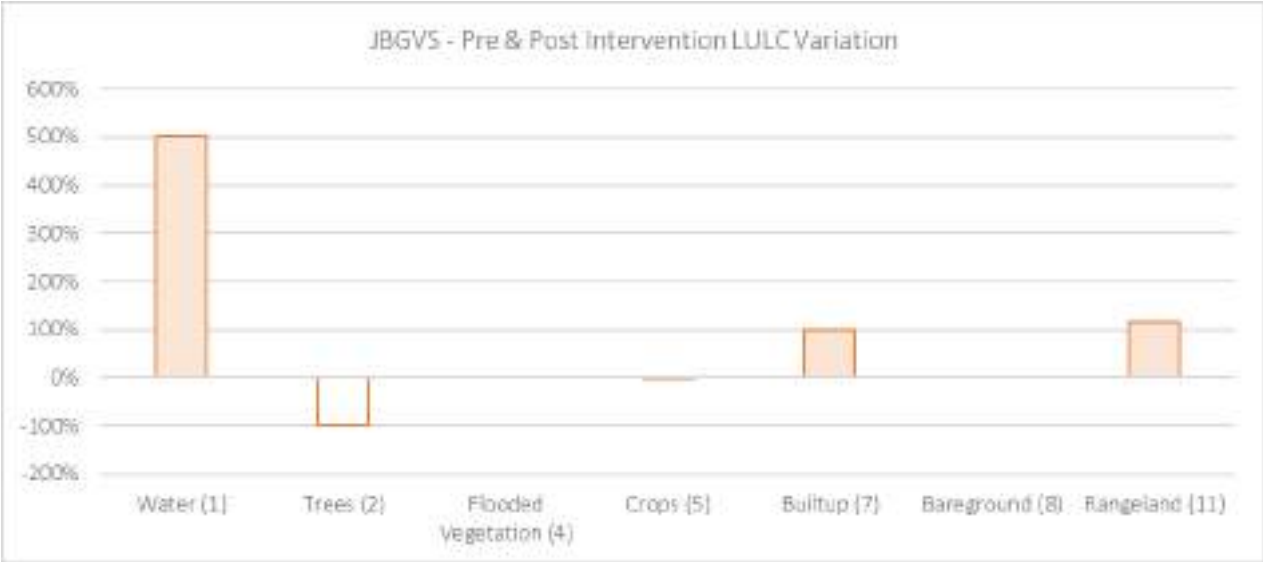
- 5.55% of the total run-off generated as a part of and due to the water conservation efforts of this project (or).
- 1.32% of the total rainfall received during the project period and ever since.

5 CHANGE IN LAND USE PATTERN

Land use and land cover change detection involves analyzing how land is utilized and how its physical coverage alters over time. Changes in land use patterns, such as urban expansion, deforestation, agricultural expansion, and the impacts of natural disasters, can be tracked using remote sensing techniques, satellite imagery, and geographic information systems (GIS). The land use and land cover for the intervention areas were developed through supervised classification of Sentinel-2 Full Colour Composite (FCC) imagery for both the pre- and post-intervention periods.

TABLE 11: ZONAL STATISTICS OF LULC FOR THE INTERVENTION AREA

District	Aurangabad				
Organisation	JBGVS				
Total Area of Watershed (Sq. Km.)	193.5039				
Soil Group	D				
Land Use Classes	Land Use - 2017		Land Use - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.1908	0.099	1.1473	0.59	501.30%
Trees (2)	0.0123	0.01			-100.00%
Flooded Vegetation (4)					0.00%
Crops (5)	189.4901	97.93	184.3975	95.29	-2.69%
Built up (7)	3.6667	1.89	7.3238	3.78	99.74%
Bare ground (8)					0.00%
Rangeland (11)	0.3125	0.16	0.6700	0.35	114.44%



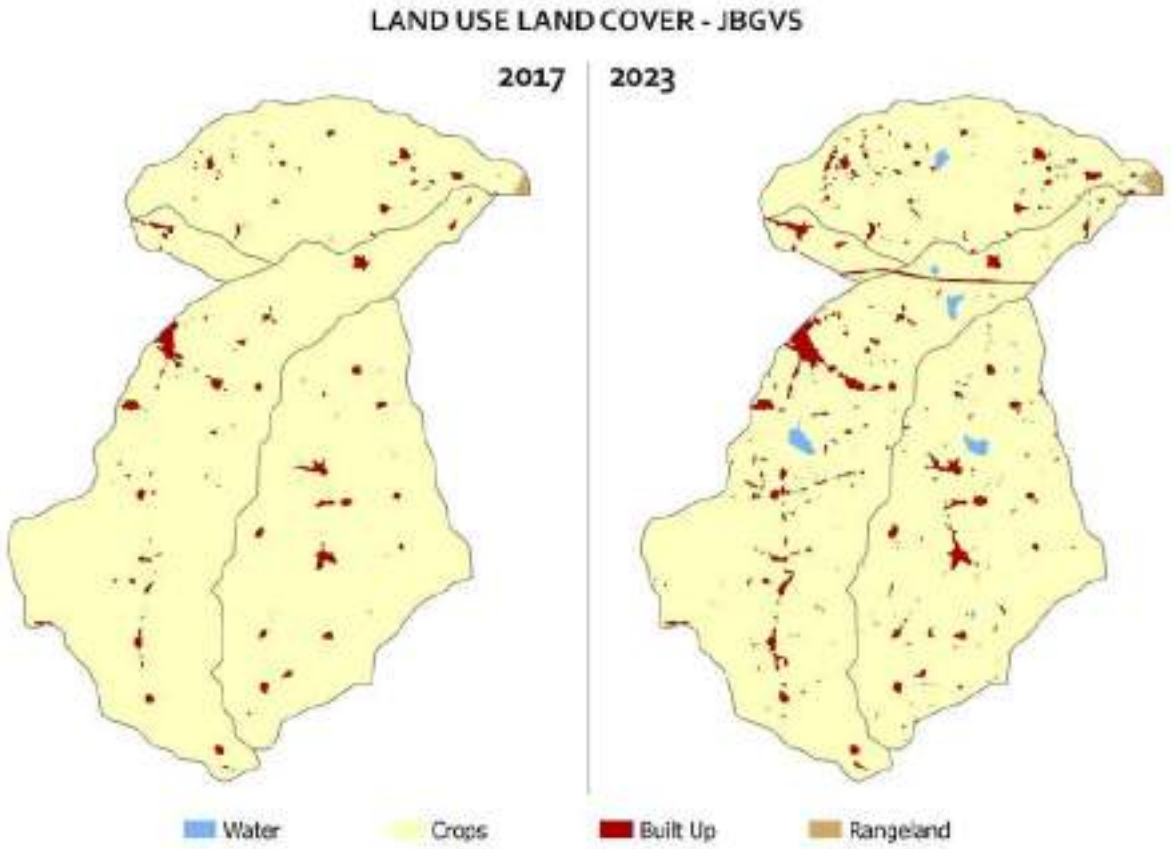


FIGURE 10: PRE- AND POST-INTERVENTION LULC OF THE INTERVENTION WATERSHED

It can be observed from the above table and charts that in terms of total area, the area under crops is the highest followed by built-up area. Looking at the changes in land use that have happened through the course of the intervention period, major changes can be observed in the growth of areas under water and built-up and the reduction in the areas under trees, while minor reduction in the area under crops can be seen. In terms of total area, the reduction in area under crops can be attributed mainly to the increase in built-up area. The following section will offer more clarity on the changes to cropping intensity.

6

VEGETATION INDEX (VI)/CROPPING INTENSITY

Vegetation Indices are combinations of surface reflectance at two or more wavelengths designed to highlight a particular property of vegetation. They are derived using the reflectance properties of vegetation. For this assessment, the Normalised Difference Vegetation Index (NDVI) is used. NDVI is an indicator that shows the greenness, density, and health of vegetation in each pixel of a satellite image. The index detects and quantifies the presence of living green vegetation using this reflected light in the visible and near-infrared bands.

The standard formula for calculating NDVI is: NDVI = (NIR – red) / (NIR + red)

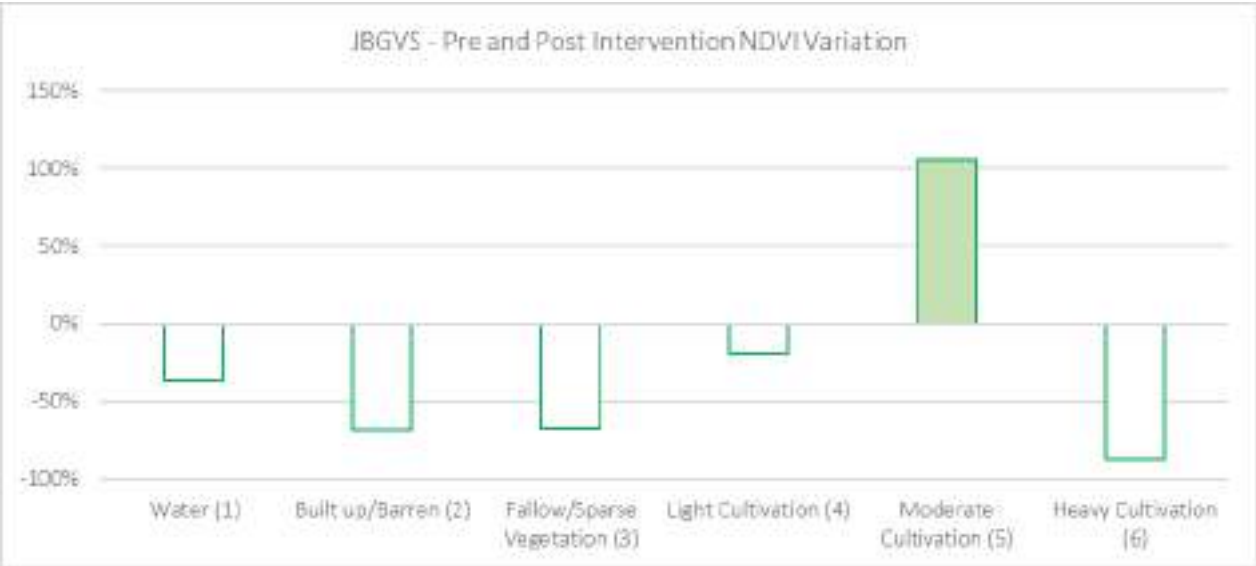
NIR is the near infra-red, band 8, and red, band 4 of Sentinel-2 imagery, composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states.

The NDVI value ranges from -1 to 1 and shows the vigour of the crop:

- **Values close to 1:** the more intense the green, the more vigorous the vegetation and vegetation cover. Considerations for the type of farming, bare soil, etc. must be made. The index also measures the vigour of the underbrush.
- **Values close to 0:** areas with very little vegetation, early stages of cultivation, bare soil, or non-productive areas.
- **Negative values:** usually associated with areas of water, snow, or clouds.

TABLE 12: ZONAL STATISTICS VALUES OF THE VEGETATION INDEX

District	Aurangabad				
Organisation	JBGVS				
Total Area of Watershed (Sq. Km.)	193.5039				
Soil Group	D				
Vegetation Index Classes	VI - 2017		VI - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.1139	0.06	0.0721	0.04	-36.73%
Built up/Barren (2)	21.3672	11.04	6.6392	3.43	-68.93%
Fallow/Sparse Vegetation (3)	42.0119	21.71	13.6429	7.05	-67.53%
Light Cultivation (4)	71.8665	37.14	57.6673	29.80	-19.76%
Moderate Cultivation (5)	55.9132	28.90	115.1741	59.52	105.99%
Heavy Cultivation (6)	2.1955	1.13	0.2798	0.14	-87.25%



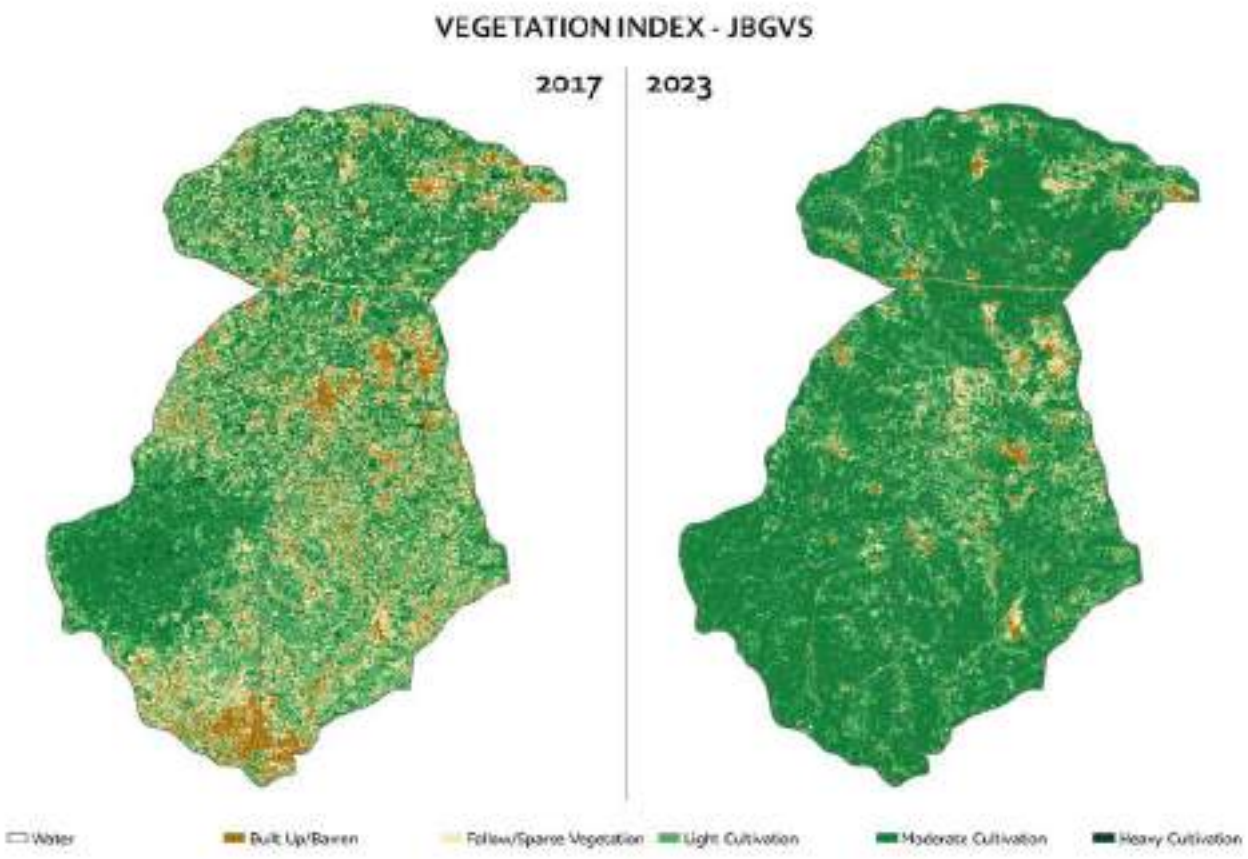


FIGURE 11: PRE- AND POST-INTERVENTION VEGETATION INDEX ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the vegetation index reveals that in the intervention watershed, the area under moderate cultivation has grown significantly along with the area under water, while the area under other classes has shrunk. With respect to the methodology applied for this analysis, it can be interpreted that the area under light cultivation corresponds to single cropping, moderate cultivation to double cropping and heavy cultivation to triple cropping. Thus, the area under double cropping has increased, indicating improved water accessibility and use, among other factors.

7 SOIL MOISTURE

Surface soil moisture (SSM), defined as the water content of the top few centimetres of soil, is a key variable that affects run-off generation, water recharge and vegetation growth. The Synthetic Aperture Radar (SAR) data from Sentinel-1 satellite is used here to study the surface soil moisture, which is in turn derived from relative soil moisture, which represents the soil moisture for a given soil column on a relative scale between soil saturation and wilting levels.

The surface soil moisture saturation is calculated as percentages using the formula[11]:

$$SSM(t) = \frac{\Delta\sigma^0(\Theta, t)}{S(\Theta)} \quad [\%]$$

Where $\Delta\sigma0(\Theta,t)$ represents the change in normalized backscatter (relative to dry conditions), and $S(\Theta)$ is the sensitivity to SSM changes at the reference angle. The sensitivity is equivalent to the local backscatter dynamic range, estimated by the difference between normalized backscatter coefficients under wet and dry conditions using,

[11]Detailed methodology is provided at https://doi.org/10.1109/TGRS.2018.2858004

$$S(\Theta) = \sigma^0_{\text{wet}}(\Theta) - \sigma^0_{\text{dry}}(\Theta) \quad [\text{dB}].$$

Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states. The values range from 0 to 100 % where values close to 0 represents water and built-up areas.

TABLE 13: ZONAL STATISTICS OF SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHEDS

District	Aurangabad				
Organisation	JBGVS				
Total Area of Watershed (Sq. Km.)	193.5039				
Soil Group	D				
Soil Moisture Classes	SM - 2017		SM - 2023		% Difference
	Area	% Area	Area	% Area	
0 - 0.1 (1)	21.0848	10.90	17.6211	9.11	-16.43%
0.1 - 0.2 (2)	62.2925	32.19	41.7459	21.57	-32.98%
0.2 - 0.3 (3)	88.7978	45.89	86.8632	44.89	-2.18%
0.3 - 0.4 (4)	20.2099	10.44	41.5494	21.47	105.59%
0.4 - 0.5 (5)	0.9163	0.47	5.2123	2.69	468.84%
> 0.5 (6)	0.0839	0.04	0.3931	0.20	368.67%

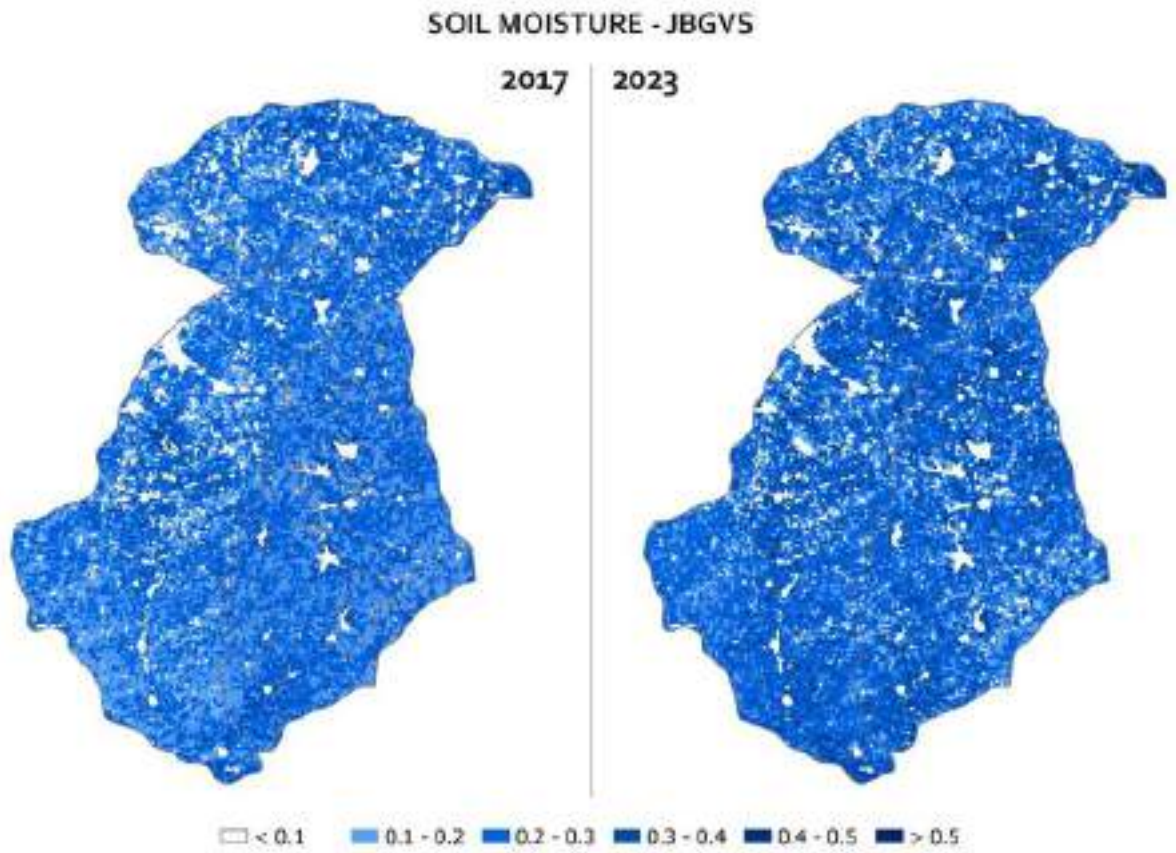
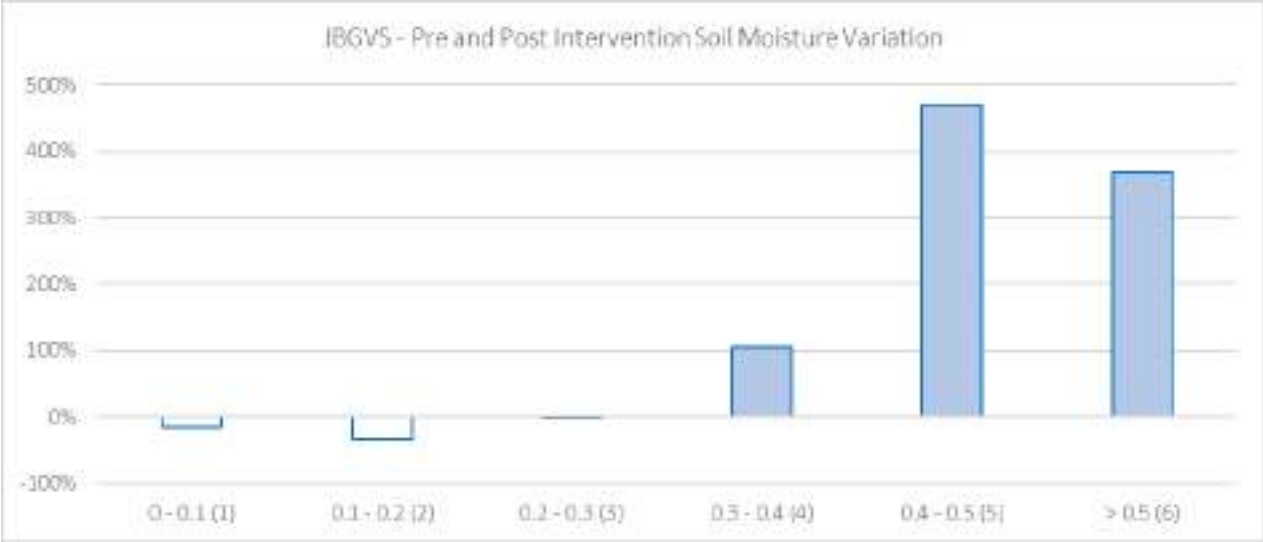


FIGURE 12: PRE AND POST INTERVENTION SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHED

[11] Detailed methodology is provided in https://doi.org/10.1109/TGRS.2018.2858004



The analysis, change detection and calculation of the soil moisture across the intervention watershed shows that there have been significant changes in the values of surface soil moisture over the course of the intervention period and since. The area under soil moisture values greater than 40% has seen a significant increase, while the area under low soil moisture values has reduced. This is to be interpreted because of multiple factors, such as the rainfall received, the vegetative cover, and the availability of surface and ground water, among others.

CONCLUSIONS

This section provides a summary of the key findings of the assessment and the limitations encountered in the process of the assessment. For a more accurate quantification outcome, further studies will have to be done using datasets of higher details and corroboration from the field.

KEY FINDINGS

In summation, the key findings from the above assessments are as follows:

- The total surface storage created in the intervention area due to the project is 8,38,012 cubic meters.
- The influence of rainfall on the ground water levels has not been very significant. However, a positive correlation between both was observed.
- The ground water levels in the intervention watershed have been increasing since 2017, are presently at high values, and are expected to persist at similar levels in the coming years. The availability of more recent data will shed more light on the trends that can be expected.
- Ground water recharge directly due to rainfall in the intervention area is about 12.45% of the total rainfall received.
- The volume of surface run-off stored by the intervention measures is 5.55% of the total run-off generated as a part of and due to the interventions (or) 1.32% of the total rainfall received during the period of the project intervention and ever since.
- Analysis of LULC, NDVI, and SSM reveal that there has been a marked increase in area under moderate or double cultivation while the crop cover overall has reduced slightly, likely due to the increase in area under built up. The surface soil moisture has shown a remarkable change with most of the area coming under moisture content of more than 40.0%.

TABLE 14: SUMMARY OF FINDINGS

District		Aurangabad
Organisation		JBGVS
Total Area of Watershed (Sq. Km.)		193.503861
Soil Group		D
Volume of Storage Created (Cu. m.)		838012
Total rainfall over intervention area (Cu. m.)		913291782.9934
Q - Total run-off over intervention area (Cu. m.)		273987534.9
Average % of fullness throughout the intervention period		30.24%
Run-off volume stored in interventions	Pre-evaporation Loss	25338073.99
	Post Evaporation Loss	15202844.39
% of run-off stored by interventions	Pre-evaporation Loss	9.25%
	Post Evaporation Loss	5.55%
% of rainfall stored by interventions	Pre-evaporation Loss	2.21%
	Post Evaporation Loss	1.32%
Surface water contribution to ground water recharge (40%) (Cu. m.)		6081137.76
Recharge only due to rainfall (Entire intervention period and since)	Cu. m.	128391016.4
	%	12.45%

LIMITATIONS

The most significant limitation faced was in terms of data availability. With the resolution of the available open-source satellite imagery being capped at 10m, 30m and 50m, the land use, vegetation index and soil moisture that can be generated, respectively, also lack resolution, especially considering the small size of the intervention area that had to be assessed. Assumptions were made to calculate the storage capacity of water harvesting structures. Owing to the limitation in the availability of data on the number of interventions, their locations and the respective dimensions, the assessments are based primarily on data from secondary sources, with the primary data being used wherever possible. Further, most of the secondary data that was available and obtained has shortcomings in one or more areas, such as the temporal coverage or the spatial resolution. Further constraints were due to the unavailability of up-to-date and reliable ground water data. With the continuous measurement of this information, the efficiency of the assessment can be improved.

ANNEXURE 1

INTERVENTIONS

Organisation	Village	Type of Activity	Latitude	Longitude
JBGVS	Daigaon	CNB - New	19.92153	75.03566
JBGVS	Daigaon	CNB - New	19.9241	75.04084
JBGVS	Daigaon	CNB - New	19.92139	75.02944
JBGVS	Daigaon	CWG	19.92002	75.02871
JBGVS	Daigaon	CWG	19.9215	75.02941
JBGVS	Daigaon	CWG	19.92361	75.03046
JBGVS	Daigaon	CWG	19.92738	75.03294
JBGVS	Daigaon	CWG	19.92651	75.03183
JBGVS	Daigaon	CWG	19.92575	75.03183
JBGVS	Daigaon	CWG	19.9225	75.04556
JBGVS	Dhamori	CNB - New	19.92944	75.05444
JBGVS	Dhamori	CNB - New	19.93058	75.0597
JBGVS	Dhamori	CNB - New	19.9375	75.05444
JBGVS	Dhamori	CNB - New	19.93583	75.05167
JBGVS	Dhamori	CNB - New	19.93115	75.06192
JBGVS	Dongaon	CNB - New	19.93861	75.10639
JBGVS	Dongaon	CNB - New	19.94028	75.07278
JBGVS	Dongaon	CNB - New	19.93417	75.10139
JBGVS	Dongaon	CNB - New	19.9383	75.10222
JBGVS	Dongaon	CNB - New	19.94333	75.105
JBGVS	Dongaon	CWG	19.94056	75.10722
JBGVS	Dongaon	CWG	19.93656	75.10522
JBGVS	Dongaon	CWG	19.93639	75.10528
JBGVS	Savangi	CNB - New	19.90667	75.04194
JBGVS	Savangi	CNB - New	19.91356	75.01973
JBGVS	Savangi	CWG	19.90944	75.01556
JBGVS	Babhulgaon	CNB - New	19.96	75.02278
JBGVS	Babhulgaon	CNB - New	19.95972	75.02444
JBGVS	Babhulgaon	CWG	19.95167	75.03472
JBGVS	Babhulgaon	CWG	19.95111	75.03306
JBGVS	Dinwada	CNB - New	20.1525	75.00083
JBGVS	Dinwada	CNB - New	19.98222	74.99944
JBGVS	Maliwadgaon	CNB - New	19.98639	75.02667
JBGVS	Maliwadgaon	CNB - New	19.97667	75.03611
JBGVS	Maliwadgaon	CNB - New	19.9775	75.03389
JBGVS	Maliwadgaon	CNB - New	19.97889	75.03222
JBGVS	Maliwadgaon	CNB - New	19.98111	75.02833
JBGVS	Maliwadgaon	CNB - New	19.99306	75.0425

Organisation	Village	Type of Activity	Latitude	Longitude
JBGVS	Maliwadgaon	CNB - New	19.99194	75.0425
JBGVS	Maliwadgaon	CNB - New	19.99	75.03972
JBGVS	Maliwadgaon	CNB - New	19.98639	75.03639
JBGVS	Maliwadgaon	CNB - New	19.97444	75.02056
JBGVS	Maliwadgaon	CNB - New	19.98778	75.02722
JBGVS	Vairagad	CNB - New	19.96083	75.00361
JBGVS	Vairagad	CNB - New	19.96917	75.005
JBGVS	Vairagad	CNB - New	19.96889	75.00278
JBGVS	Vairagad	CNB - New	19.95972	75.00556
JBGVS	Vairagad	CNB - New	19.96472	75.00194
JBGVS	Padalsa	CNB - New	19.98194	75.04278
JBGVS	Padalsa	CNB - New	19.97333	75.05556
JBGVS	Padalsa	CNB - New	19.97167	75.06083
JBGVS	Padalsa	CNB - New	19.98639	75.05306
JBGVS	Arapur	CWG	19.90911	75.05962
JBGVS	Arapur	CWG	19.9068	75.06124
JBGVS	Arapur	CWG	19.90582	75.06242
JBGVS	Arapur	CWG	19.90582	75.06242
JBGVS	Arapur	CNB - New	19.8959	75.06838
JBGVS	Arapur	CNB - New	19.90462	75.06332
JBGVS	Arapur	CNB - New	19.90268	75.06384
JBGVS	Arapur	CNB - New	19.90111	75.06566
JBGVS	Arapur	CNB - New	19.897	75.06888
JBGVS	Arapur	CNB - New	19.89538	75.06544
JBGVS	Arapur	CNB - New	19.89515	75.06648
JBGVS	Fulshiwara	CNB - New	19.87173	75.07306
JBGVS	Fulshiwara	CNB - New	19.87205	75.06908
JBGVS	Fulshiwara	CNB - New	19.86329	75.07402
JBGVS	Khadaknarla	CWG	19.90743	75.0795
JBGVS	Khadaknarla	CWG	19.91513	75.10217
JBGVS	Khadaknarla	CNB - New	19.92206	75.1038
JBGVS	Khadaknarla	CNB - New	19.92554	75.10324
JBGVS	Khadaknarla	CNB - New	19.92839	75.10258
JBGVS	Wasusaigaon	CWG	19.90345	75.08809
JBGVS	Wasusaigaon	CWG	19.91513	75.10217
JBGVS	Wasusaigaon	CWG	19.88862	75.08587
JBGVS	Derda	CWG	19.90743	75.0795
JBGVS	Derda	CWG	19.84861	75.10417
JBGVS	Derda	CWG	19.83417	75.1025
JBGVS	Derda	CWG	19.86028	75.10556
JBGVS	Singpur	CWG	19.84361	75.04167

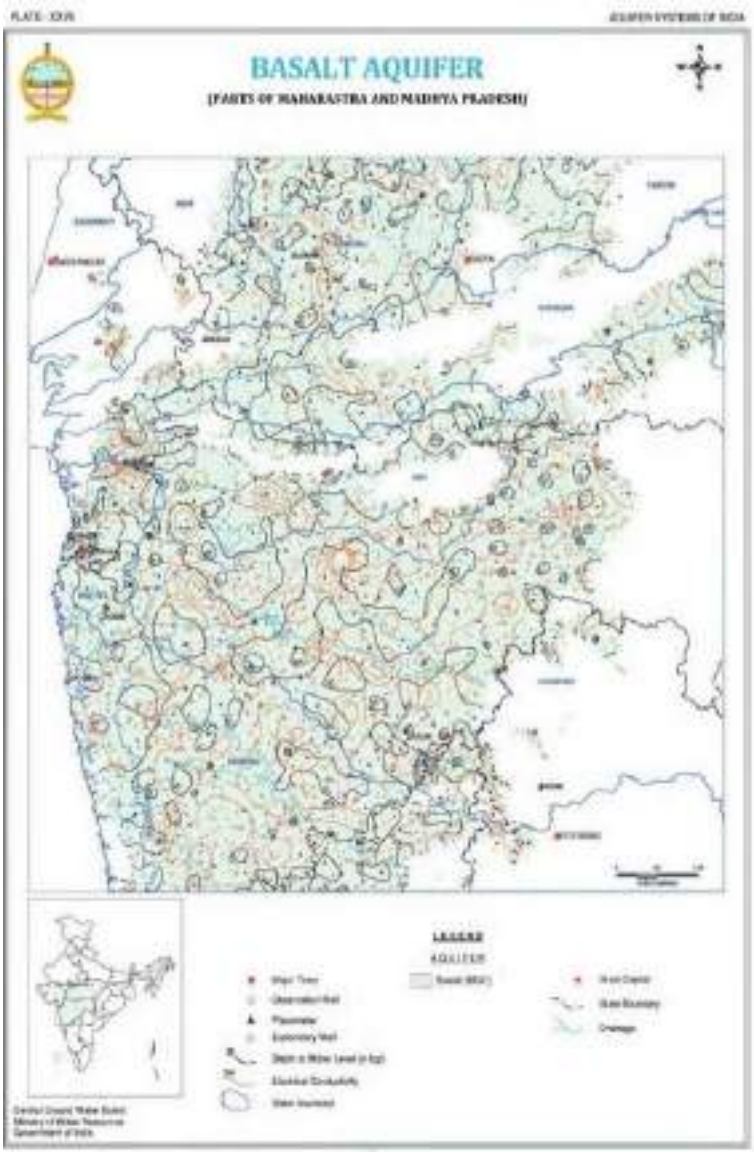
Organisation	Village	Type of Activity	Latitude	Longitude
JBGVS	Savangi	CWG	19.90944	75.01556
JBGVS	Babhulgaon	CNB - New	19.96000	75.02278
JBGVS	Babhulgaon	CNB - New	19.95972	75.02444
JBGVS	Babhulgaon	CWG	19.95167	75.03472
JBGVS	Babhulgaon	CWG	19.95111	75.03306
JBGVS	Derhala	CNB - New		
JBGVS	Derhala	CNB - New		
JBGVS	Derhala	CNB - New		
JBGVS	Derhala	CNB - New		
JBGVS	Derhala	CNB - New		
JBGVS	Derhala	CNB - New		
JBGVS	Derhala	CWG		
JBGVS	Derhala	CWG		
JBGVS	Derhala	CWG		
JBGVS	Dinwada	CNB - New	20.15250	75.00083
JBGVS	Dinwada	CNB - New	19.98222	74.99944
JBGVS	Kinhala	CNB - New	0.00000	0.00000
JBGVS	Maliwadgaon	CNB - New	19.98639	75.02667
JBGVS	Maliwadgaon	CNB - New	19.97667	75.03611
JBGVS	Maliwadgaon	CNB - New	19.97750	75.03389
JBGVS	Maliwadgaon	CNB - New	19.97889	75.03222
JBGVS	Maliwadgaon	CNB - New	19.98111	75.02833
JBGVS	Maliwadgaon	CNB - New	19.99306	75.04250
JBGVS	Maliwadgaon	CNB - New	19.99194	75.04250
JBGVS	Maliwadgaon	CNB - New	19.99000	75.03972
JBGVS	Maliwadgaon	CNB - New	19.98639	75.03639
JBGVS	Maliwadgaon	CNB - New	19.97444	75.02056
JBGVS	Maliwadgaon	CNB - New	19.98778	75.02722
JBGVS	Vairagad	CNB - New	19.96083	75.00361
JBGVS	Vairagad	CNB - New	19.96917	75.00500
JBGVS	Vairagad	CNB - New	19.96889	75.00278
JBGVS	Vairagad	CNB - New	19.95972	75.00556
JBGVS	Vairagad	CNB - New	19.96472	75.00194
JBGVS	Raipur	CNB - New		
JBGVS	Raipur	CNB - New		
JBGVS	Raipur	CNB - New		
JBGVS	Pimpalgaon	CNB - New		
JBGVS	Padalsa	CNB - New	19.98194	75.04278
JBGVS	Padalsa	CNB - New	19.97333	75.05556
JBGVS	Padalsa	CNB - New	19.97167	75.06083
JBGVS	Padalsa	CNB - New	19.98639	75.05306

Organisation	Village	Type of Activity	Latitude	Longitude
JBGVS	Arapur	CWG	19.90911	75.05962
JBGVS	Arapur	CWG	19.90680	75.06124
JBGVS	Arapur	CWG	19.90582	75.06242
JBGVS	Arapur	CWG	19.90582	75.06242
JBGVS	Arapur	CNB - New	19.89590	75.06838
JBGVS	Arapur	CNB - New	19.90462	75.06332
JBGVS	Arapur	CNB - New	19.90268	75.06384
JBGVS	Arapur	CNB - New	19.90111	75.06566
JBGVS	Arapur	CNB - New	19.89700	75.06888
JBGVS	Arapur	CNB - New	19.89538	75.06544
JBGVS	Arapur	CNB - New	19.89515	75.06648
JBGVS	Fulshiwara	CNB - New	19.87173	75.07306
JBGVS	Fulshiwara	CNB - New	19.87205	75.06908
JBGVS	Fulshiwara	CNB - New	19.86329	75.07402
JBGVS	Gawalishiwara	CNB - New		
JBGVS	Khadaknarla	CWG	19.90743	75.07950
JBGVS	Khadaknarla	CWG	19.91513	75.10217
JBGVS	Khadaknarla	CNB - New	19.92206	75.10380
JBGVS	Khadaknarla	CNB - New	19.92554	75.10324
JBGVS	Khadaknarla	CNB - New	19.92839	75.10258
JBGVS	Wasusaigaon	CNB - New		
JBGVS	Wasusaigaon	CWG	19.90345	75.08809
JBGVS	Wasusaigaon	CWG	19.91513	75.10217
JBGVS	Wasusaigaon	CWG	19.88862	75.08587
JBGVS	Derda	CNB - New		
JBGVS	Derda	CNB - New		
JBGVS	Derda	CNB - New		
JBGVS	Derda	CWG		
JBGVS	Derda	CWG		
JBGVS	Derda	CWG	19.90743	75.07950
JBGVS	Derda	CWG	19.84861	75.10417
JBGVS	Derda	CWG	19.83417	75.10250
JBGVS	Derda	CWG	0.00000	0.00000
JBGVS	Derda	CWG	19.86028	
JBGVS	Gajgaon	CNB - New		
JBGVS	Gawalidhanora	CNB - New		
JBGVS	Gawalidhanora	CNB - New		
JBGVS	Gawalidhanora	CNB - New		
JBGVS	Gawalidhanora	CWG		
JBGVS	Ghodegaon	CNB - New		
JBGVS	Ghodegaon	CNB - New		

Organisation	Village	Type of Activity	Latitude	Longitude
JBGVS	Ghodegaon	CNB - New		
JBGVS	Ghodegaon	CNB - New		
JBGVS	Ghodegaon	CNB - New		
JBGVS	Golegaon	CWG		
JBGVS	Golegaon	CWG		
JBGVS	Kankori	CWG		
JBGVS	Kankori	CWG		
JBGVS	Kankori	CWG		
JBGVS	Kankori	CNB - New		
JBGVS	Kankori	CNB - New		
JBGVS	Kankori	CWG		
JBGVS	Singpur	CWG	19.84361	75.04167
JBGVS	Palasgaon	CNB - New		
JBGVS	Pratappur	CNB - New		
JBGVS	Shahapur	CNB - New		
JBGVS	Shahapur	CWG		

ANNEXURE 2

AQUIFER TYPES



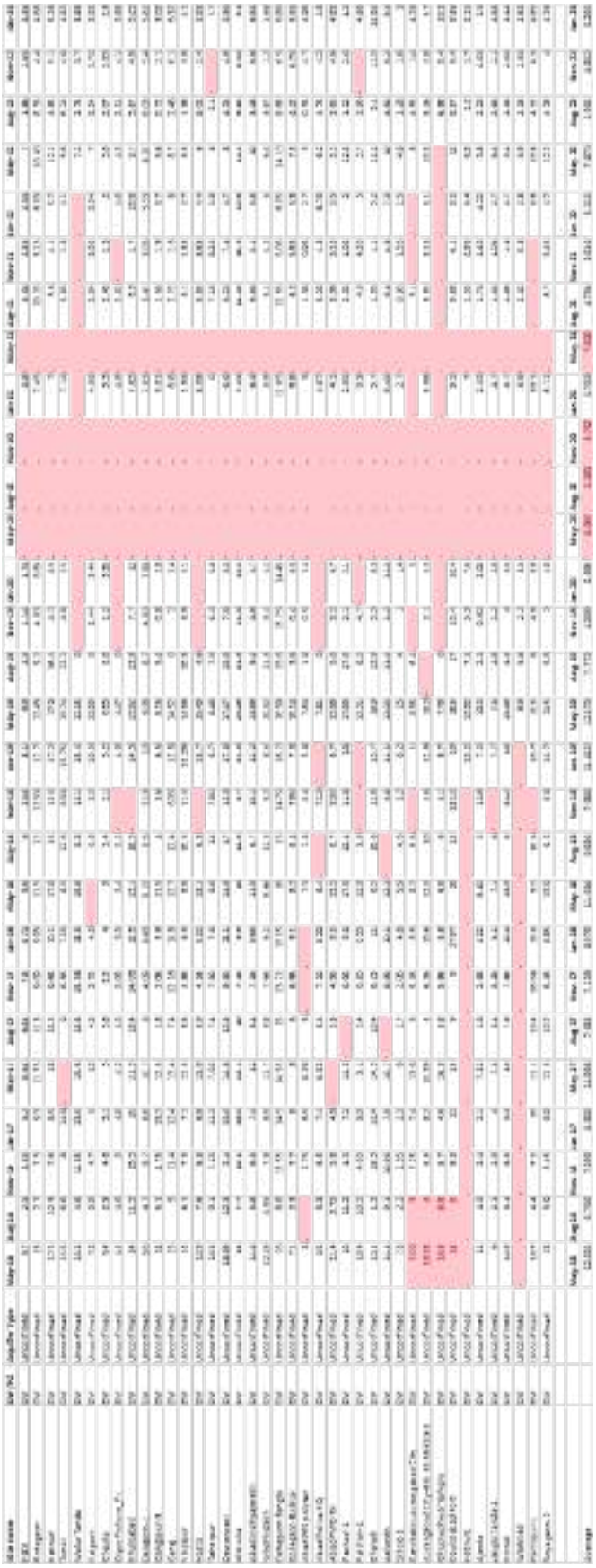
ANNEXURE 3

GROUND WATER DATA FROM NGO PARTNERS

Month	Overall	AFARM	AFPRO	BAIF	JBGVS	MGVS	DSC	SPARSH
Jun-17	16.63291	18.4859	14.58687	10.69306	17.82977		16.94432	
Jul-17	16.26051	17.0063	14.74365	10.21412	17.82977		16.94432	
Aug-17	15.89246	15.97236	14.09885	10.08629	17.82977		16.94432	
Sep-17	15.90110	15.97269	14.48017	10.42153	17.82977		16.94432	
Oct-17	15.91418	16.0541	13.77258	10.6804	17.82977		16.94432	
Nov-17	15.07909	16.14039	14.54371	10.82194	15.75072		16.36863	
Dec-17	15.28061	16.66187	14.73175	11.08952	16.01158		14.60358	
Jan-18	15.78315	17.30227	14.91724	10.10798	16.53142		15.00356	
Feb-18	16.13479	17.84025	14.97115	10.4525	16.72761		15.40358	
Mar-18	16.51477	17.97279	15.98083	10.60847	16.8196		15.50358	
Apr-18	16.62765	18.13107	16.29189	10.57028	16.86864		15.50358	
May-18	16.62098	18.09931	16.29604	10.17358	16.91076		15.73272	
Jun-18	16.69555	18.13702	16.3129	10.57145	16.95413		15.95796	
Jul-18	15.50553	16.69937	14.05222	9.815423	16.06409		15.9358	
Aug-18	15.01052	16.20999	14.20889	9.682651	15.42118		14.55531	
Sep-18	15.05038	16.07885	14.30571	9.481008	15.62163		14.78352	
Oct-18	15.16348	16.10001	14.42797	9.644355	15.78725		15.1284	
Nov-18	15.17444	16.44153	13.33897	9.762581	15.92178		15.36963	
Dec-18	15.36046	16.62517	13.66385	9.907863	16.17475		15.65383	
Jan-19	15.8186	16.82288	15.05846	10.15556	16.86138		15.67173	
Feb-19	16.04574	17.11898	15.06166	10.91272	16.98911		15.80802	
Mar-19	16.07413	17.19947	14.86218	11.01964	17.13002		15.57315	
Apr-19	16.2723	17.34318	15.35987	11.54101	17.14388		15.87414	
May-19	16.44105	17.36081	15.88693	11.99407	17.24754		15.97958	
Jun-19	16.10688	17.2091	15.93733	11.76859	17.25451	0.277391	15.85358	
Jul-19	15.50118	17.31602	16.54885	10.78345	15.61434	0.348696	15.14322	
Aug-19	15.14028	16.84152	16.44286	9.884708	14.79175	3.06933	14.80938	
Sep-19	14.7353	16.09015	16.00323	9.444355	14.64434	4.722174	14.25667	
Oct-19	14.41852	15.59718	16.04696	8.134355	14.7935	3.752174	13.4587	
Nov-19	14.2605	15.71996	16.07115	7.933548	14.79892	2.902609	12.35138	13.65
Dec-19	13.15947	15.16932	12.87019	8.591615	13.02154	2.354783	12.22096	13.86173
Jan-20	13.50751	15.523	11.01615	9.742177	14.03072	2.95933	13.06469	14.10765
Feb-20	13.92775	16.28292	10.32491	10.47444	14.5	2.95933	13.47667	14.35867

Month	Overall	AFARM	AFPRO	BAIF	JBGVS	MGVS	DSC	SPARSH
Mar-20	14.28585	16.56471	11.95991	11.11508	14.50364	0.848261	13.79852	14.71327
Apr-20	14.41203	16.43971	12.63387	11.605	14.51155	0.277391	14.1599	15.28357
May-20	14.42773	16.14196	12.15853	12.86661	14.51305	0.548696	14.2333	16.34796
Jun-20	14.38114	15.66726	11.00691	12.45274	15.42309	0.562609	14.20179	15.32653
Jul-20	9.755855	11.79976	7.473272	8.679234	6.809025	7.867826	12.33864	14.00612
Aug-20	7.548825	9.149152	5.164055	6.860808	4.173814	8.950435	10.91253	13.11888
Sep-20	6.125963	7.931561	3.3447	5.522581	2.986949	11.15043	8.431204	12.19184
Oct-20	5.247161	6.359467	2.800991	2.585645	2.846589	10.53522	8.929444	11.53724
Nov-21	5.501639	6.182822	3.549032	3.729032	3.431144	8.904783	9.05779	11.62806
Dec-21	6.33661	7.110027	4.57894	3.950645	4.446686	7.23087	9.751852	11.74082
Jan-21	7.318161	8.156152	6.028149	5.681855	5.664746	5.543913	9.541019	11.9148
Feb-21	9.133047	8.85904				3.800435	9.106494	12.11633
Mar-21	11.24193	11.52015				2.722174		12.39551
Apr-21	12.15048	12.68736				1.787391		12.96102
May-21	12.71124	13.18658				1.43087		13.91327
Jun-21	12.86181	13.2347				6.348261		13.25663
Jul-21	11.61871	11.62638				7.265652		12.61735
Aug-21	9.965919	9.479766				8.348261		11.82388
Sep-21	5.784916	6.325738				10.47		3.040816
Oct-21	5.898947	5.949663				11.43522		4.449918
Nov-21	6.860644	6.968792				10.17435		5.754082
Dec-21	7.530835	7.799686				9.47		6.258163
Jan-22	8.187613	8.372819				9.083043		7.414286
Feb-22	8.245786	8.184013				9.448261		8.152041
Mar-22	9.660788	10.16328				7.543913		8.62449
Apr-22	11.14524	12.09247				7.335217		9.140816
May-22	11.19883	13.90435				7.161304		10.00816
Jun-22	11.49931	12.10334				7.161304		10.67449
Jul-22	10.85145	11.24381				9.491739		9.973469
Aug-22	8.170429	7.784348				10.87652		8.713265
Sep-22	6.129714	5.404415				11.63826		7.035714
Oct-22	4.264286							4.264286
Nov-22	1.561224							1.561224

GROUND WATER DATA FROM CGWB



ANNEXURE 4
RAINFALL

Monthly rainfall (in mm) trends for Aurangabad from 01-Jan-2018 to 31-Mar-2024

Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)
Jan-17		0.00	Nov-18	24.8	11.03	Sep-20	153.4	197.37	Jul-22	172.8	247.29
Feb-17		0.00	Dec-18	10.3	0	Oct-20	56.9	65.44	Aug-22	175.9	84.34
Mar-17		0.00	Jan-19	2.7	0	Nov-20	24.8	1.45	Sep-22	153.4	255.34
Apr-17		0.00	Feb-19	2.5	0	Dec-20	10.3	1.33	Oct-22	56.9	132.92
May-17		2.44	Mar-19	4.6	0	Jan-21	2.7	12.03	Nov-22	24.8	0
Jun-17		149.79	Apr-19	3.5	0.94	Feb-21	2.5	2.27	Dec-22	10.3	7.04
Jul-17		86.36	May-19	18.9	0	Mar-21	4.6	5.84	Jan-23	2.7	3.14
Aug-17		165.79	Jun-19	134.6	110.63	Apr-21	3.5	4.66	Feb-23	2.5	0
Sep-17		182.62	Jul-19	172.8	162.87	May-21	18.9	30.6	Mar-23	4.6	9.83
Oct-17		95.61	Aug-19	175.9	106.42	Jun-21	134.6	132.15	Apr-23	0	39.76
Nov-17		2.83	Sep-19	153.4	213.73	Jul-21	172.8	142.21	May-23	0	9.41
Dec-17		2.27	Oct-19	56.9	193.39	Aug-21	175.9	186.88	Jun-23	134.6	43.71
Jan-18	2.7	0	Nov-19	24.8	37	Sep-21	153.4	454.42	Jul-23	172.8	173.41
Feb-18	2.5	0.72	Dec-19	10.3	1.46	Oct-21	56.9	106.39	Aug-23	175.9	46.79
Mar-18	4.6	0.53	Jan-20	2.7	0.12	Nov-21	24.8	15.3	Sep-23	153.4	220.1
Apr-18	3.5	2.01	Feb-20	2.5	0	Dec-21	10.3	6.89	Oct-23	56.9	0.85
May-18	18.9	0.17	Mar-20	4.6	22.92	Jan-22	2.7	0.2	Nov-23	24.8	54.85
Jun-18	134.6	126.39	Apr-20	3.5	2.42	Feb-22	2.5	0	Dec-23	10.3	14.13
Jul-18	172.8	85.65	May-20	18.9	6.26	Mar-22	4.6	4.91	Jan-24	0	2.44
Aug-18	175.9	180.45	Jun-20	134.6	251.86	Apr-22	3.5	0	Feb-24	0	2.25
Sep-18	153.4	29.42	Jul-20	172.8	91.32	May-22	18.9	0	Mar-24	0	0.1
Oct-18	56.9	1.65	Aug-20	175.9	221.91	Jun-22	134.6	140.36			

ANNEXURE 5

REGRESSION & CORRELATION

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.028569498
R Square	0.000816216
Adjusted R Square	-0.013457838
Standard Error	3.542306917
Observations	72

Correlation	*Column 1*	*Column 2*
Column 1	1	
Column 2	0.028569498	1

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.717513774	0.717513774	0.057181806	0.811705719
Residual	70	878.3556808	12.5479383		
Total	71	879.0731946			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.29983462	0.520525671	19.7873711	2.20591E-30	9.261678903	11.33799033	9.261678903	11.33799033
X Variable 1	0.001100177	0.004600801	0.239127175	0.811705719	-0.008075832	0.010276186	-0.008075832	0.010276186

ANNEXURE 7

PHOTOS

Latitude: 19.985582
Longitude: 75.000678
Accuracy: 8.7 m
Powered by NoteCam

Latitude: 19.98585
Longitude: 75.000331
Accuracy: 4.8 m

Latitude: 19.985384
Longitude: 75.00116
Accuracy: 80.5 m
Note: Grass speeding Dinwada

CHAPTER 9
RECOMMENDATIONS

STRENGTHEN MARKET LINKAGES

Establishing stronger market linkages is essential to build on the increased agricultural productivity and income achieved through this intervention. Enhancing access to both local and regional markets will ensure farmers receive fair prices for their produce and increase profitability. Collaboration with government agencies, agribusinesses, and cooperatives can expand market reach and support sustainable livelihoods.

ENCOURAGE KNOWLEDGE SHARING AND PEER LEARNING

Encourage farmers to share knowledge through peer learning networks. Setting up community groups, organising farm visits, and hosting hands-on workshops can help farmers learn from each other's successes and challenges, build community bonds, and make it easier to adopt new techniques.

DEVELOP YOUTH ENGAGEMENT PROGRAM IN AGRICULTURE

To ensure the continuity of sustainable agricultural practices and community resilience, it is recommended that a Youth Engagement Program in Agriculture be established. This program would actively involve young people in learning and practising sustainable farming methods, such as organic farming, crop rotation, soil conservation, and efficient water usage.

10. SUSTAINABILITY

The Bajaj Water Conservation Project (BWCP), in collaboration with Jankidevi Bajaj Gram Vikas Sanstha (JBGVS) and Bajaj Auto Limited, was implemented between 2019-20 and 2021-22 in 31 villages of Gangapur Taluka, Aurangabad, Maharashtra. The project aimed to tackle water scarcity and agricultural challenges by creating a self-sustaining, community-led water management model. It focused on building local capacity and encouraging community participation, ensuring long-term benefits for the villages

To ensure sustainability, the project focused on fostering community ownership and participation by setting up and strengthening Water User Groups (WUGs), Self-Help Groups (SHGs), and Village Development Committees (VDCs). These groups played a significant role in the planning, execution, and upkeep of water conservation structures. Additionally, the involvement of women in decision-making contributed to greater inclusivity and fair resource management.

The BWCP also adopted an integrated water resource management approach, which involved constructing and restoring key water conservation structures such as stream widening and deepening, field bunds, earthen check dams, and gully plugs. These interventions helped replenish groundwater, reduce soil erosion, and enhance water availability for both agriculture and household use. Furthermore, the project encouraged efficient irrigation techniques like micro-irrigation to maximize water use and improve crop productivity. Additionally, planting neem trees and grasses contributed to better soil fertility, erosion prevention, and sustainable land management.

For economic sustainability, the project worked towards empowering farmers by providing training in sustainable agricultural techniques, crop diversification, and high-value cash crop cultivation. By transitioning from traditional rainfed crops, farmers were able to increase their earnings and improve food security. The BWCP also promoted non-agricultural livelihoods by setting up small-scale processing units and strengthening SHGs, fostering entrepreneurship and alternative income opportunities. This economic support reduced vulnerabilities and strengthened the resilience of local communities. Capacity building and skill development were central to the project. Villagers participated in training programs on water management, sustainable farming, and financial literacy. Women's SHGs received training in group management, financial inclusion, and record-keeping, enabling them to manage initiatives independently. This transfer of knowledge and skills ensured that local communities could sustain and expand project activities over the long term. Lastly, the BWCP integrated contingency planning to enhance community resilience and support sustainable water resource management amid climate uncertainties. By forming SHGs and Farmers' Groups, the project established a network for coordinated action and swift response during crises. Adherence to water governance protocols and community-led monitoring further strengthened local preparedness and sustainability.

CHAPTER 11
CONCLUSION

The intervention undertaken by Jankidevi Bajaj Gram Vikas Sanstha, in collaboration with the Bajaj Water Conservation Project, has had a transformative impact on agricultural communities in Gangapur taluka of Aurangabad district in the state of Maharashtra, particularly in enhancing water availability, agricultural productivity, and economic stability. By implementing a comprehensive range of initiatives—from the construction of water conservation structures and strengthening community institutions to providing training in sustainable farming practices—the program has delivered essential support to rural areas grappling with resource scarcity and economic challenges.

Key outcomes of the intervention include improved access to water for both irrigation and household needs, increased crop yields, and enhanced household income levels. The adoption of sustainable agricultural practices has further fostered a resilient and self-sustaining rural economy. These achievements underscore the effectiveness of a holistic, community-centred approach to tackling water scarcity, promoting sustainable agriculture, and building economic resilience.

IMPACT ASSESSMENT REPORT

COVID-19 RESPONSE FOR CHILDREN

Implementing Partner: Kailash Satyarthi Children's Foundation

Release Date: 31-12-2024

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
CCI	Child Care Institution
FY	Development Bank of Singapore
NGO	Financial Year
SDGs	Sustainable Development Goals

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

During the second wave of the COVID-19 pandemic in India, Bajaj Auto Ltd. supported Kailash Satyarthi Children's Foundation (KSCF) to implement a project to provide emergency and long-term assistance to children in Child Care Institutions (CCIs) who faced heightened vulnerability due to limited healthcare resources. This initiative aimed to improve the health, safety, and well-being of children in 258 CCIs across Rajasthan and Maharashtra through several key interventions. KSCF distributed COVID-19 care kits, including essential medical and hygiene supplies, and conducted training sessions to educate children and staff on proper kit usage while offering psychosocial support to help them cope with pandemic-related stress. Emergency aid, including food, shelter, and psychological care, was also provided to 100 highly vulnerable children. Through these activities, the project successfully promoted a safer environment within CCIs, built resilience among both children and staff and provided critical support to those in need.

PROJECT DETAILS

Implementation year
FY 2021- FY 2022

Assessment year
FY 2024 - FY 2025

Implementing Partner
Kailash Satyarthi Children's Foundation

Project location
Multiple locations from Maharashtra & Rajasthan

Beneficiaries
258 CCIs & 100 vulnerable children

Budget
₹310 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

- Supplied COVID-19 care kits to 258 CCIs in Rajasthan and Maharashtra.
- Conducted training sessions on kit usage for 258 CCIs and psychosocial support sessions for staff and children.
- Provided emergency food, shelter, and essentials to 100 most vulnerable children.
- Monitored knowledge improvement with pre- and post-training assessments.

Key Findings

Improved hygiene practices reduced illness spread within childcare institutions.

Training on COVID kit usage reinforced daily safety protocols among caregivers.

Support from COVID kits enabled uninterrupted, safe operations during the pandemic.

Key Impacts

Ongoing health measures contributed to sustained lower illness rates.

Access to COVID-19 care items increased emotional security for children and staff.

Training and resources enhanced caregiver preparedness for health emergencies.

03. OECD FRAMEWORK

RELEVANCE

The COVID-19 care kits provided by Bajaj Auto Limited and the Kailash Satyarthi Children's Foundation directly addressed urgent health needs within Child Care Institutions (CCIs), where the crowded living conditions and limited healthcare resources made viral spread a significant risk. These kits, containing masks, sanitisers, PPE, oxygen concentrators, oximeters, and thermometers, empowered CCIs to meet both immediate health challenges and set the Foundation for ongoing health resilience. By equipping caregivers and children with essential safety tools, the program supported health security for highly vulnerable populations.

COHERENCE

The intervention is well aligned with the following:

EFFECTIVENESS

The intervention effectively improved health protocols in CCIs, making safety routines like mask-wearing, hand sanitising, and temperature checks a part of daily life. Caregivers at institutions like Mahila va balvikas vibhag and Bal Ashram implemented these measures rigorously, leading to improved hygiene standards and a significant reduction in illness rates. Additionally, children in CCIs actively participated in these routines, demonstrating adaptability and resilience. No COVID-19 outbreaks were reported at participating institutions, highlighting the initiative's effectiveness in protecting vulnerable populations.

EFFICIENCY

By leveraging CSR funding and local partnerships, the program optimised resource allocation to meet the high demand for protective equipment in CCIs. Local production efforts, such as Bal Ashram's mask-making initiative, ensured consistent access to protective supplies at a minimal cost. Moreover, the program's efficient distribution model allowed CCIs to maintain health standards independently, minimising the need for external healthcare support and effectively reducing operational costs.

IMPACT

The intervention had a substantial positive impact on the individual, community, and institutional levels. Children and caregivers reported feeling physically safer and emotionally reassured by the presence of health kits and protective protocols, which fostered an environment of security and resilience. The initiative reduced children's anxieties around illness and equipped caregivers with tools to handle emergencies effectively. Community awareness was also enhanced as CCIs like Bal Ashram extended these health measures to neighbouring areas, contributing to public health efforts. By building resilience in CCIs, the program promoted health equity, reducing the healthcare gap for vulnerable populations during a critical period.

SUSTAINABILITY

The integration of health protocols into routine caregiving practices within CCIs underscores the program's sustainability. Structured training sessions provided caregivers with practical skills and knowledge, allowing them to confidently implement hygiene and health measures even beyond the pandemic. The support from stakeholders like local authorities and donors reinforces this sustainability, while continued health awareness in institutions like SOS Village Jaipur and Surman Sansthan demonstrates the program's success in creating lasting change.

CHAPTER 4
INTRODUCTION

Interaction with Parents and Children at Naya Savera

NEED OF THE PROGRAM

During India's second wave of COVID-19, healthcare systems faced immense strain, leading to critical shortages of essential supplies and support services, which left vulnerable populations, especially children in Child Care Institutions (CCIs), at heightened risk. These children, already coping with social and emotional hardships, received limited direct support from both government agencies and civil society. In response to this urgent need, Bajaj Auto Ltd. supported the Kailash Satyarthi Children's Foundation (KSCF) to launch an initiative aimed at addressing both the immediate and ongoing needs of children across 258 CCIs in Rajasthan and Maharashtra. The initiative focused on bolstering the health and safety conditions within these institutions through a multifaceted approach. COVID care kits containing essential hygiene and medical supplies were distributed to ensure that children and staff had resources to manage and mitigate health risks. Beyond providing these kits, KSCF facilitated training on their proper use, empowering staff and caregivers with the knowledge and skills needed to enhance infection control practices.

Recognizing the psychological toll of the pandemic, KSCF also arranged psychosocial support services, helping both children and caregivers cope with pandemic-induced stress and trauma.

In addition to these core activities, the Foundation extended emergency aid to 100 of the most vulnerable children within these institutions, ensuring they had access to basic necessities such as food, safe shelter, and targeted psychological care to support emotional resilience. Through these concerted efforts, the project not only improved immediate health and safety conditions but also fostered a more supportive, resilient environment, equipping children, and caregivers with essential tools to face ongoing and future challenges with greater preparedness.

OBJECTIVES OF THE PROGRAM

Providing medical and sanitation kits for children living in 258 Child Care institutions.

Emergency support to 100 vulnerable and affected children.

Training and sensitisation sessions for children and staff of Child Care Institutions — Each training session covered 5 CCIs.

ABOUT BAJAJ AUTO LTD.

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT THE NGO PARTNER

Kailash Satyarthi Children's Foundation (KSCF), founded by Nobel Peace Laureate Kailash Satyarthi, is a leading organization dedicated to child protection and development, aiming to create a world free from violence against children. Building on Mr. Satyarthi's decades of pioneering work, KSCF addresses critical issues such as child labour, trafficking, child marriage, sexual abuse, education, and health, through holistic and collaborative efforts with governments, businesses, civil society, and communities. The Foundation's mission is to protect child rights by ensuring safety, rehabilitation, education, and health while advocating for global and national policy changes and raising awareness through campaigns. KSCF also works towards capacity building and creating a global platform to share best practices in child rights and protection, positioning itself as a trusted leader in the fight for every child's right to a safe, healthy, and educated life.

INTERACTION WITH NURSE AT SAMARPAN SANSTHAN

CHAPTER 5
RESEARCH METHODOLOGY

Students at Computer Lab - Bal Ashram

Bajaj Auto Limited had appointed SoulAce to assess the impact of its CSR initiative, designed to support to support vulnerable children during the COVID-19 pandemic.

OBJECTIVES OF THE STUDY

The primary objectives of the study were to:

- Gather in-depth insights into the program's immediate effects and long-term impacts on the target beneficiaries.
- Understand the program's role in enhancing the overall well-being of children in CCIs through detailed accounts and narratives.
- Provide insights into the strengths and areas for improvement of the program implementation from various perspectives.

QUALITATIVE METHOD

This evaluation utilises qualitative techniques to capture rich, subjective experiences and perspectives, offering a deeper understanding of the program's impact. Key informant interviews and stakeholder engagement activities were conducted to gather personal experiences, observations, and contextual details from the target beneficiaries and stakeholders. The research design adopted a descriptive approach to provide a nuanced understanding of program implementation. This approach was particularly suitable for exploring complex interactions, perceptions, and attitudes towards the initiative. By using qualitative research methodologies within a descriptive framework, the study provided a comprehensive evaluation of the program, offering insights into its practical impact and areas for enhancement.

DESIGN SNAPSHOT

Name of the project

KSCF'S COVID-19 Response for Children

Implementing agency

Kailash Satyarthi Children's Foundation

Research design used

Descriptive research design

Sampling technique

Purposive and Random Sampling

Sample size

50 stakeholders

Qualitative method used

Key informant Interview, Stakeholder Engagement

KEY STAKEHOLDERS

CCI Stakeholders

STUDY TOOLS

An interview guide was developed for directing conversations, with pre-identified focus areas and indicators. The guide facilitated open-ended discussions around program impact, implementation experiences, and perceived benefits and challenges.

Questionnaires for primary beneficiaries:
An interview guide questionnaire was crafted to review project details for each focus area, with indicators predefined before conducting the surveys.

COMMITMENT TO RESEARCH ETHICS

INFORMED CONSENT

The study followed strict guidelines regarding informed consent. Participants were fully informed about the study's goals, procedures, and possible risks and benefits. They were encouraged to ask questions and were able to make well-informed decisions.

CONFIDENTIALITY

Steps were implemented to uphold the confidentiality and privacy of participants. Data gathered was securely stored and accessible only to authorised individuals. Participant identities were safeguarded, and any personal details were either anonymised or coded to preserve confidentiality.

VOLUNTARY PARTICIPATION

Participation in the study was completely voluntary, and individuals had the liberty to decide whether or not they wished to participate. There was no coercion or undue influence to compel individuals to take part in the study.

ETHICAL TREATMENT

Participants were treated with respect, dignity, and impartiality throughout the study, prioritising their well-being and rights. Any necessary assistance was provided to ensure their comfort and understanding.

PLAYGROUND - SOS VILLAGE

CHAPTER 6
MAJOR FINDINGS

The chapter analyses the qualitative findings to create a holistic picture of the impact of the program on the underserved beneficiaries.

GEOGRAPHICAL COVERAGE

The intervention was implemented in Maharashtra and Rajasthan.

OUTREACH AND INCLUSIVITY

The primary beneficiaries of the program were children in Childcare Institutions.

FINDINGS AND ANALYSIS

ROLE OF COVID-19 KITS IN ENSURING HEALTH AND SAFETY

Child Care Institutions (CCIs), where many already faced limitations in health, hygiene, and emergency response systems, were further intensified by the pandemic. As congregate settings with high densities, CCIs were particularly susceptible to viral spread, yet they often lacked the necessary protective infrastructure to mitigate risks for both children and caregivers. This scarcity of resources, coupled with inadequate access to external healthcare support, heightened the urgency for immediate health interventions. The distribution of COVID-19 care kits by Bajaj Auto Limited and Kailash Satyarthi Children's Foundation (KSCF) became essential in addressing these gaps. These kits provided critical supplies—sanitisers, masks, PPE, oxygen equipment, oximeters, and thermometers—that empowered caregivers to uphold basic health protocols, manage hygiene, and monitor symptoms on-site. For example, caregivers like Savita Parmeswar Khadale at Mahila V Balvikash Vibhag used the kits to distribute essential protective items, bolstering daily protective measures. This added a layer of security, which became a lifeline for institutions striving to safeguard vulnerable populations. Health monitoring equipment such as oxygen concentrators and oximeters proved invaluable for CCIs, enabling immediate responses to health issues without dedicated healthcare personnel. This sense of autonomy allowed caregivers to assess and manage symptoms promptly, offering both practical and psychological reassurance during an unpredictable period. The availability of such resources not only improved daily health and safety protocols but also contributed to the broader resilience of CCIs, supporting their ability to manage crises and adapt to unprecedented public health challenges effectively.

CASE STUDY 1

During the COVID-19 pandemic, Bal Ashram in Viratnagar, Jaipur—a shelter established by the Kailash Satyarthi Children's Foundation—found itself on the front lines of an unprecedented health crisis. With a campus that houses up to 100 children, primarily rescued from child labour, Bal Ashram's staff and leadership faced unique challenges in safeguarding both the children and the broader community. Adesh Kumar Sharma, Associate Program Director at Bal Ashram, recounts how essential COVID care kits provided by Bajaj Auto Limited became a lifeline for managing health risks during the pandemic.

These kits, equipped with masks, sanitisers, oxygen concentrators, and thermometers, were indispensable in keeping the ashram safe. According to Mr. Sharma in his FGD, the kits allowed the ashram's staff to maintain a safer environment by enforcing stringent hygiene protocols, monitoring symptoms, and facilitating social distancing.

The provision of oxygen concentrators, particularly valuable during widespread oxygen shortages, enabled staff to respond proactively to any potential health emergencies, offering both practical and psychological reassurance to those on site.

The impact of these resources extended beyond Bal Ashram's gates. Staff set up community distribution points where they offered masks and sanitiser to the local population, ensuring the surrounding villages also benefited from heightened health measures. Vehicles were sanitised, temperatures were monitored, and masks were produced at the ashram's sewing centres for distribution. The careful, strategic use of these kits, through the support of Bajaj Auto Ltd., was integral in preventing any COVID-19 cases within Bal Ashram.

DINING HALL - BAL ASHRAM

IMPACT ON DAILY OPERATIONS AND ROUTINES

The pandemic further exposed the vulnerabilities within Child Care Institutions (CCIs), where resource constraints and high-density living conditions heightened the risk of viral spread. Many CCIs, serving children rescued from difficult circumstances such as child labour or homelessness, faced a dual challenge: protecting the physical health of residents while also managing the emotional strain that the pandemic imposed on children and staff alike. Without adequate health infrastructure, these institutions struggled to maintain safety standards, making them particularly susceptible to outbreaks.

The introduction of COVID care kits addressed these vulnerabilities by equipping caregivers with essential supplies—sanitisers, masks, PPE, and thermometers—to prevent the spread of infection. These resources catalysed a transformation in daily routines, establishing safety protocols as standard practice across CCIs like Bal Ashram Gram and Mahila V Balvikash Vibhag. Caregivers integrated mask-wearing, regular hand sanitisation, and temperature checks into their caregiving routines, creating a disciplined, sanitised environment that protected both children and staff. The presence of these kits also enabled institutions to cultivate a structured approach to health, turning what was initially a crisis response into a routine practice that reinforced stability. A notable shift occurred as children began to actively participate in these protocols. At Bal Basera Bal Grah, for example, children adapted well to the new hygiene practices, demonstrating cooperation and acceptance that lightened caregivers' responsibilities and nurtured a culture of shared responsibility. By involving children in maintaining their own safety, CCIs empowered them to play an active role in health security, fostering resilience and reinforcing their sense of self-worth in the process. This sense of agency and cooperation not only reduced the caregiver's burden but also instilled a sense of normalcy and order, which was essential for maintaining a stable, supportive environment amid uncertainty.

These enhanced protocols underline the need for resources that address both immediate health risks and long-term well-being in CCIs. The implementation of structured hygiene routines transformed CCIs into more resilient, secure environments, where health security became a collaborative effort, fostering both physical and emotional safety for all residents.

ADAPTABILITY AND EMOTIONAL IMPACT ON CHILDREN

The rapid spread of COVID-19 exposed the inherent vulnerabilities within Child Care Institutions (CCIs), which serve children who often come from challenging backgrounds, including those who have experienced child labour, family separation, or abuse. These children, already navigating the complexities of their past experiences, were now faced with an additional layer of stress and uncertainty due to the pandemic. The crowded settings of many CCIs and limited healthcare resources heightened the risk of viral transmission, underscoring an urgent need for health and safety protocols that these institutions were often unprepared to implement fully. In this context, the provision of COVID care kits was transformative, equipping caregivers with the tools to integrate essential safety measures into daily routines. At CCIs like Bal Basera Bal Grah and Mahila V Balvikash Vibhag, caregivers observed that, though initially challenging, children adapted quickly to the new protocols of mask-wearing, hand sanitising, and social distancing. This adaptability revealed the resilience of the children, who responded positively to structured guidance, underscoring their capacity to acclimate under supportive frameworks.

Beyond protecting physical health, visible health precautions—such as sanitisers, masks, and thermometers—offered vital emotional security. Reports from Bal Ashram Gram and Surman Sansthan noted that these measures provided children with a sense of safety and protection, reducing anxieties around illness and fostering a secure environment. For children who had already endured trauma, this emotional support was invaluable. It allowed them to focus on their personal well-being and healing, reinforcing stability amid a turbulent period. These COVID kits ultimately helped CCIs create a safety net that addressed both the immediate health risks and the deeper emotional needs of children, promoting a holistic sense of well-being. This blend of physical and emotional security not only provided stability but also helped children regain a sense of normalcy, proving critical in fostering resilience within these vulnerable populations.

TRAINING AND SENSITIZATION FOR HEALTH AND HYGIENE IN CHILD CARE INSTITUTIONS (CCIS)

The COVID-19 pandemic brought unprecedented challenges to Child Care Institutions (CCIs), particularly in maintaining health and safety standards. Recognising the vulnerability of children and the critical role of caregivers in CCIs, this program aimed to train and sensitise both staff and children in five selected CCIs. Through focused training and sensitisation sessions, the program sought to instil practices such as regular sanitisation, proper mask usage, and personal hygiene, building a proactive culture of health awareness and preparedness that would endure beyond the immediate pandemic response. This led to significant changes in caregiving routines at Mahila Va Bal Vikas, located in Mudwa, where Savita was responsible for distributing essential items, including sanitisers, masks, and medicines, among both staff and children. This inclusion of hygiene protocols as a standard routine highlights the adaptability of staff and children in CCIs when supported with proper training and resources. For example, the consistent use of masks and sanitisers within the institution became a normalised aspect of daily life at CCIs. This level of understanding highlights the program's success in equipping staff with practical skills and health knowledge that support safe caregiving practices. The routine application of these items not only facilitated infection control but also had a reassuring effect on the children, fostering a sense of security.

CASE STUDY 2

Mahila Va Bal Vikas, the introduction of COVID-19 care kits and training transformed health and hygiene practices among both caregivers and children. Junior Caregiver Savita Parmeswar Khadale, who received the training, played a central role in distributing essential items like sanitisers, masks, and medicines while also ensuring that hygiene protocols were fully adopted. Through structured training sessions, caregivers gained a clear understanding of each item in the kit, which allowed them to enforce regular mask-wearing, hand sanitising, and other safety measures. These practices, initially introduced as pandemic responses, quickly became routine, normalising hygiene behaviours and enhancing overall health standards. Children adapted well to these practices, and caregivers observed a notable reduction in common illnesses like colds and flu, indicating a positive shift in health outcomes. The training empowered caregivers by providing them with the skills and confidence needed to maintain a safe environment, contributing to their own sense of security, and highlighting the relevance of the training.

Feedback from participants underscores the program's impact on the overall health and hygiene culture within the CCI. Through structured training, staff members integrated COVID-19 care kit items into their routines, reflecting the program's success in embedding lasting changes in hygiene practices. The consistent use of masks, regular sanitisation, and preventive health measures have now become habitual practices among staff and children. Institutions like SOS Village Jaipur and Surman Sansthan have adopted these practices permanently, signifying the long-term benefits of the program's training sessions.

EMERGENCY SUPPORT TO VULNERABLE CHILDREN

Beyond physical protection, the presence of COVID-19 care kits had a profound psychological impact on both children and caregivers. Children at institutions like **Surman Sansthan and Aashray Care Home** reported feeling reassured by visible health measures, which reduced anxieties around illness and created a secure environment. Caregivers also benefited from this support, experiencing a sense of solidarity as these resources symbolised communal support. For instance, **Sunita Saini** at Aashray Care Home expressed how donated masks and sanitisers provided not only protection but also hope, highlighting how these tools strengthened morale and reduced emotional stress during a time of widespread fear.

One of the lasting effects of the program was the way children adapted and accepted new health protocols. For example, at **Bal Basera Bal Grah**, children initially faced challenges with mask-wearing and sanitisation but soon cooperated fully, helping foster a disciplined environment that supported health security.

CASE STUDY 3

In the midst of this crisis, the COVID care kits donated to Naya Savera Society became indispensable. Each kit contained masks, sanitisers, oximeters, and oxygen concentrators, which allowed Naya Savera Society staff to respond swiftly, providing emergency support to vulnerable children. The PPE kit, which the staff referred to in FGD as his "uniform of safety," allowed him to fulfil his duties while minimising his own exposure to the virus and ensuring that children were also safe. The oximeters provided critical support in monitoring children's oxygen levels, enabling them to identify any signs of deterioration early. Oxygen concentrators became lifesaving tools, providing immediate support in cases where children or staff exhibited severe symptoms of COVID-19. These resources provided by the emergency support initiative were essential in managing health crises that might have otherwise overwhelmed the institution.

The presence of COVID care kits not only addressed immediate health risks but also had a profound psychological impact on both the children and the caregivers. For the children, these visible safety measures reassured them that they were being protected, which reduced their anxiety about the virus. For Babu Lal, these resources represented solidarity and support from the broader community, strengthening his resolve to continue his work under challenging circumstances. The kits served as a morale booster, reminding him and his colleagues that they were not alone in their mission to protect and care for vulnerable children during the pandemic.

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

The distribution of COVID care kits in Child Care Institutions (CCIs) empowered caregivers and children to prioritise health and hygiene amidst the pandemic. Caregivers, equipped with essential items like masks, sanitisers, PPE, and thermometers, gained the confidence to maintain safety protocols effectively, ensuring immediate health responses in high-density environments. For the children, adopting these new routines promoted a sense of agency and participation, helping them feel protected and valued. This proactive approach enhanced children's resilience, instilling a sense of security and stability even in uncertain times.

COMMUNITY LEVEL

At the community level, the program fostered a protective environment around CCIs, where health and safety became a shared priority. Institutions like Bal Ashram extended the impact by distributing masks and sanitisers to surrounding communities, helping to build a collective approach to hygiene. This initiative not only safeguarded the children and staff within CCIs but also inspired community members to adopt preventive health measures, creating a more health-conscious and supportive community that values the well-being of vulnerable children.

INSTITUTIONAL LEVEL

The COVID-19 care kits transformed daily operations within CCIs by embedding structured health protocols into everyday routines. These kits facilitated the development of safe, disciplined environments where sanitisation, mask-wearing, and symptom monitoring became routine. Staff and children alike participated in these practices, fostering a collaborative culture that emphasised both physical and emotional well-being. Institutions like Mahila Va Bal Vikas witnessed a positive shift in health outcomes, including fewer common illnesses, demonstrating the long-term benefits of these hygiene routines.

STATE LEVEL

The initiative aligns state-level goals to improve the health and safety standards within care institutions, particularly those serving marginalised children. Through collaborations, the program ensured that CCIs across Rajasthan, Maharashtra and other regions received essential health resources, reinforcing the state's commitment to safeguarding vulnerable children.

NATIONAL LEVEL

At the national level, this program supports India’s mission to promote public health and child welfare, aligning with the Sustainable Development Goals (SDGs) of good health and well-being (SDG 3) and reduced inequalities (SDG 10). By equipping CCIs with COVID care kits, the program has addressed both immediate health risks and contributed to a broader culture of preventive care.

CHAPTER 8
RECOMMENDATIONS

Establish avenues for mental health support, such as access to counselling or group support sessions, to help caregivers and children manage the emotional toll of crises in general. This could foster a healthier, more supportive environment.

Beyond immediate response, promoting ongoing hygiene practices such as hand washing, mask usage, and regular health check-ups could become foundational in preventing the spread of other communicable diseases. Visual aids like posters and routine health reminders can help normalise these practices in care facilities.

Supplying institutions with comprehensive health kits—including oximeters, thermometers, basic medicines, and oxygen supplies—could empower caregivers to respond quickly to a range of health situations, enhancing overall safety and preparedness.

09. SUSTAINABILITY

The COVID-19 Response for Children initiative, implemented by the Kailash Satyarthi Children's Foundation with the support of Bajaj Auto Limited, demonstrates strong sustainability through the integration of long-term health protocols into daily practices across 258 Child Care Institutions (CCIs) in Rajasthan and Maharashtra. Beyond emergency relief, the program embedded structured hygiene routines, including regular use of masks, sanitizers, and thermometers, which have now become institutional norms. Training sessions empowered caregivers with practical skills and knowledge, enabling them to independently maintain safety standards even post-pandemic. The project's emphasis on capacity-building, along with the emotional and psychological support extended to children and staff, fostered resilience and self-reliance. Altogether, the program's holistic and collaborative approach has laid the groundwork for enduring improvements in child well-being and institutional preparedness.

CHAPTER 10
CONCLUSION

The COVID-19 response initiative implemented by the Kailash Satyarthi Children's Foundation (KSCF) and supported by Bajaj Auto Ltd. provided critical health and safety resources to Child Care Institutions (CCIs) across Maharashtra and Rajasthan. Through the distribution of COVID care kits—including masks, sanitisers, PPE, oxygen concentrators, and thermometers—and targeted training, the program helped safeguard vulnerable children and their caregivers, creating a resilient, health-focused environment in CCIs. The initiative not only equipped caregivers with tools for immediate health response but also fostered a culture of hygiene, safety, and emotional security among children. Caregivers and children quickly adapted to new protocols, making daily safety routines a norm and demonstrating resilience and collective responsibility. The program's impact extended beyond physical health; it promoted psychological reassurance, reduced stress, and instilled a sense of safety and solidarity within these institutions. CCIs such as **Bal Ashram and Mahila V Balvikash Vibhag** witnessed a transformation in daily practices, with caregivers and children actively participating in maintaining a safe environment. Emotional support empowered children to navigate an uncertain period with greater stability, enhancing their overall well-being. The KSCF and Bajaj Auto Ltd. initiative successfully addressed both immediate and long-term needs in CCIs, embedding lasting changes in health and hygiene practices. By strengthening institutional resilience and instilling a sense of community support, the program proved instrumental in protecting vulnerable populations during the pandemic and laying the foundation for enduring health and safety standards in CCIs.

IMPACT ASSESSMENT REPORT

INCORPORATING MULTI SKILL FOUNDATION COURSE IN SCHOOL CURRICULUM

Implementing partner – Lend A Hand India (LAHI)

Release Date: 31-12-2024

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
FY	Financial Year
NGO	Non-Governmental Organisation
SDGs	Sustainable Development Goals
LAHI	Lend A Hand India
SMC	School Management Committee

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The project supported by Bajaj Auto and implemented by LAHI aims to empower underserved youth by providing them with essential vocational skills and knowledge to succeed in a rapidly evolving job market. Recognising the significant gaps in access to quality education and skill development, the program focuses on key areas such as Food Processing, Health Care, Energy and Environment, Agriculture, and General Engineering. By offering comprehensive training in these fields, the project seeks to equip young individuals with the technical expertise and employability skills needed to secure meaningful employment and contribute positively to their communities. In addition to technical training, the program emphasises the importance of improving confidence and awareness among participants regarding their career options. By integrating vocational skills into early education, the initiative, which is a part of the school curriculum, ensures that students not only gain practical skills but also develop a sense of freedom and choice in their career trajectories. Through this initiative, young people from marginalised backgrounds can access valuable resources and support, ultimately paving the way for a brighter future.

PROJECT DETAILS

Implementation year

FY 2019 - FY 2023

Assessment year

FY 2024 - FY 2025

Implementing Partner

Lend A Hand India

Project location

Udham Singh Nagar, Nagara, & Dehradun, Uttarakhand; Sikar and Jaipur, Rajasthan

Beneficiaries

1,833 Students

Budget

₹1061 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

VOCATIONAL SKILLING INTEGRATION

Introducing vocational skills as part of the school curriculum to provide students with hands-on training in various trades, helping them gain practical skills alongside their academic education.

EARLY CAREER AWARENESS SESSIONS

Conducting awareness programs to educate students about diverse career options and the skills required for each, fostering informed decision-making from an early stage.

CAREER COUNSELLING

Offering individualised counselling sessions that assist students in exploring their interests and strengths, guiding them in choosing suitable career paths aligned with their vocational training.

COMMUNITY AND GOVERNMENT INVOLVEMENT

Engaging local government bodies, community members, school teachers, and trainers to support and promote the vocational program, ensuring a collaborative approach to student development and success.

INTERACTION WITH THE PARENTS

SOULACE TEAM INTERACTING WITH THE STUDENTS

FOCUS ON LONG-TERM GOALS

Helping students understand how vocational skilling contributes to achieving their larger career aspirations, reinforcing the value of practical training in their overall educational journey.

The project aligns with several Government of India initiatives:

SKILL INDIA MISSION

The vocational skills training in fields such as Food Processing, Health Care, Energy, and Environment, Agriculture, and General Engineering, along with awareness of employability opportunities, aligns with the Skill India Mission, which aims to equip youth with market-relevant skills to enhance their employability.

MAKE IN INDIA

The industry-endorsed practical training, industry tie-ups, and placement support align with the Make in India initiative, which encourages skill development in sectors that contribute to India's manufacturing and economic growth.

ATMANIRBHAR BHARAT (SELF-RELIANT INDIA)

The focus on empowering disadvantaged youth with skills, potential mapping, and job placement assistance contributes to creating a self-reliant workforce, aligning with the Atma Nirbhar Bharat initiative.

Key Findings

IMPROVED EXPECTATIONS MET

97.9%

of the respondents felt the training program met their expectations.

HANDS-ON EXPERIENCE

98.3%

of the respondents agreed that the training provided sufficient hands-on experience.

COURSE CONTENT

99.1%

of the respondents found the course content easy to understand.

LEARNING MATERIALS

95.3%

of the respondents believed the learning materials and resources were adequate.

TRAINING DURATION

90.1%

of the respondents felt the duration of the training was adequate for mastering the skills.

PACE OF TRAINING

97.9%

of the respondents reported being able to keep up with the pace of the training.

Key Impact

CONFIDENCE AND EMPLOYABILITY

93.1%

of the respondents stated that the training increased their confidence in using vocational skills.

87.1%

of the respondents agreed that the program would help them find job opportunities, showing its career-oriented benefits.

EDUCATIONAL VALUE

98.3%

of the respondents felt the program was a valuable addition to their education.

94.0%

of the respondents considered the skills learned relevant to their career goals.

SATISFACTION

97.9%

of the respondents were satisfied with the program's pace and content, and 98.3% appreciated the hands-on experience provided.

FUTURE PLANS

33.0%

of the respondents plan to use these skills in daily life, and 21.9% aim to start a business, reflecting the program's entrepreneurial influence.

IMPACT OF TRAINING

96.1%

of the respondents reported significant improvement in vocational skills, and 93.6% noted better school attendance due to vocational training.

67.8%

of the respondents applied these skills in school assignments or projects, showing practical relevance.

78.9%

of the respondents felt that vocational training significantly improved their learning experience.

SOCIETAL IMPACT

60.0%

of the respondents used skills to assist family and community, indicating a broader societal benefit beyond personal growth.

03. OECD FRAMEWORK

RELEVANCE

The relevance of the program is evident as it addresses the significant gaps in vocational education and job readiness for underserved youth in India. By focusing on essential skills in areas like food processing, healthcare, and general engineering, the program equips students with the knowledge needed to thrive in a rapidly changing job market. This alignment with current industry demands ensures that students gain valuable skills that enhance their employability.

COHERENCE

The program shows coherence by aligning its objectives with the broader goals of enhancing vocational skills among underserved youth. It effectively integrates vocational training into the school curriculum, ensuring that the training provided is consistent with students' educational needs and future career aspirations. This structured approach helps create a seamless learning experience, making it easier for students to transition from education to employment.

EFFECTIVENESS

The program has proven effective in meeting its objectives, with high levels of satisfaction reported by students regarding the training received. Key findings indicate that participants felt confident in their skills and recognised the relevance of the training to their future careers. Many students expressed increased interest in their vocational subjects and showed a positive change in their attitudes toward school, indicating that the program effectively engages and motivates learners.

EFFICIENCY

The program operates efficiently by making optimal use of available resources, including trained staff, educational materials, and designated training spaces. With three hours allocated weekly for vocational training, students receive focused instruction without overloading their schedules. The structured curriculum and hands-on training approach help maximise learning outcomes within the given time frame, ensuring that students gain practical skills alongside their academic education.

IMPACT

The program's impact is significant, as it not only improves students' vocational skills but also enhances their overall learning experiences. Key findings reveal that many participants have applied their newly acquired skills in real-life situations and have developed a clearer understanding of the career paths available to them. The program contributes to individual empowerment, boosts confidence, and opens up new employment opportunities for youth, ultimately contributing to economic growth and reducing social inequalities in the community.

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

SUSTAINABILITY

The program demonstrates sustainability through its potential for long-term impact on students and the community. By integrating vocational training into the school system, it ensures ongoing access to skill development for future cohorts. The involvement of stakeholders, including schools and community organisations, enables a supportive environment for continued training, increasing the program's chances of enduring success and relevance over time.

CHAPTER 4
INTRODUCTION

GROUP DISCUSSION WITH STUDENTS AT LUNIYAWAS

NEED OF THE PROGRAM

The need for this program in India arises from significant gaps in access to quality education, skill development, and employment opportunities, particularly for underserved youth. Many young individuals, especially from marginalised backgrounds, struggle to secure the resources and guidance necessary to thrive in an increasingly competitive job market. As industries evolve and the demand for skilled professionals grows, this program aims to bridge these gaps by providing specialised vocational training alongside essential employability skills and industry exposure.

When such programs are coupled with state-level participation, they further enhance access and effectiveness by integrating vocational training into the school curriculum. This approach ensures that a larger number of students benefit from essential skills early on, preparing them for future employment opportunities. By strengthening community involvement and creating supportive learning environments, these initiatives supported by Bajaj Auto Ltd and implemented by LAHI not only empower individuals but also contribute to broader economic growth and reduce social inequalities, ultimately building a skilled workforce ready to meet the challenges of a changing job market.

OBJECTIVES OF THE PROGRAM

The objective of the program is to empower underserved youth by equipping them with the skills and knowledge necessary to thrive in a rapidly changing job market. By providing comprehensive training in areas such as Food Processing, Health Care, Energy and Environment, Agriculture, Gardening/ Landscape, and General Engineering, along with essential employability skills, the program aims to prepare participants to be job-ready and competitive within their respective industries.

Offering vocational skills at an early age ensures that these young individuals gain not only technical expertise but also the confidence and awareness needed to navigate various career trajectories. This holistic approach empowers a sense of freedom of choice and provides the necessary support to help them secure meaningful employment, ultimately contributing to their personal and professional growth.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – LAHI

Lend a Hand India (LAHI) is an organisation dedicated to empowering young people with skills for employment and entrepreneurship by incorporating vocational education into the school curriculum. LAHI collaborates with government and government-aided schools to prepare students for the workforce. The organisation sets up specialised labs with essential tools and equipment, recruits, and trains vocational trainers, and organises internships, providing students with hands-on experience. LAHI also extends technical and project management support to state governments to scale up vocational education. Their program, which is taught one day per week for over two years for students in grades 9 and 10, covers a range of competencies, including intrapersonal and interpersonal skills, cognitive abilities, attitudes, values, and entrepreneurial knowledge. Through these initiatives, LAHI helps build a generation of skilled, confident, and capable young individuals ready to meet modern workforce demands.

INTERACTION WITH THE NGO PARTNER

CHAPTER 5
RESEARCH METHODOLOGY

The third-party impact assessment conducted by SoulAce for the program was supported by Bajaj Auto and implemented by LAHI, aims to evaluate the effectiveness and impact of vocational training on students. The assessment will gather insights into students' experiences, decision-making processes regarding vocational courses, and the overall benefits gained from the program.

OBJECTIVES OF THE STUDY

The objective of assessment is to analyse following:

- Students' decision-making process for choosing the vocational course.
- Quality of orientation and counselling received before joining the program.
- Influence of vocational training on students' interest in other subjects and school attendance.
- Practical applications of the skills learned in real-life situations.
- Overall satisfaction with the training experience and recommendations for improvement.

RESEARCH DESIGN

This study employs a Mixed-Method Approach, integrating both quantitative and qualitative techniques to provide a comprehensive understanding of the project's outcomes. Quantitative methods involve structured surveys administered to a sample of 233 beneficiaries selected through simple random sampling. Qualitative methods include in-depth interviews conducted with key stakeholders, including principals, parents, vocational skills trainers, and school management committee members. These methods aim to gather insights into the project's impact from diverse perspectives and to triangulate findings for robust assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods include in-depth interviews conducted with key stakeholders, namely principals, parents, vocational skills trainers, and school management committee members. These interviews aim to gather detailed insights into the quality of skills imparted as part of the curriculum, orientation of the courses, counselling of the courses, and awareness and decision-making of the youth. Qualitative data enriches the study by providing contextual understanding and personal viewpoints crucial for evaluating project impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative methodologies involve structured surveys administered to a sample of 233 beneficiaries selected through simple random sampling. This approach ensures representative data collection and allows for statistical analysis to measure the project's effectiveness in skilling and developing underserved youth towards sustainable placements.

ENSURING TRIANGULATION

To enhance the credibility and reliability of research findings, triangulation is employed by integrating data from both quantitative surveys and qualitative interviews. This approach ensures comprehensive validation of findings, reduces biases, and provides a robust assessment of the introduction of vocational skilling programs as school curriculum, the orientation of the programs, the effectiveness of the training, and awareness of choices linked with career opportunities by LAHI.

RESEARCH DESIGN

Name of the project

Incorporating Multi Skill Foundation Course in School Curriculum

Implementing agency

Lend A Hand India

Research design used

Descriptive research design

Sampling technique

Stratified random sampling and purposive sampling

Sample size

233 students

Qualitative method used

Semi-structured interviews, testimonials and surveys with beneficiaries

SAMPLING FRAMEWORK

The study includes in-depth interviews with key stakeholders and data collection from beneficiaries through simple random sampling. This sampling strategy is designed to capture diverse perspectives and experiences within the beneficiary population, reflecting the socio-economic and demographic diversity.

DATA COLLECTION

Primary data collection involves structured surveys administered in person and supplemented by in-depth interviews conducted face-to-face with key stakeholders. The use of mixed methods and technology ensures accuracy, efficiency, and real-time insights into the project's implementation and impact on hospital operations.

COMMITMENT TO RESEARCH ETHICS

The research adheres to stringent ethical guidelines to protect participant confidentiality, ensure informed consent, and uphold data security throughout the study. Ethical considerations are paramount to maintaining the integrity and validity of the research process and respecting the rights and privacy of all stakeholders involved.

SENIOR SOULACE TEAM MEMBER INTERACTION WITH THE STUDENTS

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Khushi Singh is a 14-year-old student at the Government Sindhi Senior Secondary School, currently in the 11th grade. She participated in a vocational training program in general engineering, which she chose after receiving guidance from her vocational trainers. Before joining, Khushi received clear information about the program, which helped her understand what to expect. The training allowed her to gain valuable practical skills that she has put to use in her community. She has assisted her friends and neighbours with various tasks, such as fixing items and helping organise local events.

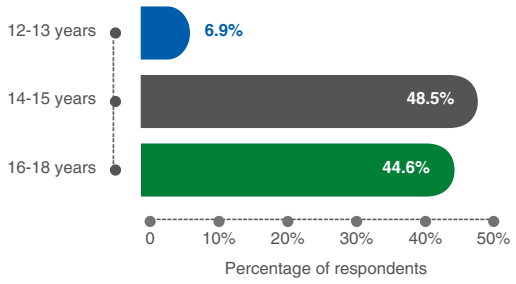
The skills Khushi learned have not only boosted her confidence but also enriched her overall learning experience at school. She plans to apply her engineering skills in daily life, helping her family and community with various projects. Khushi feels that the vocational training program has been very beneficial and has significantly increased her interest in learning. She is eager to recommend this training to her peers, believing it can help others as much as it has helped her.

”

CHAPTER 6
KEY FINDINGS

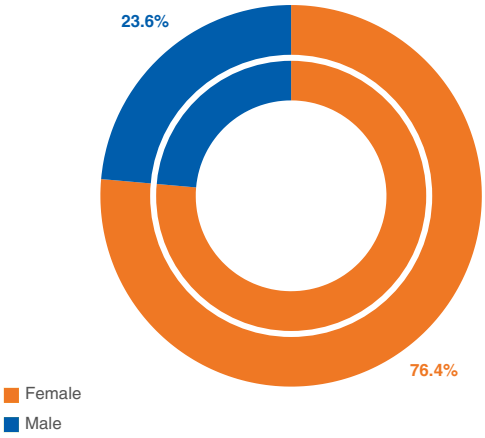
This chapter provides a detailed overview of the key findings from the comprehensive Impact Assessment study. Through extensive surveys and in-depth interactions with key stakeholders, the study provides valuable insights into the program's impact on improving educational outcomes and enhancing the well-being of youth through skill development.

CHART 1: AGE-WISE DISTRIBUTION OF THE RESPONDENTS



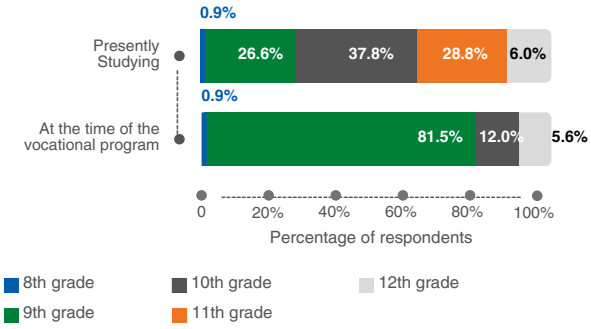
The respondents in this assessment are predominantly between the ages of 14 and 18, with almost half falling within the 14-15 age range and nearly the rest in the 16-18 age group. The 12-13 age group makes up a small fraction of the total. This distribution suggests that the program engages primarily with mid to late adolescents, indicating a focus on addressing the needs and challenges of youth nearing or in their high school years.

CHART 2: GENDER OF THE RESPONDENTS



The majority of the respondents in this survey are female, making up over three-quarters of the total, while males represent a smaller segment. This indicates that the program is engaging more with female participants, suggesting a possible emphasis on reaching young women, perhaps to address gender-specific needs or promote gender equality in opportunities and resources for youth.

CHART 3: GRADE PRESENTLY STUDYING AND GRADE AT THE TIME OF THE VOCATIONAL PROGRAM OF THE RESPONDENTS



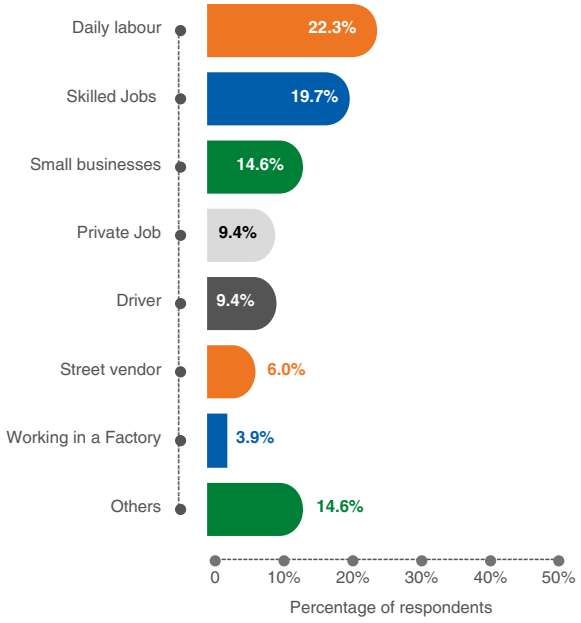
The educational levels of respondents reveal notable shifts since the time of the vocational program. Initially, the majority were in the 9th grade, with fewer respondents in higher grades. Currently, however, many have advanced to the 10th and 11th grades, indicating progression in their academic journey post-program. This progression suggests that the vocational program may have encouraged continued education, with the majority now pursuing higher secondary education, reflecting a positive academic impact on the participants.

DISCUSSION WITH MS SUSHILA MEENA, SR PHYSICS TEACHER AND MS. REENA MEENA, LAB ASSISTANT

Taskia is a 13-year-old girl currently in the 9th grade at GGIC Ajabpur Kalan. She chose to enroll in the vocational training program in Food Processing and Health Care based on the guidance provided by her vocational trainers. Taskia's father works in skilled jobs like carpentry, plumbing, and mechanics, which has influenced her understanding of the importance of practical skills.

Through the vocational training, Taskia has seen a significant improvement in her learning experience. She actively applies her skills to assist her family and community, whether it's helping with repairs or organising events. Additionally, she utilises problem-solving and teamwork skills from the program in her school projects and everyday challenges. Taskia values the program and appreciates how it has boosted her confidence and practical abilities.

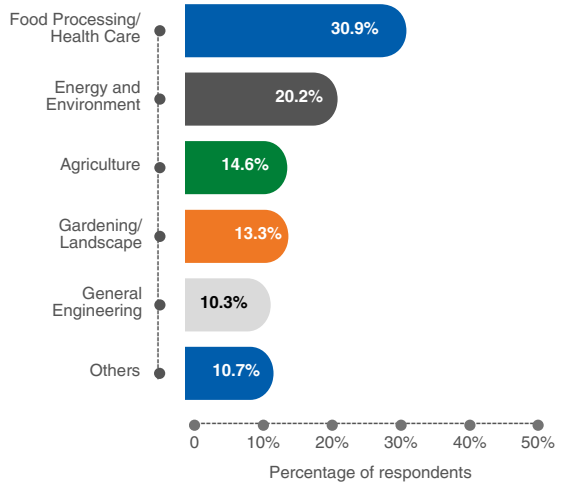
CHART 4: OCCUPATION OF RESPONDENTS' FATHER



The occupational data of respondents' fathers shows a significant portion working in daily labour or skilled jobs such as carpentry and mechanics, indicating a reliance on manual and skill-based work within the community. Smaller proportions are engaged in private jobs, driving, and small businesses, while others work as street vendors or factory employees.

This occupational spread reflects a community primarily engaged in informal or semi-skilled employment, with limited access to more stable, formal sector jobs. These insights can help inform targeted support initiatives, such as skill development or job readiness programs, which may benefit families in this demographic.

CHART 5A: NAME OF TRADE ENROLLED



The data on trade enrollment shows that the most popular courses among respondents are in Food Processing/Health Care, followed by Energy and Environment, and Agriculture. This suggests a strong interest in fields that have practical applications within community and sustainable living contexts. Smaller groups have opted for trades like General Engineering, Gardening/Landscaping, and various other fields, including Automotive Engineering and Beauty & Wellness. This distribution reflects a diversity of vocational interests, with a notable focus on trades that support health, sustainability, and essential community services.

INTERACTION WITH MR. SURENDRA KUMAR SHARMA, SR. TEACHER, SANSKRIT

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Dr. Samira Deoli, Principal of a government school serving grades 6th through 12th, has been instrumental in the implementation of LAHI's Multi-Skill Vocational Education Program, under Project Swadheen/Project Catalyst. With her 27 years of teaching experience, Dr. Deoli emphasises how the program has opened doors to self-employment opportunities for students, especially in courses like ITES, Beauty & Wellness, and Multi-Skill Foundation Courses (MSFC). Since its inception, the school has witnessed a notable increase in student engagement and interest in these vocational pathways, marking a shift from traditional subjects to a more hands-on, skills-oriented approach.

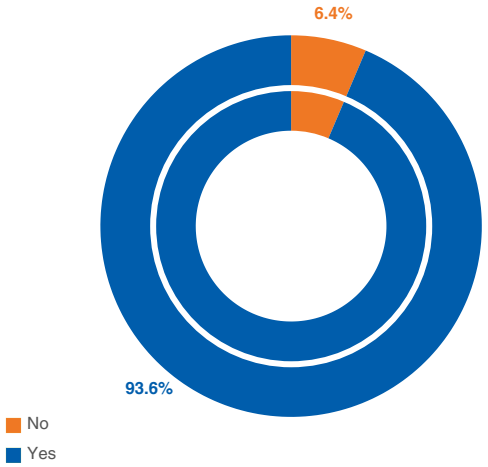
Implementing this program required adjustments to the school’s timetable and space management, with the practical sessions now needing longer periods for optimal learning. Thanks to LAHI's support, trainers were provided directly, which helped in overcoming resource constraints. Today, students have gained valuable skills in electricity management and other practical areas, leading to budding job opportunities. The program has not only enhanced students’ learning experiences but has also prepared them to step into the workforce with confidence and skill. Dr. Deoli believes the program has truly transformed the school’s environment by instilling a career-oriented approach in students, preparing them for a brighter future.

”

Nitin Kumar is a 17-year-old student in the 12th grade at Rajkiya Inter College in Nalapani. He chose to enroll in a vocational training program focused on agriculture, influenced by his parents and elder siblings who encouraged him to pursue this path. The training was explained to him clearly, helping him understand how it aligned with his interests. Through this program, Nitin has gained practical skills that he has used to enhance his school assignments and group projects.

Nitin feels that the vocational training has greatly improved his overall learning experience. He is excited about exploring career opportunities in agriculture after finishing school. The skills he has learned are not only applicable in his studies but also prepare him for future challenges. Nitin appreciates the training program and considers it very helpful, as it supports his academic growth and personal development.

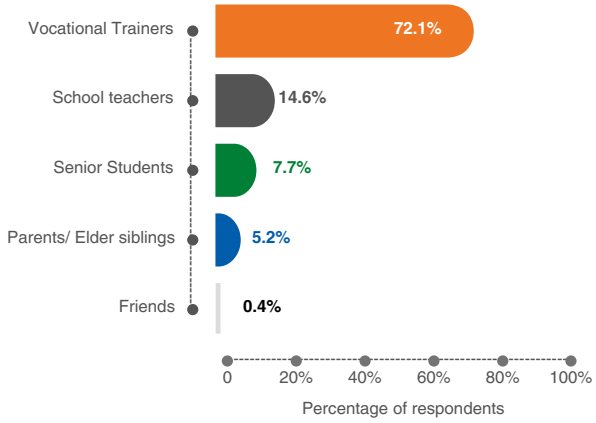
CHART 5B: CHOICE OF SKILLING PROGRAM AS PART OF CURRICULUM



The vast majority of the respondents selected vocational training as part of their curriculum, highlighting the strong integration of vocational programs into their educational experience. This high participation rate suggests that vocational training is widely accepted and valued among students, likely due to its relevance in enhancing practical skills and future employability.

A small minority opted out, which could indicate personal preferences or alternative career plans.

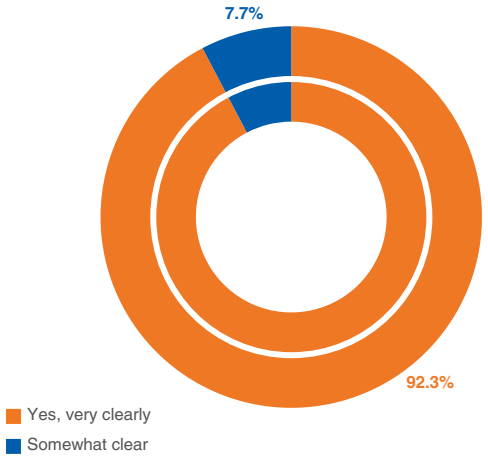
CHART 5C: PERSON FROM WHOM RESPONDENT GOT ORIENTATION



The majority of respondents received orientation or guidance about the vocational program from vocational trainers, emphasising the influential role these trainers play in program awareness and enrollment. The school teachers also served as a source of information for a notable portion, while guidance from senior students, family members, and friends was less common. This indicates that formal channels like trainers and teachers are the primary sources of program information, stating the importance of institutional support in guiding students toward vocational opportunities.

STUDENT DEMOSTRATING THE PROJECT MODULE

CHART 6: WHETHER OBJECTIVE WAS EXPLAINED

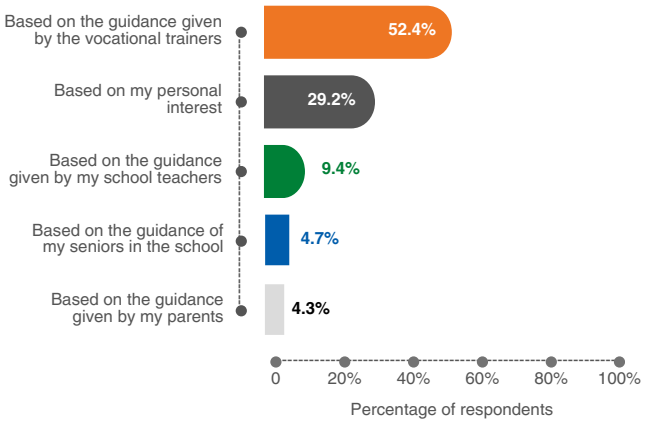


Almost all respondents reported that the vocational trainers explained the program's objectives and purposes very clearly before they joined. The clarity in communication likely contributed to better engagement and understanding of the program's value among participants. A small portion found the objectives only somewhat clear, suggesting that while overall communication was effective, minor improvements in pre-program orientation could further enhance understanding for all participants.

Siddharth Lodhi is a 14-year-old boy studying in the 9th grade at Mahatma Gandhi Government School. He enrolled in the vocational training program for Beauty and Wellness after receiving clear guidance from his vocational trainers. With a family background in small businesses, Siddharth was motivated to develop practical skills that would help him in his future career.

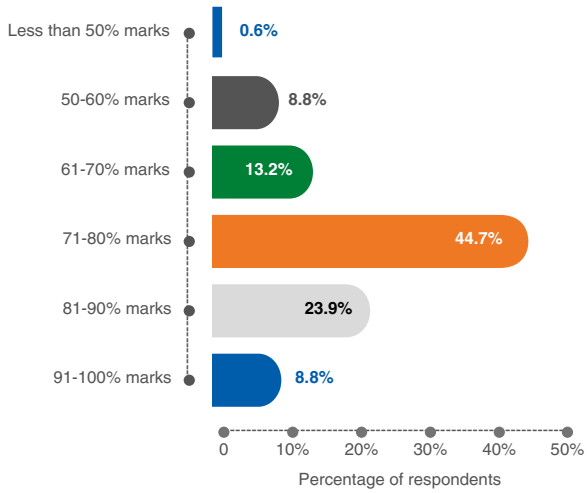
Through this vocational training, Siddharth has gained valuable skills that he has applied in real-life situations, such as helping with family projects. He feels that the training has significantly improved his overall learning experience and has increased his interest in both vocational skills and other school subjects. Looking ahead, he aims to explore career opportunities in the vocational field after finishing school. While he appreciates the program, he suggests increasing the duration of vocational classes to enhance learning further.

CHART 7: SELECTION CRITERIA OF VOCATIONAL SKILLING PROGRAM



The primary factor for selecting vocational courses among respondents was the guidance provided by vocational trainers, reflecting their significant influence on students' choices. A substantial number of courses were also selected based on personal interest, indicating that intrinsic motivation plays an essential role in course selection. Guidance from school teachers and seniors had a smaller impact, while parental advice was the least influential. This trend suggests that while trainers effectively guide students, encouraging personal interests alongside professional guidance could enhance course selection alignment with career aspirations.

CHART 8: PERFORMANCE OF THE RESPONDENTS ON ACADEMICS



The results from the final exams in the vocational courses indicate that most respondents performed well, with a significant number achieving high marks. A considerable proportion scored in the upper range, reflecting strong competency among participants. Very few scored below a satisfactory level, suggesting that the vocational training effectively prepared students with the necessary knowledge and skills. Overall, this distribution demonstrates the program's positive impact on educational outcomes for the learners.

“

Sheela Bisht, a lecturer with a decade of teaching experience, has been closely involved in the LAHI Multi-Skill Vocational Program as it was introduced in her school. Teaching English to grades 6, 11, and 12, she has observed a positive shift among her students, who now approach learning with more self-confidence and creativity. According to Ms. Bisht, the program has indeed opened up new opportunities for students, enhancing their enthusiasm and attendance, as well as their understanding of both vocational and regular subjects.

Ms. Bisht notes that scheduling has not posed significant challenges, and students have been responsive to both theoretical and practical aspects of vocational subjects. Regular assessments are conducted, and the marks from these vocational courses contribute positively to their overall grades. Field visits and guest lectures have also played a vital role in deepening students' practical understanding of the trades, making learning more impactful.

Ms. Bisht finds the program well-implemented, and says that no additional resources or changes are necessary as of now. The hands-on experiences provided have, in her view, successfully enhanced students' readiness for future career pathways, making the program an asset to their overall education journey.

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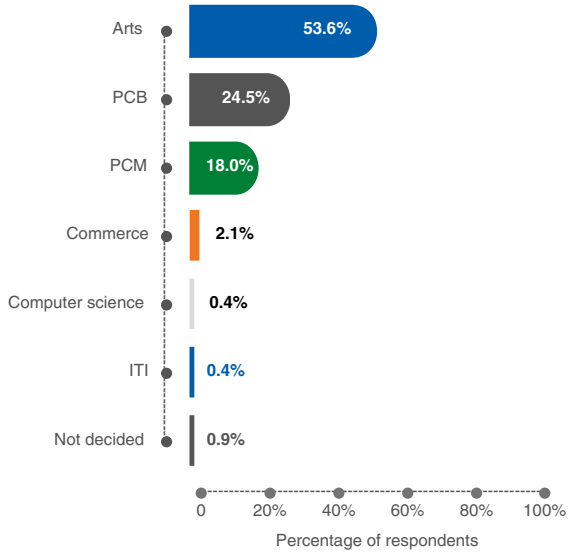
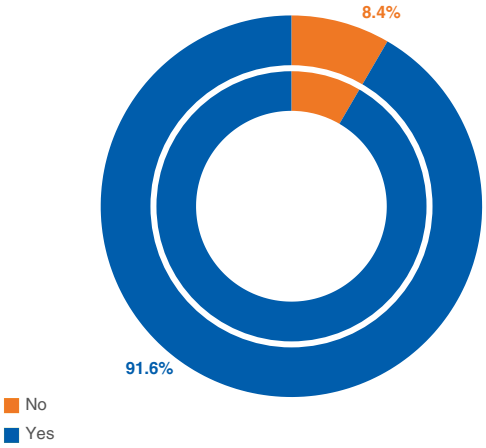
CHART 9: COURSE CHOICES FOR HIGHER SECONDARY PROGRAM



The choice of courses for higher secondary education among respondents reveals a strong preference for the Arts, indicating that a significant number of students are inclined toward subjects that allow for creative and social exploration. Science streams like PCB and PCM are also chosen, though they attract fewer students. A small fraction opted for Commerce, Computer Science, or ITI, while a couple remain undecided. This trend highlights the predominant interest in Arts, which may reflect the aspirations and career goals of the participants, suggesting that future programs might benefit from further aligning vocational training with the interests seen in higher secondary choices.

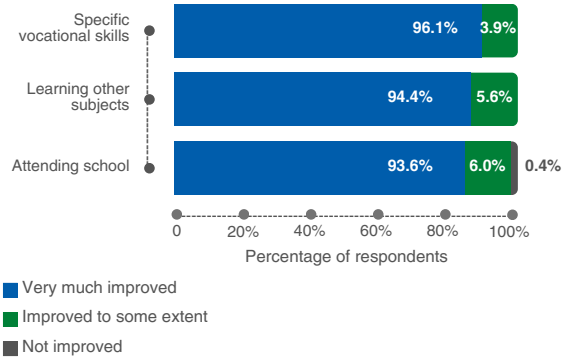
FGD WITH CLASS 9TH STUDENTS AT MGGS LUNIYAWAS

CHART 10: WHETHER CHOSEN COURSES ARE PART OF HIGHER SECONDARY PROGRAM



The majority of respondents indicated that they had chosen vocational courses as part of their higher secondary program, highlighting a strong integration of vocational training into their educational pathways. A small minority opted not to include these courses, suggesting that while the program is well-received, there may still be barriers for some students to fully embrace vocational subjects. This trend states the growing recognition of the value of vocational education in enhancing employability and practical skills among youth, which could inform future curriculum developments and outreach efforts.

CHART 11: LEVEL OF IMPROVEMENT IN VOCATIONAL SKILLS



The data indicates a significant positive impact of the vocational course on respondents' interest in vocational skills, learning in other subjects, and school attendance. A vast majority reported substantial improvements in these areas, suggesting that vocational training not only enhances specific skills but also promotes a more engaged and motivated learning environment overall. The minimal reports of limited improvement highlight the program's effectiveness in generating enthusiasm for education. This strong correlation reinforces the importance of vocational courses in promoting holistic development among students, encouraging further investment in such programs to sustain and amplify these benefits.

“

Salmun Bano, a housewife and mother of a 10th-grade student, shared her insights on the vocational education program her child attends. She expressed satisfaction with the school’s decision to introduce vocational training alongside regular academics, believing it provides valuable skills for future career pathways, including options like ITI or Polytechnic studies, or even enabling students to start their own ventures.

While the school guided the choice of vocational courses, Ms. Bano observed a notable improvement in her child’s confidence and practical knowledge, particularly with technology and devices. She appreciates that her child regularly shares what is learned in class, demonstrating an eagerness and deeper understanding of the vocational subjects. Ms. Bano also feels the school is well-equipped with resources and conducts the classes regularly. Teachers have updated her on her child’s progress, and she is fully satisfied with the program’s impact.

Without any further suggestions, Ms. Bano believes the vocational program is meeting their expectations, laying a solid foundation for future opportunities.

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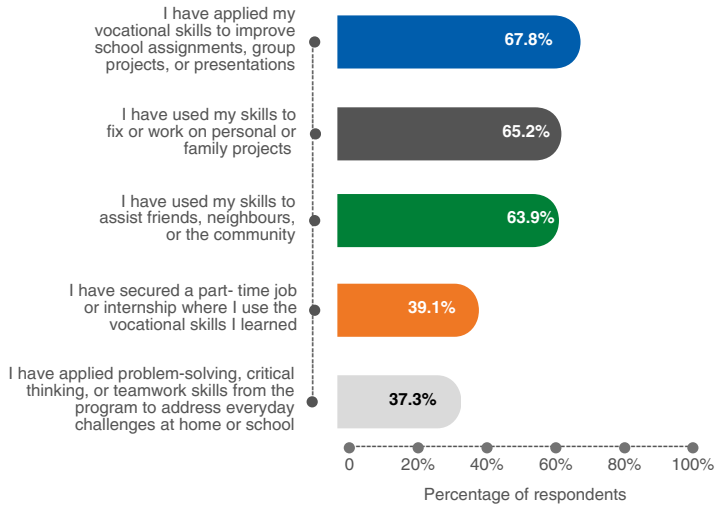
Kajal is a 15-year-old student from G.G.I.C Ajabpur Kalan, where she is currently in the 10th grade. Last year, she participated in a vocational training program focused on gardening and landscaping, which she chose based on her personal interest. Her school teachers provided her with clear guidance about the benefits of the course before she enrolled. Through this program, Kajal learned practical skills that she has applied to her daily life, including fixing items at home and working on small projects for her family. This hands-on experience has not only enhanced her confidence but has also made her more enthusiastic about her schoolwork.

Kajal's vocational training has significantly influenced her future plans. She aims to start her own business using the skills she gained during the course. She feels that this training has improved her overall learning experience, helping her connect better with her studies. Kajal appreciates the program and believes it has been very helpful.

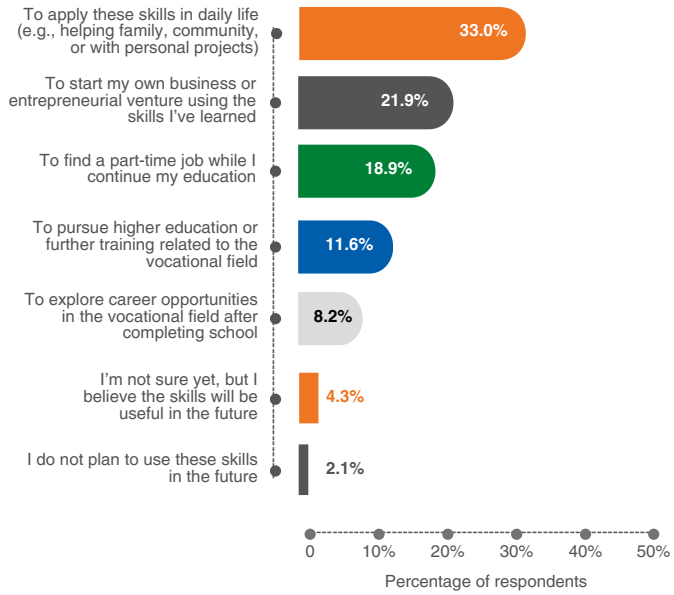
MAHATMA GANDHI SINDHI GOVERNMENT GIRLS SCHOOL (MGSGGS), JAWAHAR NAGAR

CHART 12A: USAGE OF SKILLS LEARNT IN REAL LIFE



The responses indicate that a significant number of participants have successfully applied the skills learned from the vocational program in various real-life situations. Many have utilised their vocational skills to enhance their schoolwork, engage in personal or family projects, and assist others in their community. Additionally, a notable portion has been able to secure part-time jobs or internships that utilise these skills. The application of problem-solving, critical thinking, and teamwork skills from the program further demonstrates vocational training's relevance in everyday life. Overall, this suggests that the program effectively equips students with practical skills that extend beyond the classroom, contributing positively to their personal and professional development.

CHART 12B: PLAN OF APPLICATION OF SKILLS IN FUTURE



The respondents have outlined a variety of plans for utilising their vocational skills in the future, with a

significant focus on applying these skills in daily life, particularly in helping family and community projects. A noteworthy portion expressed interest in starting their own businesses or entrepreneurial ventures, indicating a proactive approach to leveraging their skills. Others plan to seek part-time employment while continuing their education or to pursue further training related to their vocational fields. While a small number remain uncertain about their future use of these skills, the overall trend reflects a positive outlook on the practical applications of vocational training, suggesting that participants feel well-prepared to integrate their skills into various aspects of their lives.

"

Vahid is a 13-year-old boy studying in the 9th grade at Mahatma Gandhi Government School in Soorajpole. He is enrolled in a vocational training program focused on energy and environment, which he selected after receiving helpful guidance from his vocational trainers. Before starting the program, Vahid was informed clearly about what the training would involve. Through this program, he has gained practical skills that he applies to various tasks, such as fixing things around the house and improving his school projects.

Vocational training has made a big difference in Waheed's learning experience. He feels more confident and excited about his education and future career options. Vahid dreams of starting his own business one day, using the skills he has learned. He believes that this training not only benefits him but can also help his family and community. Overall, Vahid appreciates the vocational program and sees it as a valuable part of his education.

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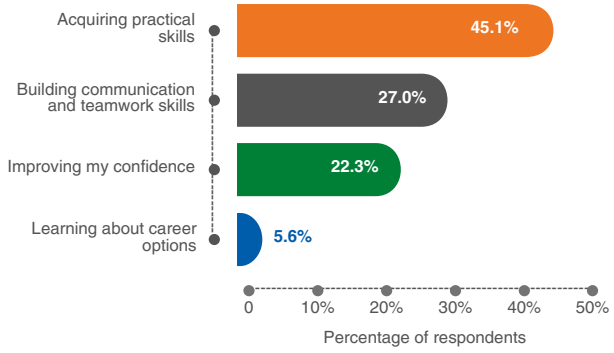
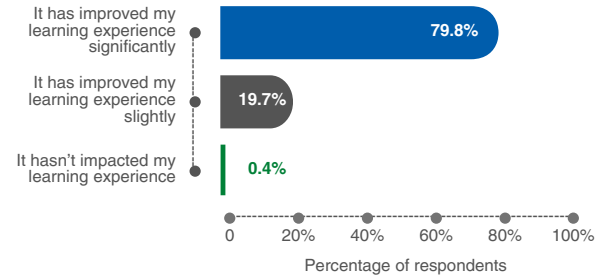
CHART 12C: BENEFITS OF SKILLS LEARNT



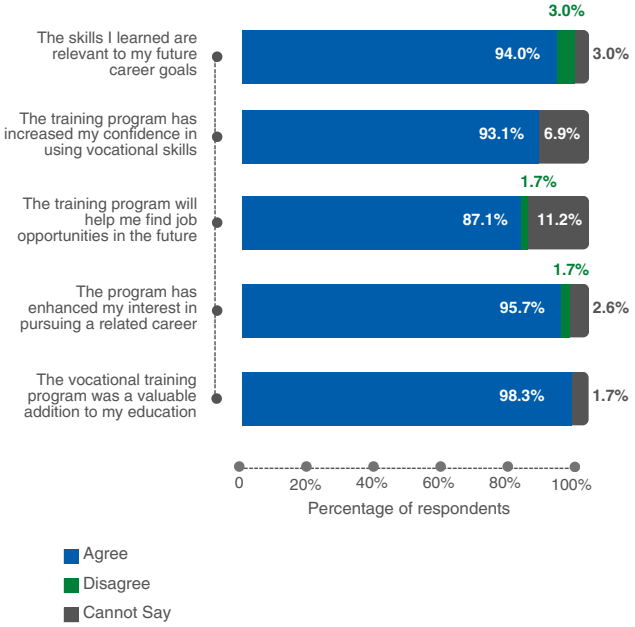
The primary benefit gained from the vocational program among respondents is the acquisition of practical skills, which highlights the program's effectiveness in providing hands-on experience that participants find valuable. Additionally, many noted improvements in their communication and teamwork abilities, essential skills for personal and professional interactions. A significant number also reported an increase in confidence, which can positively impact their overall outlook and future endeavours. While a smaller proportion acknowledged learning about career options, the predominant trends suggest that the program successfully equips participants with practical skills and soft skills that enhance their readiness for various challenges in life.

CHART 12D: IMPACT ON OVERALL LEARNING EXPERIENCE



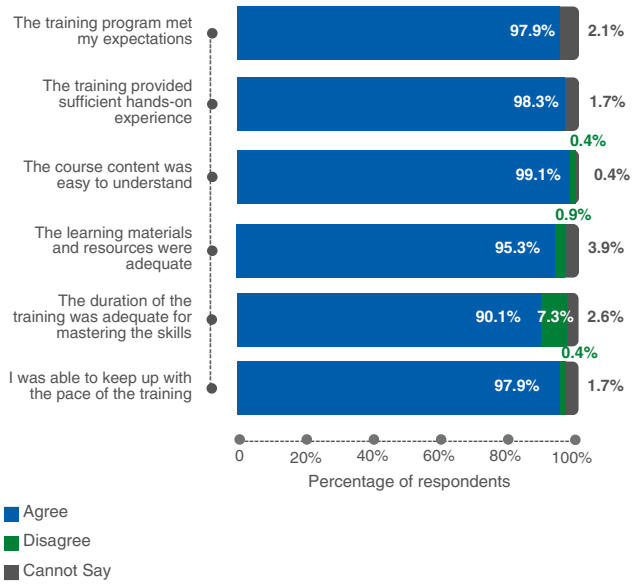
The impact of vocational training on the overall learning experience in school is predominantly positive, with a substantial majority of respondents indicating significant improvements. This suggests that vocational training not only enhances practical skills but also enriches students' academic experiences, likely leading to greater engagement and motivation in their studies. A smaller portion acknowledged only slight improvements, while very few felt that the training had no impact at all. These findings state the value of integrating vocational education into school curricula, as it appears to contribute meaningfully to the well-rounded development of students.

CHART 13: PERCEPTION OF THE RESPONDENTS ON TRAINING PROGRAM



The students' perceptions of the training program are overwhelmingly positive, with a vast majority agreeing that the skills learned are relevant to their future career goals. This strong support reflects the program's alignment with participants' aspirations. Many also feel that the training has significantly boosted their confidence in utilising these vocational skills, highlighting its effectiveness in personal development. Additionally, respondents believe the program will enhance their job prospects, further supporting its relevance in today's job market. A high level of interest in pursuing related careers was also expressed, indicating that the training has sparked enthusiasm for vocational paths. Lastly, nearly all participants viewed vocational training as a valuable addition to their education, suggesting a strong agreement on its benefits and impact.

CHART 14: SATISFACTION OF THE STUDENTS



Student satisfaction with the training program is notably high, as reflected in the responses indicating that the program largely met their expectations. A vast majority felt that the training provided ample hands-on experience, emphasising its practical relevance. Participants also found the course content easy to understand, which suggests that the program was well-structured and accessible. Furthermore, most respondents believed that the learning materials and resources were sufficient to support their training. While a significant number agreed that the training duration was adequate for mastering the skills, a small portion expressed some concerns regarding this aspect. Overall, the ability to keep pace with the training was also affirmed by nearly all students, indicating effective program delivery and engagement. These findings collectively highlight the program's success in strengthening a positive learning environment.

MGGS LUNIYAWAS, SANAGANER CITY

"

Deepti Rawat, a teacher and SMC member at the school, shared her perspective on the multi-skill vocational training program implemented by the NGO. Ms. Rawat has been part of the SMC for a year and is familiar with the program's objective of enhancing students' skill development. She emphasised that integrating vocational courses into the regular curriculum could greatly benefit the students, providing both immediate and long-term impacts by equipping them with skills that meet current market demands.

While she feels the school has the necessary infrastructure, space, and equipment to support the vocational training program, Ms. Rawat noted the need for additional trainers to meet the students' varied interests. Managing the school timetable alongside the vocational training poses a challenge, highlighting the need for better scheduling solutions. Overall, Ms. Rawat sees the program as a valuable addition that is helping students build skills for future opportunities.

"

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Rahul Kumar, a dedicated vocational trainer with six years of experience, has been instrumental in teaching skilling courses to 47 students in the 9th and 10th grades. His curriculum focuses on essential skills such as energy and environment management, simple wiring, soldering, and food processing. Rahul uses various teaching methods, including lesson plans, group discussions, and hands-on activities, to ensure that students grasp practical skills effectively. With a designated space and proper tools in the school, he allocates three hours each week for vocational training, assisting in an engaging learning environment. Over time, he has witnessed significant improvements in student participation and understanding, as they actively engage in practical activities.

Collaboration is key to Rahul's success; he works closely with school staff and parents, visiting homes and labs to showcase the students' progress. Assessments include written exams and practical evaluations, ensuring a comprehensive understanding of the subjects. Feedback from both students and parents has been overwhelmingly positive. However, Rahul believes the program could be even more effective if each school had a dedicated trainer, allowing for more personalised attention and better support for students. His commitment to empowering underserved youth through vocational training continues to make a meaningful impact on their futures.

"

TOOLS AND EQUIPMENT PROVIDED BY BAJAJ AUTO LTD FOR VOCATIONAL EDUCATION UNDER BAL-LAHI MSFC PROGRAM

CHAPTER 7
RECOMMENDATIONS

STRENGTHEN INDUSTRY PARTNERSHIPS

Collaborate with local industries to facilitate internships and job placements, giving students real-world experience and increasing their employability post-completion of their grades.

REGULAR FEEDBACK MECHANISMS

Implement a structured feedback system from students and parents to continuously improve the curriculum and teaching methods based on their experiences.

08. SUSTAINABILITY

The vocational training program supported by Bajaj Auto and implemented by Lend A Hand India (LAHI) demonstrates strong sustainability through its long-term impact on students and the community. By integrating vocational education into the school curriculum, the initiative ensures that skill development becomes a continuous and institutionalized process, benefiting future cohorts of students. This structured approach fosters self-reliance among youth, equipping them with industry-relevant skills that enhance employability and entrepreneurship.

A key factor in the program's sustainability is stakeholder engagement. The collaboration between schools, government bodies, and local communities creates a supportive ecosystem that promotes skill development. Additionally, the alignment with national initiatives like Skill India Mission, Make in India, and Atma Nirbhar Bharat reinforces its long-term viability by addressing workforce demands and economic empowerment.

With positive feedback from participants, improved school attendance, and high satisfaction rates, the program has proven effective in addressing skill gaps and career preparedness. As long as industry collaborations, community participation, and policy integration continue, the initiative holds significant potential for long-term sustainability, driving social and economic progress in the region.

CHAPTER 9
CONCLUSION

In conclusion, the vocational training program supported by Bajaj Auto and implemented by LAHI has made a meaningful impact on the lives of underserved youth. By effectively integrating vocational skills into the school curriculum, the program not only enhances students' employability but also strengthens their overall academic engagement and confidence. The positive feedback from participants highlights the program's relevance and effectiveness in addressing the gaps in skill deelopment and career preparedness. With continued support and community involvement, this initiative has the potential to sustain its benefits, ultimately contributing to the economic empowerment of youth and the reduction of social inequalities in the region.

IMPACT ASSESSMENT REPORT

INSTALLATION OF COVID ICU AT SHRI JAMNALAL BAJAJ WING OF MAHATMA GANDHI TRIBAL HOSPITAL

Implementing partner – MAHAN Trust

Release Date: 31-12-2024

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
FY	Financial Year
NGO	Non-Governmental Organisation
SDGs	Sustainable Development Goals
SMC	Severely Malnourished Children
LTF	Local Therapeutic Food

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

Bajaj Auto Limited collaborated with MAHAN Trust to initiate a response to the urgent healthcare needs of marginalised communities in rural Maharashtra during the COVID-19 pandemic. The health crisis had already exacerbated the existing gaps in healthcare access, and these communities faced significant challenges in managing the pandemic due to a lack of medical infrastructure, awareness, and essential medical supplies. The project was designed with a two-pronged approach: community-based interventions and hospital-based interventions. It aimed to enhance healthcare delivery, improve access to COVID-19 treatment, and build awareness of preventive measures. The project also emphasised behaviour change communication (BCC) to address vaccine hesitancy and misinformation prevalent in these areas. Therefore, this project sought not only to manage the immediate health crisis but also to create a sustainable health infrastructure for long-term community resilience.

PROJECT DETAILS

Implementation year

FY 2021- FY 2022

Assessment year

FY 2024 - FY 2025

Implementing Partner

MAHAN Trust

Project location

Amravati District, Maharashtra

Beneficiaries

35,347 beneficiaries from 33 villages

Budget

₹210 lakhs

Alignment with SDGs

Alignment with National Policies

- Identification of COVID-19 cases.
- Treatment of serious COVID-19 cases by drugs, oxygen, and ventilators.
- Treatment of non-serious COVID-19 cases.
- Immunization of healthcare workers by COVID-19 vaccine.
- Isolation ward and ICU development.

PROJECT ACTIVITIES

COMMUNITY-BASED INTERVENTIONS

- Intensive Behaviour Change Communication (BCC) with the villagers.
- Supply of Local Therapeutic Food (LTF) to Severely Malnourished Children (SMC).
- Supply of LTF to pregnant and lactating mothers.
- Supply of face masks and pharmaceutical drugs to villagers.
- Supply of pulse oximeter, thermometer, BP apparatus.
- Supply of personnel protection equipment (PPE) to high-risk people.
- Identification of COVID-19 cases.
- Immunisation by COVID-19 vaccine.
- Treatment of confirmed COVID-19 virus cases.
- Quarantine of suspected/confirmed persons infected by COVID-19.
- Real-time death tracking.
- Verbal autopsy.

HOSPITAL-BASED INTERVENTIONS

- Identification of COVID-19 cases.
- Treatment of serious COVID-19 cases by drugs, oxygen, and ventilators.
- Treatment of non-serious COVID-19 cases.
- Immunisation of healthcare workers by COVID-19 vaccine.
- Isolation ward and ICU development.

COMMUNITY-BASED VACCINE BCC

- Training of staff.
- Baseline data collection from 30 sample villages (related to vaccination).
- Understanding the socio-cultural issues related to vaccine acceptance/rejection.
- BCC plan development.
- Conducting BCC sessions.

COVID-19 ISOLATION WARDS & ICU DEVELOPMENT

Key Findings

40.0%

of the respondents belonged to the age group of 18-30 years, while 22.0% of them were between 31-45 years.

74.0%

of the respondents were females, while 26.0% of them were males.

42.0%

of the respondents earned an average monthly income of less than Rs. 3,000, while 28.0% of them earned between Rs. 3,000 and Rs. 5,000. Only 12.0% of them earned above Rs. 20,000.

90.0%

All of the respondents mentioned that they received face masks and sanitisers, while 96.0% of them received medicines for general health. 90.0% of them also benefited from the educational material provided regarding COVID-19 prevention.

96.0%

of the respondents were tested for COVID-19 infection. 94.0% of them were provided with free treatment in case they were COVID-19 patients, and 92.0% of them received free-of-cost inpatient admission and care for serious COVID-19 cases.

92.0%

of the mothers also received local therapeutic food for malnourished children.

Patients reported that the charges for inpatient admission/ ICU admission were all waived off. They were also given free medicines and treatment during the hospital admission period.

90.0%

of the respondents were vaccinated with two doses of COVID-19 vaccine, while 10.0% of them received a single vaccine dose.

Key Impacts

All of the respondents attributed multiple benefits to the project intervention, such as the early detection and treatment of COVID-19 cases, prevention of community-wide breaks of the disease and access to timely medical care.

All the respondents reported that the project resulted in multiple benefits ranging from the reduction of fear and panic related to the pandemic to increased trust in healthcare institutions, better awareness about COVID-19 safety practices in the community, increased community acceptance of COVID-19 vaccine and successful vaccination coverage in the community.

Over **1,705** critical COVID-19 patients were treated in the ICU.

Hospital staff received 100% immunisation against Covid. The acceptance rate of the vaccine's first dose increased from 25.0% to 65.0%, while that of the second dose increased from 5.0% to 25.0% due to the project's efforts.

Adherence to safety protocols and preventive health practices increased to 65.0-75.0% of the community post the intensive behaviour change efforts.

The death rate in intervention villages was less than 50.0% compared to control villages where no services were provided.

The hospital's mortality rate was significantly lower than the national average.

03. OECD FRAMEWORK

RELEVANCE

The project aimed at addressing the healthcare needs of marginalised communities during the COVID-19 pandemic. These populations faced multiple challenges, such as limited access to healthcare, high vaccine hesitancy, poor knowledge and adherence to safety protocols, and malnutrition among vulnerable groups (e.g., children, pregnant, and lactating mothers). By addressing these issues, the project targeted the root causes of morbidity and mortality during the pandemic.

COHERENCE

The intervention is well aligned with the following:

- National Health Policy 2017
- National Rural Health Mission
- Janani Shishu Suraksha Karyakram
- Mission Indradhanush

EFFECTIVENESS

The project has successfully achieved the objective of improving healthcare access to marginalised communities, particularly Covid patients and other vulnerable populations. With regard to COVID-19, the vaccination acceptance rate increased from 25.0% to 65.0% for the first dose and from 5.0% to 25.0% for the second dose in the targeted villages. The hospital effectively managed over 1,705 critical COVID-19 cases and reduced the ICU mortality rate. The project also improved community adherence to COVID-19 protocols from 50.0% to 65.0-75.0% through intensive BCC efforts. The nutritional needs of severely malnourished children and pregnant/lactating mothers were addressed through the distribution of LTF, contributing to better health outcomes.

EFFICIENCY

Despite all challenges, such as inadequate healthcare resources and myths surrounding vaccination, the project was able to efficiently manage and mobilise its resources to ensure that high-risk individuals and vulnerable groups received timely support, treatment, and immunisation. The use of local influencers and health workers to maximise outreach without incurring excessive costs on advertisements proved to be helpful. Moreover, the efficient distribution of hospital beds amongst serious and non-serious patients helped the team to cater to the needs of all patients within the limited resources.

IMPACT

The programme has had a significant impact on multiple levels. COVID-19 patients were diagnosed and received timely treatment. They were also vaccinated which increased their immunity against the infection. The fact that villages which received interventions reported a lower death rate of 219 per lakh, compared to over 500 per lakh in control villages, highlights the direct impact of the project in saving lives during the pandemic. The project also helped in building community resilience by increasing adherence to safety protocols.

SUSTAINABILITY

The project has been instrumental in busting myths surrounding allopathic medical treatment and building a bond of trust between the community members and the healthcare workers. The BCC's efforts to educate people on preventive health practices would equip communities to take the first response to any other widespread infections in the future. Additionally, the distribution of LTF and the knowledge about nutrition would lead to sustained improvements in dietary habits and long-term health outcomes for vulnerable populations. Lastly, the installation of the ICU would keep benefiting more patients in the long run.

CHAPTER 4
INTRODUCTION

Interaction with Arogaya Dooths on COVID-19 measures, understanding the socio-cultural issues related to vaccine acceptance/rejection.

NEED OF THE PROGRAM

The 2020 pandemic witnessed millions of deaths due to the crumbling down of global health infrastructure. Situations were worse in third-world countries where the health systems were not ready to take such a huge hit. Melghat, a hilly remote tribal area situated in the north-eastern part of Maharashtra, had to face the havoc caused by the pandemic due to a similar scarcity of healthcare resources. Its marginalisation can be understood through a high percentage (84.0%) of the local tribal population out of a total of 3,00,000 residents. 85.0% of the people are poor and economically weak while the doctor-patient ratio is <1:10,000. In response to the high 'under 5 children mortality rate', severe malnutrition, home delivery and premature adult deaths prevalent in the area, MAHAN had established a well-equipped hospital, the Mahatma Gandhi Tribal Hospital, with OPD, operation theatre, and a critical care unit. This is currently the only hospital in the area for emergency critical care. During the COVID-19 crisis, as many COVID-19 patients were dying due to lack of facilities, MAHAN started COVID-19 critical care hospital and community COVID-19 services in 33 tribal villages, undertook a Behaviour change communication program, distributed local therapeutic food to poor tribal children and pregnant mothers for 3 to 6 months. More than 30.0% of the tribal youths who had temporarily migrated to cities for work and returned back to Melghat had also become potential COVID-19 carriers. In view of this, the MAHAN trust has started working towards mitigating the spread of the virus in the area.

OBJECTIVES OF THE PROGRAM

To reduce the prevalence of COVID-19 in 33 intervention tribal villages with a population of 30,000 by at least 20.0%.

To reduce deaths and case fatality rate (CFR) of COVID-19 in 33 intervention tribal villages by at least 20.0%.

To reduce deaths of admitted serious COVID-19 patients to less than 35.0% (minimum) or 20.0% (ideal) of total serious hospitalised patients.

To improve the health of admitted COVID-19 patients by 75.0%.

To evaluate the effectiveness of the "Comprehensive Community COVID-19 Care and Vaccines (C4V) on Wheels" program to reduce the impact of the COVID-19 pandemic on tribals.

To survey and track the suspected cases and establish referral programs for the tribal population.

To assess the COVID-19 vaccination status and vaccine acceptance rate in 200 to 300 tribal villages of Melghat with a population of 2,00,000 to 3,00,000.

To assess social and behavioural causes of resistance to vaccination in the above settings.

To develop appropriate solutions to increase vaccine acceptance in the above setup.

To implement interventions for improving vaccination acceptance by at least 50.0% over the existing vaccine acceptance rate.

To propose solutions to government and other medical institutions to improve vaccination acceptance rate in all tribal areas of India.

To develop a community-based model for tribal areas.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – MAHAN TRUST

MAHAN Trust (Meditation, AIDS, Health, Addiction, Nutrition) is a non-governmental organisation based in Maharashtra, India, dedicated to providing healthcare services to underprivileged and rural communities, particularly in tribal regions. Founded in 1997 by Dr. Ashish Satav, MAHAN Trust works with a mission to reduce preventable diseases, improve maternal and child health, and raise awareness about nutrition, addiction, and hygiene. The trust focuses on addressing the healthcare needs of vulnerable populations in remote areas where access to medical services is limited. Over the years, MAHAN Trust has made a tangible impact on the health outcomes in tribal regions, with measurable reductions in child mortality, malnutrition, and disease incidence. The trust's work has been recognised at both national and international levels for its innovative and community-centred approach.

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited had appointed SoulAce to conduct a study on the work done by MAHAN Trust and assess the impact of its CSR initiative in improving healthcare accessibility for marginalised communities during the pandemic.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.

To measure the extent to which the construction of COVID-19 ICU and other community interventions were successful in the prevention, vaccination, and treatment of COVID-19.

To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders, such as patients, community members, doctors, healthcare workers and project staff, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- the patients and community members, yielding statistical insights and identifying trends. By employing a mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries, stakeholders, and those responsible for project implementation. Engaging stakeholders like patients, community members, healthcare workers like doctors, and project staff through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of the improvements in access to healthcare services brought about by the project during the pandemic. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques are employed to evaluate the project and its impacts through data analysis objectively. Surveys and questionnaires are utilised to collect numerical data on various indicators from the beneficiaries. By comparing the data gathered before and after the intervention, the project and its effects and the enhancements it has facilitated can be assessed. These quantitative methods provide a measurable approach to gauge the project and outcomes and evaluate its success through statistical evidence.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including interviews with beneficiaries, field notes, interactions with other stakeholders, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact. Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions.

This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method. Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

RESEARCH DESIGN

Name of the project

Installation of COVID-19 ICU at Shri. Jamnalal Bajaj Wing of Mahatma Gandhi Tribal Hospital and community interventions for prevention, vaccination, and treatment of COVID-19

Implementing agency

MAHAN Trust

Research design used

Descriptive research design

Sampling technique

Random Stratified sampling

Sample size

50 stakeholders

Qualitative method used

Semi-structured interviews, testimonials and focus group discussions with beneficiaries along with key stakeholders

KEY STAKEHOLDERS

- Patients (Persons from marginalised communities)
- Local community members
- Doctors
- Healthcare workers
- Project Implementation team

> "The distribution of masks, community awareness efforts for COVID-19 preparedness, and myth-busting around COVID-19 vaccines, contributed to our success in containing the spread of the virus."
>
> **- Dr. Shubhada Khirwadkar, Project In charge**

STUDY TOOLS

Questionnaires for primary beneficiaries – Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys. Questionnaires and focus group discussion guide for stakeholders – A semi-structured questionnaire and focus group discussion guide were developed for each type of sample of this group. Stakeholders were identified across the focus areas. Semi-structured questionnaires and focus group discussions were conducted with doctors, community health workers and project staff.

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. Adhering rigorously to ethical principles of research, the study prioritised the rights and well-being of participants throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Crucially, participation was fully voluntary, free from coercion or pressure, underscoring the importance of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

CHAPTER 6
MAJOR KEY FINDINGS

The chapter delves into the collaboration between Bajaj Auto Limited and MAHAN Trust, which worked in collaboration to contain, treat and prevent the spread of COVID-19.

GEOGRAPHICAL COVERAGE

The intervention was implemented in 33 villages of Melghat in the Amravati district of Maharashtra, India.

OUTREACH AND INCLUSIVITY

The primary beneficiaries of the program were people from marginalised tribal communities.

KEY FINDINGS

CHART 1: AGE-WISE DISTRIBUTION OF THE RESPONDENTS

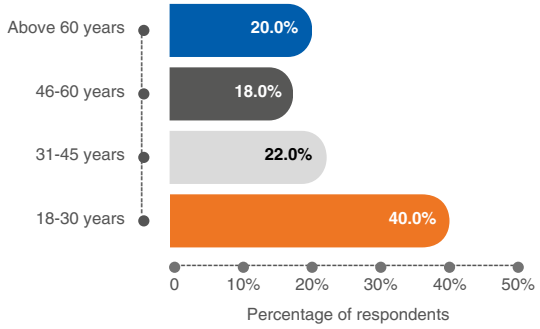


Chart 1 shows that 40.0% of the respondents belonged to the age group of 18-30 years, while 22.0% of them were between 31-45 years. 20.0% of them were senior citizens above 60 years of age.

CHART 2: GENDER-WISE DISTRIBUTION OF THE RESPONDENTS

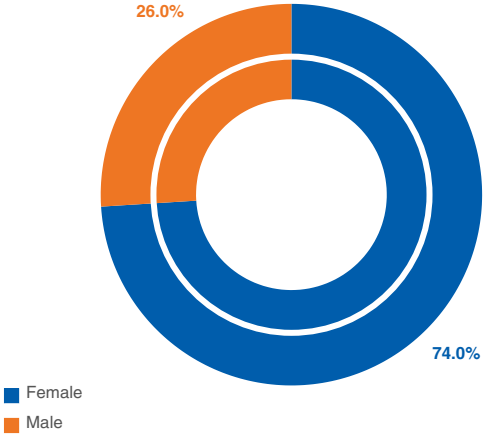


Chart 2 reveals that 74.0% of the respondents were females, while 26.0% of them were males.

TRUENAT PCR MACHINE

CHART 3: MONTHLY INCOME OF THE RESPONDENTS

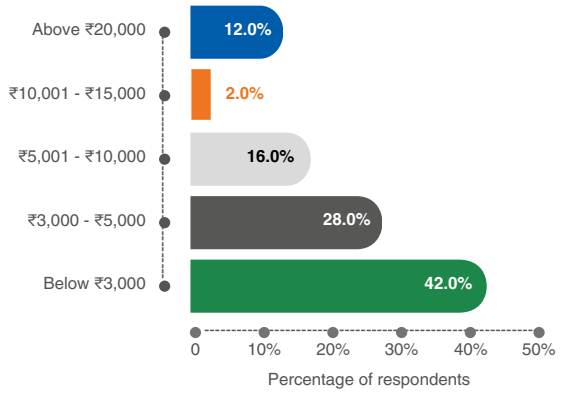


Chart 3 reveals that 42.0% of the respondents earned an average monthly income of less than Rs. 3,000, while 28.0% of them earned between Rs. 3,000 and Rs. 5,000. Only 12.0% of them earned above Rs. 20,000. As most of these individuals have very limited economic resources, they often struggle to pay attention to their health. For them, expenditure on health is an additional burden; therefore, this intervention was really needed for such individuals.

CHART 4: TYPE OF SAFETY SUPPLIES RECEIVED FROM MAHAN PROJECT INTERVENTION DURING THE COVID-19 PANDEMIC

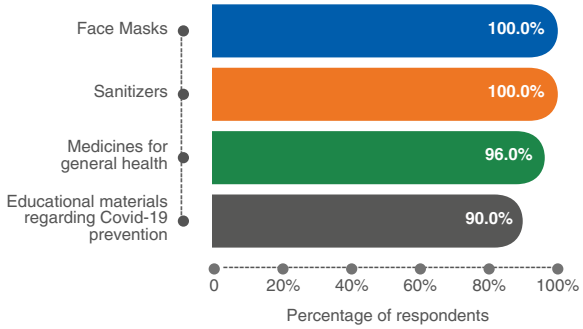


Chart 4 shows the types of safety supplies provided by the project during the pandemic. All the respondents mentioned that they received face masks and sanitisers, while 96.0% of them received medicines for general health. 90.0% of them also benefited from the educational material provided regarding COVID-19 prevention. This shows that the program design was created keeping in mind a holistic approach towards containing the spread of the pandemic.

MAHATMA GANDHI TRIBAL HOSPITAL

CHART 5: TYPE OF ACTIVITIES UNDERTAKEN BY MAHAN IN THE COMMUNITY DURING THE COVID-19 PANDEMIC (COMMUNITY LEVEL)

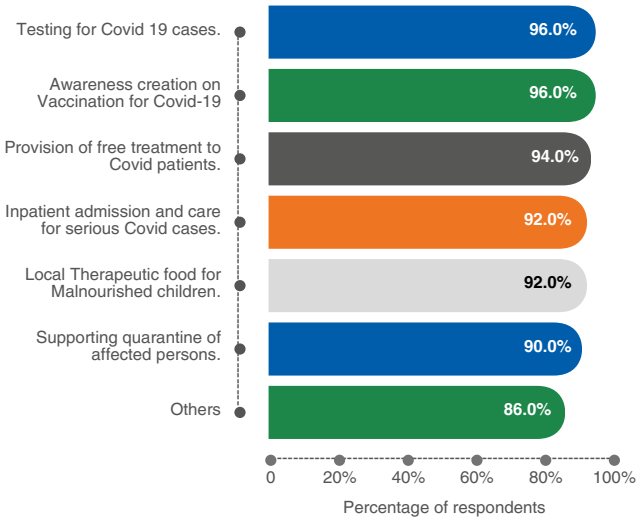
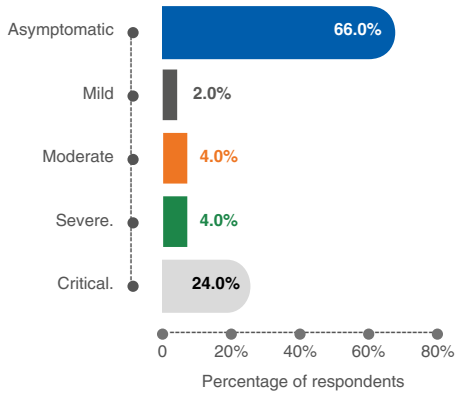


Chart 5 demonstrates that 96.0% of the respondents were tested for Covid infection. 94.0% of them were provided with free treatment as a result of being COVID-19 patients, and 92.0% of them received free-of-cost inpatient admission and care for serious COVID-19 cases. 92.0% of the mothers also received local therapeutic food for malnourished children. This reflects that the program offered a wide range of healthcare services to underserved communities.

CHART 6: SEVERITY OF ILLNESS UNDERWENT BY THE RESPONDENTS



In Chart 6, 66.0% of the respondents reported that they were asymptomatic during COVID-19. 24.0% of them reported that they were in a critical condition because of the disease, while 4.0% of them faced severe conditions due to the COVID-19 infection. It is crucial to know the intensity of the illness as patients receive different types of care through the project depending on their severity level. For example, all the asymptomatic, mild, and moderate cases of COVID-19 were quarantined.

CHART 7: WHETHER HOSPITALISED THROUGH THE SUPPORT OF THE NGO IN CASE OF SEVERE AND CRITICAL COVID-19 INFECTION

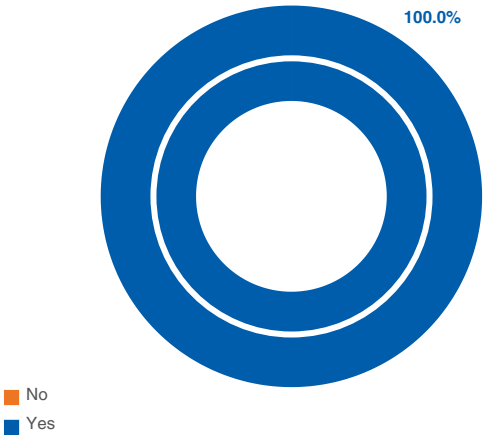


Chart 7 demonstrates that all of the severe or critical patients were admitted to the COVID-19 ICU of Mahatma Gandhi Tribal Hospital. Qualitative interviews with the patients highlight that the charges for inpatient admission/ ICU admission were all waived. Additionally, they were given free medicines and treatment during the hospital admission period.

CHART 8: TYPE OF SUPPORT PROVIDED BY THE NGO DURING THE QUARANTINE PERIOD

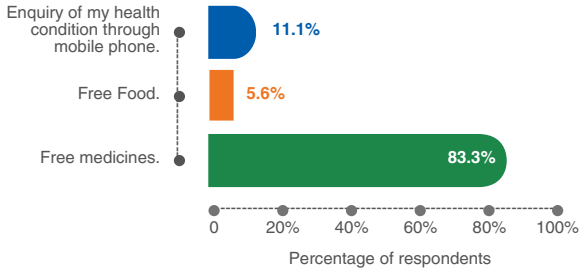


Chart 8 reveals that 83.3% of the respondents received free medicines during the quarantine period, while 5.6% of them received food. 11.1% of them also reported that the project team enquired about their health over the phone. This shows that the project team took care of every individual patient in multiple possible ways.

Excerpt from the FGD with Arogya Doots

People were afraid of COVID-19, so they started following the guidelines. We had blocked the entry of outsiders in the village. Some villagers who used to work outside came to their villages in the second wave, so we quarantined them in school for 15 days. When they came, they had an Antigen test and then quarantined again for 15 days. MAHAN Trust helped us with the testing. They also distributed masks and gave free food to our women and children.

- **Members present (Satish Sukhlal Betekar, Hiraji Dhandhe, Bishram Kalu Dhandhe, Baburam Rinya Kasdekar, Bansi Betekar, Suresh Mavaskar, Hariram Bhurya Jawarkar, Manaji Dhandhe, Balaji Kasdekar, Sukhram Baju Kasdekar**

CHART 9: NO. OF DOSES OF COVID-19 VACCINE RECEIVED

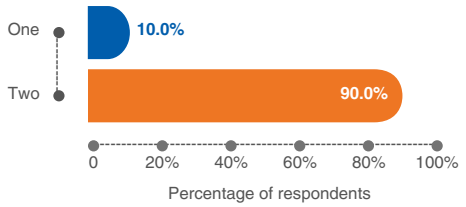
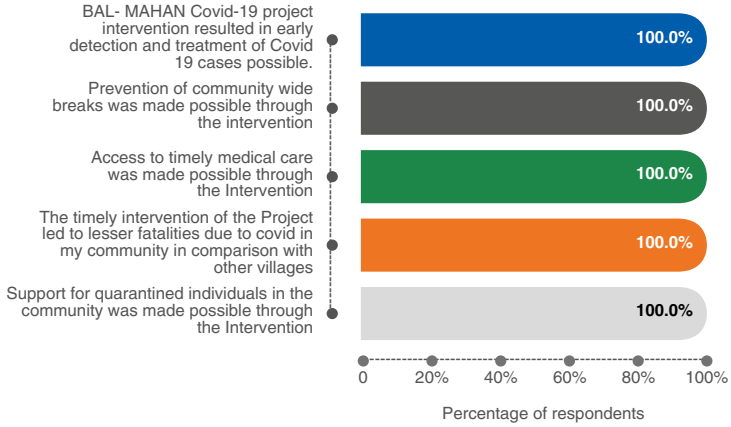


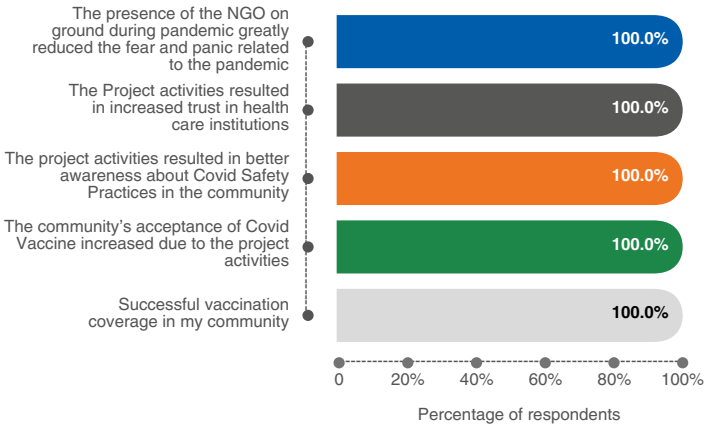
Chart 9 shows that 90.0% of the respondents were vaccinated with two doses of COVID-19 vaccine, while 10.0% of them received a single vaccine dose. Qualitative interviews highlight that the project played a critical role in helping them avail the vaccine. Given the remoteness of the area and the economic marginalisation, getting the vaccine was a distant dream for them.

CHART 10: BENEFITS ATTRIBUTED TO THE PROJECT INTERVENTION OF MAHAN RELATED TO THE DETECTION AND PREVENTION OF COVID-19



In Chart 10, all of the respondents attributed multiple benefits to the project intervention, such as the early detection and treatment of COVID-19 cases, prevention of community-wide breaks of the disease and access to timely medical care. The timely intervention of the project led to fewer fatalities due to COVID-19 in the community than in other villages. Support for quarantined individuals was also made possible through the intervention. This demonstrates that the project was successful in achieving its objective and was effective in controlling the pandemic.

CHART 11: BENEFITS ATTRIBUTED TO THE PROJECT INTERVENTION OF MAHAN RELATED TO AWARENESS AND BEHAVIOURAL CHANGE TOWARDS COVID-19 AND HEALTHCARE INSTITUTIONS



In Chart 11, all the respondents mentioned that the project resulted in multiple benefits related to awareness and behavioural change towards COVID-19 and healthcare institutions. These include the reduction of fear and panic related to the pandemic, increased trust in healthcare institutions, better awareness about COVID-19 safety practices in the community, increased community acceptance of COVID-19 Vaccine and successful vaccination coverage in the community. This reflects the long-term impact created by the intervention with regard to overall health practices. These practices have empowered individuals to avail healthcare services without hesitation.

"

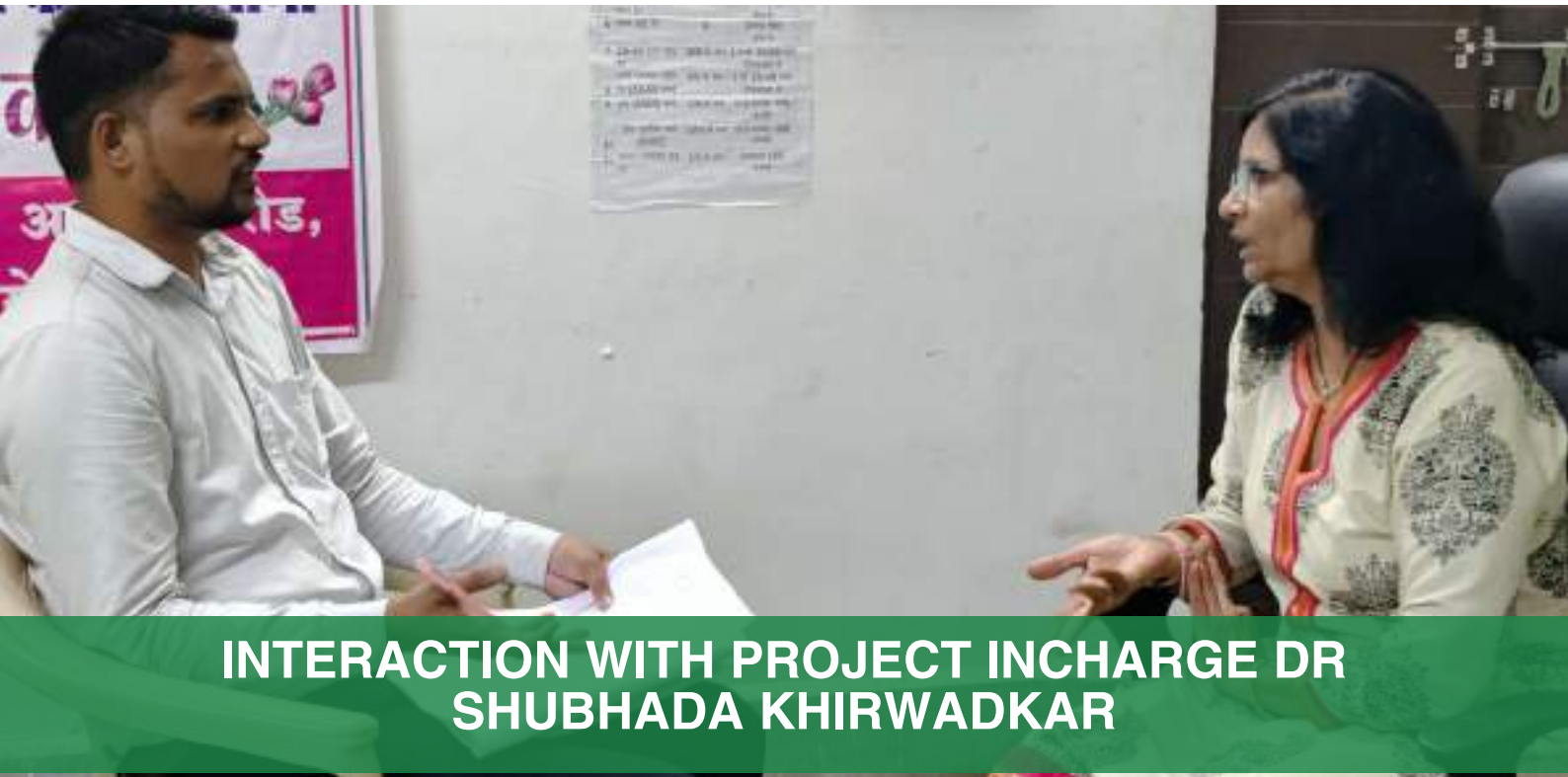
Excerpt from the FGD with Arogya Doots

"We were running the Women and Child Malnutrition Program in COVID-19. As Arogya Doots, we tell lactating mothers about what they have to feed their children when they get 6 months old. We also tell pregnant women about what they should eat. We provide one packet of nutritional food daily to the Antenatal mothers. We guide them about tablets, diet, injections, etc.

During the pandemic, people from the villages had vaccine hesitancy and resistance, but we would explain to them that the vaccine is safe. We would conduct COVID-19 testing wearing PPE kits. Whenever someone tested positive, we would quarantine them in the hospital. Due to awareness, there was zero mortality in 30 intervention villages."

- Members present (Durga Pradeep Jambekar, Meera Kasdekar, Shakuntala Bhilavekar, Veenu Jambhekar, Samoti Bethekar, Kiran Dhandhe, Meera Kasekar, Savita Sakope)

"



INTERACTION WITH PROJECT INCHARGE DR SHUBHADA KHIRWADKAR

MAJOR QUALITATIVE FINDINGS

HOSPITAL BED ALLOCATION AND PATIENT MANAGEMENT

The hospital reserved 20 beds for COVID-19 patients, with 12 designated for ICU patients. During peak times, all 12 ICU beds and up to 20-22 hospital beds were occupied by critical COVID-19 patients. Over 1,705 critical COVID-19 patients were managed in the ICU.

AWARENESS AND CONFIDENCE BUILDING MEASURES FOR VACCINATION

One of the major challenges faced was to convince people for vaccination. People were not ready because there were rumours that the vaccine was developed to kill people. To bust this myth, the doctors were first vaccinated, which instilled confidence in the staff. Hospital staff were then vaccinated, demonstrating the vaccine's safety to the community. Religious and village workers were vaccinated next, serving as local examples of vaccine safety. An intensive behaviour change communication program was launched, including one-on-one counselling, group counselling, audio-visual presentations, and lectures. Real-life examples of COVID-19 patients suffering in the ICU were shared to emphasise the disease's severity.

VACCINATION DOSAGE

When the program was initiated in the villages, the acceptance rate of the vaccine's first dose was 25.0%. Due to the support received from Bajaj Auto Limited, it increased to 65.0%. The second dose acceptance rate was just 5.0%, which increased to 25.0%. So, there was a significant improvement in the acceptance rate. For the hospital staff (who were themselves tribals from the local community), the rate of vaccination was 100%. In Melghat, 200 villages were sampled, and the vaccination rate was at a 65.0% maximum for the first dose.

ADHERENCE TO SAFETY PROTOCOLS

Initially, about 50.0% of the tribal community strictly followed COVID-19 safety protocols. After intensive behaviour change efforts, adherence increased to 65.0-75.0% of the community. Strict followers implemented measures such as restricting outsiders from entering villages, wearing masks, and using soap and water for hand sanitisation.

VERBAL AUTOPSIES

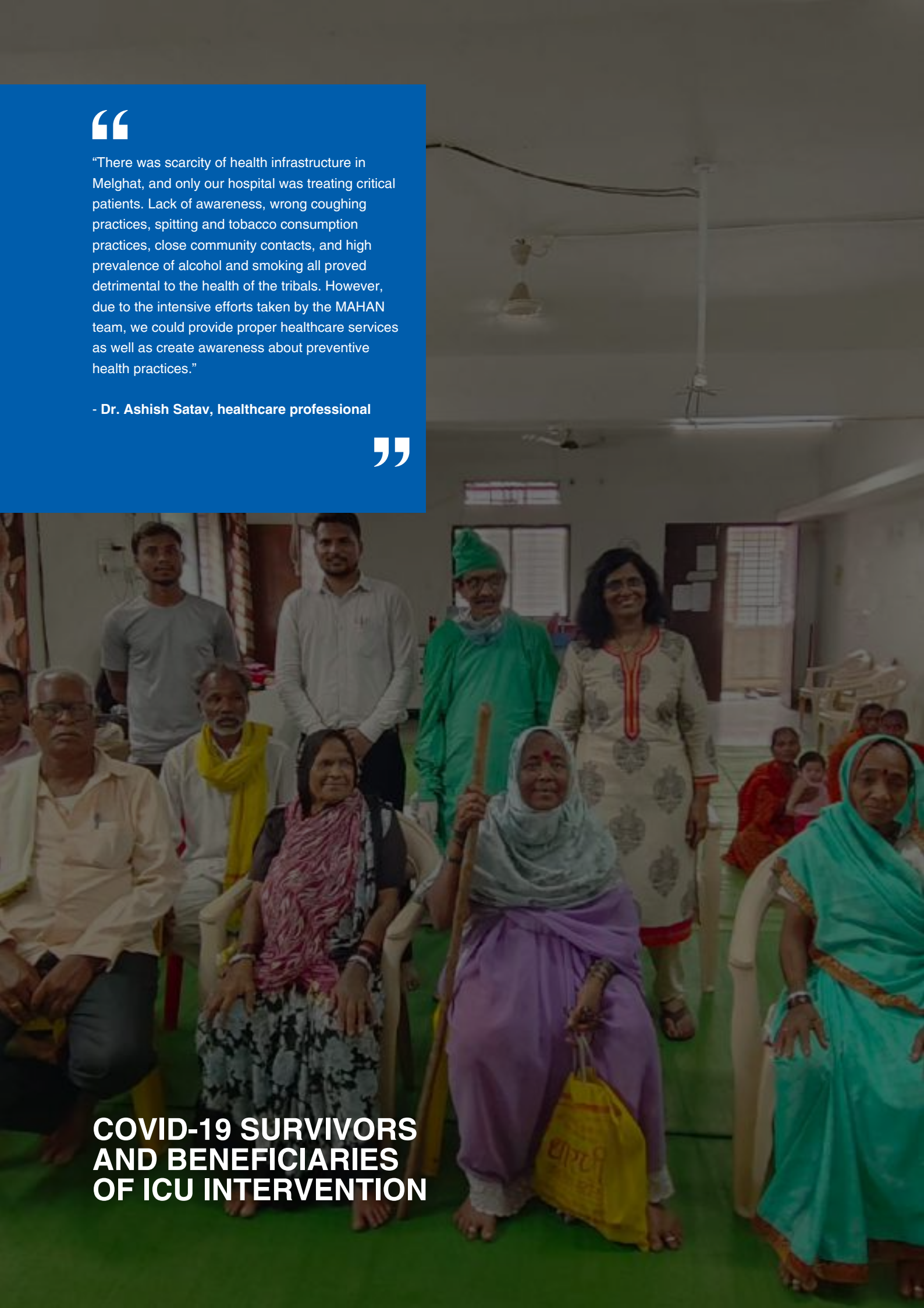
The hospital conducted verbal autopsies in 30 villages to assess COVID-19-related deaths. Findings showed a significant increase in deaths with COVID-19-like symptoms during the pandemic. Pre-pandemic death rates were around 250-260 per lakh population, which increased to over 500 per lakh during COVID-19. In villages where the hospital provided interventions, the mortality rate was lower at around 219 per lakh population. The death rate in intervention villages was less than 50.0% compared to control villages where no services were provided.

MORTALITY RATES AND COMPARISONS

The fatality rate in the ICU was 13.9% for the first two phases of the pandemic. When combining all three phases, the overall ICU mortality rate increased to 16.9%. The hospital's mortality rate was significantly lower than the national average, which was around 30.0% for critical patient mortality in ICUs. Regional mortality rates were even higher, ranging from 30.0% to 35.0%.

“There was scarcity of health infrastructure in Melghat, and only our hospital was treating critical patients. Lack of awareness, wrong coughing practices, spitting and tobacco consumption practices, close community contacts, and high prevalence of alcohol and smoking all proved detrimental to the health of the tribals. However, due to the intensive efforts taken by the MAHAN team, we could provide proper healthcare services as well as create awareness about preventive health practices.”

- Dr. Ashish Satav, healthcare professional



COVID-19 SURVIVORS AND BENEFICIARIES OF ICU INTERVENTION

07. SOCIAL IMPACT ON THE BENEFICIARIES

INDIVIDUAL LEVEL

- The project was able to extend healthcare services to remotely situated marginalised communities and was able to save the lives of over 1,705 critical COVID-19 patients, thereby reducing the disease's severity and improving recovery rates.
- Intensive Behaviour Change Communication (BCC) efforts taken by hospital staff helped improve the adoption of the vaccine, which proved beneficial in mitigating the intensity of the disease.
- Increased awareness of COVID-19 protocols, such as wearing masks and hand hygiene, led to 65.0-75.0% of the population following safety measures, reducing individual exposure to the virus.
- Severely Malnourished Children (SMC) and pregnant or lactating women were supplied with Local Therapeutic Food (LTF), improving maternal and child health outcomes.

FAMILY LEVEL

- As evident through the qualitative findings, the project's timely medical interventions in 30 villages significantly reduced death rates in families affected by COVID-19.
- Families benefited from the identification and quarantine of COVID-19 cases, helping prevent the spread of the virus within households. This also provided psychological and emotional relief to the family members as their loved ones received proper treatment and care.
- The distribution of LTF to malnourished children and mothers took care of the nutritional needs of such vulnerable members, ensuring better overall family health.
- As family members witnessed local influencers and healthcare staff getting vaccinated, their confidence in the vaccine grew, and they also agreed for immunisation.

COMMUNITY LEVEL

- Behaviour change communication efforts increased community adherence to COVID-19 safety protocols. Safety measures such as restricting the entry of outsiders, promoting the use of face masks, and implementing regular handwashing helped communities witness a safer environment as compared to earlier.
- In the intervention villages, COVID-19-related deaths were less than 50.0% compared to control villages where no services were provided. This highlights the project's significant impact on reducing community-level mortality.
- The hospital's ICU mortality rate was significantly lower than the national average for critical patients, thereby benefiting the surrounding community and saving local lives.
- The community saw a significant shift in vaccination acceptance after BCC efforts. This collective trust in vaccination enhanced herd immunity and contributed to community-level health improvements.

STATE LEVEL

- The project contributed to the development of healthcare infrastructure in the form of ICU beds and isolation wards within the only functioning local hospital. This eased the burden on state healthcare facilities.
- The project was successful in achieving 100% vaccination of healthcare workers, contributing to the state's efforts to protect frontline workers and maintain the smooth functionality of the healthcare system.
- Through the BCC program, the project reached a significant number of communities, promoting safety protocols and vaccination, thereby helping to mitigate the spread of COVID-19 across tribal and marginalised populations and reducing the pressure on the state's healthcare system.
- By conducting real-time death tracking and verbal autopsies in these villages, the project collected critical data on mortality trends. This data would act as a valuable resource for state health authorities to understand and respond to any such pandemic's impact in the future.

NATIONAL LEVEL

- The project's efforts significantly improved vaccination coverage in tribal and marginalised areas. This supported India's national vaccination campaign and increased overall vaccine coverage and adoption.
- With the hospital's ICU mortality rate significantly lower than the national average (16.9% vs. 30.0%), the project set a benchmark for other hospitals and regions.
- The project's multipronged approach of covering identification, treatment, quarantine, vaccination, and real-time death tracking strengthened the national response to the pandemic by preventing virus transmission in underserved communities.
- By addressing the socio-cultural barriers to vaccination and ensuring the safe delivery of COVID-19 treatments, the project supported India's National Health Mission and COVID-19 management strategies.
- The supply of LTF to malnourished children and pregnant women during the pandemic contributed to tackling India's malnutrition crisis. This aligned with national efforts to improve child and maternal nutrition as part of broader public health goals.

INTERACTION WITH PRESIDENT OF MAHAN TRUST AND CMO DR. ASHISH SATAV

CHAPTER 8
RECOMMENDATIONS

Create post-COVID rehabilitation programs for individuals who have recovered from severe COVID-19 but continue to suffer from long-term symptoms (also referred to as "long COVID"). This could involve regular follow-ups for both physical rehabilitation and mental health support, and it would ensure that affected individuals are able to live their lives without the debilitating long-term effects of the pandemic.

Leverage the existing COVID-19 vaccination campaign infrastructure to expand immunisation efforts for other preventable diseases (such as measles, polio, and tuberculosis).

09. SUSTAINABILITY

The project has played a crucial role in strengthening healthcare delivery and mitigating the impact of COVID-19 in underserved communities. The sustainability of this initiative is rooted in its integration of community-based interventions, capacity building, and infrastructural enhancements.The following sections outline the key elements that promote sustainability and how the project's impact findings reinforce its long-term benefits.

- Strengthening Community Health Resilience:

- The intensive behavioral change communication (BCC) efforts played a pivotal role in promoting preventive healthcare practice among the communities. The increase in adherence to safety protocols to 65-75% indicates a significant shift in community behavior that extends beyond the pandemic, promoting long-term public health resilience.
- The project's efforts led to increased community acceptance of medical interventions, including the COVID-19 vaccine, which saw a significant increase in uptake (first dose acceptance rose from 25% to 65%, and second dose acceptance from 5% to 25%). This trust-building will have lasting effects, encouraging people to seek timely medical care in the future.

2. Addressing Malnutrition:

- The impact assessment indicated that 92% of mothers received Local Therapeutic Food for their malnourished children, leading to better maternal and child health outcomes. The knowledge imparted about nutrition through these efforts will contribute to long-term dietary improvements and the reduction of malnutrition rates in the community.

3. Strengthening Pandemic Preparedness and Response Mechanisms:

- With 94% of affected individuals receiving free Covid-19 treatment and 92% benefiting from free inpatient care, the project demonstrated the effectiveness of structured pandemic response mechanisms. These strategies can be replicated for future health emergencies, ensuring long-term preparedness.

By putting these components in place, the project has laid a strong foundation for sustainable healthcare improvements, ensuring that its impact will continue to be felt well beyond the immediate crisis.

CHAPTER 10
CONCLUSION

The impact assessment study titled “Installation of COVID-19 ICU at Shri. Jamnalal Bajaj Wing of Mahatma Gandhi Tribal Hospital and Community Interventions for Prevention, vaccination, and Treatment of COVID-19" is critical evidence of the impact created by the CSR project of Bajaj Auto Limited, implemented by MAHAN Trust. It provides a snapshot of the objectives and aligned activities of the project as well as the achievements on multiple levels. Initiated with the objective of increasing healthcare access to marginalised tribal communities of rural Maharashtra, the project has been able to deliver manifold results. For individuals and families, it has been able to provide timely diagnosis and treatment of COVID-19, reducing out-of-pocket expenditure on health expenses and saving lives. It has also been able to combat malnutrition through the distribution of LTF. At the community level, it has prevented loss of life and created a trustful relationship between them and the healthcare machinery. At the state and national levels, it has been able to complement the efforts of the government to contain the spread of the virus. This report is a testament to the outcomes and impact of the project, compiled with the precision, rigour, and authenticity of a social research endeavour. This study shall serve as a piece of evidence for furthering the good work done as part of such public-private collaborations.

IMPACT ASSESSMENT REPORT

BAJAJ WATER CONSERVATION PROJECT (BWCP)

Implementing Partner: Marathwada Gramin Vikas Santha

Release Date: 31-12-2024

SoulAce
Path to Sustainability
SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

BWCP	Bajaj Water Conservation Project
CNB	Cement Nala Bunds
CSR	Corporate Social Responsibility
ENB	Earthen Nala Bunds
MGVS	Marathwada Gramin Vikas Santha
NGO	Non-Governmental Organisation
NRLM	National Rural Livelihoods Mission
PMKSY	Pradhan Mantri Krishi Sinchai Yojana
SDGs	Sustainable Development Goals
SHG	Self-Help Group
VDC	Village Development Committee
WUGs	Water User Groups

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The collaborative intervention by Marathwada Gramin Vikas Santha with support from Bajaj Auto Limited on the Bajaj Water Conservation Project significantly improved water resource management across seven villages in Kannad and Vaijapur talukas, Aurangabad district Maharashtra. The initiative focused on constructing water recharge structures and strengthening community institutions such as Village Development Committees and Water User Groups. The project enhanced soil fertility and crop productivity through hands-on training to farmers in sustainable agricultural practices, including the use of Amrut Jal and vermicompost. As a result, households experienced increased agricultural yields and incomes, leading to better quality of life and reduced reliance on chemical fertilisers.

PROJECT DETAILS

Implementation year

FY 2019 - FY 2023

Assessment year

FY 2024 - FY 2025

Implementing Partner

Marathwada Gramin Vikas Sanstha

Project location

Aurangabad district, Maharashtra

Beneficiaries

8931 Farmers, women, and community members from Kannad and Vaijpur talukas

Budget

₹957 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

The project has the following key components:

- Conducting hands-on training sessions on preparing and applying organic inputs, such as Amrut Jal and vermicompost, to enhance soil fertility and crop health.
- Providing training on utilising micro-irrigation systems to optimise water use and improve irrigation efficiency.
- Organising and strengthening existing SHGs, focusing on empowering women through training in group management, financial inclusion, and developing livelihood skills.
- Establishing WUGs consisting of 20-30 farming households to manage local water resources effectively and coordinate crop planning based on water availability.

Key Outputs

29.8%

of the respondents were in the age group 31-40 years, followed by 25.6% who were in the age group of 41-50 years.

31.8%

of the respondents have completed 9th to 10th standard education, while 27.5% have completed 11th to 12th standard. Additionally, 9.3% of the respondents have completed only primary schooling.

45.0%

of the respondents own 2-3 hectares of land, while 25.6% own 1-2 hectares. Furthermore, 9.7% possess less than 1 hectare of land.

Less than half (46.9%) of the respondents report an annual family income between Rs. 2.1 to 3 lakhs, while 32.5% fall within the income range of Rs. 1.1 lakh to 2 lakhs. A small segment (5.0%) has an annual income of less than Rs. 1 lakh.

Before the CSR intervention, 1.2% of the respondents practised micro-irrigation; after the intervention, this increased to 98.8%.

Key Impacts

87.0%

of the respondents reported a 20.0% reduction in water usage, with an additional 11.8% observing a reduction of 20-30%, indicating significant water conservation and improved moisture retention in the soil.

The intervention boosted Kharif crops' resilience to dry spells, with 38.0% of the respondents reporting their crops could withstand drought for an extra 15 to 20 days, while 60.9% noted an increase of 10 to 14 days.

Post-intervention, 69.8% of the respondents experienced water scarcity for only two months, a dramatic improvement compared to 81.0% who previously faced scarcity for over six months, indicating the availability of water post-intervention.

Before the intervention, 99.6% of the respondents lacked sufficient water for their livestock; after the intervention, 99.2% reported having adequate water.

After the intervention, 86.8% of the respondents experienced drinking water scarcity for only one month, compared to 79.1% who faced scarcity for more than six months before the intervention, thus improving community well-being.

64.3%

of the respondents gained an additional cultivable land of 0.250 to 0.500 hectares, and 26% gained between 0.501 and 0.750 hectares.

5.3%

of the respondents reported over a 20.0% increase in Kharif crops, and 68.2% observed a 15-19% increase in Rabi crop yields. This also shows that the intervention has increased agricultural productivity.

60.9%

of the respondents reported an increased annual agricultural income of 10-15%, and 32.1% experienced a rise of 15-20%, enhancing the economic well-being of the farming community.

Improved earnings and increased agricultural productivity have alleviated family stress, contributing to overall well-being.

The intervention has enhanced access to water for domestic use, significantly reducing the time and effort spent on water collection.

Increased agricultural productivity and improved water management practices have bolstered the local economy, creating opportunities for job growth and stimulating income-generating activities within the community.

03. OECD FRAMEWORK

RELEVANCE

The intervention addressing sustainable agricultural practices in Maharashtra is highly relevant, targeting challenges such as water scarcity and low productivity among economically disadvantaged farmers. By empowering these farmers through capacity-building initiatives and forming Water User Groups (WUGs), the program promotes efficient water management and enhances soil fertility through organic practices. Additionally, strengthening Self Help Groups (SHGs) for women tackles gender disparities and fosters their empowerment.

COHERENCE

The intervention is well aligned with the following SDG:

The intervention also aligns with the Jal Jeevan mission, Pradhan Mantri Krishi Sinchai Yojana (PMKSY) and the National Rural Livelihoods Mission (NRLM).

EFFECTIVENESS

Farmers, the primary beneficiaries of the intervention, have reported substantial benefits, including improved agricultural productivity and enhanced soil health, attributed to training in sustainable practices and the use of organic inputs. The program's effectiveness is reflected in positive outcomes such as increased crop yields, better water management, and greater resilience to climate-related challenges. Implementing organic farming techniques has led to healthier crops and reduced dependency on chemical inputs, contributing to long-term sustainability and economic viability for farming households.

EFFICIENCY

The project has efficiently supported farmers from economically marginalised backgrounds in adopting sustainable agricultural practices. Resources have been utilised well, leading to significant improvements in crop yields and water management.

IMPACT

The intervention has created both immediate and long-term effects on the farming community. The farmers trained on sustainable practices have seen significant improvements in crop quality and yields because of the adoption of organic inputs like Amrut Jal and vermicompost. Enhanced access to water resources through the formation of Water User Groups (WUGs) has further boosted agricultural productivity. These changes have not only improved individual livelihoods but have also strengthened community resilience by fostering economic stability. The program has ultimately contributed to better food security and overall well-being within the community.

SUSTAINABILITY

The intervention has created a solid foundation for sustainability by encouraging farmers to share their knowledge and experiences with peers, fostering a community of continuous learning and support. By establishing Water User Groups (WUGs) and empowering Self-Help Groups (SHGs), the program has promoted a sense of ownership among stakeholders. This involvement helps ensure ongoing participation from farmers and community members in sustainable agricultural practices, ultimately leading to long-term benefits for the farming community.

CHAPTER 4
INTRODUCTION

SoulAce team observing water resource areas

NEED OF THE PROGRAM

In rural Maharashtra, water scarcity and erratic rainfall severely impact agricultural productivity and livelihood security, with communities often relying on tanker supply for drinking and irrigation water during the summer. The lack of adequate water storage infrastructure hinders the ability to irrigate, making it challenging for farmers to grow a second crop each year. To address these critical challenges, Marathwada Gramin Vikas Sanstha (MGVS), supported by Bajaj Auto Limited, launched the Bajaj Water Conservation Project over the period of four years in seven villages across Kannad and Vaijapur talukas in Aurangabad district in the state of Maharashtra. This intervention focuses on watershed management to enhance water availability, support sustainable agriculture, and bolster rural livelihoods.

The initiative aims to create resilient, self-sufficient communities equipped to manage and protect their water resources through in-situ soil moisture conservation, water harvesting, and capacity building in sustainable farming practices.

OBJECTIVES OF THE PROGRAM

To increase water availability for drinking and agricultural purposes by developing and restoring water conservation structures and creating storage facilities to mitigate seasonal water shortages.

To promote sustainable agricultural practices that increase crop yields and ensure better soil moisture retention, enabling farmers to cultivate two crops annually.

ABOUT BAJAJ AUTO LTD.

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER - MARATHWADA GRAMIN VIKAS SANSTHA (MGVS)

Marathwada Gramin Vikas Sanstha (MGVS) is a Non-Governmental Organization registered under the Public Trust and Society Registration Act, with additional registrations under the FCRA Act and 12A and 80G certifications. Since 1995-96, MGVS has been dedicated to supporting underprivileged and affected communities across the outskirts of Aurangabad, Nasik, Ahmednagar, and Jalna districts in Maharashtra. The organisation focuses primarily on health, water and sanitation, water conservation, watershed development, and women's empowerment for both rural and urban low-income populations. Sanitation is a key focus for MGVS, which operates in 100 villages within Aurangabad district. Since 2003, MGVS has been actively engaged in water and sanitation initiatives in the districts of Aurangabad and Jalna. Additionally, MGVS is recognised as a District Resource Organization by the Vasundhara Watershed Development Agency, Government of Maharashtra, under the Integrated Watershed Management Programme (IWMP).

SOULACE TEAM OBSERVING FIELD

CHAPTER 5
RESEARCH METHODOLOGY

Focus Group Discussion with SHG members

The Bajaj Auto Limited had appointed SoulAce to assess the impact of Bajaj Water Conservation Project implemented by Marathwada Gramin Vikas Sanstha (MGVS).

OBJECTIVES OF THE STUDY

The primary objectives of the study were to:

- To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.
- To measure the extent to which the program has contributed to the well-being of the community.
- To provide insights into the strengths and areas for improvement of the program implementation.

DEFINITION OF THE RESEARCH

Research can be described as a logical and systematic search for new and useful information on a particular subject. Social science research refers to the systematic activity of gaining new understanding by following scientific principles and methods to minimise bias and subjectivity. It is contrary to writing something based on assumptions or speculations. Though information on certain facts can also be gained through common sense and based on general observation and hearsay, those facts will not be considered valid until they have been obtained in a methodical manner, which can stand the test of time. The defining characteristics of scientific research are objectivity, ethical neutrality, reliability, testability and transparency. The identification of the research problem provides the starting point of research, which is then defined and redefined through a proper review of the literature on the problem or deliberations with research experts and knowledgeable others in the subject matter of interest. Each research problem has a multitude of perspectives and dimensions, and research cannot cover all of those in a single study.

DESIGN SNAPSHOT

Name of the project

Bajaj Water Conservation Project (BWCP)

Implementing agency

Marathwada Gramin Vikas Sanstha (MGVS)

Research design used

Random stratified sampling

Sampling technique

Descriptive

Sample size

258 villagers

Qualitative method used

Semi-structured interviews, testimonials, and focus group discussions with key stakeholders

KEY STAKEHOLDERS

Village Development Committee members

Community members

STUDY TOOLS

Questionnaires for primary beneficiaries:
Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys.

Questionnaires for secondary beneficiaries and stakeholders :
A semi-structured questionnaire was developed for each type of sample of this group. Stakeholders were identified across the focus areas. One-on-one discussions were conducted with beneficiaries to prepare case studies.

COMMITMENT TO RESEARCH ETHICS

The impact evaluation adhered to a strong ethical framework, ensuring responsible and ethical research practices. Participants' rights and well-being were prioritised at every stage of the study. Informed consent was obtained by clearly explaining the study's objectives, procedures, potential risks, and benefits, allowing participants to make fully informed decisions after addressing any questions. Confidentiality was strictly maintained, with data securely stored, accessible only to authorised personnel, and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of coercion, ensuring autonomy and respect for individual choice. Participants were consistently treated with respect, dignity, and fairness, with their well-being prioritised. Support or assistance was readily available whenever needed to ensure their comfort and safety throughout the research process.

INTERACTION WITH A BENEFICIARY

CHAPTER 6
KEY STUDY FINDINGS AND IMPACT

This chapter explores the partnership between Bajaj Auto Limited and Marathwada Gramin Vikas Sanstha (MGVS) through the Bajaj Water Conservation Project, aimed at improving water availability and agricultural productivity in seven villages of Kannad and Vaijapur talukas, Aurangabad district.

GEOGRAPHICAL COVERAGE

The intervention was implemented in seven villages in Kannad and Vaijapur Talukas, Aurangabad district in Maharashtra.

OUTREACH AND INCLUSIVITY

Primary beneficiaries were communities from the selected villages.

DEMOGRAPHY OF BENEFICIARY POPULATION

CHART 1: AGE-WISE DISTRIBUTION OF THE RESPONDENTS

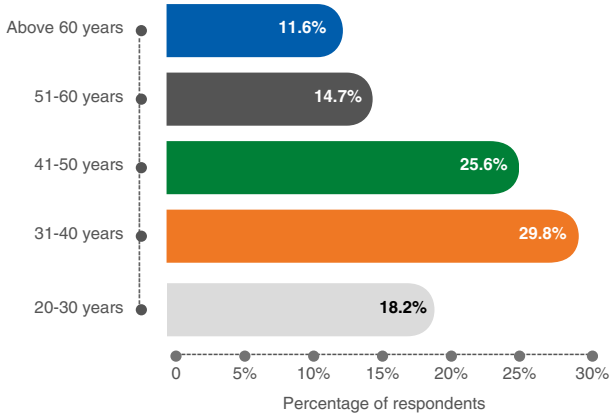


Chart 1 shows the age distribution of respondents. The most prominent group includes those aged between 31-40 years, accounting for 29.8% of the total, while 25.6% fall within the 41–50-year age range. Furthermore, 18.2% of respondents belong to the 20–30-year age group.

CHART 2: GENDER-WISE DISTRIBUTION OF RESPONDENTS

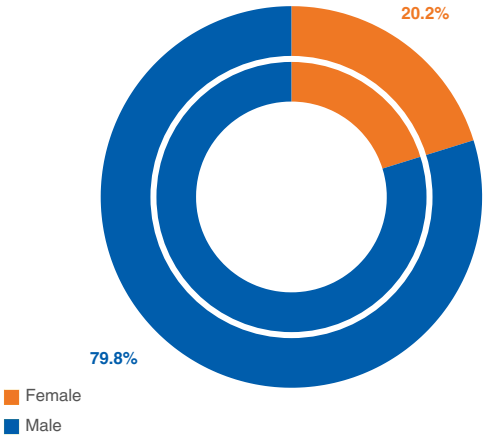


Chart 2 shows that the gender distribution of respondents is significantly skewed toward males, who make up 79.8% of the total, while females account for 20.2%.

INTERACTION WITH THE STAKEHOLDERS

CHART 3: EDUCATION LEVEL OF RESPONDENTS

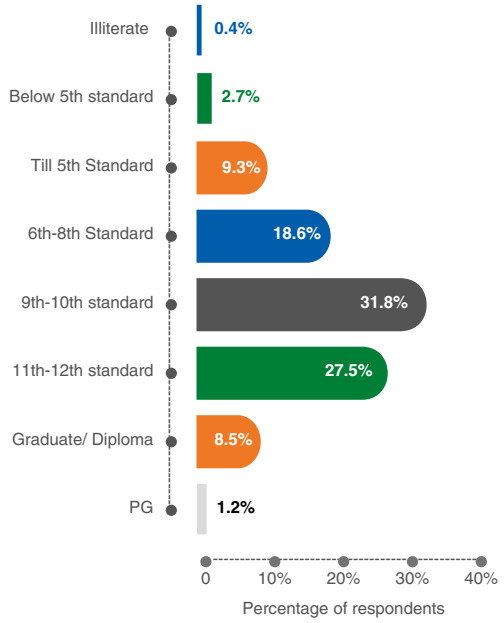


Chart 3 shows that 31.8% of respondents have an educational level of 9th to 10th standard, followed by over one-fourth (27.5%) who have completed the 11th and 12th standard. Additionally, 9.3% of respondents have completed primary schooling.

CHART 4: AREA OF LAND OWNED

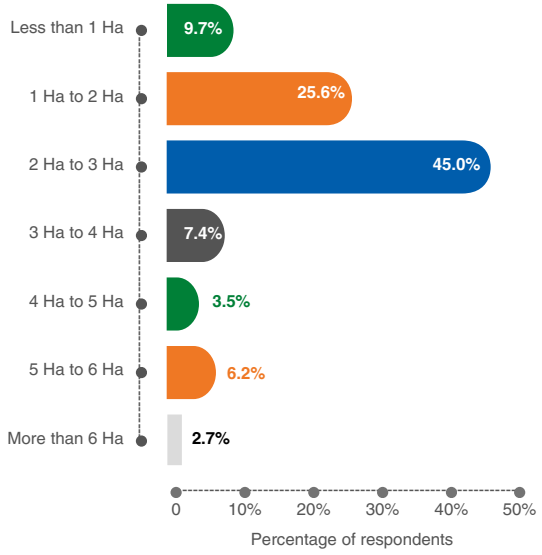


Chart 4 shows that approximately 45% own 2-3 hectares of land, followed by 25.6% who own 1-2 hectares. Additionally, 9.7% of respondents possess less than 1 hectare of land.

CHART 5: ANNUAL FAMILY INCOME

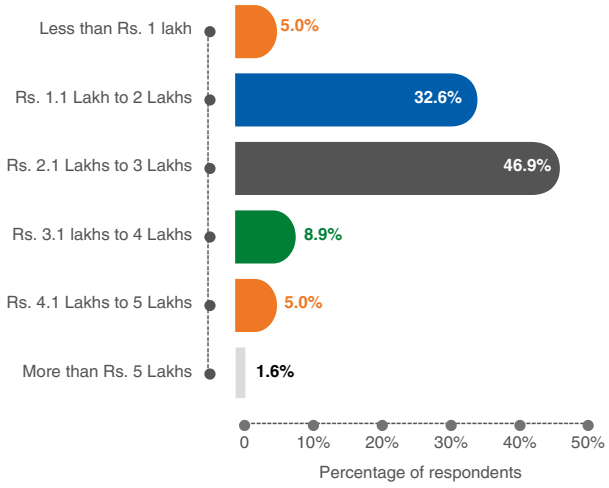


Chart 5 shows that less than half (46.9%) of respondents reported an annual family income between Rs. 2.1 to 3 lakhs. This is followed by 32.6% of respondents who fall within the income range of Rs. 1.1 lakh to 2 lakhs. Additionally, 5% of respondents have an annual family income of less than Rs. 1 lakh.

CHART 6: MAJOR CROPS CULTIVATED

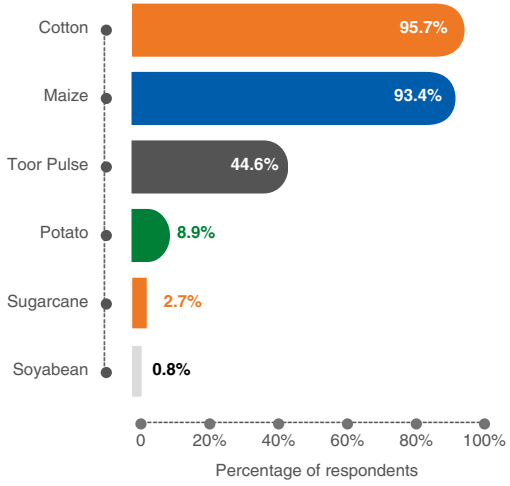


Chart 6 shows that a substantial majority of respondents (95.7%) reported cultivating cotton, followed by 93.4% who grow maize. Additionally, less than half of the respondents (44.6%) reported cultivating toor pulse. The percentage of those growing other crops, such as potato, sugarcane, and soybean, is notably lower, at around 10%.

PRE-INTERVENTION STATUS

A pre-assessment survey of respondents in the villages has unveiled the intervention status of the program:

CHART 7: WHETHER PRACTISING MICRO IRRIGATION- BEFORE AND AFTER THE INTERVENTION

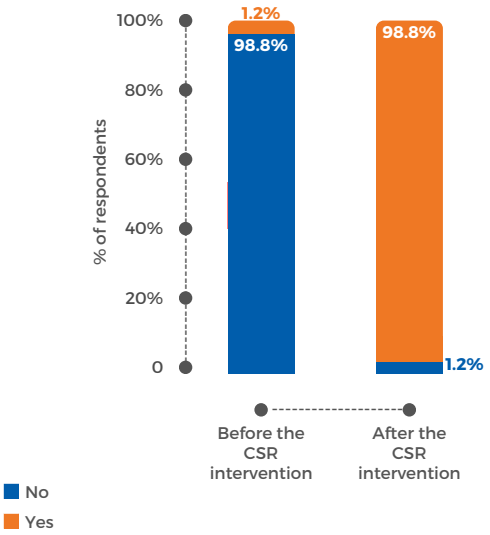


Chart 7 indicates that a large majority of respondents (98.8%) were not utilising micro-irrigation techniques in their agricultural practices.

CHART 8: WHETHER DEPENDENT ON WATER TANKERS FOR GETTING DRINKING WATER BEFORE THE INTERVENTION

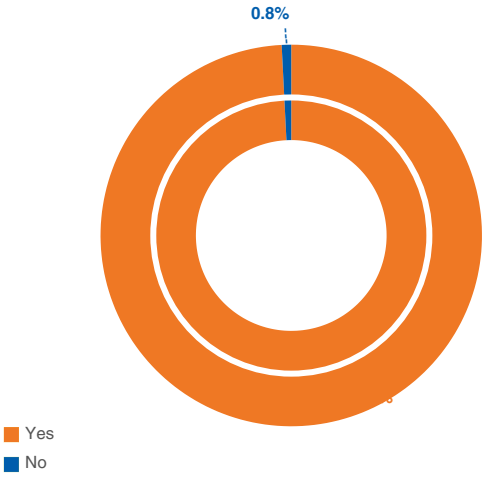


Chart 8 reveals that prior to the intervention, nearly all respondents (99.2%) relied on water tankers for their drinking water supply.

CHART 9: PERCENTAGE OF CULTIVABLE LAND AREA GOT ASSURED IRRIGATION BEFORE THE INTERVENTION

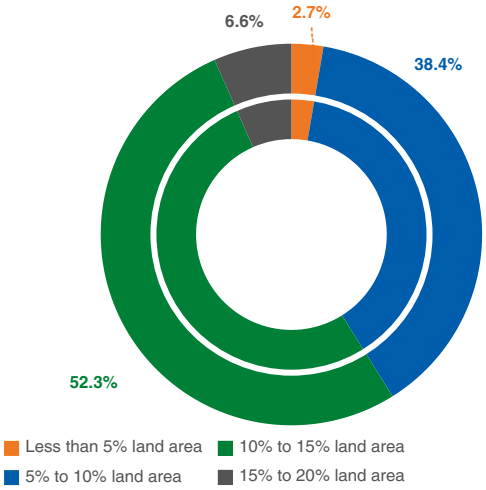


Chart 9 illustrates the distribution of cultivable land with assured irrigation before the CSR intervention. Notably, 52.3% of respondents had 10% to 15% of their land area irrigated, while 38.4% had between 5% and 10% of their land under assured irrigation. Additionally, 6.6% of respondents reported that 15% to 20% of their cultivable land received assured irrigation, and a small portion, 2.7%, indicated less than 5% of their land being irrigated.

Discussions with key stakeholders revealed that before the installation of recharge shafts, water availability for agriculture was a major challenge. Farmers faced severe water shortages, especially during dry seasons and droughts, which hindered crop and livestock production. Irrigation was unreliable, leading to crop loss and reduced productivity.

INTERACTION WITH A VILLAGER

KEY PROGRAM INPUTS AND ACTIVITIES

The program intervention focuses on improving water resources and enhancing livelihoods in the community. Key components include the development of water resources through activities such as deepening and widening drainage channels, constructing cement nala bunds, and repairing existing water structures. Additionally, the intervention aims to support resource-poor households by promoting Self-Help Groups (SHGs) and facilitating small enterprises. Community mobilisation and capacity building are also integral to the program, achieved through training sessions and awareness campaigns designed to equip stakeholders, including village development committees, jalmitra members, and gram panchayat members, with essential skills and knowledge.

FORMATION AND STRENGTHENING OF COMMUNITY INSTITUTIONAL STRUCTURES

The project initiative included the formation and strengthening of community-based institutional structures to support sustainable development:

VILLAGE DEVELOPMENT COMMITTEES (VDCS)

Seven VDCs were established across project villages, with members chosen through Gramsabha consensus to represent all socioeconomic groups, with 50% women participation. VDCs oversee project implementation, coordinate locally, manage community contributions, and resolve conflicts, ensuring inclusive involvement in village development.

WATER USER GROUPS (WUGS)

Each WUG, consisting of 20–30 farming households, manages water resources, coordinates crop planning based on water availability, and raises a 10% community contribution toward water infrastructure. Training covered maintenance, operations, and water-efficient practices.

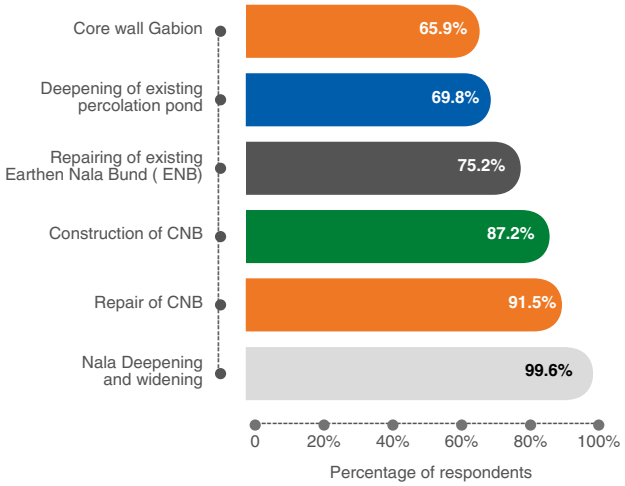
SELF-HELP GROUPS (SHGS)

Focused on empowering women, both new and existing SHGs were strengthened with training on group-building, management, financial inclusion, and record-keeping. Skills training in areas like poultry and dairy management further supports SHG's participation in water resource maintenance and livelihood improvement.

Another key activity of the intervention involves implementing vegetative measures to strengthen bund stability and increase biomass along nala banks. This initiative includes procuring and sowing stylohemata grass seeds, which add nutritious fodder value while helping to stabilize soil and prevent erosion. Additionally, neem seeds are being planted along these bunds, contributing to soil retention and improving the ecological balance in the area. Training sessions were conducted to equip farmers and community members with the skills needed for effective planting and maintenance.

Another activity under livelihood development focuses on enhancing the skills and economic opportunities for resource-poor families, particularly landless households. This is achieved through the formation and strengthening of Self-Help Groups (SHGs), which provide members with training in financial management, record-keeping, and various vocational skills such as tailoring, dairy farming, and goat rearing. Beneficiaries also receive support for establishing small enterprises like poultry farming and paper dish making.

CHART 10: TYPE OF WATER RESOURCE DEVELOPMENT ACTIVITY CARRIED OUT IN THE COMMUNITY

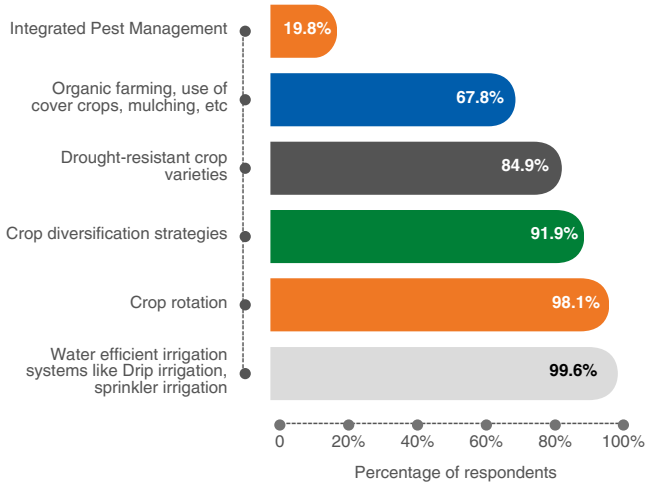


The activities carried out in the community include nala deepening and widening, with 99.6% of respondents reporting that this activity is taking place. Additionally, 91.5% of respondents reported the repair of cement nala bunds (CNB), while 87.2% indicated that the construction of new CNBs is occurring. Other significant activities include the repair of existing earthen nala bunds (ENB), reported by 75.2% of respondents, the deepening of existing percolation ponds, with 69.8% reporting this activity, and core wall gabion construction, which was noted by 65.9% of respondents.

SOULACE TEAM AT THE PROJECT BRANDING SITE

CAPACITY BUILDING

CHART 11: AREAS OF CLIMATE-RESILIENT CROPPING IN WHICH RESPONDENTS GAINED KNOWLEDGE THROUGH TRAINING



The training programs of the Bajaj Water Conservation Project (BWCP) implemented by MGVS indicate a strong emphasis on equipping respondents with essential skills and knowledge related to climate-resilient agricultural practices. Notably, 99.6% of respondents gained insights into water-efficient irrigation systems, including drip and sprinkler irrigation. Additionally, 98.1% learned about crop rotation, while 91.9% were educated on crop diversification strategies. Knowledge about drought-resistant crop varieties was acquired by 84.9% of respondents. Furthermore, more than two-thirds of respondents (67.8%) received training in organic farming techniques, such as the use of cover crops and mulching. 19.8% of respondents reported gaining knowledge in integrated pest management.

To further boost agricultural productivity, training sessions on bio-pesticide and bio-fertiliser techniques, specifically through Amrut Jal and vermicomposting, were provided. Amrut Jal, a natural bio-fertiliser, is made by combining cow dung, cow urine, and black jaggery and allowing it to ferment for three days with regular stirring. This organic approach supports healthier soil and plants, reducing reliance on chemical inputs and enhancing sustainable farming practices.

"The training I received through the Bajaj Water Conservation Project was incredibly beneficial. The structure of the training was clear and straightforward, with all topics explained in simple language that was easy to understand. I learned how to effectively use and maintain water structures, covering everything from basic principles to detailed operational strategies."

- Sorupchand Tarachand Ghunavat, 44 years male, Khaper Kheda village

FGDS WITH STAKEHOLDERS

Qualitative discussions with stakeholders have revealed that the training provided to Water User Group (WUG) members on water resource structures, such as cement nala bunds and gabion check dams, was highly beneficial in enhancing their understanding and management of these resources. The training focused on the basics of these structures, including their purpose, usage, and maintenance, which helped participants gain practical knowledge of water conservation techniques. WUG members reported that the training equipped them with the skills needed to effectively use and maintain the structures, leading to improved water management practices within their communities. They have since applied the knowledge gained to enhance irrigation practices, ensuring more efficient water usage for agricultural purposes.

Discussions from FGDs revealed that the project has been well-executed, with the NGO and social worker effectively engaging the community. Villagers noted a positive shift in crop and irrigation patterns, while water levels in wells and borewells have risen by 10-12 feet, even in summer. SHG members have become self-reliant, expanding their businesses by applying training knowledge, and farmers are achieving higher financial yields. The community emphasised the unity fostered through CSR intervention, which strengthened their collective efforts. However, maintenance challenges were highlighted, underscoring the need for regular collection of funds by the village committee to ensure sustainability.

Through discussions with stakeholders, it was revealed that community members became aware of the training on Amrut Jal preparation when the trainers visited their village. The experience of attending the training was described as positive, with participants learning how to prepare Amrut Jal, a bio-fertiliser made using cow urine and other natural ingredients. After attending the training, they were able to prepare Amrut Jal themselves without encountering any significant difficulties.

"Since incorporating Amrut Jal on our farm, we've seen clear improvements in both soil quality and crop health. By soaking vegetable leaves in cow urine and other natural ingredients for 15 days, we were able to create a potent bio-fertiliser that has significantly benefited our crops. Applying it through monthly spraying, we've observed better soil fertility, improved moisture retention, and a noticeable boost in crop quality and yield. The produce is healthier and more vibrant, showcasing the positive impact of using natural fertilisers like Amrut Jal on sustainable farming practices."

- Asha Krushna Kavde, 40 years female, Khamgaon village

INTEREACTION WITH PROJECT BENEFICIARY

IMPACT

IMPROVED WATER AVAILABILITY FOR AGRICULTURAL PURPOSE

CHART 12: PERCENTAGE OF REDUCTION IN WATER USAGE FOLLOWING MICRO-IRRIGATION

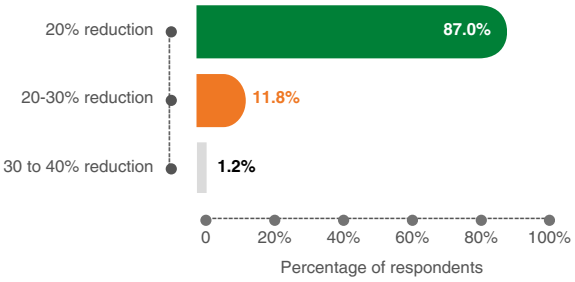


Chart 12 shows that following the intervention with micro-irrigation systems, a significant majority of respondents (87%) reported a 20% reduction in water usage, while an additional 11.8% observed a reduction of 20–30%. This suggests that micro-irrigation has not only reduced water consumption but also helped retain moisture in the ground, leading to more fertile soil.

Qualitative discussions with stakeholders have revealed that the installation of water recharge shafts has had a significant positive impact on water availability, benefiting both farming and household needs. Many farmers have adjusted their farming practices, such as adopting alternate cropping techniques, due to the improved and more reliable access to water. Additionally, farmers have observed a noticeable rise in groundwater levels in their wells and borewells since the recharge shafts were installed. This increase in water levels has provided them with more water for irrigation and daily household use, reducing their reliance on external water sources and contributing to greater sustainability in their agricultural practices.

CHART 13: LEVEL OF IMPROVEMENT OBSERVED IN THE RESILIENCE OF KHARIF CROPS DURING DRY SPELLS

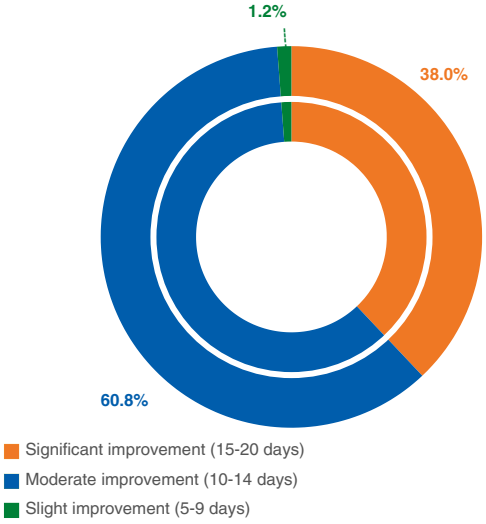


Chart 13 shows that the intervention significantly improved the resilience of Kharif crops during critical dry spells, which are essential for agricultural productivity. A notable 38% of respondents reported substantial improvements, enabling their crops to endure periods without rainfall for 15 to 20 days, thereby offering greater security against drought conditions. Additionally, 60.8% of respondents noted a moderate improvement, allowing their crops to survive dry spells for an extra 10 to 14 days. This highlights the intervention's effectiveness in promoting better water management practices, which enhanced water retention and availability, ultimately contributing to increased agricultural productivity.

CHART 14: NO OF MONTHS IN A YEAR RESPONDENTS EXPERIENCED SCARCITY FOR IRRIGATION PURPOSES AFTER THE INTERVENTION

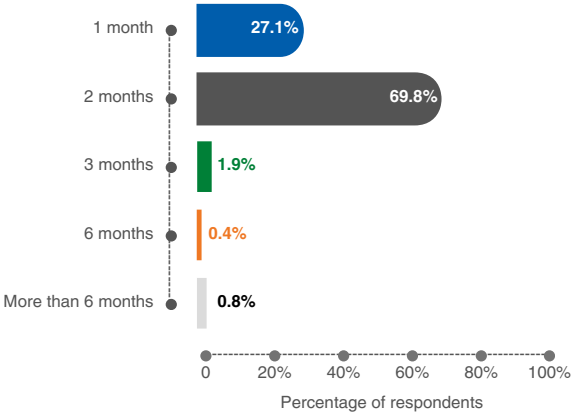


Chart 14 shows that 69.8% of respondents reported experiencing water scarcity for irrigation purposes for only two months after the intervention, while 27.1% faced scarcity for just one month. In contrast, prior to the intervention, 81% indicated that they experienced water scarcity for more than six months. This reflects a significant improvement in water availability for agriculture following the intervention, indicating enhanced access to irrigation resources that likely contribute to increased agricultural productivity.

CHART 15: WHETHER HAVING SUFFICIENT WATER FOR CATTLE DRINKING

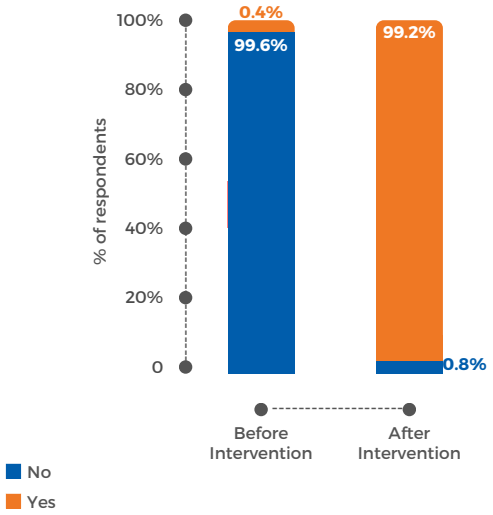


Chart 15 shows a significant improvement in water availability for cattle drinking following the intervention. Before the intervention, nearly all respondents (99.6%) reported not having sufficient water for their cattle. In contrast, after the intervention, a substantial majority of respondents (99.2%) confirmed that they now have adequate water for their cattle.

This shift highlights the positive impact of the intervention on livestock water supply, enhancing the overall well-being of both the cattle and the farmers relying on them.

FOR DRINKING PURPOSE

CHART 16: NO OF MONTHS IN A YEAR RESPONDENTS EXPERIENCED SCARCITY OF DRINKING WATER AFTER THE INTERVENTION

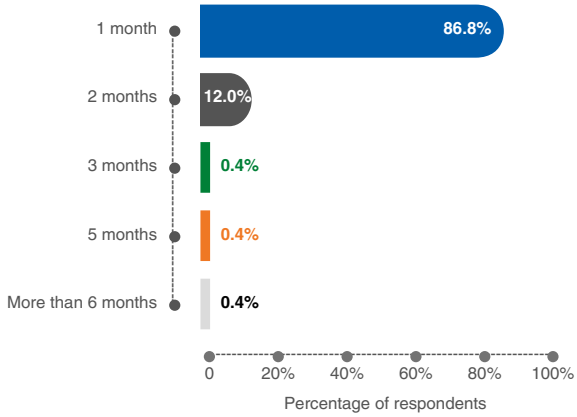


Chart 16 shows that after the intervention, the majority of respondents (86.8%) reported experiencing drinking water scarcity for just one month, while 12% faced scarcity for two months. A small fraction, 0.4%, indicated they experienced scarcity for three months, five months, or more than six months. This represents a significant improvement compared to before the intervention, when 79.1% of respondents faced water scarcity for over six months. This reduction in the duration of water scarcity contributed to improving the quality of life for the respondents and ensured the overall well-being of the community.

CHART 17: HEIGHT OF WATER LEVEL FROM SURFACE LEVEL DURING THE SUMMER SEASON IN WELL- BEFORE AND AFTER INTERVENTION

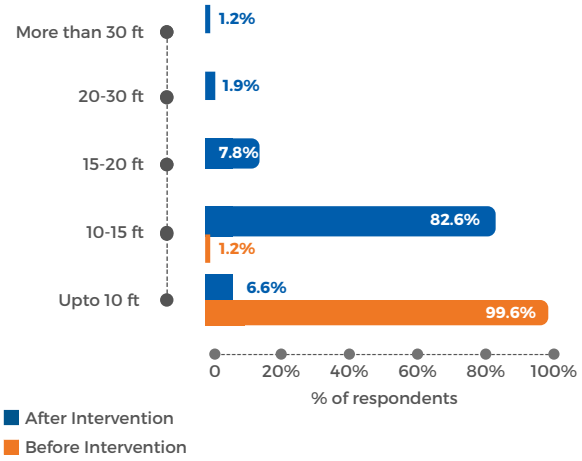


Chart 17 shows a significant improvement in water levels from the surface in wells during the summer season following the intervention. Before the intervention, almost all respondents (99.6%) reported water levels of up to 10 feet, indicating severe scarcity. After the intervention, only 6.6% reported the same shallow water level. In contrast, a substantial 82.6% of respondents indicated that the water level had risen to between 10 and 15 feet, indicating enhanced water availability and better resource management resulting from the intervention.

"Since we started using Amrut Jal as a bio-fertiliser, we've seen significant improvements in the growth of our crops. The length of the crops has increased, and overall, the quality of the produce has become much better. We have reduced our use of chemical fertilisers considerably, and the results with Amrut Jal are far better than what we experienced with chemicals. The soil has improved, and the crops are thriving. The change has not only improved the yield but also reduced our farming costs. I am very satisfied with the results and would recommend Amrut Jal to other farmers."

- Uddhav Pawar, 48 years male, Rohila village

IMPROVED AGRICULTURAL PRODUCTIVITY

CHART 18: LAND AREA MADE CULTIVABLE AFTER PROJECT INTERVENTION

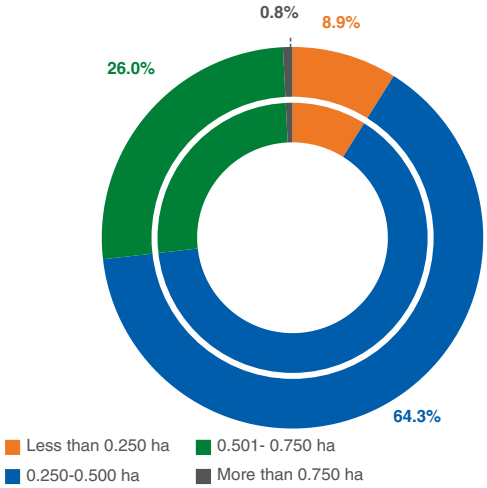


Chart 18 shows that the project intervention has successfully increased the cultivable land area for many respondents. Nearly two-thirds (64.3%) reported that an additional 0.250 to 0.500 hectares of land became cultivable. Additionally, 26% indicated that they gained between 0.501 and 0.750 hectares of arable land, while 8.9% were able to cultivate an extra area of less than 0.250 hectares. These enhancements demonstrate the project's effectiveness in improving land usability and boosting agricultural productivity by making more land available for cultivation.

Qualitative feedback from farmers has shown positive results from using Amrut Jal as a bio-fertiliser. Many farmers have noticed an improvement in soil quality, with better moisture retention and enhanced soil fertility. They have observed that the growth of their crops has improved, with crops growing taller and healthier. The use of Amrut Jal has also led to a noticeable increase in crop quality, with farmers reporting that the produce is of better quality compared to before.

CHART 19: PERCENTAGE INCREASE IN YIELD OF KHARIF CROP FOLLOWING CSR INTERVENTION

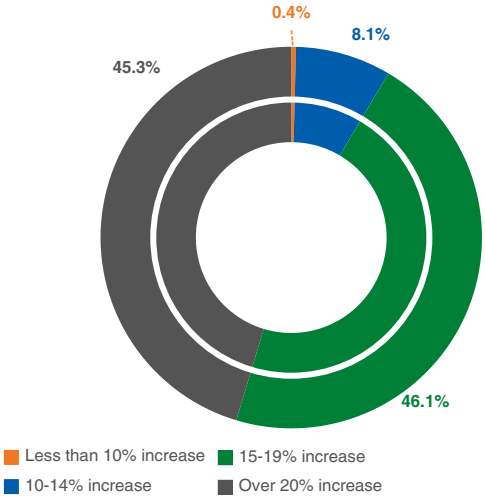


Chart 19 shows that the CSR intervention resulted in significant improvements in Kharif crop yields among respondents. Notably, 45.3% of respondents reported an increase of over 20% in their crop yields, while 46.1% experienced a rise of 15-19%.

CHART 20: PERCENTAGE INCREASE IN YIELD OF RABI CROP FOLLOWING CSR INTERVENTION

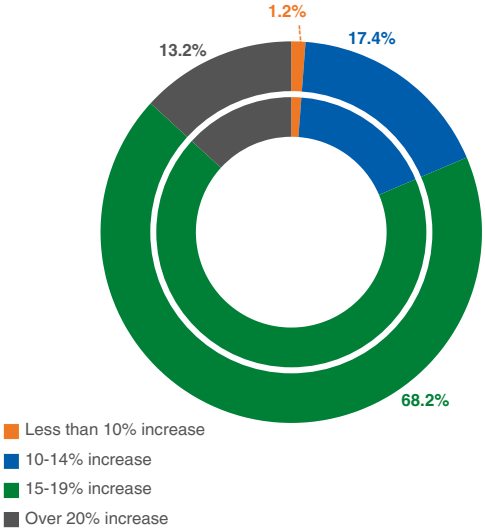


Chart 20 shows that over two-thirds (68.2%) of respondents observed an increase in Rabi crop yields by 15-19% following the intervention, while 17.4% reported an increase of 10-14%. These results underscore the intervention's effectiveness in boosting agricultural productivity, demonstrating its positive influence on farmers' livelihoods and contributing to enhanced food production in the region.

Stakeholders have shared that the installation of water recharge shafts has led to a notable increase in crop yield.

With more consistent access to water, particularly during dry seasons, farmers have observed better crop growth and higher productivity. Several farmers reported that their crops have grown taller and stronger, leading to greater yields compared to previous years.

INCREASED INCOME OF THE COMMUNITY MEMBERS

CHART 21: PERCENTAGE INCREASE IN ANNUAL AGRICULTURAL INCOME FOLLOWING POST INTERVENTION

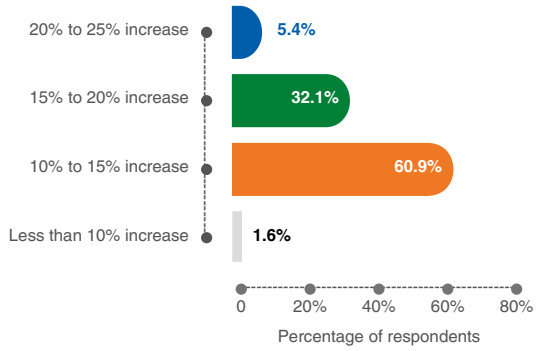


Chart 21 shows that the intervention had a major impact on annual agricultural income, with 60.9% of respondents reporting an increase of 10% to 15%. Additionally, 32.1% experienced a rise of 15% to 20%. 5.4% experienced an increase in annual income of 20-25%. This indicates that the intervention effectively enhanced the economic well-being of farmers, contributing to improved livelihoods in the region.

SOULACE MEMBER INTERACTING WITH THE LOCAL COMMUNITY MEMBERS

CHART 22: AREA OF FARMLAND UNDER ORCHARD CULTIVATION-BEFORE AND AFTER INTERVENTION

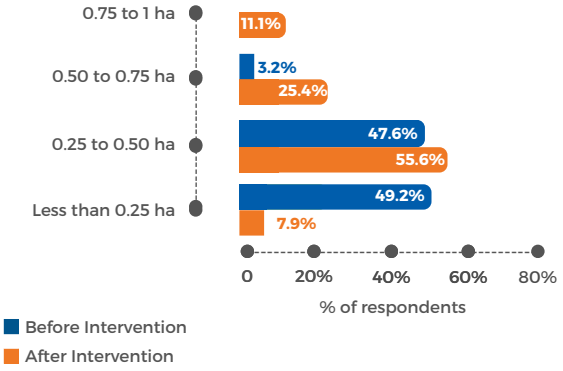


Chart 22 shows that prior to the intervention, 47.6% of respondents were cultivating between 0.25 and 0.50 hectares. This increased to 55.6% after the intervention. Furthermore, the percentage of respondents cultivating between 0.50 to 0.75 hectares rose from 3.2% before the intervention to 25.4% after. Additionally, while no respondents reported cultivating between 0.75 to 1 hectare before the intervention, 11.1% of respondents indicated that they were cultivating this amount of land following the intervention, highlighting a notable increase in the land under cultivation.

CHART 23: AREA OF FARMLAND UNDER VEGETABLE CULTIVATION-BEFORE AND AFTER INTERVENTION

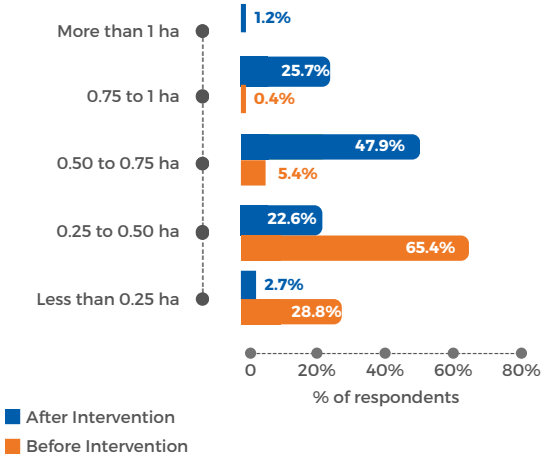


Chart 23 shows that prior to the intervention, only 5.4% of respondents were cultivating between 0.50 to 0.75 hectares of vegetables. However, following the intervention, there was a substantial increase, with nearly half (47.9%) of respondents now cultivating vegetables on 0.50 to 0.75 hectares. Additionally, the area dedicated to vegetable cultivation in the 0.75 to 1-hectare range also grew, with 25.7% of respondents reporting an expansion in this area. This increase in vegetable cultivation areas after the intervention has contributed to enhanced food security and higher income for farmers.

FGDs with farmers have revealed that since the intervention, there has been a significant increase in crop yield. Many farmers have reported growing two to three crops per year, compared to only one crop prior to the intervention. This boost in productivity has been attributed to improved irrigation practices and better water management. Farmers have also noted a rise in crop quality, with improved soil fertility and moisture retention contributing to healthier, more robust crops.

"Since the installation of the recharge shafts, I have definitely noticed an improvement in water availability for my farm. During dry seasons and drought periods, the difference has been significant; I now have better access to water when I need it most. The recharge shafts have positively impacted my irrigation methods, making it easier to manage water for my crops."

- Madan Nana Munde, 32 years male, Sasegaon village

"Since the installation and proper use of the water structures, I've noticed a positive shift in our water availability and a real improvement in our irrigation practices. These structures effectively meet the water needs of our agricultural community, allowing us to manage water resources more efficiently and with greater consistency. It has brought noticeable benefits to our productivity and crop yield.

- Gangubai Sudhakar Ghuge, 54 years female, Sasegaon village

CASE STUDY 1

Sorupchand Tarachand Ghunavat, a 44-year-old farmer from Khaper Kheda, cultivates cotton on his 1-acre plot of land. He learned about Amrut Jal, a natural bio-fertiliser, through a training session organised in his village. Following the training, he began preparing Amrut Jal using cow urine, cow dung, and jaggery, a mixture that is fermented and then applied to the soil.

After using Amrut Jal for several months, Sorupchand observed noticeable improvements in both the quality of his soil and the growth of his cotton crops. The soil became richer and more fertile, with better moisture retention, which significantly benefited his crops, especially during the dry season. The height of his cotton plants increased, and he noticed a marked improvement in crop quality and yield.

By using Amrut Jal, Sorupchand reduced his dependency on chemical fertilisers, leading to cost savings while also contributing to a more sustainable farming approach. He now applies Amrut Jal every two months and finds the process much quicker and easier than using chemical fertilisers. He believes that the long-term use of Amrut Jal will continue to boost both the fertility of his soil and the productivity of his farm.

Sorupchand has faced no challenges in consistently using Amrut Jal and feels confident in its positive impact on his farming practices. He does not require additional support or training, as the process is simple and effective. He believes that Amrut Jal has not only benefited his farm but also helped reduce soil pollution, promoting a more sustainable and eco-friendly farming practice.

CASE STUDY 2

Sanjay Sahebrao Nalawade, a 52-year-old farmer from Kanadgaon village under the Kanadgaon Gram Panchayat, has experienced a remarkable transformation in his agricultural practices and livelihood due to a CSR initiative aimed at nala deepening. Before the intervention, water scarcity was a persistent issue in the village, particularly during the summer months when wells and borewells ran completely dry. This severely limited irrigation and impacted crop yields, reducing income for Sanjay and other farmers in the community.

Through the CSR project, the deepening of a nearby nala significantly improved water retention and storage in the area. Sanjay's farm, located only 100 meters from the newly deepened nala, benefited directly as water levels in his well increased substantially. This newfound water availability enabled year-round irrigation, improving crop yields and creating a ripple effect of economic growth in the village. According to Sanjay, the intervention has been pivotal in enhancing village income and fostering development, with most villagers expressing satisfaction with the project's outcomes.

However, He also highlighted the need for sustainable maintenance of the water resource. He suggested that a monitoring committee be established to prevent encroachment near the water storage and ensure that regular deepening activities take place as needed.
The intervention has truly given a new life to our village. Earlier, water scarcity was a constant challenge, but now we have sufficient water for drinking and farming. This has transformed our farming practices, with villagers shifting to profitable crops and fruits, significantly improving livelihoods. This project has brought sustainable growth and prosperity to Nipani.

Asaram Borse, VDC member, Nipani village

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- For farmers, the increased access to water through recharge shafts and community water structures has significantly improved crop yields, allowing them to plan irrigation schedules effectively and maintain crop health even during dry periods.
- Through Self-Help Groups (SHGs), women gained critical financial and livelihood skills, enhancing their economic independence.
- The intervention has also increased the annual family income of the farmers, leading to a better quality of life.
- Through training on sustainable practices, including the preparation and use of organic inputs like Amrut Jal, vermicompost, and micro irrigation, farmers have achieved healthier soil, higher crop yields, and reduced reliance on chemical inputs, supporting more sustainable, cost-efficient farming and boosting long-term productivity.

HOUSEHOLDS

- Improved earnings and increased agricultural productivity have alleviated family stress, contributing to overall well-being.
- The intervention has enhanced access to water for domestic use, significantly reducing the time and effort spent on water collection.
- Higher agricultural productivity has led to increased household incomes, allowing families to invest in education, nutrition, and other essential needs, thereby improving their overall quality of life.
- Training in sustainable farming practices has empowered families to adopt eco-friendly methods, fostering a more self-sufficient and resilient household economy.

COMMUNITY

- The formation and strengthening of community institutions, such as Village Development Committees (VDCs) and Water User Groups (WUGs), has fostered local governance and collective decision-making, enhancing community cohesion and participation in development initiatives.
- Increased agricultural productivity and improved water management practices have bolstered the local economy, creating opportunities for job growth and stimulating income-generating activities within the community.
- The rise in agricultural output and income has enhanced community resilience, fostering collective investments in infrastructure, education, and healthcare, which improves the overall quality of life.

STATE

- The intervention has positively influenced state-level agricultural policies and practices by demonstrating successful sustainable farming methods, increasing overall agricultural productivity, and contributing to food security.
- Enhanced agricultural output also boosts the state's economy, supports rural development initiatives, and promotes eco-friendly practices that align with state sustainability goals.

NATIONAL

The intervention aligns with national initiatives aimed at improving rural livelihoods, such as the Jal Jeevan Mission, Pradhan Mantri Krishi Sinchai Yojana (PMKSY) and the National Rural Livelihoods Mission (NRLM).

CHAPTER 8
HYDROLOGICAL ASSESSMENT

OBJECTIVES OF THE ASSESSMENT

Change in surface water holding capacity and reduction in Run-off.

Change/improvement of Groundwater table/recharge.

Change in land use pattern, agricultural productivity, and soil moisture conditions.

PROJECT LOCATIONS

The project was implemented in the Gangapur taluka of Aurangabad district. The measures that were implemented as a part of the water conservation efforts can broadly be categorised into construction and repair of Water Harvesting Structures (WHS), measures for Soil Moisture Conditions (SMC) improvement, and promoting water use efficiency. The details of the same are as below:

TABLE 1: DETAILS OF THE INTERVENTIONS

District	Aurangabad	**Area of Watershed**	160.7237
Block	Kannad & Vaijapur		**Core Wall Gabion**
	Cement Nala Bund	**KT Weir**	
Nos.	28		
Capacity	404818.00	269051.00	269051.00

The maps below give the location of the intervention watershed in the Aurangabad district of Maharashtra and all the available locations of the various interventions across the intervention watersheds as a part of this project.

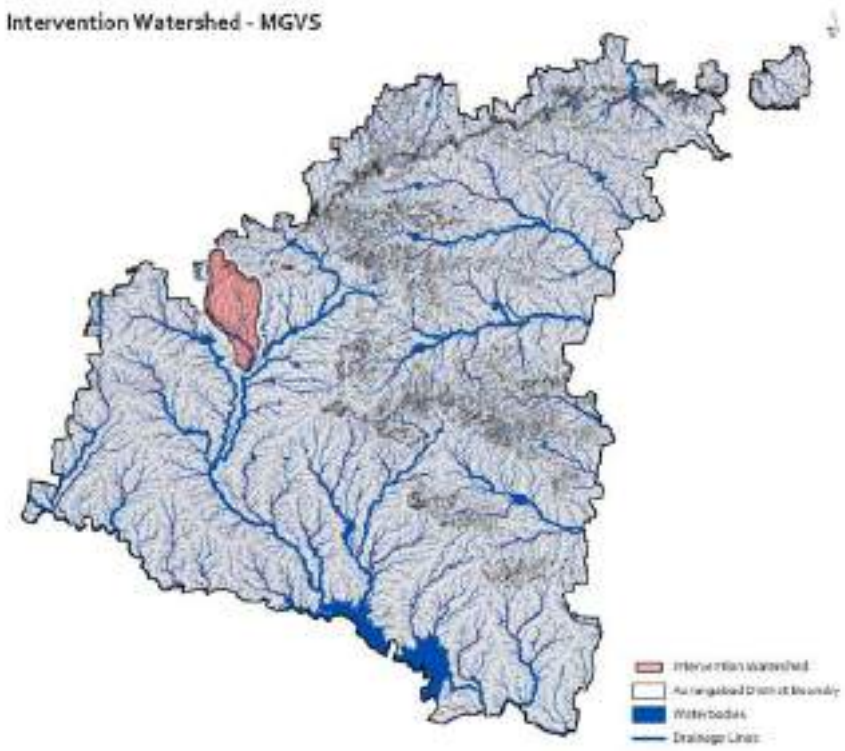


FIGURE 1: PROJECT LOCATIONS IN AURANGABAD

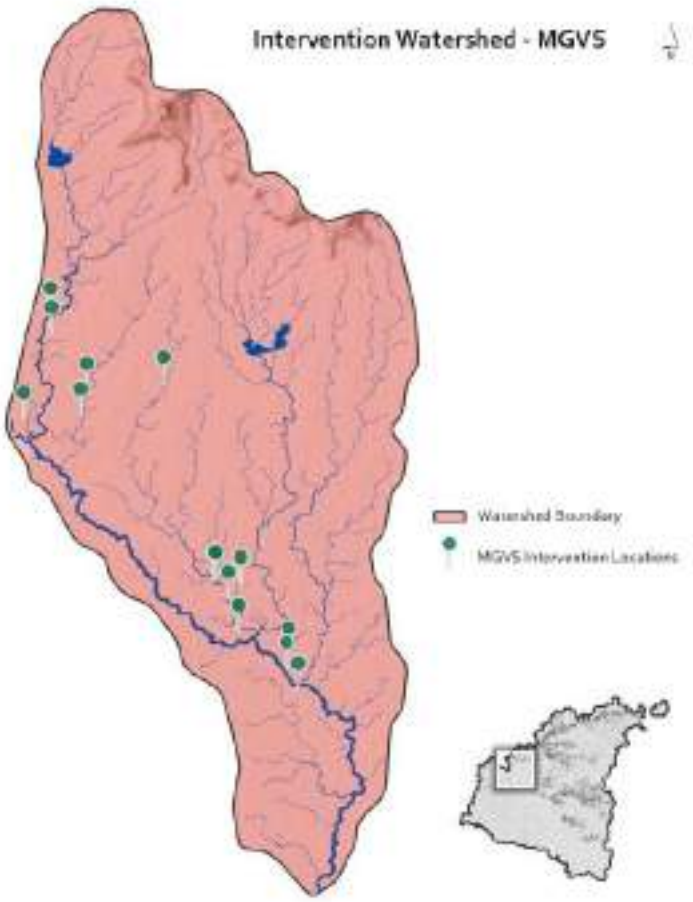


FIGURE 2: LOCATION OF PROJECT INTERVENTIONS

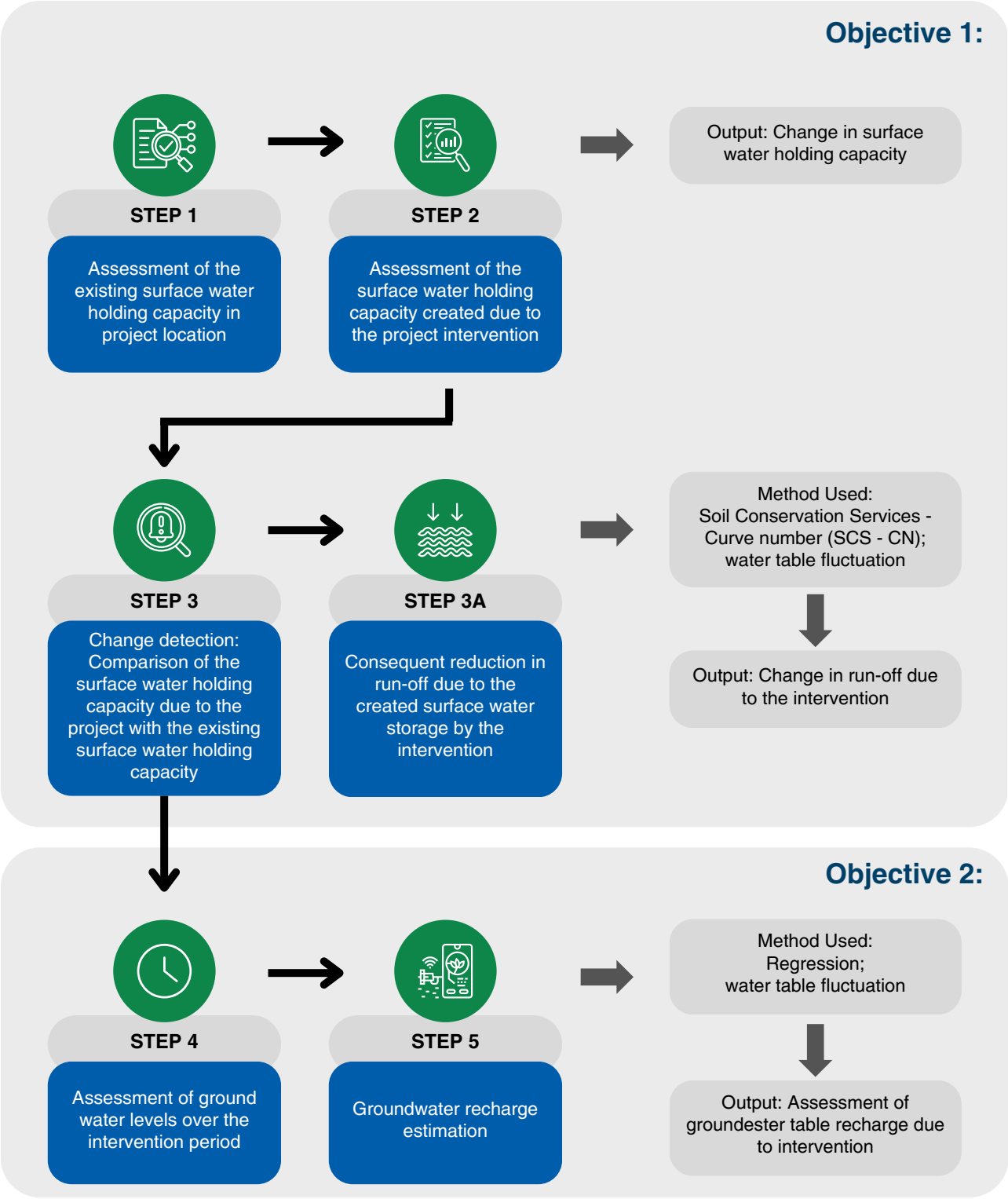
The detailed location of all the interventions covered as a part of the evaluations are provided in Annexure 1. The additional parameters that were considered are geology, hydrogeology, and soil types, and the information about the same is provided in Annexure 2.

While some of the assessments, such as the run-off estimation and the contribution of the interventions to the ground water levels, were done only considering the intervention area, some assessments, such as the rainfall and the ground water depth assessments, had to be done considering a larger area such as the entire block or the district due to the constraints faced with data availability. Care was taken to ensure that the results were represented correctly in this condition to varying assessment units.[1]

[1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

ASSESSMENT APPROACH

The assessment approach consists of various steps for each objective, as shown below:



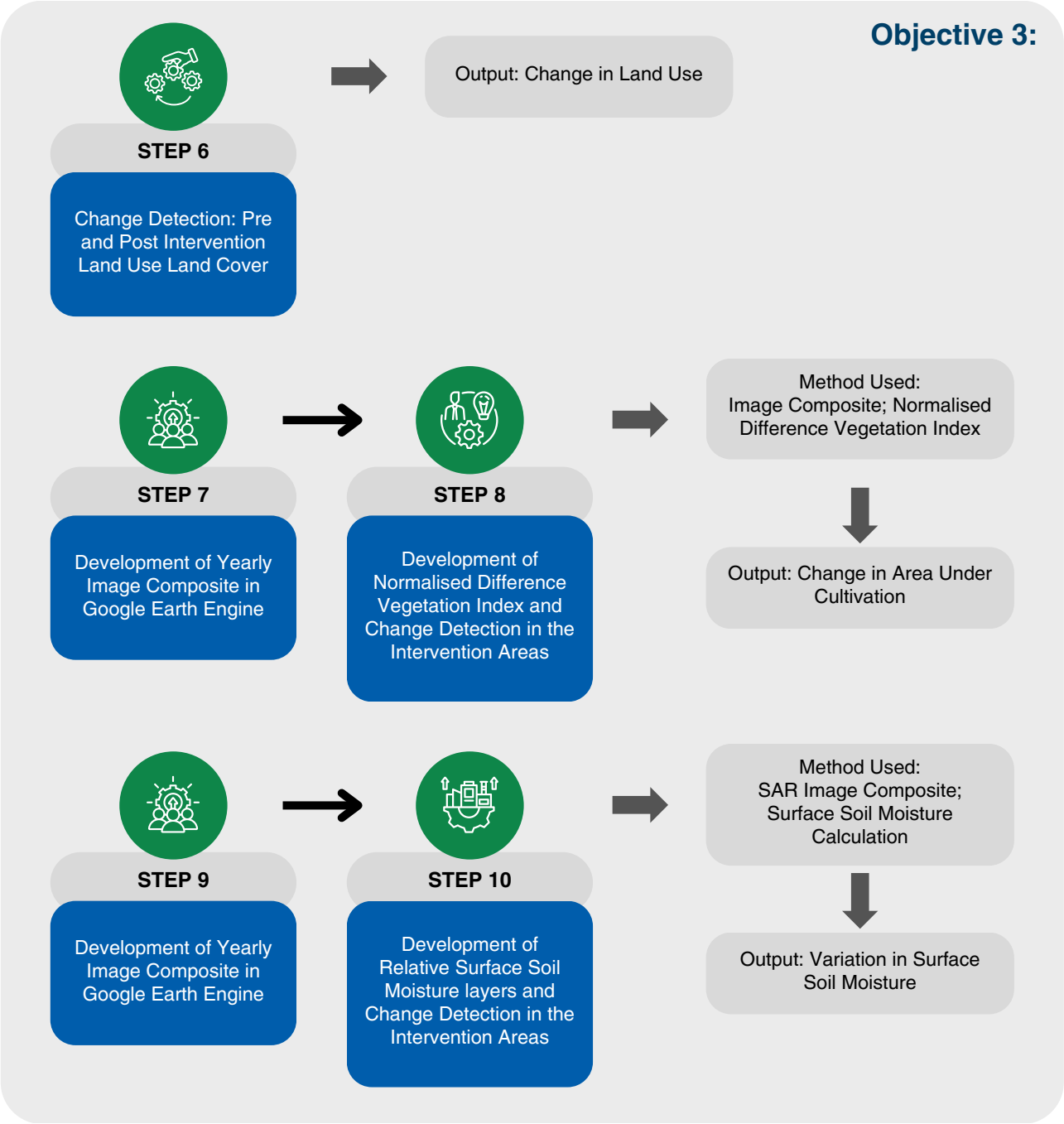


FIGURE 3: APPROACH OF THE ASSESSMENT

DATA COLLECTION

The following datasets have been collected from the field to facilitate the objectives of the study:

- All the intervention locations that were available (Annexure 1)
- Photos from the field survey (Annexure 6)

In addition to the above datasets, additional data was collected from various sources to fill in the data gaps that were present in the conduct of the assessment. These are as follows:

- Depth to water level from the NGO partners and the Central Ground Water Board (CGWB) (Annexure 3)
- Rainfall data from the Indian Meteorological Department (IMD) (Annexure 4)

Other datasets that were used in the assessment are as follows:

- Soil types from National Remote Sensing Centre[2] (provided in Annexure 2)
- Aquifer system from Central Ground Water Board (CGWB) (provided in Annexure 2)
- Specific Yield from Central Ground Water Board (CGWB) (provided in Annexure 2)

- Land Use Land Cover change between 2017 – 2023 from ESRI Living Atlas[3]
- Global Hydrologic Soil Groups for Runoff Estimation[4] (Annexure 2)

RESULTS

The results of the assessment to identify the impacts of the interventions on water conservation are presented in the below sections. It includes an assessment of rainfall and water level trends, an estimation of recharge due to rainfall, an assessment of surface water holding capacity and the associated run-off reduction and the estimation of recharge due to the interventions, the change in land use land cover, the changes in vegetation levels, and the changes in soil moisture conditions over the course of the intervention period.

Analysis of Rainfall Trends

Overall, while the values of rainfall have shown a slight positive trend during the intervention period, with significant peaks observed during the north-east monsoon period. The graphs below show the trend in their change over time.

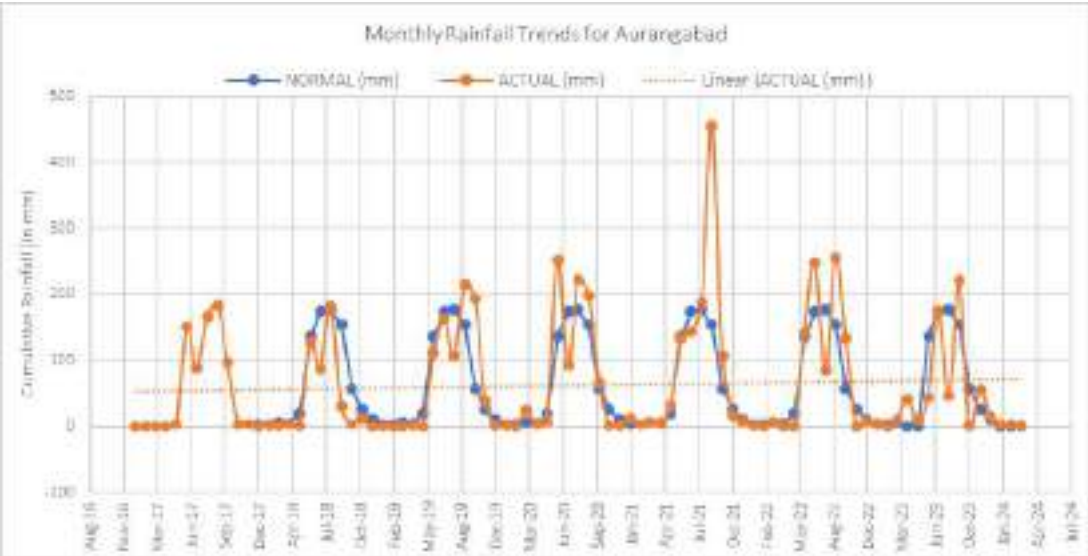


FIGURE 4: MONTHLY CUMULATIVE RAINFALL OVER THE INTERVENTION PERIOD (IN MM)

The trends of normal and actual rainfall reveal that over the intervention period, the rains have been above normal for most of the years. The slight positive trend that comes through is due to the above-normal rainfall received in June and August of most years and the unseasonal rainfall received in some of the years during the non-monsoon months.

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO
[3]Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.
[4] Ross, C.W., L. Prihodko, J.Y. Anchang, S.S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Run-off Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1566

Change in Water Level

The depth to water level data was obtained from two sources: one is the NGO partners, and the other is the annual Ground Water Year Books for Maharashtra published by the Central Ground Water Board (CGWB) for the years between 2017 and 2023. However, a complete collection of the data for the entire period from 2017 and since was not available with either source. Thus, for the final assessment, the datasets from both sources were combined after evaluating them individually and ensuring cohesion, and any missing values were filled out using statistical methods. The detailed dataset is provided in Annexure 3. The figures below show the ground water level trends in in the intervention districts:

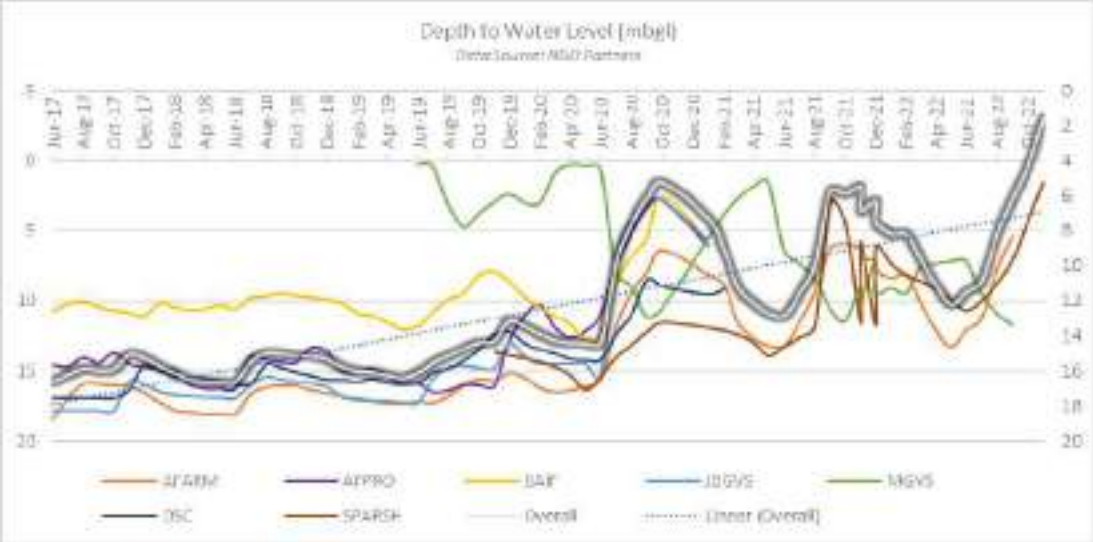


FIGURE 5: DEPTH TO WATER LEVEL (IN MBGL) – NGO PARTNERS

FIGURE 6: DEPTH TO WATER LEVEL (IN MBGL) – CGWB

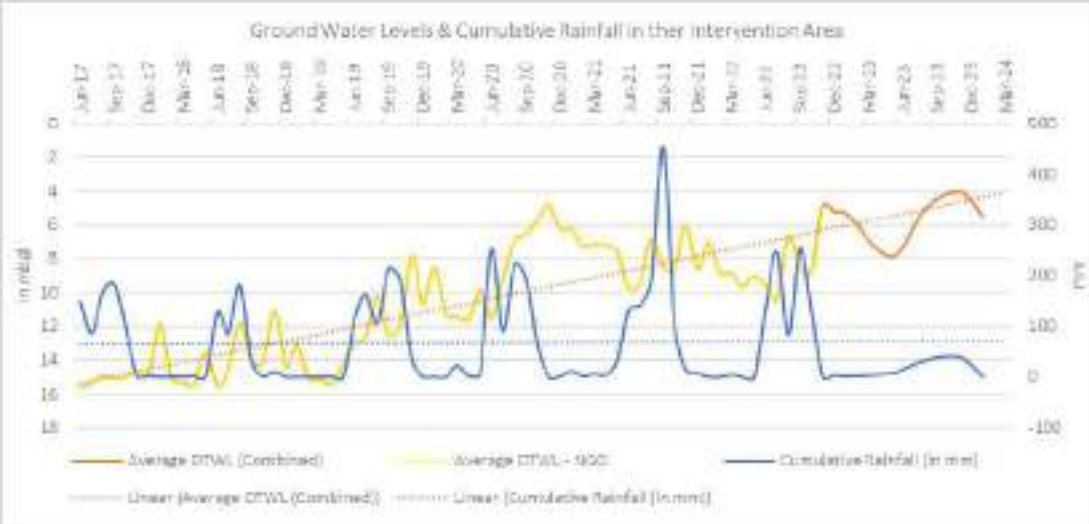


FIGURE 7: GROUND WATER LEVELS DURING AND SINCE THE INTERVENTION PERIOD (IN MBGL) COMPARED WITH MONTHLY CUMULATIVE RAINFALL (IN MM)

For this step of the assessment, the rainfall data from IMD was compared with the combined depth-to-water level data from the NGO partners and the CGWB. The rationale behind this is that rainfall is the most critical variable that determines the level of water availability below ground. Thus, by establishing the role of rainfall in the change in water levels, we would be able to identify the role of the measures implemented on the ground in augmenting the ground water levels.

A regression analysis of rainfall and depth to water level was done for the same effect to understand the strength of the relationship between these two variables (detailed results in Annexure 5). The p-value obtained is greater than 0.05 for the intervention area, meaning no significant relationship. However, the low R2 (coefficient of determination) values obtained for the intervention area, along with the weak positive correlation established between rainfall and ground water points to the fact that among the factors that influence ground water levels, rainfall has had its influence, although not significantly. Detailed results are provided below.[1]

This essentially means that rainfall influence on the ground water level has been to a minimal extent in the intervention areas over the period from 2017 to the relative present. However, over this period, the rainfall received has shown a very slight negative trend, while the ground water levels have shown significant positive trends. Considering the R2 values and the results of the correlation analysis, it can be understood that while the rainfall and ground water levels are not closely related, the factors such as improved water percolation and water storage mechanisms have had significant contributions in augmenting the ground water levels, supported by the rainfall trends. The ground water levels are expected to continue to rise and stabilise at a high level over the coming years, and the contributions of the interventions would help in improving the ground water levels. The availability of the most recent and more local measurements will help in assessing the same more accurately.

Note: The last available data on ground water depth data is till January 2023. The data from May 2023 to the present has not been published yet. Thus, in the absence of the necessary data, statistical methods were used to project the values for this period. This projected data might not necessarily reflect the true levels of ground water levels, and the derived estimates are bound to change on the availability of official measurements of ground water depth for 2023 and 2024.

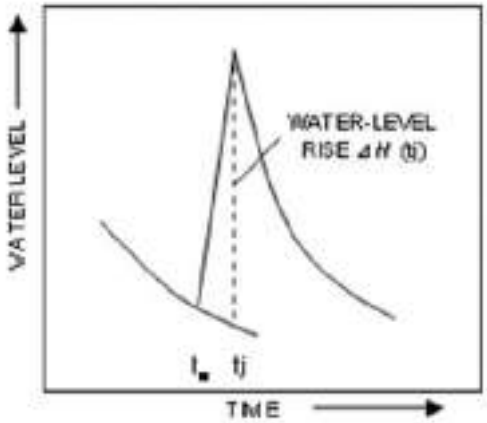
[5] The ground water recharge calculations based only on data from NGO partners and based only on CGWB data are provided in the attached Excel document sheets 9 and 10, respectively.

Estimation of Ground Water Recharge Due to Rainfall

The Water Table Fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The water-table fluctuation method is based on the premise that rises in groundwater levels in unconfined aquifers are due to recharge arriving at the water table. Recharge is calculated as the change in water level over time multiplied by the specific yield [6]

$$R(tj) = Sy^* \Delta H(tj)$$

where R(tj) (m) is recharge occurring between times t0 and tj, Sy is specific yield (dimensionless), and ΔH(tj) is the peak water level rise attributed to the recharge period (cm).



The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology[7] [8]. The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

Location	Aurangabad
Major Aquifer System	Basalt
Sy Range	0.01 – 0.03
Sy Chosen	0.02
RIF Range	0.12 – 0.14
RIF Chosen	0.13

As per the results of the method, about 13.1% of the rainfall has recharged directly to the ground in the intervention sites. The results and calculations are presented below:

TABLE 2: WATER TABLE FLUCTUATION METHOD RESULTS

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2017	687.704	1.100	0.02	0.022002477	22.002477	3.2%	3536319.561
2018	438.020	4.509	0.02	0.090184267	90.184267	20.6%	14494749.01
2019	826.440	7.633	0.02	0.152661156	152.66116	18.5%	24536265.85

[6]USGS GWRP: Techniques/Methods -Water-Table Fluctuation (WTF) Method

[7]The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology[8][8]. The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

[2]Detailed Guidelines (cgwb.gov.in)

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2020	862.400	6.835	0.02	0.136709574	136.70957	15.9%	21972468.49
2021	1099.640	3.748	0.02	0.074956747	74.956747	6.8%	12047325.69
2022	865.360	5.505	0.02	0.11010815	110.10815	12.7%	17696989.26
2023	548.052	3.844	0.02	0.076883855	76.883855	14.0%	12357057.65
Average Recharge directly due to Rainfall received (intervention period)						**13.1%**	**106641175.52**

Further, the groundwater recharge from Rainfall Infiltration Method (RIF) can be obtained from the following relation:
Groundwater Recharge = Geographical Area x Actual Rainfall x Infiltration Factor

TABLE 3: RAINFALL INFILTRATION METHOD

Area (in sq. m.) =			160723700
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)
2017	0.687703555	0.089401462	14368933.78
2018	0.43802	0.0569426	9152025.36
2019	0.82644	0.1074372	17267704.3
2020	0.8624	0.112112	18019055.45
2021	1.09964	0.1429532	22975967.23
2022	0.86536	0.1124968	18080901.93
2023	0.548051549	0.071246701	11451033.45
Total			111315621.5

Estimation of percent rainfall converted into groundwater recharge

As per GEC-1997 norms, the rainfall recharge as computed by the WTF method has been compared with that of the RIF method, and finally, the rainfall recharge is assigned a value based on set criteria to avoid unreasonably high or low estimates.

A quantity called percentage difference (PD) is the difference between the rainfall recharge computed by the water table method (A) and the recharge by the rainfall infiltration method (B) and expressed as a percentage of the rainfall recharge by rainfall infiltration method is computed as below:

$$PD = \frac{(A - B)}{B} \times 100$$

Where 'A' is the rainfall recharge by the WTF method and 'B' is the rainfall recharge by the RIF method.
The set criteria (GEC 1997) to be adopted are as follows:
(a) If PD ≥ – 20 and < + 20%, then the value of the water table fluctuation method is adopted.

(b)If PD ≤ – 20%, then the value of 0.8 × rainfall infiltration factor method is adopted.
(c)If PD ≥ + 20%, then the value of 1.2 × rainfall infiltration factor method is adopted.

By following the above criteria, ground water recharge is estimated.

Organisation	Rainfall Infiltration Method	WTF Model	Percentage Difference	Criteria	Volume of recharge due to rainfall (Cu. m.)
	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)			
MGVS	111315621.5	106641175.52	-4.19	A	106641175.52

Over the period of 2017 to 2023, an almost 7-year period covering the interventions and their operations till the present, the amount of ground water recharge directly due to rainfall stands at 10,66,41,175.52 Cu. m. across the intervention watershed, which is about 12.45% of the total rainfall received over the intervention area.

Change in surface water holding capacity and run-off reduction

The intervention area is spread over multiple watersheds in the southern part of the state. On-site verification and satellite imagery show that the major land use in the intervention area is rangelands, followed by crops. Based on the information available from the field survey and the organisation, the volume of storage created is estimated.

The change in surface storage in the intervention area was net positive, i.e., no existing surface storage was considered in the pre-intervention period.[9] An intervention volume of 8,38,012 cubic meters created through the project is being considered for assessment as there might be a double accounting of the storage of nalas, which is also included in considering the storage of the check dam type of interventions.

Estimation of ground water recharge due to the interventions

Groundwater recharge due to the interventions occurs primarily through the capture and storage of surface runoff water using Cement Nala Bunds, as well as through natural processes and Groundwater Recharge Shaft.

Run-off is defined as the portion of the precipitation that makes its way towards rivers or oceans as surface or subsurface flow. After the occurrence of infiltration and other losses from the precipitation, excess rainfall flows out through the small natural channels on the land surface and into the main drainage channels. Such types of flow are called surface flows. A part of the infiltrated rainwater moves parallel to the land surface as subsurface flow and reappears on the surface at certain other points. Such flows are called interflows. Another part of the infiltrated water percolates downwards to ground water and moves laterally to emerge in depression and rivers and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

While the interventions such as the Cement Nala Bunds and the Gabion Structure capture the surface flows, both these structures and the Ground Water Recharge Shafts contribute to the recharge of the ground water in the intervention sites.

[9] This is due to the constraints of establishing the status of all water bodies in the intervention area.

Estimation of the run-off can give us an estimate of the amount of water that has been essentially captured by the intervention structures as surface storage, and thus point towards the potential amount of water available for ground water recharge. Run-off can be estimated by various methods, such as:

- Empirical formulae and tables
- Run-off Estimation based on Land Use and Treatment
- Rational Method
- Empirical formulae for flood peak

In this assessment, we are using the method of empirical formulae and tables along with run-off estimation based on land use and treatment, as it has proven to be the most reliable to conduct the assessment in the absence of reliable ground water level data and access to the intervention sites on the ground.

1 BINNIE'S PERCENTAGES

1. It provides the relationship of run-off to rainfall with a view to express the former as a percentage of the latter. The percentages mentioned below are based on observations on two rivers in Madhya Pradesh.

TABLE 4: RUN-OFF AS A % OF THE RAINFALL RECEIVED

Annual Rainfall (mm)	Runoff (%)
500	15
600	21
700	25
800	29
900	34
1,000	38
1,100	40

2 COEFFICIENTS

The run-off 'R' in cm and rainfall 'P' in cm can be correlated as R = KP, where 'K' is the run-off coefficient. The run-off coefficient depends on factors affecting run-off. This method is applicable only for small projects such as the ones implemented as a part of this project. The usual values of K are as given below.

TABLE 5: USUAL VALUES OF RUNOFF COEFFICIENTS (K)

Type of Area	K
Urban Residential	0.3 - 0.5
Forests	0.05 - 0.2
Commercial & Industrial	0.9
Parks, farms, Pastures	0.05 - 0.3
Asphalt or concrete pavement	0.85

3

BARLOW'S TABLES

The following values of K (in percentage) for various types of catchments were developed by T.G. Barlow based on the studies of catchments mostly under 130 sq. km. in Uttar Pradesh.

TABLE 6: BARLOW'S PERCENTAGE RUNOFF COEFFICIENTS

Class	Description of Catchment	Percent runoff
A	Flat, cultivated and black cotton soils	10
B	Flat, partly cultivated-various soils	15
C	Average	20
D	Hills and plains with little cultivation	35
E	Very hilly and steep, with hardly any cultivation	45

These percentages are for the average type of monsoon and are to be modified by the application of the following coefficients according to the nature of the season, as shown below.

TABLE 7: BARLOW'S RUN-OFF COEFFICIENTS FOR DIFFERENT NATURES OF SEASON

Nature of Season	Class of catchments				
	A	B	C	D	E
Light rain, no heavy downpour	0.7	0.8	0.8	0.8	0.8
Average or varying rainfall, no continuous downpour	1	1	1	1	1
Continuous downpour	1.5	1.5	1.6	1.7	1.8

As part of this method, the special tropical rainfall was divided into the following four classes:

- **Negligible falls:** All rainfalls under 12 mm a day unless continuous for several days; also rainfalls 12 to 40 mm a day, when there is no rain.
- **Light falls:** All rainfalls up to 25 mm a day followed by similar or heavier falls. Steady pours of 25 to 40 mm a day, when there is no rain of similar or greater amount before or after that.
- **Medium falls:** Rainfalls from 25 to 40 mm a day when preceded or followed by any but light falls.
- **Heavy Falls:**
  - All rainfalls are over 75 mm a day or continuous falls at 50 mm a day.
  - All rainfalls of an intensity of 50 mm or more per hour.

The run-off percentages, as shown in the following table, were developed by combining the type of catchment and nature of the season.

TABLE 8: BARLOW'S RUNOFF PERCENTAGES

Nature of Rainfall	Percentage of Flow in Catchments of Different Type				
	A	B	C	D	E
Negligible falls	-	-	-	-	-
Light falls	1%	3%	5%	10%	15%
Medium falls	10%	15%	20%	25%	33%
Heavy falls	20%	33%	40%	55%	70%

4 ESTIMATION OF DIRECT RUNOFF FROM RAINFALL

In this method of run-off estimation, the effects of the surface conditions of a watershed area are evaluated by means of land use and treatment classes. Land use is the watershed cover, and it includes every kind of vegetation, litter and mulch, and fallow, as well as non-agricultural uses such as water surfaces (lakes, swamps, etc) and impervious surfaces (roads, roofs, etc.). Land treatment applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing and management practices such as grazing control or rotation of crops. The classes consist of use and treatment combinations to be found in watersheds. Land use and treatment classes are readily obtained either by observation or by measurement of plant and litter density and extent in sample areas.

4.1 Hydrological Soil Groups

There are four soil groups that are used in determining the hydrological soil cover complexes, which are used in a method for estimating the run-off from rainfall. The major characteristics of these groups are described below. The respective infiltration rates and permeability of soils in different groups are also shown below. The infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The permeability rate is the rate at which water moves in the soil, which is controlled by the nature and characteristics of soil horizons.

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.	Low	High rate
Group B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	High	Low rate

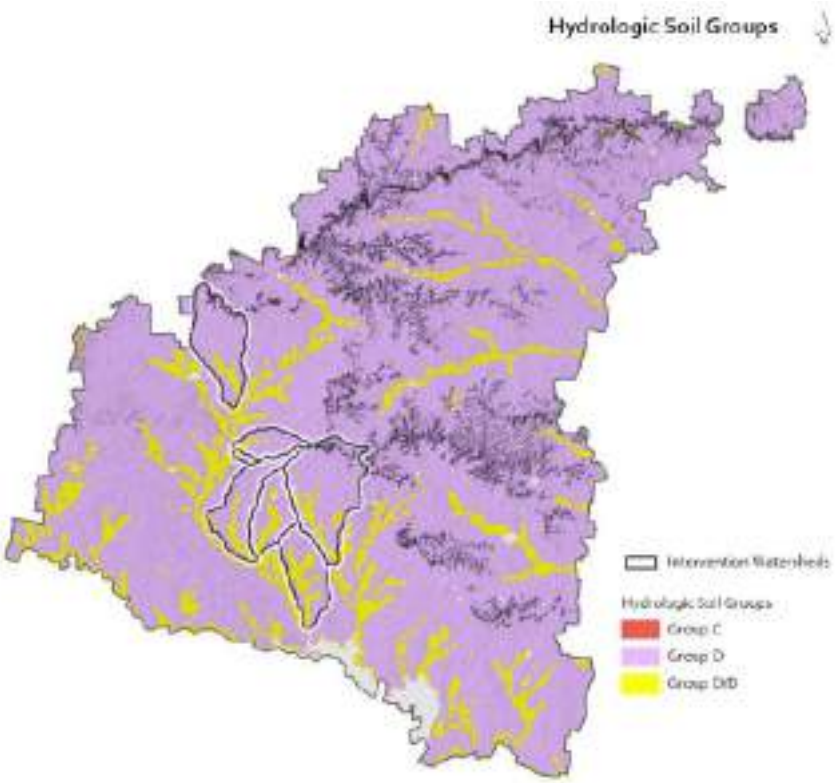


FIGURE 8: HYDROLOGIC SOIL GROUPS OF THE PROJECT WATERSHEDS

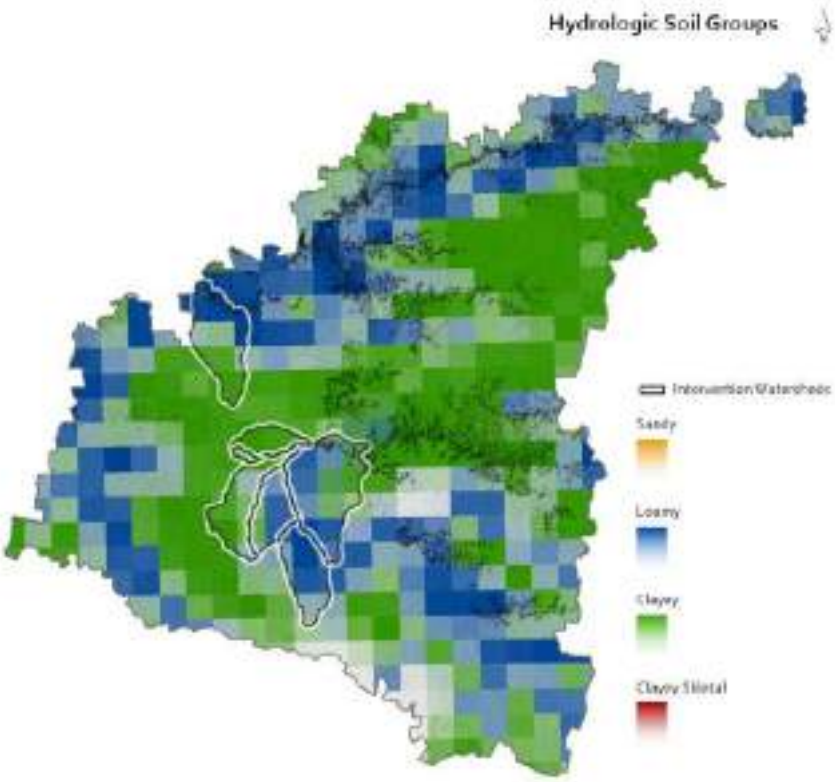


FIGURE 9: SOIL CHARACTERISTICS IN THE PROJECT WATERSHEDS

TABLE 9: INFILTRATION RATES

Class	Rates / hr in		Remarks
	Inches	Millimetres	
Very Low	Below 0.1	Below 2.5	Highly clayey soils
Low	0.1 - 0.5	2.5 - 12.5	Shallow soils, clay soils, soils low in organic matter
Medium	0.5 - 1.0	12.5 - 25.0	Sandy loams, silt loams
High	Above 1.0	Above 25.0	Deep sands, well aggregated soils

TABLE 10: RELATIVE CLASSES OF SOIL PERMEABILITY

Class	Permeability	
	Inches/ hr	mm/ hr
Slow		
Very Slow	Less than 0.05	1.3
Slow	0.05 to 0.20	1.31 to 5.00
Moderate		
Moderately Slow	0.20 to 0.30	5.01 to 20.00
Moderate	0.80 to 2.50	20.01 to 50.00
Moderately Rapid	2.50 to 5.00	50.01 to 130.00
Rapid		
Rapid	5.00 to 10.00	130.01 to 250.00
Very Rapid	Over 10.00	Over 250.00

4.2 Land Use and Treatment Classes

The commonly used land use and treatment classes are briefly described below. These classes are used in determining hydrologic soil-cover complexes, which are used in one of the methods for estimating runoff from rainfall.

- **Cultivated lands:** These include all field crops such as maize, sugarcane, paddy and wheat.
- **Fallow lands:** These are lands taken up for cultivation, but are temporarily out of cultivation for a period of not less than one year, and not more than 5 years. Current fallow lands are cropped areas kept fallow during the current year.
- **Uncultivated lands include:**
  - Permanent pastures and other grazing lands.
  - Cultivable waste, which are lands available for cultivation whether or not taken up for cultivation or abandoned after a few years for one reason or another. Land once cultivated but uncultivated for 5 years in succession shall also be included in this category.
- Forest area includes all lands classed as forest under any legal enactment dealing with forest or administered as forest whether State-owned or private and whether wooded or maintained as potential forest land.
- Tree crops include woody perennial plants that reach a mature height of at least 8 feet and have well-defined stems and a definite crown shape.

- Lands put to non-agricultural uses are areas occupied by buildings, roads, railroads, etc.
- Barren and uncultivable lands include areas covered by mountains, deserts, etc.

Based on these assessments, the following were estimated:

Surface Storage

The volume of surface storage created by the intervention = 9,42,920 m3

Rainfall & Runoff

- Total rainfall received over the intervention period and since = 75,85,77,290.31 m3
- Total run-off generated over the intervention area = 20,64,10,215.3 m3
- Percentage of rainfall that is converted to runoff = 30%

The intervention area received enough rainfall for all the intervention structures to be at a constant capacity of 26.24% throughout the period since 2017 as a part of and due to the project Bajaj Water Conservation Project implemented by MGVS in Aurangabad. This shall be interpreted as the intervention structures always having water and never drying since 2017 or operating at more than 50% storage filled through the dry seasons since 2017.

Runoff Reduction

- The volume of surface run-off stored by the intervention measures after considering 40% evaporation loss = 1,48,44,685.65 m3.

Which is,

- 7.19% of the total run-off generated as a part of and due to the water conservation efforts of this project (or).
- 1.29% of the total rainfall received during the project period and ever since.

This means that the interventions that were created as a part of this project have contributed to a combined reduction in surface run-off by about 7.19% in the intervention area. Although this number is a conservative estimation and however, it is bound to increase over the years. Care must be taken to ensure the effective functioning of these water harvesting structures. Regular desilting and clearing of overgrowth, along with any structural repairs, are required across all the structures to ensure that their storage capacity is maintained, and the structural integrity is preserved.

Thus, in total, 12.45% of the rainfall is converted into direct recharge, about 7.19% of the rainfall is stored in the intervention-created surface storage, 40% is lost as evaporation, and the remaining 40.36% accounts for factors such as run-off that is stored in other water bodies present, run-off that is not captured evapotranspiration, and other losses.

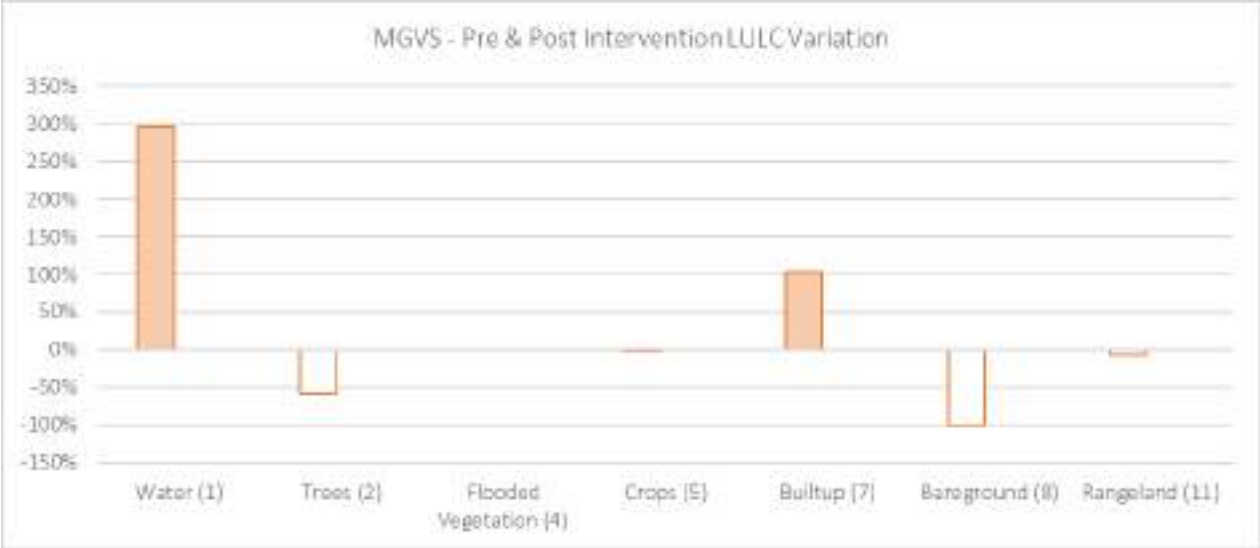
5

CHANGE IN LAND USE PATTERN

Land use and land cover change detection involves analyzing how land is utilized and how its physical coverage alters over time. Changes in land use patterns, such as urban expansion, deforestation, agricultural expansion, and the impacts of natural disasters, can be tracked using remote sensing techniques, satellite imagery, and geographic information systems (GIS). The land use and land cover for the intervention areas were developed through supervised classification of Sentinel-2 Full Colour Composite (FCC) imagery for both the pre- and post-intervention periods.

TABLE 11: ZONAL STATISTICS OF LULC FOR THE INTERVENTION AREA

District	Aurangabad				
Organisation	MGVS				
Total Area of Watershed (Sq. Km.)	160.7237				
Soil Group	D				
Land Use Classes	Land Use - 2017		Land Use - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.3832	0.24	1.5149	0.94	295.35%
Trees (2)	0.0042	0.003	0.0018	0.001	-58.21%
Flooded Vegetation (4)					0.00%
Crops (5)	142.2700	88.52	139.0870	86.54	-2.24%
Built up (7)	2.8550	1.78	5.7968	3.61	103.04%
Bare ground (8)	0.0013	0.0008			-100.00%
Rangeland (11)	14.9528	9.30	14.0646	8.75	-5.94%



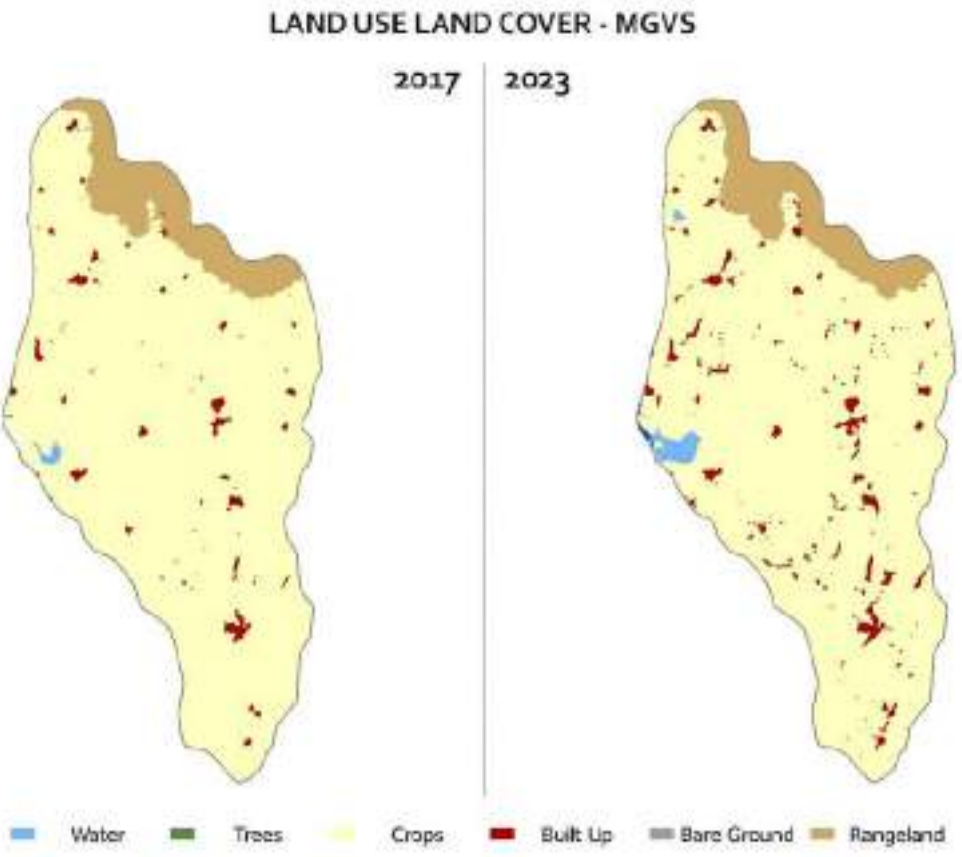


FIGURE 10: PRE- AND POST-INTERVENTION LULC OF THE INTERVENTION WATERSHED

It can be observed from the above table and charts that in terms of total area, the area under crops is the highest followed by built-up area. Looking at the changes in land use that have happened through the course of the intervention period, major changes can be observed in the growth of areas under water and built-up and the reduction in the areas under trees, while minor reduction in the area under crops can be seen. In terms of total area, the reduction in area under crops can be attributed mainly to the increase in built-up area. The following section will offer more clarity on the changes to cropping intensity.

6 VEGETATION INDEX (VI)/CROPPING INTENSITY

Vegetation Indices are combinations of surface reflectance at two or more wavelengths designed to highlight a particular property of vegetation. They are derived using the reflectance properties of vegetation. For this assessment, the Normalised Difference Vegetation Index (NDVI) is used. NDVI is an indicator that shows the greenness, density, and health of vegetation in each pixel of a satellite image. The index detects and quantifies the presence of living green vegetation using this reflected light in the visible and near-infrared bands.

The standard formula for calculating NDVI is: NDVI = (NIR – red) / (NIR + red)

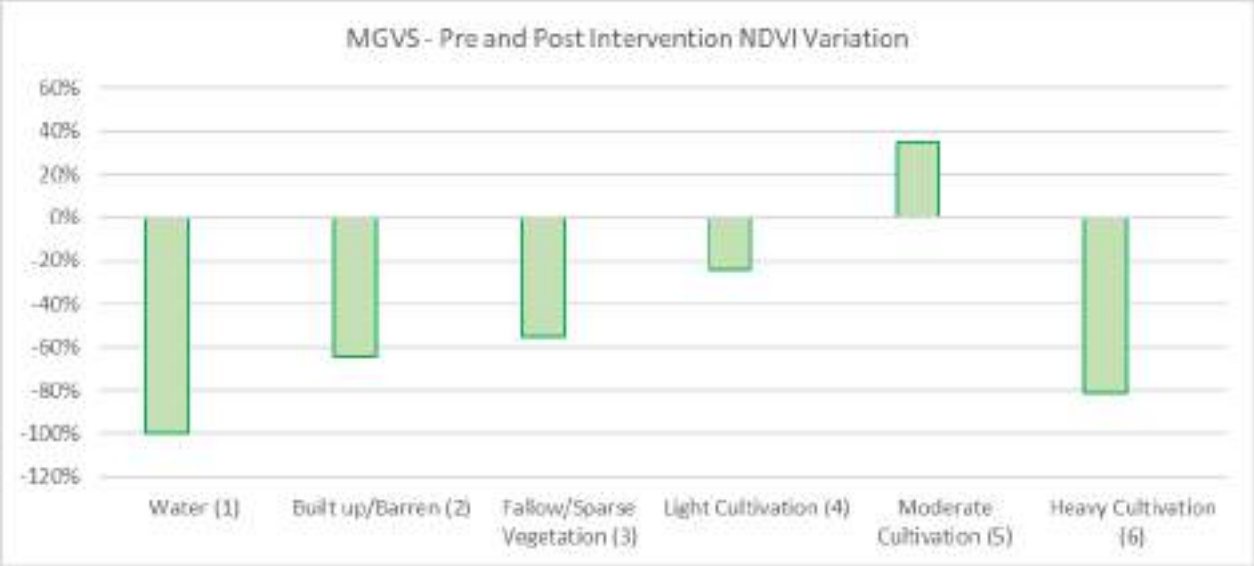
NIR is the near infra-red, band 8, and red, band 4 of Sentinel-2 imagery, composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states.

The NDVI value ranges from -1 to 1 and shows the vigour of the crop:

- **Values close to 1:** the more intense the green, the more vigorous the vegetation and vegetation cover. Considerations for the type of farming, bare soil, etc. must be made. The index also measures the vigour of the underbrush.
- **Values close to 0:** areas with very little vegetation, early stages of cultivation, bare soil, or non-productive areas.
- **Negative values:** usually associated with areas of water, snow, or clouds.

TABLE 12: ZONAL STATISTICS VALUES OF THE VEGETATION INDEX

District	Aurangabad				
Organisation	MGVS				
Total Area of Watershed (Sq. Km.)	160.7237				
Soil Group	D				
Vegetation Index Classes	VI - 2017		VI - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.2139	0.13	0.0010	0.00	-99.53%
Built up/Barren (2)	5.7486	3.58	2.0525	1.28	-64.30%
Fallow/Sparse Vegetation (3)	18.8617	11.74	8.4585	5.26	-55.16%
Light Cultivation (4)	47.3270	29.45	35.9888	22.39	-23.96%
Moderate Cultivation (5)	84.1676	52.37	113.3654	70.53	34.69%
Heavy Cultivation (6)	4.3535	2.71	0.8132	0.51	-81.32%



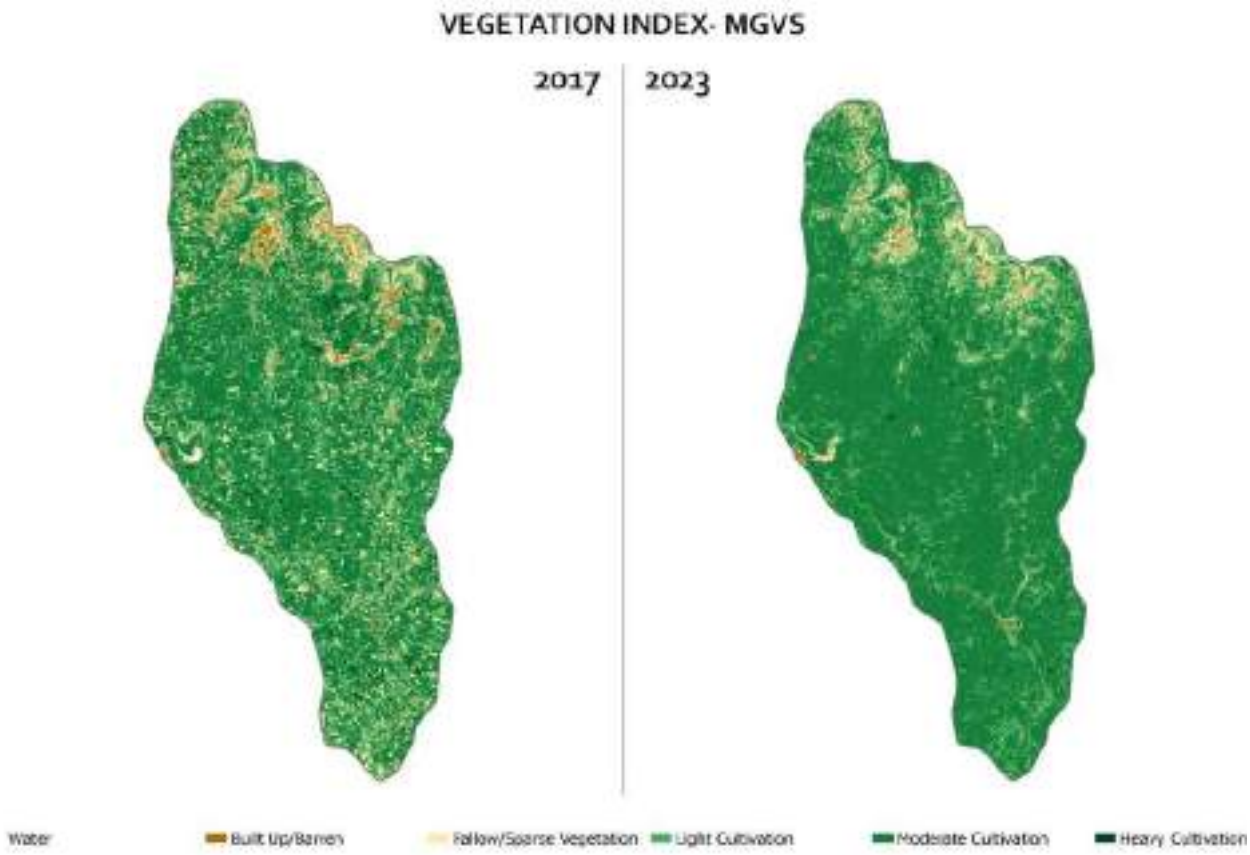


FIGURE 11: PRE- AND POST-INTERVENTION VEGETATION INDEX ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the vegetation index reveals that in the intervention watershed, the area under moderate cultivation has grown while the area under all other types has reduced. With respect to the methodology applied for this analysis, it can be interpreted that the area under light cultivation corresponds to single cropping, moderate cultivation to double cropping and heavy cultivation to triple cropping. Thus, the area under double cropping has increased, indicating improved water accessibility and use, among other factors.

7 SOIL MOISTURE

Surface soil moisture (SSM), defined as the water content of the top few centimetres of soil, is a key variable that affects run-off generation, water recharge and vegetation growth. The Synthetic Aperture Radar (SAR) data from Sentinel-1 satellite is used here to study the surface soil moisture, which is in turn derived from relative soil moisture, which represents the soil moisture for a given soil column on a relative scale between soil saturation and wilting levels.

The surface soil moisture saturation is calculated as percentages using the formula[10]:

$$SSM(t) = \frac{\Delta\sigma^0(\Theta, t)}{S(\Theta)} \quad [\%]$$

Where $\Delta\sigma0(\Theta,t)$ represents the change in normalized backscatter (relative to dry conditions), and $S(\Theta)$ is the sensitivity to SSM changes at the reference angle. The sensitivity is equivalent to the local backscatter dynamic range, estimated by the difference between normalized backscatter coefficients under wet and dry conditions using,

[10] Detailed methodology is provided at https://doi.org/10.1109/TGRS.2018.2858004

$$S(\Theta) = \sigma^0_{\text{wet}}(\Theta) - \sigma^0_{\text{dry}}(\Theta) \quad [\text{dB}].$$

Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states. The values range from 0 to 100 %, where values close to 0 represent water and built-up areas.

TABLE 13: ZONAL STATISTICS OF SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHEDS

District	Aurangabad				
Organisation	MGVS				
Total Area of Watershed (Sq. Km.)	160.7237				
Soil Group	D				
Soil Moisture Classes	SM - 2017		SM - 2023		% Difference
	Area	% Area	Area	% Area	
0 - 0.1 (1)	11.7818	7.33	11.8413	7.37	0.50%
0.1 - 0.2 (2)	27.7033	17.24	29.0987	18.10	5.04%
0.2 - 0.3 (3)	83.0574	51.68	74.1029	46.11	-10.78%
0.3 - 0.4 (4)	36.7004	22.83	37.7161	23.47	2.77%
0.4 - 0.5 (5)	1.2325	0.77	7.2311	4.50	486.68%
> 0.5 (6)	0.0691	0.04	0.5521	0.34	699.18%

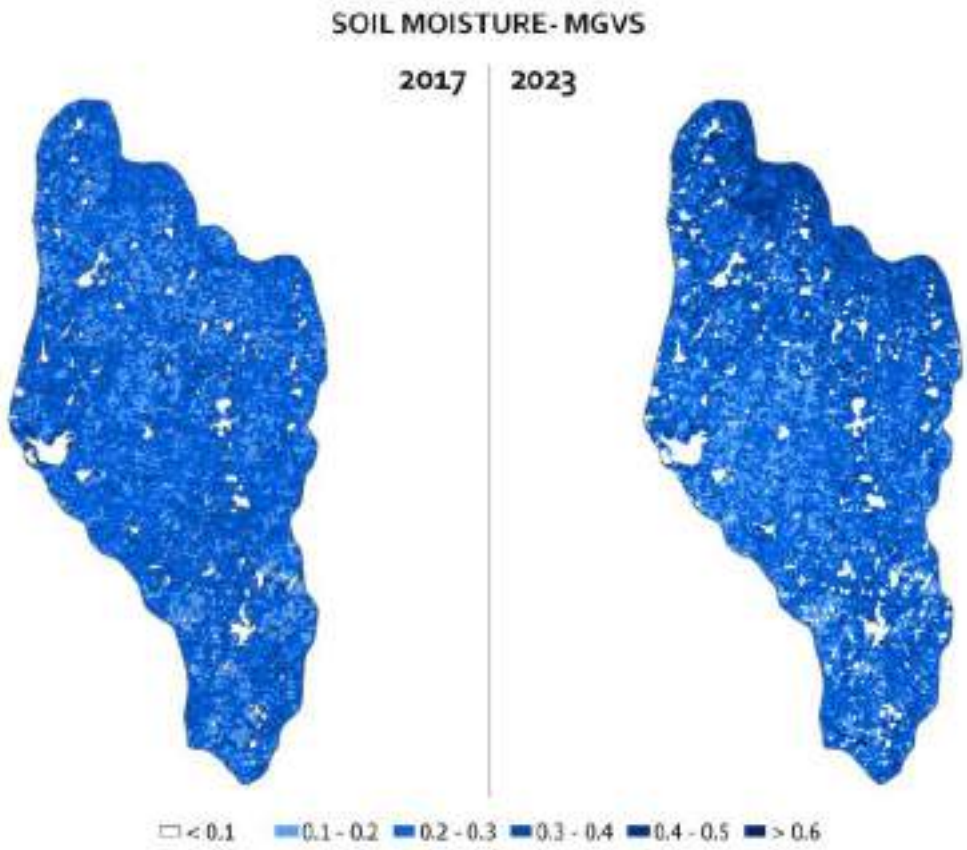
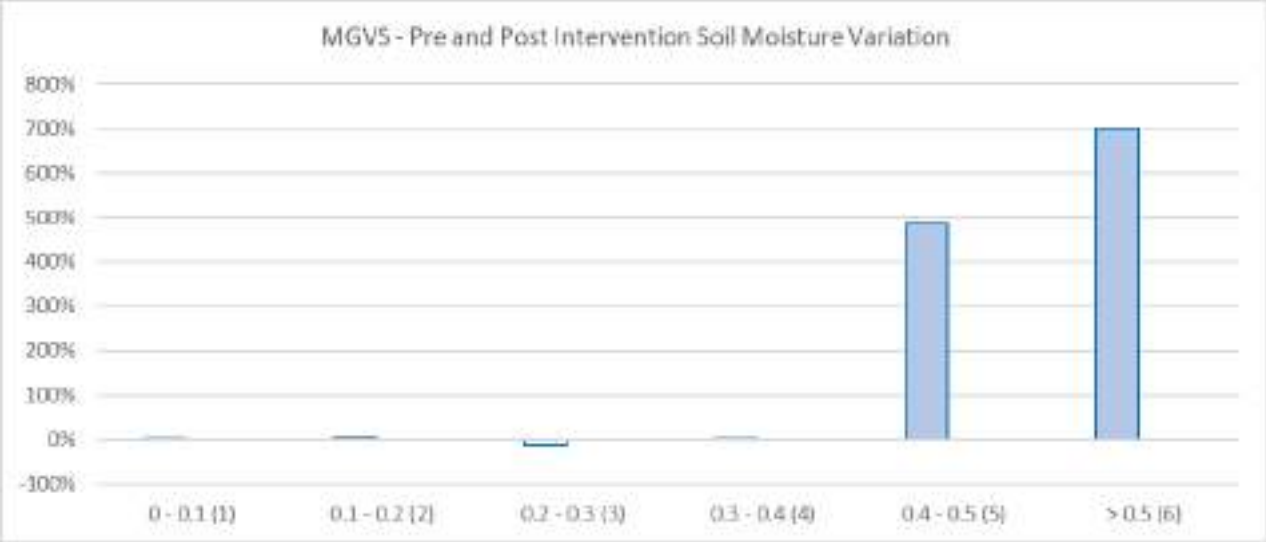


FIGURE 12: PRE AND POST INTERVENTION SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHED



The analysis, change detection and calculation of the soil moisture across the intervention watershed shows that there have been significant changes in the values of surface soil moisture over the course of the intervention period and since. The area under soil moisture values greater than 40% has seen a significant increase, while the area under low soil moisture values has reduced. This is to be interpreted because of multiple factors, such as the rainfall received, the vegetative cover, and the availability of surface and ground water, among others.

CONCLUSIONS

This section provides a summary of the key findings of the assessment and the limitations encountered in the process of the assessment. For more accurate quantification outcomes, further studies will have to be done using datasets of higher details and corroboration from the field.

KEY FINDINGS

In summation, the key findings from the above assessments are as follows:

- The total surface storage created in the intervention area due to the project is 9,42,920 cubic meters.
- The influence of rainfall on the ground water levels has not been very significant. However, a positive correlation between both was observed.
- The ground water levels in the intervention watershed have been increasing since 2017, are presently at high values, and are expected to persist at similar levels in the coming years. The availability of more recent data will shed more light on the trends that can be expected.
- Ground water recharge directly due to rainfall in the intervention area is about 12.45% of the total rainfall received.
- The volume of surface run-off stored by the intervention measures is 7.19% of the total run-off generated as a part of and due to the interventions (or) 1.29% of the total rainfall received during the period of the project intervention and ever since.
- Analysis of LULC, NDVI, and SSM reveal that there has been a marked increase in area under moderate or double cultivation while the crop cover overall has reduced slightly likely due to the increase in area under built up. The surface soil moisture has shown a remarkable change, with most of the area having a moisture content of more than 40%.

TABLE 14: SUMMARY OF FINDINGS

District		Aurangabad
Organisation		MGVS
Total Area of Watershed (Sq. Km.)		160.7237
Soil Group		D
Volume of Storage Created (Cu. m.)		942920
Total rainfall over intervention area (Cu. m.)		758577290.3120
Q - Total run-off over intervention area (Cu. m.)		206410215.3
Average % of fullness throughout the intervention period		26.24%
Run-off volume stored in interventions	Pre-evaporation Loss	24741142.75
	Post Evaporation Loss	14844685.65
% of run-off stored by interventions	Pre-evaporation Loss	11.99%
	Post Evaporation Loss	7.19%
% of rainfall stored by interventions	Pre-evaporation Loss	2.15%
	Post Evaporation Loss	1.29%
Surface water contribution to ground water recharge (40%) (Cu. m.)		5937874.26
Recharge only due to rainfall (Entire intervention period and since)	Cu. m.	106641175.5
	%	12.45%

LIMITATIONS

The most significant limitation faced was in terms of data availability. With the resolution of the available open-source satellite imagery being capped at 10m, 30m and 50m, the land use, vegetation index and soil moisture that can be generated, respectively, also lack resolution, especially considering the small size of the intervention area that had to be assessed. Assumptions were made to calculate the storage capacity of water harvesting structures. Owing to the limitation in the availability of data on the number of interventions, their locations and the respective dimensions, the assessments are based primarily on data from secondary sources, with the primary data being used wherever possible. Further, most of the secondary data that was available and obtained has shortcomings in one or more areas, such as the temporal coverage or the spatial resolution. Further constraints were due to the unavailability of up-to-date and reliable ground water data. With the continuous measurement of this information, the efficiency of the assessment can be improved.

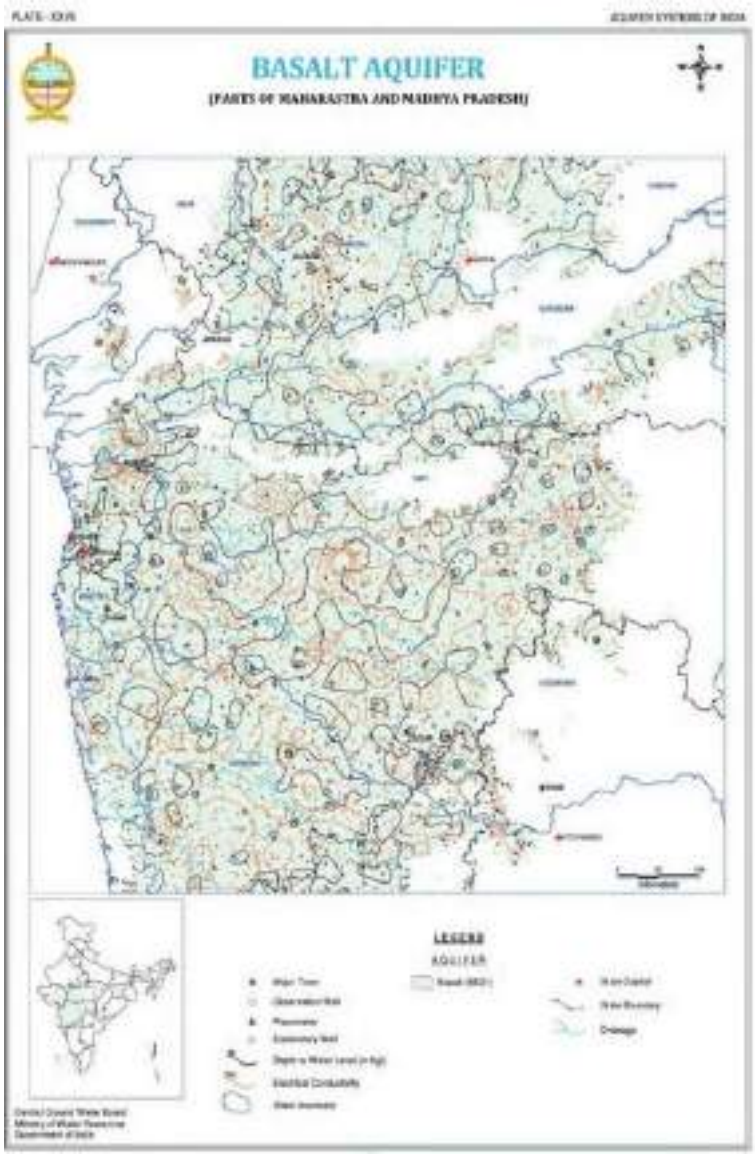
ANNEXURE 1

INTERVENTIONS

Organisation	Village	Type of Activity	Latitude	Longitude
MGVS	Khaparkheda	CNB	20.126548	74.976643
MGVS	Khaparkheda	CNB	20.125298	74.983418
MGVS	Khaparkheda	CNB	20.121833	74.980278
MGVS	Khaparkheda	CNB	20.126748	74.97709
MGVS	Rupwadi (Sasegaon)	CNB	20.107377	74.995643
MGVS	Rupwadi (Sasegaon)	CNB	20.113322	74.982858
MGVS	Rupwadi (Sasegaon)	CNB	20.103843	74.995005
MGVS	Manur	CNB	20.098557	74.998122
MGVS	Nipani	CNB	20.19376	74.935303
MGVS	Nipani	CNB	20.188883	74.935463
MGVS	Nipani	CNB	20.17611111	74.96388889
MGVS	Rohila	CNB	20.174568	74.944397
MGVS	Rohila	CNB	20.168193	74.942807
MGVS	Rohila	CNB	20.167082	74.928407
MGVS	Khaparkheda	CNB	20.126548	74.976643
MGVS	Khaparkheda	CNB	20.125298	74.983418
MGVS	Khaparkheda	CNB	20.121833	74.980278
MGVS	Khaparkheda	CNB	20.126748	74.97709
MGVS	Rupwadi (Sasegaon)	CNB	20.107377	74.995643
MGVS	Rupwadi (Sasegaon)	CNB	20.113322	74.982858
MGVS	Rupwadi (Sasegaon)	CNB	20.103843	74.995005
MGVS	Manur	CNB	20.098557	74.998122
MGVS	Nipani	CNB	20.19376	74.935303
MGVS	Nipani	CNB	20.188883	74.935463
MGVS	Nipani	CNB	20.17611111	74.96388889
MGVS	Rohila	CNB	20.174568	74.944397
MGVS	Rohila	CNB	20.168193	74.942807
MGVS	Rohila	CNB	20.167082	74.928407

ANNEXURE 2

AQUIFER TYPES



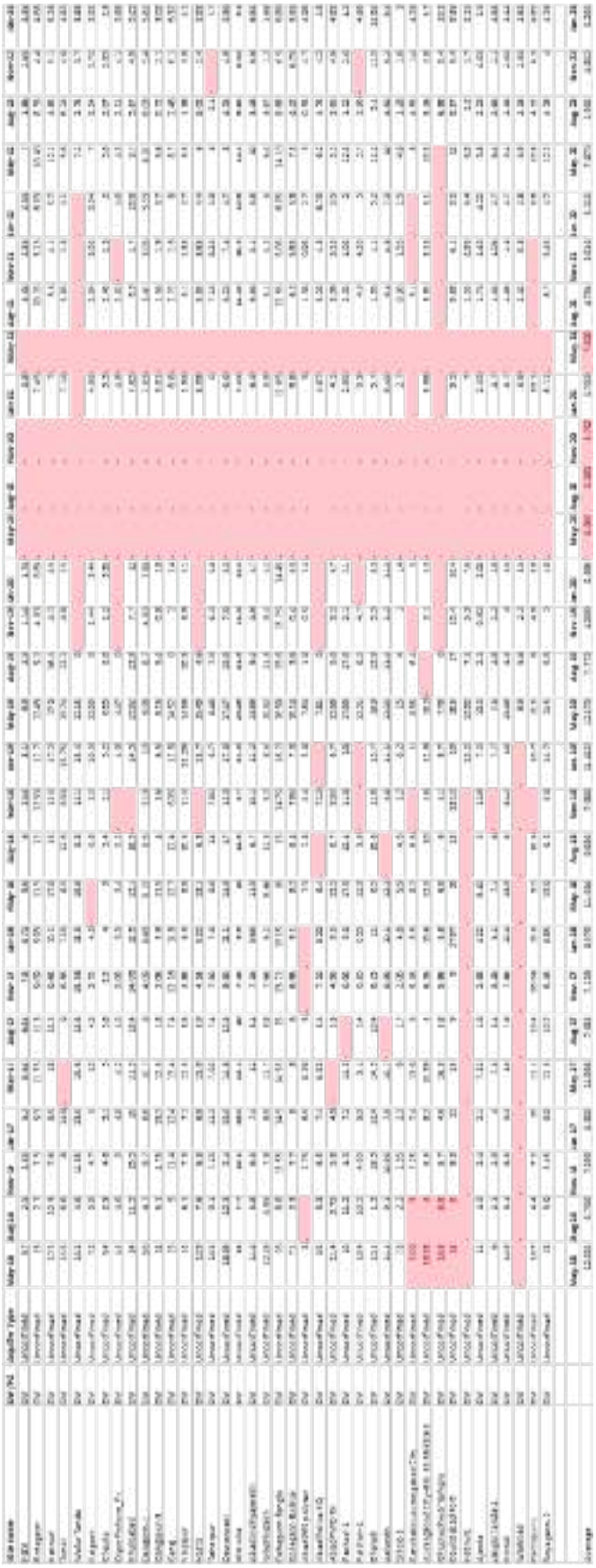
ANNEXURE 3

GROUND WATER DATA FROM NGO PARTNERS

Month	Overall	AFARM	AFPRO	BAIF	JBGVS	MGVS	DSC	SPARSH
Jun-17	16.60291	13.6899	14.59697	10.69306	17.82977		16.94432	
Jul-17	16.26091	17.0088	14.74898	10.22412	17.82977		16.94432	
Aug-17	15.89046	15.97236	14.06895	10.08629	17.82977		16.94432	
Sep-17	15.39119	15.97269	14.48917	10.42158	17.82977		16.94432	
Oct-17	15.91418	16.0541	13.77258	10.6804	17.82977		16.94432	
Nov-17	15.07609	16.14039	14.54075	10.02194	15.75072		16.36965	
Dec-17	15.18061	16.60187	14.73175	11.08952	16.01258		14.80558	
Jan-18	15.79116	17.30227	14.91724	10.10798	16.03142		16.06269	
Feb-18	16.13479	17.84025	14.97115	10.4525	16.72761		15.40858	
Mar-18	16.51477	17.97270	15.28088	10.60847	16.8188		15.80558	
Apr-18	16.62765	18.18107	16.29189	10.57028	16.88964		15.56858	
May-18	16.82098	18.06931	16.28604	10.27559	16.91076		15.73272	
Jun-18	16.89559	18.13702	16.5129	10.57145	16.95413		15.98798	
Jul-18	15.50553	16.68937	14.05212	9.815428	16.06469		15.9358	
Aug-18	15.04052	16.20999	14.20809	9.682651	15.42218		14.55551	
Sep-18	15.05038	16.07885	14.39571	9.481008	15.62163		14.78852	
Oct-18	15.16548	16.10001	14.42737	9.644355	15.78725		15.1284	
Nov-18	15.17444	16.44153	13.53897	9.762581	15.92178		15.36965	
Dec-18	15.36046	16.82517	13.66568	9.907869	16.17475		15.85588	
Jan-19	15.8188	16.82288	15.06846	10.15556	16.86138		15.87173	
Feb-19	16.04674	17.11998	15.06166	10.91272	16.90911		15.86602	
Mar-19	16.07413	17.19947	14.86218	11.02964	17.13082		15.57815	
Apr-19	16.2723	17.36518	15.36927	11.61101	17.14358		15.87614	
May-19	16.44109	17.56081	15.88658	11.99407	17.24754		15.97938	
Jun-19	16.10588	17.2031	15.95713	11.76859	17.25451	0.277391	15.85558	
Jul-19	15.56118	17.31602	16.54885	10.78345	15.61434	0.348696	15.14312	
Aug-19	15.14528	16.84152	16.44186	9.884798	14.79275	5.06913	14.85958	
Sep-19	14.7353	16.09015	16.00525	9.444355	14.64434	4.721174	14.25667	
Oct-19	14.41852	15.59718	16.04696	8.134355	14.7935	3.751174	13.4587	
Nov-19	14.2809	15.71996	16.07115	7.533545	14.75852	2.501605	12.33118	13.65
Dec-19	13.15947	15.16832	12.87619	8.593613	13.02254	2.354783	12.22696	13.86173
Jan-20	13.30751	15.523	11.01615	9.742177	14.02072	2.95913	13.06469	14.10765
Feb-20	13.92775	16.28292	10.52491	10.47444	14.5	2.95913	13.47667	14.35867

Month	Overall	AFARM	AFPRO	BAIF	JBGVS	MGVS	DSC	SPARSH
Mar-20	14.20616	16.56171	11.95991	11.11509	14.90461	0.808241	13.79852	14.71107
Apr-20	14.41228	16.48971	12.68887	11.805	14.51125	0.277391	14.1999	15.18397
May-20	14.42773	16.14196	12.15853	12.86661	14.51108	0.348696	14.2333	16.14795
Jun-20	14.39114	15.68728	11.00891	12.49174	13.42809	0.562609	14.10175	15.32659
Jul-20	9.755855	11.79978	7.475271	8.679274	8.809825	7.867528	12.33864	14.00612
Aug-20	7.348815	9.549152	5.164055	6.860606	4.173814	8.950455	10.91153	15.11009
Sep-20	6.125985	7.931561	3.5447	5.522581	2.988849	11.15049	8.431104	12.19184
Oct-20	6.147161	6.209467	2.800991	2.585645	2.946599	10.02622	9.919444	11.52724
Nov-21	5.501699	6.182822	3.348032	3.729082	3.431144	8.904783	9.05779	11.62806
Dec-21	8.33681	7.110027	4.57924	3.950645	4.446895	7.28087	9.751852	11.74082
Jan-21	7.318161	8.136932	6.028249	5.681855	5.664746	5.548913	9.541019	12.9148
Feb-21	9.155047	8.85904				3.800455	9.105494	12.11655
Mar-21	11.24193	11.52013				2.722174		12.39551
Apr-21	12.15048	12.68736				1.787391		12.96102
May-21	12.71124	13.13658				1.45087		13.91527
Jun-21	12.86181	13.2347				6.348261		13.15663
Jul-21	11.61871	11.60828				7.205652		12.61735
Aug-21	9.985919	9.479785				8.548261		11.82388
Sep-21	5.784916	6.525758				10.47		3.040616
Oct-21	5.398947	5.949885				11.48522		4.445918
Nov-21	6.060644	6.960792				10.17435		5.754002
Dec-21	7.530835	7.799698				9.47		6.258163
Jan-22	8.187618	8.172816				9.068043		7.416196
Feb-22	8.245786	8.184015				9.448261		8.192041
Mar-22	9.660758	10.16328				7.548915		8.82449
Apr-22	11.14324	12.09247				7.505217		9.140816
May-22	12.19885	13.50455				7.161304		10.00816
Jun-22	11.49931	12.10334				7.161304		10.67449
Jul-22	10.85145	11.24981				9.491739		9.979469
Aug-22	8.170425	7.784345				10.87032		8.715163
Sep-22	6.129714	5.404415				11.68826		7.065714
Oct-22	4.264286							4.264286
Nov-22	1.561224							1.561224

GROUND WATER DATA FROM CGWB



ANNEXURE 4

RAINFALL

Monthly rainfall (in mm) trends for Aurangabad from 01-Jan-2018 to 31-Mar-2024

Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)
Jan-17		0.00	Nov-18	24.8	11.03	Sep-20	153.4	197.37	Jul-22	172.8	247.29
Feb-17		0.00	Dec-18	10.3	0	Oct-20	56.9	65.44	Aug-22	175.9	84.34
Mar-17		0.00	Jan-19	2.7	0	Nov-20	24.8	1.45	Sep-22	153.4	255.34
Apr-17		0.00	Feb-19	2.5	0	Dec-20	10.3	1.33	Oct-22	56.9	132.92
May-17		2.44	Mar-19	4.6	0	Jan-21	2.7	12.03	Nov-22	24.8	0
Jun-17		149.79	Apr-19	3.5	0.94	Feb-21	2.5	2.27	Dec-22	10.3	7.04
Jul-17		86.36	May-19	18.9	0	Mar-21	4.6	5.84	Jan-23	2.7	3.14
Aug-17		165.79	Jun-19	134.6	110.63	Apr-21	3.5	4.66	Feb-23	2.5	0
Sep-17		182.62	Jul-19	172.8	162.87	May-21	18.9	30.6	Mar-23	4.6	9.83
Oct-17		95.61	Aug-19	175.9	106.42	Jun-21	134.6	132.15	Apr-23	0	39.76
Nov-17		2.83	Sep-19	153.4	213.73	Jul-21	172.8	142.21	May-23	0	9.41
Dec-17		2.27	Oct-19	56.9	193.39	Aug-21	175.9	186.88	Jun-23	134.6	43.71
Jan-18	2.7	0	Nov-19	24.8	97	Sep-21	153.4	454.42	Jul-23	172.8	173.41
Feb-18	2.5	0.72	Dec-19	10.3	1.46	Oct-21	56.9	106.39	Aug-23	175.9	46.79
Mar-18	4.6	0.53	Jan-20	2.7	0.12	Nov-21	24.8	15.3	Sep-23	153.4	220.1
Apr-18	3.5	2.01	Feb-20	2.5	0	Dec-21	10.3	6.89	Oct-23	56.9	0.85
May-18	18.9	0.17	Mar-20	4.6	22.92	Jan-22	2.7	0.2	Nov-23	24.8	54.85
Jun-18	134.6	126.39	Apr-20	3.5	2.42	Feb-22	2.5	0	Dec-23	10.3	14.13
Jul-18	172.8	85.65	May-20	18.9	6.26	Mar-22	4.6	4.91	Jan-24	0	2.44
Aug-18	175.9	180.45	Jun-20	134.6	251.86	Apr-22	3.5	0	Feb-24	0	2.25
Sep-18	153.4	29.42	Jul-20	172.8	91.32	May-22	18.9	0	Mar-24	0	0.1
Oct-18	56.9	1.65	Aug-20	175.9	221.91	Jun-22	134.6	140.36			

ANNEXURE 5

REGRESSION & CORRELATION

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.028569498
R Square	0.000816216
Adjusted R Square	-0.013457838
Standard Error	3.542306917
Observations	72

Correlation	*Column 1*	*Column 2*
Column 1	1	
Column 2	0.028569498	1

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.717513774	0.717513774	0.057181806	0.811705719
Residual	70	878.3556808	12.5479383		
Total	71	879.0731946			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.29983462	0.520625671	19.7873711	2.20591E-30	9.261678903	11.33799033	9.261678903	11.33799033
X Variable 1	0.001100177	0.004600801	0.239127175	0.811705719	-0.008075832	0.010276186	-0.008075832	0.010276186

ANNEXURE 7

PHOTOS

CHAPTER 9
RECOMMENDATIONS

STRENGTHEN MARKET LINKAGES

Establishing stronger market linkages is essential to build on the increased agricultural productivity and income achieved through this intervention. Enhancing access to both local and regional markets will ensure farmers receive fair prices for their produce and increase profitability. Collaboration with government agencies, agribusinesses, and cooperatives can expand market reach and support sustainable livelihoods.

ENCOURAGE KNOWLEDGE SHARING AND PEER LEARNING

Encourage farmers to share knowledge through peer learning networks. Setting up community groups, organising farm visits, and hosting hands-on workshops can help farmers learn from each other's successes and challenges, build community bonds, and make it easier to adopt new techniques.

10. SUSTAINABILITY

Sustainability is a fundamental aspect of the Bajaj Water Conservation project implemented by MGVS, ensuring its positive impact continues beyond the project's duration. The project's sustainability approach is rooted in community participation, integrated water resource management, and capacity building, fostering long-term resilience in the target villages.

One of the key sustainability strategies of the BWCP is promoting community ownership and active participation. The establishment of Water User Groups (WUGs) ensures that local stakeholders are directly involved in decision-making, implementation, and maintenance of water conservation structures. This participatory approach cultivates a sense of responsibility, increasing the likelihood of continued success. Additionally, strengthening Self-Help Groups (SHGs), particularly for women, empowers them to take part in resource management and decision-making, promoting gender equality and social sustainability.

The project also employs integrated water resource management by developing and restoring water conservation structures and establishing storage facilities. These initiatives enhance water availability for drinking and agriculture, reducing seasonal water shortages. Soil moisture conservation and water harvesting techniques are promoted to improve groundwater recharge and optimize water use efficiency. Furthermore, the BWCP supports sustainable farming practices, such as using organic inputs and water-efficient irrigation methods, to improve soil health, increase agricultural productivity, and reduce dependence on external inputs.

Capacity building and knowledge dissemination are also critical to the project's sustainability. Training programs equip farmers and community members with skills in sustainable agriculture, water management, and organic farming techniques like Amrit Jal and vermicompost. By fostering a culture of knowledge-sharing among farmers, the project ensures the continued adoption of sustainable practices and ongoing learning within the community.

The Bajaj Water Conservation Project, with its focus on community ownership, integrated water resource management, capacity building, and sustainable agricultural practices, has established a solid foundation for long-term sustainability. By empowering local communities to manage their water resources and adopt sustainable farming practices, the BWCP contributes to building resilient and self-sufficient communities capable of adapting to the challenges of water scarcity and climate change.

CHAPTER 11
CONCLUSION

The intervention, led by Marathwada Gramin Vikas Santha in partnership with the Bajaj, has had a profound impact on the agricultural communities in seven villages across Kannad and Vaijapur talukas in Aurangabad district in the state of Maharashtra, particularly in improving water availability, agricultural productivity, and economic resilience. By implementing a range of initiatives, from water conservation structures and community institutional strengthening to training in sustainable farming practices, the program has provided essential support to rural communities facing resource scarcity and economic challenges.

Notable outcomes of the intervention include enhanced water access for irrigation and household needs, increased agricultural productivity, and improved household income levels. Additionally, the shift towards sustainable practices has encouraged a self-sustaining, resilient rural economy. These results demonstrate the effectiveness of an integrated, community-centred approach to addressing water scarcity, supporting sustainable agriculture, and building economic resilience. By contributing to improved livelihoods and well-being, the intervention stands as a model for holistic rural development, with long-term benefits for individuals, families, and communities at large.

IMPACT ASSESSMENT REPORT

REDUCING COMMUNICABLE, MATERNAL, NEONATAL AND NUTRITION-RELATED MORBIDITIES IN THE TRIBAL COMMUNITY OF PRATAPGARH

Implementing partner – PRAYAS

Release Date: 31-12-2024

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

ANC	Antenatal Care
ASHA	Accredited Social Health Activist
CHCs	Community Health Centers
COVID	Coronavirus Disease
IUDs	Intrauterine Devices
NGO	Non-Governmental Organisation
PHCs	Primary Health Centers
PMJAY	Pradhan Mantri Jan Arogya Yojana
PMMVY	Pradhan Mantri Matru Vandana Yojana
PNC	Post-Natal Care
PRI	Panchayati Raj Institution
SDGs	Sustainable Development Goals

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The project aimed to improve access to quality health services, including preventive, curative, rehabilitative and palliative care for people of 30 villages in Pratapgarh district of Southern Rajasthan. It focused on reducing illnesses and early deaths caused by communicable diseases as well as maternal, neo-natal and nutritional issues.

PROJECT DETAILS

Implementation year

FY 2019 - FY 2022

Assessment year

FY 2024 - FY 2025

Implementing Partner

PRAYAS

Project location

Pratapgarh District of Rajasthan

Beneficiaries

27,478 beneficiaries from 30 villages

Budget

₹149 lakhs

Alignment with SDGs

Alignment with National Policies

- National Health Policy
- Ayushman Bharat - Pradhan Mantri Jan Aarogya Yojana
- Pradhan Mantri Matru Vandana Yojana

PROJECT ACTIVITY

The goal was to lower illness, disability, and early mortality in the area by 30% over the period of. The approach involved raising awareness, creating community groups for discussions and actions, and involving citizens in planning and monitoring public health services. It also encouraged better communication between users and healthcare providers to improve the health system.

Key Findings

91.3%
of the respondents reported that healthcare services were made accessible after the project.

99.6%
of the respondents confirmed that the services provided by the project were affordable for their families.

99.6%
of the respondents received counselling on contraceptive methods from project staff.

91.3%
of the respondents utilised nutritional support, 89.1% accessed antenatal care (ANC) services, and 88.3% received immunisation services during the project.

89.4%
of the respondents indicated a significant improvement in the nutritional status of children under five years of age in their households.

90.9%
of the respondents reported a noticeable increase in exclusive breastfeeding for infants during the first six months.

Key Impact

91.7%
of respondents reported increased awareness of communicable diseases and their prevention methods.

91.3%
of the respondents gave birth in a hospital or clinic during their most recent delivery.

88.3%
of the respondents noted substantial improvements in maternal health within the community since the project began.

90.9%
of the respondents engaged in early registration for ANC, and 88.3% adopted contraception during awareness campaigns.

91.3%
of the respondents felt that the action groups were very effective in addressing community health issues.

89.1%
of the respondents expressed that they were very satisfied with the outcomes and services of the project.

03. OECD FRAMEWORK

RELEVANCE

The program in Pratapgarh district directly responded to local needs such as the lack of access to quality maternal and child health services, poor nutrition, and the prevalence of communicable diseases. It was aligned with national priorities like improving maternal and child health, which further connected the initiative to state and national goals. By focusing on the needs of tribal women and children, the project effectively targeted the village population, ensuring that its objectives were rooted in the real and urgent issues faced by the community.

COHERENCE

The project aligned well with the Sustainable Development Goals (SDGs), especially SDG 3: Good Health and Well-being by promoting healthy lives and well-being, and it advanced SDG 5: Gender Equality by addressing women's unique health needs. The project also aligned with national policies, including the National Health Policy, Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana and the Pradhan Mantri Matru Vandana Yojana, reinforcing its relevance in advancing local and national health objectives.

EFFECTIVENESS

The program effectively met its objectives by significantly improving healthcare access and raising awareness within the community. Respondents confirmed better access to healthcare services, highlighting the success of the project in making these services both accessible and affordable. Counselling on contraceptive methods plays a vital role in enhancing knowledge and empowering individuals to make informed decisions regarding their health. Necessary health services such as antenatal care, immunisations, and nutritional support were widely utilised, showing the project's ability to deliver necessary interventions. Hence, the initiative resulted in improved health outcomes, including better maternal health, increased breastfeeding practices and healthier children.

EFFICIENCY

The project utilised available resources efficiently to reach its intended outcomes. The coordination between the NGO and community action groups facilitated efficient service delivery. By establishing community groups for discussions and actively involving participants in healthcare decisions, the project optimised its resource use. Also, the implementation of both qualitative and quantitative methods in data collection allowed for a streamlined approach to monitoring and evaluation, ensuring timely responses and adjustments.

IMPACT

The project significantly improved health outcomes across various areas. Participants experienced better health due to increased access to quality services, enhanced knowledge about contraceptive methods and greater awareness of communicable diseases. There were improvements in nutritional status for children and safer pregnancies through better access to antenatal care. The initiative led to a reduction in illnesses caused by communicable diseases and strengthened local health initiatives through community groups. Further, the project contributed to lowering early mortality and disability rates while supporting goals aimed at enhancing maternal and child health and influencing policies for better healthcare access and quality.

SUSTAINABILITY

The sustainability of the project was enhanced by the creation of community action groups and the focus on raising awareness and educating the population. By empowering the local community and developing a sense of ownership, the program has built a foundation for long-term health improvements. These groups, along with the improved communication between healthcare users and providers, ensured that health services would continue to be effectively utilised even after the program ended. The alignment with national health priorities also supported the sustainability of the program by making it a model for future health interventions.

CHAPTER 4
INTRODUCTION

Kishori Meeting

BACKGROUND AND NEED OF THE PROGRAM

In the rural areas of Pratapgarh district, Rajasthan, community members had difficulty accessing proper healthcare, especially women and children. Many faced illnesses and early deaths from diseases as well as issues related to mothers and newborns were common. Poor nutrition and lack of maternal care were an obstacle, and there was a need to address them. To tackle these concerns, the project was initiated to provide healthcare services, including preventive and curative care. It focused on reducing illness and deaths while involving the community in health planning and improving communication between villagers and healthcare workers. The program is centred on improving maternal and child care, nutrition, and disease prevention in the tribal community.

OBJECTIVES OF THE PROGRAM

Provide comprehensive access to quality health services, including preventive, curative, rehabilitative, and palliative care, with a focus on maternal, neo-natal, and nutritional health.

Raise awareness about communicable diseases and promote essential health practices such as antenatal care, immunisation, and exclusive breastfeeding.

Offer counselling on contraceptive methods and encourage early adoption of family planning through awareness campaigns and community engagement.

Establish community groups to address public health concerns, facilitating discussions and actions for improved health outcomes.

Strengthen the healthcare system by improving communication between healthcare providers and users, ensuring better access to services and support.

ABOUT THE CSR FIRM

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT THE NGO

Prayas, established in 1979, is a voluntary organisation based in Chittorgarh, Southern Rajasthan, dedicated to social, political, and economic development. Known for its evolving and adaptive approach, Prayas consistently aligns itself with the needs and voices of the community, prioritising practical experience over rigid theories. The organisation focuses on empowering the underprivileged, addressing contemporary poverty-related challenges and advocating for social, economic, and cultural rights. Prayas also works towards gender equity and fosters community growth through innovative projects and alternative development methods, staying true to its mission of empowering the people it serves.

CHAPTER 5
RESEARCH METHODOLOGY

This chapter explores the objectives and methodology of the study, focusing on assessing the impact of the project aimed at reducing communicable, maternal, neo-natal and nutrition-related illnesses in the tribal community. The study used both qualitative and quantitative methods to gather data and understand the outcomes of the project. Surveys, interviews, and community discussions were conducted to collect information from various groups.

OBJECTIVES OF THE STUDY

To assess the accessibility and affordability of healthcare services in the project area.

To examine the utilisation of services such as nutritional support, antenatal care, and immunisations provided during the project.

To evaluate the impact of counselling on contraceptive methods and health awareness of reproductive health practices.

To analyse improvements in maternal health, child nutrition, and exclusive breastfeeding practices.

To identify the effectiveness of community action groups in addressing local health issues and overall satisfaction among participants.

To formulate strategic recommendations based on findings to enhance the effectiveness and sustainability of healthcare interventions in the project area.

USE OF MIXED METHOD APPROACH

The evaluation used a mix of qualitative and quantitative methods. The qualitative part gathered opinions and experiences from key stakeholders to understand their views better. The quantitative methods collected and analysed numbers from respondents to show trends and patterns.

By using both methods, the evaluation captured personal stories and data insights, giving a full picture of the progress and results of the project.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative methods provided an objective way to evaluate the project and its impact by analysing data. Surveys and questionnaires collected numbers from beneficiaries on different factors. Comparing this data from before and after the intervention showed the effects and improvements of the project. These methods gave a clear and measurable way to assess the success of the project using statistical evidence.

APPLICATION OF QUALITATIVE TECHNIQUES

Interviews were held with important people involved in the project to understand the initiative better. These discussions gathered their thoughts, experiences, and opinions, providing valuable context about how the project was implemented and its effects. This method helped uncover the challenges, successes, and outcomes of those directly involved in the project.

ENSURING TRIANGULATION

The study used different methods to ensure the findings were reliable and accurate. Information was collected from various sources, including field observations, participant interviews, community discussions, and feedback from project volunteers. This structured approach helped clarify the results of the program. A mix of research methods, like interviews and case studies, was used to compare the data and reduce bias. These methods made the analysis stronger and the conclusions more trustworthy.

DATA QUALITY CONTROL AND ANALYSIS

The study used a central dashboard and an internal app to track data in real time, ensuring accuracy and enabling quick fixes when needed. It also applied different descriptive statistical methods and visual tools to organise and understand data patterns showing various features and trends.

SAMPLING FRAMEWORK

The study used a stratified random sampling method to include a wide range of different groups within the target population. For qualitative engagement, purposive sampling was used to make sure key stakeholders were part of the discussions.

Stratified random sampling involves dividing the population into different subgroups and then randomly choosing participants from each group to get a varied and representative sample.

Purposive sampling, on the other hand, is a targeted method where individuals or groups are intentionally selected based on their specific characteristics or expertise, providing detailed and focused insights on the research topic.

STANDARDISED FRAMEWORK FOR EVALUATION

The research study used the OECD DAC framework to meet international standards and ensure a consistent evaluation of the impact of the project. This framework enhanced the credibility and relevance of the findings, giving a solid foundation for assessing the outcomes.

DESIGN SNAPSHOT

Name of the project

Reducing communicable, maternal, neo-natal and nutrition-related morbidities in tribal community

Implementing agency

PRAYAS

Research design used

Descriptive research design

Sampling technique

Purposive random sampling

Sample size

265

KEY STAKEHOLDERS

UPHOLDING RESEARCH ETHICS

The impact assessment study followed strict ethical standards at every step.

INFORMED CONSENT

Participants received clear information about the goals, methods, risks, and benefits of the study before agreeing to take part. They joined willingly and understood why the research was being done.

CONFIDENTIALITY

The information of the participants was protected to build trust.

DATA SECURITY AND ANONYMITY

Personal data was kept private during the research.

All collected information was stored safely and only accessible to authorised staff. Any shared data was made anonymous to protect privacy.

NON-MALEFICENCE

The well-being of participants was a top priority, ensuring that no harm came from the research.

INTEGRITY

The research was credible by using clear and honest methods.

JUSTICE

All participants were treated fairly, ensuring equity and fairness throughout the research process.

GROUP INTERACTION WITH WOMEN BENEFICIARIES

CHAPTER 6
KEY STUDY FINDINGS AND IMPACTS

The chapter explores the findings and impact of the project involving better access to affordable healthcare for families, community reach of the services, counselling on contraceptive methods and services on nutritional support, antenatal care, immunisations, and improved health of children under five and the focus on increased exclusive breastfeeding. Awareness of communicable diseases led to more hospital deliveries and improved maternal health. The project promoted early antenatal care registration and contraception use. The action groups effectively addressed the community health issues, receiving positive feedback on outcomes and services.

GEOGRAPHICAL COVERAGE

The impact assessment study covered 9 villages of Pratapgarh district of Southern Rajasthan.

9 VILLAGES → **1 BLOCK** → **1 DISTRICT**

OUTREACH AND INCLUSIVITY

The primary beneficiaries of the program were women and adolescents from rural and marginalized communities of Pratapgarh. District, Rajasthan.

KEY FINDINGS

SOCIO-ECONOMIC AND DEMOGRAPHIC PROFILE OF THE POPULATION

CHART 1: AGE-WISE DISTRIBUTION

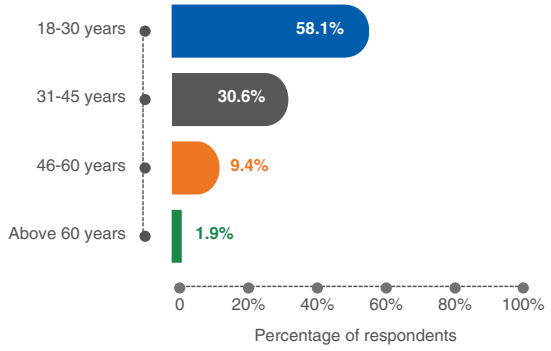


CHART 3: HIGHEST LEVEL OF EDUCATION

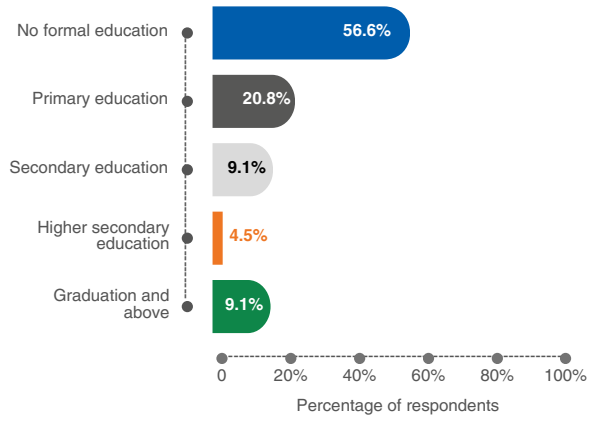


CHART 2: MARITAL STATUS

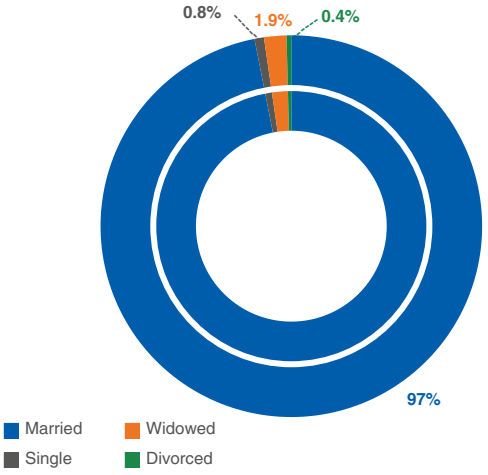


CHART 4: PRIMARY OCCUPATION

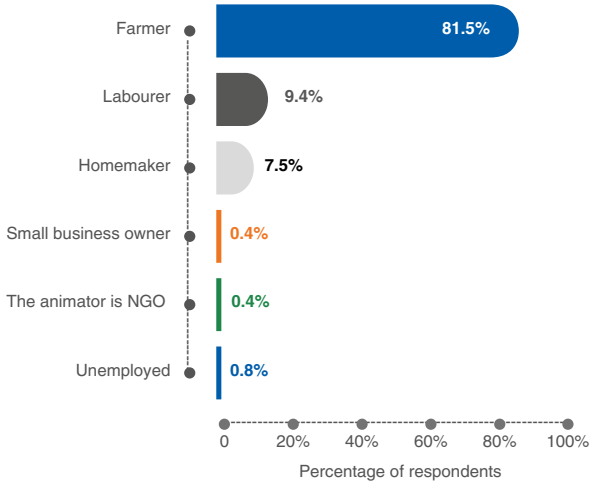
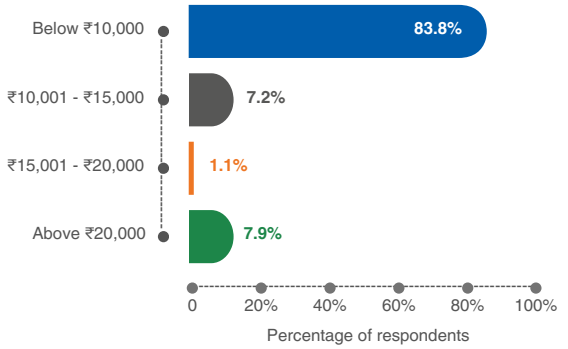


CHART 5: AVERAGE MONTHLY HOUSEHOLD INCOME



- A significant majority of the respondents were between the ages of 18 and 30, while a small number of respondents fell within the 31 to 45 years age range.
- A large majority of the respondents being surveyed were married.

20.8%

More than half of the respondents had no formal education, and a substantial majority (20.8%) of the respondents had received only primary education, while a smaller group had completed secondary education or graduated and above.

- A large majority of the respondents were engaged in farming as their primary occupation and a small group worked as labourers.
- A large majority of the respondents reported an average monthly household income below ₹10,000, and a notable fraction had income between ₹10,001 to ₹20,000.

AVAILABILITY OF HEALTHCARE SERVICES

CHART 6: WHETHER HEALTHCARE SERVICES (ANC, IMMUNIZATIONS, MATERNAL CARE) WERE EASILY ACCESSIBLE IN THE VILLAGE BEFORE THE PROJECT

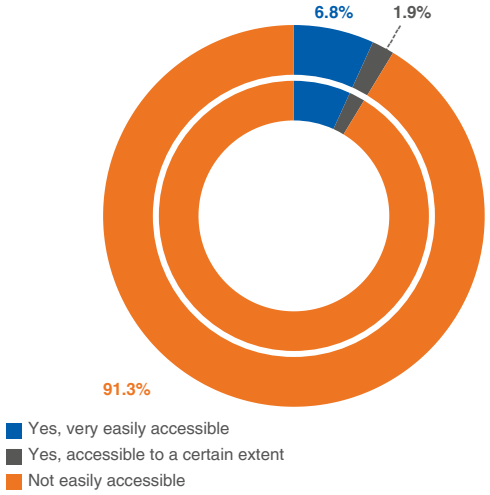


CHART 7: ACCESSIBILITY OF HEALTHCARE SERVICES AFTER THE PROJECT

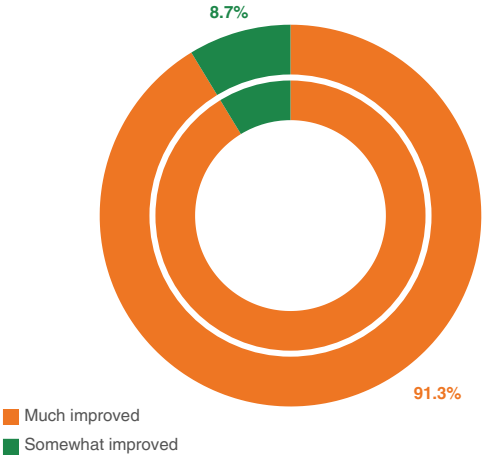
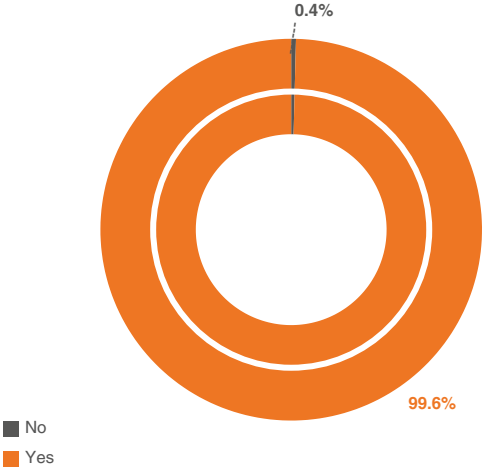


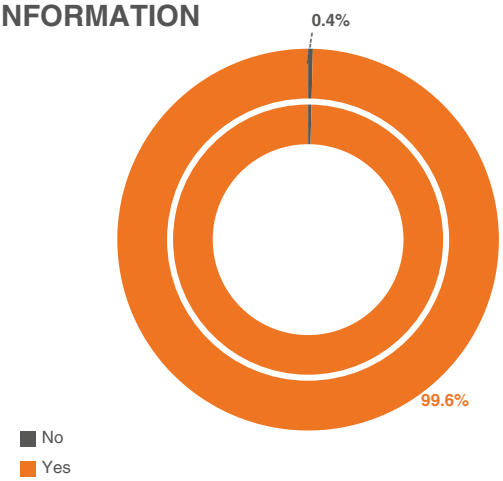
CHART 8: WHETHER THE SERVICES PROVIDED BY THE PROJECT WERE AFFORDABLE FOR THE FAMILY



- A large majority of the respondents indicated that healthcare services, including ANC, immunisations, and maternal care, were not easily accessible in their village before the project.
- A large majority of the respondents reported that the accessibility of healthcare services had improved after the project, while a small group noted that healthcare services had somewhat improved.
- Almost all of the respondents said that the services provided by the project were affordable for their families.

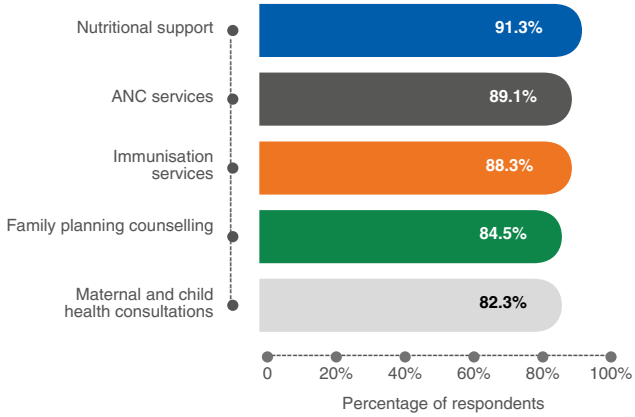
> Before this project, healthcare services were not easy for us to access, and we had to travel far for the services. However, after the project, healthcare services became better and closer to our village. The village health animators came to our house and gave us information about the care provided during pregnancy, vaccinations, and other services. I used the ANC services during my pregnancy, and it was very helpful. The project also made it affordable for us, which made a big difference for my family.
>
> **- Reshma Devi Meena**

CHART 9: VILLAGE HEALTH ANIMATORS OR OTHER PROJECT STAFF VISIT THE HOUSEHOLD FOR HEALTHCARE SUPPORT OR INFORMATION



Nearly all of the respondents reported that village health animators or other project staff visited their households for healthcare support or information.

CHART 10: TYPES OF HEALTH SERVICES USED DURING THE PROJECT



A vast majority of the respondents utilised nutritional support services (91.3) during the project. A large majority (89.1%) accessed ANC services, while around an equal number (88.3%) of the respondents accessed immunisation services. A significant number (84.5%) of the respondents had access to family planning counselling, and a substantial majority (82.3%) sought maternal and child health consultations.

SOULACE TEAM CONDUCTING SURVEY WITH BENEFICIARIES

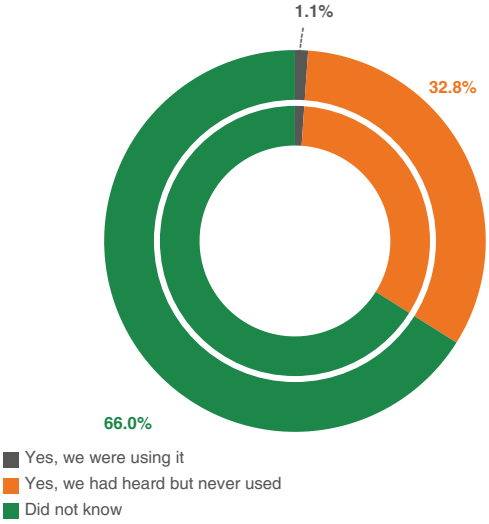
Case Study: Ramu Bai, ASHA worker, Chiklad, Pratapgarh

Ramu Bai, an ASHA worker from Chiklad, was an active member of the Prayas project and worked in the village of Anganwadi. She was well-known in the community for her dedication to promoting health and hygiene and supporting vaccination efforts, especially during the COVID-19 pandemic. During one of her routine interactions, she came across a pregnant woman who needed an abortion but was unaware of the process due to lack of knowledge. The woman had been struggling as doctors were unavailable, and she faced repeated excuses instead of getting the necessary care. Ramu Bai stepped in to help when the woman approached her for guidance. Unable to meet the doctor directly, Ramu Bai contacted the Prayas project team and shared the woman's situation in detail. The project team quickly reached out to the PMO and medical officers to inform them of the issue. With their support, the hospital facilitated the abortion. Through this case, Ramu Bai emphasised to the women in her community the importance of timely and effective access to healthcare services.

GROUP INTERACTION WITH BENEFICIARIES

FAMILY PLANNING COUNSELING

CHART 11: KNOWLEDGE ABOUT FAMILY PLANNING METHODS BEFORE THE INTERVENTION



A significant majority of the respondents said that they did not know about family planning methods before the project intervention. One-third of the respondents had heard of family planning methods but had never used any of them.

> Before this project, I had heard about family planning, but my husband and I did not use any methods. We did not know much about it or how it could help us. When the project staff intervened and explained about contraceptives and why it is important to know about family planning.
>
> **- Ganga Meena**

CHART 12: WHETHER RECEIVED COUNSELLING ON CONTRACEPTIVE METHODS FROM THE PROJECT STAFF

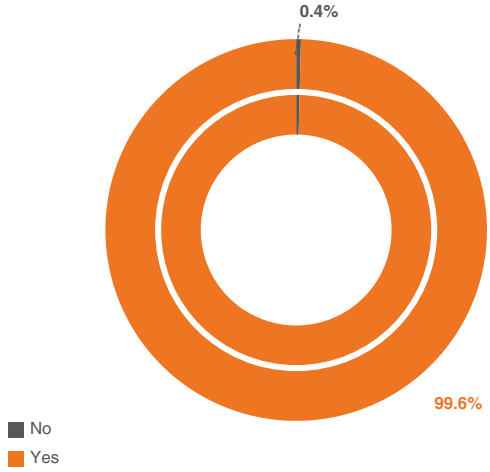


CHART 13: WHETHER THE PARTNER ADOPTED ANY CONTRACEPTIVE METHODS AFTER RECEIVING COUNSELLING

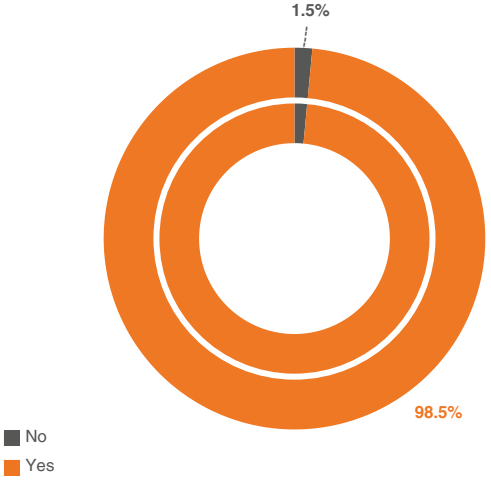
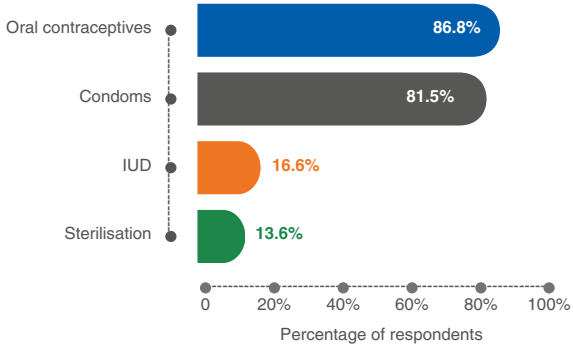


CHART 14: CONTRACEPTIVE METHOD THE RESPONDENTS OR THEIR PARTNER WERE CURRENTLY USING



- Nearly all of the respondents reported that they received counselling on contraceptive methods from project staff, while a very small number of

respondents stated that they did not receive such counselling.

- The vast majority of the respondents (98.5%) mentioned that their partners adopted contraceptive methods after receiving counselling, while a small number said that their partners did not adopt any contraceptive methods.

- A large majority (86.8%) of the respondents or their partners stated that they were currently using oral contraceptives, and a significant majority (81.5%) of the respondents reported using condoms as well. A smaller ratio (16.6%) utilised intrauterine devices (IUDs).

> "During my last pregnancy, I went for all four ANC check-ups because the project staff explained how important it was for my child and me. I also started only breastfeeding my baby after they told me about the benefits. Prior to this, I did not have much information, but now I follow their advice. I even registered early for ANC and made sure to eat better food during pregnancy."
>
> **- Navali Bai**

ANTENATAL CARE (ANC)

CHART 15: AWARENESS OF THE IMPORTANCE OF ANTENATAL CARE (ANC) BEFORE THE PROJECT

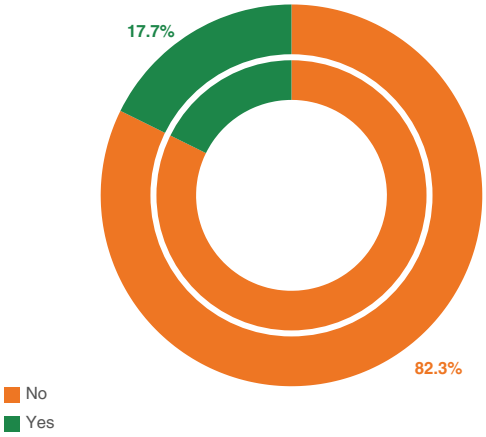
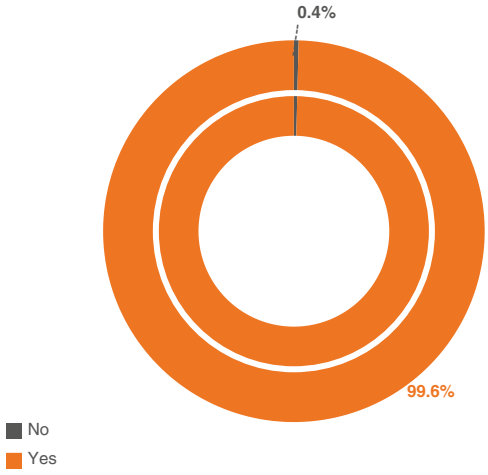


CHART 16: WHETHER RECEIVED INFORMATION ABOUT THE IMPORTANCE OF COMPLETING ALL FOUR ANC CHECK-UPS AFTER THE PROJECT

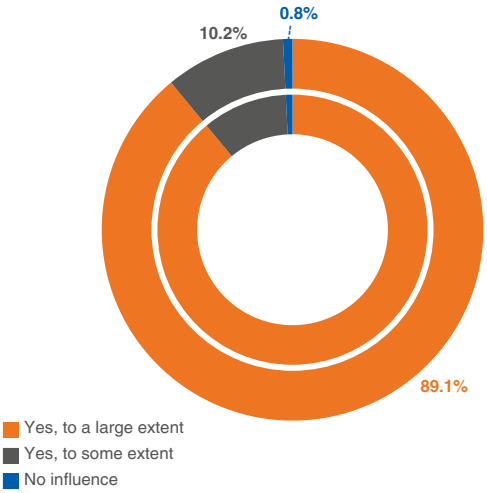


GROUP DISCUSSION AT RAANPUR VILLAGE

Case Study: Raju Bai, Devpura Panchayat, Pratapgarh

Raju Bai was a dedicated member of Devpura Panchayat in Pratapgarh and was actively involved with the Prayas project to improve healthcare access and awareness in her village. She worked closely with the women of Devpura and focused on increasing their understanding of important health concerns like maternal care, immunisation and antenatal check-ups (ANC). Through her mobilisation efforts, she gathered women on a common platform, provided information on these sensitive topics, and spread awareness about their importance in community health and family planning. Her involvement led to a positive shift in the behaviour of the women in the village, and they began actively discussing these matters with neighbours and within the households. She noticed a significant attitudinal change as the women started taking more responsibility for their healthcare decisions. Her efforts not only increased awareness but also helped create a lasting social and behavioural impact in the community.

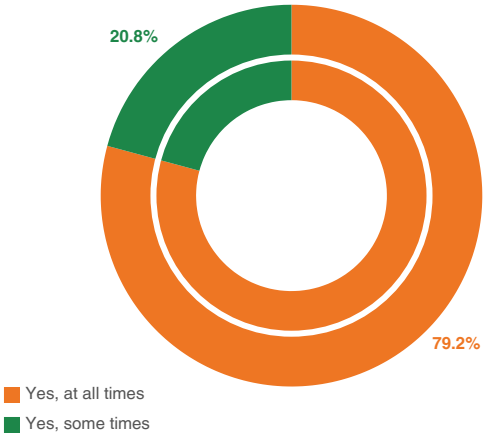
CHART 17: WHETHER THE PROJECT INFLUENCE THE DECISION TO REGISTER FOR ANC SERVICES DURING PREGNANCY



- A significant majority of the respondents were not aware of the importance of antenatal care before the project, while few of the respondents recognised the importance of ANC.
- Nearly all of the respondents reported that they received information about the importance of completing all four antenatal care check-ups after the project.
- A substantial majority of the respondents said that the project influenced their decision to register for antenatal care services during pregnancy to a large extent, while a small number of the respondents noted that the project influenced their decision to some extent.

> I did not know much about antenatal care and why it is important for pregnant women. But when the project started, the health workers came to our village and explained the need for care during pregnancy. They told us how attending all four check-ups can keep both the mother and baby healthy. I followed their advice and registered for ANC services during my pregnancy. The information really supported me and my child.
>
> **- Kesar Meena**

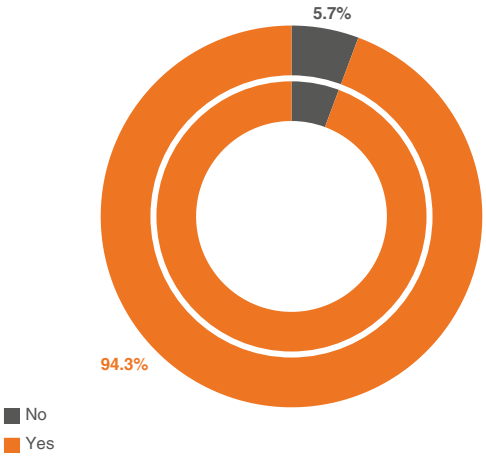
CHART 18: WHETHER THE RESPONDENTS OR ANY FAMILY MEMBER RECEIVED COUNSELLING OR SUPPORT ON REDUCING MATERNAL ANAEMIA DURING PREGNANCY



A significant majority of respondents stated that they or a family member received counselling or support on reducing maternal anaemia throughout pregnancy. Meanwhile, a notable portion (20.8%) reported receiving such support sometimes only.

EARLY MARRIAGE AND FREQUENT PREGNANCIES

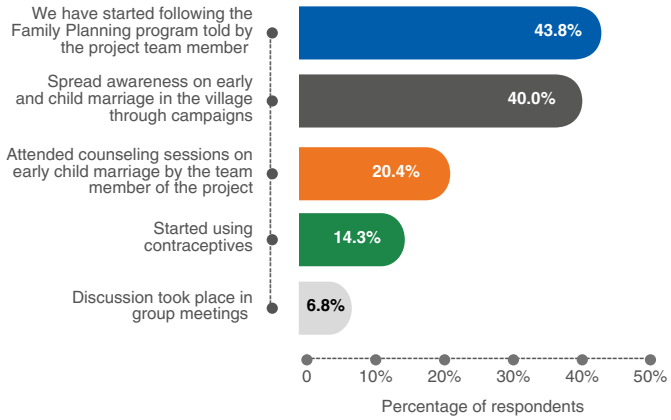
CHART 19: WHETHER AWARE OF THE RISKS OF EARLY MARRIAGES AND FREQUENT PREGNANCIES FOR MATERNAL AND CHILD HEALTH



A vast majority of the respondents reported being aware of the risks associated with early marriages and frequent pregnancies for maternal and child health, and a small ratio of the respondents said that they were not aware of these risks.

> I got help from the project to understand how weakness during pregnancy can occur. They also taught me and my family about the problems with early marriage and having too many children. We learned it is better for girls not to have early marriage. The project staff gave me iron and folic acid tablets, which helped me feel stronger.
>
> **- Sona Bai Meena**

CHART 20: ACTIONS TAKEN TO REDUCE THE HEALTH RISKS OF EARLY MARRIAGE AND FREQUENT PREGNANCIES

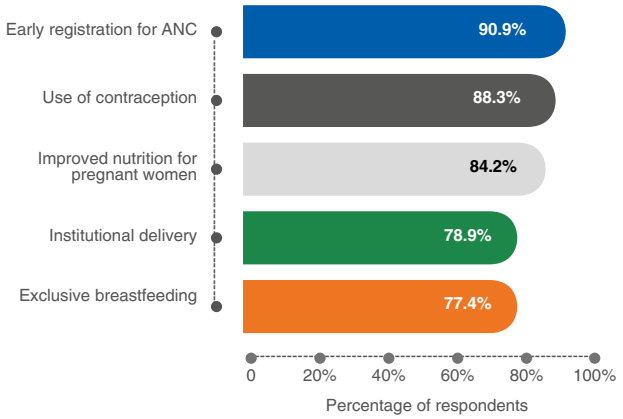


Nearly half of the respondents stated that they have started following the family planning program introduced by the project team, while a considerable majority (40.0%) of the respondents reported spreading awareness on early and child marriage through village campaigns, and a notable number of the respondents (20.4%) mentioned attending counselling sessions on early child marriage provided by the project team.

FOCUSED GROUP DISCUSSION WITH BENEFICIARIES

KEY IMPACT

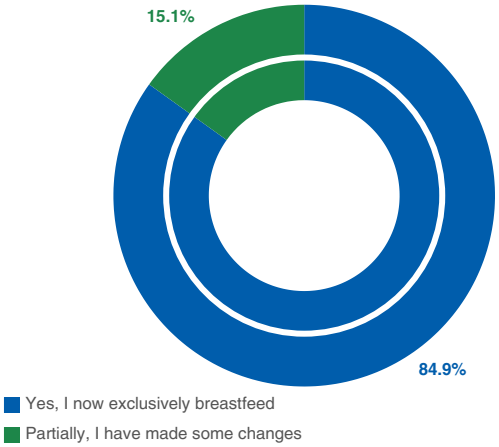
CHART 21: PRACTICES ADOPTED AS A RESULT OF THE PROJECT'S AWARENESS CAMPAIGNS



The vast majority of the respondents (90.9%) adopted early registration for antenatal care as a result of the project's awareness campaigns. A large majority (88.3%) also began using contraception. Whereas a substantial portion (84.2%) improved nutrition for pregnant women. A significant majority (78.9%) of the respondents stated opting for institutional delivery, while a considerable portion adopted exclusive breastfeeding practices.

SOULACE TEAM CONDUCTING SURVEY WITH BENEFICIARIES

CHART 22: WHETHER THE CAMPAIGN AROUND EXCLUSIVE BREASTFEEDING CHANGED THE PRACTICE

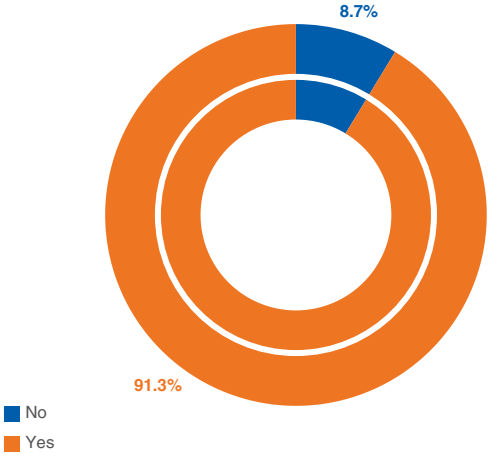


A large majority of the respondents said that they now exclusively breastfeed after the campaign, while a small group of the respondents said that they have made some changes to their breastfeeding practices but have not fully adopted exclusive breastfeeding.

INTERACTION WITH WOMEN BENEFICIARIES

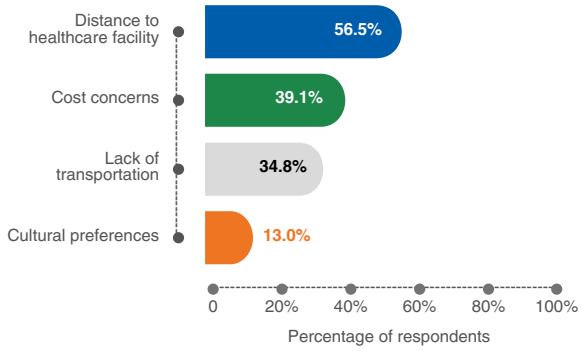
INSTITUTIONAL DELIVERIES

CHART 23: WHETHER GAVE BIRTH IN AN INSTITUTION (HOSPITAL OR CLINIC) DURING THE MOST RECENT DELIVERY



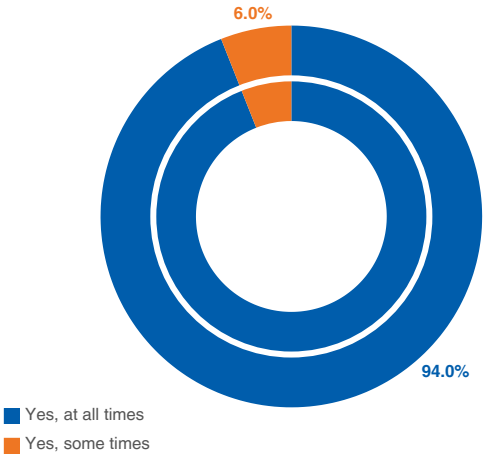
A vast majority of the respondents reported giving birth in a healthcare institution (hospital or clinic) during their most recent delivery, while a few of the respondents surveyed said that they did not deliver in a healthcare institution.

CHART 24: REASONS FOR NOT CHOOSING INSTITUTIONAL DELIVERY



More than half of the respondents mentioned the distance to healthcare facilities as the main reason for not choosing institutional delivery. The concerns related to costs were mentioned by a significant number of the respondents (39.1%), while a similar portion (34.8%) stated that a lack of transportation was the reason for not choosing institutional delivery.

CHART 25: WHETHER THE RATE OF INSTITUTIONAL DELIVERIES HAS INCREASED IN THE VILLAGE SINCE THE PROJECT STARTED



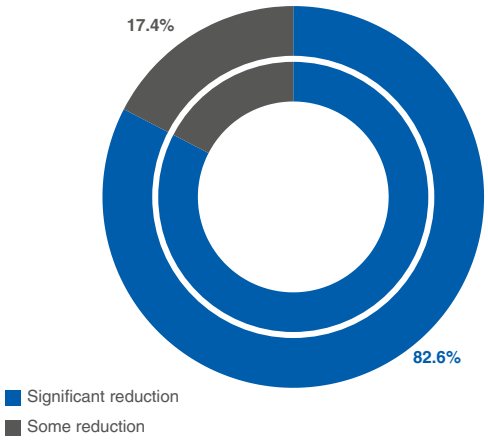
A substantial majority of the respondents (94.0%) reported that the rate of institutional deliveries has consistently increased in the village since the project was initiated, while a smaller group said that the increase has been occasional.

FOCUSED GROUP DISCUSSION WITH BENEFICIARIES

Case Study: Yashoda, Animator, Bordi, Pratapgarh

Yashoda, an Animator from Bordi in Pratapgarh district, has been working attentively in her role. She was particularly focused on working with women in the village, especially raising awareness among mothers about the benefits of government schemes. Initially, many mothers were unaware of the project and its benefits. Through her efforts, she spread awareness about the schemes and guided those who knew about the benefits of the schemes on how to avail them. She went door to door to ensure that the maximum number of girl children in the village was registered on time. In one case, Yashoda helped a woman with a girl child by registering her in one of the government schemes and advocating on her behalf to secure an instalment of ₹11,400. This financial support helped the woman run her household and made her aware of the benefits. Even after the closure of the project, Yashoda continued to conduct meetings with the village women, especially mothers, to ensure that they maintained good maternal health and that deliveries were institutional. She worked to reduce unhealthy and unhygienic birth practices or births at home, which cause serious health issues to the child and the mother, even if the death of an infant can occur and encouraged the use of Primary Health Centers (PHCs) and Community Health Centers (CHCs). After her efforts and with support from the Prayas project, nearly all deliveries in Bordi village now take place in hospitals, leading to a significant reduction in home births.

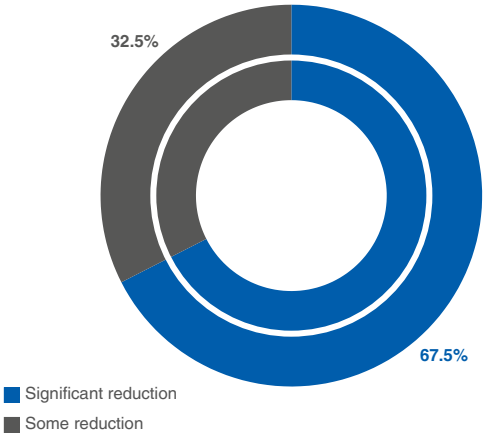
CHART 26: WHETHER NOTICED ANY REDUCTION IN NEONATAL OR INFANT DEATHS IN THE VILLAGE



A large majority (82.6%) of the respondents reported noticing a significant reduction in neo-natal or infant deaths in the village, while a small group observed some reduction.

> I see fewer children suffering and dying now in our village since the project started. Before this, we had many problems with mothers and their children not being healthy. The staff of the project taught us how to take care of our health and feed our children properly. My child under five is healthier now because we learned about nutritional food and its requirements for a child's healthy growth.
>
> **- Tulsi Bai**

CHART 27: WHETHER THERE HAS BEEN ANY REDUCTION IN MATERNAL OR INFANT HEALTH ISSUES IN THE HOUSEHOLD OR COMMUNITY OVER THE PAST YEAR

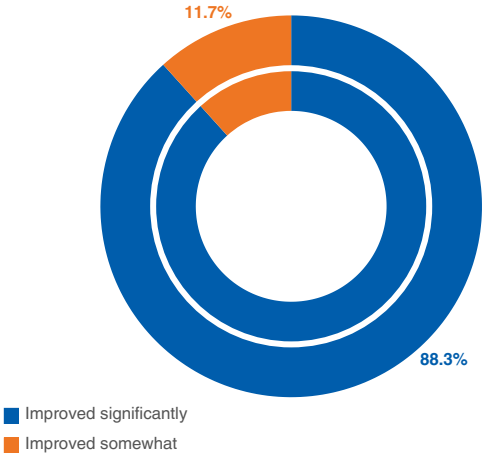


According to the findings, a significant majority of the respondents (67.5%) mentioned a significant reduction in maternal or infant health issues in their household or community. A considerable majority of the respondents observed a reduction in these health issues.

SOULACE TEAM CONDUCTING DISCUSSION ON MATERNAL HEALTH ISSUES

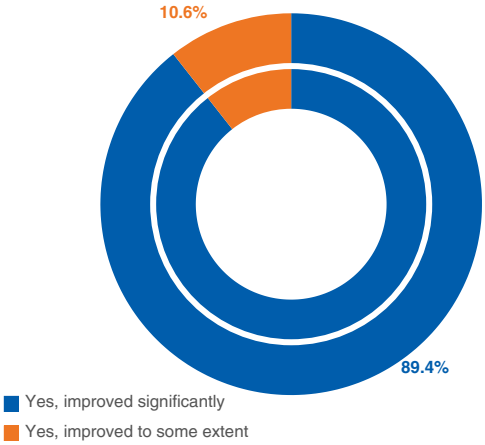
SOULACE TEAM CONDUCTING DISCUSSION ON MATERNAL HEALTH ISSUES

CHART 28: LEVEL OF CHANGE IN MATERNAL HEALTH IN THE COMMUNITY SINCE THE PROJECT



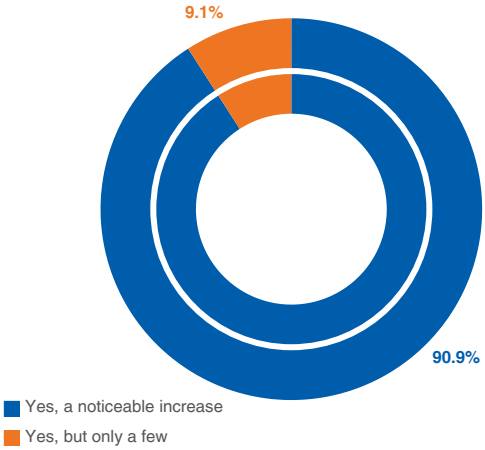
A significant majority (88.3%) of the respondents noted that maternal health in the community improved significantly since the project, while a smaller group observed that there was some improvement.

CHART 29: LEVEL OF IMPROVEMENT IN THE NUTRITIONAL STATUS OF CHILDREN UNDER FIVE IN THE HOUSEHOLD



A large majority of the respondents (89.4%) reported that the nutritional status of children under five in the household improved significantly, and a small number of the respondents noted that it improved to some extent.

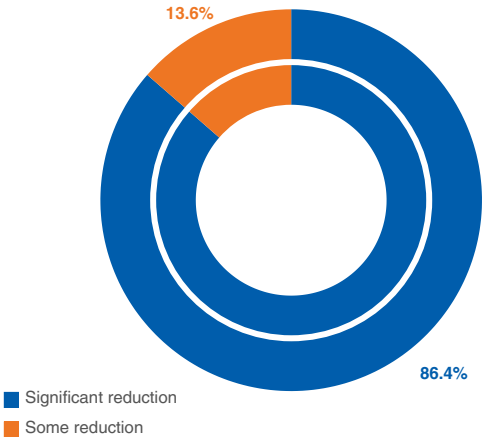
CHART 30: WHETHER MORE MOTHERS IN THE VILLAGE ARE NOW EXCLUSIVELY BREASTFEEDING THEIR INFANTS FOR THE FIRST SIX MONTHS



A vast majority of the respondents (90.9%) observed a noticeable increase in the number of mothers in the village exclusively breastfeeding their infants for the first six months, while a small number of the respondents said that only a few mothers were breastfeeding exclusively.

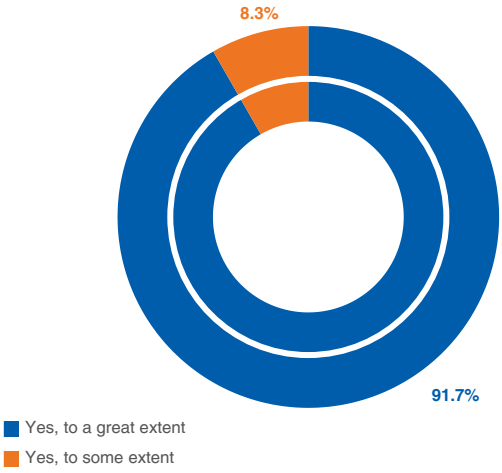
> “In our village, almost all of the mothers give only breast milk to their children for the first six months, as the project staff explained the benefits of this. Earlier, not many mothers used to do this, and I also started doing it because it is healthy for children. Since the project began, I have seen fewer children who were not healthy. My children are better now, and I am happy to see other mothers have started caring for their children well, too.”
>
> **- Geeta Meena**

CHART 31: WHETHER THERE HAVE BEEN CHANGES IN MALNUTRITION RATES IN THE HOUSEHOLD OR VILLAGE SINCE THE PROJECT BEGAN



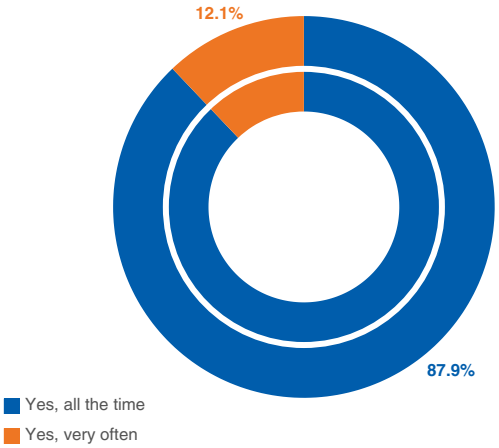
A large majority of the respondents (86.4%) noticed a significant reduction in malnutrition rates in the household or village since the project began, while a small group observed some reduction in malnutrition rates.

CHART 32: WHETHER THE CAMPAIGNS AND ACTIVITIES CARRIED OUT BY THE PROJECT HAVE MADE THE RESPONDENTS MORE AWARE OF COMMUNICABLE DISEASES AND HOW TO PREVENT THEM



A large majority of the respondents (91.7%) stated that the campaigns and activities carried out by the project made them more aware of communicable diseases and how to prevent them to a great extent, while a smaller group noted that their awareness increased to some extent.

CHART 33: FREQUENCY OF ENGAGEMENT IN PREVENTIVE HEALTH PRACTICES (E.G., HANDWASHING, USE OF CLEAN DRINKING WATER)



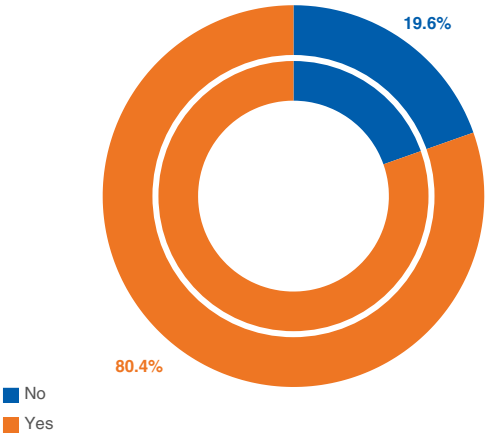
A significant majority of respondents (87.9%) reported engaging in preventive health practices, such as handwashing and using clean drinking water all the time. The remaining portion said that they engage in these practices very often.

INTERACTION WITH BENEFICIARIES AT GYAASPUR VILLAGE ACTION GROUP

"I learned many things about sickness and how to stay healthy. Before the project, I did not know much about hygiene, but now I wash my hands whenever necessary and make sure my family drinks clean water. I have also joined a group with other women from my village, and we generally discuss health issues in our meetings. It helps us understand what to do to stay healthy."

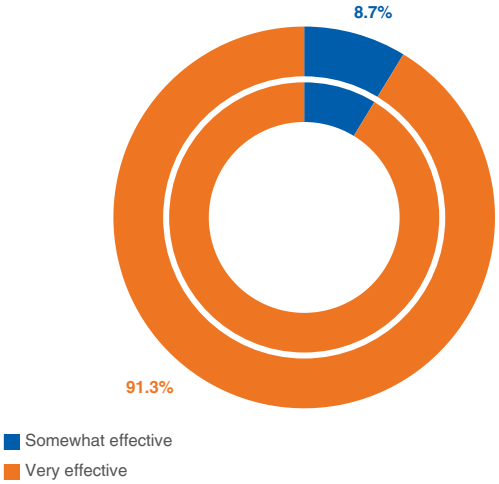
- Jiwali Meena

CHART 34: WHETHER THE RESPONDENTS OR THEIR FAMILY IS A PART OF AN ACTION GROUP FORMED BY THE PROJECT



A large majority of the respondents said that they or their family are part of an action group formed by the project, while a notable number of the respondents stated that they are not involved in such a group.

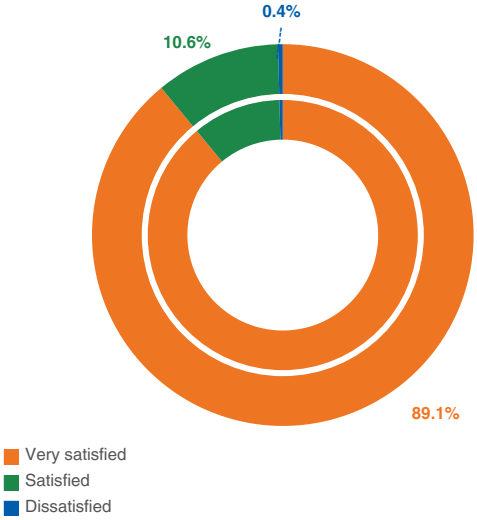
CHART 35: EXTENT TO WHICH THE ACTION GROUPS HAVE BEEN EFFECTIVE IN ADDRESSING HEALTH ISSUES IN THE COMMUNITY



A vast majority of the respondents stated that the action groups have been very effective in addressing health issues in the community, while a smaller group of the respondents reported that the groups have been somewhat effective.

GROUP PHOTO OF WOMEN BENEFICIARIES

CHART 36: OVERALL SATISFACTION WITH THE PROJECT



A large majority of the respondents expressed being very satisfied with the project, while a smaller group reported being satisfied.

> Healthcare was not easy to access in our village before the project. We had to struggle for services like immunisations and maternal care. After the project, when the project staff started visiting our homes and explaining about maternal care and family planning, I used the nutritional support and immunisation services for my children. Also, affordable healthcare services have become easier for us.
>
> **- Amba Bai Meena**

INTERACTION WITH BENEFICIARIES

Case Study: Chanda, Volunteer, Pratapgarh

Chanda is a dedicated volunteer who has been working on the Prayas project for an extended period. During her time with the project, she played a crucial role in implementing various health and awareness initiatives in her community. She shared that the project brought about significant positive changes. Through this initiative, awareness was raised about various important topics like antenatal care, immunisation, nutrition, family planning counselling, maternal and child health consultations, and adolescent health. She and her team worked to register ANC services in Devgarh and neighbouring villages. Chanda also mentioned that they conducted awareness campaigns, which contributed to an increased understanding of exclusive breastfeeding, institutional deliveries, and timely registration for ANC. As a result of the project's efforts, she noticed improvements in the nutrition of women and children. In addition, Chanda formed different adolescent groups in the villages where regular meetings were held, focusing on discussions about early marriage and its health risks.

07. SOCIAL IMPACT ON THE BENEFICIARIES

INDIVIDUAL LEVEL

- Improved access to quality health services led to better health outcomes for individuals.
- Counseling on contraceptive methods enhanced individuals' knowledge and decision-making regarding their health.
- Increased awareness of communicable diseases empowered individuals to adopt preventive measures.

FAMILY LEVEL

- Families experienced better nutritional status for children under five, resulting in healthier households.
- Access to antenatal care services contributed to safer pregnancies and improved maternal health.
- Increased satisfaction with healthcare services fostered a supportive environment for family health.

STATE LEVEL

- The project contributed to state efforts to reduce early mortality and disability rates among residents.
- Local health improvements served as a model for public health initiatives across the state.
- Enhanced collaboration between healthcare providers and community members supported state health goals.

NATIONAL LEVEL

- The project aligned with national health goals aimed at improving maternal and child health outcomes.
- Increased awareness and preventive practices advanced the country's public health initiatives.

CHAPTER 8
RECOMMENDATIONS

Organising exposure visits for women and adolescent girls to Kishori and Mahila Melas, similar to those attended by the animators, would provide valuable opportunities to learn, develop insights, and gain enriching experiences from these events.

The program was limited to a few villages in one district. Expanding such initiatives to a wider area would engage a larger population, encouraging more adolescent girls and women to participate, which in turn would foster greater understanding and support within the community.

09. SUSTAINABILITY

The sustainability of the PRAYAS health initiative in Pratapgarh district is rooted in its community-centric approach and alignment with national health priorities. By establishing and strengthening community action groups, the project fostered local ownership and accountability, ensuring continued engagement in health-seeking behaviours beyond the project timeline. These groups served not just as platforms for awareness but also as catalysts for behavioural change, empowering women and families to make informed decisions about maternal health, nutrition, and disease prevention.

Furthermore, the project's emphasis on capacity-building—through awareness campaigns, counselling on contraceptive methods, and training of grassroots workers like ASHA workers and animators—created a pool of informed community leaders who continue to act as health advocates. Improved communication between healthcare providers and beneficiaries also enhanced trust in public health systems, increasing service uptake.

Crucially, the project was well-aligned with government schemes such as the National Health Policy, Ayushman Bharat, and PMMVY, reinforcing its relevance and viability for integration into existing health frameworks. This alignment not only improves the chances of long-term support but also makes the initiative replicable and scalable across similar geographies. Together, these elements create a resilient foundation for lasting impact and continuity of outcomes.

CHAPTER 10
CONCLUSION

With the support of Bajaj Auto Limited and the efforts of Prayas, this initiative addressed health challenges, particularly for women and children. The focus on raising awareness about communicable diseases, promoting maternal and child health, and facilitating access to antenatal care and nutritional support showed a strong focus on the health and support of the community. Action groups played a vital role in addressing local health issues, leading to positive feedback and engagement from community members. This collaboration not only improved healthcare access but also promoted a culture of empowerment and support within the tribal community, setting a strong foundation for sustainable health improvements in the future.

BAJAJ THE WORLD'S FAVOURITE INDIAN

IMPACT ASSESSMENT REPORT

TO IMPROVE ACCESS TO HEALTH SERVICES DURING COVID-19 THROUGH MOBILE MEDICAL UNITS IN UNDERSERVED VILLAGES

Implementing partner – The PRIDE India

Release Date: 31-12-2024

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
FY	Financial Year
PRIDE	Planning Rural-Urban Development through Education
NGO	Non-Governmental Organisation
SDGs	Sustainable Development Goals
MMU	Mobile Medical Unit
ASHA	Accredited Social Health Activist

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

During the COVID-19 pandemic, Bajaj Auto Limited collaborated with The Pride India to undertake a project to improve healthcare access in 48 remote and underserved villages in the districts of Maharashtra. Osmanabad and Latur districts were chosen for the project as they were turning hotbeds for the virus infection due to reverse migrant influx. Additionally, these villages, with an approximate total population of 97,000 individuals, did not have access to any doorstep healthcare services through the existing government health infrastructure. To facilitate last-mile connectivity, two customised mobile medical units were set up, which included a doctor's chamber, laboratory set-up, nursing section with one bed and a pharmacy chamber. Laboratory tests were also made available to patients, and reports were sent to them through local ASHA workers/community health animators. In addition to focusing on COVID-19, efforts were directed toward addressing the health concerns of patients with non-communicable diseases, pregnant women, and at-risk individuals. It also worked towards building awareness about preventive healthcare measures. Therefore, this project was a major step towards complementing the existing healthcare infrastructure during the global medical crisis and creating linkages for marginal communities to access healthcare services smoothly in the long run.

PROJECT DETAILS

Implementation year
FY 2020 - FY 2022

Assessment year
FY 2024 - FY 2025

Implementing Partner
The PRIDE India

Project location
Osmanabad & Latur Districts (Maharashtra)

Beneficiaries
1,31,057 people from marginalized communities

Budget
₹101 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

Providing primary health services, including diagnostic and referral services.

Providing Antenatal and Postnatal care and promotion of safe delivery and care of neonates.

- The ANC Services include early diagnosis of pregnancy, early registration, providing MCH Cards to each ANC, MCT, regular minimum 4 Antenatal check-ups, screening for hypertension, diabetes, anaemia, TT Immunization for mother, Iron-folic acid and calcium supplementation, identification, and referral of high-risk pregnancy.
- The Post Natal services, includes counselling, support and motivation for institutional delivery, counselling about nutrition, enabling Take Home Rations (THR) for pregnant women through Asha Workers/AWW).
- The Neonatal and infact health services (0 to 1 year old), includes examination of low birth weight/preterm newborn/other high-risk newborns and management or referral as required, counselling and support for early breastfeeding, improved weaning practices, identification of congenital anomalies, other disabilities and appropriate referral, family/community education on prevention of infections, complete immunization, vitamin a supplementation,

INTERACTION WITH STAKEHODERS

VICE-SARPANCH WELCOMED SOULACE TEAM

Care of Common illnesses of newborns, AGE with mild dehydration, pneumonia case management, home base care.

Tracking and follow-up of ANC and PNC and infant care through home visits, monthly meetings (through local health animators) and mobile-based voice messaging (M-Mitra).

- M-Mitra services: The women who come for their antenatal check-up to the Mobile Medical Unit are enrolled with personal details and contact numbers. The same registered data is shared with the voice call service. The mobile-based technology called m-MITRA tracks every individual pregnant woman and reminds them periodically to take appropriate action during the pregnancy, delivery and post-delivery for their newborn infant up to the age of one year. After enrolling them, they start receiving personalized voice calls of 90-120 seconds (145 voice calls in all) in Hindi or Marathi directly on mobile phones.

Special Camps are organised for identifying and tracking the prevalence of hypertension and diabetes among populations above 30 years.

Promotion of access to government services like free ambulances and accessing government schemes for maternity care.

Screening for COVID-19 and referral of migrant/suspected cases to nearby facilities for treatment.

Distribution of hygiene kits, including masks and soaps, for COVID-19 prevention.

Spreading awareness and sensitisation about all health-related matters, including preventive care for COVID-19.

Key Findings

30.0%
of the respondents belonged to the age group of 46-60 years, while 28.0% of them were between 18-30 years. 24.0% of them were senior citizens above 60 years of age.

72.0%
of the respondents stated that their primary occupation was farming, which reflects their underprivileged socio-economic status, resulting in difficulty in accessing healthcare.

50.0%
of the respondents used to travel 10-20 kilometres to access basic healthcare facilities, while 36.0% of them travelled more than 20 kilometres.

86.0%
of the respondents availed general health check-ups, 80.0% of them received help regarding child healthcare, and 70.0% of them benefitted from the screening of non-communicable diseases like Hypertension and Diabetes.

86.0%
of the respondents received antenatal and postnatal care from the MMU if they were pregnant or had a pregnant family member during the project period.

98.0%
of the respondents received voice calls from the M-mitra service reminding them to take appropriate pregnancy-related action.

96.0%
of the respondents were screened for hypertension during MMU visits.

56.0%
of the respondents had been tested for COVID-19 by the MMU.

Key Impacts

95.0%
of the respondents shared that if any person is diagnosed with diabetes and hypertension,they have provided with medications from the MMU for the same. This resulted in reduced out-of-pocket expenditure along with early diagnosis of the illness.

88.0%
of the respondents agreed that the MMU services helped to reduce the severity of health issues for the family during the pandemic to a great extent.

78.0%
of the respondents agreed that they have started using local health centres more frequently after receiving MMU services.

92.0%
of the respondents feel that the MMU program has significantly improved the overall healthcare access in the community.

90.0%
of the respondents received hygiene kits (masks and soaps) through the Mobile Medical Unit, which helped them to prevent the spread of infection during the pandemic.

88.0%
of the respondents attribute the availability of the vaccine to the MMU.

88.0%
of the respondents agreed that awareness programs conducted by the MMU improved the understanding of preventive health practices (e.g., handwashing and social distancing) to a great extent.

03. OECD FRAMEWORK

RELEVANCE

The project was instrumental in addressing the healthcare needs of the marginalised community, especially at a time when the entire country was going through a major health crisis. Even though there was a special focus on Covid, the program gave equal attention to health concerns like chronic illnesses and childcare. The use of Mobile Medical Units (MMUs) and mobile technology for messaging (M-Mitra) also ensured that the project could reach the most vulnerable populations in a context where travel and access to healthcare were limited.

COHERENCE

The intervention is well aligned with the following:

It is also following Government of India policies like:
National Health Policy 2017, National Rural Health Mission, Janani Shishu Suraksha Karyakram, Mission Indradhanush

EFFECTIVENESS

The project goals of improving healthcare access to marginalised factions like pregnant women and neonates were achieved. Encouraging systematic institutional deliveries and home visits had reduced maternal and infant mortality rates. MMUs provided bi-monthly access to healthcare to each village, while the integration of the M-Mitra solution helped track and support pregnant and new mothers. The projects success was further achieved through health camps for screening non-communicable diseases, distribution of COVID-19 kits and by organising awareness programs.

EFFICIENCY

Mobile medical units helped address the healthcare needs of marginalised factions living in remote areas. Such units are apt as they save cost of creating multiple medical set-ups. Each unit covered two villages a day and all the villages twice a month without burdening the resources. Voice messaging also enabled for a reduction in the human and financial resources needed for follow-ups in cases of pregnancy. Efficiency was achieved through the use of local healthcare infrastructure(ASHA workers).

IMPACT

For individuals and families, healthcare costs decreased as maternal and neonatal care improved pregnancies, deliveries, and immunizations. Early detection and treatment enhanced chronic illness management. Communities became more aware of preventive healthcare and used government services, goals like reducing maternal and infant mortality, boosting immunization, and containing COVID were achieved.

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

SUSTAINABILITY

The project has ensured its sustainability by empowering people and making them aware of the existing government infrastructure. The involvement of local ASHA workers in the process also helped in creating a rapport between the community and the healthcare providers. The use of technology (M-mitra service), which continues to send voice messages and reminders to pregnant women and new mothers, also serves as an additional layer of support which continues beyond the duration of the project.

CHAPTER 4
INTRODUCTION

Interaction with Villagers and Medical Team

NEED OF THE PROGRAM

The COVID-19 pandemic is one of the most disastrous health crisis that the world has witnessed in recent times. Apart from the lives lost, the pandemic also severely impacted the healthcare sector, as countries struggled with resource shortages to manage the crisis on such a large scale. While the nation grappled to contain the spread of infection, districts like Osmanabad and Latur in Maharashtra also saw a surge in symptomatic cases due to an increase in reverse migration. As social distancing was the only solution to combat the problem, a nationwide lockdown was imposed. However, this step also impacted patients' access to healthcare facilities. These districts were already facing a shortage of adequate health services, with only 11-12% of villages being close to Primary Health Centers (PHCs). On an average, the nearest PHC is around 10 km away, and the rural hospital is 30 km away from villages. The restriction on movement meant a complete disconnect from these facilities, which posed a major risk to the vulnerable population, especially the elderly, people with pre-existing medical conditions (asthma, diabetes, hypertension, heart disease) and pregnant women who were more likely to become infected with this virus. Alongside this, many 100-bed hospitals in the vicinity, like the rural hospitals in Umerga, Tuljapur and Osmanabad, had been converted into fully COVID-19 hospitals. This meant a further decrease in the availability of beds for patients suffering from other illnesses. Thus, this project was conceptualised to prevent the spread of the virus locally and provide them with health services so that they remain indoors without being severely impacted.

OBJECTIVE OF THE PROGRAM

To contain the spread of the coronavirus infection locally and enhance easy access to affordable and quality health services through the Mobile Medical Unit (MMU).

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – THE PRIDE INDIA

The PRIDE India (Planning Rural-Urban Development through Education) is a non-governmental organisation established in 1982. The organisation's work is based on a holistic approach to bring about a sustainable change in the lives of marginalised communities. It helps them lead lives filled with dignity and self-respect and has been promoting the holistic development of such communities by adopting an integrated approach, with special emphasis on early childhood care and development, education, health and sanitation, livelihood, disaster relief and women empowerment. Its work spans 8 districts of Maharashtra, touching the lives of 19.55 lakh beneficiaries to date across more than 1040 villages. SPARSH (Sastur Project of Action Research Services through Hospital), a public-private partnership initiative, along with the outreach program through mobile medical units, is their flagship project focusing on providing quality health services to the rural poor in Marathwada region of Maharashtra State.

SOULACE TEAM WITH SPARSH TEAM AT SASTUR HOSPITAL

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited had appointed SoulAce to conduct a study on the work done by The PRIDE India and assess the impact of its CSR initiative in improving healthcare accessibility for marginalised communities.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

To evaluate the immediate impact of the program implemented and assess the enduring impact of the program.

To measure the extent to which the program was able to improve accessibility to healthcare through Mobile Medical units (MMU) in underserved villages during the pandemic.

To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders, such as patients, community members, doctors, healthcare workers and project staff, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- the patients and community members yielding statistical insights and identifying trends. By employing a mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries, stakeholders, and those responsible for project implementation. Engaging stakeholders like patients, community members, healthcare workers and doctors, and project staff through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of improvements in access to healthcare services brought about by the mobile medical unit during the pandemic. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries, stakeholders, and those responsible for project implementation. Engaging stakeholders like patients, community members, healthcare workers like doctors, and project staff through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of improvements in access to healthcare services brought about by the mobile medical unit during the pandemic. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including interviews with beneficiaries, field notes, interactions with other stakeholders, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact.

Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method. Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

RESEARCH DESIGN

Name of the project

To improve access to health services during COVID-19 through Mobile Medical units (MMU) in underserved villages

Implementing agency

The PRIDE India

Research design used

Descriptive research design

Sampling technique

Random Stratified sampling

Sample size

50 beneficiaries

Qualitative method used

Semi-structured interviews, testimonials and focus group discussions with beneficiaries along with key stakeholders

KEY STAKEHOLDERS

- Local community members
- Doctors
- Healthcare workers
- Project Implementation team
- Patients

STUDY TOOLS

Questionnaires for primary beneficiaries –

- Structured questionnaires were developed after reviewing project details for each focus area.
- Indicators were pre-defined before conducting the surveys.
- A semi-structured questionnaire and focus group discussion guide were designed for each stakeholder sample group.
- Stakeholders were identified across the various focus areas.
- Semi-structured questionnaires and focus group discussions were conducted with: Doctors, Community health workers and project staff.

ETHICAL CONSIDERATIONS

The impact evaluation adhered to a strong ethical framework, ensuring responsible and ethical research practices. Participants' rights and well-being were prioritized at every stage of the study. Informed consent was obtained by clearly explaining the study's objectives, procedures, potential risks, and benefits, allowing participants to make fully informed decisions after addressing any questions. Confidentiality was strictly maintained, with data securely stored, accessible only to authorized personnel, and participant identities protected through anonymization or coding techniques. Participation was entirely voluntary, free from any form of coercion, ensuring autonomy and respect for individual choice. Participants were consistently treated with respect, dignity, and fairness, with their well-being prioritized. Support or assistance was readily available whenever needed to ensure their comfort and safety throughout the research process.

CHAPTER 6
MAJOR KEY FINDINGS

The chapter delves into the collaboration between Bajaj Auto Limited and The PRIDE India, which worked in collaboration to improve access to healthcare services. It captures the inputs and efforts taken by the team to spread awareness about the pandemic and improve the health status of marginalised communities living in remote areas.

GEOGRAPHICAL COVERAGE

The intervention was implemented in 48 villages in the Osmanabad and Latur districts of Maharashtra, India.

OUTREACH AND INCLUSIVITY

The primary beneficiaries of the program were marginalised communities from rural villages.

KEY FINDINGS

CHART 1: AGE-WISE DISTRIBUTION OF THE RESPONDENTS

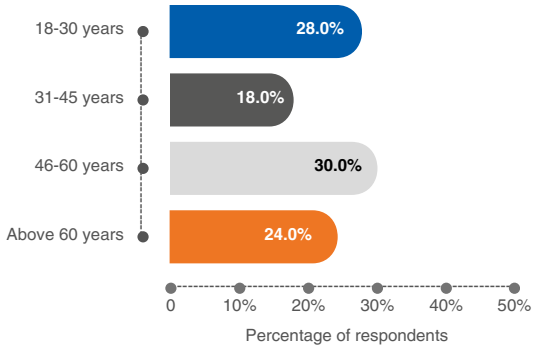


Chart 1 shows that 30.0% of the respondents belonged to the age group of 46-60 years, while 28.0% of them were between 18-30 years. 24.0% of them were senior citizens above 60 years of age.

CHART 2: PRIMARY OCCUPATION

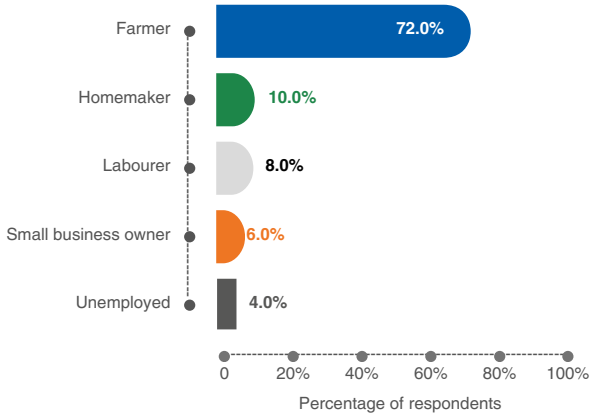


Chart 2 reveals that the primary occupation of 72.0% of the respondents was farming. Most of these households face a lack of access to healthcare services as the economic resources are directed towards fulfilling their basic needs like food and shelter.

SOULACE MEMBER INTERACTING WITH LOCAL COMMUNITY MEMBERS

CHART 3: DISTANCE TRAVELLED TO ACCESS BASIC HEALTHCARE BEFORE THE MMU

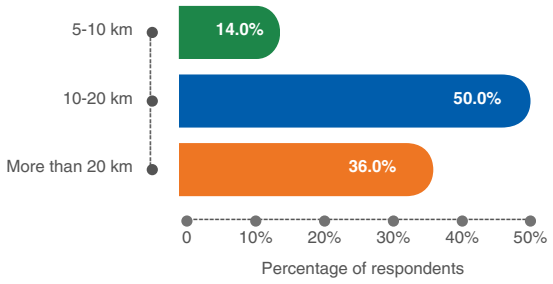


Chart 3 shows that 50.0% of the respondents would travel 10-20 kilometres to access basic healthcare facilities, while 36.0% of them travelled more than 20 kilometres. Proximity to healthcare facilities is a major determinant of a community's approach towards healthcare. Due to the remoteness of these communities and the lack of adequate healthcare infrastructure in these areas, such an intervention becomes imperative to enhance the physical well-being of the people.

CHART 4: TYPE OF HEALTH SERVICES ACCESSED THROUGH THE MMU

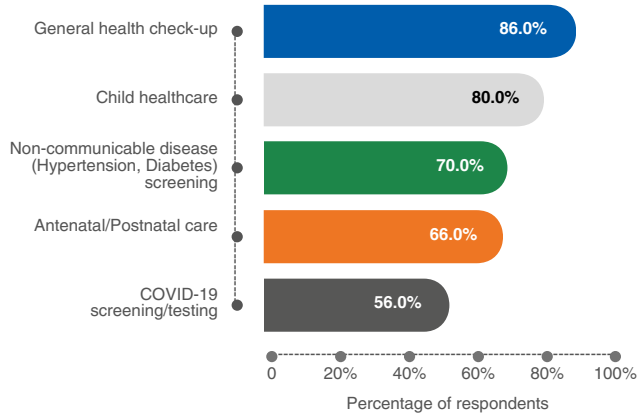


Chart 4 shows the types of healthcare services accessed by the respondents. The MMU tried to become a holistic one-stop solution for these communities and offered various diagnostic services. 86.0% of the respondents availed general health check-ups, 80.0% of them received help regarding child healthcare, and 70.0% of them benefitted from the screening of non-communicable diseases like Hypertension and Diabetes. 66.0% and 56.0% of them availed Antenatal/Postnatal care and COVID-19 testing facilities, respectively.

INTERACTION WITH VILLAGE PANCHYAT

ANTENATAL AND POSTNATAL CARE

CHART 5: WHETHER RECEIVED ANTENATAL AND POSTNATAL CARE FROM THE MMU IF PREGNANT OR HAD A PREGNANT FAMILY MEMBER DURING THE PROJECT PERIOD

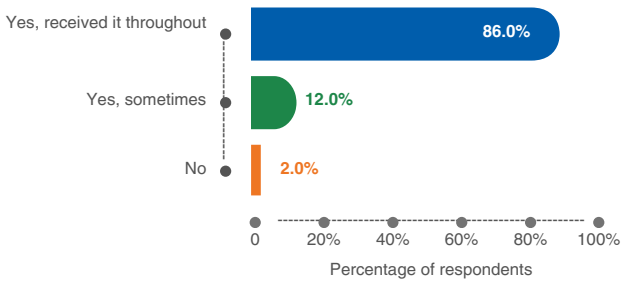
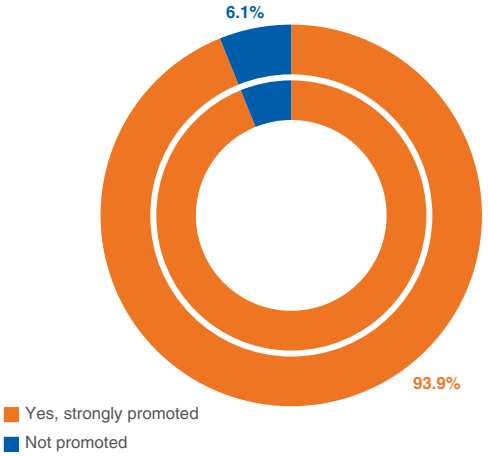


Chart 5 demonstrates that 86.0% of the respondents received antenatal and postnatal care from the MMU if they were pregnant or had a pregnant family member during the project period. These respondents received care throughout the pregnancy period, while 12.0% of them highlighted that they received care sometimes.

CHART 6: WHETHER INSTITUTIONAL DELIVERIES PROMOTED BY MMU STAFF IF PREGNANT OR HAD A PREGNANT FAMILY MEMBER DURING A PANDEMIC



In Chart 6, 93.9% of the respondents reported that the MMU staff promoted institutional deliveries. Qualitative interviews also highlight that they were made aware of the benefits of institutional deliveries and also guided about the necessary steps required to avail of the service from their local healthcare facility.

CHART 7: WHETHER THE RESPONDENT'S CHILD WAS PROVIDED WITH VACCINATIONS THROUGH THE MMU

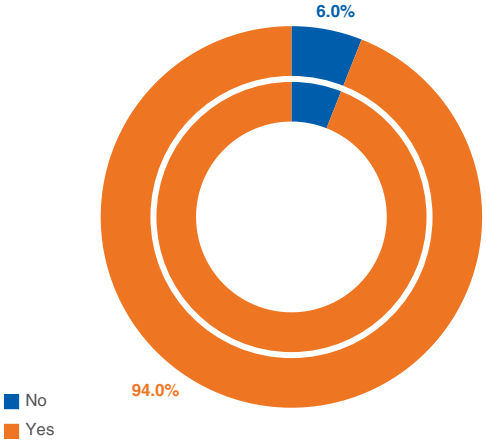


Chart 7 shows that 94.0% of the respondents child received vaccinations through the MMU. The impact of immunisation can be witnessed as parents confirm that their children are healthier and less prone to infections.

CHART 8: WHETHER RECEIVED VOICE CALLS FROM THE M-MITRA SERVICE REMINDING TO TAKE APPROPRIATE PREGNANCY-RELATED ACTION

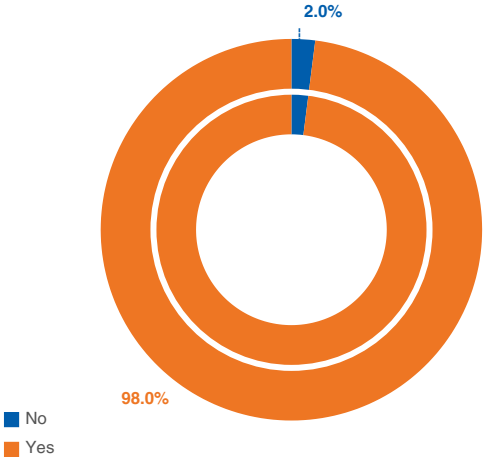


Chart 8 reveals that 98.0% of the respondents received voice calls from the M-mitra service reminding them to take appropriate pregnancy-related action. This shows the efficiency of the project implementation team in using the power of information and communication technology. The app has made it easier for ladies to remember the dates of hospital visits, the medicines to be consumed and other information pertinent to their pregnancy. Moreover, these calls were continued till one year after the delivery of the child.

SCREENING AND TREATMENT OF NON-COMMUNICABLE DISEASES

CHART 9: WHETHER THE RESPONDENT OR FAMILY MEMBERS ABOVE 30 YEARS OF AGE SCREENED FOR HYPERTENSION DURING MMU VISITS

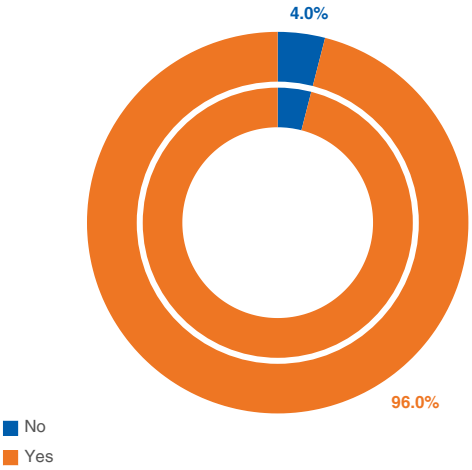


Chart 9 demonstrates that 96.0% of the respondents were screened for hypertension during MMU visits. Hypertension is a common health condition where the pressure in the blood vessels is constantly high.

CHART 10: WHETHER THE RESPONDENT OR FAMILY MEMBERS ABOVE 30 YEARS OF AGE SCREENED FOR DIABETES DURING MMU VISITS

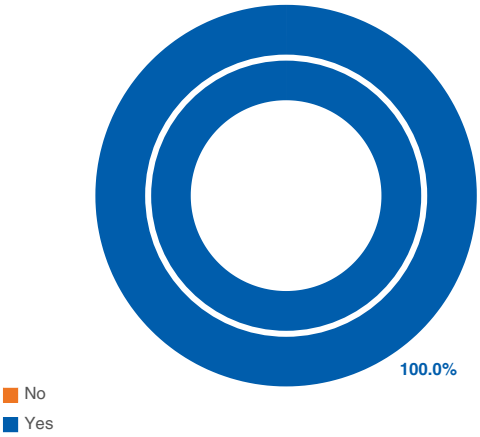
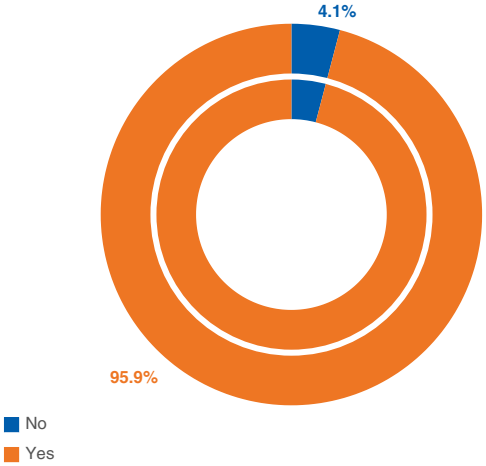


Chart 10 reveals that all of the respondents were screened for diabetes during MMU visits. Diabetes is a chronic disease that occurs when the body cannot regulate blood sugar levels.

CHART 11: WHETHER RECEIVED MEDICATIONS FOR DIABETES/ HYPERTENSION FROM THE MMU



95.9% of the respondents revealed that if diagnosed with diabetes or hypertension, they have received medications from the MMU for the same. The expenditure on medicines is an additional economic burden on the pockets of individuals coming from socio-economic backgrounds. The effectiveness of the project can be understood through the timely diagnosis and treatment of the disease. As per the community healthcare workers, there have been instances in the past where health conditions of patients have deteriorated as these illnesses were ignored at the onset stage and would worsen later.

SOULACE MEMBER INTERACTING WITH HEALTHCARE PROFESSIONAL DR. RAMESH JOSHI

COVID-19 PREVENTION, SCREENING AND TREATMENT

CHART 12: WHETHER THE RESPONDENT OR FAMILY MEMBERS TESTED FOR COVID-19 BY THE MMU

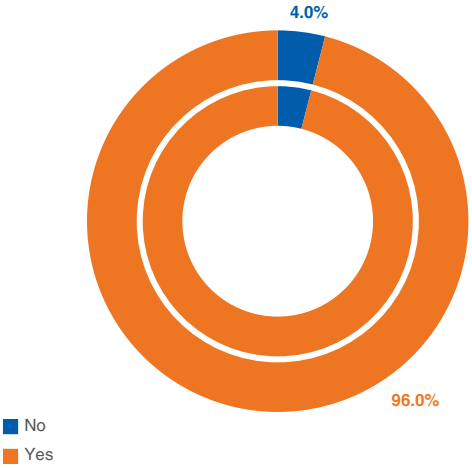


Chart 12 shows that 96.0% of the respondents had been tested for COVID-19 by the MMU. During the pandemic, with the exponential rise in COVID-19 cases, it was really important to screen individuals so as to avoid delay in treatment, if detected positive, and quarantine the patients to contain the spread of the virus.

> The work done by the MMU team during the COVID-19 pandemic is commendable. At a time when nobody was willing to leave their houses, the team would come to our village twice a month to conduct COVID-19 testing and screenings for other illnesses. They also distributed medicines and hygiene kits, which resulted in the overall well-being of the community.
>
> **Padmakar Kunale, Sarpanch, Ekurga village**

CHART 13: WHETHER SUSPECTED/SEVERE COVID-19 CASES FROM FAMILY REFERRED TO THE HOSPITAL BY THE MMU

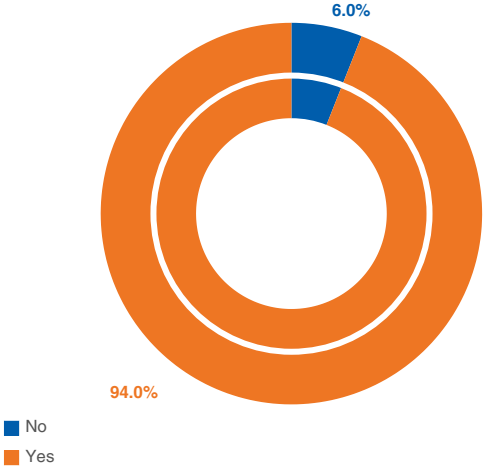


Chart 13 highlights that 94.0% of the respondents' cases were referred to the hospital if there were any suspected COVID-19 patients or severe cases of the disease. As per the interviews with the beneficiaries, the referrals have been really helpful in saving lives, as the virus was known to impact the body at a really fast pace. Quick guidance and an easy process of referral aided them in navigating the treatment process with ease.

CHART 14: WHETHER HYGIENE KITS (MASKS, SOAPS) DISTRIBUTED TO THE RESPONDENTS AND THEIR FAMILY

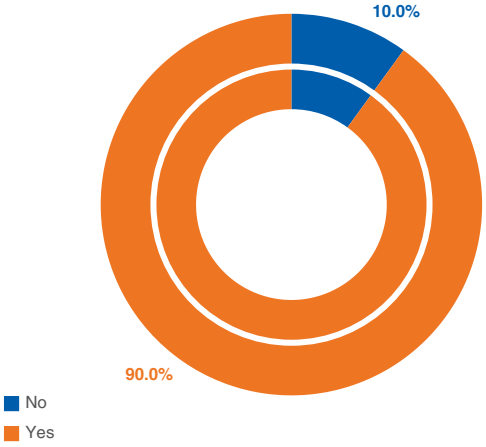


Chart 14 reveals that 90.0% of the respondents received hygiene kits (masks and soaps) through the Mobile Medical Unit. The use of masks and soaps prevented them from getting infected with the virus.

CHART 15: WHETHER ATTRIBUTE THE VACCINATION FOR COVID-19 TO THE AVAILABILITY OF MMU

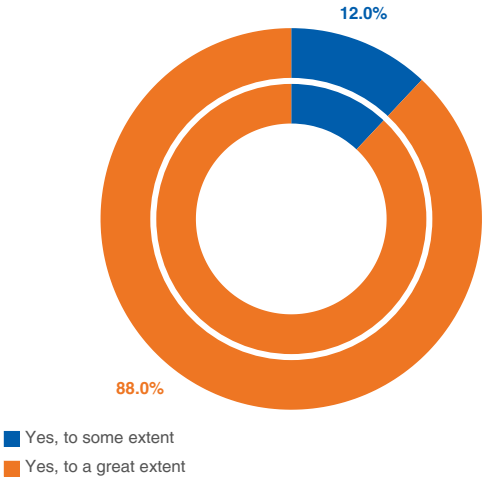
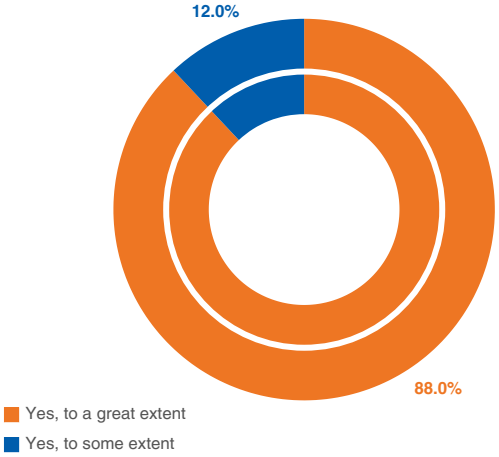


Chart 15 demonstrates that 88.0% of the respondents attribute the availability of the vaccine to the MMU. In the interviews, respondents recollect how the vaccine was a scarce resource, and it would have taken a much longer time for them to avail it, but the presence of the MMU made the vaccine more easily accessible.

> During the pandemic, most of the health-related services were not functional and full service was provided through MMUs to the remote areas of the district. We would visit all the villages, conduct screenings for COVID-19, and distribute hygiene kits. This has saved many lives as they would receive the treatment on time through our referrals if it were detected positive.
>
> **Dr. Yuvraj Popat Hake, Medical Officer**

CHART 16: WHETHER AWARENESS PROGRAMS CONDUCTED BY THE MMU IMPROVED THE UNDERSTANDING OF PREVENTIVE HEALTH PRACTICES (E.G., HANDWASHING, SOCIAL DISTANCING)



In Chart 16, 88.0% of the respondents agreed that awareness programs conducted by the MMU improved the understanding of preventive health practices (e.g., handwashing, social distancing) to a great extent. This reflects the long-term impact created by the intervention with regard to preventive health practices. These practices have provided respondents with scientific methods to safeguard themselves from infectious diseases.

CHART 17: WHETHER THE MMU SERVICES HELPED TO REDUCE THE SEVERITY OF HEALTH ISSUES FOR THE FAMILY DURING THE PANDEMIC

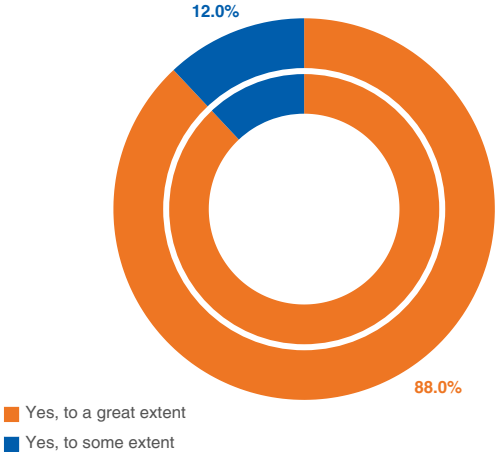


Chart 17 reveals that 88.0% of the respondents agreed that the MMU services helped to reduce the severity of health issues for the family during the pandemic to a great extent. This highlights the effectiveness of the project in achieving its objective of containing the spread of Coronavirus locally.

All the measures, including screening, referrals, and preventive care, have contributed to the successful management of the situation. Interviews with community members reflect the rigorous commitment shown by the PRIDE team to carry out the entire project.

CHART 18: WHETHER ENCOURAGED BY THE MMU STAFF TO ACCESS GOVERNMENT HEALTH SCHEMES (E.G., MATERNITY CARE, FREE AMBULANCE)

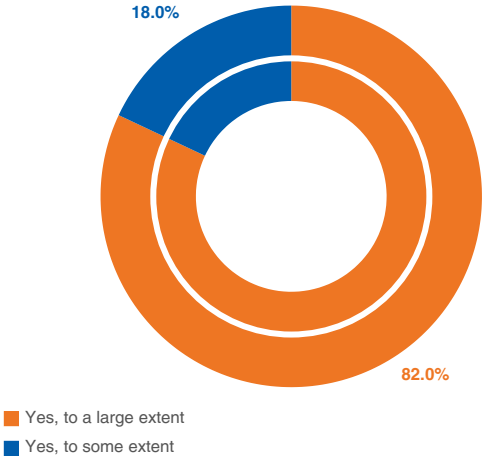
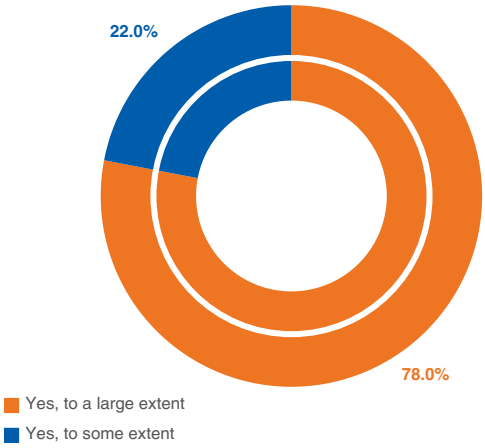


Chart 18 highlights that 82.0% of the respondents agreed that the MMU staff encouraged them to access government health schemes. While the lack of availability of healthcare infrastructure is always a concern, lack of awareness about the existing ones is an equally important challenge. This project raised public consciousness by informing them about the ways of using existing government healthcare support. Alongside helping the community during need, the project also ensured the sustainability of its efforts by raising awareness.

CHART 19: WHETHER THE RESPONDENTS AND THEIR FAMILY MEMBERS STARTED USING LOCAL HEALTH CENTRES MORE FREQUENTLY AFTER RECEIVING MMU SERVICES



As evident in Chart 19, 78.0% of the respondents agreed that they have started using local health centres more frequently after receiving MMU services. This bears testimony to the fact that the sustainability measures taken by the program team have also started showing results as more people have started availing the support of local healthcare infrastructure.

> "The MMU service has been really helpful for our village residents, especially the pregnant mothers, children and the elderly. With its unmatched commitment towards improving maternal and child healthcare, the MMU staff was successful in promoting institutional deliveries and taking care of the overall health of the mother and child. Their families are still very grateful to the staff members and the people who supported this project."
>
> **Sunita Pavshere, Upsarpanch, Nimbala village**

CHART 20: THE EXTENT TO WHICH THE MMU PROGRAM HAS IMPROVED OVERALL HEALTHCARE ACCESS IN THE COMMUNITY

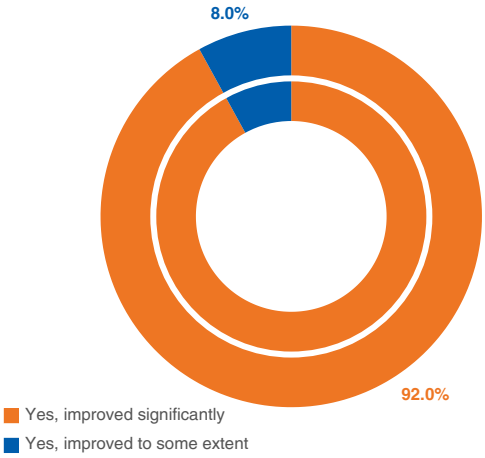


Chart 20 reveals that 92.0% of the respondents feel that the MMU program has significantly improved their access to overall healthcare facilities. All the measures taken to contain the spread of Coronavirus, check non-communicable diseases, provide antenatal and postnatal care as well as raise public awareness about health, have comprehensively resulted in the community's acceptance and appreciation of the intervention.

INTERACTION WITH MMU TEAM

> "The village does not have a primary health centre; one has to travel 20-25 km away from the village. This is very challenging for them, especially the pregnant women and the elderly. The Mobile Medical Unit is like a ray of hope in these villages. It saves them from so much hassle and additional expenditure."
>
> **-Dr. Ramesh Joshi, Healthcare professional**

KEY CHALLENGES AND BARRIERS

Interviews with project implementation team members like Dr. Ramesh Joshi highlight that the team faced multiple operational challenges during their work:

It was difficult to meet the high demand of healthcare services during the pandemic despite making multiple visits to the villages.

Conducting Covid-testing and vaccination drives along with facilitating antenatal and postnatal care to mothers was a huge task due to lack of human and medical resources.

07. SOCIAL IMPACT ON THE BENEFICIARIES

INDIVIDUAL LEVEL

- At the individual level, this project has made a significant impact on pregnant women, children, and the elderly.
- For pregnant women, improved access to ANC and PNC has improved care services which are critical for ensuring a healthy pregnancy and delivery.
- Individualised counselling and support ensured that the pregnant women were empowered with the knowledge needed to take care of themselves and their newborns.
- For others, the project provided timely diagnostic and referral services after the screening for conditions like hypertension and diabetes.
- The project also helped in containing the spread of the virus through testing and referral to hospitals. Early detection and treatment of such cases resulted in saving the lives of these marginalised individuals.

SCHOOL LEVEL

- With better individual health outcomes, the overall well-being of the family also increased.
- Improved maternal healthcare helped primary caregivers in the household. When mothers receive proper prenatal care and antenatal care, it relieves the family from the emotional and financial strain of dealing with complications that could arise from lack of healthcare.
- Institutional deliveries and subsequent immunisation of the babies reduced infant mortality and ensured healthier babies.
- Moreover, for families dealing with chronic health conditions like hypertension and diabetes, treatment through medical mobile units helped reduce the long-term cost of untreated illnesses.
- Proper and timely management of health conditions helped prevent severe health crises, allowing families to avoid loss of income due to illness and maintain a better quality of life.
- Most importantly, with regard to the pandemic, the distribution of hygiene kits and awareness campaigns has helped curb the spread of infection.

COMMUNITY LEVEL

- At the community level, the project has been successful in fostering a culture of awareness related to healthcare.
- Through the initiatives to spread awareness about preventive health measures, it has created a group of conscious hygiene practitioners.
- The project has also made people aware of the existing medical infrastructure and has facilitated linkages to it.
- The project team's regular visits to the villages have helped in the early diagnosis and treatment of various chronic illnesses., This, in turn, has helped develop trust between the community and healthcare providers. This has resulted in more people opening up to medical healthcare instead of using unscientific treatment methods.
- Most importantly, with regard to the pandemic, the distribution of hygiene kits and awareness campaigns has helped curb the spread of infection.
- The project’s promotion of safe delivery practices and the importance of institutional deliveries strengthened community health systems, reducing the risk of maternal and infant mortality.
- The combined impact strengthens the community's health and resilience, making it better equipped to tackle future health challenges.

STATE LEVEL

- By addressing multiple health concerns such as maternal and infant care, chronic illnesses like hypertension and diabetes, and lack of hygienic practices, the project aligns with state health objectives aimed at reducing maternal and infant mortality, controlling non-communicable diseases, and preventing the spread of infectious diseases.
- The integration of technology (M-Mitra services) has enabled efficient tracking and monitoring of pregnant women and infants, ensuring that health interventions are timely and effective. This serves as a scalable model which can be adopted across regions to achieve better health outcomes, especially in remote areas.
- The project has been able to reduce the economic burden of healthcare on the State as it complements the larger healthcare infrastructure and makes room for the limited resources to be utilised in other areas.
- By improving healthcare access in marginalised communities, the project supports broader state-level objectives of reducing health inequities and improving the quality of life for all citizens, particularly those in underserved areas.

NATIONAL LEVEL

- The project has been successful in reducing maternal and infant mortality rates, which is one of the major objectives of the National Health Mission.
- By offering free diagnostic and referral services, chronic disease screenings, and access to maternal and child health services, the project helps in extending healthcare access to vulnerable populations, thus reducing disparities in healthcare delivery. This is in alignment with India's commitment of achieving Universal Health Coverage.
- The project provided hygiene kits and conducted COVID-19 screenings and preventive health awareness campaigns, which helped reduce the spread of the virus in underserved communities. This was a major move in the direction of combatting the pandemic on a national scale.
- The project's screening and referral for hypertension and diabetes among populations over 30 years old contribute to national efforts aimed at the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS).
- By collaborating with government functionaries and aligning the project's objectives with national health missions, the project becomes the perfect example of the role that the private sector can play in supporting national healthcare priorities through public-private partnerships.

CHAPTER 8
RECOMMENDATIONS

EXPANSION OF COVERAGE DONE BY MOBILE MEDICAL UNITS

Given the success of the MMUs in improving healthcare access, more such units can be sent across multiple other locations, which would ensure maximum geographical coverage. This would enhance the health outcomes for many more marginalised communities.

INTRODUCTION OF TELEMEDICINE SERVICES FOR REMOTE CONSULTATIONS

In addition to the care available through the MMUs, a telemedicine platform would allow patients to consult specialists remotely for more complex medical cases. This would save on resources like travel costs, mostly in the case of follow-ups for chronic illnesses.

SCALING UP DIGITAL HEALTH EDUCATION CAMPAIGNS

The M-mitra mobile messaging system has already proven successful in educating pregnant women and new mothers. This service can be expanded to cover a broader range of health topics, such as chronic disease management, child nutrition, personal hygiene, and family planning. This will improve awareness and health literacy across the communities.

9. SUSTAINABILITY

The project implemented by The PRIDE India, with support from Bajaj Auto Limited, has incorporated multiple sustainability measures to ensure long-term impact beyond the project duration. A key sustainability factor is the integration of local health infrastructure. The involvement of ASHA workers and community health animators has helped build strong linkages between the community and existing government healthcare services. This ensures that the population continues to access healthcare facilities even after the project concludes.

Additionally, the use of technology—specifically, the M-Mitra voice messaging service—provides an ongoing mechanism for maternal and neonatal health tracking. Pregnant women and new mothers continue to receive crucial health reminders, which supports long-term behavioral change and adherence to healthcare best practices.

The project has also contributed to capacity building through health awareness initiatives, including preventive healthcare education and access to government schemes. These interventions have empowered communities to proactively manage their health and utilize available resources effectively.

Furthermore, the project's focus on cost-effective service delivery through Mobile Medical Units (MMUs) has demonstrated a scalable and replicable model for improving healthcare access in remote areas. The model's efficiency—serving multiple villages without requiring additional infrastructure—makes it a viable strategy for broader implementation. Finally, the shift in community behavior, such as increased usage of local health centers and preventive healthcare practices, highlights the long-term impact of the project. By fostering self-reliance and improving healthcare awareness, the intervention ensures that the benefits continue well beyond its operational period.

Overall, the project successfully strengthens local healthcare systems, leverages technology for continuity, and promotes sustainable health-seeking behaviors, making it a robust and enduring intervention.

CHAPTER 10
CONCLUSION

The impact assessment study of 'To improve access to health services during COVID-19 through Mobile Medical units (MMU) in underserved villages', a CSR project implemented by The PRIDE India, through the support of Bajaj Auto Limited., is a crucial piece of evidence about the impactful work done in the field of healthcare access. It gives a comprehensive understanding of the activities and approaches utilised to achieve the goal of improving healthcare access among marginalised communities of rural India. Through its successful implementation, the project has been able to improve maternal health, reduce infant mortality and ensure the overall well-being of the newborns. It has also been able to contain the spread of virus infection during the pandemic through preventive measures and rigorous screening for cases. For individuals suffering from chronic illness, it has helped reduce out-of-pocket expenditure by providing early diagnosis and treatment. At the community level, it has built trust and transformed the manner in which the community interacts with the existing healthcare infrastructure. This report captures all these aspects of the project through a rigorous attempt at various data collection methods and a subsequent data analysis. It is, therefore, a pivotal step towards understanding the overall transformation journey of such marginalised communities.

IMPACT ASSESSMENT REPORT

BAJAJ WATER CONSERVATION PROJECT (BWCP)

Implementing partner – Shramjivi Janata Sahayyak Mandal

Release Date: 31-12-2024

SoulAce
Path to Sustainability
SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
CSR	Financial Year
NGO	Non-Governmental Organisation
SDGs	Sustainable Development Goals
SJSM	Shramjivi Janata Sahayyak Mandal
SHG	Self-Help Groups
VDC	Village Development Committee
WUG	Water User Group

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

In collaboration with Bajaj Auto Limited, Shramjivi Janata Sahayyak Mandal initiated the 'Bajaj Water Conservation Project' to address the severe water crisis in the district of Satara, Maharashtra. Before the project implementation, the area had received only 225 to 450 mm of rainfall in the last decade. With agriculture being the only source of livelihood, low rainfalls wreaked havoc on the economic stability of marginalised households and pushed people to leave their homes and migrate to urban areas in search of jobs. To address this concern, the project was set in place at four villages covering an area of 5396 hectares with a population of 6251. Alongside the problem of water scarcity, the major problems of these villages were degraded land patches, deforestation, low production of crops and productivity of land, scarcity of fodder and improper agricultural practices. Therefore, an integrated watershed development program was implemented that sought to mitigate the larger concerns of the people and help improve their quality of life. The project has been successful in creating the desired impact and has enriched the lives of the beneficiaries.

PROJECT DETAILS

Implementation year

FY 2017 - FY 2021

Assessment year

FY 2024 - FY 2025

Implementing Partner

Sharmjivi Janata Sahayak Mandal

Project location

Satara District, Maharashtra

Beneficiaries

6251 Marginalized Rural Communities from four Villages [Paryanti, Bhataki, Khadaki, Hawaldarwadi] from Man Taluka

Budget

₹850 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

AWARENESS GENERATION

- VDC formation
- Entry Point Activity
- Formation of SHGs
- User Group Formation
- Exposure Visits to Model projects for selected VDC members and Opinion leaders
- Provide Seed capital for SHG entrepreneurs

CAPACITY BUILDING

- Training to VDC Members and Opinion leaders
- Training to Women Group/ SHGs
- User Group Training

AGRICULTURAL DEVELOPMENT

- Horticultural Plantation
- Micro-Irrigation
- Vermicompost & Biodynamic compost unit
- Azolla Preparation
- Hydroponic Unit Formation
- Farmer's Training/Workshops
- Agricultural Field Days
- Promotion of Kitchen Garden
- Livestock Animal Health Check-up camps

LIVELIHOOD

- Goat rearing

BWC WATERSHED STRUCTURES

AREA TREATMENT

- Staggered Contour Trenches
- Loose Boulder Structures
- Gully Plugs
- Gabion Structures
- Water Absorption Trenches
- Forestry Plantation

LAND DEVELOPMENT

- Earthen Farm Bunding (by Mechanical Means)
- Earthen Farm Bunding (Manually)

DRAINAGE LINE TREATMENT

- Cement Nala Bund with RCC work
- Earthen Nala Bandh
- Recharge Shaft
- Nala Deepening & Widening
- Desilting of old Earthen Nala Bandh
- Renovation & Restoration of Earthen Nala Bandh

Key Findings

28.1%
of the respondents belonged to the age group of 31-40 years while 27.7% of them were between 41-50 years.

43.8%
of the respondents had a family of 6 members while 23.4% of them had 5 members. 11.7% of them reported having 7 members in their household.

59.8%
of the respondents earned an annual family income of less than a lakh, while 38.7% of them earned between Rs.1.1 lakhs and 2 lakhs, highlighting the limited economic resources possessed by the respondents.

50.0%
of the respondents owned 1 to 2 hectares of land, while 14.1% of them owned 2 to 3 hectares. 9.4% of them owned less than 1 hectare, which shows that the respondents were small-scale farmers.

85.2%
of the respondents would manually irrigate their farmlands while 28.9% of them would use drip irrigation methods.

98.8%
confirmed Nala deepening and widening activities being carried out in their area, followed by 98% who reported about the construction of Gabion and 95.3% who witnessed the construction of a staggered contour trench.

Key Impacts

23.4%
of the respondents practiced micro irrigation after the CSR intervention, whereas, it was only 23.4% before the intervention.

76.6%
of the respondents mentioned that they could save 20% of water usage for irrigation through the micro-irrigation methods. 22% of them also mentioned saving 20 to 30%, demonstrating that the project has been able to effectively reduce water wastage.

0.25 - 0.50
hectares of land have been made cultivable due to increased water availability for irrigation after the project intervention as reported by 37.9% of the respondents. For 35.9% of them, this area went up to more than 0.75 hectares while for 15.6% of them, it was an increase of less than 0.25 hectares.

82.4%
of the respondents reported an increase of over 20% in the yield of Kharif crops after the project implementation, followed by 11.7% of them who reported a 15-19% increase.

39.8%
of the respondents, observed an increased yield of over 20% in Rabi crops, followed by a 10-14% increase reported by 32% of them. 20.7% of the respondents witnessed a 15-19% increase in their yield. Increased yield has led to increase income and provided economic stability to the households.

39.8%
of the respondents witnessed a 25-30% increase in their annual agricultural income, while 31.3% of them experienced a 20-25% increase. A 15 to 20% increase was reported by 15.2% of the respondents, while a 10-15% increase was seen by 9.8% of them.

99.2%
of the respondents follow the water governance protocols and surveillance mechanisms established by the Community institutions.

03. OECD FRAMEWORK

RELEVANCE

The project's aim of addressing the water crisis in the drought-prone district of Satara is highly relevant to the local needs of the people. The project, through its multiple activities, seeks to work on not just the issue of water conservation but also on the livelihood concerns of the marginalised communities.

COHERENCE

The intervention is well aligned with the foloowing SDG goals:

The program also aligns with Government of India programs like:

- Pradhan Mantri Krishi Sinchai Yojana (PMKSY)
- National Rural Livelihoods Mission (NRLM)

EFFECTIVENESS

The project successfully increased groundwater levels, enhancing water availability. Micro-irrigation methods boosted farmers' yields and incomes, while constructing water conservation structures created local jobs. Additionally, villages now rely on tankers for only four months instead of over six, moving closer to tanker-independence for drinking water.

EFFICIENCY

The use of CCT, WAT, Gabion structures, and community activities like organic farming training demonstrates efficient resource use. By promoting cost-effective organic methods, the project reduced reliance on chemical fertilizers, cutting costs and maximizing returns. Integrating conservation techniques further enhanced the project's impact.

IMPACT

The project has been able to create a multidimensional impact on the lives of marginalised communities. On an individual and family level, it has increased the economic stability and food security of farmers by enhancing crop yield. On a community level, it has increased the production of crops, given employment to local people and reduced migration among communities. It has also provided the benefits of water conservation and reduced soil erosion.

SUSTAINABILITY

The project built water conservation structures for a sustainable water supply and trained village committees to maintain them post-completion. The team remains accessible for major assistance. Water-conscious practices like micro-irrigation have reduced water wastage, promoting long-term efficient water management.

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

CHAPTER 4
INTRODUCTION

Fruit and Vegetable Cultivation

NEED OF THE PROGRAM

Water scarcity is one of the most critical issues faced by the district of Satara, Maharashtra. Frequent water shortages due to erratic rainfall negatively impacts all the facets of human and animal existence including agricultural activities, drinking water availability and water for consumption by livestock. As agriculture is mostly dependent on rainfall, dry spells affect crop produce and food security for the local population. Groundwater levels are also strained by heavy agricultural dependence, with some areas depleting faster than they can recharge.

Moreover, the loss of livelihood due to failed crops and a lack of alternate income-generating sources further creates marginalisation. These poor farmers are forced to migrate to cities in search of jobs and take up low-paying, unskilled work. In the villages, the cost of getting water tankers also adds a significant financial burden on the households. Thus, this water conservation project by Bajaj Auto Limited addressed the water crisis issue and increased the income levels of the rural communities through enhanced agricultural productivity.

OBJECTIVES OF THE PROGRAM

To decrease soil erosion of the selected watershed area by introducing soil conservation treatments like CCT, WAT, loose boulder structures & gully plugs etc.

To increase the flora and fauna of the Paryanti watershed area by 29,101 tree plantations within four years and motivate farmers to plant 4000 trees every year thereafter.

To make the village free from tanker-fed supply of drinking water. Increase the water table of the area through soil and water conservation treatments like CCT, WAT, Gabion structures, ENB, CNB, repair, renovation & restoration of percolation tank and Nalla widening and deepening, etc.

Increase the crop yields by 50% over 4 years.

To ensure the food security of the target group through a sustainable farm production system.

To stop at least 50% of present migration by ensuring improvement in the livelihood support system, facilitated through the imparting of knowledge, skills, and adoption of alternate income generation activities.

To ensure the food security of the target group through a sustainable farm production system.

Train farmers to prepare organic fertilisers, organic fungicides, and pesticides. It will decrease the dependency on chemicals as well as decrease the cost of cultivation

To set up models of land-based livelihood security that could be replicated in the region.

Equip the target group to conserve, develop and manage their life-supporting activities and resources developed under the project.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – SHRAMJIVI JANATA SAHAYYAK MANDAL

Founded in 1980 by a group of local tribal youth of Satara district, Shramjivi Janata Sahayyak Mandal (SJSM) is a grassroots organisation committed to the socio-economic empowerment of marginalised communities in rural areas of India. Established with a mission to uplift and support the disadvantaged population, SJSM focuses on a holistic approach to development, addressing various community needs like education, healthcare, sustainable livelihood, and social inclusion. From its inception, it has worked to promote self-reliant community development organisations through a process of forming people's organisations. In this regard, it has promoted multiple people's institutions, especially cooperatives with membership strengths of 27,540 families from nomadic and primitive tribes in the state.

SJSM's community-centric approach has built trust and encouraged collaboration among local stakeholders, government agencies, and private sector partners, thereby enhancing the impact of its initiatives. Through its continuous commitment, the organisation strives to work toward a more inclusive and equitable society, addressing systemic barriers and enabling empowered communities.

FIELD VISIT STAKEHOLDER INTERACTION

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited had appointed SoulAce to conduct a study on the project implemented by SJSM and assess the impact of its CSR initiative in fostering water conservation in the rural areas of Satara, Maharashtra.

OBJECTIVES OF THE STUDY

To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.

To measure the extent to which the project has been able to develop long-term water solutions in drought-prone areas while simultaneously enhancing livelihood options for vulnerable population.

To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders, such as community members, local Panchayat members, village development committees, user groups, Self-help groups and project staff, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- the farmers, yielding statistical insights and identifying trends. By employing a mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries, stakeholders, and those responsible for project implementation. Engaging stakeholders like local Panchayat members, village development committees, water user groups, Self-help groups, and project staff through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of the improvements in the availability of water and sustainable water usage brought about by the project. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques are employed to evaluate the project and its impacts objectively through data analysis. Surveys and questionnaires are utilised to collect numerical data on various indicators from the beneficiaries. By comparing the data gathered before and after the intervention, the project and its effects and the enhancements it has facilitated can be assessed. These quantitative methods provide a measurable approach to gauge the project and outcomes and evaluate its success through statistical evidence.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including interviews with beneficiaries, field notes, interactions with other stakeholders, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact. Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method. Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

DESIGN SNAPSHOT

Name of the project

Bajaj Water Conservation Project

Implementing agency

Shramjivi Janata Sahayyak Mandal

Research design used

Descriptive research design

Sampling technique

Random Stratified sampling

Sample size

256 beneficiaries

Qualitative method used

Semi-structured interviews, testimonials and focus group discussions with beneficiaries along with key stakeholders.

KEY STAKEHOLDERS

- Community Members
- Local Panchayat members
- Village Development Committees
- User Groups
- Self Help Groups
- Project Implementation team

STUDY TOOLS

Questionnaires for primary beneficiaries:
Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys.

Questionnaires and focus group discussion guide for stakeholders:
A semi-structured questionnaire and focus group discussion guide were developed for each type of sample of this group. Stakeholders were identified across the focus areas. Semi-structured questionnaires and focus group discussions were conducted with local Panchayat members, village development committee members, user groups, self-help group members and project staff.

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. With strict adherence to ethical research principles, the study ensured the safeguarding of participants' rights and well-being throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of influence or obligation, reinforcing the principles of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

CHAPTER 6
KEY STUDY FINDINGS AND IMPACTS

The chapter explores the collaboration between Bajaj Auto Limited and SJSM directed towards introducing integrated watershed development program in drought-prone rural areas.

GEOGRAPHICAL COVERAGE

The intervention was implemented in 04 villages [Paryanti, Bhataki, Khadaki, Hawaldarwadi] from Man Taluka of Satara District, Maharashtra, India.

OUTREACH AND INCLUSIVITY

The primary beneficiaries of the program were mostly farmers from rural communities.

KEY FINDINGS

CHART 1: AGE-WISE DISTRIBUTION OF THE RESPONDENTS

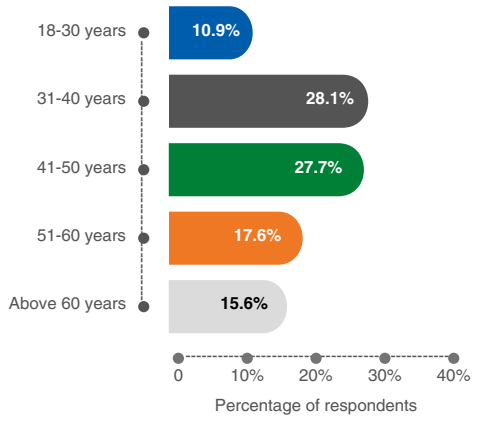


Chart 1 shows that 28.1% of the respondents belonged to the age group of 31-40 years while 27.7% of them were between 41-50 years. 15.6% of them were senior citizens above 60 years of age.

CHART 2: NUMBER OF FAMILY MEMBERS IN THE HOUSEHOLD

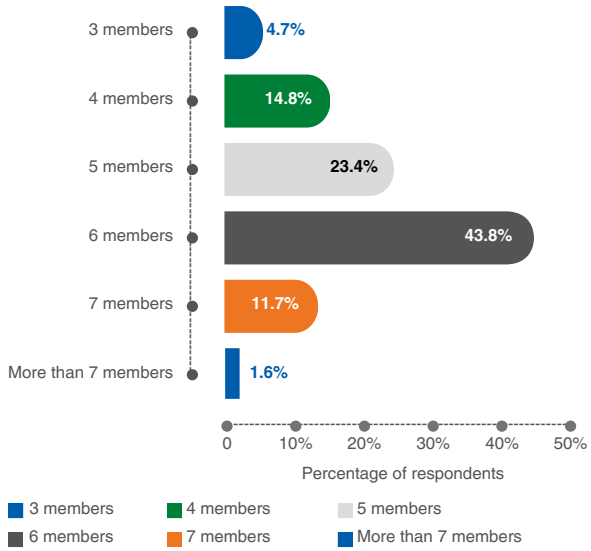


Chart 2 reveals that 43.8% of the respondents had a family of 6 members while 23.4% of them had 5 members. 11.7% of them reported having 7 members in their household.

BWC BENEFICIARY - FRUIT CULTIVATION

CHART 3: ANNUAL FAMILY INCOME OF THE RESPONDENTS

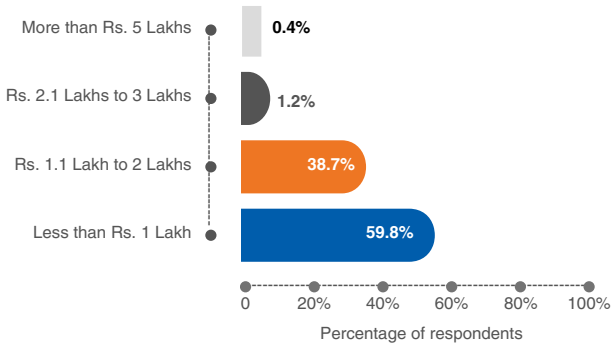


Chart 3 reveals that 59.8% of the respondents earned an annual family income of less than a lakh while 38.7% of them earned between Rs.1.1 lakhs and 2 lakhs. Only 1.2% of them earned between Rs. 2.1 to 3. With a meagre annual family income and big family size, the respondents were in dire need of a major source of sustainable livelihood.

CHART 4: AREA OF LAND OWNED

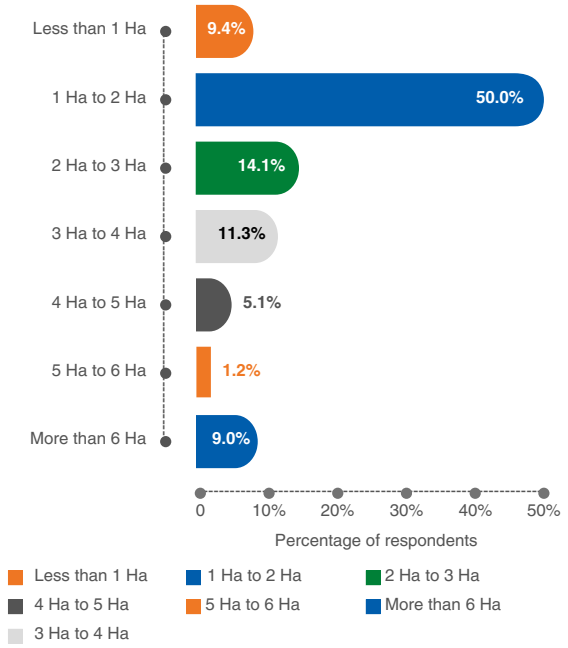


Chart 4 shows that 50% of the respondents owned 1 to 2 hectares of land while 14.1% of them owned 2 to 3 hectares. 9.4% of them owned less than 1 hectare. This highlights that while agriculture was their sole source of income, most of the respondents had small-scale farms and scarce resources which limited their income generation capacity.

CHART 5: MAJOR CROP CULTIVATED

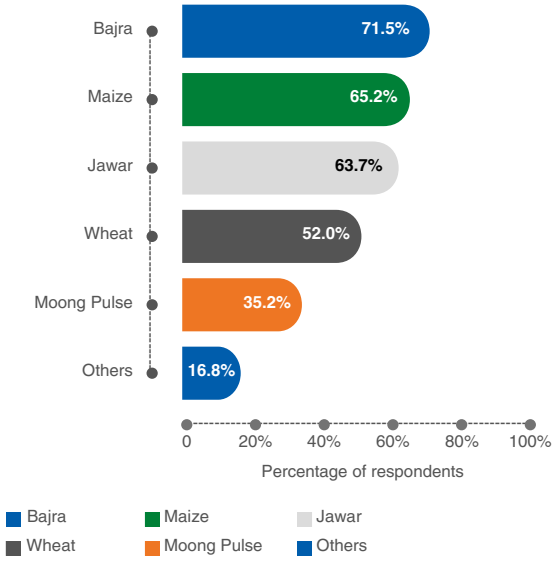


Chart 5 demonstrates that 71.5% of the respondents cultivated Bajra, followed by 65.2% of them who grew maize. Jowar and wheat were cultivated by 63.7% and 52% of respondents, respectively. Jowar and Bajra do not require much water and are usually grown in drought-prone areas.

> "I have a small farm where I grow jowar and bajra. I also have some pomegranate trees. I attended the User Group training organised by SJSM and learnt new cropping techniques. It has significantly helped me in my cultivation and increased production. I am really grateful."
>
> **- Sangram Anna Tupe, Community Member Khadki**

CHART 6: FRUITS CULTIVATED

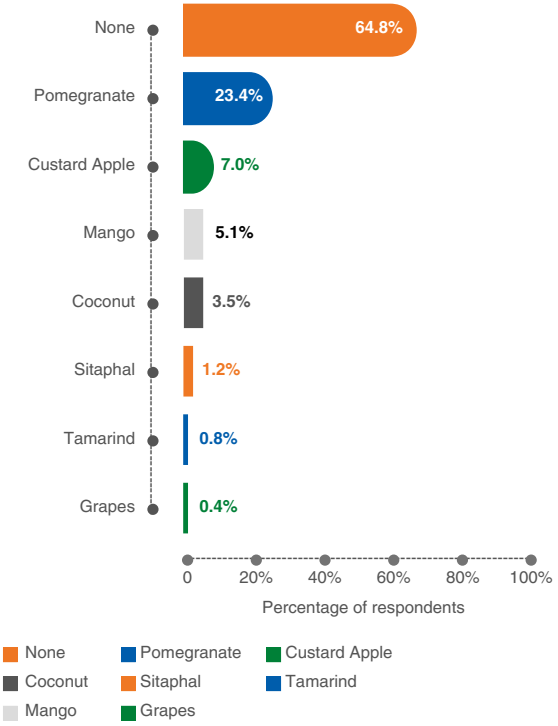


Chart 6 shows that 64.8% of the respondents did not grow any fruits on their farmland. 23.4% of them grew pomegranate and 7% of them grew custard apple. As evident through qualitative interviews, a lot of the respondents could not cultivate fruits due to the scarcity of water and financial resources.

CHART 7: VEGETABLES CULTIVATED

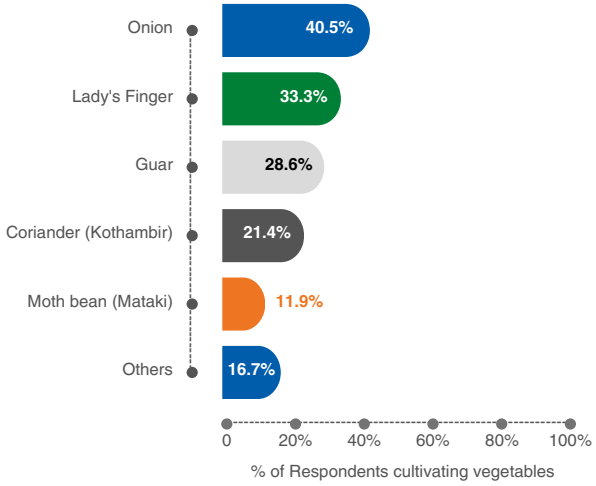


Chart 7 shows that 40.5% of the respondents grow onions on their farmland, followed by 33.3% who grow lady's fingers, and 28.6% who grow guar (cluster beans).

CHART 8: PRIMARY METHOD OF IRRIGATION

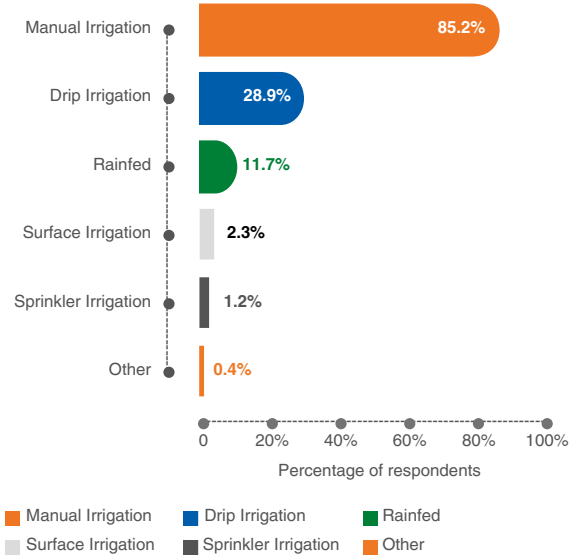


Chart 8 demonstrates that 85.2% of the respondents would manually irrigate their farmlands, while 28.9% of them would use the drip irrigation method. 11.7% of them would practise rainfed irrigation. The water for most of the irrigation methods would come through wells/borewells, with very little water coming from rivers or ponds. This qualitative finding reflects the need for a water conservation project in the area, which would help increase groundwater levels.

> "Training by SJSM was conducted to help us understand the importance of maintaining these water structures. We feel more capable after the training and actively participate in the management of these resources. We have assured that we will undertake crop management in our village alongside the preparation of a water budget and a water distribution system. Due to the project, the problem of soil erosion has decreased while the groundwater level has increased in the area."
>
> **- Ankush Manohar Shirke, VDC President, Bhatki**

CHART 9: TYPE OF WATER RESOURCE DEVELOPMENT ACTIVITY CARRIED OUT IN THE COMMUNITY

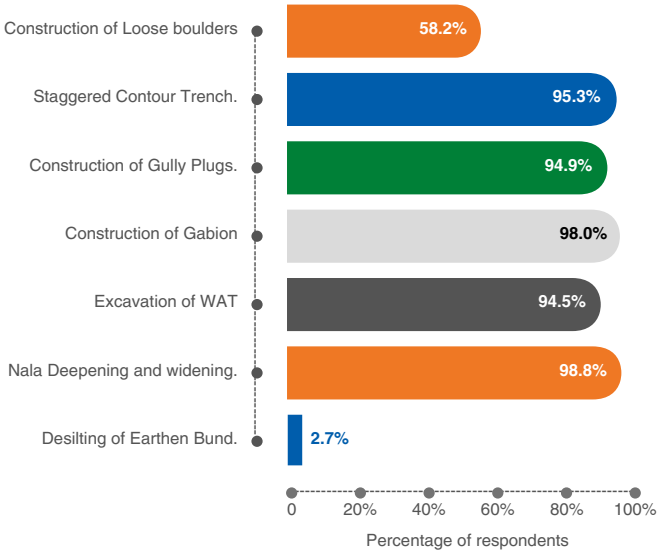


Chart 9 reveals that 98.8% confirmed Nala deepening and widening activities being carried out in their area, followed by 98% who reported about the construction of Gabion and 95.3% who witnessed the construction of a staggered contour trench. Construction of gully plugs was confirmed by 94.9% of them, along with excavation of WAT in 94.5% cases and construction of loose boulders being reported by 58.2% of them.

Participants in the Focus Group Discussions mentioned that alongside these activities, training on the technical aspects of these water structures ("Matah to Paytha") and resource management was also conducted. These trainings were focused on water recharge, budgeting, and agricultural land development, which improved their capacity for planning and implementing water projects. It also gave them guidance in cultivation planning and water distribution management.

CHART 10: WHETHER PRACTISING MICRO-IRRIGATION

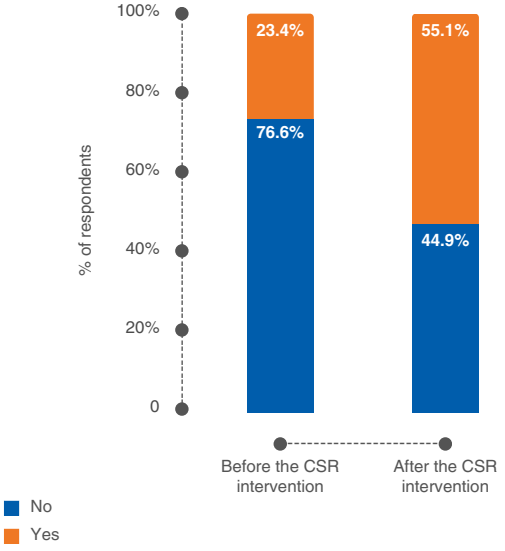
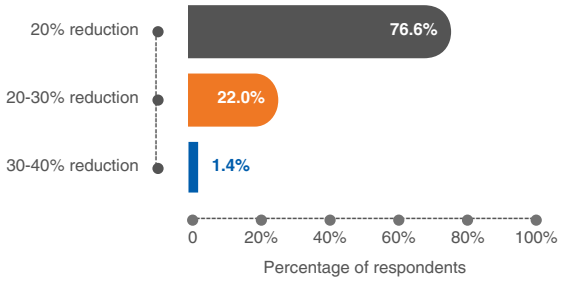


Chart 10 shows that only 23.4% of the respondents practised micro irrigation before the CSR intervention but the percentage increased to 55.1% post the intervention, showcasing the behavioural change impact of the project's agricultural training component.

CHART 11: PERCENTAGE OF REDUCTION IN WATER USAGE FOLLOWING MICRO-IRRIGATION



In Chart 11, 76.6% of the respondents mentioned that they could save 20% of water usage for irrigation through the micro-irrigation methods. 22% of them also mentioned saving 20 to 30%, demonstrating the project outcome of saving water. The water thus saved was used for other purposes ranging from domestic usage to use for livestock.

"Before the project, I faced many challenges on the field, including water scarcity and low crop yields. With the support of the SJSM initiative, my farm now receives more consistent irrigation, and my Bajra crops are doing better. The drip irrigation system has helped reduce water usage by 20%, and my farm's resilience during dry spells has improved. I'm thankful for the assistance."

- Dhanaji Rajaram Shirke from Bhataki

CHART 12: ADDITIONAL LAND AREA THAT HAS BEEN MADE CULTIVABLE DUE TO INCREASED WATER AVAILABILITY FOR IRRIGATION AFTER THE PROJECT INTERVENTION

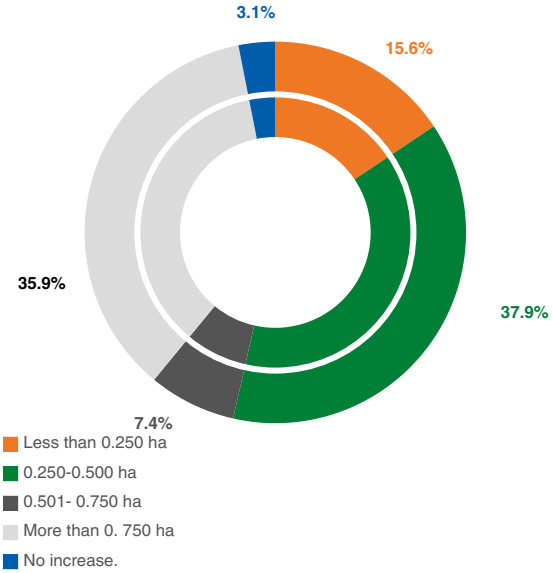


Chart 12 highlights that 0.25 to 0.50 hectares of additional land have been made cultivable due to increased water availability for irrigation after the project intervention, as reported by 37.9% of the respondents. For 35.9% of them, this area went up to more than 0.75 hectares, while for 15.6% of them, it was an increase of less than 0.25 hectares. This reveals that the project has been able to successfully increase agricultural land through its initiative. As more land is brought under cultivation, the production of the crop also increases.

CHART 13: PERCENTAGE INCREASE IN THE YIELD OF KHARIF CROPS FOLLOWING THE CSR INTERVENTION

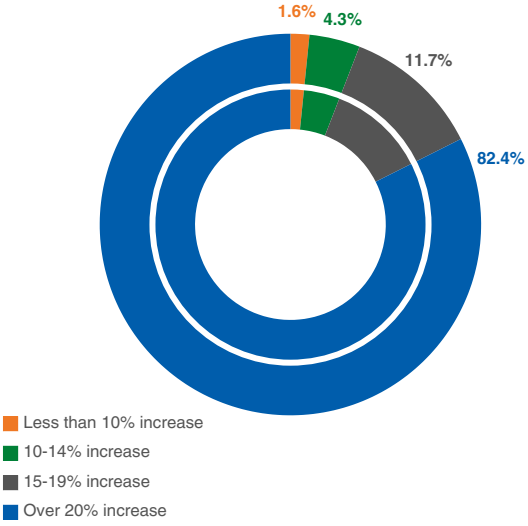


Chart 13 shows that 82.4% of the respondents reported an increase of over 20% in the yield of Kharif crops after the project implementation, followed by 11.7% of them who reported a 15-19% increase.

CHART 14: PERCENTAGE INCREASE IN THE YIELD OF RABI CROPS FOLLOWING THE CSR INTERVENTION

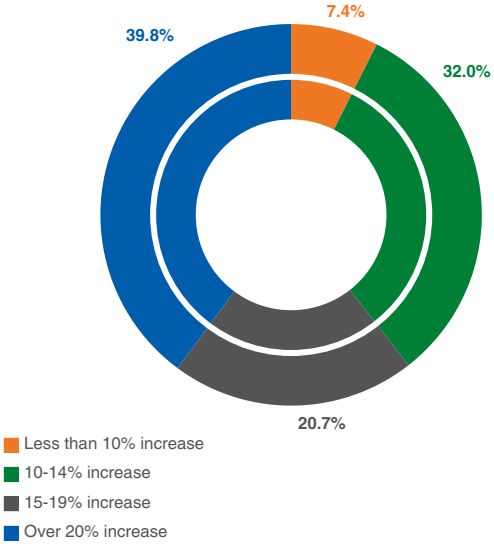


Chart 14 shows that for 39.8% of the respondents, there was an increased yield of over 20% in Rabi crops, followed by a 10-14% increase reported by 32% of them. 20.7% of the respondents witnessed 15-19% increase in their yield. This showcases the project's success in increasing the productivity of the area and enhancing agricultural quality.

CASE STUDY 1

Lalaso Rajaram Shirke, a 40-year-old farmer from Bhatki, struggled with chronic water scarcity and relied on external water sources for irrigation. With five family members and an annual income of less than 1 lakh rupees, he recognised the urgent need for a sustainable solution. The project facilitated the construction of gabions and implemented Nala deepening techniques in his area. Additionally, community-driven water governance was established to maintain the new resources. As a result of these efforts, Lalaso observed a significant improvement in crop resilience and reduced dependency on water tankers. His annual income increased from 100,000 to 125,000 rupees, highlighting the effectiveness of multidimensional water management strategies and the power of community-led agricultural interventions in fostering long-term sustainability.

During the interviews, farmers like Lalaso highlighted that the project had substantially contributed to the increase in their agricultural produce and had positively impacted the quality of their crops.

CHART 15: PERCENTAGE INCREASE IN THE ANNUAL AGRICULTURAL INCOME FOLLOWING THE CSR INTERVENTION

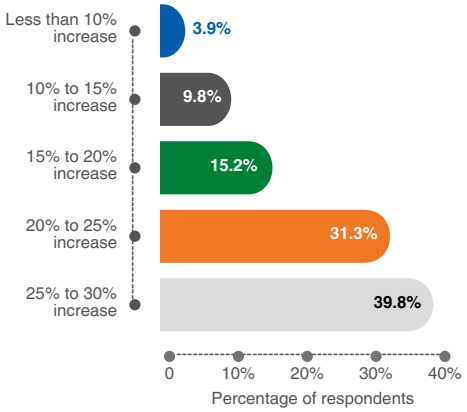


Chart 15 shows that 39.8% of the respondents witnessed a 25-30% increase in their annual agricultural income post the CSR intervention, while 31.3% of them experienced a 20-25% increase. A 15 to 20% increase was reported by 15.2% of the respondents, while a 10-15% increase was seen by 9.8% of them. As informed by participants like Ramesh Hariba Pawar and Hambiraw Rajaram Shirke in the qualitative interviews, this change was possible largely through the water conservation efforts undertaken by the project. This signifies that the project has been able to achieve its goal of livelihood promotion by increasing income levels.

> "The project has significantly impacted my family. We used to rely heavily on rainfed farming, but now, with water resource development activities, our crops are healthier and more productive. The drip irrigation method has reduced water usage by 20% and increased our crop yield by over 20%."
>
> **- Ramesh Hariba Pawar, Bhataki Man**

> "The project has made a positive difference in my farming practices. The construction of gully plugs has ensured that my farm receives better irrigation, even during dry spells. With drip irrigation, water usage has been reduced by 20%, and my Bajra crops are more resilient. My annual income has increased from 100,000 to 150,000 rupees, and I appreciate the project's support."
>
> **- Hambiraw Rajaram Shirke**

CHART 16: NO. OF MONTHS IN A YEAR, THE RESPONDENTS EXPERIENCED SCARCITY OF DRINKING WATER BEFORE THE INTERVENTION

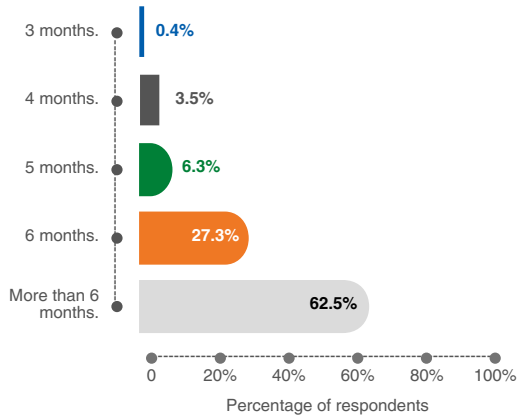


Chart 16 reveals that 62.5% of the respondents were experiencing scarcity of drinking water for more than 6 months before the intervention. 27.3% of them experienced it for six months while 6.3% of them witnessed it for 5 months in a year.

WATER CONSERVATION SITE

CHART 17: NO. OF MONTHS IN A YEAR, THE RESPONDENTS ARE EXPERIENCING SCARCITY OF DRINKING WATER AFTER THE INTERVENTION

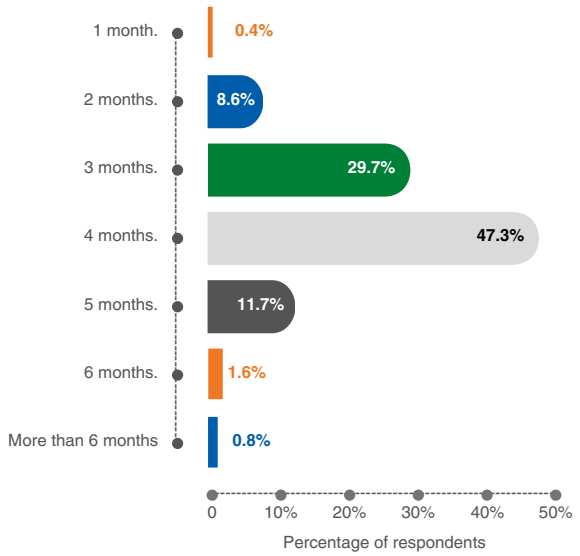


Chart 17 shows the scarcity of water experienced post the intervention. 47.3% of the respondents reported that they have experienced it only for four months now, followed by 29.7% reporting the number to be three months and 11.7% mentioning a 5-month period of scarcity. Before the intervention, 62.5% of the respondents faced water scarcity for more than six months, while post-intervention, only 0.8% of them experienced it. This shows a significant reduction in water scarcity and highlights the effectiveness of the program in addressing the water crisis alongside reducing the financial burden of buying water tankers.

> "The issue of water availability has significantly reduced in the village. Earlier, one could hear every woman of the village being worried about managing the water for domestic use, our livestock would remain thirsty all day. We had to get so many water tankers, but the issue has now been resolved. We get sufficient water."
>
> **- Subhadra Navnath Sawant, Hawaldarwadi**

CHART 18: NO. OF MONTHS IN A YEAR, THE RESPONDENTS EXPERIENCED SCARCITY OF WATER FOR IRRIGATION PURPOSES BEFORE THE INTERVENTION

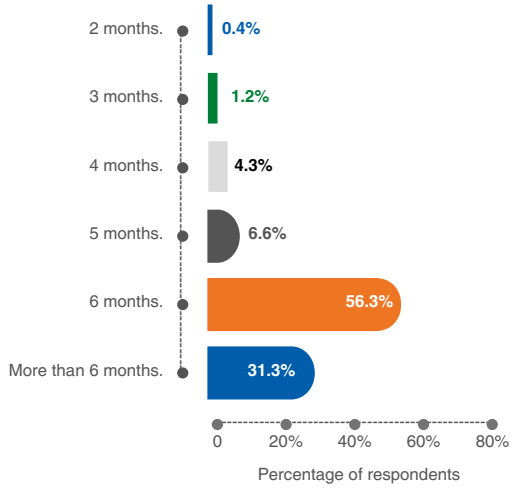


Chart 18 shows that 56.3% of the respondents experienced scarcity of water for six months in a year for irrigation purposes before the intervention, while for 31.3% of them, it was for more than six months.

CHART 19: NO. OF MONTHS IN A YEAR, THE RESPONDENTS EXPERIENCED SCARCITY OF WATER FOR IRRIGATION PURPOSES AFTER THE INTERVENTION

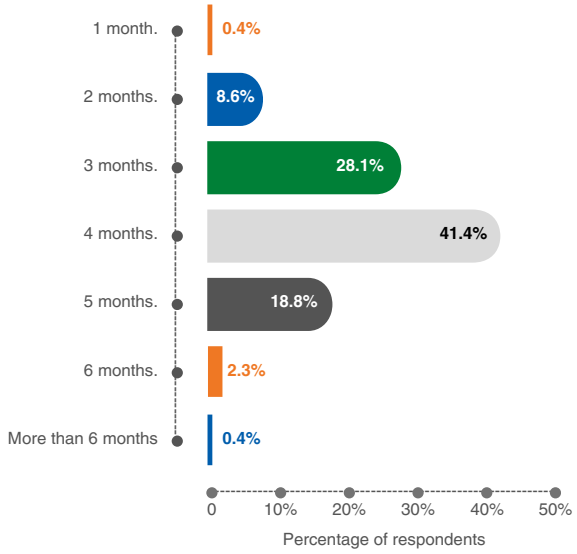
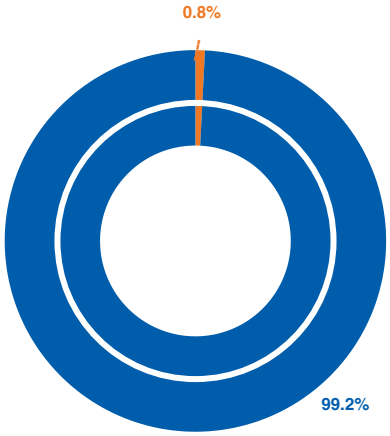


Chart 19 reveals that post the intervention, 41.4% of the respondents witnessed water scarcity for only four months in a year for irrigation purposes, followed by 18.8% who experienced it for 5 months and only 0.4% witnessed it for more than 6 months. A significant shift in the water scarcity for irrigation was also witnessed, as 31.3% of the respondents faced the scarcity for more than six months pre-intervention, but only 0.4% of them faced it in the post-intervention time frame. This further highlights that the project has been able to achieve its objective.

CHART 20: WHETHER FOLLOWING THE WATER GOVERNANCE PROTOCOLS AND SURVEILLANCE MECHANISMS ESTABLISHED BY THE COMMUNITY INSTITUTIONS



No
Yes

Chart 20 highlights that 99.2% of the respondents follow the water governance protocols and surveillance mechanisms established by the Community institutions. Focus Group Discussion with the Village Development Committee of Bhataki highlights that they were involved in the program from the initial stage and still continue to engage themselves in the maintenance and monitoring of these water structures. These structures are maintained through community contributions and 'shramdaan' (voluntary contribution of labour towards community welfare). They also mentioned that this participatory approach enhances accountability and helps in the timely resolution of issues related to monitoring. The members also underscored that this initiative helped the village win a cash prize of Rs. 5 lakhs in the Pani Foundation competition.

"Joining the Self-Help Group has transformed my life and my family's future. Before, I struggled to manage our household expenses and relied on seasonal work with little stability. Through the SHG, I learned about saving and even accessed small loans. My confidence has grown, and I feel empowered. The SHG has given me hope and the tools to build a better future."

- Sanjeevani Vishwas Salunkhe, Palaspimpri Self-Help Group

SOULACE TEAM INTERACTION WITH BENEFICIARY

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Individual farmers experience improved income stability as the agricultural yield for both Rabi and Kharif crops has now increased by over 20% for most of them.
- The training provided to them has also reduced their dependency on chemical fertilisers, resulting in reduced input costs.
- By providing training in sustainable agricultural practices, water conservation and soil management, the program has played a major role in building the capacity of these individuals and reducing dependency on external resources.
- Increased crop yields also ensure food security and better nutrition for the individual, enhancing their overall health.

FAMILY LEVEL

- Increased Economic Security is a major outcome of this project as higher crop production results in increased income. This additional income is utilised to fulfil other needs of the household, resulting in their long-term well-being.
- With reduced dependency on water tankers from over six months in a year to just four months in a year, the project has ensured the supply of clean drinking water to families and cut down their additional financial burden. Families experience an improved quality of life and reduction in health issues due to increased water accessibility.
- As the project provided job opportunities to local people during the implementation phase as well as trained them in sustainable agriculture practices alongside increase in income, the project has managed to reduce migration to urban areas and provided stability to families.

COMMUNITY LEVEL

- The project has played a huge role in environmental restoration of the area through the creation of water conservation structures.
- The formation of water user committees and community-driven maintenance initiatives fosters shared responsibility and self-management. The communities can now effectively manage their resources collectively, strengthening local government.

NATIONAL LEVEL

- The project has contributed to national-level goals of sustainable agriculture by reducing dependency on water and chemical inputs and aligning with the objectives for water conservation and food security.
- Sustainable agricultural practices and increased supply of water reduce environmental contamination risks, supporting National-level public health objectives by mitigating waterborne illnesses and exposure to harmful pesticides.

CHAPTER 8
HYDROLOGICAL ASSESSMENT

OBJECTIVES OF THE ASSESSMENT

Change in surface water holding capacity and reduction in Run-off.

Change/improvement of Groundwater table/recharge.

Change in land use pattern, agricultural productivity, and soil moisture conditions.

PROJECT LOCATIONS

The project was implemented in the Man Taluka of Satara district. The measures that were implemented as a part of the water conservation efforts can broadly be categorised into construction and repair of Water Harvesting Structures (WHS), measures for Soil Moisture Conditions (SMC) improvement, and promoting water use efficiency. The details of the same are as below:

TABLE 1: DETAILS OF THE INTERVENTIONS

	District	Satara		Block	Man		Area of Watershed	72.29016
Structure	NDW	CWG	Gully Plugs	LBS	Water Absorption Trenches	SCT	Farm Bund	ENB
Nos.	18	12		28		14	10	22
Capacity	401203.30	1964.16	96.30	10111.50	7752.00	349843.20	7225.00	182228.48

The maps below give the location of the intervention watershed in the Satara district of Maharashtra and all the available locations of the various interventions across the intervention watersheds as a part of this project.

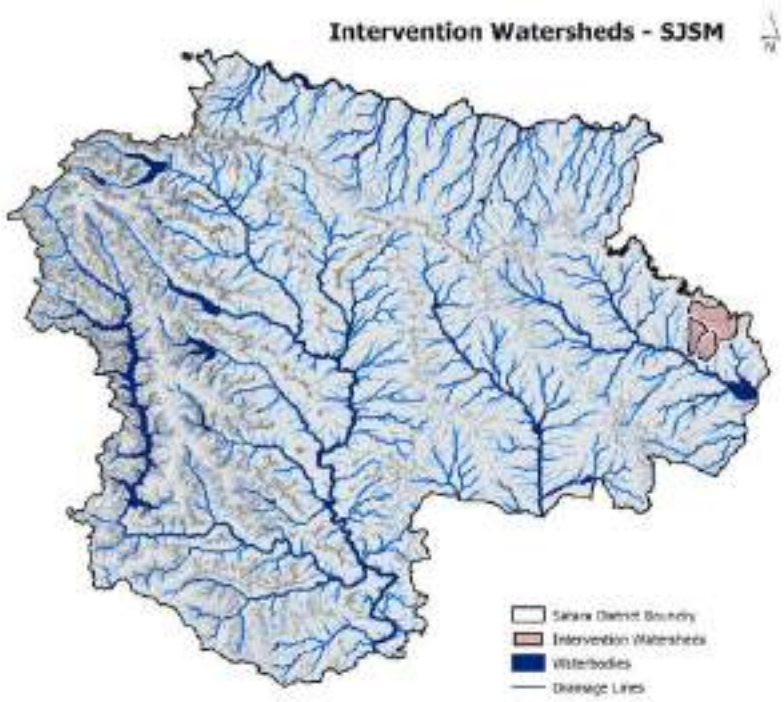


FIGURE 1: PROJECT LOCATIONS IN SATARA

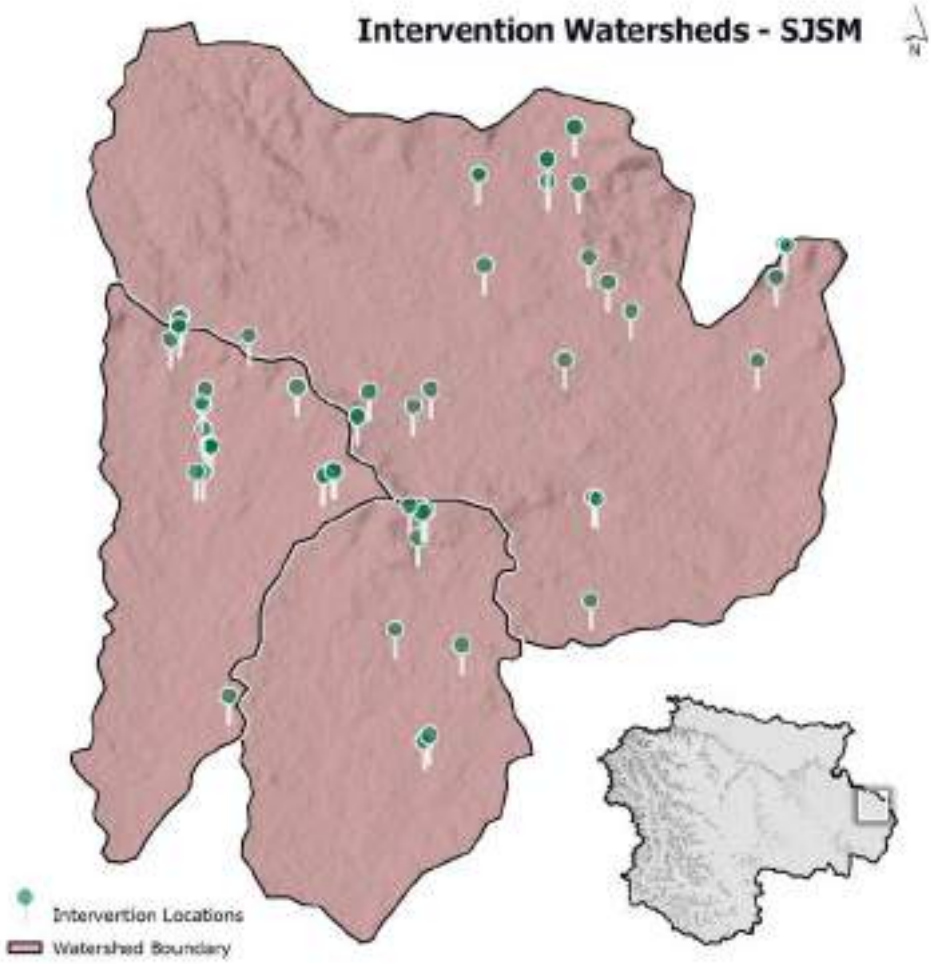


FIGURE 2: LOCATION OF PROJECT INTERVENTIONS

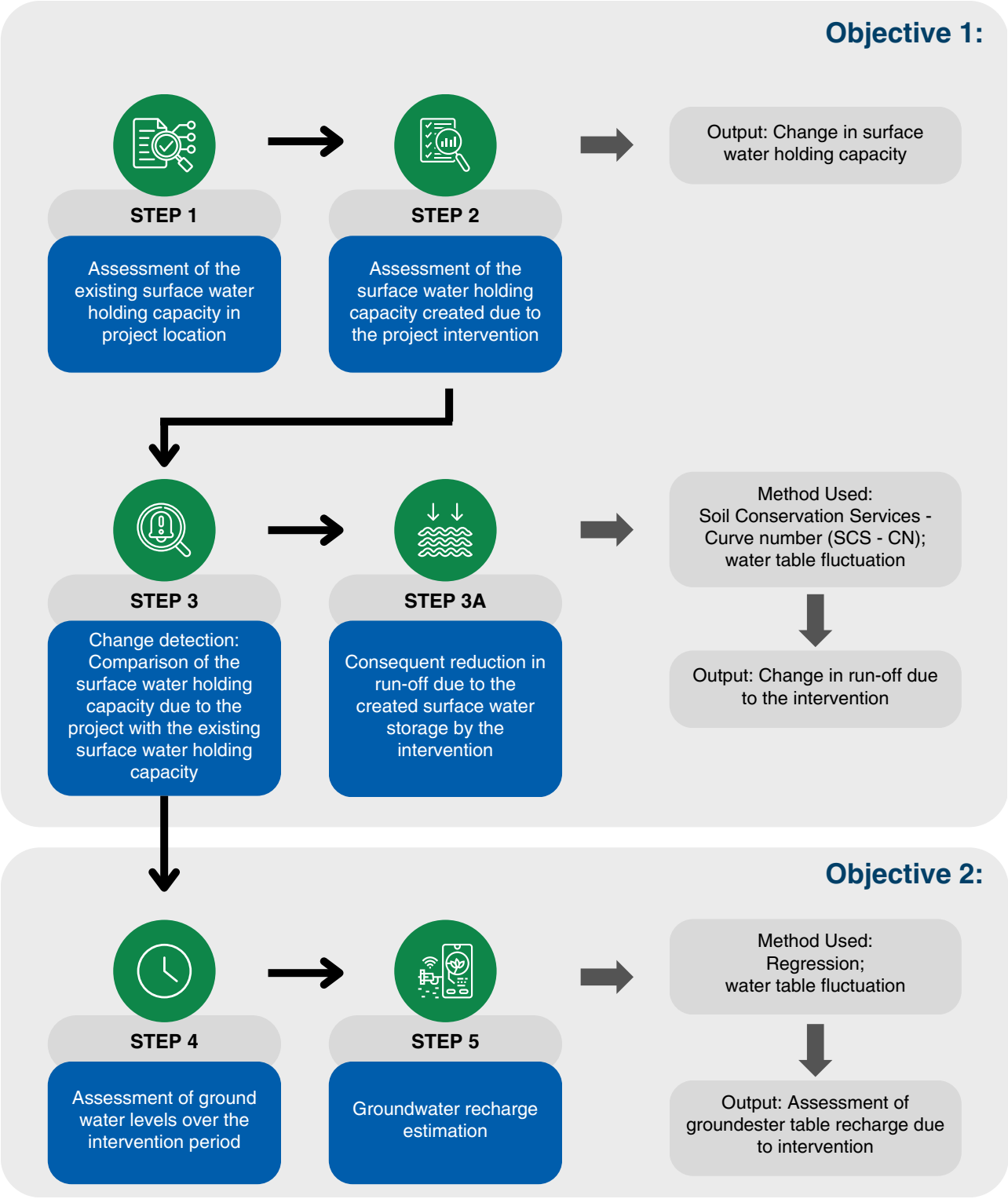
The detailed location of all the interventions covered as a part of the evaluations is provided in Annexure 1. The additional parameters that were considered are geology, hydrogeology, and soil types, and the information about the same is provided in Annexure 2.

While some of the assessments, such as the run-off estimation and the contribution of the interventions to the ground water levels, were done only considering the intervention area, some assessments, such as the rainfall and the ground water depth assessments, had to be done considering a larger area such as the entire block or the district due to the constraints faced with data availability. Care was taken to ensure that the results were represented correctly in this condition to varying assessment units.[1]

[1] The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

ASSESSMENT APPROACH

The assessment approach consists of various steps for each objective, as shown below:



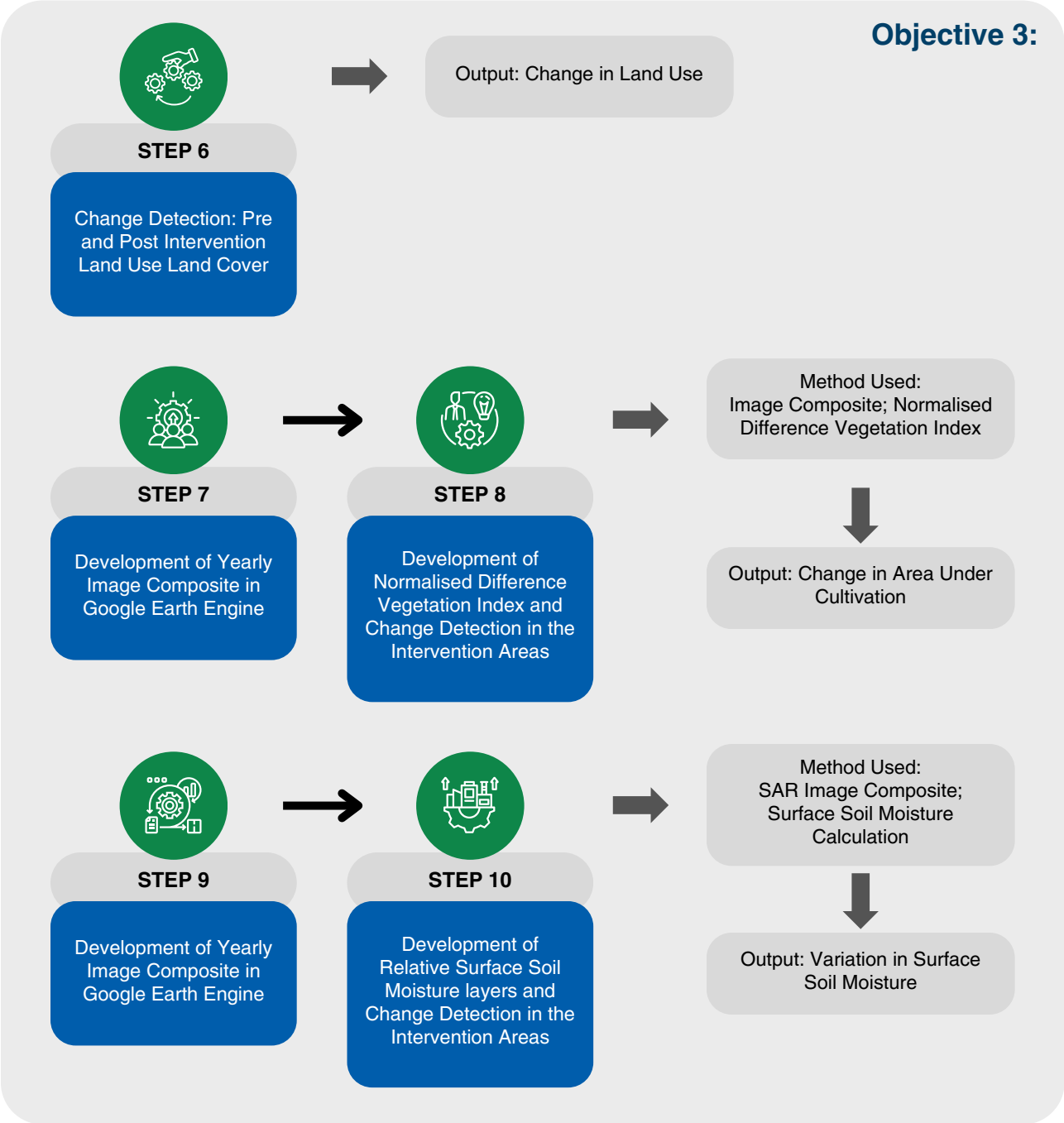


FIGURE 3: APPROACH OF THE ASSESSMENT

DATA COLLECTION

The following datasets have been collected from the field to facilitate the objectives of the study:

- All the intervention locations that were available (Annexure 1)
- Photos from the field survey (Annexure 6)

In addition to the above datasets, additional data was collected from various sources to fill in the data gaps that were present in the conduct of the assessment. These are as follows:

- Depth to water level from the NGO partners and the Central Ground Water Board (CGWB) (Annexure 3)
- Rainfall data from the Indian Meteorological Department (IMD) (Annexure 4)

Other datasets that were used in the assessment are as follows:

- Soil types from the National Remote Sensing Centre[2] (Annexure 2)
- Aquifer system from Central Ground Water Board (CGWB) (provided in Annexure 2)
- Specific Yield from Central Ground Water Board (CGWB) (provided in Annexure 2)

- Land Use Land Cover change between 2017 – 2023 from ESRI Living Atlas[3]
- Global Hydrologic Soil Groups for Run-off Estimation[4] (Annexure 2)

RESULTS

The results of the assessment to identify the impacts of the interventions on water conservation are presented in the below sections. It includes an assessment of rainfall and water level trends, an estimation of recharge due to rainfall, an assessment of surface water holding capacity and the associated run-off reduction and the estimation of recharge due to the interventions, the change in land use land cover, the changes in vegetation levels, and the changes in soil moisture conditions over the course of the intervention period.

Analysis of Rainfall Trends

Overall, while the values of rainfall have shown a slight positive trend during the intervention period with significant peaks observed during the north-east monsoon period, the graphs below show the trend in their change over time.

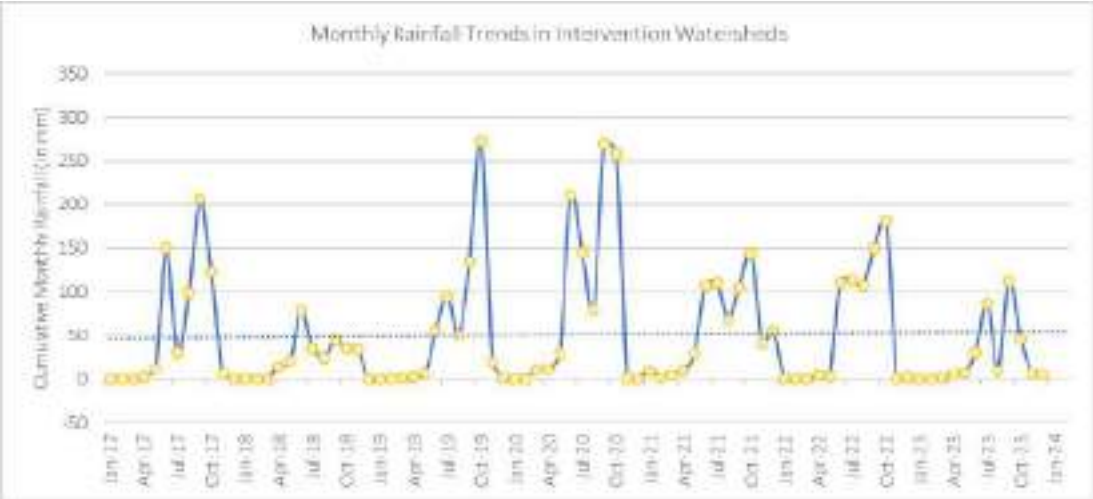


FIGURE 4: MONTHLY CUMULATIVE RAINFALL OVER THE INTERVENTION PERIOD (IN MM)

The slight positive trend that comes through is due to the above-normal rainfall received in June and August, the increasing number of rainy days in most years, and the unseasonal rainfall received in some of the years, during the non-monsoon months.

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO
[3]Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.
[4]Ross, C.W., L. Prihodko, J.Y. Anchang, S.S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Run-off Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1566

Change in Water Level

The depth to water level data was obtained from two sources: one is the NGO partners, and the other is the annual Ground Water Year Books for Maharashtra published by the Central Ground Water Board (CGWB) for the years between 2017 and 2023. However, a complete collection of the data for the entire period from 2017 and since was not available with either source. Thus, for the final assessment, the datasets from both sources were combined after evaluating them individually and ensuring cohesion, and any missing values were filled out using statistical methods. The detailed dataset is provided in Annexure 3. The figures below show the ground water level trends in in the intervention districts:

FIGURE 5: DEPTH TO WATER LEVEL (IN MBGL) – CGWB

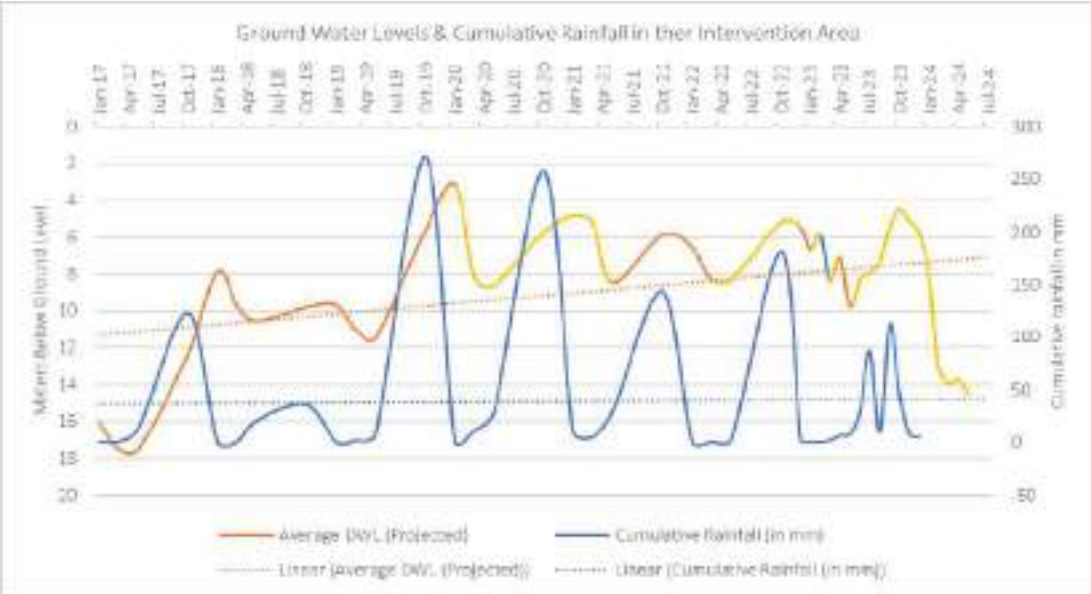


FIGURE 6: GROUND WATER LEVELS DURING AND SINCE THE INTERVENTION PERIOD (IN MBGL) COMPARED WITH MONTHLY CUMULATIVE RAINFALL (IN MM)

For this step of the assessment, the rainfall data from IMD was compared with the depth-to-water level data from the CGWB. The rationale behind this is that rainfall is the most critical variable that determines the level of water availability below ground. Thus, by establishing the role of rainfall in the change in water levels, we would be able to identify the role of the measures implemented on ground in augmenting the ground water levels.

A regression analysis of rainfall and depth to water level was done for the same effect to understand the strength of the relationship between these two variables (detailed results in Annexure 5). The p-value obtained is less than 0.05 for the intervention area, pointing to a significant relationship. However, the low R2 (coefficient of determination) values obtained for the intervention area, along with the weak negative correlation established between rainfall and ground water points to the fact that among the factors that influence ground water levels, rainfall has had minimal influence. Detailed results are provided below.[5]

This essentially means that rainfall influence on the ground water level has been to a minimal extent in the intervention areas over the period from 2017 to the relative present. However, over this period, the rainfall received has shown a very slight positive trend, while the ground water levels have shown significant positive trends. Considering the R2 values, it can be understood that while the rainfall and ground water levels are not closely related, the factors such as improved water percolation and water storage mechanisms have had significant contributions in augmenting the ground water levels, supported by the rainfall trends. The ground water levels are expected to continue to rise and stabilise at a high level over the coming years, and the contributions of the interventions would help in improving the ground water levels. The availability of the most recent and more local measurements will help in assessing the same more accurately.

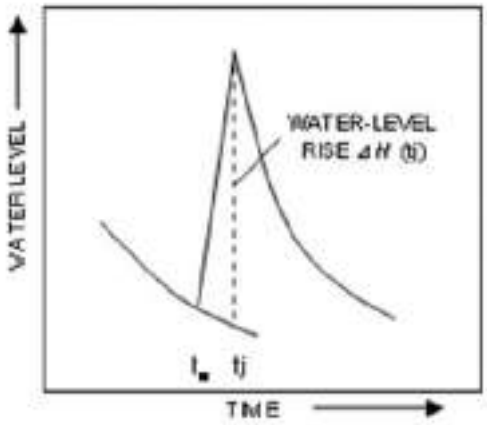
Note: The last available data on ground water depth data is till January 2023. The data from May 2023 to the present has not been published yet. Thus, in the absence of the necessary data, statistical methods were used to project the values for this period. This projected data might not necessarily reflect the true levels of ground water levels, and the derived estimates are bound to change on the availability of official measurements of ground water depth for 2023 and 2024.

Estimation of Ground Water Recharge Due to Rainfall

The Water Table Fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The water-table fluctuation method is based on the premise that rises in groundwater levels in unconfined aquifers are due to recharge arriving at the water table. Recharge is calculated as the change in water level over time multiplied by the specific yield.[6]

$$R(tj) = Sy^* \Delta H(tj)$$

where R(tj) (m) is recharge occurring between times t0 and tj, Sy is specific yield (dimensionless), and ΔH(tj) is the peak water level rise attributed to the recharge period (cm).



The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology.[7] [8] The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

Location	Satara
Major Aquifer System	Basalt
Sy Range	0.01 – 0.03

[5] The groundwater recharge calculations are based on data from NGO partners and CGWB data, are provided in the attached Excel document in sheets 9 and 10, respectively.

[6]USGS GWRP: Techniques/Methods -Water-Table Fluctuation (WTF) Method

[7]The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology[7][7]. The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

[8]Detailed Guidelines (cgwb.gov.in)

Sy Chosen	0.02
RIF Range	0.12 – 0.14
RIF Chosen	0.13

As per the results of the method, about 13.1% of the rainfall has recharged directly to the ground in the intervention sites. The results and calculations are presented below:

TABLE 2: WATER TABLE FLUCTUATION METHOD RESULTS

Major Aquifer System		**Basalt**					
Year	**Precipitation (mm)**	**ΔH annual**	**Sy**	**Rm**	**Rmm**	**as % of P**	**Volume of recharge (in cu. m.)**
2017	632.0281509	5.150	0.02	0.103	103	16.3%	7445886.48
2018	288.6828926	2.650	0.02	0.053	53	18.4%	3831378.48
2019	637.4668549	5.800	0.02	0.116	116	18.2%	8385658.56
2020	1015.439807	5.463	0.02	0.10925	109.25	10.8%	7897699.98
2021	685.9557037	3.623	0.02	0.0724625	72.4625	10.6%	5238325.719
2022	671.6402445	3.131	0.02	0.062624659	62.624659	9.3%	4527146.648
2023	312.5106585	5.270	0.02	0.105399319	105.39932	33.7%	7619333.619
Average Recharge directly due to Rainfall received						**16.7%**	**44945429.49**

Further, the groundwater recharge from Rainfall Infiltration Method (RIF) can be obtained from the following relation:
Groundwater Recharge = Geographical Area x Actual Rainfall x Infiltration Factor

TABLE 3: RAINFALL INFILTRATION METHOD

Area (in sq. m.) =			**72290160**
Year	**P (m)**	**RIF (m)**	**Volume of recharge (in cu. m.)**
2017	0.632028151	0.08216366	5939624.1
2018	0.288682893	0.017320974	1252135.95
2019	0.637466855	0.038248011	2764954.856
2020	1.015439807	0.060926388	4404378.367
2021	0.685955704	0.041157342	2975270.854
2022	0.671640244	0.040298415	2913178.844
2023	0.312510659	0.01875064	1355486.73
Total			**21605029.7**

Estimation of percent rainfall converted into groundwater recharge

As per GEC-1997 norms, the rainfall recharge as computed by the WTF method has been compared with that of the RIF method, and finally, the rainfall recharge is assigned a value based on set criteria to avoid unreasonably high or low estimates.

A quantity called percentage difference (PD) is the difference between the rainfall recharge computed by the water table method (A) and the recharge by the rainfall infiltration method (B) and expressed as a percentage of the rainfall recharge by rainfall infiltration method is computed as below:

$$PD = \frac{(A - B)}{B} \times 100$$

where 'A' is the rainfall recharge by the WTF method and 'B' is the rainfall recharge by the RIF method.
The set criteria (GEC 1997) to be adopted are as follows:
(a) If PD ≥ – 20 and < + 20%, then the value of the water table fluctuation method is adopted.
(b)If PD ≤ – 20%, then the value of 0.8 × rainfall infiltration factor method is adopted.
(c)If PD ≥ + 20%, then the value of 1.2 × rainfall infiltration factor method is adopted.

By following the above criteria, ground water recharge is estimated.

Organisation	Rainfall Infiltration Method	WTF Model	Percentage Difference	Criteria	Volume of recharge due to rainfall (Cu. m.)
	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)			
SJSM	21605029.7	44945429.49	108.032	C	25926035.64

Over the period of 2017 to 2023, an almost 7-year period covering the interventions and their operations till the present, the amount of ground water recharge directly due to rainfall stands at 2,59,26,035.64 Cu. m. across the intervention watershed, which is about 8% of the total rainfall received over the intervention area.

Change in surface water holding capacity and run-off reduction

The intervention area is spread over multiple watersheds in the southern part of the state. On-site verification and satellite imagery show that the major land use in the intervention area is rangelands, followed by crops. Based on the information available from the field survey and the organisation, the volume of storage created is estimated.

The change in surface storage in the intervention area was net positive, i.e., no existing surface storage was considered in the pre-intervention period.[9] An intervention volume of 8,38,012 cubic meters created through the project is being considered for assessment as there might be a double accounting of the storage of nalas, which is also included in considering the storage of the check dam type of interventions.

Estimation of ground water recharge due to the interventions

Groundwater recharge due to the interventions occurs primarily through the capture and storage of surface runoff water using Cement Nala Bunds, as well as through natural processes and Groundwater Recharge Shafts.

[9] This is due to the constraints of establishing the status of all water bodies in the intervention area.

Run-off is defined as the portion of the precipitation that makes its way towards rivers or oceans as surface or subsurface flow. After the occurrence of infiltration and other losses from precipitation (rainfall), excess rainfall flows out through the small natural channels on the land surface and into the main drainage channels. Such types of flow are called surface flows. A part of the infiltrated rainwater moves parallel to the land surface as subsurface flow and reappears on the surface at certain other points. Such flows are called interflows. Another part of the infiltrated water percolates downwards to ground water and moves laterally to emerge in depression and rivers and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

While the interventions such as the Cement Nala Bunds and the Gabion Structure capture the surface flows, both these structures and the Ground Water Recharge Shafts contribute to the recharge of the ground water in the intervention sites.

Estimation of the run-off can give us an estimate of the amount of water that has been essentially captured by the intervention structures as surface storage, and thus point towards the potential amount of water available for ground water recharge. Run-off can be estimated by various methods, such as:

- Empirical formulae and tables
- Run-off Estimation based on Land Use and Treatment
- Rational Method
- Empirical formulae for flood peak

In this assessment, we are using the method of empirical formulae and tables along with run-off estimation based on land use and treatment, as it has proven to be the most reliable to conduct the assessment in the absence of reliable ground water level data and access to the intervention sites on the ground.

1

BINNIE'S PERCENTAGES

It provides the relationship of run-off to rainfall with a view to express the former as a percentage of the latter. The percentages mentioned below are based on observations on two rivers in Madhya Pradesh.

TABLE 4: RUN-OFF AS A % OF THE RAINFALL RECEIVED

Annual Rainfall (mm)	Runoff (%)
500	15
600	21
700	25
800	29
900	34
1,000	38
1,100	40

2 COEFFICIENTS

The run-off 'R' in cm and rainfall 'P' in cm can be correlated as R = KP, where 'K' is the run-off coefficient. The run-off coefficient depends on factors affecting run-off. This method is applicable only for small projects such as the ones implemented as a part of this project. The usual values of K are as given below.

TABLE 5: USUAL VALUES OF RUNOFF COEFFICIENTS (K)

Type of Area	K
Urban Residential	0.3 - 0.5
Forests	0.05 - 0.2
Commercial & Industrial	0.9
Parks, farms, Pastures	0.05 - 0.3
Asphalt or concrete pavement	0.85

3 BARLOW'S TABLES

The following values of K (in percentage) for various types of catchments were developed by T.G. Barlow based on the studies of catchments mostly under 130 sq. km. in Uttar Pradesh.

TABLE 6: BARLOW'S PERCENTAGE RUNOFF COEFFICIENTS

Class	Description of Catchment	Percent runoff
A	Flat, cultivated and black cotton soils	10
B	Flat, partly cultivated-various soils	15
C	Average	20
D	Hills and plains with little cultivation	35
E	Very hilly and steep, with hardly any cultivation	45

These percentages are for the average type of monsoon and are to be modified by the application of the following coefficients according to the nature of the season, as shown below.

TABLE 7: BARLOW'S RUN-OFF COEFFICIENTS FOR DIFFERENT NATURES OF SEASON

Nature of Season	Class of catchments				
	A	B	C	D	E
Light rain, no heavy downpour	0.7	0.8	0.8	0.8	0.8
Average or varying rainfall, no continuous downpour	1	1	1	1	1
Continuous downpour	1.5	1.5	1.6	1.7	1.8

As part of this method, the special tropical rainfall was divided into the following four classes:

- **Negligible falls:** All rainfalls under 12 mm a day unless continuous for several days; also rainfalls 12 to 40 mm a day, when there is no rain.
- **Light falls:** All rainfalls up to 25 mm a day followed by similar or heavier falls. Steady pours of 25 to 40 mm a day, when there is no rain of similar or greater amount before or after that.
- **Medium falls:** Rainfalls from 25 to 40 mm a day when preceded or followed by any but light falls.
- **Heavy Falls:**
  - All rainfalls are over 75 mm a day or continuous falls at 50 mm a day.
  - All rainfalls of an intensity of 50 mm or more per hour.

The run-off percentages, as shown in the following table, were developed by combining the type of catchment and nature of the season.

TABLE 8: BARLOW'S RUNOFF PERCENTAGES

Nature of Rainfall	Percentage of Flow in Catchments of Different Type				
	A	B	C	D	E
Negligible falls	-	-	-	-	-
Light falls	1%	3%	5%	10%	15%
Medium falls	10%	15%	20%	25%	33%
Heavy falls	20%	33%	40%	55%	70%

4 ESTIMATION OF DIRECT RUNOFF FROM RAINFALL

In this method of run-off estimation, the effects of the surface conditions of a watershed area are evaluated by means of land use and treatment classes. Land use is the watershed cover, and it includes every kind of vegetation, litter and mulch, and fallow, as well as non-agricultural uses such as water surfaces (lakes, swamps, etc) and impervious surfaces (roads, roofs, etc.). Land treatment applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing and management practices such as grazing control or rotation of crops. The classes consist of use and treatment combinations to be found in watersheds. Land use and treatment classes are readily obtained either by observation or by measurement of plant and litter density and extent in sample areas.

4.1 Hydrological Soil Groups

There are four soil groups that are used in determining the hydrological soil cover complexes, which are used in a method for estimating the run-off from rainfall. The major characteristics of these groups are described below. The respective infiltration rates and permeability of soils in different groups are also shown below. The infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The permeability rate is the rate at which water moves in the soil, which is controlled by the nature and characteristics of soil horizons.

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.	Low	High rate
Group B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	High	Low rate

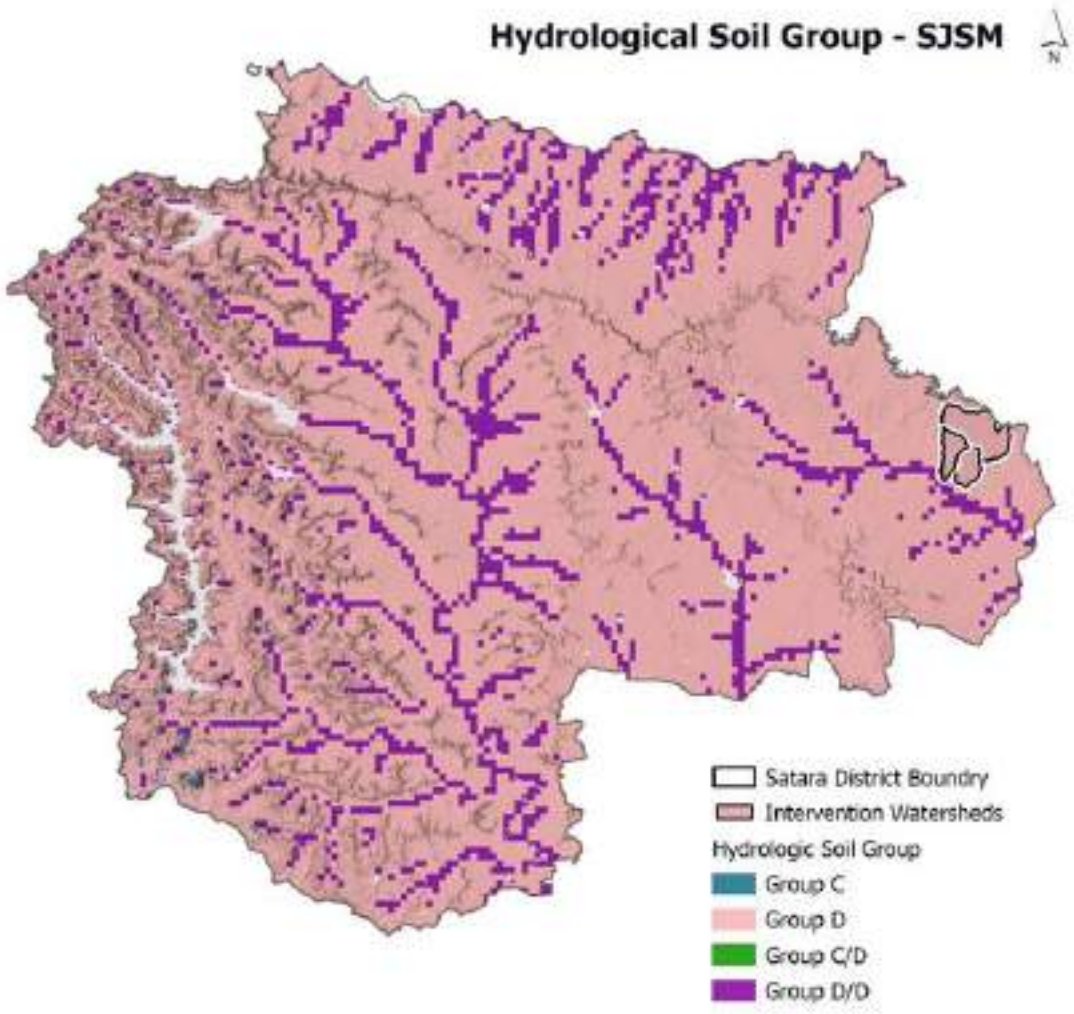


FIGURE 8: HYDROLOGIC SOIL GROUPS OF THE PROJECT WATERSHEDS

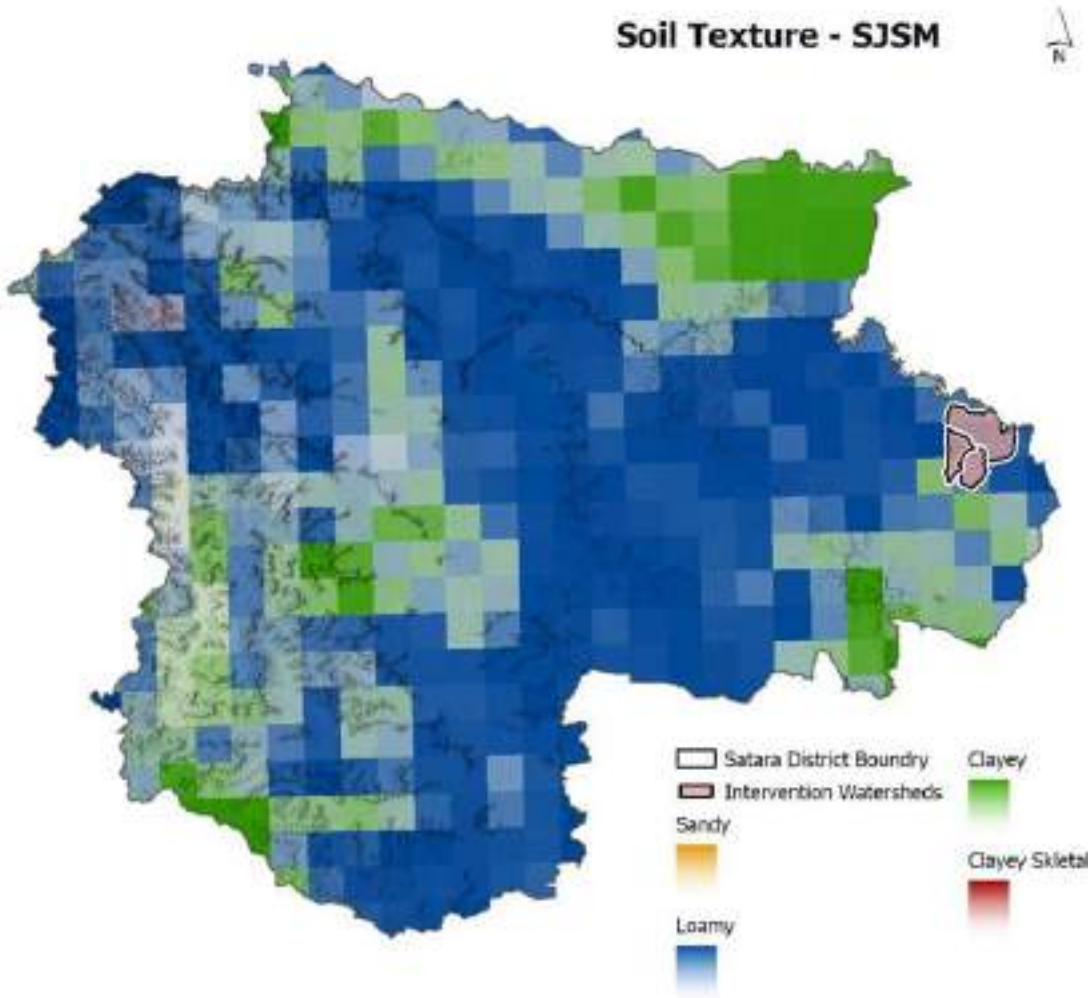


FIGURE 9: SOIL CHARACTERISTICS IN THE PROJECT WATERSHEDS

TABLE 9: INFILTRATION RATES

Class	Rates / hr in		Remarks
	Inches	Millimetres	
Very Low	Below 0.1	Below 2.5	Highly clayey soils
Low	0.1 - 0.5	2.5 - 12.5	Shallow soils, clay soils, soils low in organic matter
Medium	0.5 - 1.0	12.5 - 25.0	Sandy loams, silt loams
High	Above 1.0	Above 25.0	Deep sands, well aggregated soils

TABLE 10: RELATIVE CLASSES OF SOIL PERMEABILITY

Class	Permeability	
	Inches/ hr	mm/ hr
Slow		
Very Slow	Less than 0.05	1.3
Slow	0.05 to 0.20	1.31 to 5.00

Class	Permeability	
	Inches/ hr	mm/ hr
Moderate		
Moderately Slow	0.20 to 0.30	5.01 to 20.00
Moderate	0.80 to 2.50	20.01 to 50.00
Moderately Rapid	2.50 to 5.00	50.01 to 130.00
Rapid		
Rapid	5.00 to 10.00	130.01 to 250.00
Very Rapid	Over 10.00	Over 250.00

4.2 Land Use and Treatment Classes

The commonly used land use and treatment classes are briefly described below. These classes are used in determining hydrologic soil-cover complexes, which are used in one of the methods for estimating runoff from rainfall.

- **Cultivated lands:** These include all field crops such as maize, sugarcane, paddy and wheat.
- **Fallow lands:** These are lands taken up for cultivation, but are temporarily out of cultivation for a period of not less than one year, and not more than 5 years. Current fallow lands are cropped areas kept fallow during the current year.
- **Uncultivated lands include:**
  - Permanent pastures and other grazing lands.
  - Cultivable waste, which are lands available for cultivation whether or not taken up for cultivation or abandoned after a few years for one reason or another. Land once cultivated but uncultivated for 5 years in succession shall also be included in this category.
- Forest area includes all lands classed as forest under any legal enactment dealing with forest or administered as forest whether State-owned or private and whether wooded or maintained as potential forest land.
- Tree crops include woody perennial plants that reach a mature height of at least 8 feet and have well-defined stems and a definite crown shape.
- Lands put to non-agricultural uses are areas occupied by buildings, roads, railroads, etc.
- Barren and uncultivable lands include areas covered by mountains, deserts, etc.

Based on these assessments, the following were estimated:

Surface Storage

The volume of surface storage created by the intervention = 5,59,220 m3.

Rainfall & Runoff

- Total rainfall received over the intervention period and since = 26,97,24,249.1 m3
- Total run-off generated over the intervention area = 8,09,17,274.73 m3
- Percentage of rainfall that is converted to run-off = 30%

The intervention area received enough rainfall for all the intervention structures to be at a constant capacity of 14.78% throughout the period since 2017 as a part of and due to the project Bajaj Water Conservation Project implemented by SJSM in Satara. This shall be interpreted as the intervention structures always having water and never drying since 2017 or operating at more than 50% storage filled through the dry seasons since 2017.

Runoff Reduction

- The volume of surface run-off stored by the intervention measures after considering 40% evaporation loss = 49,58,191.33 m3.

Which is,

- 6.13% of the total run-off generated as a part of and due to the water conservation efforts of this project (or)
- 2.02% of the total rainfall received during the project period and ever since

This means that the interventions that were created as a part of this project have contributed to a combined reduction in surface run-off by about 6.13% in the intervention area. Although this number is a conservative estimation and however, it is bound to increase over the years. Care must be taken to ensure the effective functioning of these water harvesting structures. Regular desilting and clearing of overgrowth, along with any structural repairs, are required across all the structures to ensure that their storage capacity is maintained and the structural integrity is preserved.

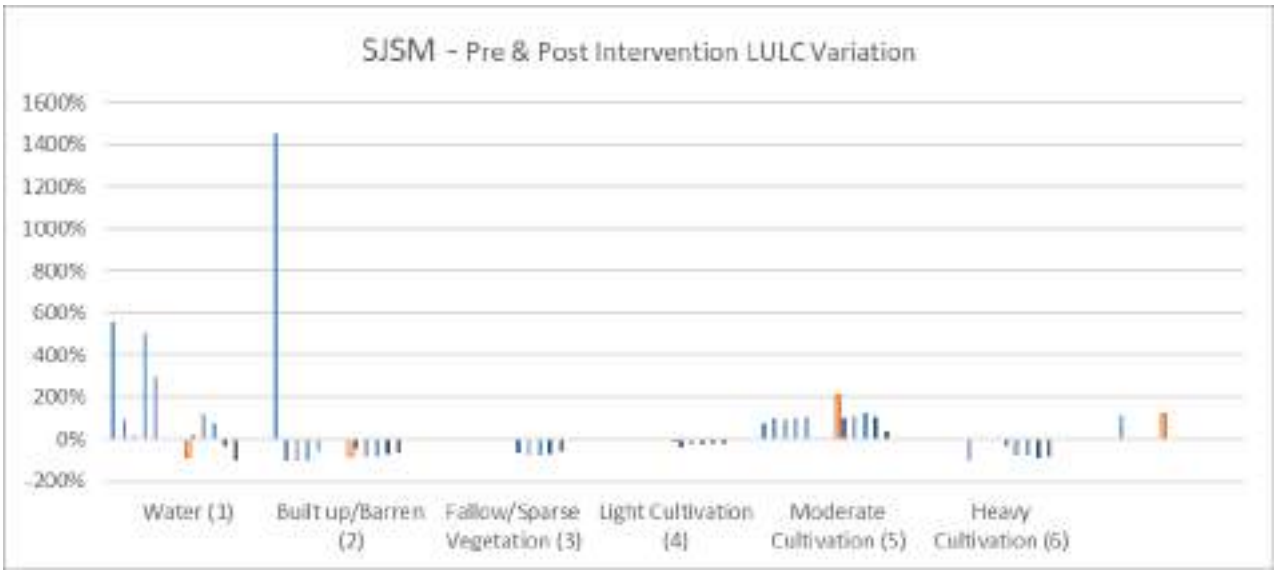
Thus, in total, 8% of the rainfall is converted into direct recharge, about 6.13% of the rainfall is stored in the intervention-created surface storage, 40% is lost as evaporation, and the remaining 45.8% accounts for factors such as run-off that is stored in other water bodies present, run-off that is not captured evapotranspiration, and other losses.

5 CHANGE IN LAND USE PATTERN

Land use and land cover change detection involves analyzing how land is utilized and how its physical coverage alters over time. Changes in land use patterns, such as urban expansion, deforestation, agricultural expansion, and the impacts of natural disasters, can be tracked using remote sensing techniques, satellite imagery, and geographic information systems (GIS). The land use and land cover for the intervention areas were developed through supervised classification of Sentinel-2 Full Colour Composite (FCC) imagery for both the pre- and post-intervention periods.

TABLE 11: ZONAL STATISTICS OF LULC FOR THE INTERVENTION AREA

District	Satara				
Organisation	SJSM				
Total Area of Watershed (Sq. Km.)	72.29016				
Soil Group	D				
Land Use Classes	Land Use - 2017		Land Use - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.2012	0.28	0.0316	0.04	-84.27%
Trees (2)	0.0039	0.01	0.0010	0.00	-75.17%
Flooded Vegetation (4)		0.00		0.00	0.00%
Crops (5)	66.6760	92.23	59.2777	82.00	-11.10%
Built up (7)	1.0253	1.42	3.1951	4.42	211.63%
Bare ground (8)		0.00		0.00	0.00%
Rangeland (11)	4.3599	6.03	9.7625	13.50	123.92%



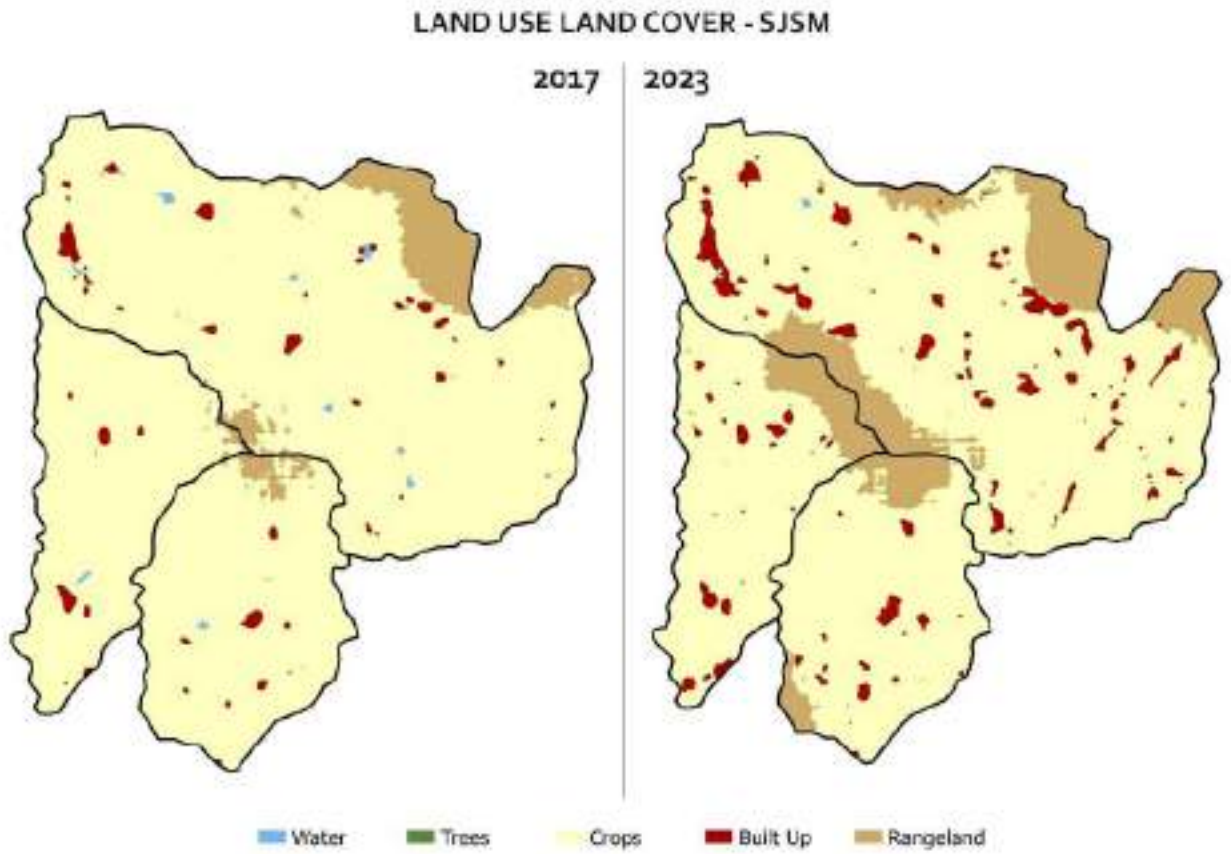


FIGURE 9: PRE AND POST-INTERVENTION LULC OF THE INTERVENTION WATERSHED

It can be observed from the above table and charts that in terms of total area, the area under crops is the highest, followed by rangelands and built-up area. Looking at the changes in land use that have happened through the course of the intervention period and since, major changes can be observed in the growth of areas under built-up and rangeland, the reduction in the areas under the rest, while minor reduction in the area under crops can be seen. In terms of total area, the reduction in area under crops can be attributed mainly to the increase in built-up area and rangelands. The following section will offer more clarity on the changes to cropping intensity.

6

VEGETATION INDEX (VI)/CROPPING INTENSITY

Vegetation Indices are combinations of surface reflectance at two or more wavelengths designed to highlight a particular property of vegetation. They are derived using the reflectance properties of vegetation. For this assessment, the Normalised Difference Vegetation Index (NDVI) is used. NDVI is an indicator that shows the greenness, density, and health of vegetation in each pixel of a satellite image. The index detects and quantifies the presence of living green vegetation using this reflected light in the visible and near-infrared bands.

The standard formula for calculating NDVI is: NDVI = (NIR – red) / (NIR + red)

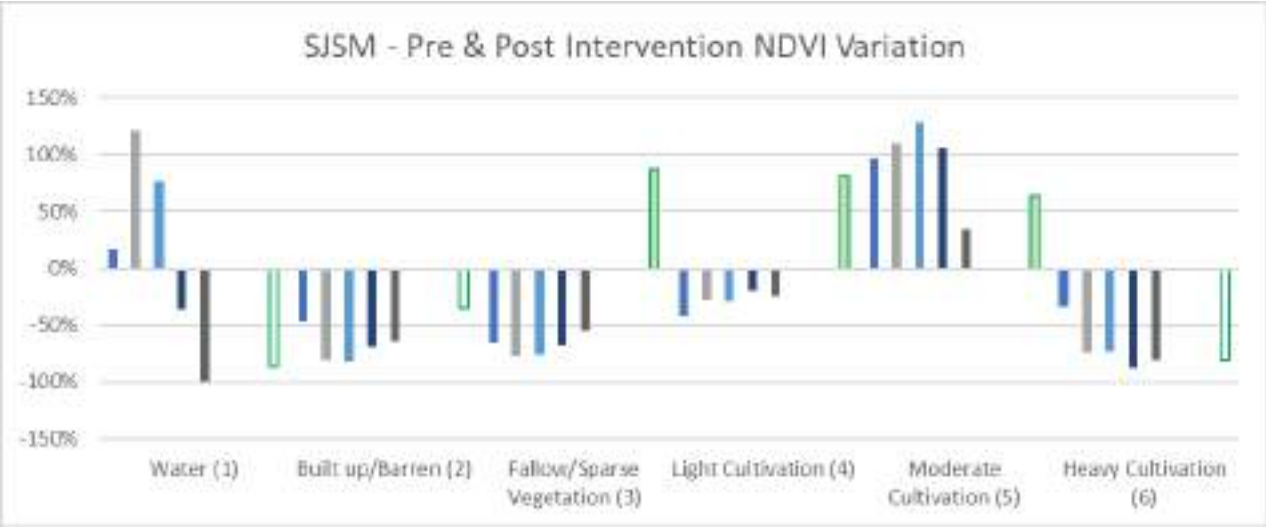
Where, NIR is the near infra-red, band 8, and red, band 4 of Sentinel-2 imagery. Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states.

The NDVI value ranges from -1 to 1 and shows the vigour of the crop:

- **Values close to 1:** the more intense the green, the more vigorous the vegetation and vegetation cover. Considerations for the type of farming, bare soil, etc. must be made. The index also measures the vigour of the underbrush.
- **Values close to 0:** areas with very little vegetation, early stages of cultivation, bare soil, or non-productive areas.
- **Negative values:** usually associated with areas of water, snow, or clouds.

TABLE 12: ZONAL STATISTICS VALUES OF THE VEGETATION INDEX

District	Satara				
Organisation	SJSM				
Total Area of Watershed (Sq. Km.)	72.29016				
Soil Group	D				
Vegetation Index Classes	VI - 2017		VI - 2023		% Difference
	Area	% Area	Area	% Area	
Water (1)	0.0762	0.11	0.0105	0.01	-86.19%
Built up/Barren (2)	50.7312	70.18	33.0702	45.75	-34.81%
Fallow/Sparse Vegetation (3)	11.0769	15.32	20.7600	28.72	87.42%
Light Cultivation (4)	7.8386	10.84	14.3030	19.79	82.47%
Moderate Cultivation (5)	2.5233	3.49	4.1297	5.71	63.67%
Heavy Cultivation (6)	0.0396	0.05	0.0078	0.01	-80.34%



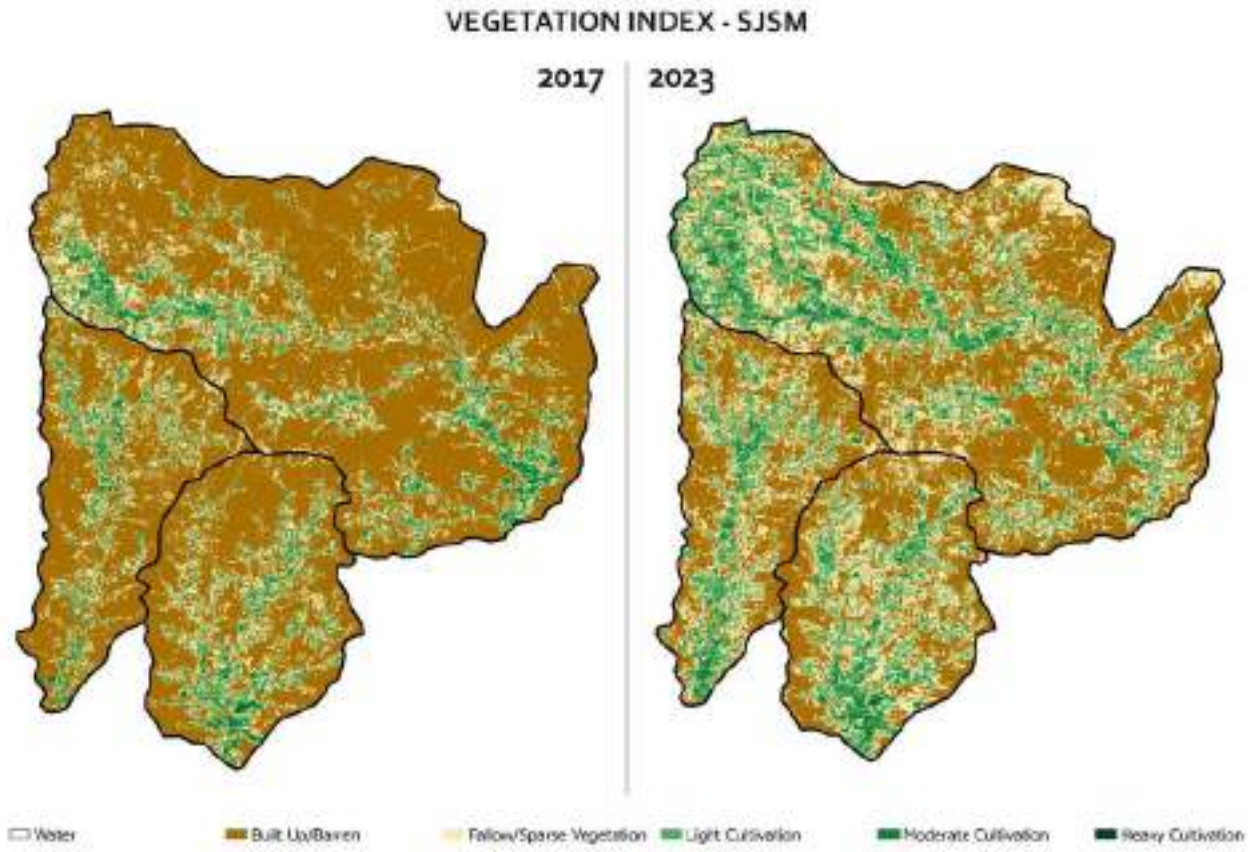


FIGURE 10: PRE AND POST-INTERVENTION VEGETATION INDEX ACROSS THE INTERVENTION WATERSHED

The analysis, change detection, and calculation of the vegetation index reveal that in the intervention watershed, the majority of the land falls under the fallow and barren categories. Further, the area under moderate and light cultivation has grown along with the fallow lands while the area under all other types has reduced. With respect to the methodology applied for this analysis, it can be interpreted that the area under light cultivation corresponds to single cropping, moderate cultivation to double cropping and heavy cultivation to triple cropping. Thus, in the intervention watersheds, the amount of vegetation that is present has grown over the course of the intervention period, indicating improved water accessibility and use, among other factors.

7 SOIL MOISTURE

Surface soil moisture (SSM), defined as the water content of the top few centimetres of soil, is a key variable that affects run-off generation, water recharge and vegetation growth. The Synthetic Aperture Radar (SAR) data from Sentinel-1 satellite is used here to study the surface soil moisture, which is in turn derived from relative soil moisture, which represents the soil moisture for a given soil column on a relative scale between soil saturation and wilting levels.

The surface soil moisture saturation is calculated as percentages using the formula[11]:

$$\mathrm{SSM}(t) = \frac{\Delta\sigma^0(\Theta, t)}{S(\Theta)} \quad [\%]$$

[11]Detailed methodology is provided at https://doi.org/10.1109/TGRS.2018.2858004

Where Δσ0(Θ,t) represents the change in normalized backscatter (relative to dry conditions), and S(Θ) is the sensitivity to SSM changes at the reference angle. The sensitivity is equivalent to the local backscatter dynamic range, estimated by the difference between normalized backscatter coefficients under wet and dry conditions using,

$$S(\Theta) = \sigma^0_{\text{wet}}(\Theta) - \sigma^0_{\text{dry}}(\Theta) \quad [\text{dB}].$$

Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states. The values range from 0 to 100 %, where values close to 0 represent water and built-up areas.

TABLE 13: ZONAL STATISTICS OF SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHEDS

District	Satara				
Organisation	SJSM				
Total Area of Watershed (Sq. Km.)	72.29016				
Soil Group	D				
Soil Moisture Classes	SM - 2017		SM - 2023		% Difference
	Area	% Area	Area	% Area	
0 - 0.1 (1)	7.3809	10.21	5.5693	7.70	-24.54%
0.1 - 0.2 (2)	19.6656	27.20	13.8008	19.09	-29.82%
0.2 - 0.3 (3)	30.4532	42.13	31.3920	43.42	3.08%
0.3 - 0.4 (4)	11.8235	16.36	16.8255	23.27	42.31%
0.4 - 0.5 (5)	2.4891	3.44	3.9177	5.42	57.40%
> 0.5 (6)	0.4507	0.62	0.7555	1.05	67.63%

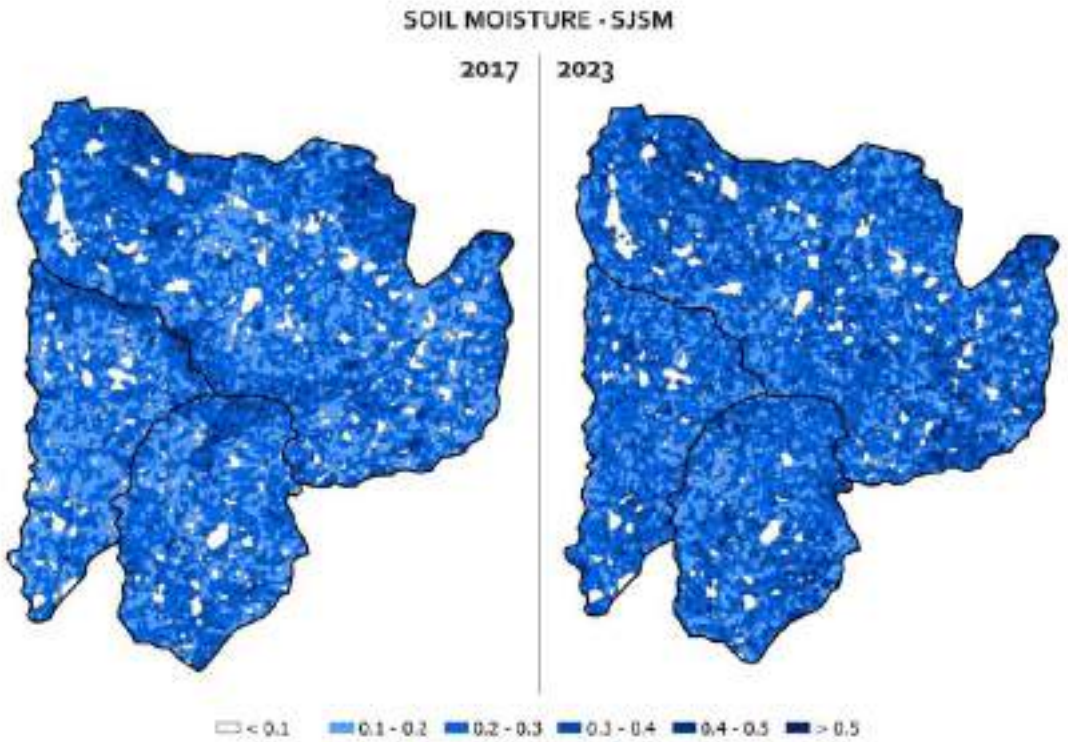
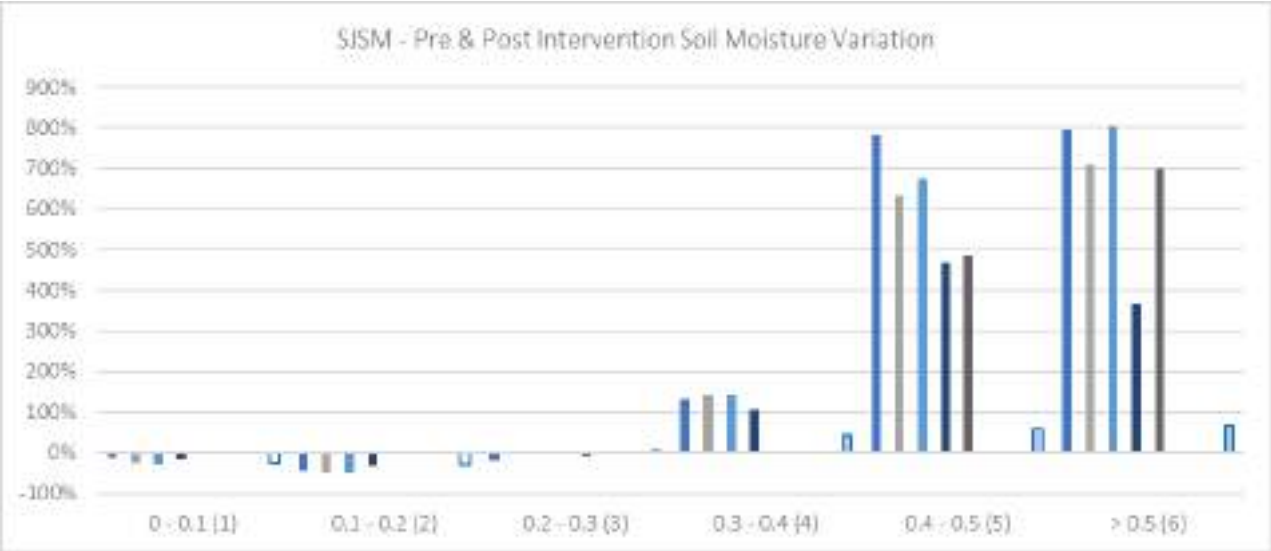


FIGURE 11: PRE AND POST INTERVENTION SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHED

[11] Detailed methodology is provided in https://doi.org/10.1109/TGRS.2018.2858004



The analysis, change detection and calculation of the soil moisture across the intervention watershed shows that there have been significant changes in the values of surface soil moisture over the course of the intervention period and since. The area under soil moisture values greater than 30% has seen a significant increase, while the area under low soil moisture values has reduced. This is to be interpreted because of multiple factors, such as the rainfall received, the vegetative cover, and the availability of surface and ground water, among others.

CONCLUSIONS

This section provides a summary of the key findings of the assessment and the limitations encountered in the process of the assessment. For a more accurate quantification outcome, further studies will have to be done using datasets of higher details and corroboration from the field.

KEY FINDINGS

In summation, the key findings from the above assessments are as follows:

- The total surface storage created in the intervention area due to the project is 5,59,220 cubic meters.
- The influence of rainfall on the ground water levels has not been very significant. However, it has been a contributing factor in the rise in ground water levels.
- The ground water levels in the intervention watershed have been increasing since 2017, are presently at high values, and are expected to persist at similar levels in the coming years. The availability of more recent data will shed more light on the trends that can be expected.
- Ground water recharge directly due to rainfall in the intervention area is about 8% of the total rainfall received.
- The volume of surface run-off stored by the intervention measures is 6.13% of the total run-off generated as a part of and due to the interventions (or) 2.02% of the total rainfall received during the period of the project intervention and ever since.
- Analysis of LULC, NDVI, and SSM reveal that there has been a marked increase in area under light (single cultivation) and moderate (double) cultivation while the crop cover overall has reduced slightly, likely due to the increase in area under built-up. The surface soil moisture has shown a remarkable change, with most of the area having a moisture content of more than 40.0%.

TABLE 14: SUMMARY OF FINDINGS

District		Satara
Organisation		SJSM
Total Area of Watershed (Sq. Km.)		72.29016
Soil Group		D
Volume of Storage Created (Cu. m.)		559220
Total rainfall over intervention area (Cu. m.)		269724249.1011
Q - Total run-off over intervention area (Cu. m.)		80917274.73
Average % of fullness throughout the intervention period		14.78%
Run-off volume stored in interventions	Pre-evaporation Loss	8263652.21
	Post Evaporation Loss	4958191.327
% of run-off stored by interventions	Pre-evaporation Loss	10.21%
	Post Evaporation Loss	6.13%
% of rainfall stored by interventions	Pre-evaporation Loss	3.37%
	Post Evaporation Loss	2.02%
Surface water contribution to ground water recharge (40%) (Cu. m.)		1983276.53
Recharge only due to rainfall (Entire intervention period and since)	Cu. m.	3278874656.26
	%	8.00%

LIMITATIONS

The most significant limitation faced was in terms of data availability. With the resolution of the available open-source satellite imagery being capped at 10m, 30m and 50m, the land use, vegetation index and soil moisture that can be generated, respectively, also lack resolution, especially considering the small size of the intervention area that had to be assessed. Assumptions were made to calculate the storage capacity of water harvesting structures. Owing to the limitation in the availability of data on the number of interventions, their locations and the respective dimensions, the assessments are based primarily on data from secondary sources, with the primary data being used wherever possible. Further, most of the secondary data that was available and obtained has shortcomings in one or more areas, such as the temporal coverage or the spatial resolution. Further constraints were due to the unavailability of up-to-date and reliable ground water data. With the continuous measurement of this information, the efficiency of the assessment can be improved.

ANNEXURE 1

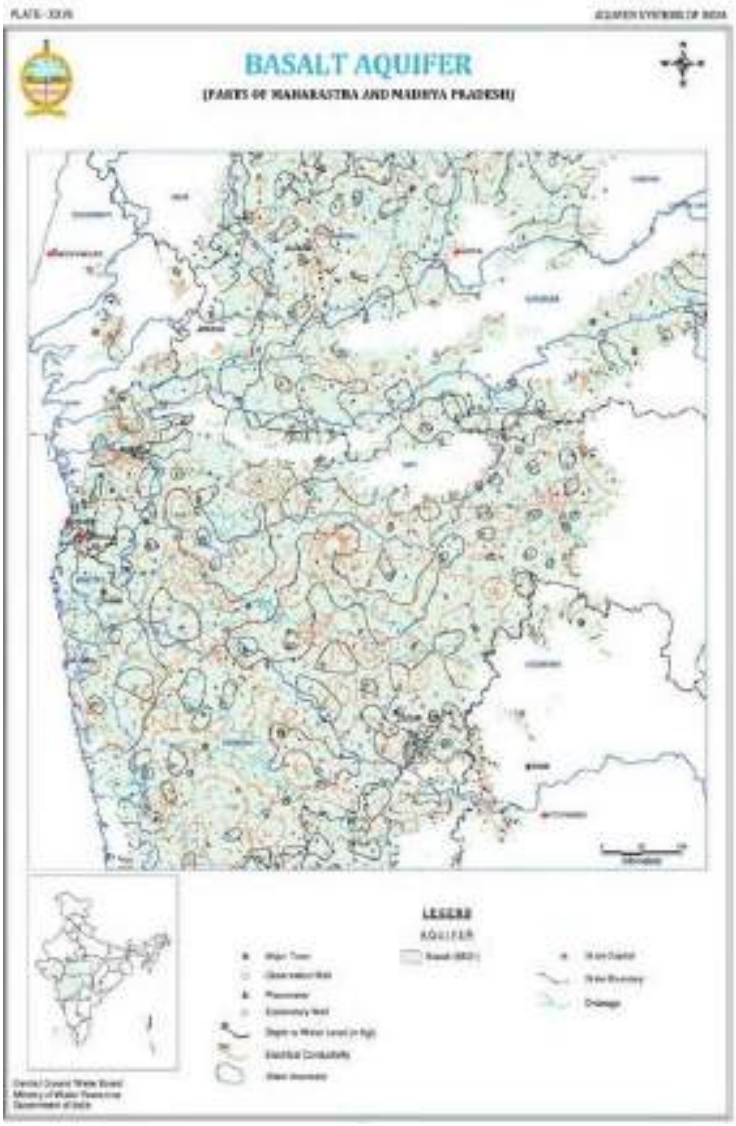
INTERVENTIONS

Organisation	Type of Activity	Latitude	Longitude
SJSM	SCT	17.72653	74.84172
SJSM	SCT	17.72653	74.84172
SJSM	SCT	17.72467	74.84209
SJSM	SCT	17.72484	74.81782
SJSM	SCT	17.67562	74.81178
SJSM	SCT	17.69293	74.79745
SJSM	SCT	17.69607	74.79837
SJSM	LBS	17.73977	74.81617
SJSM	LBS	17.73972	74.81616
SJSM	LBS	17.69584	74.79794
SJSM	LBS	17.70666	74.7902
SJSM	LBS	17.70961	74.79159
SJSM	LBS	17.71817	74.76914
SJSM	LBS	17.70671	74.79023
SJSM	LBS	17.71819	74.76909
SJSM	LBS	17.70051	74.78736
SJSM	LBS	17.69992	74.78613
SJSM	LBS	17.70064	74.78729
SJSM	LBS	17.70057	74.78744
SJSM	LBS	17.69995	74.78622
SJSM	LBS	17.70051	74.78736
SJSM	Farm bunding	17.72394	74.80541
SJSM	Farm bunding	17.71314	74.83803
SJSM	Farm bunding	17.73432	74.80469
SJSM	Farm bunding	17.58834	74.78102
SJSM	Farm bunding	17.73429	74.80476
SJSM	CWG	17.73608	74.81287
SJSM	CWG	17.73348	74.81293
SJSM	CWG	17.69585	74.79794
SJSM	CWG	17.71789	74.7689
SJSM	CWG	17.7179	74.76891
SJSM	CWG	17.71549	74.76792
SJSM	ENB	17.69657	74.79644
SJSM	ENB	17.71323	74.81501
SJSM	ENB	17.73319	74.81664
SJSM	ENB	17.71594	74.77726
SJSM	ENB	17.71011	74.78299

Organisation	Type of Activity	Latitude	Longitude
SJSM	ENB	17.72203	74.82019
SJSM	ENB	17.70987	74.88279
SJSM	NDW	17.66977	74.79817
SJSM	NDW	17.67038	74.79872
SJSM	NDW	17.70788	74.79691
SJSM	NDW	17.73608	74.81287
SJSM	NDW	17.67488	74.77485
SJSM	NDW	17.68246	74.79471
SJSM	NDW	17.71686	74.76891
SJSM	NDW	17.71684	74.76891
SJSM	NDW	17.71712	74.76887
SJSM	ENB	17.70988	74.77198
SJSM	ENB	17.70988	74.79891
SJSM	ENB	17.69746	74.8183
SJSM	ENB	17.69734	74.8188
SJSM	Wells	17.70338	74.77222
SJSM	Wells	17.7035	74.77254
SJSM	Wells	17.70329	74.77271
SJSM	Wells	17.70348	74.77262
SJSM	Wells	17.70329	74.77271
SJSM	Wells	17.70791	74.77177
SJSM	Wells	17.70534	74.77181
SJSM	Wells	17.70042	74.77181
SJSM	Wells	17.70042	74.77097
SJSM	Wells	17.70824	74.77155

ANNEXURE 2

AQUIFER TYPES



ANNEXURE 3

GROUND WATER DATA FROM CGWB

ANNEXURE 4

RAINFALL

Monthly rainfall (in mm) trends for Satara from 01-Oct-2017 to 31-Dec-2023							
	2017	2018	2019	2020	2021	2022	2023
Jan	0	0	0	0	9.568042585	0	0.050592778
Feb	0	0	0	0	1.607596971	0	0
Mar	0.4859078	0	1.388695137	10.85567331	4.710713688	0.124329838	1.37823462
Apr	3.1607102	14.03196369	2.109887363	11.94851591	10.13650463	3.244221494	6.027866604
May	12.515584	20.82607532	6.959372332	29.88254168	29.90540627	2.297908215	7.643489464
Jun	150.69976	78.85288595	54.84090652	210.3860903	108.0021922	111.0210568	30.40036555
Jul	30.358379	35.41397612	94.71443027	144.905508	109.3931857	113.692052	86.50878697
Aug	99.460489	24.93475781	50.11814844	79.51167185	67.9029436	107.1676715	9.15515063
Sep	206.72492	44.90926484	133.8332024	270.0844718	105.7313459	149.8502122	112.3082221
Oct	122.74091	35.42645037	271.8032464	257.5300118	143.6680579	181.3103389	46.31778034
Nov	5.8037312	34.28751851	20.50132809	0.335322354	40.77494583	0.021041973	7.650698071
Dec	0.0777607	0	1.197637957	0	54.55476849	2.911411521	5.069471353
Total	**632.02815**	**288.68289**	**637.46685**	**1015.43981**	**685.95570**	**671.64024**	**312.51066**

ANNEXURE 5

REGRESSION & CORRELATION

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.340788016
R Square	0.116136472
Adjusted R Square	0.090883228
Standard Error	3.378730474
Observations	37

Correlation	*Column 1*	*Column 2*
Column 1	1	
Column 2	-0.340788016	1

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	52.49990968	52.49990968	4.598873445	0.039015405
Residual	35	399.5536865	11.41581961		
Total	36	452.0535962			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	8.608029822	0.638463889	13.48240671	2.01293E-15	7.311879219	9.904180424	7.311879219	9.904180424
X Variable 1	-0.017138791	0.007991981	-2.144498413	0.039015405	-0.033363376	-0.000914207	-0.033363376	-0.000914207

ANNEXURE 7

PHOTOS

CHAPTER 9
RECOMMENDATIONS

Introducing agroforestry practices by planting native, drought-resistant trees alongside crops can help further improve soil quality and provide additional income to farmers.

The program has established its efficacy, and the model can now be scaled to a larger number of villages to benefit more farming communities.

10. SUSTAINABILITY

The sustainability of the Bajaj Water Conservation Project, implemented by Shramjivi Janata Sahayyak Mandal, is embedded in its array of holistic community development strategies - participatory program design, capacity-building approach, efficient water resource management practices, creation of soil and air conservation structures and livelihood integration. The impact assessment study conducted by SoulAce clearly highlights that through these programmatic strengths, the intervention has been able to increase agricultural productivity, conserve water and enhance economic stability.

1. Community Institutionalization and Governance:

- Creation of community-based institutions: The establishment of community-based institutions like the Village Development Committees, Self-Help Groups and Water User Groups have ensured continuous water conservation efforts through the maintenance and monitoring of these conservation structures.
- Voluntary contribution of labour: Operationalising the concept of 'Shram daan' (voluntary contribution of labour towards community welfare), the villages have been able to repair and upkeep the conservation structures, highlighting community accountability and ownership.

2. Capacity building for long term impact:

- Knowledge Transfer through training sessions: The project provided training to the community members on multiple topics including technical aspects of water conservation structures ('matah' to 'paytha'), water-recharge techniques, agricultural enhancement techniques and land development strategies. These training sessions have equipped them with the knowledge and expertise required to ensure sustainability of the project in the long run.
- Continued access to expert guidance: Besides building local expertise, the program provides access to guidance from the program team members on a 'need' basis, even beyond the project timeline.

Additionally, infrastructure support such as the construction of gabion structures, staggered contour trenches and gully plugs reduce soil run-off while activities like Nala desilting enhance water retention and storage capacity.

Overall, the project design enhances its sustainability through the creation of long-term community assets and investments in building local expertise.

CHAPTER 11
CONCLUSION

The impact assessment study of the “Bajaj Water Conservation Project” collates critical information about the impact created by the CSR project of Bajaj Auto Limited in collaboration with Shramjivi Janata Sahayyak Mandal. It captures the activities undertaken, outcomes achieved, and the impact of the project on the drought-prone areas of Satara district. By increasing water availability, the program has ushered in a new wave of development in the area. Increased crop yield has enhanced family income. Improved drinking water accessibility and farmer’s training have resulted in reduced financial expenditure. On a community and State level, it has addressed the problems of migration, water scarcity, and poverty. It has also been instrumental in creating social cohesion as communities come together to manage the project resources collectively post-program completion.

IMPACT ASSESSMENT REPORT

BAJAJ WATER CONSERVATION PROJECT PHASE III

Implementing Partner: SPARSH - Center for participatory learning
(Technical Partner- Nirman Bahuuddeshiya Sanstha, Aurangabad)

Release Date: 31-12-2024

SoulAce
Path to Sustainability
SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
FY	Financial Year
NGO	Non-Governmental Organisation
SDGs	Sustainable Development Goals
SHGs	Self Help Groups
VDC	Village Development Committee
WUG	Water User Group

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

In collaboration with Bajaj Auto Limited, SPARSH- Centre for Participatory Learning began working towards the cause of sustainable water conservation. The CSR initiative titled 'Bajaj Water Conservation Project Phase III' was initiated after the successful completion of a similar project in the Gangapur district in Aurangabad. SPARSH, having a strong base of working with the community, played the lead role in project implementation, whereas NIRMAN, having expertise in planning and implementation of watershed activities, took up the technical responsibilities.

The project included eight villages from Vaijapur taluka of Aurangabad district of Maharashtra, spanning across an area of 8543.04 hectares. Along with water conservation, the project has not only helped develop livelihood options for the beneficiaries but also worked on enhancing their agricultural output. On the whole, the project was an exercise in mitigating the water crisis and increasing income generation for the rural population.

PROJECT DETAILS

Implementation year

FY 2019 - FY 2022

Assessment year

FY 2024 - FY 2025

Implementing Partner

SPARSH - Center for Participatory Learning (Technical Partner - Nirman Bahuuddeshiya Sanstha, Aurangabad)

Project location

Aurangabad District, Maharashtra

Beneficiaries

Marginalized Tribal Communities of 5 villages (Rahegaon, Amanatpurwadi, Undiwadi, Bahigaon Ganga, Pashapur] from Block Vaijpur

Budget

₹735 Lakhs

Alignment with SDGs

PROJECT ACTIVITIES

WATER RESOURCES DEVELOPMENT

- In situ soil moisture conservation.
- Nala deepening and widening are based on existing and proposed water harvesting structures.
- Construction of Cement Nala Bunds, etc.
- Recharge Shafts to recharge the shallow aquifer.
- Construction of Farm Ponds.
- Micro Irrigation, including Drip and Sprinkler irrigation.

LIVELIHOOD DEVELOPMENT

- Promotion / Strengthening of SHGs by providing help in livelihood support activity.
- Organise and conduct training in small enterprises (units) like dairy, goatery, poultry, drone and patravali making, electric motor, saloon and tailoring.

AGRICULTURE PRODUCTIVITY ENHANCEMENT

- Training on making Amrit Jal fertiliser.
- Creating Vermicompost Units to increase the organic carbon of soil.
- Promotion of Kitchen Garden.

COMMUNITY MOBILISATION AND CAPACITY BUILDING

- Conduct activity-wise skill development training for SHG members.
- Organise and conduct training of water user groups for community contribution collection, work quality supervision and structure maintenance.
- Formation of Village Development Committees in all project villages along with their training orientation for enhancing community involvement.
- Conduct 10 Jalmitra training sessions for community awareness and community contribution.

SOULACE TEAM AT THE PROJECT IMPLEMENTATION SITE IN RAHEGAON

Key Findings

40.0%
of the respondents belonged to the age group of 18-30 years, while 22.0% of them were between 31-45 years. 20.0% of them were senior citizens above 60 years of age.

63.6%
of the respondents were males, while the rest of them were females.

44.1%
of the respondents earned an annual family income between Rs. 2.1 lakhs to 3 lakhs, while 33.9% of them earned between Rs.1.1 lakhs and 2 lakhs.

42.4%
of the respondents owned 1 to 2 hectares of land, while 25.0% of them owned 2 to 3 hectares. 11.9% of them owned less than 1 hectare.

15.7%
of the respondents grow fruit-bearing trees on their farmland.

43.2%
of the respondents grow vegetables on their farmland.

96.6%
of the respondents were dependent on groundwater (wells/borewells) for irrigation purposes, which underscores the need for the implementation of such a project.

90.3%
confirmed Nala deepening and widening activities being carried out in their area, followed by 75.4% who reported about the construction of a new Cement Nala Bund and 36.9% who witnessed the repair of a Cement Nala Bund.

99.2%
of the respondents reported using drip irrigation methods as part of the project.

Key Impacts

69.9%
of the respondents mentioned that they could save 10.0 to 20.0% of water usage for irrigation through the micro-irrigation methods. 18.6% of them also mentioned saving 20 to 30.0%.

Less than 0.25 hectares of land have been cultivable due to increased water availability for irrigation after the project intervention, as reported by 47.5% of the respondents. For 28.8% of them, this area went up to 0.50 hectares, while for 16.1% of them, it was an increase between 0.5 and 0.75 hectares.

66.5%
of the respondents reported a 15.0-19.0% increase in the yield of Kharif crops after the project implementation, followed by 10.6% of them who reported a 10-14% increase. 22.9% of them witnessed an increase of more than 20% in their agricultural yield.

For 47.9% of the respondents, there was an increased yield in Rabi crops by 15.0-19.0%, followed by an increase of over 20.0% being reported by 40.3% of them.

72.9%
of them reported being dependent on water tankers for more than 6 months in a year before the project intervention, whereas 71.6% of them reported that the dependency had reduced to one month in a year after the project implementation.

73.5%
of the respondents agreed that there was a 10-20% increase in their annual income through vegetable cultivation post-project implementation. This was followed by 11.8% of them who experienced more than a 30.0% increase in their income.

All of the respondents followed the water governance protocols and surveillance mechanisms established by the community institutions.

03. OECD FRAMEWORK

RELEVANCE

The project was instrumental in increasing water accessibility in a drought-prone area. By addressing the issue of water scarcity, both for domestic and agricultural purposes, the project has taken a holistic approach to solving the problem of water availability. Livelihood interventions through SHG strengthening and skill development initiatives were also aligned with the community's socio-economic needs, particularly for such marginalised families.

COHERENCE

The intervention is well aligned with:

It is also following Government of India programs like:

- Pradhan Mantri Krishi Sinchayee Yojana
- Atal Bhujal Yojana
- Jal Shakti Abhiyan

EFFECTIVENESS

The project has been able to enhance water security in the region, which was the primary objective of the intervention. With the development of water structures like cement nala bunds, gabions, and recharge shafts, the project has saved and stored water for continued agricultural and domestic usage. Additionally, by introducing organic fertilisers and irrigation techniques, the project has improved soil quality and increased agricultural output. Most importantly, the project has been effective in the capacity building of SHGs, who are now empowered in their small business skills and agricultural practices.

EFFICIENCY

The program has been able to utilise its resources to combat multiple challenges on the field and deliver positive results. For example, when women members were not taking an interest in coming together and forming a new SHG, the team took a series of meetings with women members and made them aware of the benefits of it and also provided information on different government schemes for SHG. It also showed them examples of good SHG practices carried out in other villages. This highlights that the project team has always been finding innovative ways of tackling issues on the field and ensuring that the project is implemented properly.

IMPACT

The project has been able to drive a huge change in the area of intervention. At the individual and household level, it has been able to increase agricultural productivity and provide stable earnings. Improved water availability also reduced time spent on water collection, freeing time for income-generating or educational pursuits. Engaging village-level committees such as the Village Development Committees and Water User Groups, the project has encouraged community cohesion and self-sufficiency, empowering local communities to manage resources on their own. Environmentally, soil and water conservation measures have led to an increase in groundwater levels, a decrease in soil erosion, and improved soil fertility.

SUSTAINABILITY

The project has ensured its sustainability by empowering local bodies such as the Village Development Committees with relevant water management skills and encouraging community ownership of structures like recharge shafts and farm ponds. Mobilising community members in the form of Jalmitras has ensured that the project activities directed towards conscious and sustainable water usage are practised in the long term. The establishment of SHGs and capacity building in diverse livelihood activities ensures that people are able to sustain themselves even after the project is completed.

CHAPTER 4
INTRODUCTION

SoulAce team member with Self-Help Group Beneficiaries at Rahegaon

NEED OF THE PROGRAM

The district of Aurangabad faces major climatic challenges. As per the agro-climatic chart, the area falls under the water-scarce zone and has witnessed a significant number of droughts over the years. During the implementation phase, the project area received only 293 mm (55%) of rainfall against an annual average of 535 mm and Vaijapur taluka was declared as a 'severe' drought hit region. Agriculture, being the key source of livelihood in the area, came to a standstill with the erratic nature of rainfall in the area. Most of the time, dry spells occur during the rainy season and extend up to 20 days. Drinking water scarcity, lack of irrigation facilities, and depleted groundwater levels became the pressing concerns for the people. The cultivation of cotton, which is a major crop grown in the area and requires high input cost, also took a hit, pushing multiple farmer families into poverty and loss of livelihood.

Therefore, to address the challenges of water scarcity and income generation, the project started working on water conservation and agriculture enhancement methods using an alternative paradigm of development that values appreciating people's basic potential to lead the process of socio-economic change.

Livelihood promotion and resource management were used as instruments to build leadership and entrepreneurial skills of individuals, communities, systems and institutions.

OBJECTIVES OF THE PROGRAM

To strengthen and sustain the drinking water sources in the project villages, benefitting the project households and livestock.

To promote and capacitate community-based organisations like VDC, WUG, and SHGS for effective implementation of project activities and to take up post-project management interventions.

To conserve the runoff through restoration of water harvesting capacities of existing water conservation structures and construction of new structures in series.

To increase the ground water level, benefitting for increasing protective and seasonal irrigation potential.

To promote water management practices for efficient use through capacity building of the user community as well as through the promotion of micro irrigation.

To increase farmers' awareness level of improved agriculture practices, especially focusing on low external input sustainable agriculture techniques.

To enhance the income level of project households through enhanced access to on-farm water and diversified livelihood sources for resource-poor families.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – SPARSH – CENTRE FOR PARTICIPATORY LEARNING & NIRMAN

SPARSH – Centre for Participatory Learning is a social organisation that works to empower communities through education, capacity building, and participatory learning initiatives. With the mission of addressing socio-economic inequalities, SPARSH believes in fostering sustainable development by placing community needs first and encouraging the active involvement of community members in each of its projects. Through multiple programs spread across the domains of health, education, livelihood, and environment, SPARSH collaborates with local stakeholders, NGOs, government bodies, and corporations to drive meaningful change. By fostering local leadership and building capacity within communities, SPARSH promotes self-reliance and sustainable growth.

NIRMAN, the technical knowledge partner for this project, is an organization dedicated to promoting need-based and sustainable livelihoods. Backed by a trans-disciplinary team with expertise in social sciences, management, ecology, environmental sciences, engineering, and information technology, it brings a strong academic foundation to its initiatives.

INTERACTION WITH GRAM PANCHAYAT MEMBERS AT UNDIRWADI

CHAPTER 5
RESEARCH METHODOLOGY

SoulAce was appointed by Bajaj Auto Limited to conduct a study on the work done by SPARSH and assess the impact of its CSR initiative in improving water availability and conservation in the rural areas of Aurangabad, Maharashtra.

OBJECTIVES OF THE STUDY

The primary objectives of the study were to:

- To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.
- To measure the extent to which the project has been able to develop a sustainable model of participatory water conservation and management for the long-term well-being of primary stakeholders.
- To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders, such as community members, local Panchayat members, village development committees, water user groups, Self-help groups and project staff, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- the community members, yielding statistical insights and identifying trends. By employing a mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries, stakeholders, and those responsible for project implementation. Engaging stakeholders like local Panchayat members, village development committees, water user groups, Self-help groups and project staff through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of the improvements in the availability of water and sustainable water usage brought about by the project. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques are employed to evaluate the project and its impacts objectively through data analysis. Surveys and questionnaires are utilised to collect numerical data on various indicators from the beneficiaries. By comparing the data gathered before and after the intervention, the project and its effects and the enhancements it has facilitated can be assessed. These quantitative methods provide a measurable approach to gauge the project and outcomes and evaluate its success through statistical evidence.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including interviews with beneficiaries, field notes, interactions with other stakeholders, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact. Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions.

This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method. Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

RESEARCH DESIGN

Name of the project

Bajaj Water Conservation Project Phase III

Implementing agency

SPARSH - Center for participatory learning

Research design used

Descriptive research design

Sampling technique

Random Stratified sampling

Sample size

236 beneficiaries

Qualitative method used

Semi-structured interviews, testimonials and focus group discussions with beneficiaries along with key stakeholders

KEY STAKEHOLDERS

- Community Members
- Local Panchayat members
- Village Development Committees
- Water User Groups
- Self Help Groups
- Project Implementation team

STUDY TOOLS

Questionnaires for primary beneficiaries – Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys. Questionnaires and focus group discussion guide for stakeholders – A semi-structured questionnaire and focus group discussion guide were developed for each type of sample of this group. Stakeholders were identified across the focus areas. Semi-structured questionnaires and focus group discussions were conducted with local Panchayat members, village development committee members, water user groups, self-help group members and project staff.

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. With strict adherence to ethical research principles, the study ensured the safeguarding of participants' rights and well-being throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of influence or obligation, reinforcing the principles of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

CHAPTER 6
MAJOR KEY FINDINGS

The chapter delves into the collaboration between Bajaj Auto Limited and SPARSH, which is directed towards increasing water availability and enhancing livelihood amongst the marginalised population.

GEOGRAPHICAL COVERAGE

The intervention was implemented in 5 villages [Rahegaon, Amanatpurwadi, Undirwadi, Bhaigaon Ganga, Pashapur] from Block Vaijapur of Aurangabad District, Maharashtra, India.

OUTREACH AND INCLUSIVITY

The primary beneficiaries of the program were mostly farmers from rural communities.

"The Gram Panchayat members underwent hands-on training that covered the maintenance, monitoring, and effective use of water resource structures, focusing on practical skills and surveillance techniques. Post-training support included access to maintenance tools, resource materials, and ongoing guidance from experts for effective management of the water resource structure.

Vijay Shaynath Kadam, Gram Panchayat Member, Bhaygoan Ganga"

MEETING WITH SHG MEMBERS

KEY FINDINGS

CHART 1: AGE-WISE DISTRIBUTION OF THE RESPONDENTS

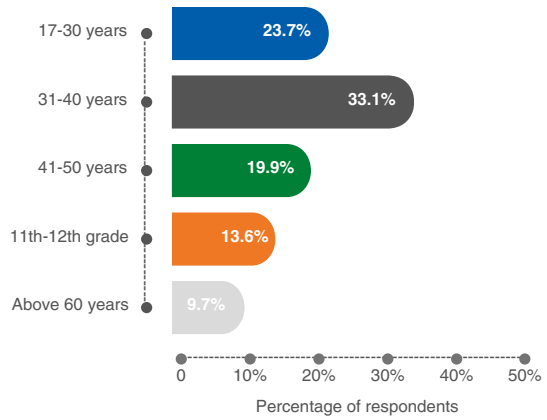


Chart 1 shows that 23.7% of the respondents belonged to the age group of 17-30 years, while 33.1% of them were between 31-40 years. 9.7% of them were senior citizens above 60 years of age.

CHART 2: GENDER-WISE DISTRIBUTION OF THE RESPONDENTS

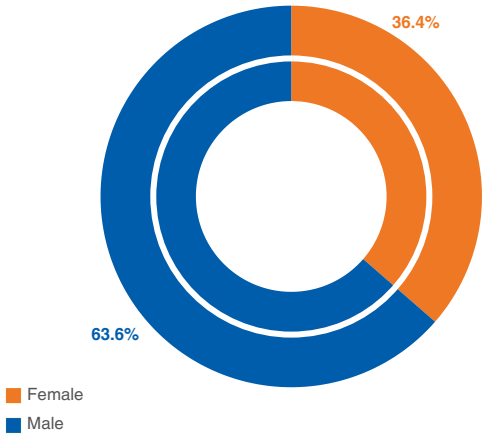


Chart 2 reveals that 63.6% of the respondents were males, while the rest of them were females.

CHART 3: ANNUAL FAMILY INCOME OF THE RESPONDENTS

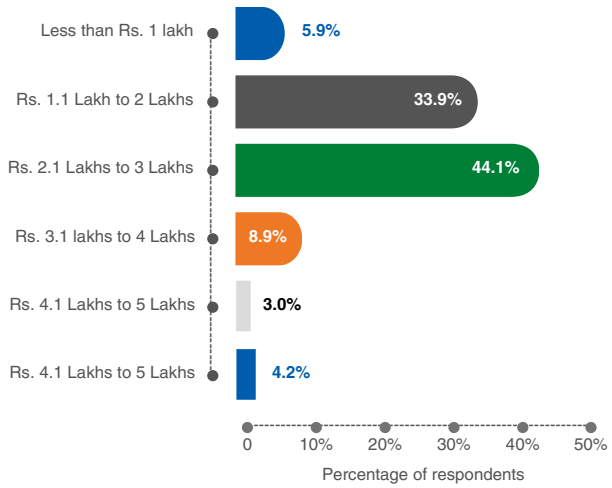


Chart 3 reveals that 44.1% of the respondents earned an annual family income between Rs. 2.1 lakhs to 3 lakhs, while 33.9% of them earned between Rs.1.1 lakhs and 2 lakhs. 5.9% of them earned below Rs. 1 lakh. While most of them worked hard to meet their household expenses, the number of family members, limited rainfall and reduced selling price of agricultural produce negatively impacted their livelihood.

INTERACTION WITH THE SARPANCH AT RAHEGAON

CHART 4: AREA OF LAND OWNED

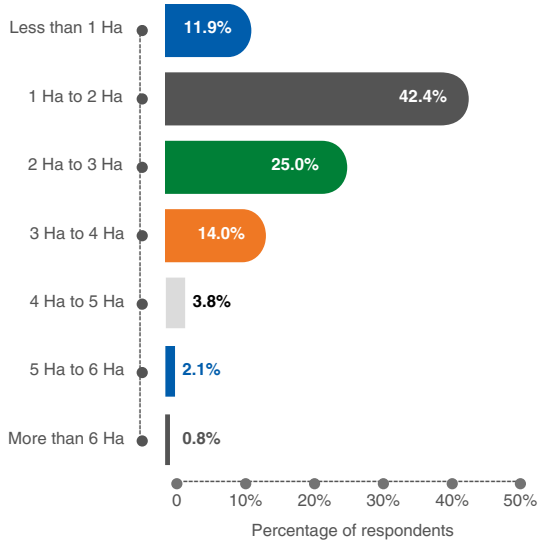


Chart 4 shows that 42.4% of the respondents owned 1 to 2 hectares of land, while 25.0% of them owned 2 to 3 hectares. 11.9% of them owned less than 1 hectare. This signifies that most of them were small-scale farmers with limited land resources. Agriculture is the major source of livelihood, and such small farms often limit their income generation capacity.

INTERACTION WITH BENEFICIARY OF VERMICOMPOST

CHART 5: MAJOR CROP CULTIVATED

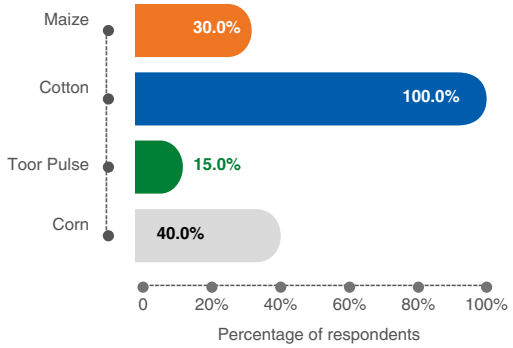


Chart 5 demonstrates that all the respondents cultivated cotton. Cotton is a water-intensive crop that requires a good amount of rainfall. This shows that their livelihood is hugely dependent on the availability of water in the area.

CHART 6: WHETHER GROW FRUIT BEARING TREES IN THE FARM LAND

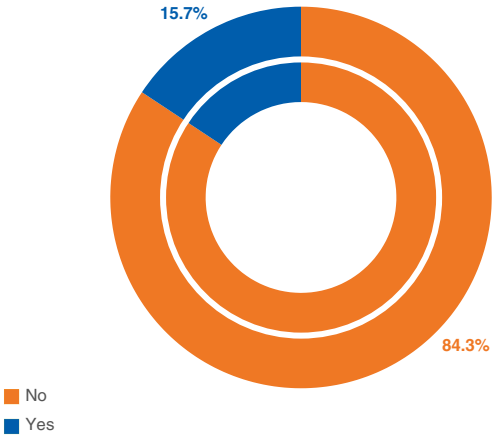


Chart 6 shows that 15.7% of the respondents grow fruit-bearing trees on their farmland. These include fruits like sweet lemon (mosambi) and mango.

CHART 7: WHETHER GROW VEGETABLES IN THE FARM LAND

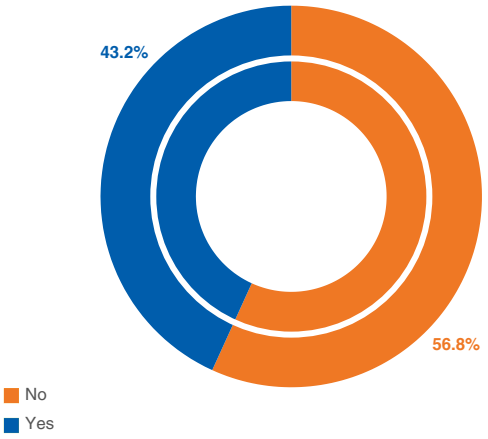


Chart 7 shows that 43.2% of the respondents grow vegetables on their farmland. These include Coriander (Kothambir), Onion, Tomato, Chilli, Brinjal and Ginger.

> The farmers of our village have started cultivating 'export quality' fruits and vegetables, which has increased their daily wages. These individual beneficiaries have become more independent due to the project.
>
> **-Subash Bargal, VDC President, Mandki village**

CHART 8: SOURCE OF WATER FOR IRRIGATION

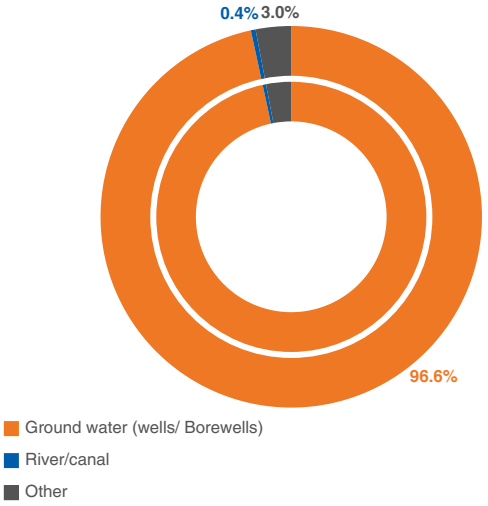


Chart 8 demonstrates that 96.6% of the respondents were dependent on groundwater (wells/borewells) for irrigation purposes, highlighting the need for such a water conservation project which would increase the groundwater levels.

> I was introduced to the concept of forming a Self-Help Group (SHG) through community development programs and workshops. Being part of an SHG has significantly boosted my sense of empowerment and decision-making ability, allowing me to contribute more actively to the group and my community.
>
> **Kalinda Laxman Kadam, SHG member, Undirwadi**

CHART 9: TYPE OF WATER RESOURCE DEVELOPMENT ACTIVITY CARRIED OUT IN THE COMMUNITY

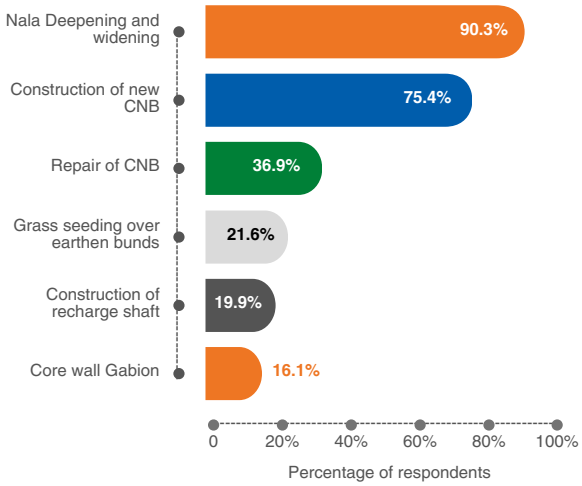


Chart 9 reveals that 90.3% confirmed Nala deepening and widening activities being carried out in their area, followed by 75.4% who reported about the construction of a new Cement Nala Bund and 36.9% who witnessed the repair of a Cement Nala Bund. Grass seeding over earthen bunds was confirmed by 21.6% of them, along with the construction of recharge shaft in 19.9% of cases, and core wall Gabion construction was reported by 16.1% of them.

CHART 10: TYPE OF THE MICRO-IRRIGATION ADOPTED THROUGH BWCP- SPARSH

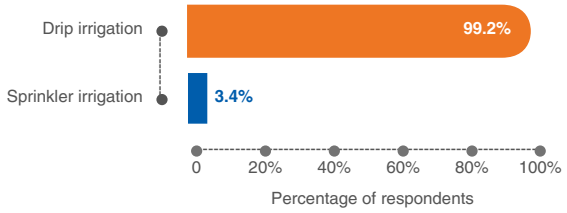
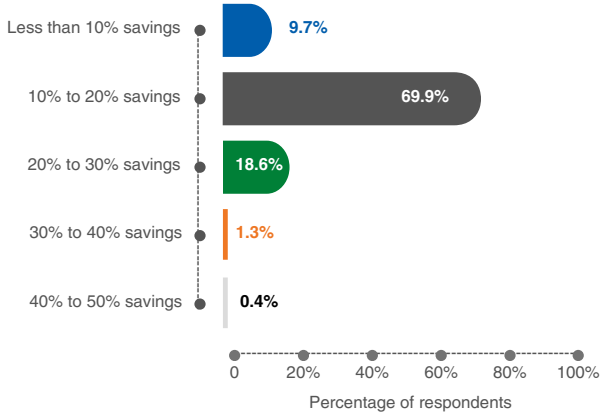


Chart 10 shows that 99.2% of the respondents reported using the drip irrigation method as part of the project.

CHART 11: PERCENTAGE OF SAVINGS OF WATER USAGE FOR IRRIGATION THROUGH THE MICRO-IRRIGATION METHOD



In Chart 11, 69.9% of the respondents mentioned that they could save 10 to 20% of water usage for irrigation through the micro-irrigation methods. 18.6% of them also mentioned saving 20 to 30%. This highlights the project outcome of saving water and managing water usage for agricultural needs. Qualitative interviews also point out that the water saved is then used for other purposes, including domestic use. This has reduced the burden on the women for whom the scarcity of water for household usage is a major stressor.

CHART 12: ADDITIONAL LAND AREA THAT HAS BEEN MADE CULTIVABLE DUE TO INCREASED WATER AVAILABILITY FOR IRRIGATION AFTER THE PROJECT INTERVENTION

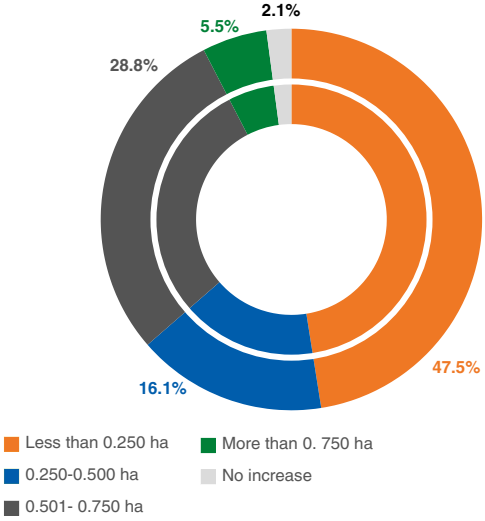


Chart 12 reveals that less than 0.25 hectares of land has been made cultivable due to increased water availability for irrigation after the project intervention, as reported by 47.5% of the respondents. For 28.8% of them, this area went up to 0.50 hectares, while for 16.1% of them, it was an increase between 0.5 and 0.75 hectares. This showcases that the project has been able to achieve the immediate output of increasing agricultural land under irrigation.

CHART 13: PERCENTAGE INCREASE IN THE YIELD OF KHARIF CROPS FOLLOWING THE CSR INTERVENTION

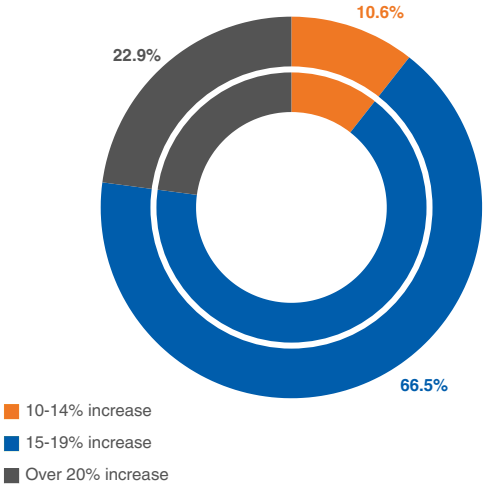


Chart 13 shows that 66.5% of the respondents reported a 15-19% increase in the yield of Kharif crops after the project implementation, followed by 10.6% of them who reported a 10-14% increase. 22.9% of them witnessed an increase of more than 20% in their agricultural yield.

CHART 14: PERCENTAGE INCREASE IN THE YIELD OF RABI CROPS FOLLOWING THE CSR INTERVENTION

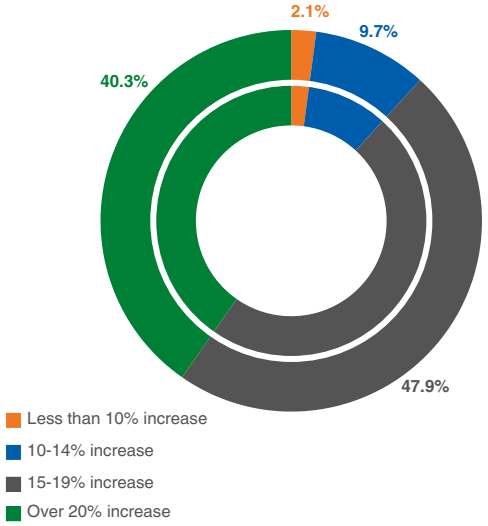


Chart 14 shows that for 47.9% of the respondents, there was an increased yield in Rabi crops by 15-19%, followed by an increase of over 20% being reported by 40.3% of them. This showcases the success of the project in achieving outcomes which are in line with the project objectives. Qualitative interviews suggest that alongside the water conservation and irrigation methods, this increase was also attributed to the training given by the project team in enhancing agricultural output.

> I had a positive experience learning about the preparation of Amrit Jal as a bio-fertiliser, including its ingredients, fermentation process, and benefits for improving soil health and enhancing crop growth. I use Amrit Jal as part of my farming routine every two to four weeks, depending on the crop's growth stage and the soil's nutrient needs. I have noticed improvements in my soil condition, such as increased fertility, better moisture retention, and a healthier soil structure.
>
> **Gangadhar namdev Shelar, community member, Rahegaon**

CHART 15: NO. OF MONTHS IN A YEAR THE RESPONDENTS ARE DEPENDING ON WATER TANKERS FOR DRINKING WATER

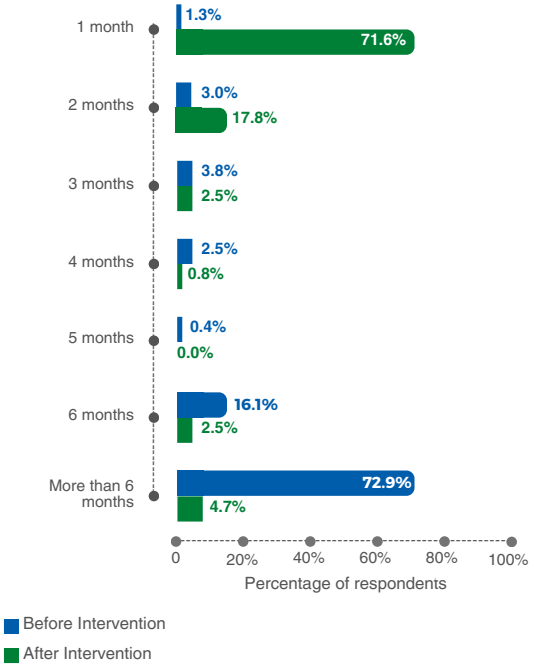


Chart 15 reveals the change in the number of months in a year during which respondents are depending on water tankers for drinking water. 72.9% of them reported being dependent on water tankers for more than 6 months in a year before the project intervention whereas 71.6% of them reported that the dependency had reduced to one month in a year after the project implementation. This testifies that the project has enhanced the quality of life of people by increasing their access to water and saving up on the economic costs of ordering tankers.

PRESIDENT AND SECRETARY OF SHG GROUPS - AMANATPURWADI

CASE STUDY

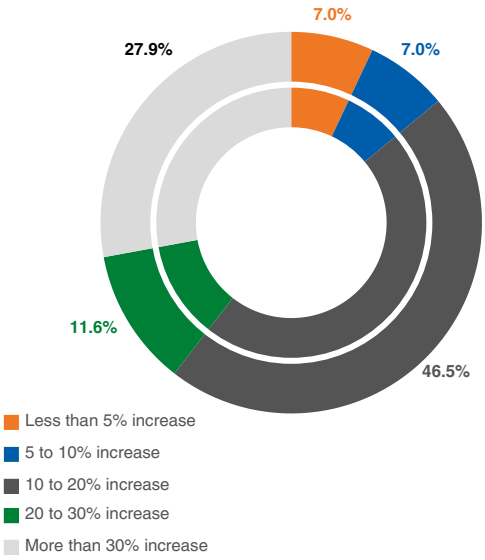
Amanatpur Wadi is a rural village that faces acute water scarcity, especially during the summer months. With no permanent water sources, the village relied heavily on local tanker services, which strained every household's finances. For Sandip Dhumale, a farmer, the lack of water also meant that farming was entirely rain-dependent, leaving him unable to grow crops during dry seasons. This severely limited his income and the village's agricultural output.

Through the CSR intervention, multiple initiatives were carried out in the village, which included providing basic training to villagers about sustainable water use and resource management, developing water infrastructure to ensure year-round availability, and promoting multi-cropping practices to maximise agricultural output. Villagers were actively involved in the project by contributing their resources and participation, fostering a sense of ownership and responsibility.

The project ushered a new wave of transformation in the village as the construction of these water structures eliminated the need for costly tankers. Farmers, including Sandip, can now use water for summer crops, enhancing their income. Additionally, the adoption of multi-cropping has diversified crop production, improving the village's economy.

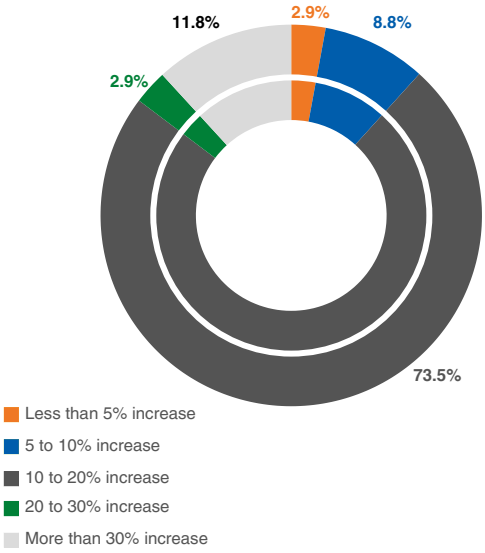
Sandip believes such initiatives should be replicated in other villages to achieve widespread benefits. He emphasises the need for long-term engagement to ensure sustained development and support for rural communities.

CHART 16: PERCENTAGE INCREASE IN ANNUAL INCOME FROM THE CULTIVATION OF ORCHARD AFTER INTERVENTION



In Chart 16, 46.5% of the respondents reported a 10-20% increase in their annual income through orchard cultivation post project implementation. This was followed by 27.9% of them who experienced more than 30% increase in their income.

CHART 17: PERCENTAGE INCREASE IN ANNUAL INCOME FROM THE CULTIVATION OF VEGETABLES AFTER INTERVENTION



In Chart 17, 73.5% of the respondents agreed that there was a 10-20% increase in their annual income through vegetable cultivation post-project implementation. This was followed by 11.8% of them who experienced more than a 30% increase in their income.

In the qualitative interviews, stakeholders suggested that this increase was possible only because of the agriculture-enhancing techniques taught through the project. This reveals that the project's holistic approach was able to create multiple pathways for increasing the yield and income of the beneficiaries.

> "I've grown herbs like basil and mint, leafy greens such as spinach and lettuce, tomatoes, peppers, and root vegetables like carrots and radishes. Not only has it provided a regular supply of fresh herbs and vegetables to the household, but it has also reduced our grocery expenses. Kitchen gardening has enhanced my view on food security and self-reliance, making me less dependent on external sources for fresh produce."
>
> **Chabu Sheshrao Kadam (Kitchen Garden beneficiary)**

CHART 18: WHETHER FOLLOW THE WATER GOVERNANCE PROTOCOLS AND SURVEILLANCE MECHANISMS ESTABLISHED BY THE COMMUNITY INSTITUTIONS

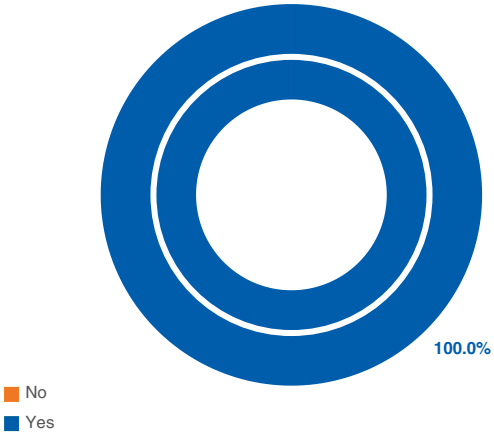


Chart 18 highlights that all the respondents follow the water governance protocols and surveillance mechanisms established by the Community institutions. They are members of some of these institutions and are involved in taking the necessary steps to conserve water and maintain the work done throughout the project. Focus Group Discussions with the community members reveal that the training provided to Water User Groups and Village

Development Committees has been very useful in developing a sense of ownership among the villagers. It has also motivated them to work towards critical issues like water conservation. Everyone now feels more involved in initiating this huge change in the village.

> We conduct checks monthly, and my role involves coordinating inspections, documenting any issues, and facilitating repairs as needed. The Water User Group ensures effective use by regularly monitoring the structures and coordinating irrigation schedules with farmers. Implementing rotational irrigation schedules, promoting water-saving techniques are some of the guidelines that we follow. I've observed improved water availability, higher crop yields, and more efficient irrigation practices.
>
> **Bhagvan Kadu Ubale, Water User Group member**

> The Gram Panchayat members underwent hands-on training that covered the maintenance, monitoring, and effective use of water resource structures, focusing on practical skills and surveillance techniques. Post training support included access to maintenance tools, resource materials, and ongoing guidance from experts for effective management of the water resource structure.
>
> **Vijay Shaynath Kadam, Gram Panchayat Member, Bhaygoan Ganga**

INTERACTION WITH FARMERS AT UNDIRWADI

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- There has been an increase in agricultural productivity as farmers reported an increase in their crop yield due to increased water availability from the micro-irrigation systems. This has also led to an increase in their income.
- The increase in water table levels has resulted in an increase in the availability of water in wells and borewells, benefitting women who can now access it easily for their domestic use.
- The skill development initiatives have been instrumental in providing valuable insights about enhancing agricultural output as well as rearing livestock. It has also helped SHGs in boosting their self-confidence.
- With the introduction of techniques for creating Amrit Jal and vermicompost, the farmers have been able to reduce dependency on chemical fertilisers, improving soil health and cutting down on high input costs.

FAMILY LEVEL

- Families experienced improved livelihood and food security with a stable flow of income from diversified livelihood options.
- The kitchen gardens became a source of access to fresh fruits and vegetables, fulfilling the health and nutritional needs of the household and reducing expenditure on food.
- Reliable sources of water reduce the time spent on water collection, especially by women who can now devote it to other productive activities.

COMMUNITY LEVEL

- Training of water user groups and the formation of Village Development Committees helped foster community ownership, ensuring sustainable maintenance and management of water structures.
- Community members, trained as Jalmitras, now serve as water conservation advocates, helping raise awareness on conscious water management practices and contributing to the long-term sustainability of the resource.
- With the availability of water and agricultural productivity enhancements, the project has fostered a more stable and resilient local economy, reducing the community's vulnerability to seasonal water shortages.
- Farmer suicides in the village have significantly reduced due to the increased livelihood linkages provided through the program.

STATE LEVEL

- Enhanced agricultural productivity from improved irrigation and sustainable soil practices contributed to the state's agricultural output, benefiting both food security and the local economy.
- With the increase in water availability and stability of income, the project has been able to reduce the rate of farmer suicides in the State of Maharashtra.
- The project set an example of scalable and integrated water resource management and community involvement for other regions within the state.

CHAPTER 8
HYDROLOGICAL ASSESSMENT

OBJECTIVES OF THE ASSESSMENT

Change in surface water holding capacity and reduction in Run-off.

Change/improvement of Groundwater table/recharge.

Change in land use pattern, agricultural productivity, and soil moisture conditions.

PROJECT LOCATIONS

The project was implemented in the Gangapur taluka of Aurangabad district. The measures that were implemented as a part of the water conservation efforts can broadly be categorised into construction and repair of Water Harvesting Structures (WHS), measures for Soil Moisture Conditions (SMC) improvement, and promoting water use efficiency. The details of the same are as below:

TABLE 1: DETAILS OF THE INTERVENTIONS

District	Aurangabad	Block	Vijapur	Area of Watershed	172.5902 Sq. Km
	Cement Nala Bund	KT Weir	Percolation Tank	Farm Pond	Farm Bund
Nos.	44 + 38	3.00	13.00	125.00	1185.40
Capacity Cubic Meters	387000	13500	39000	187500	1481750

The maps below give the location of the intervention watershed in the Aurangabad district of Maharashtra and all the available locations of the various interventions across the intervention watersheds as a part of this project.

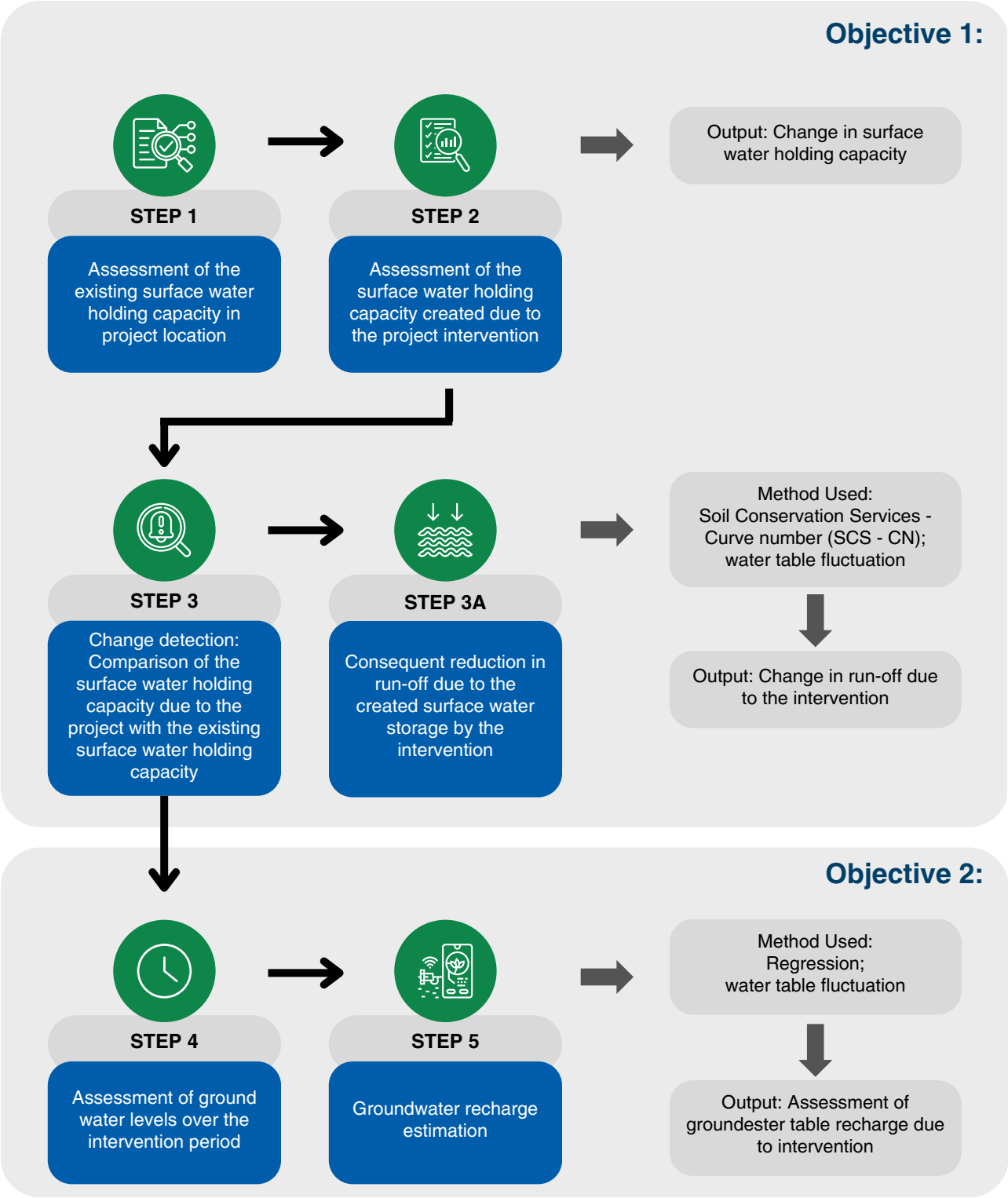
FIGURE 1: PROJECT LOCATIONS IN AURANGABAD

The additional parameters that were considered are geology, hydrogeology, and soil types, and the information about the same is provided in Annexure 1.

While some of the assessments, such as the run-off estimation and the contribution of the interventions to the ground water levels, were done only considering the intervention area, some assessments, such as the rainfall and the ground water depth assessments, had to be done considering a larger area such as the entire block or the district due to the constraints faced with data availability. Care was taken to ensure that the results were represented correctly in this condition to varying assessment units.[1]

ASSESSMENT APPROACH

The assessment approach consists of various steps for each objective, as shown below:



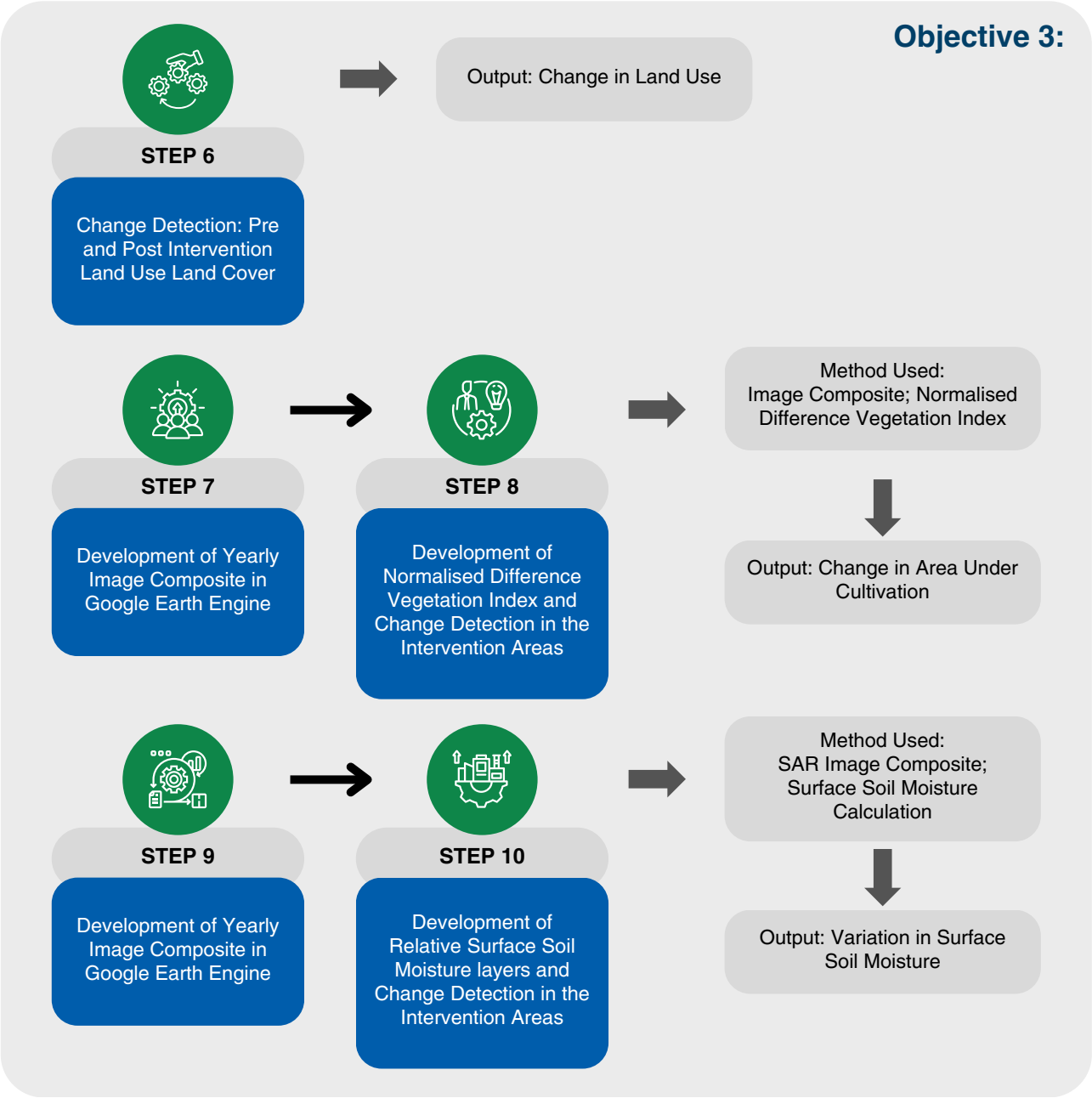


FIGURE 3: APPROACH OF THE ASSESSMENT

The rainfall and the ground water depth assessments were done with the district as the unit of assessment as these parameters, i.e., rainfall and ground water are not bound on the surface by any constraints and can be reasonably generalised for the project area.

DATA COLLECTION

The following datasets have been collected from the field to facilitate the objectives of the study:

- Photos from the field survey (Annexure 5)

In addition to the above datasets, additional data was collected from various sources to fill in the data gaps that were present in the conduct of the assessment. These are as follows:

- Depth to water level from the NGO partners and the Central Ground Water Board (CGWB) (Annexure 2)
- Rainfall data from the Indian Meteorological Department (IMD) (Annexure 3)

Other datasets that were used in the assessment are as follows:

- Soil types from the National Remote Sensing Centre[2] (Annexure 1)
- Aquifer system from Central Ground Water Board (CGWB) (Annexure 1)
- Specific Yield from Central Ground Water Board (CGWB) (Annexure 1)
- Land Use Land Cover change between 2017 – 2023 from ESRI Living Atlas[3]
- Global Hydrologic Soil Groups for Run-off Estimation[4] (Annexure 1)

RESULTS

The results of the assessment to identify the impacts of the interventions on water conservation are presented in the below sections. It includes an assessment of rainfall and water level trends, an estimation of recharge due to rainfall, an assessment of surface water holding capacity and the associated run-off reduction and the estimation of recharge due to the interventions, the change in land use land cover, the changes in vegetation levels, and the changes in soil moisture conditions over the course of the intervention period.

Analysis of Rainfall Trends

Overall, while the values of rainfall have shown a slight positive trend during the intervention period, with significant peaks observed during the north-east monsoon period. The graphs below show the trend in their change over time.

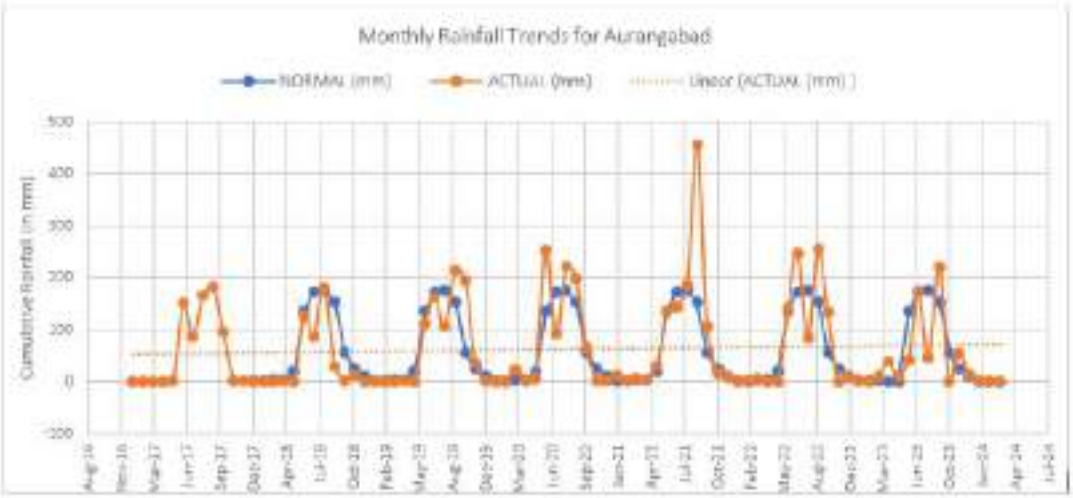


FIGURE 4: MONTHLY CUMULATIVE RAINFALL OVER THE INTERVENTION PERIOD (IN MM)

The trends of normal and actual rainfall reveal that over the intervention period, the rains have been above normal for most of the years. The slight positive trend that comes through is due to the above-normal rainfall received in June and August of most years and the unseasonal rainfall received in some of the years during the non-monsoon months.

[2] Soil and Land Resources Assessment Division, National Remote Sensing Centre, ISRO

[3]Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.

[4]Ross, C.W., L. Prihodko, J.Y. Anchang, S.S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Run-off Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1566

Change in Water Level

The depth to water level data was obtained from two sources: one is the NGO partners, and the other is the annual Ground Water Year Books for Maharashtra published by the Central Ground Water Board (CGWB) for the years between 2017 and 2023. However, a complete collection of the data for the entire period from 2017 and since was not available with either source. Thus, for the final assessment, the datasets from both sources were combined after evaluating them individually and ensuring cohesion, and any missing values were filled out using statistical methods. The detailed dataset is provided in Annexure 2. The figures below show the ground water level trends in in the intervention districts:

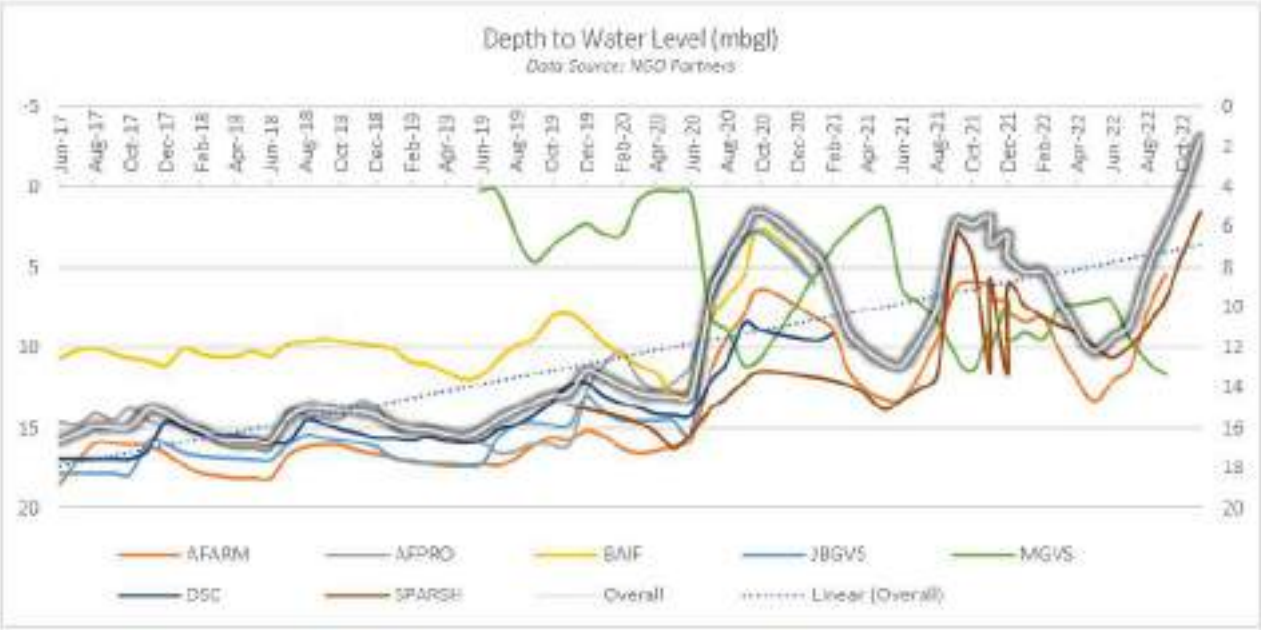


FIGURE 5: DEPTH TO WATER LEVEL (IN MBGL) – NGO PARTNERS

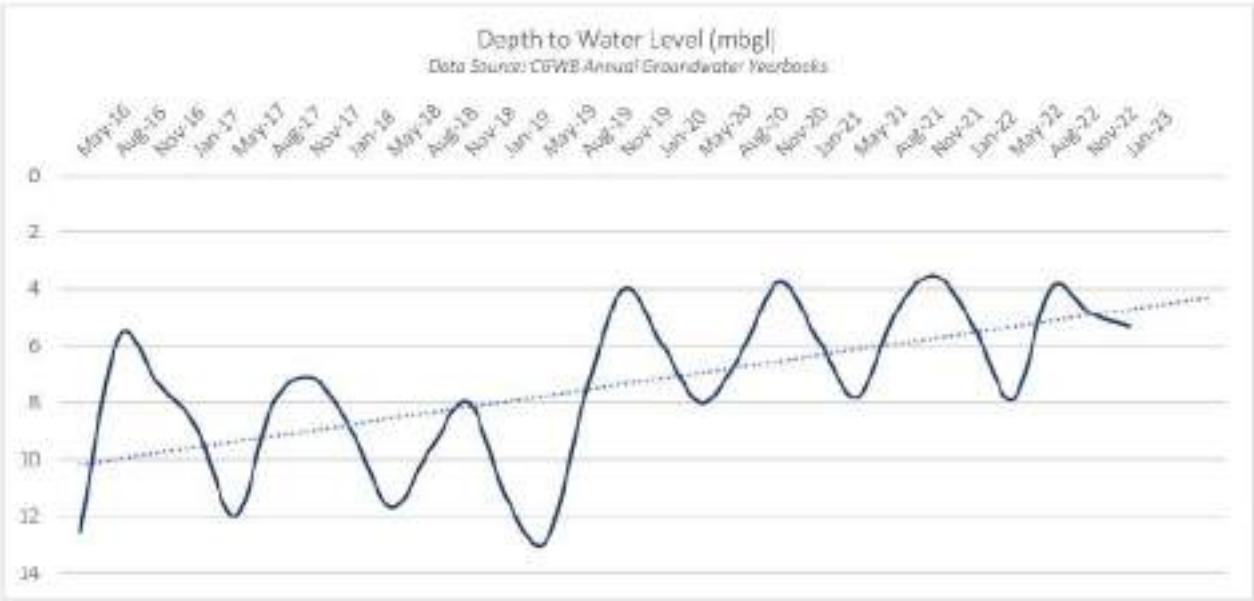


FIGURE 6: DEPTH TO WATER LEVEL (IN MBGL) – CGWB

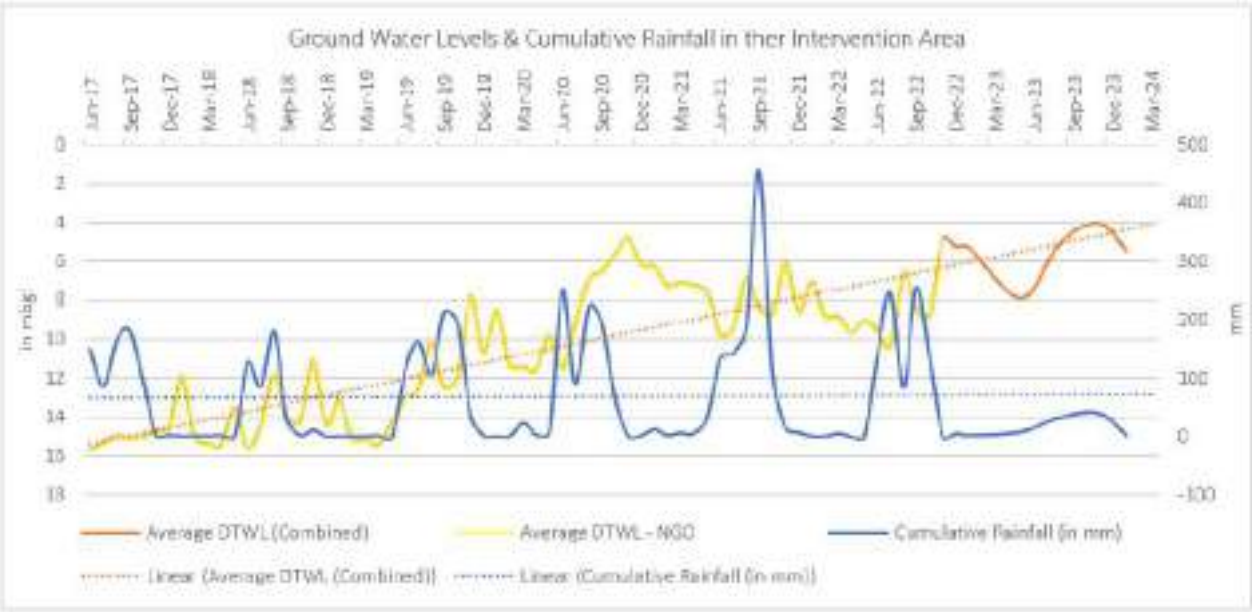


FIGURE 7: GROUND WATER LEVELS DURING AND SINCE THE INTERVENTION PERIOD (IN MBGL) COMPARED WITH MONTHLY CUMULATIVE RAINFALL (IN MM)

For this step of the assessment, the rainfall data from IMD was compared with the combined depth-to-water level data from the NGO partners and the CGWB. The rationale behind this is that rainfall is the most critical variable that determines the level of water availability below ground. Thus, by establishing the role of rainfall in the change in water levels, we would be able to identify the role of the measures implemented on the ground in augmenting the ground water levels.

A regression analysis of rainfall and depth to water level was conducted to assess the strength of the relationship between these two variables (detailed results in Annexure 4). The p-value obtained is greater than 0.05 for the intervention area, indicating no statistically significant relationship. However, the low R^2 (coefficient of determination) values obtained for the intervention area, along with the weak positive correlation established between rainfall and groundwater, suggest that while the impact of rainfall may be small, it has had its influence(although not significantly). [Here the R^2 value represents the proportion of variation in depth to water levels that can be explained by rainfall, indicating how well rainfall predicts water level changes. In this case, the low R^2 values suggest that multiple other factors also play a role. Detailed results are provided below.[5]]

This essentially means that rainfall influence on the ground water level has been to a minimal extent in the intervention areas over the period from 2017 to the relative present. However, over this period, the rainfall received has shown a very slight negative trend, while the ground water levels have shown significant positive trends. Considering the R2 values and the results of the correlation analysis, it can be understood that while the rainfall and ground water levels are not closely related, the factors such as improved water percolation and water storage mechanisms have had significant contributions in augmenting the ground water levels, supported by the rainfall trends. The ground water levels are expected to continue to rise and stabilise at a high level over the coming years, and the contributions of the interventions would help in improving the ground water levels. The availability of the most recent and more local measurements will help in assessing the same more accurately.

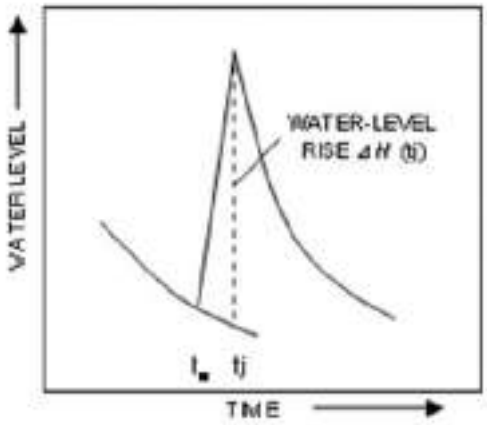
Note: The last available data on ground water depth data is till January 2023. The data from May 2023 to the present has not been published yet. Thus, in the absence of the necessary data, statistical methods were used to project the values for this period. This projected data might not necessarily reflect the true levels of ground water levels, and the derived estimates are bound to change on the availability of official measurements of ground water depth for 2023 and 2024.

Estimation of Ground Water Recharge Due to Rainfall

The Water Table Fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The water-table fluctuation method is based on the premise that rises in groundwater levels in unconfined aquifers are due to recharge arriving at the water table. Recharge is calculated as the change in water level over time multiplied by the specific yield.[6]

$$R(tj) = Sy^* \Delta H(tj)$$

where R(tj) (m) is recharge occurring between times t0 and tj, Sy is specific yield (dimensionless), and ΔH(tj) is the peak water level rise attributed to the recharge period (cm).



The specific yield values were obtained from the Groundwater Estimation Commission's report on ground water resource estimation methodology.[7] [8] The specific yield values identified for the different types of aquifers found across the intervention areas identified from the GEC reports are given below:

Location	Aurangabad
Major Aquifer System	Basalt
Sy Range	0.01 – 0.03
Sy Chosen	0.02
RIF Range	0.12 – 0.14
RIF Chosen	0.13

As per the results of the method, about 13.1% of the rainfall has recharged directly to the ground in the intervention sites. The results and calculations are presented below:

TABLE 2: WATER TABLE FLUCTUATION METHOD RESULTS

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Rm	Rmm	as % of P	Volume of recharge (in cu. m.)
2017	687.704	1.1	0.02	0.022002477	22.0024773	3.20%	3797411.958
2018	438.02	4.509	0.02	0.090184267	90.1842666	20.60%	15564920.61
2019	826.44	7.633	0.02	0.152661156	152.6611561	18.50%	26347819.46
2020	862.4	6.835	0.02	0.136709574	136.7095736	15.90%	23594732.65
2021	1099.64	3.748	0.02	0.074956747	74.95674684	6.80%	12936799.93

[5] The groundwater recharge calculations are based on data from NGO partners and CGWB data, are provided in the attached Excel document in sheets 9 and 10, respectively.

[6] USGS GWRP: Techniques/Methods -Water-Table Fluctuation (WTF) Method

[7] https://cgwb.gov.in/Documents/GEC97.pdf

[8] Detailed Guidelines (cgwb.gov.in)

Major Aquifer System		Basalt					
Year	Precipitation (mm)	ΔH annual	Sy	Recharge in meters	Recharge in millimeters	as % of P	Volume of recharge (in cu. m.)
2022	865.36	5.505	0.02	0.11010815	110.10815	12.70%	19003587.63
2023	548.052	3.844	0.02	0.076883855	76.883855	14.00%	13269399.91
Average Recharge directly due to Rainfall received						**13.10%**	**114514672.1**

Further, the groundwater recharge from Rainfall Infiltration Method (RIF) can be obtained from the following relation:
Groundwater Recharge = Geographical Area x Actual Rainfall x Infiltration Factor

TABLE 3: RAINFALL INFILTRATION METHOD

Area (in sq. m.) =			243365400
Year	P (m)	RIF (m)	Volume of recharge (in cu. m.)
2017	0.687703555	0.089401462	15429816.23
2018	0.43802	0.0569426	9827734.723
2019	0.82644	0.1074372	18542607.84
2020	0.8624	0.112112	19349432.5
2021	1.09964	0.1429532	24672321.38
2022	0.86536	0.1124968	19415845.21
2023	0.548051549	0.071246701	12296482.43
Total			**119534240.3**

Estimation of per cent rainfall converted into groundwater recharge

As per GEC-1997 norms, the rainfall recharge as computed by the WTF method has been compared with that of the RIF method, and finally, the rainfall recharge is assigned a value based on set criteria to avoid unreasonably high or low estimates.

A quantity called percentage difference (PD) is the difference between the rainfall recharge computed by the water table method (A) and the recharge by the rainfall infiltration method (B) and expressed as a percentage of the rainfall recharge by rainfall infiltration method is computed as below:

$$PD = \frac{(A - B)}{B} \times 100$$

where 'A' is the rainfall recharge by the WTF method and 'B' is the rainfall recharge by the RIF method.
The set criteria (GEC 1997) to be adopted are as follows:
(a) If PD ≥ – 20 and < + 20%, then the value of the water table fluctuation method is adopted.
(b)If PD ≤ – 20%, then the value of 0.8 × rainfall infiltration factor method is adopted.
(c)If PD ≥ + 20%, then the value of 1.2 × rainfall infiltration factor method is adopted.

By following the above criteria, ground water recharge is estimated.

Organisation	Rainfall Infiltration Method	WTF Model	Percentage Difference	Criteria	Volume of recharge due to rainfall (Cu. m.)
	Volume of recharge (in cu. m.)	Volume of recharge (in cu. m.)			
SPARSH	114514672.1	119534240.3	-4.19	A	114514672.1

Over the period of 2017 to 2023, an almost 7-year period covering the interventions and their operations till the present, the amount of ground water recharge directly due to rainfall stands at 11,45,14,672.1 Cu. m. across the intervention watershed, which is about 12.45% of the total rainfall received over the intervention area.

Change in surface water holding capacity and run-off reduction

The intervention area is spread over multiple watersheds in the southern part of the state. On-site verification and satellite imagery show that the major land use in the intervention area is rangelands, followed by crops. Based on the information available from the field survey and the organisation, the volume of storage created is estimated.

The change in surface storage in the intervention area was net positive, i.e., no existing surface storage was considered in the pre-intervention period[9] and an intervention volume of 21,08,750 cubic meters created through the project is being considered for assessment as there might be a double accounting of the storage of nalas as it is also included in considering the storage of the check dam type of interventions.

Estimation of ground water recharge due to the interventions

Groundwater recharge due to the interventions occurs primarily through the capture and storage of surface runoff water using Cement Nala Bunds, as well as through natural processes and Groundwater Recharge Shafts.

Run-off is defined as the portion of the precipitation that makes its way towards rivers or oceans as surface or subsurface flow. After the occurrence of infiltration and other losses from precipitation (rainfall), excess rainfall flows out through the small natural channels on the land surface and into the main drainage channels. Such types of flow are called surface flows. A part of the infiltrated rainwater moves parallel to the land surface as subsurface flow and reappears on the surface at certain other points. Such flows are called interflows. Another part of the infiltrated water percolates downwards to ground water and moves laterally to emerge in depression and rivers and joins the surface flow. This type of flow is called the subsurface flow or ground water flow.

While the interventions such as the Cement Nala Bunds and the Gabion Structure capture the surface flows, both these structures and the Ground Water Recharge Shafts contribute to the recharge of the ground water in the intervention sites.

Estimation of the run-off can give us an estimate of the amount of water that has been essentially captured by the intervention structures as surface storage, and thus point towards the potential amount of water available for ground water recharge. Run-off can be estimated by various methods, such as:

- Empirical formulae and tables
- Run-off Estimation based on Land Use and Treatment
- Rational Method
- Empirical formulae for flood peak

[9] This is due to the constraints of establishing the status of all water bodies in the intervention area.

In this assessment, we are using the method of empirical formulae and tables along with run-off estimation based on land use and treatment, as it has proven to be the most reliable to conduct the assessment in the absence of reliable ground water level data and access to the intervention sites on the ground.

1 BINNIE'S PERCENTAGES

It provides the relationship of run-off to rainfall with a view to express the former as a percentage of the latter. The percentages mentioned below are based on observations on two rivers in Madhya Pradesh.

TABLE 4: RUN-OFF AS A % OF THE RAINFALL RECEIVED

Annual Rainfall (mm)	Runoff (%)
500	15
600	21
700	25
800	29
900	34
1,000	38
1,100	40

2 COEFFICIENTS

The run-off 'R' in cm and rainfall 'P' in cm can be correlated as R = KP, where 'K' is the run-off coefficient. The run-off coefficient depends on factors affecting run-off. This method is applicable only for small projects such as the ones implemented as a part of this project. The usual values of K are as given below.

TABLE 5: USUAL VALUES OF RUNOFF COEFFICIENTS (K)

Type of Area	K
Urban Residential	0.3 - 0.5
Forests	0.05 - 0.2
Commercial & Industrial	0.9
Parks, farms, Pastures	0.05 - 0.3
Asphalt or concrete pavement	0.85

3 BARLOW'S TABLES

The following values of K (in percentage) for various types of catchments were developed by T.G. Barlow based on the studies of catchments mostly under 130 sq. km. in Uttar Pradesh.

TABLE 6: BARLOW'S PERCENTAGE RUNOFF COEFFICIENTS

Class	Description of Catchment	Percent runoff
A	Flat, cultivated and black cotton soils	10
B	Flat, partly cultivated-various soils	15
C	Average	20
D	Hills and plains with little cultivation	35
E	Very hilly and steep, with hardly any cultivation	45

These percentages are for the average type of monsoon and are to be modified by the application of the following coefficients according to the nature of the season, as shown below.

TABLE 7: BARLOW'S RUN-OFF COEFFICIENTS FOR DIFFERENT NATURES OF SEASON

Nature of Season	Class of catchments				
	A	B	C	D	E
Light rain, no heavy downpour	0.7	0.8	0.8	0.8	0.8
Average or varying rainfall, no continuous downpour	1	1	1	1	1
Continuous downpour	1.5	1.5	1.6	1.7	1.8

As part of this method, the special tropical rainfall was divided into the following four classes:

- **Negligible falls:** All rainfalls under 12 mm a day unless continuous for several days; also rainfalls 12 to 40 mm a day, when there is no rain.
- **Light falls:** All rainfalls up to 25 mm a day followed by similar or heavier falls. Steady pours of 25 to 40 mm a day, when there is no rain of similar or greater amount before or after that.
- **Medium falls:** Rainfalls from 25 to 40 mm a day when preceded or followed by any but light falls.
- **Heavy Falls:**
  - All rainfalls are over 75 mm a day or continuous falls at 50 mm a day.
  - All rainfalls of an intensity of 50 mm or more per hour.

The run-off percentages, as shown in the following table, were developed by combining the type of catchment and nature of the season.

TABLE 8: BARLOW'S RUNOFF PERCENTAGES

Nature of Rainfall	Percentage of Flow in Catchments of Different Type				
	A	B	C	D	E
Negligible falls	-	-	-	-	-
Light falls	1%	3%	5%	10%	15%
Medium falls	10%	15%	20%	25%	33%
Heavy falls	20%	33%	40%	55%	70%

4 ESTIMATION OF DIRECT RUNOFF FROM RAINFALL

In this method of run-off estimation, the effects of the surface conditions of a watershed area are evaluated by means of land use and treatment classes. Land use is the watershed cover, and it includes every kind of vegetation, litter and mulch, and fallow, as well as non-agricultural uses such as water surfaces (lakes, swamps, etc) and impervious surfaces (roads, roofs, etc.). Land treatment applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing and management practices such as grazing control or rotation of crops. The classes consist of use and treatment combinations to be found in watersheds. Land use and treatment classes are readily obtained either by observation or by measurement of plant and litter density and extent in sample areas.

4.1 Hydrological Soil Groups

There are four soil groups that are used in determining the hydrological soil cover complexes, which are used in a method for estimating the run-off from rainfall.

The major characteristics of these groups are described below. The respective infiltration rates and permeability of soils in different groups are also shown below. The infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The permeability rate is the rate at which water moves in the soil, which is controlled by the nature and characteristics of soil horizons.

Hydrologic soil (HSG)	Soil textures	Runoff potential	Water transmission
Group A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.	Low	High rate
Group B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.	Moderate	Moderate rate
Group D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	High	Low rate

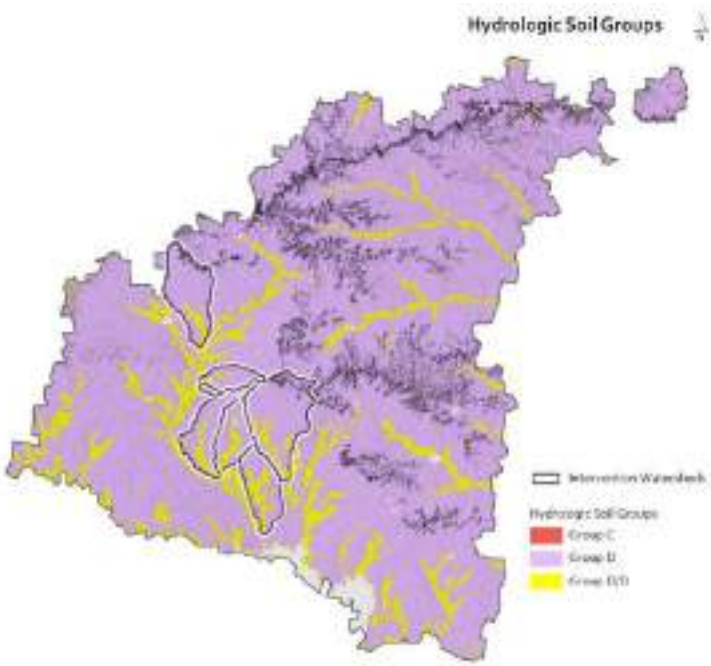


FIGURE 8: HYDROLOGIC SOIL GROUPS OF THE PROJECT WATERSHEDS

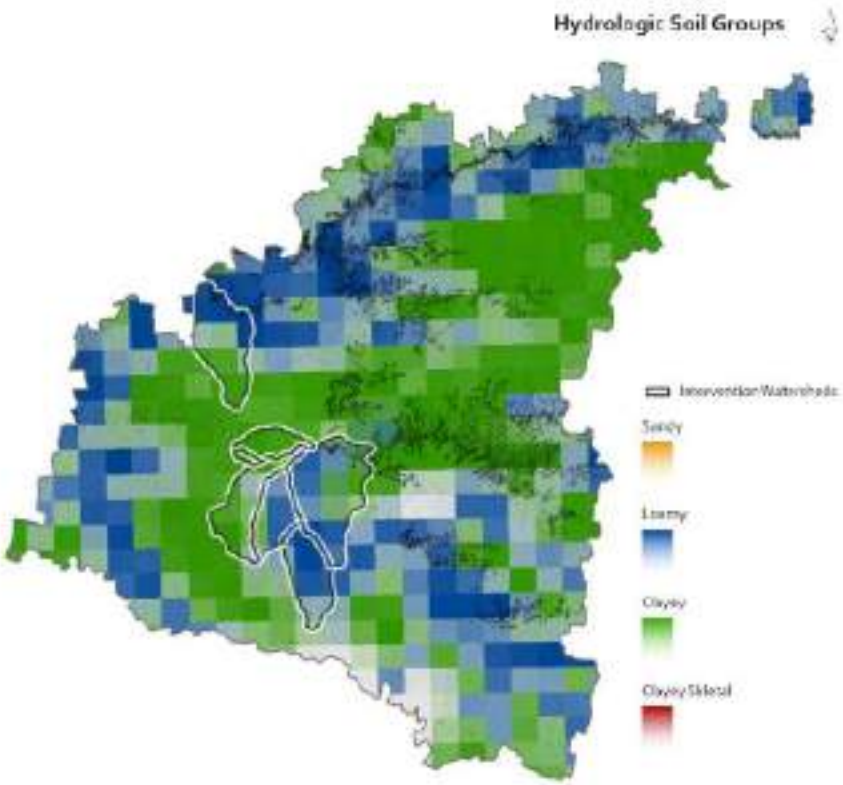


FIGURE 9: SOIL CHARACTERISTICS IN THE PROJECT WATERSHEDS

TABLE 9: INFILTRATION RATES

Class	Rates / hr in		Remarks
	Inches	Millimetres	
Very Low	Below 0.1	Below 2.5	Highly clayey soils
Low	0.1 - 0.5	2.5 - 12.5	Shallow soils, clay soils, soils low in organic matter
Medium	0.5 - 1.0	12.5 - 25.0	Sandy loams, silt loams
High	Above 1.0	Above 25.0	Deep sands, well aggregated soils

TABLE 10: RELATIVE CLASSES OF SOIL PERMEABILITY

Class	Permeability	
	Inches/ hr	mm/ hr
Slow		
Very Slow	Less than 0.05	1.3
Slow	0.05 to 0.20	1.31 to 5.00
Moderate		
Moderately Slow	0.20 to 0.30	5.01 to 20.00
Moderate	0.80 to 2.50	20.01 to 50.00
Moderately Rapid	2.50 to 5.00	50.01 to 130.00
Rapid		
Rapid	5.00 to 10.00	130.01 to 250.00
Very Rapid	Over 10.00	Over 250.00

4.2 Land Use and Treatment Classes

The commonly used land use and treatment classes are briefly described below. These classes are used in determining hydrologic soil-cover complexes, which are used in one of the methods for estimating runoff from rainfall.

- **Cultivated lands:** These include all field crops such as maize, sugarcane, paddy and wheat.
- **Fallow lands:** These are lands taken up for cultivation, but are temporarily out of cultivation for a period of not less than one year, and not more than 5 years. Current fallow lands are cropped areas kept fallow during the current year.
- **Uncultivated lands include:**
  - Permanent pastures and other grazing lands.
  - Cultivable waste, which are lands available for cultivation whether or not taken up for cultivation or abandoned after a few years for one reason or another. Land once cultivated but uncultivated for 5 years in succession shall also be included in this category.
- Forest area includes all lands classed as forest under any legal enactment dealing with forest or administered as forest whether State-owned or private and whether wooded or maintained as potential forest land.
- Tree crops include woody perennial plants that reach a mature height of at least 8 feet and have well-defined stems and a definite crown shape.
- Lands put to non-agricultural uses are areas occupied by buildings, roads, railroads, etc.
- Barren and uncultivable lands include areas covered by mountains, deserts, etc.

Based on these assessments, the following were estimated:

Surface Storage

The volume of surface storage created by the intervention = 21,08,750 m3

Rainfall & Runoff

- Total rainfall received over the intervention period and since = 81,45,84,322.4 m3
- Total run-off generated over the intervention area = 24,43,75,296.7 m3
- Percentage of rainfall that is converted to runoff = 30%

The intervention area received enough rainfall for all the intervention structures to be at a constant capacity of 13.31% throughout the period since 2017 as a part of and due to the project Bajaj Water Conservation Project implemented by SPARSH in Aurangabad. This shall be interpreted as the intervention structures always having water and never drying since 2017 or operating at more than 50% storage filled through the dry seasons since 2017.

Runoff Reduction

- The volume of surface run-off stored by the intervention measures after considering 40% evaporation loss = 1,68,43,738.56 m3.

Which is,

- 6.89% of the total run-off generated as a part of and due to the water conservation efforts of this project (or)
- 1.47% of the total rainfall received during the project period and ever since

This means that the interventions that were created as a part of this project have contributed to a combined reduction in surface run-off by about 6.89% in the intervention area. Although this number is a conservative estimation and however, is bound to increase over the years. Care must be taken to ensure the effective functioning of these water harvesting structures.

Regular desilting and clearing of overgrowth, along with any structural repairs, are required across all the structures to ensure that their storage capacity is maintained, and the structural integrity is preserved.

Thus, in total, 12.45% of the rainfall is converted into direct recharge, about 6.89% of the rainfall is stored in the intervention-created surface storage, 40% is lost as evaporation, and the remaining 40.66% accounts for factors such as run-off that is stored in other water bodies present, run-off that is not captured evapotranspiration, and other losses.

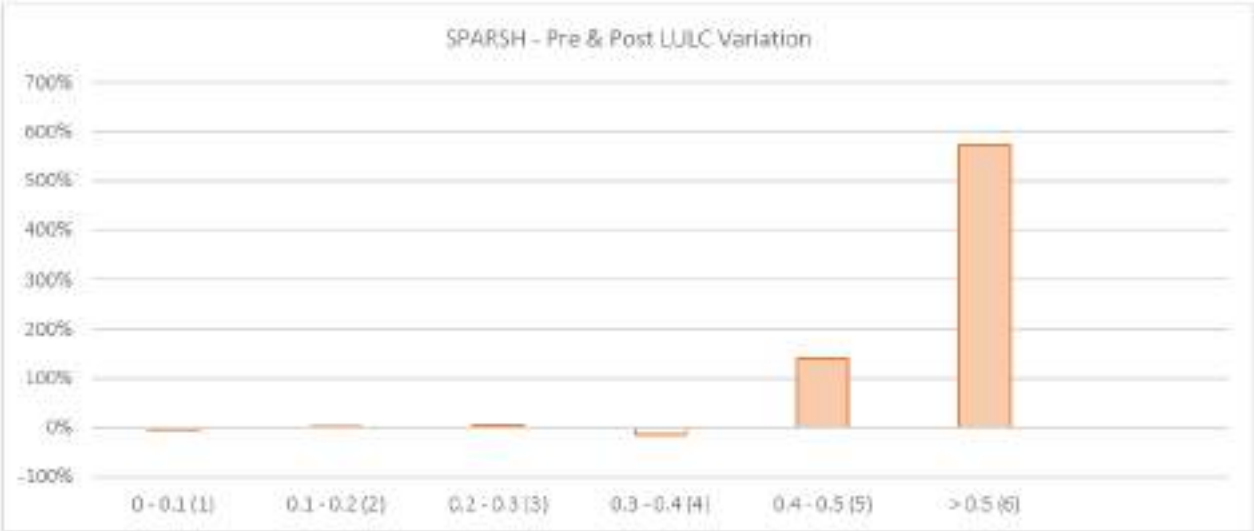
5

CHANGE IN LAND USE PATTERN

Land use and land cover change detection involves analyzing how land is utilized and how its physical coverage alters over time. Changes in land use patterns, such as urban expansion, deforestation, agricultural expansion, and the impacts of natural disasters, can be tracked using remote sensing techniques, satellite imagery, and geographic information systems (GIS). The land use and land cover for the intervention areas were developed through supervised classification of Sentinel-2 Full Colour Composite (FCC) imagery for both the pre- and post-intervention periods.

TABLE 11: ZONAL STATISTICS OF LULC FOR THE INTERVENTION AREA

Organisation	SPARSH				
Total Area of Watershed (Sq. Km.)	172.5902				
Soil Group	D				
Land Use Classes	Land use (2017)		Land use (2023)		Percentage Difference
	Area	% Area	Area	% Area	
Water (1)	0.4358	0.18	0.0764	0.04	93.74%
Trees (2)	0.1839	0.08		0.00	-100.00%
Flooded Vegetation (4)		0.00		0.00	0.00%
Crops (5)	209.0662	85.91	166.6349	96.55	-2.02%
Built up (7)	13.4602	5.53	5.3527	3.10	116.88%
Bare Ground (8)		0.00		0.00	0.00%
Rangeland (11)	20.2023	8.30	0.5258	0.30	100.00%



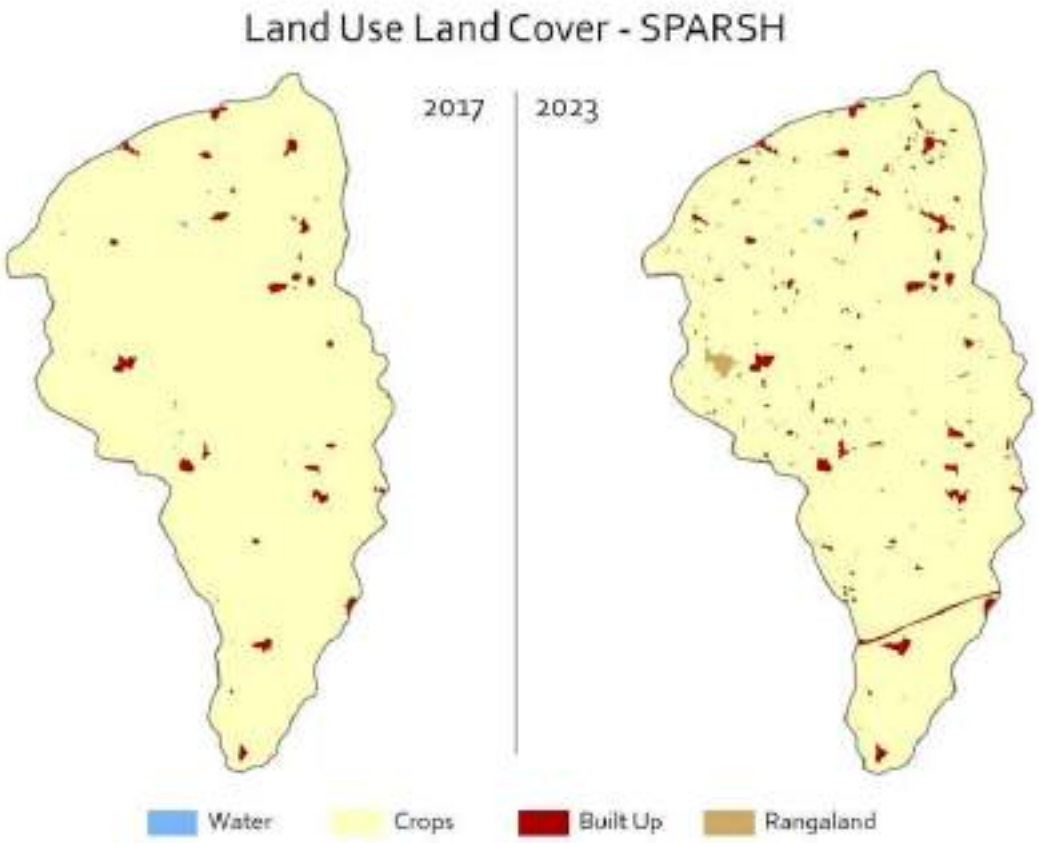


FIGURE 10: PRE- AND POST-INTERVENTION LULC OF THE INTERVENTION WATERSHED

It can be observed from the above table and charts that in terms of total area, the area under crops is the highest, followed by similar values for built-up areas and rangelands. Looking at the changes in land use that have happened through the course of the intervention period and since, major changes can be observed in the growth of areas under water and trees, minor reduction in the area under crops and minor growth in the area built up and rangelands. In terms of total area, the reduction in area under crops can be attributed mainly to the increase in built-up area. The following section will offer more clarity on the changes to cropping intensity.

6

VEGETATION INDEX (VI)/CROPPING INTENSITY

Vegetation Indices are combinations of surface reflectance at two or more wavelengths designed to highlight a particular property of vegetation. They are derived using the reflectance properties of vegetation. For this assessment, the Normalised Difference Vegetation Index (NDVI) is used. NDVI is an indicator that shows the greenness, density, and health of vegetation in each pixel of a satellite image. The index detects and quantifies the presence of living green vegetation using this reflected light in the visible and near-infrared bands.

The standard formula for calculating NDVI is: NDVI = (NIR – red) / (NIR + red)

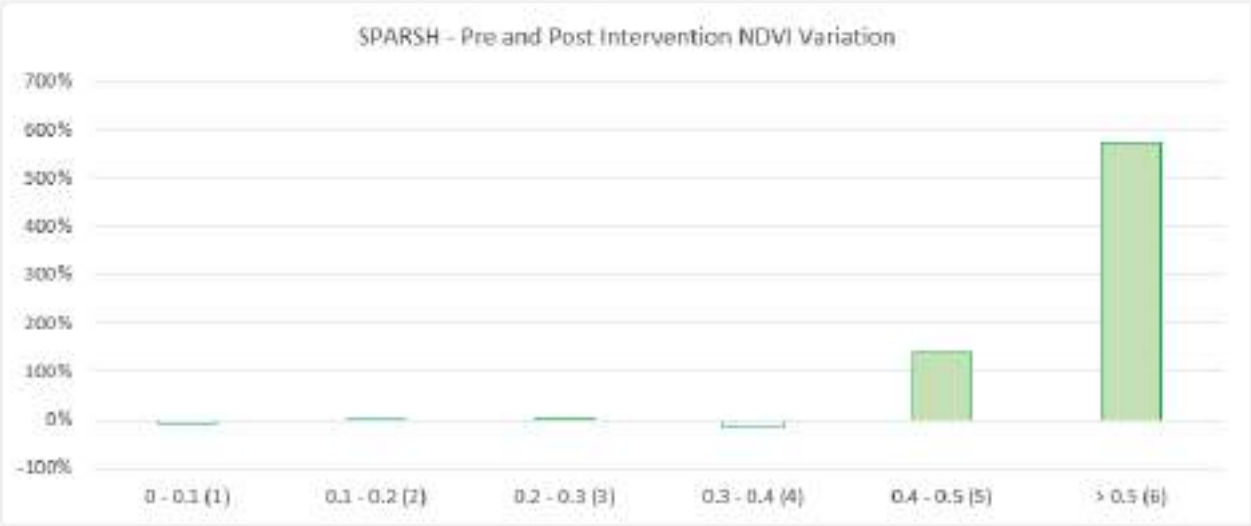
NIR is the near infra-red, band 8, and red, band 4 of Sentinel-2 imagery. Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states.

The NDVI value ranges from -1 to 1 and shows the vigour of the crop:

- **Values close to 1:** the more intense the green, the more vigorous the vegetation and vegetation cover. Considerations for the type of farming, bare soil, etc. must be made. The index also measures the vigour of the underbrush.
- **Values close to 0:** areas with very little vegetation, early stages of cultivation, bare soil, or non-productive areas.
- **Negative values:** usually associated with areas of water, snow, or clouds.

TABLE 12: ZONAL STATISTICS VALUES OF THE VEGETATION INDEX

District	Aurangabad				
Organisation	SPARSH				
Total Area of Watershed (Sq. Km.)	172.5902				
Soil Group	D				
Vegetation Index Classes	VI (2017)		VI (2023)		Percentage Difference
	Area	% Area	Area	% Area	
Water (1)	0.0260	0.02	0.0091	0.01	-64.95%
Built up/Barren (2)	10.2991	5.97	1.5856	0.92	-84.60%
Fallow/Sparse Vegetation (3)	36.2545	21.01	4.9484	2.87	-86.35%
Light Cultivation (4)	79.8424	46.26	41.7972	24.22	-47.65%
Moderate Cultivation (5)	44.6760	25.89	123.2230	71.40	175.81%
Heavy Cultivation (6)	1.4922	0.86	1.0269	0.60	-31.18%



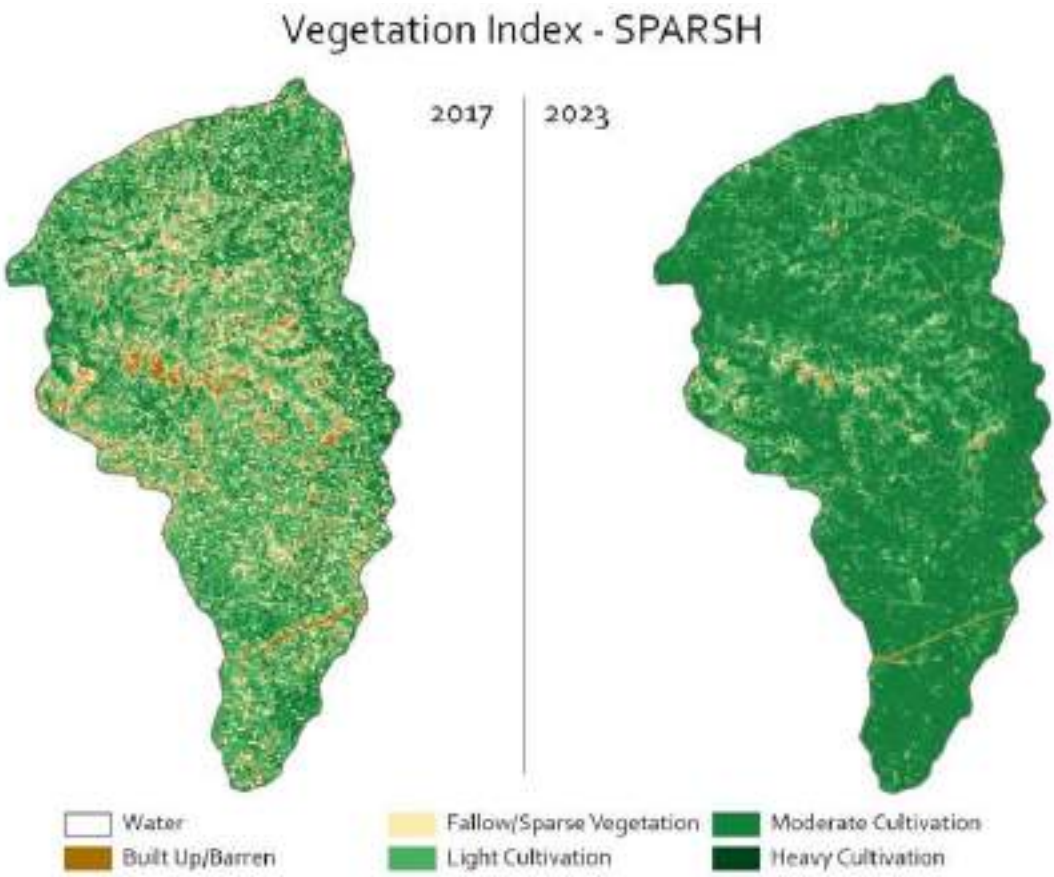


FIGURE 11: PRE- AND POST-INTERVENTION VEGETATION INDEX ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the vegetation index reveals that in the intervention watershed, the area under moderate cultivation has grown significantly, while the area under other classes has shrunk. With respect to the methodology applied for this analysis, it can be interpreted that the area under light cultivation corresponds to single cropping, moderate cultivation to double cropping and heavy cultivation to triple cropping. Thus, the area under double cropping has increased, indicating improved water accessibility and use, among other factors.

7 SOIL MOISTURE

Surface soil moisture (SSM), defined as the water content of the top few centimetres of soil, is a key variable that affects run-off generation, water recharge and vegetation growth. The Synthetic Aperture Radar (SAR) data from Sentinel-1 satellite is used here to study the surface soil moisture, which is in turn derived from relative soil moisture, which represents the soil moisture for a given soil column on a relative scale between soil saturation and wilting levels.

The surface soil moisture saturation is calculated as percentages using the formula[10]:

$$\mathrm{SSM}(t) = \frac{\Delta\sigma^0(\Theta, t)}{S(\Theta)} \quad [\%]$$

Where Δσ0(Θ,t) represents the change in normalized backscatter (relative to dry conditions), and S(Θ) is the sensitivity to SSM changes at the reference angle. The sensitivity is equivalent to the local backscatter dynamic range, estimated by the difference between normalized backscatter coefficients under wet and dry conditions using,

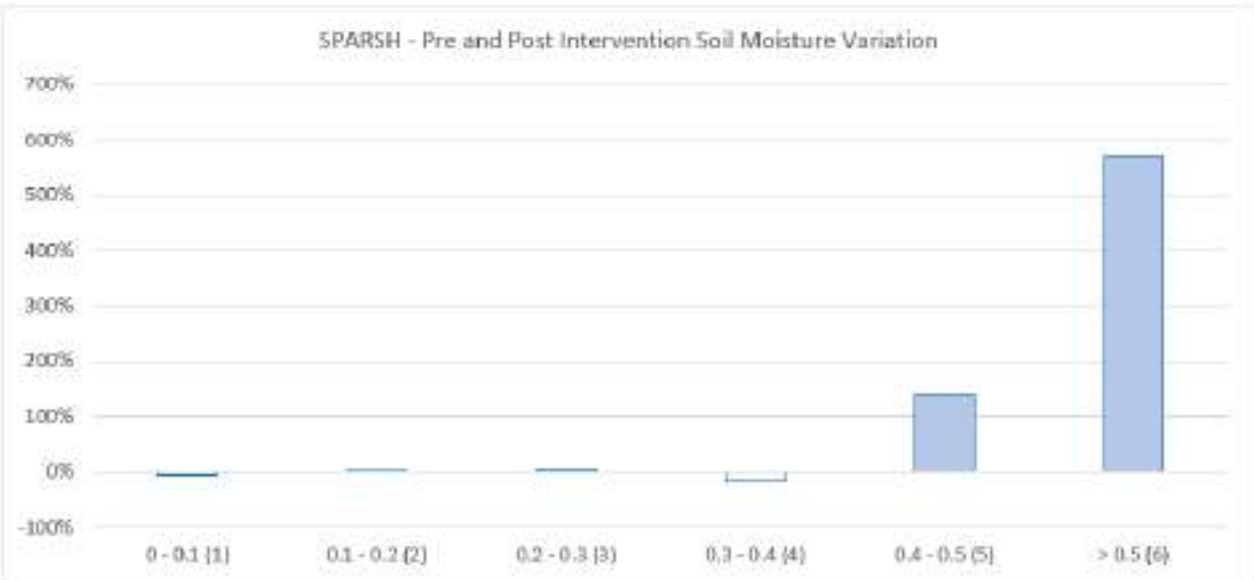
[10]Detailed methodology is provided at https://doi.org/10.1109/TGRS.2018.2858004

$$S(\Theta) = \sigma^0_{\text{wet}}(\Theta) - \sigma^0_{\text{dry}}(\Theta) \quad [\text{dB}].$$

Composite Images for the years 2017 and 2023 have been developed using Google Earth Engine, and the resulting images were considered for this assessment to understand the changes between the pre-intervention and post-intervention states. The values range from 0 to 100 %, where values close to 0 represent water and built-up areas.

TABLE 13: ZONAL STATISTICS OF SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHEDS

District	Aurangabad				
Organisation	SPARSH				
Total Area of Watershed (Sq.Km.)	172.5902				
Soil Group	D				
Soil Moisture Classes	SM - 2017		SM - 2023		% Difference
	Area	% Area	Area	% Area	
0 - 0.1 (1)	38.2169	15.70	33.2725	13.67	-12.94%
0.1 - 0.2 (2)	63.2528	25.99	34.6515	14.24	-45.22%
0.2 - 0.3 (3)	109.8822	45.15	88.8593	36.51	-19.13%
0.3 - 0.4 (4)	29.9928	12.32	69.6398	28.62	132.19%
0.4 - 0.5 (5)	1.7148	0.70	15.1290	6.22	782.25%
> 0.5 (6)	0.1897	0.08	1.6982	0.70	795.04%



[10] Detailed methodology is provided at https://doi.org/10.1109/TGRS.2018.2858004

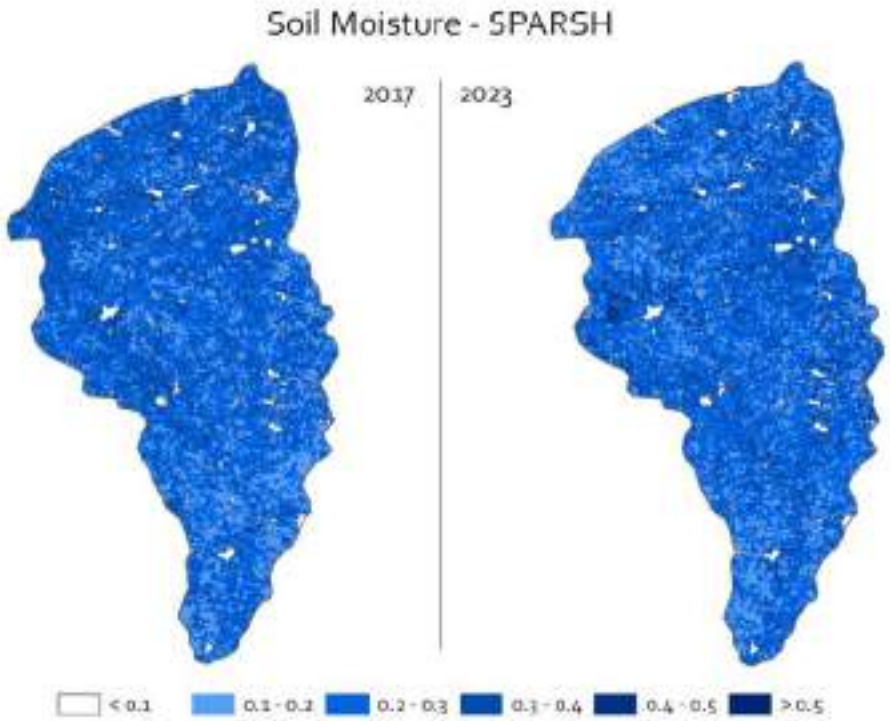


FIGURE 12: PRE AND POST INTERVENTION SURFACE SOIL MOISTURE ACROSS THE INTERVENTION WATERSHED

The analysis, change detection and calculation of the soil moisture across the intervention watershed shows that there have been significant changes in the values of surface soil moisture over the course of the intervention period and since. The area under soil moisture values greater than 40% has seen a significant increase, while the area under low soil moisture values has reduced. This is to be interpreted because of multiple factors, such as the rainfall received, the vegetative cover, and the availability of surface and ground water, among others.

CONCLUSIONS

This section provides a summary of the key findings of the assessment and the limitations encountered in the process of the assessment. For more accurate quantification outcomes, further studies will have to be done using datasets of higher details and corroboration from the field.

KEY FINDINGS

In summation, the key findings from the above assessments are as follows:

- The total surface storage created in the intervention area due to the project is 21,08,750 cubic meters.
- The influence of rainfall on the ground water levels has not been very significant. However, a positive correlation between both was observed.
- The ground water levels in the intervention watershed have been increasing since 2017, are presently at high values, and are expected to persist at similar levels in the coming years. The availability of more recent data will shed more light on the trends that can be expected.
- Ground water recharge directly due to rainfall in the intervention area is about 12.45% of the total rainfall received.
- The volume of surface run-off stored by the intervention measures is 6.89% of the total run-off generated as a part of and due to the interventions (or) 1.47% of the total rainfall received during the period of the project intervention and ever since.
- Analysis of LULC, NDVI, and SSM reveal that there has been a marked increase in area under moderate or double cultivation while the crop cover overall has reduced slightly likely due to the increase in area under built up. The surface soil moisture has shown a remarkable change with most of the area coming under moisture content of more than 40%.

TABLE 14: SUMMARY OF FINDINGS

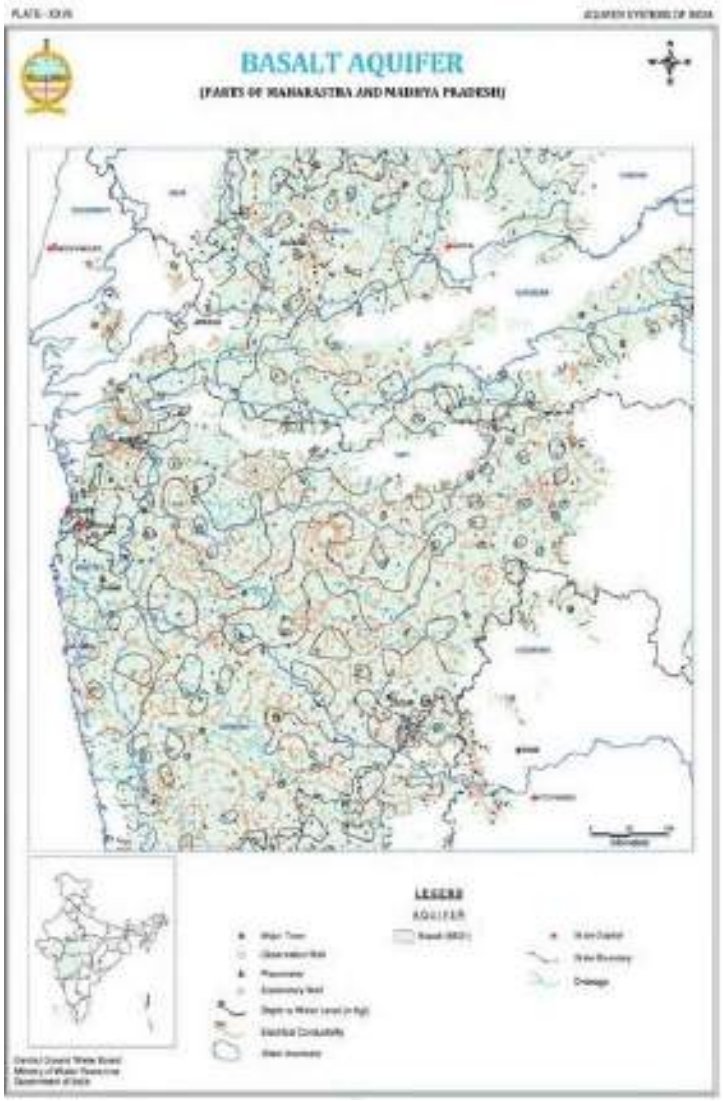
District		Aurangabad
Organisation		SPARSH
Total Area of Watershed (Sq. Km.)		172.5902
Soil Group		D
Volume of Storage Created (Cu. m.)		2108750
Total rainfall over intervention area (Cu. m.)		814584322.4
Q - Total run-off over intervention area (Cu. m.)		244375296.7
Average % of fullness throughout the intervention period		13.31%
Run-off volume stored in interventions	Pre-evaporation Loss	28072897.6
	Post Evaporation Loss	16843738.56
% of run-off stored by interventions	Pre-evaporation Loss	11.49%
	Post Evaporation Loss	6.89%
% of rainfall stored by interventions	Pre-evaporation Loss	2.44%
	Post Evaporation Loss	1.47%
Surface water contribution to ground water recharge (40%) (Cu. m.)		6737495.42
Recharge only due to rainfall (Entire intervention period and since)	Cu. m.	114514672.1
	%	12.45%

LIMITATIONS

The most significant limitation faced was in terms of data availability. With the resolution of the available open-source satellite imagery being capped at 10m, 30m and 50m, the land use, vegetation index and soil moisture that can be generated, respectively, also lack resolution, especially considering the small size of the intervention area that had to be assessed. Assumptions were made to calculate the storage capacity of water harvesting structures. Owing to the limitation in the availability of data on the number of interventions, their locations and the respective dimensions, the assessments are based primarily on data from secondary sources, with the primary data being used wherever possible. Further, most of the secondary data that was available and obtained has shortcomings in one or more areas, such as the temporal coverage or the spatial resolution. Further constraints were due to the unavailability of up-to-date and reliable ground water data. With the continuous measurement of this information, the efficiency of the assessment can be improved.

ANNEXURE 1

AQUIFER TYPES



ANNEXURE 2

GROUND WATER DATA FROM NGO PARTNERS

Month	Overall	AFARM	AFPRO	BAIF	IBGVS	MGVS	DSC	SPARSH
Jun-17	16.63251	18.4855	14.58867	10.69306	17.62977		16.94432	
Jul-17	16.26061	17.0063	14.74266	10.21412	17.62977		16.94432	
Aug-17	15.89246	15.97235	14.05885	10.08615	17.62977		16.94432	
Sep-17	15.99119	16.97269	14.48917	10.42163	17.62977		16.94432	
Oct-17	15.51416	16.0541	13.77258	10.5804	17.62977		16.94432	
Nov-17	15.07609	15.14039	14.54375	10.81134	13.75072		16.36363	
Dec-17	15.28061	16.60187	14.73175	11.08953	16.01258		14.60358	
Jan-18	15.78315	17.30227	14.81724	10.10798	16.53142		15.00358	
Feb-18	16.13479	17.84025	14.97115	10.4525	16.72761		15.40358	
Mar-18	16.51477	17.37275	15.58083	10.60847	16.8196		15.50358	
Apr-18	16.62765	18.15107	16.29189	10.57018	16.85864		15.50358	
May-18	16.62066	18.05931	16.29804	10.27355	16.91076		15.73272	
Jun-18	16.69556	18.15703	16.3129	10.57145	16.95413		15.95796	
Jul-18	15.50558	16.69937	14.05222	9.815413	16.06409		15.3358	
Aug-18	15.01062	16.20999	14.20389	9.680651	15.42118		14.55591	
Sep-18	15.09088	16.07885	14.39571	9.481008	15.62163		14.78352	
Oct-18	15.16348	16.30001	14.42797	9.644355	15.78725		15.1384	
Nov-18	15.17444	16.44153	13.93897	9.762581	15.92178		15.34563	
Dec-18	15.36046	16.62517	13.66385	9.907863	16.17475		15.65383	
Jan-19	15.8186	16.82288	15.05846	10.35556	16.86138		15.67173	
Feb-19	16.04574	17.11898	15.06166	10.91272	16.98911		15.80602	
Mar-19	16.07412	17.19947	14.86218	11.01564	17.13002		15.87315	
Apr-19	16.2723	17.34318	15.35987	11.54101	17.14888		15.87414	
May-19	16.44106	17.36091	15.69099	11.99407	17.24764		15.97608	
Jun-19	16.10688	17.2031	15.92713	11.76359	17.25461	0.277391	15.85168	
Jul-19	15.56118	17.31602	15.54885	10.78343	15.61434	0.348696	15.14322	
Aug-19	15.14828	16.84163	15.44286	9.884798	14.79173	3.06913	14.80328	
Sep-19	14.7353	16.09015	16.00323	9.444355	14.64434	4.722174	14.25667	
Oct-19	14.41852	15.99718	16.04696	8.124355	14.7921	3.752174	13.4687	
Nov-19	14.2605	15.71595	16.07115	7.555548	14.75852	2.901605	12.35138	13.65
Dec-19	13.18947	15.16892	12.87519	8.691613	13.03164	1.354788	12.21686	13.06178
Jan-20	13.50751	15.523	11.01615	9.742177	14.02072	1.35515	13.08469	14.10765
Feb-20	13.92775	16.28292	10.32451	10.47444	14.3	1.35515	13.47867	14.33867

Month	Overall	AFARM	AFPRO	BAIF	IBGVS	MGVS	DSC	SPARSH
Mar-20	14.28585	16.56471	11.55891	11.11508	14.50364	0.348261	13.79852	14.71327
Apr-20	14.41208	16.49971	11.63287	11.605	14.61165	0.277391	14.1899	15.28267
May-20	14.42775	16.14156	11.15853	12.85661	14.51305	0.348696	14.2333	15.34795
Jun-20	14.38134	15.66726	11.00691	12.46174	15.42209	0.562609	14.20179	15.32653
Jul-20	13.755855	11.79575	7.475271	8.675174	8.809025	7.887828	12.33864	14.00612
Aug-20	7.548825	5.148132	5.184085	9.890806	4.173824	8.950435	10.91253	13.11688
Sep-20	6.135865	7.551561	3.3447	5.522561	2.986545	11.15048	8.431204	12.15184
Oct-20	5.247161	6.359467	2.800991	2.985845	2.848389	10.53822	8.929494	11.83724
Nov-21	5.581639	6.182822	3.348081	3.725092	3.451144	8.984785	9.05779	11.62806
Dec-21	6.33661	7.110027	4.57384	3.990845	4.446655	7.21087	9.751852	11.74082
Jan-21	7.918161	8.196392	6.028249	5.681855	5.664746	5.543915	9.541069	11.9148
Feb-21	9.133047	8.88504				3.800435	9.105454	12.11633
Mar-21	11.24193	11.53043				2.721174		12.39651
Apr-21	12.15048	12.68756				1.787391		12.96102
May-21	12.71124	13.18658				1.43087		13.31927
Jun-21	12.86181	13.2947				6.348261		13.25663
Jul-21	11.61871	11.62528				7.265652		12.61735
Aug-21	9.965919	9.479765				8.348261		11.82388
Sep-21	5.284516	6.325738				10.47		3.040816
Oct-21	5.898947	5.949663				11.45522		4.445918
Nov-21	6.860644	6.968792				10.17435		5.754082
Dec-21	7.530935	7.799698				9.47		6.158163
Jan-22	8.187613	8.372819				9.069048		7.414286
Feb-22	8.245798	8.184013				9.448061		8.152041
Mar-22	9.660798	10.16328				7.943913		8.62449
Apr-22	11.14524	12.09247				7.335217		9.140816
May-22	12.19893	13.30426				7.161304		10.00816
Jun-22	11.49931	12.10394				7.161304		10.67449
Jul-22	10.85146	11.24381				9.491739		9.979469
Aug-22	8.170425	7.784346				10.87652		8.715265
Sep-22	6.139714	5.404416				11.69826		7.035714
Oct-22	4.164285							4.164285
Nov-22	1.561224							1.561224

GROUND WATER DATA FROM CGWB

ANNEXURE 3

RAINFALL

Monthly rainfall (in mm) trends for Aurangabad from 01-Jan-2018 to 31-Mar-2024

Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)	Dates	NORMAL (mm)	ACTUAL (mm)
Jan-17		0.00	Nov-18	24.8	11.03	Sep-20	153.4	197.37	Jul-22	172.8	247.29
Feb-17		0.00	Dec-18	10.3	0	Oct-20	56.9	65.44	Aug-22	175.9	84.34
Mar-17		0.00	Jan-19	2.7	0	Nov-20	24.8	1.45	Sep-22	153.4	255.34
Apr-17		0.00	Feb-19	2.5	0	Dec-20	10.3	1.33	Oct-22	56.9	132.92
May-17		2.44	Mar-19	4.6	0	Jan-21	2.7	12.03	Nov-22	24.8	0
Jun-17		149.79	Apr-19	3.5	0.94	Feb-21	2.5	2.27	Dec-22	10.3	7.04
Jul-17		86.36	May-19	18.9	0	Mar-21	4.6	5.84	Jan-23	2.7	3.14
Aug-17		165.79	Jun-19	134.6	110.63	Apr-21	3.5	4.66	Feb-23	2.5	0
Sep-17		182.62	Jul-19	172.8	162.87	May-21	18.9	30.6	Mar-23	4.6	9.83
Oct-17		96.61	Aug-19	175.9	106.42	Jun-21	134.6	132.15	Apr-23	0	39.76
Nov-17		2.83	Sep-19	153.4	213.73	Jul-21	172.8	142.21	May-23	0	9.41
Dec-17		2.27	Oct-19	56.9	193.39	Aug-21	175.9	186.88	Jun-23	134.6	43.71
Jan-18	2.7	0	Nov-19	24.8	37	Sep-21	153.4	454.42	Jul-23	172.8	173.41
Feb-18	2.5	0.72	Dec-19	10.3	1.46	Oct-21	56.9	106.39	Aug-23	175.9	46.79
Mar-18	4.6	0.53	Jan-20	2.7	0.12	Nov-21	24.8	15.3	Sep-23	153.4	220.1
Apr-18	3.5	2.01	Feb-20	2.5	0	Dec-21	10.3	6.89	Oct-23	56.9	0.85
May-18	18.9	0.17	Mar-20	4.6	22.91	Jan-22	2.7	0.1	Nov-23	24.8	54.85
Jun-18	134.6	126.39	Apr-20	3.5	2.42	Feb-22	2.5	0	Dec-23	10.3	14.13
Jul-18	172.8	85.65	May-20	18.9	6.26	Mar-22	4.6	4.91	Jan-24	0	2.44
Aug-18	175.9	180.45	Jun-20	134.6	251.86	Apr-22	3.5	0	Feb-24	0	2.25
Sep-18	153.4	29.42	Jul-20	172.8	91.32	May-22	18.9	0	Mar-24	0	0.1
Oct-18	56.9	1.66	Aug-20	175.9	221.91	Jun-22	134.6	140.36			

ANNEXURE 4

REGRESSION & CORRELATION

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.028569498
R Square	0.000816216
Adjusted R Square	-0.013457838
Standard Error	3.542306917
Observations	72

Correlation	*Column 1*	*Column 2*
Column 1	1	
Column 2	0.028569498	1

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.717513774	0.717513774	0.057181806	0.811705719
Residual	70	878.3556808	12.5479383		
Total	71	879.0731946			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	10.29983462	0.520525071	19.7875711	2.20591E-30	9.261678903	11.33799033	9.261678903	11.33799033
X Variable 1	0.001100177	0.004600801	0.239127175	0.811705719	-0.008075832	0.010276186	-0.008075832	0.010276186

ANNEXURE 5

PHOTOS

CHAPTER 9
RECOMMENDATIONS

As livestock rearing is a key focus area for the program, a mobile veterinary clinic could prove beneficial for vaccinations, check-ups, and on-site treatment for livestock in these rural areas, increasing livestock productivity and life expectancy.

Setting up a digital marketplace for SHGs would help them sell their products online through social media applications or local e-commerce platforms. This would substantially increase their market outreach and sales in the long run.

Introducing solar-powered water pumps for irrigation would reduce reliance on electric or diesel pumps, increasing irrigation efficiency and reducing costs for farmers.

10. SUSTAINABILITY

Water conservation projects play an important role in creating solutions to the problem of water availability and management, especially in agrarian communities where groundwater depletion is a major issue. The sustainability of such a project rests on strategic programmatic planning, community engagement mechanisms and effective implementation of the program. This note explains the sustainability aspect of the Bajaj Water Conservation Project Phase III, implemented by SPARSH- Center for participatory learning (Technical Partner- Nirman Bahuuddeshiya Sanstha, Aurangabad), by analysing the programmatic findings from the impact assessment report prepared by SoulAce.

The salient features promoting sustainability in the project include:

1. Governance and Community Ownership

- Decentralised decision making through the mobilisation of Village Development Committees (VDCs) and Water User Groups (WUGs).They are trained to ensure maintenance and efficiency of water conservation structures.
- Self-sustaining monitoring done by community members (Jal Mitras/water stewards) ensures that conscious and sustainable usage of water is practised in the long run.
- Strong local ownership as evident through the community's adherence to water governance protocols and surveillance mechanisms established by the community's institution.

2. Infrastructure support designed for long-term impact

- Introduction of micro-irrigation techniques like drip irrigation for efficient water utilisation in the field.
- Construction of water conservation structures like cement nala bunds ensures long-term water storage. Activities like nala deepening and widening enhance water retention capacity.

These sustainability features have proved to have long-term impacts, as evident through the findings of the study, including reduction in groundwater dependency and water scarcity, efficient water use on farms and increased agricultural sustainability.

CHAPTER 11
CONCLUSION

The impact assessment study titled "Bajaj Water Conservation Project Phase III" is a crucial piece of evidence of the impact created by the CSR project of Bajaj Auto Limited, implemented by SPARSH. It encapsulates the goals, activities and achieved outcomes of the project, along with the long-term impact achieved through the efforts. The project's manifold impact ranges from the individual to the State level, from the economic to the environmental domain. It includes the increase in agricultural yield and economic stability of the farmer households, along with an increase in groundwater levels. Enhanced skill building in alternate livelihood options and shared community responsibility of development projects also form an integral part of the program's impact. This report tries to encompass all these impacts in a detailed format with the integrity and meticulous precision of social science research methods, making the findings reliable and valid. Therefore, this study can be used as a reference to the impactful work done by Bajaj Auto Limited towards bringing rural communities out of the cycle of deprivation and poverty.

IMPACT ASSESSMENT REPORT

EXPANSION OF BHAKTI VEDANTA HOSPITAL

Implementing Partner: Sri Chaitanya Seva Trust

Release Date: 31-12-2024

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

FY	Financial Year
CSR	Corporate Social Responsibility
SDGs	Sustainable Development Goals
NABH	National Accreditation Board for Hospitals and Healthcare Providers
OECD	Organisation for Economic Cooperation and Development

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The Bhaktivedanta Hospital expansion project, launched in FY 2016-2017 with support from Bajaj Auto Ltd., has significantly strengthened healthcare services for underserved communities in the Mira-Bhayander and Thane-Palghar region. Among the ongoing developments, the newly established Rahul Bajaj Auditorium on the 8th floor stands out as a cornerstone of this initiative. Designed specifically for interdisciplinary training and professional development for medical staff, the auditorium features multiple screens and advanced audio-visual technology, ensuring effective learning and collaboration. It plays a pivotal role in enhancing the educational experiences of both medical professionals and students.

This report outlines the substantial impact achieved thus far, highlighting how Bajaj's support is enhancing high-quality medical and nursing education within the hospital. As the expansion project continues, the Bhaktivedanta Hospital, equipped with this modern auditorium, is positioned to serve its community with excellence.

PROJECT DETAILS

Implementation year
FY 2017 - FY 2021

Assessment year
FY 2024 - FY 2025

Implementing Partner
Sri Chaitanya Seva Trust

Project location
Mumbai, Maharashtra

Beneficiaries
Medical Students & Nursing Staff

Budget
₹600 lakhs

Alignment with SDGs

PROJECT ACTIVITIES

PLANNING AND FOUNDATION PHASE

- Conducted geological surveys and technical assessments.
- Appointed architects, MEP consultants, and hospital planning specialists.
- Executed shore piling with 220 cast-in-situ piles and applied waterproofing for challenging soil and water conditions.

AUDITORIUM CONSTRUCTION

- Built on the eighth floor of the hospital.
- Annexe has two basements, incorporating NABH-compliant infrastructure, advanced audio-visual systems, and comfortable seating for 400 individuals to enhance educational experiences.

QUALITY ASSURANCE AND FACILITY INTEGRATION

- Ensured high-quality construction through stringent controls and finalised technical specifications for optimal functionality.
- Integrated the auditorium with hospital facilities to support seamless access for medical students, nursing, and hospital staff, positioning it as a central educational space.

Key Outputs

MEDICAL STUDENTS

84%
of the student respondents attended training sessions or seminars in the auditorium weekly.

100%
of the student respondents reported that seating arrangements provide clear visibility and audibility, supporting a productive learning environment.

100%
of the students reported that the use of the auditorium for lectures has significantly improved their understanding of medical concepts.

96%
of the students rated the auditorium facilities effective in supporting focus and engagement during sessions.

NURSING STAFF

100%
of the nursing staff reported using the auditorium for training sessions.

100%
of the nursing staff reported that seating arrangements provide clear visibility and audibility, creating a conducive environment for learning.

100%
of the nursing staff report that the auditorium has significantly improved their nursing practice, especially through workshops and live demonstrations.

96%
of the nursing staff are very satisfied with the auditorium's facilities, indicating it meets the professional learning needs of nursing staff.

Key Impact

Expanded access to professional development for healthcare staff through regular training sessions and seminars.

Enhanced understanding of complex medical concepts through advanced audio-visual resources, including 3D modelling and augmented reality.

Strengthened nursing practices through hands-on workshops, live-streamed surgeries, and collaborative sessions.

Supported NABH-compliant training environment, contributing to higher standards in medical and nursing education.

Fostered community-oriented learning by facilitating lectures, panel discussions, and expert-led events for holistic growth.

03. OECD FRAMEWORK

Relevance Coherence Effectiveness Efficiency Impact Sustainability

RELEVANCE

The addition of the auditorium significantly enhances training opportunities for healthcare professionals, enabling specialised services and community engagement in health education. This state-of-the-art facility fosters capacity building among medical staff, aligning with the healthcare needs of underserved populations and improving overall quality and equity in healthcare delivery.

COHERENCE

The project aligns with following Sustainable Development Goals (SDGs):

Additionally, the project complements national initiatives such as:

- National Health Policy
- Ayushman Bharat

EFFECTIVENESS

The auditorium facilitates interdisciplinary training and professional development, significantly enhancing the competency of medical staff. With a large seating capacity and advanced audio-visual technology, the auditorium supports diverse educational activities, from lectures to workshops. Findings show that 100% of the healthcare staff and students believe the auditorium fosters collaboration and knowledge sharing. Overall, the auditorium enhances training experiences and contributes to improving healthcare quality and accessibility in the Mira-Bhayander and Thane-Palghar regions.

EFFICIENCY

Efficient resource allocation is demonstrated through strategic CSR support. The collaborative approach with Bajaj Auto Ltd. illustrates cost-effective private-public synergy, maximising social value. The project's adherence to quality standards and compliance measures further supports efficient service delivery and long-term operational stability.

IMPACT

The Rahul Bajaj Auditorium enhances healthcare education and professional development, promoting health equity in the region. By providing a state-of-the-art space for interdisciplinary training, it improves competencies among healthcare professionals, benefiting economically disadvantaged communities. The auditorium also fosters community engagement through health education programs, supporting India's Ayushman Bharat and amplifying socio-economic impact by increasing access to quality healthcare services in the Mira-Bhayander and Thane-Palghar regions.

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

SUSTAINABILITY

The project demonstrates sustainability by incorporating environment friendly construction practices and energy-efficient technologies. Moreover, the auditorium plays a crucial role in the ongoing professional development of healthcare workers. This focus on training and education contributes to a sustainable healthcare workforce capable of adapting to evolving medical needs.

The auditorium's design promotes long-term durability and resource efficiency, ensuring that it meets the needs of healthcare professionals and the community while aligning with environmental standards. This commitment to sustainability reflects a holistic approach to healthcare infrastructure, contributing to the overall well-being of the region and its residents.

CHAPTER 4
INTRODUCTION

Project Branding

BACKGROUND AND NEED OF THE PROGRAM

Bhaktivedanta Hospital and Research Institute, a project of Sri Chaitanya Seva Trust, embarked on an ambitious expansion in FY 2017-2018 to address the growing healthcare needs in the Mira-Bhayander and Thane-Palghar regions of Maharashtra. The hospital initiated the construction of a new annexe building to expand its capacity and specialised care facilities.

Construction for this project began in 2017 and involved creating an advanced eight-story building with two basement levels. Notably, the project included the construction of a modern auditorium. Supported by a g Bajaj Auto Limited, the Rahul Bajaj Auditorium serves professional development needs.

With the hospital's NABH accreditation and a commitment to delivering affordable, high-quality care, the auditorium complements Bhaktivedanta's mission by offering essential infrastructure for hands-on training, seminars, and workshops. As the hospital currently is planned to include 12 floors, the fully operational auditorium provides a vital resource equipped with digital technology and audio-visual units, enhancing the quality of healthcare education, and supporting professional growth for the medical community in the region.

OBJECTIVES OF THE PROGRAM

Infrastructure Enhancement: To establish the Rahul Bajaj Auditorium as a modern educational facility dedicated to enhancing the professional development of medical students, nursing staff, and hospital personnel.

Educational Support: To provide a specialised, technology-enabled space equipped with digital and audio-visual resources aimed at fostering high-quality medical and nursing education within the hospital.

Staff Development: To offer an accessible and advanced learning environment that supports continuous skill development for healthcare professionals.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – SRI CHAITANYA SEVA TRUST

Sri Chaitanya Seva Trust, founded in 1985, is a charitable organisation dedicated to serving underprivileged communities through initiatives in healthcare, education, and community welfare. The Trust operates Bhaktivedanta Hospital & Research Institute in Mira-Bhayander in Thane, Maharashtra, providing affordable and accessible medical care to underserved populations.

Their healthcare services are comprehensive, spanning preventive, curative, and palliative care, and include specialised units in oncology, ophthalmology, and mental health. The Trust also engages in various social outreach programs, benefiting thousands of individuals, aiming to improve community health, promote preventive care, and empower local populations through wellness and support services.

SOULACE TEAM INTERACTING WITH NURSING STAFF

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto had appointed SoulAce to conduct a study on the work undertaken by Sri Chaitanya Seva Trust and assess the impact of its CSR initiative in enhancing healthcare infrastructure.

OBJECTIVES OF THE STUDY

The primary objectives of the study were to:

- To investigate the influence of the auditorium and multi-use spaces on the professional growth of medical and nursing staff.
- To assess the effectiveness of the auditorium in hosting health awareness programs, community workshops, and public health campaigns.
- To provide insights into the areas for improvement and better outcomes for the program.

MIXED METHODS APPROACH

The impact assessment study adopted a comprehensive mixed-methods strategy, blending quantitative and qualitative approaches to offer a more intricate understanding of the project's impact. Quantitative methods involve structured surveys administered to a sample of auditorium users, who are selected through simple random sampling. Qualitative methods included in-depth interviews conducted with doctors, medical students, nursing staff and the hospital administration. These methods aim to gather insights into the project's impact from diverse perspectives and to triangulate findings for robust assessment.

APPLICATION OF QUANTITATIVE TECHNIQUES

In the quantitative aspect, the study utilised structured surveys administered through stratified random sampling and purposive sampling. This approach ensures representative data collection and allows for statistical analysis to measure the project's effectiveness in providing financial support to students for continuing higher education without interruptions.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods include in-depth interviews conducted with key stakeholders. These interviews aim to gather detailed insights into operational improvements, challenges encountered, and overall perceptions of the process of the essential project. Qualitative data enriches the study by providing contextual understanding and personal viewpoints crucial for evaluating project impact.

ENSURING TRIANGULATION

The quantitative research findings were cross-validated with the insights derived from the qualitative research. The report was structured to reflect this triangulation, enhancing the reliability of the findings.

INTERACTION WITH HOSPITAL AUTHORITIES

RESEARCH DESIGN

Name of the project

Construction of Rahul Bajaj Auditorium

Implementing agency

Sri Chaitanya Seva Trust

Research design used

Descriptive Research

Sampling technique

Stratified Random Sampling and Purposive Sampling

Sample size

50

Qualitative method used

Semi-structured interviews, Open-ended interviews, and User Testimonials

KEY STAKEHOLDERS

- Hospital Administration
- Healthcare Professionals
- Medical Students
- Local representatives of Thane-Palghar region's health department
- Bajaj Auto Representatives

STUDY TOOLS

Questionnaires for primary beneficiaries –
Structured questionnaires were developed for healthcare professionals (nursing staff) and medical students, reviewing the project details for each of the focus areas, and indicators were pre-defined before conducting the surveys.

Questionnaires for stakeholders –
A semi-structured questionnaire was developed for each type of sample of this group. Stakeholders were identified across the focus areas. Semi-structured questionnaires and interviews were conducted with doctors, nursing staff and hospital administration.

ETHICAL CONSIDERATIONS

The impact evaluation adhered to a strong ethical framework, ensuring responsible and ethical research practices. Participants' rights and well-being were prioritised at every stage of the study. Informed consent was obtained by clearly explaining the study's objectives, procedures, potential risks, and benefits, allowing participants to make fully informed decisions after addressing any questions. Confidentiality was strictly maintained, with data securely stored, accessible only to authorised personnel, and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of coercion, ensuring autonomy and respect for individual choice. Participants were consistently treated with respect, dignity, and fairness, with their well-being prioritised. Support or assistance was readily available whenever needed to ensure their comfort and safety throughout the research process.

CHAPTER 6
KEY FINDINGS

The chapter explores the partnership between Bajaj Auto and Sri Chaitanya Seva Trust, focusing on their joint efforts to enhance access to healthcare services.
Surveys were conducted to investigate the influence of the auditorium and multi-use spaces on the professional growth of medical and nursing staff and evaluate the effectiveness of the auditorium in hosting health awareness programs. The findings are discussed along with key insights.

GEOGRAPHICAL COVERAGE

Mira-Bhayander and Thane-Palghar, Maharashtra

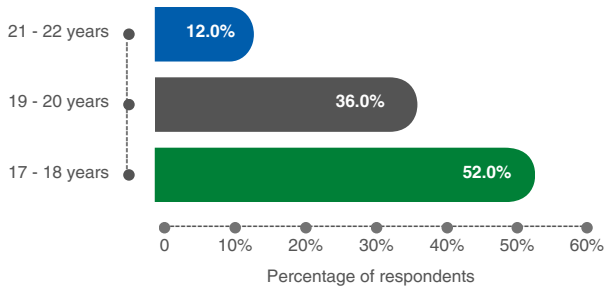
OUTREACH AND INCLUSIVITY

- Nursing Staff
- Medical Students

CASE DISCUSSION BY DOCTORS OF THE HOSPITAL IN AUDITORIUM AT ROOM - 3 GOKUL.

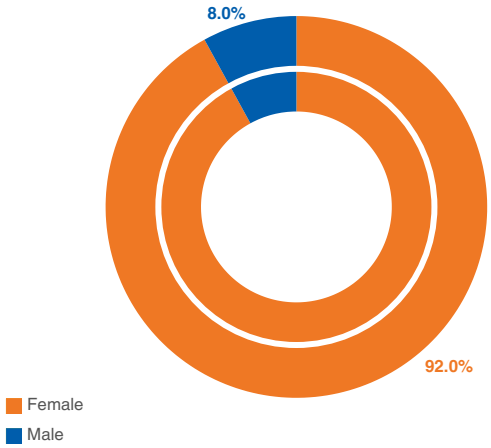
3.1. KEY FINDINGS – MEDICAL STUDENTS

CHART 1: AGE-WISE DISTRIBUTION OF THE RESPONDENTS



In Chart 1, 52% of respondents are between 17-18 years, 36% are between 19-20 years, and 12% are between 21-22 years.

CHART 2: GENDER-WISE DISTRIBUTION OF THE RESPONDENTS



According to Chart 2, 92% of respondents are female, and 8% are male.

CHART 3: YEARS OF EXPERIENCE

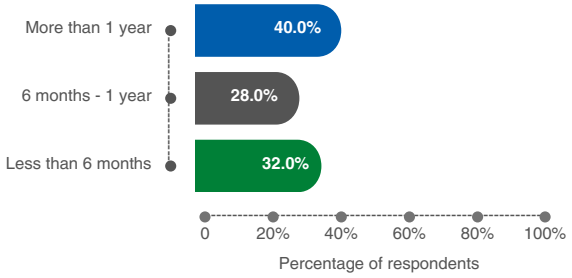


Chart 3 shows the years of experience of the medical students in the Bhaktivedanta hospital. 32% of respondents have less than 6 months of experience, 28% have between 6 months to 1 year of experience, and 40% have more than 1 year of experience.

ENGAGEMENT AND USAGE

CHART 4: FREQUENCY OF ATTENDING TRAINING SESSIONS/ SEMINARS/ DISCUSSIONS/DEPARTMENT EVENTS IN THE AUDITORIUM FOR NURSING-RELATED ACTIVITIES

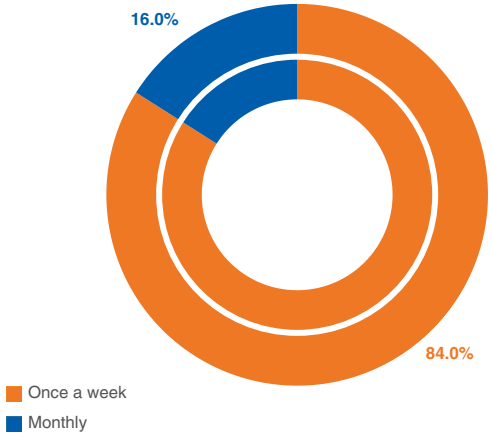
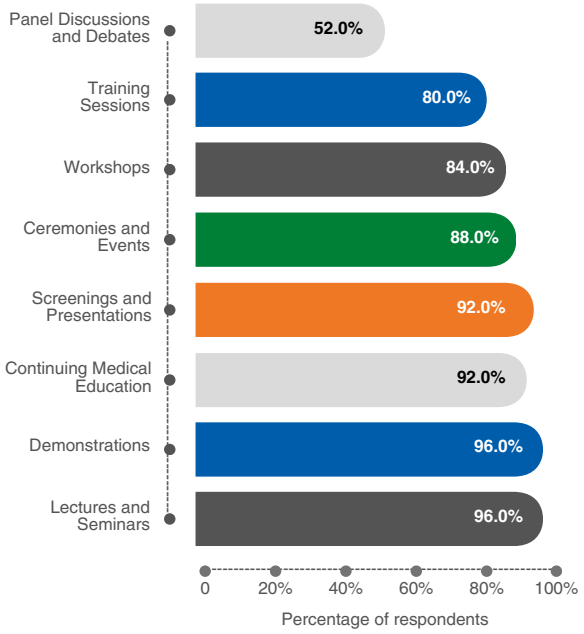


Chart 4 shows that 84% of participants attend training sessions or seminars in the auditorium once a week, indicating strong engagement with educational activities. Only 16% attend these sessions on a monthly basis.

> "Hosting inductions and regular training for our staff in the new auditorium has enhanced onboarding significantly. With advanced seating and AV systems, we're able to provide effective training to ensure everyone is well-prepared from day one."
>
> **Sumedha, Deputy Manager HR**

> The auditorium is pivotal for various departmental and academic gatherings. At the auditorium, we've conducted live-streamed surgeries for national-level workshops, and our students benefit from well-equipped training sessions twice weekly.
>
> **Dr. Bhakti Bhatt, Manager, Medical Administration**

CHART 5: TYPE OF ACTIVITIES PRIMARILY ATTENDED IN THE AUDITORIUM



According to Chart 5, 96% of respondents utilise the auditorium for lectures and demonstrations, highlighting its central role in knowledge dissemination. Furthermore, 92% indicated its use for continuing medical education and screening and presentations, while 88% noted it as a venue for ceremonies and events. This data reflects a broad acceptance of the auditorium as a versatile educational space, with only 52% citing panel discussions and debates as a purpose, indicating room for increased engagement in this area.

COMFORT AND ACCESSIBILITY

CHART 6: LEVEL OF COMFORT IN THE SEATING ARRANGEMENTS IN THE AUDITORIUM

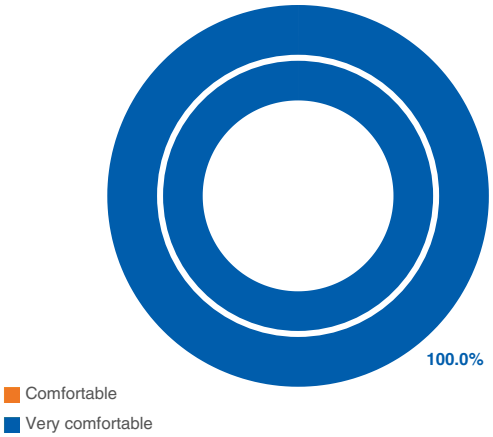
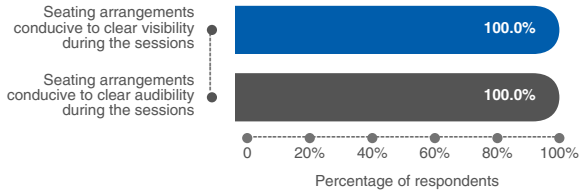


Chart 6 indicates that 100% of participants find the seating arrangements "very comfortable," showing high satisfaction with the auditorium's design.

CHART 7: CLEAR VISIBILITY & AUDIBILITY RELATED TO PROPER SEATING ARRANGEMENTS



According to Chart 7, 100% of the respondents agreed that the seating arrangements facilitated clear visibility and audibility during sessions, underscoring the auditorium's effectiveness in supporting a conducive learning environment. This unanimous feedback indicates that the design meets the educational needs of all participants.

AV CONTROLLING UNIT THROUGH TABLET

"The new auditorium setup with multiple screens and excellent soundproofing ensures everyone can see and hear clearly during presentations. This feature alone has elevated our lectures and helped increase understanding for both students and staff. The flexibility and comfort significantly improve focus and engagement during training and meetings, which was challenging in the older hall."

Dr. Chandrakant Mishra, Optometrist

BENEFITS OF EDUCATIONAL ACTIVITIES

CHART 8: EXTENT TO WHICH THE SEATING CAPACITY OF THE AUDITORIUM IS SUFFICIENT FOR THE NURSING STAFF

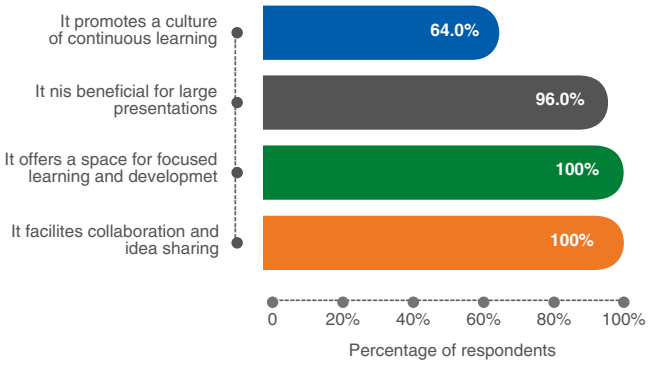


Chart 8 demonstrates that 100% of participants believe the auditorium facilitates collaboration and idea sharing, which is vital for fostering a community-oriented learning environment. Additionally, 96% find it beneficial for large presentations, while 64% agree it promotes a culture of continuous learning. This data highlights the auditorium's multifaceted role in enhancing educational experiences.

> With regular CME programs, workshops, and conferences, the auditorium has become our central learning hub.
>
> **Dr. Kailash Mithe, Medical Superintendent**

> The hall's advanced AV technology is a tremendous asset. It enables us to present visual information with remarkable clarity, which is crucial for training medical staff. It's now far easier to cover complex content with confidence.
>
> **Sumedha, Deputy Manager HR**

EFFECTIVENESS OF RESOURCES

CHART 9: EXTENT TO WHICH THE AUDITORIUM FACILITATED LEARNING RELATED TO THE PROFESSION AMONG THE NURSING STAFF

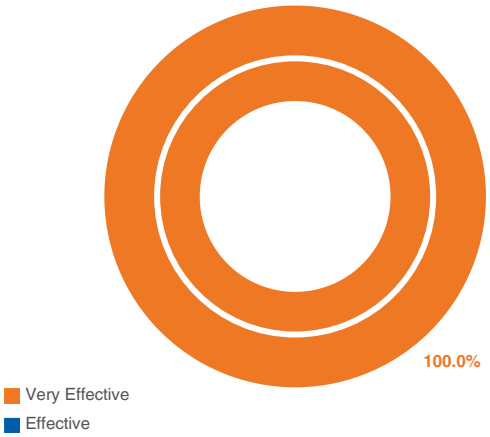


Chart 9 reveals that 100% of participants rated the audio-visual equipment as "very effective" for presentations and training. This strong endorsement indicates that the technology is successfully meeting educational demands.

CHART 10: ENHANCED LEARNING ENVIRONMENT IN AUDITORIUM

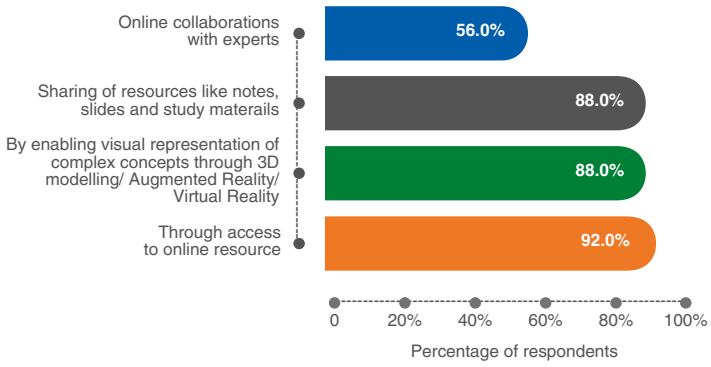
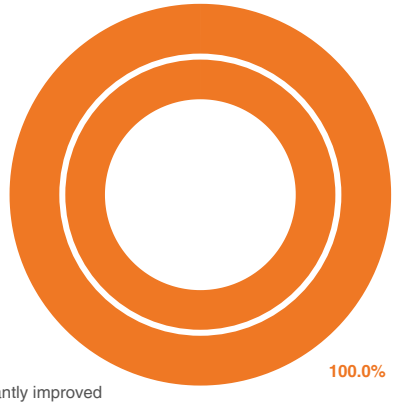


Chart 10: 92% of respondents acknowledged that access to online resources enhances their learning experience, and 88% noted the importance of visual representation of complex concepts through 3D modelling or augmented reality. These findings suggest that the integration of technology is significantly enriching the educational environment, with only 56% recognising online collaborations with experts as a benefit.

IMPACT ON LEARNING OUTCOMES

CHART 11: WHETHER EVENTS IN THE AUDITORIUM (E.G., TRAINING, WORKSHOPS) HAVE CONTRIBUTED TO IMPROVEMENTS IN THE NURSING PRACTICE

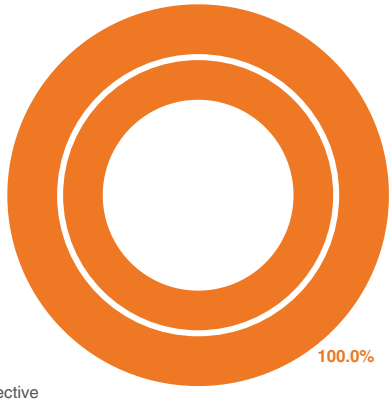


Significantly improved

Not improved

Chart 11 shows that 100% of the respondents indicated that the use of the auditorium for lectures and presentations has "significantly improved" their understanding of medical concepts. This overwhelming agreement points to the auditorium's crucial role in knowledge acquisition.

CHART 12: EXTENT TO WHICH THE TRAINING SESSIONS CONDUCTED IN THE AUDITORIUM HAVE BEEN EFFECTIVE FOR THE PROFESSIONAL GROWTH



Very effective

Not effective

Chart 12 highlights that 100% of participants found the auditorium's facilities "very effective" in supporting engagement and focus during lectures. This data suggests that the auditorium environment is successfully enhancing the overall learning experience.

> "The new AV systems have made medical presentations and student lectures far more impactful. The clarity and visibility make it easier to follow complex topics, creating a stronger educational foundation for all participants."
>
> Dr. Bhakti Bhatt, Manager, Medical Administration

> "The well-thought-out design of the auditorium, with features like soundproofing and spacious seating, helps keep participants focused and engaged. It's a significant upgrade from previous setups and positively impacts every session held here."
>
> **Chandra Naphade, Sr. Executive, Projects**

3.2 KEY FINDINGS - NURSING STAFF

DEMOGRAPHIC ANALYSIS

CHART 13: AGE-WISE DISTRIBUTION

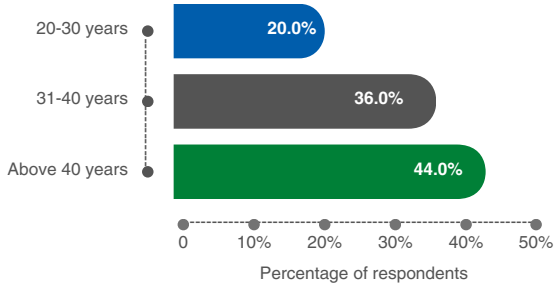


Chart 13 shows that 20% of respondents are between 20-30 years, 36% are between 31-40 years, and 44% are above 40 years.

CHART 14: GENDER-WISE DISTRIBUTION

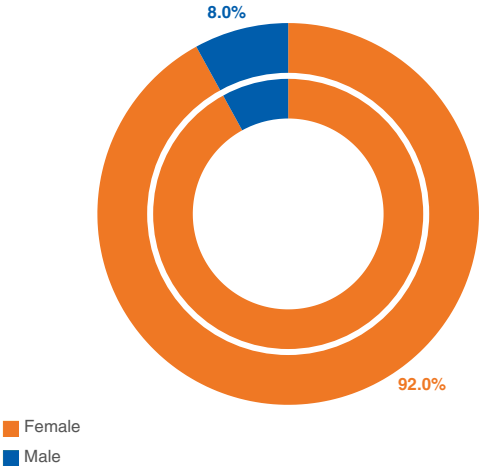


Chart 14 shows that 92% of respondents are female, and 8% are male.

CHART 15: YEARS OF EXPERIENCE

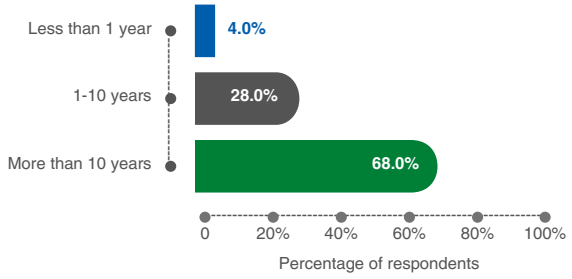


Chart 15 shows that 4% have less than 1 year of experience, 28% have between 1-10 years of experience, and 68% have more than 10 years of experience.

ENGAGEMENT IN AUDITORIUM ACTIVITIES

CHART 16: FREQUENCY OF ATTENDING TRAINING SESSIONS/ SEMINARS/ DISCUSSIONS/DEPARTMENT EVENTS IN THE AUDITORIUM FOR NURSING-RELATED ACTIVITIES

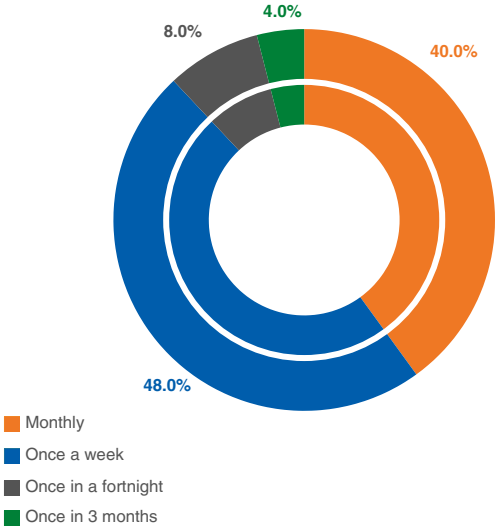


Chart 16 shows that 48% of nursing staff attend training or department events in the auditorium once a week, while 40% participate monthly, and 8% once every two weeks. This regular attendance underscores the auditorium's pivotal role in supporting professional development and continuous learning for the nursing team. However, 4% of the respondents attended the auditorium only once in 3 months.

> "The auditorium has become essential for our department, especially with monthly sessions that range from hands-on workshops to induction meetings and guest lectures."
>
> **Tejal Sankhe, Senior nursing staff**

CHART 17: TYPE OF ACTIVITIES IN WHICH PRIMARILY ATTEND IN THE AUDITORIUM

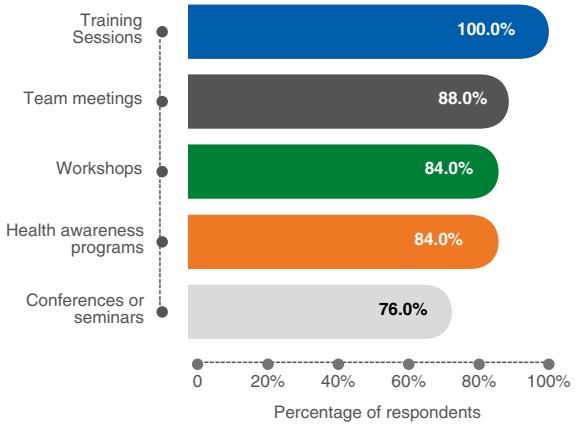


Chart 17 indicates that among primary activities, 100% of nursing staff reported attending training sessions, with 88% participating in team meetings and 84% each in workshops and health awareness programs. Additionally, 76% attend conferences or seminars. These findings highlight the auditorium's capacity to support a diverse array of professional activities essential for nursing education and team collaboration.

> For workshops, guest lectures, and cultural events, the auditorium has enabled us to bring in expert speakers and learn directly from their experiences. One of the standout features has been the opportunity to participate in guest lectures, which is invaluable for both seasoned nurses and those still training. Sessions like these offer real-time learning.
>
> **Ananya Patil, Senior nursing staff**

COMFORT AND USABILITY

CHART 18: LEVEL OF COMFORT IN THE SEATING ARRANGEMENTS IN THE AUDITORIUM

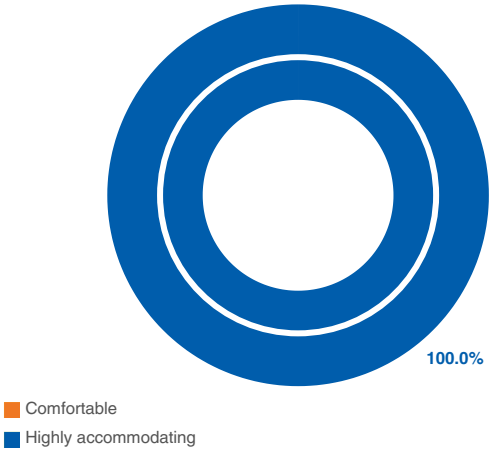


Chart 18 reveals that 100% of respondents found the seating arrangements "highly accommodating". The high comfort level supports focused engagement during extended sessions, enhancing the learning environment for nursing staff.

CHART 19: CLEAR VISIBILITY & AUDIBILITY RELATED TO PROPER SEATING ARRANGEMENTS

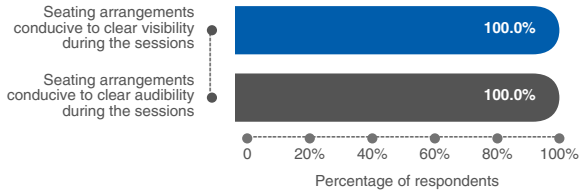
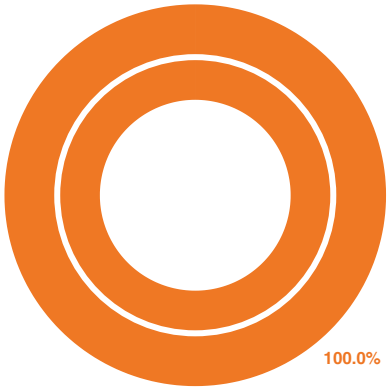


Chart 19 shows unanimous agreement among nursing staff (100%) that the auditorium's seating arrangements ensure clear visibility and audibility. This conducive setup ensures all participants have equal access to information shared during sessions.

> Unlike previous setups, the current seating allows for clear visibility of presentations. With ample seating space now, we are able to accommodate all nursing staff without overcrowding. This has been especially beneficial during larger events like the Nursing Council workshop, where nurses from various departments come together. It fosters a sense of unity and collaboration that wasn't possible before in our limited spaces.
>
> **Leena Satpar, Nursing Staff**

CHART 20: EXTENT TO WHICH THE SEATING CAPACITY OF THE AUDITORIUM IS SUFFICIENT FOR THE NURSING STAFF

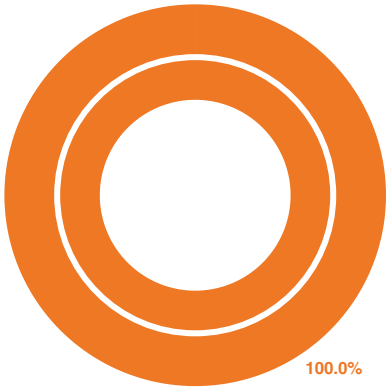


Always sufficient
Mostly sufficient

Chart 20 shows that 100% of respondents believe the auditorium's seating capacity is "always sufficient". This adequacy in capacity helps to ensure accessibility and convenience for staff attending sessions.

LEARNING AND PROFESSIONAL DEVELOPMENT

CHART 21: EXTENT TO WHICH THE AUDITORIUM FACILITATED LEARNING RELATED TO THE PROFESSION AMONG THE NURSING STAFF



Significantly improved
Not improved

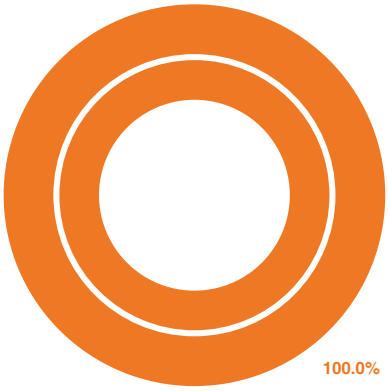
Chart 21 demonstrates that 100% of respondents feel the auditorium has "significantly improved" their professional learning. This strong consensus reflects the value of dedicated spaces in enhancing learning and professional gains.

"The auditorium has truly elevated our nursing practices. Hosting events and receiving real-time feedback during Nursing Council workshops has refined our skills, and meeting seasoned speakers directly has exposed us to diverse perspectives in patient care."

Jija Gopal Bhusara, Female Staff Nurse

SOULACE TEAM INTERACTING WITH NURSING STAFF

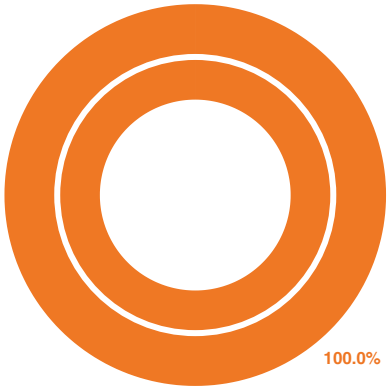
CHART 22: WHETHER EVENTS IN THE AUDITORIUM (E.G., TRAINING, WORKSHOPS) HAVE CONTRIBUTED TO IMPROVEMENTS IN THE NURSING PRACTICE



Significantly improved
Not improved

Chart 22 shows that 100% of respondents reported that events in the auditorium, such as training and workshops, have "significantly improved" their nursing practice. This unanimity highlights the auditorium's role in bridging theoretical knowledge and practical skills essential for quality patient care.

CHART 23: EXTENT TO WHICH THE TRAINING SESSIONS CONDUCTED IN THE AUDITORIUM HAVE BEEN EFFECTIVE FOR THE PROFESSIONAL GROWTH

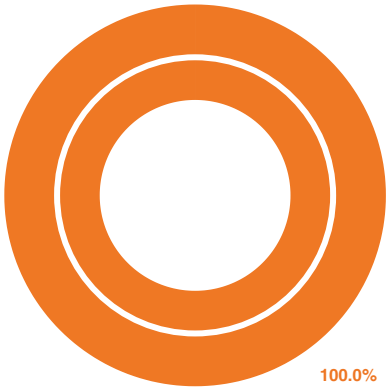


Very effective
Not effective

Chart 23 shows that the training sessions conducted in the auditorium are seen as "very effective" for professional growth by 100% of respondents. This data reinforces the alignment of the training space with the needs and goals of the nursing staff, directly supporting their professional trajectory.

> "With the auditorium's high-quality audio-visual setup, we've been able to dive deeper into complex cases and even observe surgical broadcasts that aid our practical understanding. Seeing procedures live offers a unique educational experience, reinforcing techniques and providing a real-world look at patient care that textbooks alone can't offer."
>
> **Prerna Ghosh, Nurse Educator**

CHART 24: OVERALL SATISFACTION WITH THE AUDITORIUM AS A VENUE FOR NURSING- RELATED ACTIVITIES



Highly satisfied
Satisfied

Chart 24 reveals that 100% of respondents are "highly satisfied" with the auditorium as a venue for nursing activities. This high satisfaction rate reflects the facility's success as a supportive learning environment tailored to the needs of nursing professionals.

INTERACTION WITH DR. K VENKATRAMAN, DIRECTOR PROJECTS

“Overall, the auditorium has exceeded our expectations. It is not only a space for professional growth but has also helped elevate our department’s reputation, especially during NABH certification evaluations. Having such a comprehensive facility has allowed us to welcome experts, host critical workshops, and engage in collaborative learning—all of which reflect the hospital’s commitment to excellence in nursing and patient care.”

Sunita Pande, Deputy Manager in Nursing Sector

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

Medical Students

- Enhanced learning opportunities through improved facilities for lectures, practical demonstrations, and workshops.
- Access to state-of-the-art audio-visual equipment for better engagement during sessions.
- Fosters professional growth by equipping students with the necessary skills and knowledge for their healthcare careers.

Nursing Staff

- Regular training sessions and workshops enable continuous professional development for nursing staff.
- Opportunities to attend guest lectures enhance their knowledge base and practical skills.
- Interactions in seminars, lectures and surgery broadcasts allows for deeper insights. reinforces learning and directly contributes to improved patient care practices.

COMMUNITY LEVEL

- The new building serves as a hub for community health initiatives and outreach programs, strengthening the relationship between the hospital and the surrounding community.
- Encourages community engagement in health matters, fostering a healthier community by improving health literacy and access to medical services.

DISTRICT LEVEL

- Enhanced hospital infrastructure leads to improved healthcare services at the district level, attracting more medical professionals and resources.
- Capacity-building initiatives elevate the standard of care, reduce healthcare disparities, and promote collaboration among various health institutions, contributing to better health outcomes for the population.

STATE LEVEL

- Upgraded hospital facilities can serve as a model for healthcare infrastructure development at the state level.
- Showcases effective practices in medical education, training, and community engagement, influencing state policies and funding allocations for public health initiatives.

NATIONAL LEVEL

- Contributes to national health goals by aligning with initiatives aimed at improving medical education and public health infrastructure.
- Supports the objective of addressing healthcare workforce shortages by training highly skilled medical professionals and nursing staff.
- Implements best practices in health education and community engagement, contributing to national standards and fostering a culture of excellence in healthcare delivery.
- Ultimately, it promotes a healthier population and a more resilient healthcare system nationwide.

CHAPTER 8
RECOMMENDATIONS

Integrate Multi-Use Spaces:
Design the new building with flexible multi-use spaces to address the challenge of having only one auditorium for multiple bookings. These adaptable areas can accommodate various functions, such as training sessions, workshops, and community events. This versatility will ensure efficient use of space, allowing different departments to meet their needs without the necessity for additional resources.

Community Engagement Programs:
Establish regular community health programs and workshops in the new auditorium, inviting local residents to participate. This initiative will enhance public health awareness in the region.

09. SUSTAINABILITY

A thorough evaluation of the project reveals that its sustainable impact is deeply rooted in infrastructure resilience, professional capacity building, and increased accessibility to advanced healthcare training. These elements ensure long-term benefits for both medical professionals and the wider community:

Enduring Learning Space: The Rahul Bajaj Auditorium is designed as a dynamic, professional development hub where healthcare workers can continuously enhance their skills. It offers a modern venue for training, seminars, and workshops, ensuring that medical staff and students have a dedicated space for ongoing learning.

Professional Development for Healthcare Workers: Regular training programs and hands-on sessions held in the auditorium contribute to capacity building, empowering healthcare professionals with the latest knowledge and practical skills. This continuous development encourages innovation in patient care.

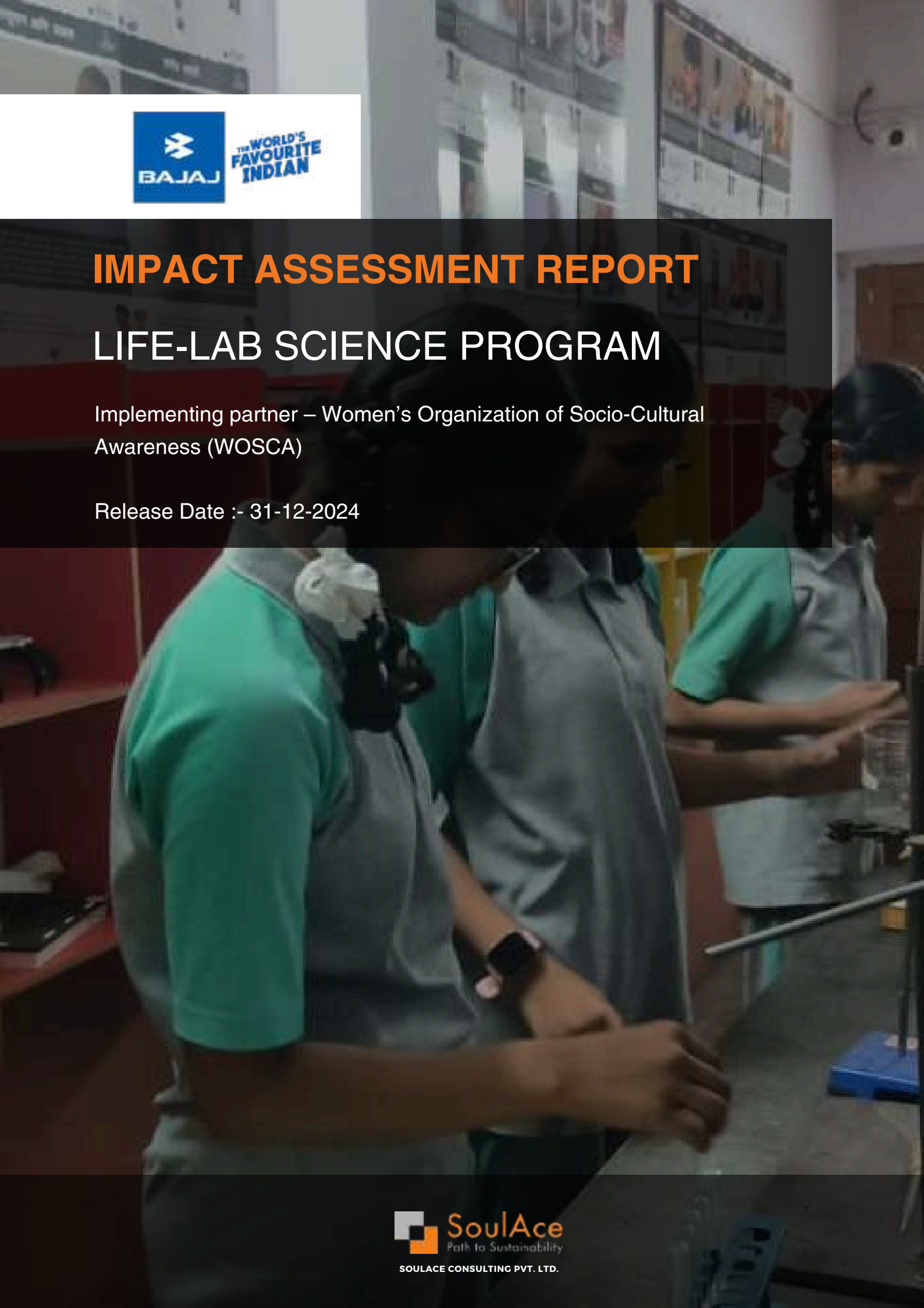
Public Health Awareness: The auditorium is not only a center for professional training but also organises preventive public health awareness programs. By engaging the medical community in such programs, it helps promote better health practices and supports the broader goal of improving public health in the region.

NABH-Compliant Infrastructure: Every element of the auditorium is crafted with the end-user in mind, creating a comfortable, inclusive, and engaging environment. Built to meet stringent NABH standards, the auditorium's state-of-the-art digital and audiovisual systems ensure long-term functionality and reliability. This commitment to quality guarantees that the facility remains a valuable resource for healthcare education for years to come.

CHAPTER 10
CONCLUSION

In conclusion, the Bhaktivedanta Hospital's initiative to expand its infrastructure through the addition of a new auditorium has significantly enhanced the healthcare delivery experience for medical professionals. With the capacity to host over 400 participants in the new auditorium and facilitate multiple workshops and training sessions monthly, the hospital has become a vital resource for both medical students and nursing staff. The upgraded facilities have enabled over 200 nursing staff to partake in continuous professional development, leading to improved patient care practices.

Bajaj's support has been instrumental in this transformative journey, exemplifying a commitment to strengthening public health infrastructure. By fostering a collaborative environment where healthcare professionals can thrive, the hospital is not only addressing immediate health challenges but also contributing to the long-term resilience of the healthcare system. This project aligns with the collective vision of promoting health equity and enhancing the quality of care for the communities.



IMPACT ASSESSMENT REPORT

LIFE-LAB SCIENCE PROGRAM

Implementing partner – Women's Organization of Socio-Cultural Awareness (WOSCA)

Release Date :- 31-12-2024

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

ABL	Activity-Based Learning
CSR	Corporate Social Responsibility
FY	Financial Year
ICDS	Integrated Child Development Services
NEP	National Education Policy
NGO	Non-Governmental Organization
NMEICT	National Mission on Education through Information and Communication Technology
SDG	Sustainable Development Goal
STEM	Science, Technology, Engineering, and Mathematics
TLM	Teaching Learning Material
WOSCA	Women's Organization of Socio-Cultural Awareness

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The Life-Lab Science Program, initiated by the Women's Organization of Socio-Cultural Awareness (WOSCA) with support from Bajaj Auto Limited, was launched to revolutionize science education in 36 schools located in underserved regions of the Aurangabad district. The program focused on improving the learning experience of students by introducing Activity-Based Learning (ABL), encouraging students to engage in hands-on experiments that foster curiosity, critical thinking, and creativity. The goal was to enhance student participation, improve academic performance, and cultivate a scientific mindset by making science lessons more interactive and relevant to real-world applications. By emphasising practical learning and providing necessary resources, the Life-Lab Science program aimed to create an enriching, student-centred environment that empowers both learners and educators.

PROJECT DETAILS

Implementation year
FY 2019 - FY 2022

Assessment year
FY 2024 - FY 2025

Implementing Partner
Women's Organization of Socio-Cultural Awareness

Project location
Aurangabad District, Maharashtra

Beneficiaries
9,660 students from 31 govt. and 5 private schools

Budget
₹165 Lakhs

Alignment with SDGs

PROJECT ACTIVITIES

- Setting up Science Learning Centers with hands-on models and activity booklets for experiential learning.
- Training teachers on effective science education techniques and resource use.
- Launching a Remote Engagement Program (REP) to ensure virtual science learning during school closures.

STUDENTS DOING GROUP PRESENTATION OF THIER PROJECT

Key Findings

75.3%
of the respondents reported a significant improvement in their ability to think creatively and generate new ideas.

69.9%
experienced strong improvements in critical thinking and problem-solving skills.

78.5%
of the respondents reported that they feel more confident doing science experiments on their own after participating in the Life-Lab Science program.

78.5%
of the respondents reported feeling more confident in conducting science experiments independently after participating in the Life-Lab Science program.

70.4%
of students highlighting an increase in their confidence regarding hands-on experiments.

44.6%
of the respondents attended science lab sessions once a week, while 32.0% attended twice a week. A smaller group (15.8%) attended twice a month.

Key Impacts

98.0%
of the students agree that hands-on activities make learning more enjoyable.

70.4%
of the respondents feel the program has helped them understand how science is applied in everyday life.

72.7%
of the students feel more motivated to participate in science classes due to the program's activities.

91.9%
of the students report a better understanding of scientific concepts.

78.1%
of found that demonstration models helped make science concepts easier to remember, improving overall academic performance.

71.5%
of expressed increased curiosity about science topics.

55.8%
report increased curiosity during science lessons, indicating that the Life-Lab Science program fosters an engaging and enjoyable learning environment.

58.8%
linking experiments to real-life situations, emphasising the importance of experiential learning.

03. OECD FRAMEWORK

RELEVANCE

The Life-Lab program has been a significant intervention in schools in the Aurangabad district in the state of Maharashtra, directly addressing the critical need for improved science education in underserved communities. It aligns with national educational priorities aimed at enhancing practical, hands-on learning. By integrating Activity-Based Learning (ABL), the program creates inquiry-driven experiences that foster curiosity, creativity, and critical thinking.

COHERENCE

The intervention is well aligned with SDG:

Additionally, the intervention also aligned with the government of India's flagship program of National Education Policy (NEP) and the National Mission on Education through Information and Communication Technology (NMEICT).

EFFECTIVENESS

The Life-Lab Science program has proven highly effective in improving educational outcomes, particularly in science education, by fostering a more engaging and interactive learning environment. Teachers and students shared positive feedback, noting that the hands-on learning activities have increased student motivation and interest in science. The program's success in fostering a deeper understanding of concepts, enhancing critical thinking skills, and encouraging teamwork reflects its overall positive impact on academic achievement.

EFFICIENCY

The project demonstrates a high level of efficiency through its well-organised and decentralised team structure, collaborative grant-based model, and strategic partnerships. The efficient allocation of resources and streamlined decision-making processes contribute to the project's overall efficiency.

IMPACT

The Life-Lab Science program, implemented in schools across the Aurangabad district, has had a transformative impact on science education, fostering immediate and long-term benefits for students. Through the introduction of Activity-Based Learning (ABL), the program has significantly enhanced student engagement in science, making learning more interactive and enjoyable. Students actively participate in hands-on experiments, improving their understanding of scientific concepts and increasing their curiosity and critical thinking abilities. The program's success in promoting practical science education has also led to improved academic outcomes. Students show better retention and application of scientific knowledge, bridging the gap between theoretical learning and real-world applications. Teachers have reported a positive shift in teaching practices, with ABL providing them with tools to create a more engaging and effective learning environment.

SUSTAINABILITY

The Life-Lab Science program's sustainability is ensured through its integration into existing educational frameworks, with a focus on hands-on learning and skill development that can be continuously adapted and expanded. By equipping teachers with the necessary resources, training, and tools, the program fosters long-term improvements in science education, enhancing the overall learning environment. Moreover, it encourages a culture of inquiry and critical thinking among students, which will benefit them in their academic journey and beyond. Aligning with government policies, such as the National Education Policy (NEP) and the National Mission on Education through Information and Communication Technology (NMEICT), secures ongoing support and resources, reinforcing the program's long-term viability.

CHAPTER 4
INTRODUCTION

Students presenting their projects

BACKGROUND AND NEED OF THE PROGRAM

Activity-Based Learning (ABL), emphasised in the National Curriculum Framework 2005, has seen minimal adoption among teachers, especially in government schools. Key challenges include science teachers' difficulty in adopting ABL methods and students' weak foundational knowledge, leading to poor grade-level adaptation. Data from the National Assessment Survey (2017) indicates declining student performance in Maharashtra across classes 3, 5, and 8, with averages of 69%, 56%, and 40%, respectively. In Aurangabad, only 44% of grade 8 students answered basic science questions, and 71% struggled with reasoning tasks. The COVID-19 pandemic has further disengaged students, increasing dropout risks.

To address challenges in science education, WOSCA, supported by Bajaj Auto Limited, launched the "Life-Lab Science" program in 36 schools across Aurangabad. The initiative aims to create engaging classrooms that encourage students to enjoy science and consider STEM careers. By improving Teaching Learning Materials (TLM) and fostering 21st-century skills like creativity and problem-solving, the program seeks to empower students to develop innovative solutions to community issues while enhancing their overall learning experience.

OBJECTIVES OF THE LIFE-LAB SCIENCE PROGRAM

Enhance the quality of science education using Life-Lab's science demonstration models and activity-based learning methods.

Foster a scientific temperament among students in government schools.

Build teachers' capacity to effectively teach science concepts.

KEY ACTIVITIES

The intervention included a selection of thirty-six schools in Aurangabad district, specifically focused on government Zilla Parishad and Municipal Corporation Schools. A survey was conducted in over 50 schools to assess their readiness to accept the program activities.

Installation of science labs

The initiative aims to bridge the gap in experiential learning opportunities in underserved rural schools by setting up Science Learning Centres. These dedicated labs are designed to help students explore abstract scientific concepts through hands-on activities, making learning more engaging and effective. Each school received a well-equipped science lab with proper lighting and space for conducting experiments. The labs feature 81 demonstration models covering over 500 scientific concepts aligned with the school curriculum, allowing students to visualise and grasp complex ideas. Additionally, science posters were installed to spark curiosity and encourage thoughtful discussions among students.

To further enhance learning, 9,660 activity booklets were distributed to students. These booklets include engaging, science-based activities with animated descriptions, fostering self-learning and deeper conceptual understanding. Through these resources, the Science Learning Centres promote interactive and meaningful education.

Capacity building of teachers

To ensure the success of the program, a virtual orientation was conducted with headmasters across 36 schools. This session introduced them to the year-long program activities, including virtual initiatives planned during school closures. Key topics covered included the Life-Lab Science program design, the Remote Engagement Program, assessments, science competitions, and exhibitions. The orientation highlighted the need for collaboration among headmasters, teachers, and parents for effective data collection, virtual Activity-Based Learning (ABL) sessions, and behaviour management throughout the program.

Teacher training was a pivotal component of the initiative, focusing on equipping educators with the tools and techniques necessary to deliver effective science education. Sessions familiarized teachers with the program's layout, assessments, and resources, including science toolkits and support materials. Interactive activities, such as constructing paper gliders and balloon cars, illustrated how basic materials could promote meaningful learning. Teachers also received Master Demo Booklets and Student Activity Booklets with clear instructions on incorporating these resources into their classrooms and remote lessons, enhancing both teaching practices and student engagement.

Remote engagement program (REP)

The Remote Engagement Program (REP) was a key initiative of the Life-Lab Science Program, introduced to ensure uninterrupted science education during COVID-19-related school closures. Targeting up to 5,000 students across 36 schools in Aurangabad, the REP leveraged internet-enabled smartphones to deliver educational content. WhatsApp groups were established for each grade, connecting students, teachers, headmasters, and Life-Lab facilitators.

Facilitators shared Science Do-It-Yourself (DIY) instructional videos through these groups, enabling students to conduct hands-on activities at home. These videos were engaging and easy to follow, encouraging active participation. The REP ensured that the students could continue their science learning effectively by maintaining continuous interaction, despite the challenges of remote education.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – WOMEN'S ORGANISATION FOR SOCIO-CULTURAL AWARENESS (WOSCA)

The Women's Organization for Socio-Cultural Awareness (WOSCA) is a voluntary organisation founded on December 20, 1993. It focuses on empowering underprivileged communities through programs in education, livelihood, health, child rights, environmental conservation, and human resource development. Registered under the Society Registration Act XXI of 1860 and FCRA in 2000, WOSCA designs need-based initiatives to foster sustainable development and improve quality of life.

INTERACTION WITH THE STUDENTS

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited had appointed SoulAce to assess the "Life-Lab Science" program implemented in 36 schools across Aurangabad. The initiative aimed to improve science education by integrating activity-based learning, enhancing teaching resources, and developing teachers' capabilities. Focused on fostering a scientific temperament among students, the program also sought to inspire interest in STEM careers, providing a creative and engaging learning environment for children in underserved communities.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

- To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.
- To measure the effectiveness of the program in achieving its intended goals and objectives.
- To measure the extent to which the program has contributed to the well-being of the beneficiaries.

DEFINITION OF THE RESEARCH

Research can be described as a logical and systematic search for new and useful information on a particular subject. Social science research refers to the systematic activity of gaining new understanding by following scientific principles and methods to minimise bias and subjectivity. It is contrary to writing something based on assumptions or speculations. Though information on certain facts can also be gained through common sense and based on general observation and hearsay, those facts will not be considered valid until they have been obtained in a methodical manner, which can stand the test of time. The defining characteristics of scientific research are objectivity, ethical neutrality, reliability, testability, and transparency. The identification of the research problem provides the starting point of research, which is then defined and redefined through a proper review of the literature on the problem or deliberations with research experts and knowledgeable others in the subject matter of interest. Each research problem has a multitude of perspectives and dimensions, and research cannot cover all of those in a single study.

USE OF MIXED METHODOLOGY FOR MAXIMUM INSIGHTS

This evaluation utilised a mixed-methods approach, incorporating both qualitative and quantitative research methods.

APPLICATION OF QUANTITATIVE TECHNIQUES

In quantitative research, standardised instruments such as questionnaires and interview schedules are employed to collect data. However, the information that is obtained is easily amenable to various statistical measures and tests. The quantitative methods facilitated the collection and analysis of numerical data, yielding statistical insights and identifying trends.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative research can only unravel enriched and hidden information that may not be evident on the face of it. The qualitative approach is distinguished by deeper probing and flexibility, and it can yield massive amounts of data that were not anticipated when the research was initiated. The qualitative component delved into subjective experiences and perspectives, providing a nuanced understanding of participant views.

PROJECT EVALUATION FRAMEWORK

After the collection of relevant information and perceptions through interviews, the OECD framework was followed/applied, which has six evaluation criteria - relevance, coherence, efficiency, effectiveness, impact, and sustainability for each of the indicators.

The study's research design was descriptive, aiming to present a detailed analysis and exploration of the various facets of the Bajaj-supported program.

Descriptive research is apt for creating an overview, discerning patterns, and grasping the current state of affairs. By integrating both qualitative and quantitative research methodologies within a descriptive framework, the study aimed to deliver a thorough evaluation of the program, elucidating its impact and suggesting avenues for enhancement. This methodological blend ensured a holistic examination of the subject, lending both depth and breadth to the findings and bolstering the study's credibility.

ENSURING TRIANGULATION

To enhance the reliability and validity of its findings, the study implemented various triangulation techniques. Data triangulation was achieved through gathering information from diverse sources, including field notes, interviews with beneficiaries, interactions with community members, and feedback from project volunteers. This extensive data collection facilitated a comprehensive evaluation of the program's impact. Methodological triangulation was also employed, utilising a variety of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases. Through these triangulation strategies, the study ensured a robust and dependable analysis, reinforcing the trustworthiness of its findings.

KEY STAKEHOLDERS

Students

Teachers

STUDY TOOLS

Questionnaires for primary beneficiaries – Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys.

Questionnaires for secondary beneficiaries and stakeholders – A semi-structured questionnaire was developed for each type of sample of this group. Stakeholders were identified across the focus areas. One-on-one discussions were conducted with beneficiaries to prepare case studies.

RESEARCH DESIGN

Name of the project

Life-Lab Science Program

Implementing organisation

Women's Organization of Socio-Cultural Awareness (WOSCA)

Research design used

Descriptive

Sampling technique

Random stratified sampling

Sample size

260 students

Qualitative method used

Semi-structured interviews, testimonials

ENSURING COMMITMENT TO RESEARCH ETHICS

The impact evaluation adhered to a strong ethical framework, ensuring responsible and ethical research practices. Participants' rights and well-being were prioritised at every stage of the study. Informed consent was obtained by clearly explaining the study's objectives, procedures, potential risks, and benefits, allowing participants to make fully informed decisions after addressing any questions. Confidentiality was strictly maintained, with data securely stored, accessible only to authorised personnel, and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of coercion, ensuring autonomy and respect for individual choice. Participants were consistently treated with respect, dignity, and fairness, prioritising their well-being. Support or assistance was readily available whenever needed to ensure their comfort and safety throughout the research process.

CHAPTER 6
KEY FINDINGS

This chapter provides a detailed overview of the key findings from the comprehensive Impact Assessment study. Through extensive surveys and in-depth interactions with key stakeholders, the study provides valuable insights into the program's impact on fostering a scientific temperament among students.

GEOGRAPHICAL COVERAGE

The intervention was implemented in 36 schools across Aurangabad district in Maharashtra.

OUTREACH AND INCLUSIVITY

The primary beneficiaries of the program were children, teachers, and their parents. Additionally, the program's outreach extended to encompass broader local communities.

DEMOGRAPHIC PROFILE OF THE RESPONDENTS

CHART 1: GENDER-WISE DISTRIBUTION OF RESPONDENTS

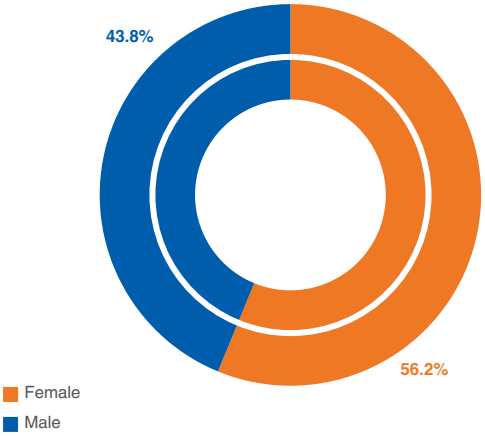

Chart 1 shows that more than half (56.2%) of respondents were female, while 43.8% were male.

CHART 2: AGE-GROUP-WISE DISTRIBUTION OF RESPONDENTS

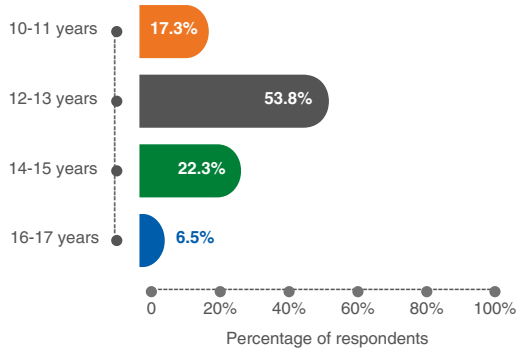

Chart 2 shows that more than half of the respondents (53.8%) were aged 12-13, followed by 22.3% aged 14-15, and 17.3% aged 10-11.

FDG WITH THE TEACHERS

CHART 3: GRADE-WISE DISTRIBUTION OF RESPONDENTS

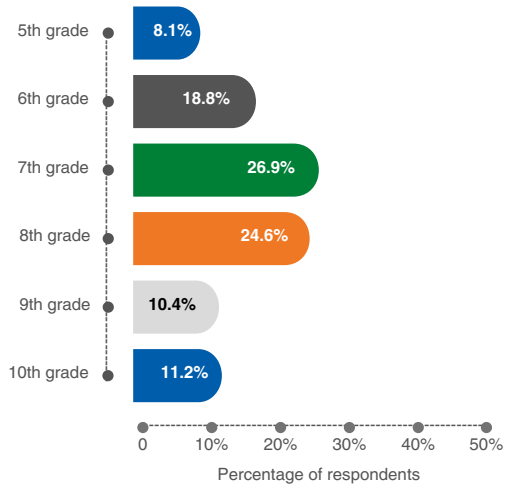

Chart 3 shows that more than one-fourth (26.9%) of respondents were studying in 7th grade, followed by 24.6% in 8th grade. 18.8% of the students were from the 6th grade, and around 11.2% were in the 10th grade.

PRE-INTERVENTION STATUS

Discussions with stakeholders revealed the following pre-intervention status of the program:

- Students primarily relied on observational learning with minimal opportunities for experimental learning, leading to a lack of conceptual clarity.
- Teachers reported low student participation and limited engagement in classroom activities.
- Academic challenges, particularly in science, were noted due to a lack of understanding, resulting in students' disinterest in the subject.

STUDENTS' PARTICIPATION IN SCIENCE LAB SESSIONS

CHART 4: FREQUENCY OF ATTENDING THE SCIENCE LAB SESSIONS IN SCHOOL

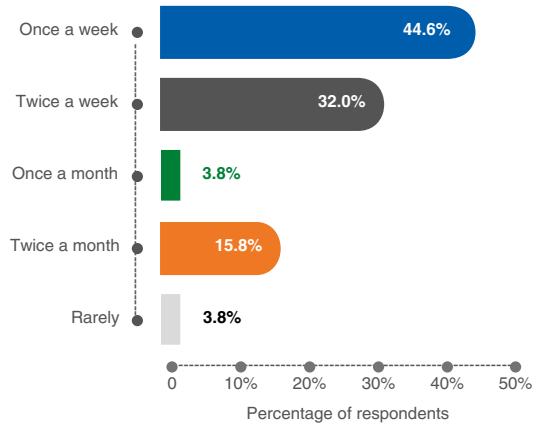

Chart 4 shows that less than half (44.6%) of the respondents reported attending science lab sessions once a week, while 32% reported attending twice a week. Additionally, 15.8% attended twice a month. This attendance pattern reflects the program's success in encouraging science education through hands-on learning, as regular lab participation plays a vital role in reinforcing scientific concepts and enhancing subject comprehension.

> "My son Rushikesh has benefited greatly from the Life-Lab program. Before this, he struggled with science and lacked motivation. Now, he enjoys attending the sessions and has developed a keen interest in exploring scientific concepts. The program has boosted his confidence, and he feels much more satisfied with his learning experience."
>
> **- Parent of Rushikesh Harne**

CHART 5: FREQUENCY OF PARTICIPATION IN HANDS-ON ACTIVITIES DURING SCIENCE CLASS

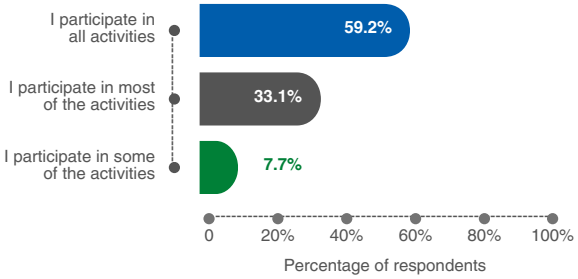

Chart 5 shows that 59.2% of respondents participated in all science class activities, while 33.1% engaged in most activities. This reflects high student involvement and the program's effectiveness in fostering an interactive learning environment. Respondents created science demo models on concepts like air pressure, blood circulation, Bohr's atomic model, and electric bell, enhancing practical understanding.

Teachers reported that the Activity-Based Learning (ABL) approach through Life-Lab boosted student engagement, with students attending regularly and actively participating in experiments. This hands-on learning increased their enthusiasm for science, made teaching more enjoyable, and fostered a more interactive and effective learning environment.

> "Since the introduction of the Life-Lab program, I have noticed a significant increase in student motivation and participation. Around 70% of students are actively engaging in classroom activities, which has made the learning process much more interactive. The hands-on experiments have created a refreshing change in how we approach science, allowing students to better grasp scientific concepts."
>
> **- Nirmala sambhaji Bansode,45 years female teacher, Z.P. school Aadgaon Khurd village**

> "The Life-Lab Science Program has been an insightful experience for my son, Swaraj. Earlier, he struggled with science and was not confident in problem-solving. Now, he enjoys the hands-on activities and has shown significant improvement in his confidence and understanding of science concepts. It's heartening to see him apply what he learns to real-life situations, and he is much happier and more satisfied with his learning experience."
>
> **- Parent of Swaraj Thombre**

STUDENTS' ENGAGEMENT IN THE LIFE-LAB SCIENCE PROGRAM

CHART 6: STUDENT'S OPINION ABOUT THE ENGAGEMENT, INTEREST AND ENJOYMENT IN THE LIFE-LAB SCIENCE PROGRAM

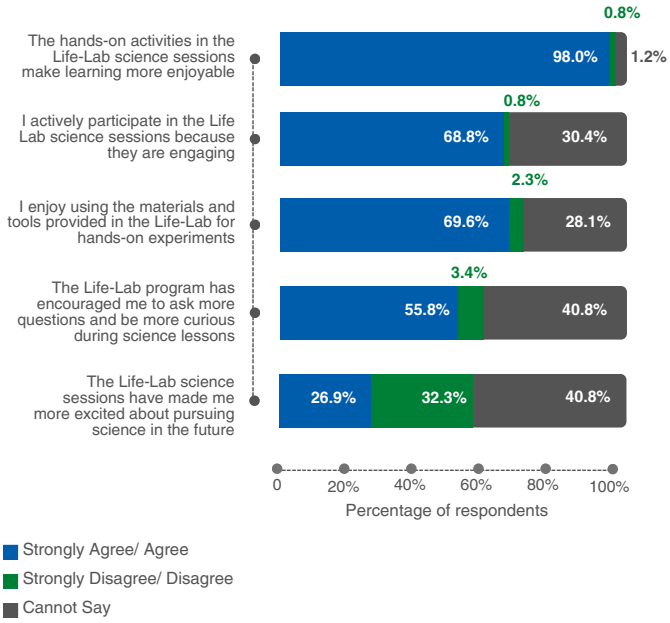

Chart 6 shows that 98% of respondents strongly agreed that hands-on activities make learning more enjoyable. Additionally, 68.8% actively participate in Life-Lab science sessions due to their engaging nature, while 69.6% enjoy using the materials and tools provided. Over half of the respondents (55.8%) reported increased curiosity during science lessons. These findings demonstrate that the Life-Lab Science Program has effectively fostered an engaging and enjoyable learning environment for students.

OPINION ABOUT THE LIFE-LAB SCIENCE PROGRAM

CHART 7: STUDENT'S OPINION ABOUT THE UNDERSTANDING AND REAL-LIFE APPLICATION OF EXPERIMENTS DONE IN THE LIFE-LAB SCIENCE PROGRAM

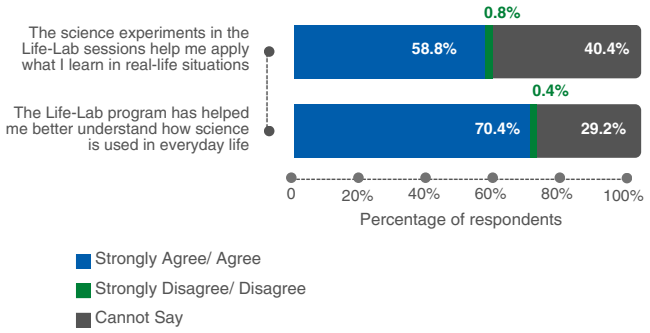

Chart 7 shows that 70.4% of respondents reported that the Life-Lab Science Program helped them understand how science is applied in everyday life. More than half of the respondents (58.8%) stated that the experiments conducted during the program helped them relate what they learned to real-life situations. This highlights the program's success in promoting experiential learning and fostering a positive scientific temperament. By emphasising practical applications and encouraging hands-on experiments, the Life-Lab Science Program has enhanced students' understanding of scientific concepts and inspired them to appreciate the relevance of science in their daily lives.

CHART 8: STUDENT'S OPINION ABOUT MOTIVATION AND CURIOSITY TO ATTEND SCIENCE CLASSES DUE TO THE LAB SCIENCE PROGRAM

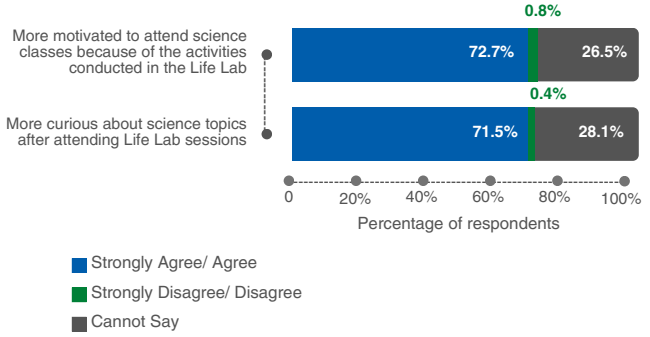

Chart 8 shows that 72.7% of respondents reported increased motivation to participate in science classes due to the activities offered in the Life-Lab. Additionally, 71.5% of the respondents expressed that their curiosity about science topics grew after attending the Life-Lab sessions. This demonstrates the Life-Lab's success in fostering greater interest and enthusiasm for science, encouraging students to actively engage with the subject and explore scientific concepts with more curiosity.

This aligns with the qualitative observations shared by teachers, who noted that students are actively engaging with science by creating projects at home, such as pinhole cameras, demonstrating their growing interest in the subject. Teachers also observed improvements in student discussions and their ability to ask questions, indicating an increase in curiosity and critical thinking. The rise in questioning reflects students' deeper engagement and active thought processes in science.

> "Snehal's participation in Life-Lab sessions has sparked her curiosity and creativity. Before joining, she found science challenging and dull. Now, she eagerly shares what she learns and experiments at home. The program has made science enjoyable for her and boosted her confidence. She is very happy with her progress and is satisfied with learning."
>
> **- Parent of Snehal Kuber**

STUDENTS PRESENTING THEIR PROJECT

"I have observed a significant increase in student interest and enthusiasm for science since the introduction of the Life-Lab program. The hands-on, activity-based learning approach has truly sparked their curiosity, making them more engaged in the subject. Students are not only participating more in class, but many are also taking the initiative to bring experiments from home, demonstrating their growing interest in applying scientific concepts outside the classroom. This shift in their attitude towards science is evident in their increased involvement and active engagement. It's inspiring to see how the Life-Lab program has transformed their approach to science, making it both enjoyable and meaningful."

- Kalyani Babanrao Kandharkar, 27 years teacher of Sarswati Vidhyamandir Waluj school

"My daughter's involvement in the Life-Lab program has been very positive. Before joining, she was unsure about her abilities in science. Now, she is more curious and confident about science. The program has also taught her the value of teamwork and creativity. She is very satisfied and happy with her progress."

- Parent of Aparna Wagh

"Ruturaj's interest in science has grown tremendously since he joined the Life-Lab Science Program. Earlier, he showed little enthusiasm for the subject. The hands-on activities and teacher support have made a big difference in his academic performance. He is more engaged, confident, and happier with his learning journey."

Parent of Ruturaj Tombare

STUDENTS' LEARNING OUTCOMES

CHART 9: STUDENT'S OPINION ABOUT THE UNDERSTANDING OF SCIENTIFIC CONCEPTS FROM THE LIFE-LAB SCIENCE PROGRAM

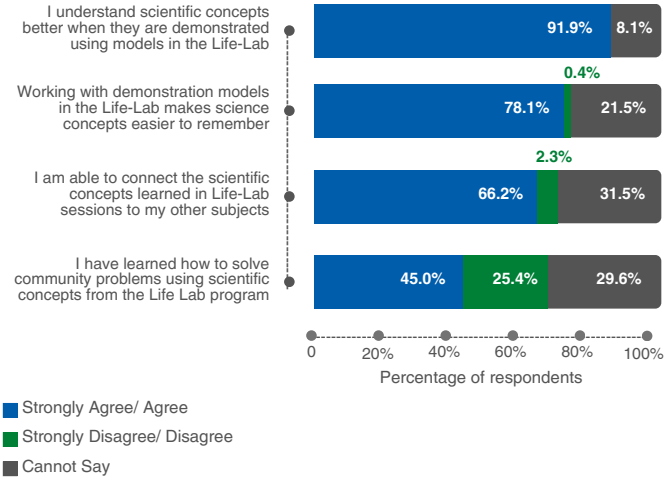

Chart 9 shows that a large majority of respondents (91.9%) reported being better able to understand scientific concepts through the Life-Lab Science program. More than three-fourths (78.1%) indicated that working with demonstration models in the Life-Lab makes science concepts easier to remember. Additionally, 66.2% of respondents reported being able to apply the concepts learned in the lab to other subjects. These findings highlight the program's effectiveness in improving conceptual clarity and retention of scientific knowledge, as well as its positive impact on students' ability to transfer these concepts to other areas of learning, enhancing their overall academic performance.

Teachers have observed improved learning outcomes, noting that specialised science lectures have been initiated, and students are effectively connecting theoretical knowledge to practical applications through hands-on demonstrations. They report that students actively apply learned concepts, demonstrating a clear understanding of the material.

CHART 10: STUDENT'S OPINION ABOUT IMPROVEMENT IN SKILL AND PERFORMANCE IN SCIENCE AFTER LIFE-LAB SCIENCE PROGRAM

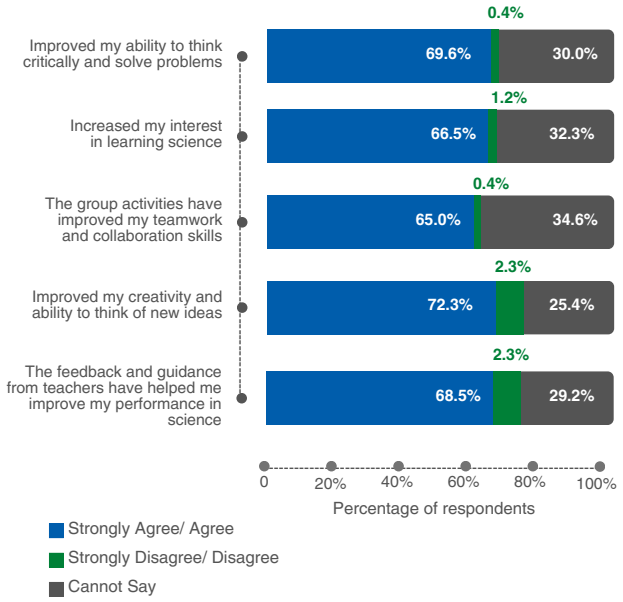

Chart 10 shows that nearly three-fourths of the respondents (72.3%) reported that the Life-Lab Science program has significantly improved their ability and creativity to think of new ideas. This was followed by 69.6% of respondents, who reported a strong improvement in their ability to think critically and solve problems. Nearly two-thirds (65%) of respondents stated that group activities have enhanced their teamwork and collaboration skills. These findings indicate that the Life-Lab Science program effectively fosters creativity, critical thinking, and collaborative skills, contributing to the overall development of students' problem-solving and teamwork abilities.

These findings align with qualitative feedback from teachers, who observed increased questioning, creativity, critical thinking, and teamwork among students, with 60% showing notable progress in 21st-century skills. Both data sources emphasise the program's success in fostering curiosity, innovation, and collaborative problem-solving.

> "As a teacher, I've seen how the Life-Lab program has truly sparked a new level of interest in science among students. The hands-on experiments make the subject come alive, and I love seeing how eager they are to try these activities at home. It's incredible to watch them grow—thinking critically, solving problems, and even stepping up to help others, like when they take the initiative to treat small injuries. It's clear that this program is making a real difference in how they learn and apply science."
>
> **- Vandana Chavhan, 38 years old teacher in ZP School Bhalgaon Garkheda school**

> "The introduction of the Life-Lab program has brought a noticeable shift in how science is taught in my classroom. By focusing on learning through experiments rather than just theory, the program's objective of "learning by doing" has been successfully implemented. Students are more actively engaged, and communication between them and me has improved, making the learning process more interactive and enjoyable. The classroom environment has also become more positive, with students demonstrating better material handling, improved behaviour, and a stronger sense of teamwork and creativity."
>
> **- Jyoti Talele, teacher, Sanskar Balak Mandir, Jadhavwadi**

CASE STUDY 1

Srushti Laxman Dalavi, a 13-year-old student in the 7th grade at ZP School Adgaon Khu, initially struggled with science, feeling overwhelmed by its complexities. Her lack of creativity and engagement in the subject affected her academic performance, and she rarely participated in class activities. However, her experience transformed when she joined the Life-Lab program, which emphasises hands-on, practical learning. This new approach allowed Srushti to explore scientific concepts in an engaging way, both at school and at home. As a result, her attitude toward science changed dramatically. She now eagerly participates in activities, showing curiosity and enthusiasm for the subject. Her teachers have noted her increased confidence and active involvement in class discussions, describing her as a more curious and engaged learner. The program has instilled a sense of accomplishment in Srushti, significantly improving both her attitude and academic performance in science.

CASE STUDY 2

Deepak Uddhav Wagh, a 13-year-old student in the 7th grade at ZP PS Adgaon Kurdh, initially faced significant challenges in both teamwork and understanding science concepts. He often found it difficult to collaborate with his peers and felt intimidated by science tasks. However, after enrolling in the Life-Lab sessions, Deepak experienced a transformation. The program's innovative teaching methods and supportive environment helped him not only improve his scientific understanding but also develop essential interpersonal skills. He now enjoys working in groups and actively contributes to team projects. His problem-solving abilities have seen significant growth, and he approaches science with newfound curiosity and confidence. Teachers have noted his remarkable progress and the positive changes in his attitude. Deepak's journey has been one of personal and academic growth.

CASE STUDY 3

Snehal Rajendra Kuber, a 13-year-old student in the 7th grade at ZP School Adgaon Khu, once found science to be one of her most challenging subjects. Before participating in the Life-Lab sessions, she often struggled to grasp even basic concepts and felt disengaged from the subject. However, the program's creative and experimental approach sparked her interest and transformed her perspective. Snehal discovered a newfound passion for science as she actively engaged in hands-on experiments and activities that ignited her curiosity. She now regularly conducts small experiments at home, impressing her family with the knowledge she has gained. Her teachers have noticed a significant improvement in her understanding of scientific concepts, and Snehal has become more confident and vocal in class discussions. Overcoming her previous challenges, Snehal now feels a deep sense of satisfaction and joy in excelling at a subject that once intimidated her.

07. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Students have reported a significant increase in their interest and engagement in science since the introduction of the Life-Lab Science program. They feel more motivated to participate in hands-on activities and experiments, which has made learning more enjoyable and interactive.
- Increased understanding of scientific concepts through practical application rather than just theoretical knowledge.
- The program has also enhanced learning outcomes, with students demonstrating a better grasp of scientific concepts through the hands-on activities in Life-Lab.

SCHOOL LEVEL

- The intervention has boosted student engagement, with increased participation in science classes and active involvement in hands-on activities, creating a more interactive learning environment.
- The intervention has fostered collaboration through group work, enhancing teamwork and communication skills.
- The intervention has improved the school's academic performance, especially in science, by helping students better grasp and retain scientific concepts through practical application, connecting theory to real-world scenarios.
- Teachers have seen a positive shift in their practices, with Life-Lab providing tools that make science lessons more engaging and effective, improving both the quality of education and overall teaching methods.

COMMUNITY LEVEL

- The Life-Lab Science program has boosted awareness and interest in science, as students share their knowledge and projects with families and peers, fostering greater appreciation for science and education.

STATE LEVEL

- The intervention has positively influenced state-level educational policies and practices by showcasing successful practical science learning methods, such as the Life-Lab Science program, which emphasises hands-on activities and real-world applications of scientific principles.

NATIONAL LEVEL

- The intervention aligns with national initiatives aimed at improving educational quality and student engagement, such as the National Education Policy (NEP) and the National Mission on Education through Information and Communication Technology (NMEICT).

CHAPTER 8
RECOMMENDATIONS

The Life-lab Science program has proven to be highly effective and impactful, and expanding its reach to more districts and schools, particularly in underserved areas, would be highly beneficial. Many regions, especially in rural and marginalised areas, still lack access to quality science education, limiting students' exposure to hands-on learning. By targeting these areas, the Life-Lab Science program could bridge the gap and provide opportunities for practical, inquiry-based science education. Collaborating with local educational authorities, NGOs, and other stakeholders can facilitate the program's expansion and ensure it is tailored to the specific needs of each community, ensuring sustainability and deeper engagement.

09. SUSTAINABILITY

The Life-Lab Science Program, led by the Women's Organization of Socio-Cultural Awareness (WOSCA) with the support of Bajaj Auto Limited, exhibited a strong commitment to sustainability through institutional, educational, social, and economic frameworks.

Institutionally, the program fostered sustainability through strategic partnerships between WOSCA, Bajaj Auto Limited, and local schools, ensuring a collaborative approach to enhancing science education. The involvement of headmasters, teachers, and parents in program implementation promoted community ownership, thereby increasing the likelihood of continued engagement and support. Capacity-building initiatives, such as teacher training sessions and distribution of science toolkits, empowered educators to sustain Activity-Based Learning (ABL) methodologies beyond the project's duration.

From an educational perspective, the establishment of Science Learning Centres equipped with demonstration models and educational materials created a lasting infrastructure for experiential learning. These resources, combined with the training provided to teachers, ensured that students could continue to benefit from the interactive, hands-on science education. Furthermore, the distribution of student activity booklets facilitated self-learning, enhancing knowledge retention and application over time.

Socially, the program promoted inclusivity by engaging students from underserved rural schools, fostering equal opportunities for quality education. The focus on building scientific temperament and enhancing 21st-century skills such as creativity and problem-solving contributed to the holistic development of students, preparing them for future academic and career pursuits. Additionally, the program's emphasis on collaboration among various stakeholders strengthened community ties and enhanced social cohesion.

Economically, the program's relatively low-cost model, involving the establishment of science labs and distribution of learning materials, ensured affordability and scalability. The potential for replication in other underserved regions increased its sustainability.

CHAPTER 10
CONCLUSION

The Life-Lab Science Program supported by Bajaj Auto Limited has proven to be a transformative initiative in enhancing science education, particularly in underserved areas. By shifting the focus from traditional theoretical learning to Activity-Based Learning (ABL), the program has significantly increased student engagement, fostered curiosity, and improved the understanding of scientific concepts through practical, hands-on activities. The integration of Life-Lab into schools has not only strengthened student-teacher interactions but has also helped students develop critical thinking, creativity, and problem-solving skills. The program's positive impact extends beyond the classroom, contributing to improved academic outcomes, enhanced teaching practices, and a greater appreciation for science within the community. The program's success highlights the positive outcomes of investing in school education and underscores the potential for broader application to foster scientific temperament in students.

IMPACT ASSESSMENT REPORT

BRINGING QUALITY HEALTHCARE TO RURAL KUMAON UTTARAKHAND

Implementing Organisation - AAROHI, Nainital, Uttarakhand

Release Date: 31-03-2025

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

AAK	Aarohi Arogya Kendra
ASHA	Accredited Social Health Activist
ANC	Antenatal Care
BAL	Bajaj Auto Ltd.
BCC	Behavioural Change Communication
BEST	Bajaj Engineering Skills Training
BMS	Bajaj Manufacturing Systems
CSR	Corporate Social Responsibility
FGD	Focus Group Discussion
FLW	Frontline Health Workers
FY	Financial Year
MMU	Mobile Medical Units
MOHFW	Ministry of Health and Family Welfare
NFHS	National Family Health Survey
NHP	National Health Policy
NRHM	National Rural Health Mission
OECD	The Organisation for Economic Cooperation and Development
PNC	Postnatal Care
SDGS	Sustainable Development Goals
SK	Swasthya Karmikas
STEM	Science, Technology, Engineering, And Mathematics
TBAS (DAIS)	Traditional Birth Attendants
WHRC	Women's Health and Resource Centre

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The "Bringing Quality Healthcare to Rural Kumaon, Uttarakhand" project, supported by Bajaj Auto Ltd. and implemented by Aarohi, aims to provide accessible and affordable healthcare services in Uttarakhand's remote and underserved regions. The project works through Mobile Medical Units (MMU), the Aarohi Arogya Kendra (AAK), and the Women's Health and Resource Centre (WHRC) to address critical health issues in marginalised communities with poor road connectivity, limited medical infrastructure, and financial constraints.

The project yielded significant positive results. Nearly all respondents attended at least one Swasthya Mela (health awareness camp), and 98.3% benefited from these interventions. Over 94.8% of pregnant women reported good health as a result of Aarohi's support, and 93.3% received ongoing support after childbirth. These efforts have helped to improve maternal and child health, raise healthcare awareness, and deliver timely medical interventions.

To ensure long-term viability, the project intends to integrate with government health programs such as Ayushman Bharat, broaden its reach to more villages, improve digital health record systems, and strengthen funding partnerships. Continued efforts to build capacity, develop infrastructure, and expand services will be critical to improving access to quality healthcare in rural Kumaon.

INTERACTION WITH WOMEN AND CHILDREN AT OKHALKANDA BLOCK

PROJECT DETAILS

Implementation year
FY 2020-2023

Assessment year
FY 2024-25

Implementing Partner
Aarohi

Beneficiaries
Women and mothers, children and infants, the elderly and adolescents, and rural communities as a whole

Number of beneficiaries
23,147

Project Budget
₹340 lakhs

Location

Nainital District, Rural Kumaon, Uttarakhand		
Okhalkanda Block	Dhari Block	Ramgarh Block

Alignment with SDGs

Alignment with National Goals:

- National Health Policy (NHP) 2017
- Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PMJAY)
- National Rural Health Mission (NRHM) under NHM
- Poshan Abhiyaan (National Nutrition Mission)
- Atmanirbhar Bharat & Localised Health Initiatives

PROJECT ACTIVITIES

- Need Assessment
- Stakeholder Engagement
- Training and Capacity Building
- Mobile Medical Unit (MMU) Services
- Aarohi Arogya Kendra (AAK) Operations
- Organising Surgical camp
- Swasthya Melas (Health Awareness Camps)
- Adolescent Health and Nutrition Programs
- Women and Adolescents group
- Monitoring and Evaluation
- Sustainability Planning

Key Findings

Sample Size - 400

ACCESS AND UTILISATION OF HEALTHCARE SERVICES

94.8%
of the respondents belong to lower-income families (Annual family income less than 5 lakhs per annum.

51.3%
of the respondents still travel more than 15 km to access MMU services.

93%
of the respondents paid to avail of MMU services.

94.8%
of the beneficiaries expressed satisfaction with MMU services.

AGRICULTURAL PRODUCTIVITY

90%
of the respondents found support from ASHA, SK, and Aarohi helpful in understanding their child's health needs.

72%
of the respondents found counselling on infant and young child feeding practices beneficial.

COMMUNITY ENGAGEMENT AND AWARENESS

100%
of the respondents attended at least one Swasthya Mela (Health Awareness Camp) and acknowledged its importance.

92.5%
of the respondent women received encouragement from village members and leaders to visit WHRC and MMU.

98.3%
of the respondents reported benefiting from health camps and awareness drives.

WOMEN'S HEALTH AND MATERNAL CARE

90.4%
of the pregnant women registered their pregnancy within the first 12 weeks.

97%
of the respondents acknowledged that Aarohi's timely referrals helped prevent further complications.

95.7%
of the respondent women had live births without any complications.

90.4%
of the respondents were satisfied with ASHA's support during pregnancy.

93.6%

of the respondent women did not experience post-delivery complications.

94.8%

of the respondents reported maintaining good health during pregnancy due to Aarohi's support.

MOTHER AND ADOLESCENT GROUP FUNCTIONALITY

91.7%

of the mothers' groups and 76.7% of adolescent groups were functional in the community.

93.3%

of the respondents received continuous support and guidance after childbirth.

95.8%

of the respondents reported that monthly mothers' group meetings continued in their community.

77.9%

of respondents found pregnancy-related meetings useful.

83.3%

of the respondents received training for conducting health-related sessions at WHRC.

Key Impacts

Sample Size - 400

IMPROVED HEALTH-SEEKING BEHAVIOUR

The project instilled a culture of preventive healthcare in rural communities. Women and families seek medical attention, attend health camps, and participate in discussions about maternal and child health.

EMPOWERMENT OF WOMEN THROUGH KNOWLEDGE

Mothers and adolescent groups have provided a forum for women to share their experiences, gain knowledge, and actively participate in making healthcare decisions for themselves and their families. This has increased their confidence and decision-making skills in health and nutrition.

SAFER PREGNANCIES AND DELIVERIES

Timely access to healthcare services, counselling, and ongoing support from ASHA workers and Aarohi staff have significantly reduced pregnant women's fear and uncertainty, resulting in safer pregnancies and births.

ACCESSIBILITY IN REMOTE AREAS

MMU has helped to bridge healthcare gaps for families living in difficult terrains. The community recognises its role in providing timely medical care, particularly in high-risk cases.

INCREASED AWARENESS OF CHILD AND MATERNAL HEALTH

The project has led to a greater understanding of maternal nutrition, newborn care, and infant feeding practices, leading to better early childhood health outcomes.

ENHANCED TRUST IN HEALTHCARE SERVICES

Continued support and successful interventions have increased rural communities' trust in healthcare services, making them more open to medical advice, referrals, and follow-up treatments.

03. OECD FRAMEWORK

RELEVANCE

The project is highly relevant to the healthcare needs of remote, hilly communities where access to primary care is still a major challenge. By focusing on maternal and child health, mobile medical units (MMUs), and Women's Health Resource Centres (WHRCs), the project addresses the region's specific health challenges, such as limited medical facilities, financial constraints, and harsh geographical conditions. The initiative has a direct impact on improving health outcomes for marginalised populations, making it critical for the target communities.

COHERENCE

The project closely aligns with SDG 3 (Good Health and Well-Being), as it improves maternal and child health, provides essential healthcare services, and promotes preventive healthcare practices. It also contributes to SDG 5 (Gender Equality) by empowering women with health education and access to healthcare. At the national level, the project adds to India's National Health Mission (NHM) and Ayushman Bharat by addressing healthcare access in remote areas. It also aligns with government initiatives for maternal and child health, primary healthcare infrastructure, and improving health outcomes in underserved communities, thereby contributing to national and global health goals.

EFFECTIVENESS

The project has proven effective in increasing healthcare access and awareness. High community participation in Swasthya Melas, increased institutional deliveries, and improved maternal and neonatal care are all indicators of success. The availability of trained local health facilitators through WHRC has increased community health ownership. However, challenges such as the community's expectation of free specialised services need to be addressed .

EFFICIENCY

The project has made good use of resources by deploying MMUs and WHRCs, which reduces the burden on distant healthcare facilities. The subsidised service model makes services more affordable for low-income families. However, financial constraints and logistical challenges in the difficult terrain impact service delivery consistency. Improving financial planning and integrating digital health tools may increase operational efficiency.

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

IMPACT

The program has had a significant impact by raising health awareness and promoting institutional deliveries, thereby lowering maternal and infant mortality. Community engagement through mothers' groups, adolescent health groups, and Swasthya Melas has enabled people to adopt better healthcare practices. Aarohi's ongoing support has instilled trust in the villagers, resulting in regular use of MMU and Arogya Kendra services. The availability of low-cost healthcare has reduced financial burdens for marginalised families. Furthermore, the program has promoted a culture of preventive healthcare, encouraging early detection and treatment, ultimately improving overall health outcomes in rural Kumaon.

SUSTAINABILITY

A multifaceted approach is used to ensure the project's sustainability over the long term. Subsidised service charges make healthcare more affordable for marginalised communities, ensuring continued use. The capacity building of community health workers, such as ASHAs and Swasthya Karmikas, improves local healthcare delivery. Behavioural Change Communication (BCC) encourages healthy behaviours and raises long-term health awareness. Integration with government health schemes, such as Ayushman Bharat, can help to improve sustainability by providing financial support and expanding healthcare options. These strategies work together to ensure that the project continues to provide quality healthcare while also effectively meeting the changing health needs of rural Kumaon residents.

CHAPTER 4
INTRODUCTION

Interaction with the Dentist at Aarohi Aarogya kendra

Access to quality healthcare in Uttarakhand's rural mountain districts remains a significant challenge due to difficult terrain, scattered settlements, and limited healthcare infrastructure (NHM, 2021). Rural communities, particularly women, face significant health vulnerabilities, such as inadequate maternal and child healthcare, high out-of-pocket costs, and limited institutional delivery services (MoHFW, 2020). According to studies, maternal and child morbidity and mortality rates remain high in remote areas due to limited access to timely medical care (NFHS-5, 2021). Furthermore, rural women face a disproportionate share of labour, malnutrition, and social constraints, exacerbating health risks (IIPS & ICF, 2021). These communities' economic vulnerability limits their ability to afford private healthcare, while public healthcare facilities remain distant and insufficient.

Aarohi's health program, which was supported by Bajaj Auto Limited, aimed to bridge these gaps by providing equitable, accessible, and affordable healthcare through Aarohi Arogya Kendra (AAK),Mobile Medical Units (MMU) and a dedicated Women's Health Resource Centre (WHRC).

The initiative integrated maternal and child health services, frontline health worker capacity building, and community-based awareness programs, resulting in improved health outcomes and lower maternal and child morbidity and mortality in Nainital district's remote villages. Strengthening primary healthcare at the grassroots level aligns with national health objectives and helps to reduce health disparities in Uttarakhand.

OBJECTIVES OF THE PROGRAM

Provide comprehensive promotive, preventive, and curative health care services.

Improve maternal (15-49 years) and child (0-5 years) health, reduce morbidity and mortality.

Gender mainstreaming in health and making health information accessible to women.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting its commitment to serving society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelling its CSR resources and expertise into skilling, especially in STEM and related fields.

Additionally, Bajaj Auto CSR also contributes to education, health, environment, and animal welfare projects for the sustainable development of the community and the nation.

ABOUT NGO PARTNER- AAROHI

Aarohi, a non-profit organisation founded in 1992 in Satoli, Uttarakhand, is dedicated to the sustainable development of rural Himalayan communities. Its mission encompasses quality healthcare, education, enterprise promotion, women empowerment, sustainable natural resource management, and the revitalisation of traditional cultures. Over the years, Aarohi has expanded its initiatives to include a primary school and a livelihoods program, benefiting over 50,000 people in various villages. The organisation runs the Aarohi Arogya Kendra (AAK), which is a primary healthcare centre that serves 30 villages in the Satoli area around the clock. Aarohi's comprehensive approach addresses these communities' multifaceted challenges while promoting resilience and self-reliance.

INTERACTION WITH WOMEN AT SHIMAL KANYA

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited assigned SoulAce to conduct a study on the work done by Aarohi and assess the impact of its CSR initiative 'Bringing Quality Healthcare to Rural Kumaon' on various aspects, including healthcare access, maternal and child health, disease prevention, nutrition, community health awareness, and overall well-being.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

- To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.
- To measure the extent to which the program has enhanced healthcare access, disease prevention, maternal and child health, nutrition, community awareness, and overall well-being in the target communities.
- To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH TO ASSESS THE IMPACT OF THE PROJECT

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- students and teaching staff, yielding statistical insights, and identifying trends. By employing a mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries and stakeholders like those responsible for project implementation. Engaging these stakeholders through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of improvements in the overall skilling and employability of the beneficiaries through the intervention. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques are employed to evaluate the project and impact through data analysis objectively. Surveys and questionnaires are utilised to collect numerical data on various indicators from beneficiaries of each program. These quantitative methods provide a measurable approach to gauge the project and outcomes and evaluate its success through statistical evidence.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including field notes, interviews with beneficiaries, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact. Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method.

Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

DESIGN SNAPSHOT

Name of the project

Bringing Quality Healthcare to Rural Kumaon

Implementing agency

Aarohi

Research design used

Descriptive research design

Sampling technique

Purposive and Stratified random sampling

Sample size

400

Qualitative methods used

Semi-structured interviews, testimonials and focus group discussions with beneficiaries along with key stakeholders

KEY STAKEHOLDERS

- Beneficiary Communities
- Healthcare Workers & Facilitators
- Local Government & Health Departments
- Project Implementation team

STUDY TOOLS

Questionnaires for primary beneficiaries- Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys. Stakeholders were identified across the focus areas. Semi-structured questionnaires and focus group discussions were conducted with the project staff.

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. Adhering rigorously to ethical principles of research, the study prioritised the rights and well-being of participants throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Crucially, participation was fully voluntary, free from coercion or pressure, underscoring the importance of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

INTERACTION WITH A BENEFICIARY

CHAPTER 6
KEY FINDINGS AND IMPACTS

This chapter compiles and analyses data from multiple sources to evaluate the overall impact and effectiveness of the program. It integrates qualitative and quantitative insights gathered through extensive surveys and detailed interactions with stakeholders. Drawing on diverse viewpoints, the chapter provides an in-depth analysis of how well the program has met its intended goals and contributed to long-term sustainability.

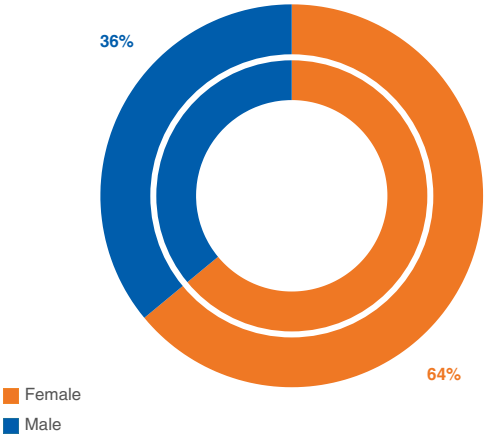
Interaction With the Program manager

AAROHI AAROGYA KENDRA (AAK)

Aarohi Arogya Kendra (AAK) is a five-bed cottage hospital that offers comprehensive healthcare services to rural mountain communities. It provides outpatient (OPD), inpatient, and emergency care, as well as advanced diagnostics like pathology, radiology, X-ray, ECG, dental, and surgical care. AAK is committed to providing quality primary healthcare and operates around the clock to ensure uninterrupted medical support. Since October 1, 2022, the hospital has been operating 24 hours a day, seven days a week, to provide emergency medical care to patients from remote villages. Surgical services are critical to achieving local health needs, with expert surgeons leading specialised surgical camps. Through these initiatives, AAK strives to bridge healthcare gaps, improve health outcomes, and promote a sustainable, community-driven approach to well-being in rural Uttarakhand.

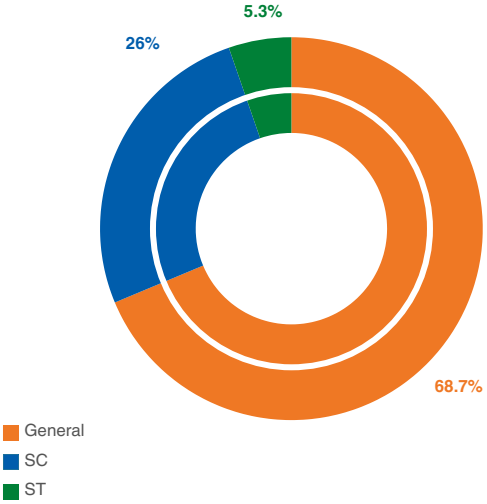
DEMOGRAPHICS

CHART 1: GENDER-WISE DISTRIBUTION



64%
of the respondents were female, highlighting the program's strong outreach to women in rural Uttarakhand and its critical role in meeting their healthcare needs. The lower male participation (36%) can be attributed to the region's economic realities, where uncertain livelihoods in the mountains frequently force male-earning members to migrate to larger cities in search of better income opportunities. This emphasizes the importance of accessible healthcare services, such as AAK, which primarily serve women, children, and the elderly who are left behind in these remote communities.

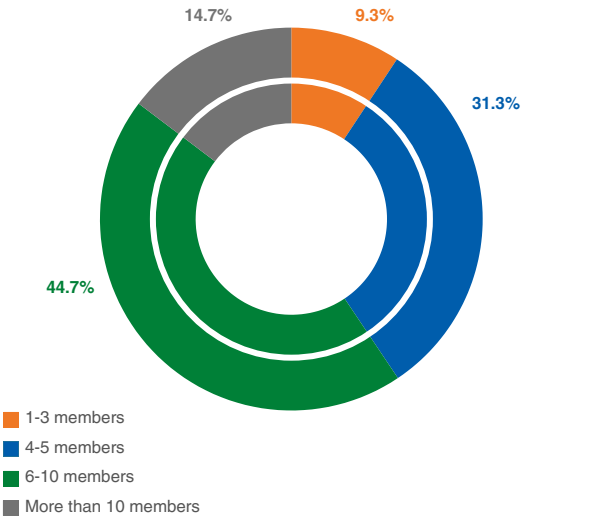
CHART 2: SOCIAL CATEGORY



68.7%
of the respondents belong to the General category, 26% to Scheduled Castes (SC), and 5.3% to Scheduled Tribes. This distribution highlights AAK's inclusive healthcare outreach, which ensures that marginalised communities have access to medical services. By addressing healthcare disparities, AAK helps to improve health outcomes for the region's socially and economically disadvantaged populations.

PATHOLOGY LAB AT AAK

CHART 3: TOTAL NUMBER OF FAMILY MEMBERS



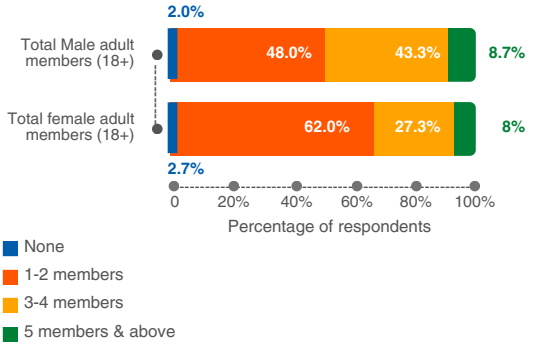
44.7%

of the respondents belong to families with 6-10 members, while 31.3% have 4-5 members, indicating that joint families are prevalent in the region. This reflects a disproportionate healthcare burden, particularly for low-income families. Larger families frequently face greater financial and logistical barriers to accessing quality healthcare, emphasising the importance of AAK in this region and providing accessible and affordable medical services. The findings highlight the importance of long-term healthcare interventions in supporting these vulnerable rural communities.

> "For the past 15 years, I've been a volunteer doctor at Aarohi, where we focus on primary healthcare. While we provide some specialised services, our primary focus is on providing essential healthcare to the community. Access to basic medical services is a significant challenge for the people here, and we are determined to continue our efforts to strengthen primary healthcare for those in need."
>
> **Dr. Puneet Singh (MBBS, MD)**

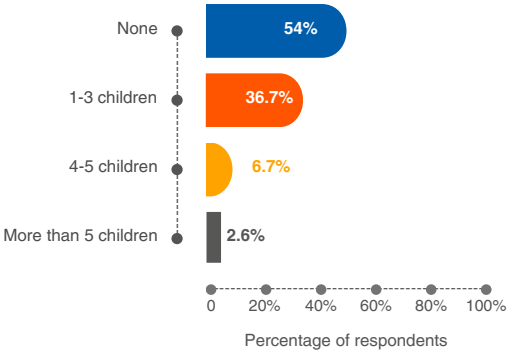
HOUSEHOLD COMPOSITION

CHART 4: TOTAL NUMBER OF MALE AND FEMALE ADULT MEMBERS



The data shows that most households have 1-2 adult female members (62%) and 1-2 adult male members (46%). The presence of larger households (3–4 adult members) is more common among males (43.3%) than females (27.3%).

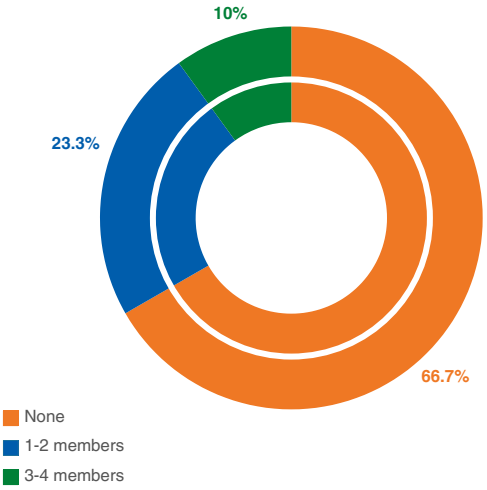
CHART 5: TOTAL NUMBER OF CHILDREN IN HOUSEHOLD/FAMILY (AGE 0-12 YEARS)



54%

of the households do not have any children aged between 0 to 12 years. Meanwhile, 36.7% of households have one to three children, while only 9.3% have more than three.

CHART 6: TOTAL NUMBER OF YOUTH/ADOLESCENTS IN HOUSEHOLD/FAMILY (AGE 10-18 YEARS)



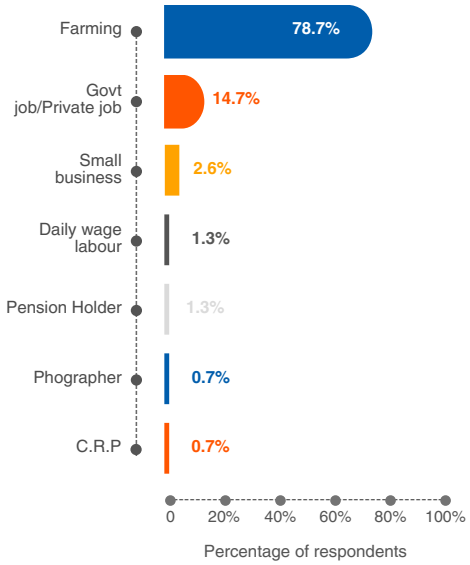
66.7%

of the households do not have adolescents aged 10 to 18. Meanwhile, 23.3% have one or two adolescents, with only 10% having three members or more.

THE LIST OF VISITING RADIOLOGISTS AT AAK

SOCIO-ECONOMIC STATUS

CHART 7: PRIMARY OCCUPATION OF THE HOUSEHOLD

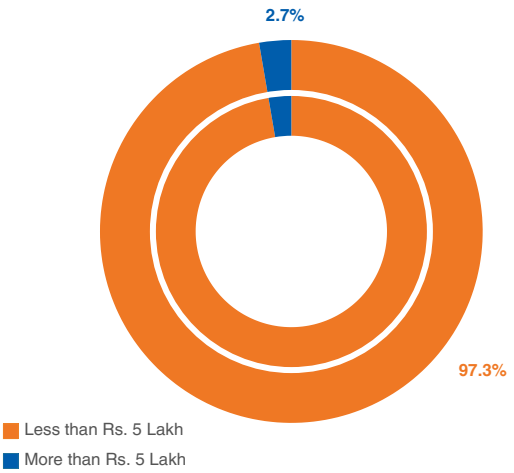


78.7%

of the respondents' primary occupation is farming, highlighting agrarian dependency. Only 14.7% work for the government or the private sector, with small businesses and daily wage labour accounting for a small percentage. This economic vulnerability, caused by agriculture's seasonal and uncertain income, emphasises the critical need for accessible healthcare services. The scarcity of alternative livelihoods highlights the importance of ongoing healthcare interventions, as financial constraints frequently impede access to essential, preventive, and specialised medical care in these communities.

> "The emergency services provided by Aarohi Arogya Kendra are invaluable in our hilly region, where accidents such as broken limbs or even amputations can occur. With no other healthcare facility nearby, Aarohi Arogya Kendra is our only option in such an emergency. It provides immediate medical care and support to those in need."
>
> **Anand Ballabh, village Shimayal**

CHART 8: AVERAGE ANNUAL FAMILY INCOME

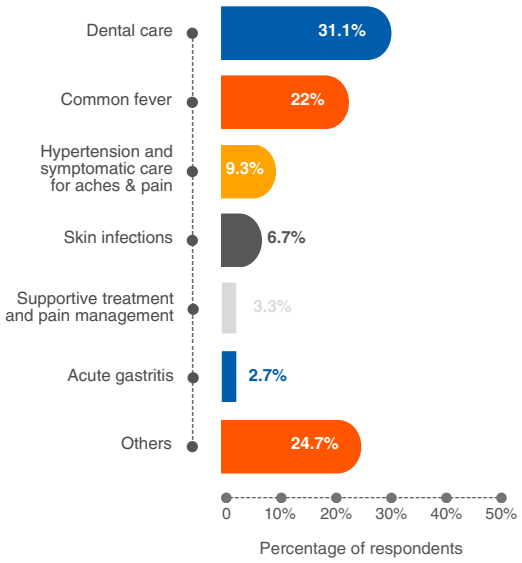


97.3%

of the respondent households have an annual family income of less than ₹5 lakh, highlighting the financial constraints faced by the majority of rural families. Only 2.7% earn above this threshold, reflecting limited economic opportunities. This economic vulnerability reinforces the importance of affordable and accessible healthcare services, as high medical costs can be a significant burden.

HEALTHCARE ACCESS AND UTILISATION AT AAROHI AROGYA KENDRA (AAK)

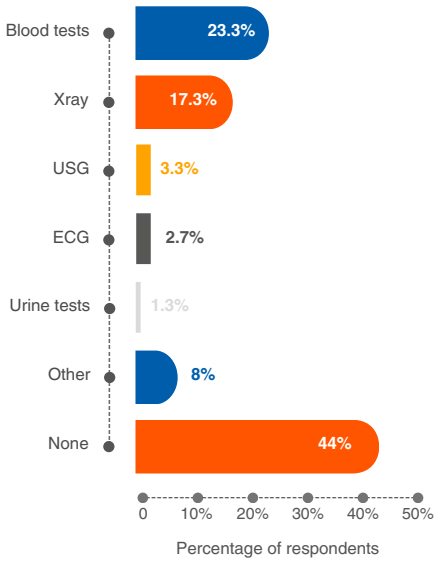
CHART 9: TYPES OF CONDITIONS FOR WHICH TREATMENT WAS RECEIVED



The data shows how Aarohi Arogya Kendra (AAK) addresses a wide range of healthcare needs. Dental care (31.3%) and common fever (22%) were the most commonly treated conditions, followed by hypertension, pain management, and skin infections. Furthermore, 24.7% of cases necessitated specialised treatment, which included surgeries, fractures, and chronic disease management. This demonstrates AAK's critical role in providing both primary and specialised care in rural areas where access to advanced medical facilities is limited. The variety of conditions treated emphasises the importance of ongoing healthcare interventions in ensuring comprehensive and continuous medical support for underserved communities.

INTERACTION WITH A KEY MEMBER OF MMU SERVICE EXECUTION BODY

CHART 10: DIAGNOSTIC TESTS AVAILED AT THE AAK CENTRE



56%

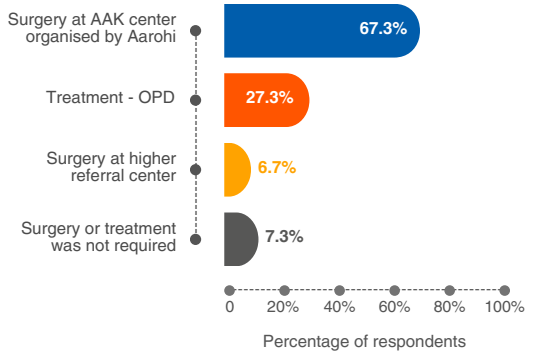
of respondents used Aarohi Arogya Kendra (AAK) diagnostic services, the most common of which were blood tests (23.3%) and X-rays (17.3%). A smaller proportion used USG, ECG, and urine tests, and 44% did not require diagnostic services. The diverse range of tests demonstrates AAK's ability to provide critical diagnostic support in a rural setting, allowing for timely detection and treatment. The centre's significant reliance on these services highlights its role in bridging healthcare gaps, particularly for underserved populations who have limited access to diagnostic facilities.

CASE STUDY
BALI RAM'S JOURNEY TO AFFORDABLE HEALTHCARE

Bali Ram, 56, a member of the SC community in Myora Village, had hernia surgery at Aarohi's surgical camp three years ago. He described his experience as excellent, having paid only ₹12,000. A similar surgery in a private hospital would have cost ₹70,000-₹80,000. He also received extensive dental treatment, including 11 fixed and 10 temporary teeth, which would have been prohibitively expensive elsewhere. Bali Ram expresses gratitude for Aarohi's affordable healthcare services, stating that access to such critical treatments would have been impossible without them. He greatly appreciates Aarohi's dedication to providing accessible healthcare.

INTERACTION WITH A TRAINED WORK ATTENDANT

CHART 11: TYPES OF SERVICES RECEIVED AT AAK CENTRE IN THE LAST THREE TO FOUR YEARS



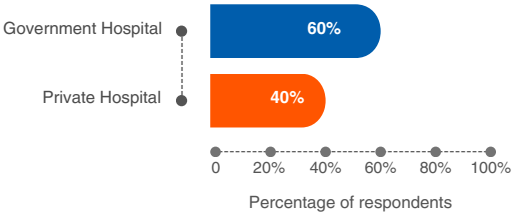
67.3%

of the respondents underwent Aarohi-organised surgeries at the camps, demonstrating the centre's critical role in providing essential surgical care in rural Uttarakhand. Furthermore, 27.3% received OPD treatment, with 6.7% requiring surgery at a higher referral centre. Only 7.3% did not require medical attention. The high percentage of surgical cases demonstrates the community's critical healthcare needs and the significance of AAK's specialised services in meeting them.

> "Dental problems are common in our hilly region, particularly among children, as a result of drinking hard water. My 25-year-old daughter, Mamta Tiwari, was treated at Aarohi Arogya Kendra with four root treatments and five dental implants. Without this facility, I would have struggled to pay for her treatment. Aarohi Arogya Kendra has been a blessing to us."
>
> **Girish Chandra Tiwari from village Lewsal**

REFERRAL AND FINANCIAL ASPECTS OF TREATMENT

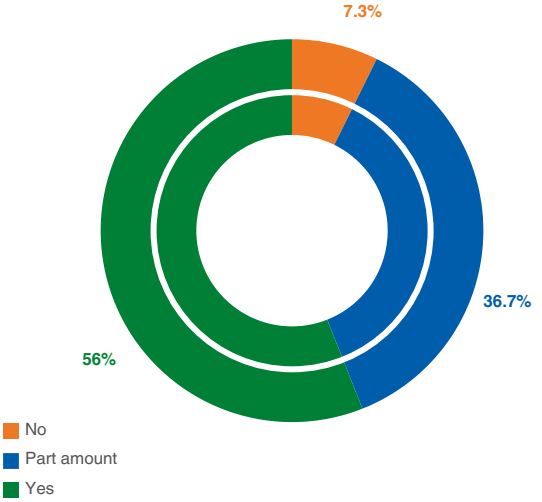
CHART 12: REFERRAL FOR SURGERY: RECOMMENDED HOSPITAL OR FACILITY



60%

of the respondents who required surgical referrals were directed to government hospitals, while 40% sought care at private hospitals.

CHART 13: PAYMENT REQUIREMENT FOR TREATMENT OR SURGERY AT AAK



56%

of the respondents had to pay for treatment or surgery at AAK, 36.7% contributed a portion of the cost, and only 7.3% received free care. This highlights AAK's efforts to provide subsidised healthcare while remaining financially sustainable.

This highlights the importance of ongoing financial assistance and support programs to Aarohi to improve affordability and accessibility for economically disadvantaged rural populations, ensuring that essential healthcare services are available to all members of the community.

Focus Group Discussion

During the Focus Group Discussion with the program implementing team, Mr. Pratik (Pharmacist) and Mr. Prakash Pandey (X-Ray Technician) emphasised the importance of Aarohi Arogya Kendra's strategic location, as there are no other quality healthcare facilities within a 30-kilometer radius. The centre offers affordable healthcare services, such as laparoscopic surgery, for just ₹15,000-₹20,000, compared to ₹70,000-₹80,000 in private hospitals. This makes essential medical care accessible to the community.

The Aarohi Arogya Kendra (AAK) has significantly improved healthcare access in rural Uttarakhand, addressing critical medical needs through surgeries, outpatient care, and diagnostic tests. Despite financial constraints, AAK interventions have resulted in better health outcomes. Improving affordability, expanding specialised care, and raising community awareness to increase impact and sustainability.

CASE STUDY
GIRDDHARI LAL'S EXPERIENCE WITH AAROHI'S HEALTHCARE SERVICES

Girddhari Lal, a daily wage labourer from Shimayal village, is the sole breadwinner for his joint family of nine. He relies on Aarohi's low-cost healthcare services for any health issues. Two years ago, his 12-year-old daughter "Diksha" fractured her hand after falling from a nearby hill while gathering wood. In distress, he rushed her to Aarohi, where she received timely treatment, including plastering, for a low cost of approximately ₹1,000. Today, she has fully recovered. Girddhari is grateful for Aarohi's support and recognises its critical role in providing quality healthcare to families like his.

DAILY MONITORING REGISTER

WOMEN HEALTH RESOURCE CENTRE (WHRC)

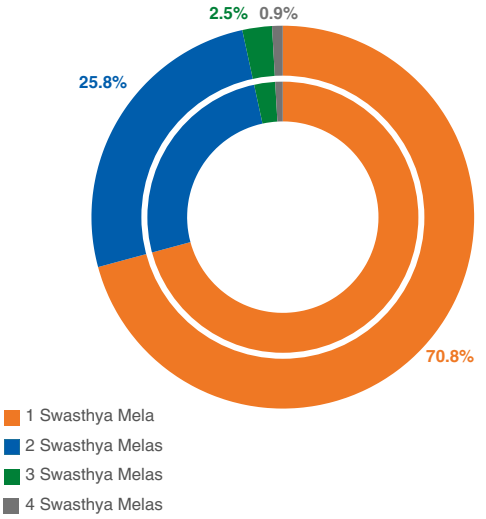
Aarohi established the Women's Health Resource Centre (WHRC) to provide essential healthcare services and information to rural women in the remote villages of Okhalkhanda block, Nainital district, Uttarakhand. WHRC provides a safe environment in which women can receive primary healthcare, medical services, and counselling without fear or hesitation. Women are empowered by WHRC's community engagement, capacity building, and awareness programs, which improve their health and well-being.

> "WHRC is an innovative concept in which we developed a collaborative framework that brings together private healthcare professionals, government health workers, ASHAs, and community members." This group, known as the WHRC, actively engages with the community to discuss health-related issues and find solutions. The approach ensures that solutions emerge from within the community and are implemented through collective participation, making healthcare more accessible and sustainable.
>
> **Mr. Kavi Kumar Nagrajan, Program Manager, Health**

INTERACTION WITH A GROUP OF ADOLESCENT GIRLS

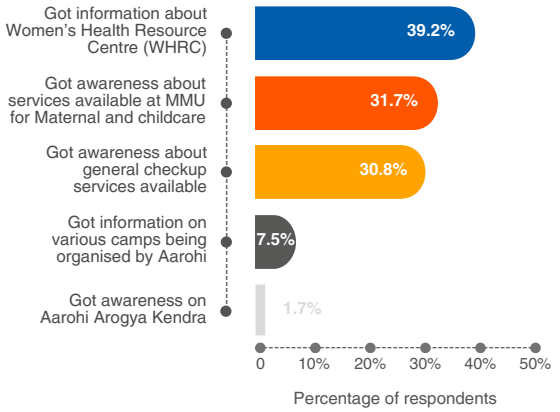
PARTICIPATION IN HEALTH CAMPS AND AWARENESS INITIATIVES

CHART 14: NUMBER OF SWASTHYA MELAS ATTENDED



All respondents reported attending at least one Swasthya Mela organised by Aarohi as part of the WHRC initiative, with 70.8% participating once and 29.2% attending multiple times. This demonstrates WHRC's success in engaging rural women in health awareness and services, emphasizing the importance of ongoing outreach and community participation.

CHART 15: TOPICS LEARNED AND BENEFITS GAINED FROM SWASTHYA MELA (HEALTH CAMP)

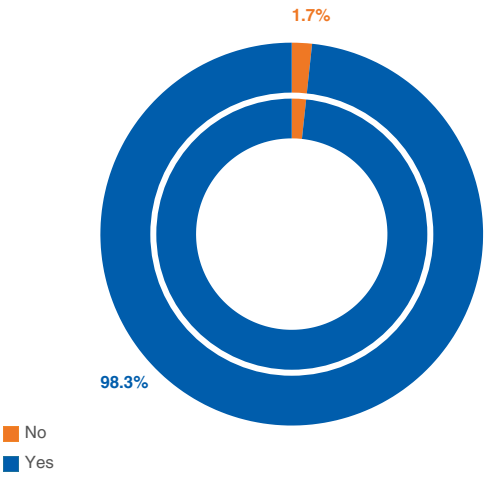


The Swasthya Mela effectively raised rural women's awareness of available healthcare services. 39.2% of the respondents learnt about the WHRC, while 31.7% and 30.8% became aware of MMU's maternal and childcare services, as well as general check-ups, respectively. This highlights Swasthya Mela's role in increasing healthcare access and knowledge in remote communities.

"As a teacher at Simal Kanya Government Upper Primary School since 2001, I've seen firsthand how lack of education contributes to health problems in our hilly villages. There are only 14 students enrolled right now, but with no other staff, I am the teacher, principal, and peon. Despite having infrastructure, the lack of teachers impedes education. Improving health awareness is difficult to achieve without proper education. I urge the government and organisations such as Aarohi to address this critical issue for the betterment of our communities."

Mr. Hema Chandra Goswami, principal of Government Upper Primary School, Simal Kanya, Okhalkanda Block

CHART 16: COMMUNITY BENEFITS FROM HEALTH CAMPS AND AWARENESS DRIVES



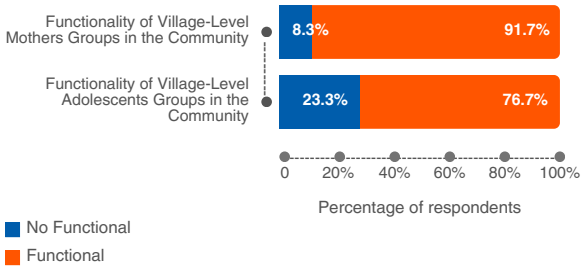
An overwhelming 98.3% of the respondents recognised the benefits of health camps and awareness campaigns organised by Aarohi. This demonstrates the initiative's success in improving healthcare access, knowledge, and services for rural women.

"Ever since Aarohi's emergency service became available 24/7, it has been a huge relief for us. Earlier, the Aarohi Arogya Kendra was not accessible at night. I remember a tragic incident when a villager suffered an electric shock, and we had to take him to Almora, but he did not survive the journey. Now, with round-the-clock medical support, we can access immediate healthcare, even at night, during emergencies, resulting in saving many lives."

Dinesh Chandra Tiwari, Village Lewshal

COMMUNITY-BASED WOMEN'S HEALTH INITIATIVES

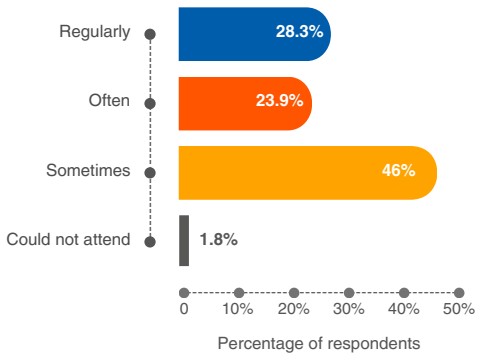
CHART 17: FUNCTIONALITY OF VILLAGE-LEVEL MOTHERS AND ADOLESCENT GROUPS IN THE COMMUNITY



91.7%

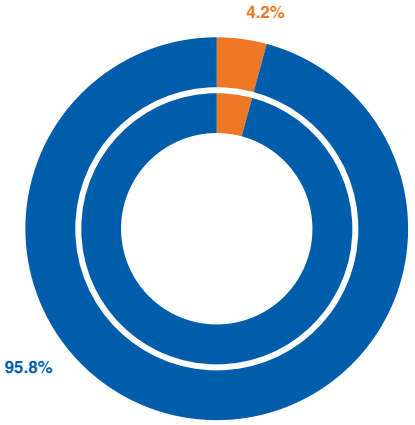
of the village-level mothers' groups and 76.7% of adolescent groups are operational under the WHRC initiative, indicating strong community involvement. However, 8.3% of mothers' groups and 23.3% of adolescent groups are still non-functional, highlighting the need for ongoing capacity building and support to ensure long-term participation and effectiveness in addressing women's and adolescents' health concerns.

CHART 18: FREQUENCY OF ATTENDANCE IN MOTHERS' GROUP MEETINGS AT WHRC



28.3%
of the Mothers' Group members attended meetings regularly, and 23.9% participated often. However, 46% only attended sometimes, and 1.8% were unable to attend at all. This demonstrates varying levels of engagement, emphasizing the need for strategies to encourage consistent participation, ensure sustained knowledge-sharing, and increase community impact through WHRC's maternal health initiatives.

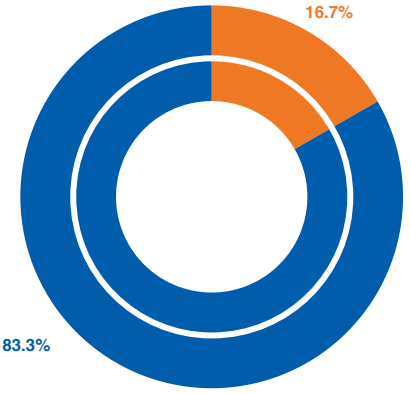
CHART 19: CONTINUATION OF MONTHLY MEETINGS IN THE COMMUNITY/VILLAGE – WHRC



No
Yes

According to the data, 95.8% of respondents confirmed that monthly meetings in their villages would continue as part of the WHRC initiative, demonstrating strong community engagement and ongoing interest in maternal and adolescent health discussions.

CHART 20: TRAINING PROVIDED FOR CONDUCTING THESE SESSIONS – WHRC

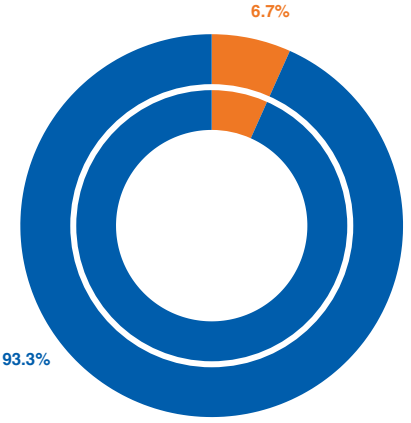


No
Yes

According to the data, 83.3% of the respondents received training to conduct WHRC sessions, indicating a significant effort to build community capacity. However, 16.7% did not receive training, indicating a critical gap that must be addressed. Strengthening training initiatives can improve the effectiveness of these sessions while also ensuring consistent knowledge dissemination across all villages.

SUPPORT AND GUIDANCE FOR MATERNAL AND CHILD HEALTH

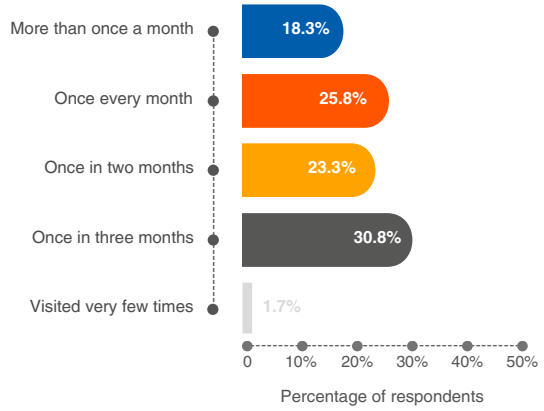
CHART 21: CONTINUOUS SUPPORT AND GUIDANCE PROVIDED BY WHRC POST-DELIVERY



No
Yes

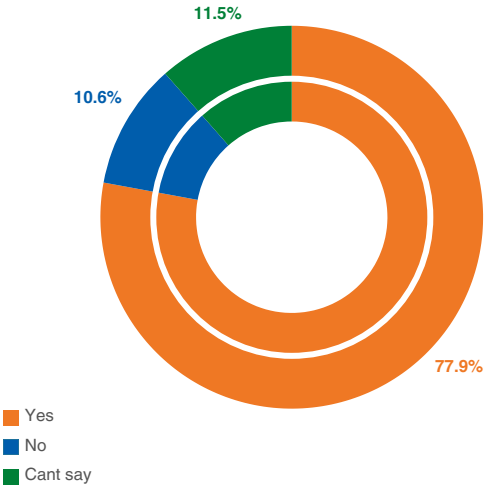
93.3%
of the respondents received continuous support and guidance from WHRC post-delivery, demonstrating the centre's commitment to maternal and newborn care. Strengthening follow-up mechanisms can ensure that all women receive the necessary postnatal care and guidance.

CHART 22: FREQUENCY OF VISITS TO WHRC POST-DELIVERY



According to the data, 98.3% of the respondents visited the WHRC at least once after delivery, with 18.3% visiting more than once per month and 25.8% visiting every month. 23.3% of the respondents visited once every two months. This highlights the WHRC's role in ensuring maternal and newborn health through regular follow-ups.

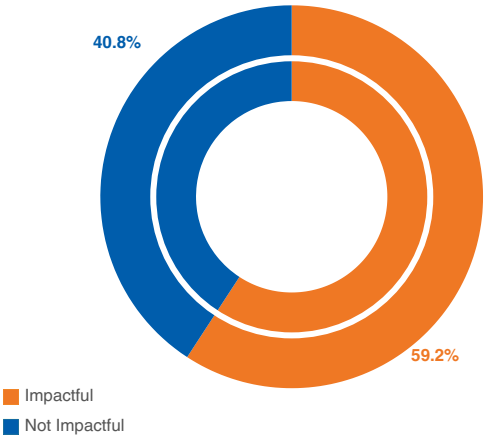
CHART 23: WHETHER THE MEETINGS WERE USEFUL IN RESOLVING DOUBTS ON PREGNANCY, POSTPARTUM CARE, AND CHILDCARE GUIDANCE



77.9%

of the mothers' group members found the meetings helpful in addressing concerns about pregnancy, postpartum care, and childcare, demonstrating the WHRC's effectiveness in providing critical maternal health guidance. However, 10.6% found them ineffective, while 11.5% were unsure, emphasizing the need for more tailored discussions and interactive engagement.

CHART 24: IMPACT AND TIMELINESS OF HOME VISITS BY VILLAGE HEALTH WORKERS DURING PREGNANCY AND AFTER CHILDBIRTH



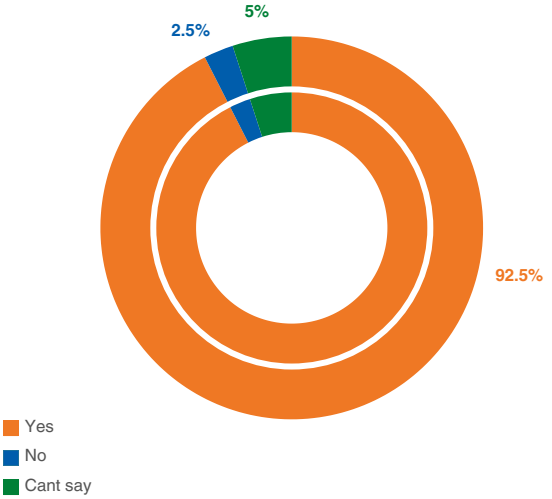
59.2%

of the respondents found home visits by the village health worker during pregnancy and after childbirth to be beneficial, emphasising the importance of community-based maternal health support. However, 40.8% did not find them effective, indicating a need to improve the quality, frequency, and responsiveness of these visits to achieve better maternal and child health outcomes.

> We are very grateful to Bajaj Auto Limited for their invaluable assistance. The Aarohi health program has two distinct phases: before and after Bajaj's support, which began in 2020. With their help, we increased our human resources and improved staff capabilities through training. Key upgrades included the use of digital equipment in MMU and ultrasound facilities, the installation of a horizontal autoclave, and the upgrade of our X-ray machine. MMU coverage expanded, patient volume at AAK increased, and we successfully launched WHRC services. While these advancements have improved our healthcare delivery, ongoing financial support is required to maintain growth and impact.
>
> **Mr. Samiran Narayan Tripathi, Implementing and Monitoring Manager Aarohi**

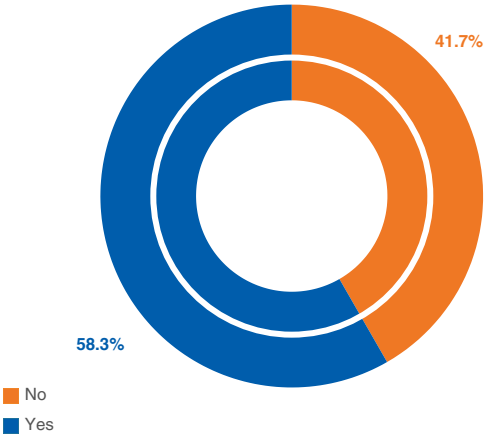
COMMUNITY PARTICIPATION AND ENGAGEMENT

CHART 25: PARTICIPATION OF VILLAGE COMMUNITY MEMBERS, INCLUDING THE VILLAGE PRADHAN, IN ENCOURAGING WOMEN TO VISIT MMU AND WHRC



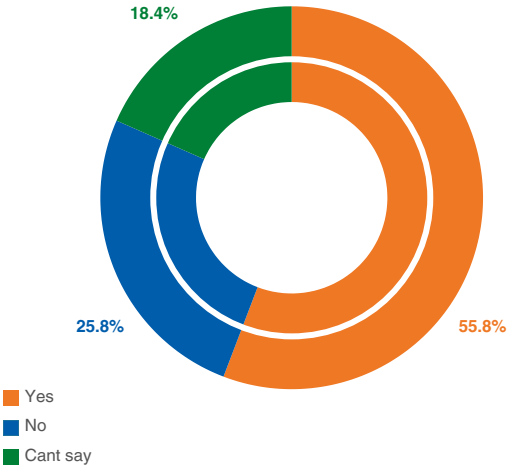
The data indicates strong community support for women's healthcare, with 92.5% of the respondents acknowledging the role of village members, including the Pradhan, in encouraging women to visit the MMU and WHRC. This highlights effective community mobilisation. However, 7.5% were either unaware or did not perceive such efforts, suggesting scope for strengthening engagement and awareness initiatives.

CHART 26: ENCOURAGEMENT FOR MORE WOMEN TO DELIVER IN MEDICAL INSTITUTIONS



The data show that 58.3% of the respondents supported institutional deliveries, while 41.7% did not, highlighting persistent barriers. High costs and long distances to healthcare facilities remain significant barriers to timely maternal care. Strengthening financial support, improving transportation, and raising awareness through WHRC initiatives can improve institutional delivery rates and make childbirth safer for rural mothers.

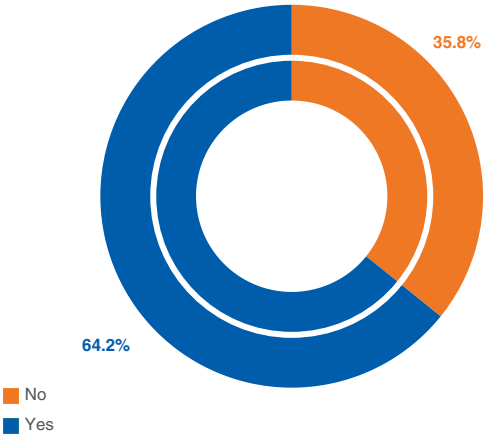
CHART 27: REASSURANCE PROVIDED BY COUNSELLING FROM FRONTLINE HEALTH WORKERS (FLW)



55.8%

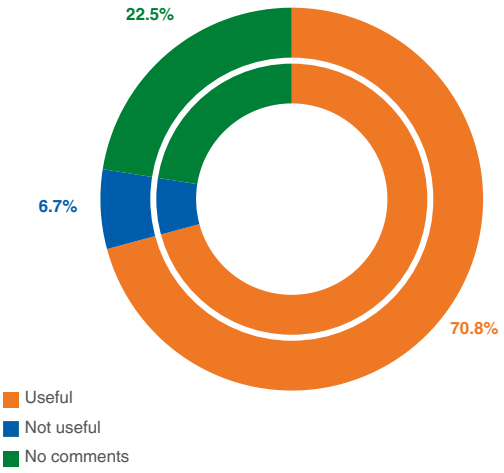
of the respondents found reassurance in counselling from frontline health workers (FLWs), 25.8% did not, and 18.4% were unsure. This emphasises the importance of FLWs in providing emotional and medical support. Strengthening counselling sessions and addressing trust and awareness gaps can improve maternal health outcomes under the WHRC initiative.

CHART 28: CONSIDERATION OR ADOPTION OF FAMILY PLANNING AFTER COUNSELLING



The data show that 64.2% of the respondents considered or adopted family planning after receiving counselling from the Aarohi team, while 35.8% did not. This demonstrates the effectiveness of the WHRC's awareness campaigns in promoting reproductive health choices. Strengthening counselling strategies and addressing barriers can improve informed decision-making and increase community adoption of family planning methods.

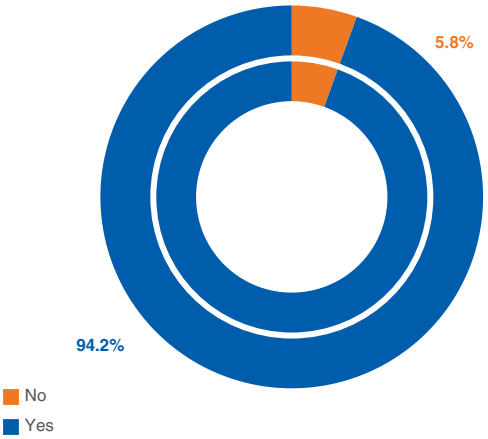
CHART 29: RATING THE USEFULNESS OF THE AAROHI TEAM AND TRAINED PERSONNEL



70.8%

of the respondents found the Aarohi team and trained personnel useful, demonstrating their positive impact on community health awareness and service delivery. However, 6.7% did not find them useful, and 22.5% chose not to comment. Improving outreach, addressing concerns, and increasing engagement can all help to improve the effectiveness of WHRC interventions.

CHART 30: MEMBERSHIP IN THE MOTHERS' GROUP



The data show that the Mothers' Group at WHRC will have a high level of participation between 2020 and 2023. 94.2% of respondents identified as members, indicating strong community engagement. Only 5.8% did not join the group.

Aarohi's WHRC initiative has significantly improved maternal and child healthcare access in rural communities. With 94.2% of women participating in mothers' groups, 98.3% benefiting from health camps, and 93.3% receiving post-delivery support, the initiative has increased awareness and service utilisation. Community participation (92.5%) and frontline health worker counselling (55.8%) have improved healthcare decision-making.However, barriers such as high costs and distance remain. Continued outreach, training, and institutional support are critical to sustaining and expanding these health interventions.

> "When Bajaj Auto Limited extended its support in 2020, Aarohi was in the process of transitioning its healthcare services. We wanted to improve and expand our healthcare services, and Bajaj's support gave us the stability we needed to accomplish this goal. Their assistance enabled us to improve our MMU services, launch the WHRC initiative, and work towards making it a long-term healthcare solution for the community."
>
> **Mr. Kavi Kumar Nagrajan, Programme Manager Health**

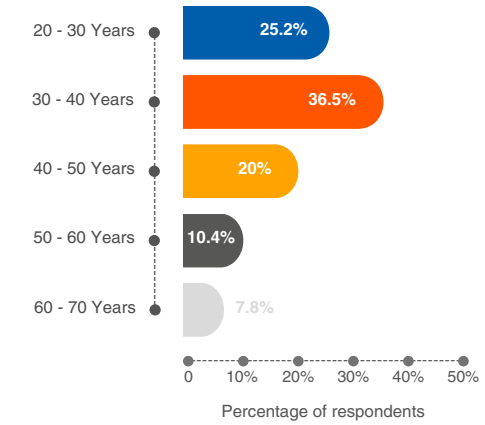
FGD WITH SARPANCH AND ANOTHER COMMUNITY MEMBER AT SIMALKANYA, OKHALKANDA BLOCK

MOBILE MEDICAL UNIT (MMU)

Aarohi's Mobile Medical Unit (MMU) is a vital healthcare initiative that has been in operation since June 2014 and provides essential healthcare services to remote villages in the Ramgarh, Dhari, and Okhalkhanda blocks of Nainital district. MMU organises monthly camps for 105 villages and a population of 55,000, providing maternal, child, adolescent, adult, and geriatric care. MMU's laboratory, pharmacy, and diagnostic tools ensure early detection, treatment, and referrals. Collaborating with health authorities improves last-mile healthcare access in underserved communities.

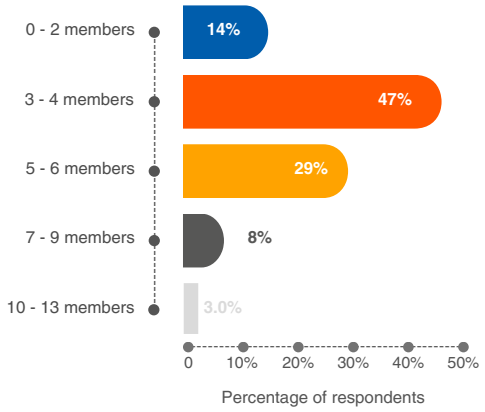
DEMOGRAPHICS

CHART 31: AGE-WISE DISTRIBUTION OF RESPONDENTS



The age distribution of MMU beneficiaries shows that the majority (36.5%) are between 30 and 40 years old, followed by 25.2% in the 20 to 30 age group. Older beneficiaries (50 years and older) account for 18.2%, emphasizing the MMU's role in meeting healthcare needs across age groups. The data show how the unit provides critical support for maternal, adult, and geriatric healthcare in underserved communities.

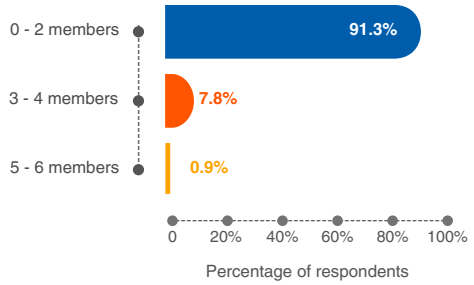
CHART 32: NUMBER OF FAMILY MEMBERS



This data provides a better understanding of healthcare needs, emphasising the importance of MMU services for both nuclear and joint families in remote areas. The family size distribution of beneficiaries shows that nearly half (47%) belong to families with 3-4 members, followed by 29% who have 5-6 members. Smaller families (0-2 members) account for 14%, with larger households (7+ members) accounting for 11%.

> My name is Ganesh Ram, and I am 75 years old. At this age, health issues are common, and I cannot imagine life without Aarohi. I frequently visit Aarohi for check-ups, and my wife also underwent a successful uterus operation. We are deeply grateful for their support and always look forward to the MMU's visit for medical care.
>
> **Ganesh Ram, Village Jaand, Okhalkanda Block**

CHART 33: TOTAL NUMBER OF CHILDREN IN HOUSEHOLD (AGE 0-12 YEARS)

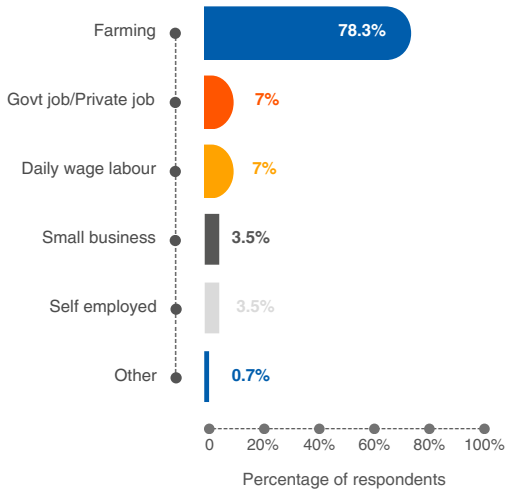


91.3%

of the MMU beneficiaries have 0-2 children aged 0-12 years, followed by 7.8% with 3-4 children and 0.9% with 5-6 children. This highlights the demographic profile of beneficiary families, emphasizing the importance of the MMU's maternal and child healthcare services in supporting the health and well-being of young children.

ECONOMIC CONDITIONS OF HOUSEHOLDS

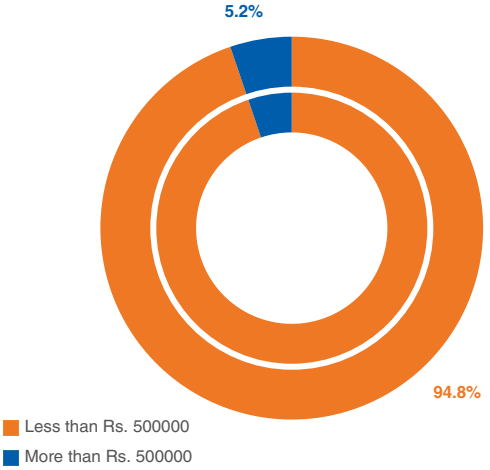
CHART 34: FAMILY OCCUPATION



78.3%

of the beneficiaries are farmers, making agriculture their primary occupation. A small percentage work in the government or private sector (7%), daily wage labour (7%), small businesses (3.5%), or self-employment (3.5%). This occupational distribution emphasises rural communities' reliance on agriculture and the importance of accessible healthcare services.

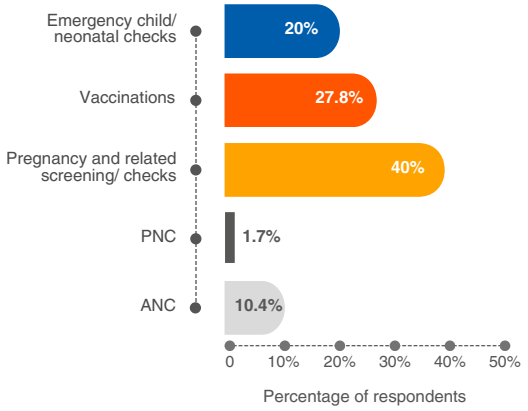
CHART 35: AVERAGE YEARLY FAMILY INCOME



The data shows that 94.8% of the MMU beneficiaries have an annual family income of less than ₹5,00,000, indicating a predominantly low-income rural population. This economic vulnerability highlights the importance of the MMU's accessible and affordable healthcare services, which provide critical medical support to financially disadvantaged households in remote villages.

ACCESS AND UTILISATION OF MMU SERVICES

CHART 36: REASONS FOR ACCESSING THE MMU SERVICES

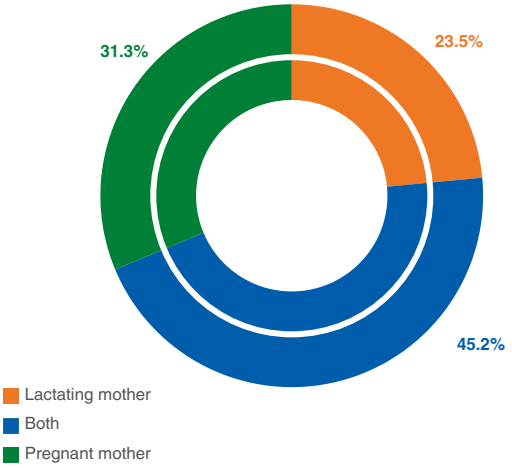


40%

of the MMU beneficiaries sought pregnancy-related screenings, 27.8% sought vaccinations, and 20% required emergency child/neonatal care. A smaller proportion of the population used MMU for antenatal care (10.4%) and postnatal care (1.7%). These figures highlight MMU's critical role in providing maternal and child healthcare services to underserved rural communities.

> "As Sarpanch, I can attest to the importance of MMU in our village. Without its services, villagers would have to travel 100 to 200 kilometres for quality healthcare, as there are no well-equipped medical stores or 24-hour health centres nearby. Even for minor ailments, nearly 80% of our population would have to make the long journey. MMU is a lifeline for us, providing critical healthcare access in our remote location."
>
> **Roshan Singh Lamgadiya, Former Sarpanch of Village Soni**

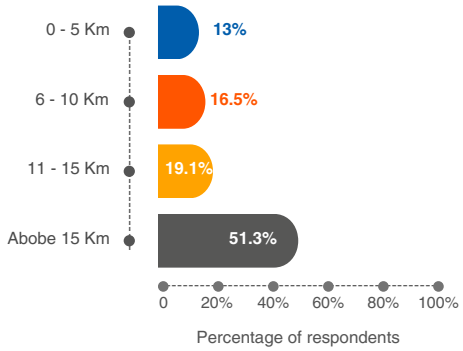
CHART 37: STATUS WHEN AVAILED MMU SERVICES



45.2%

of the MMU beneficiaries used services during both pregnancy and lactation, with 31.3% seeking care specifically during pregnancy and 23.5% during lactation. This highlights the MMU's critical role in ensuring continuous maternal healthcare, from pregnancy to postpartum, for women living in remote areas with limited access to medical facilities.

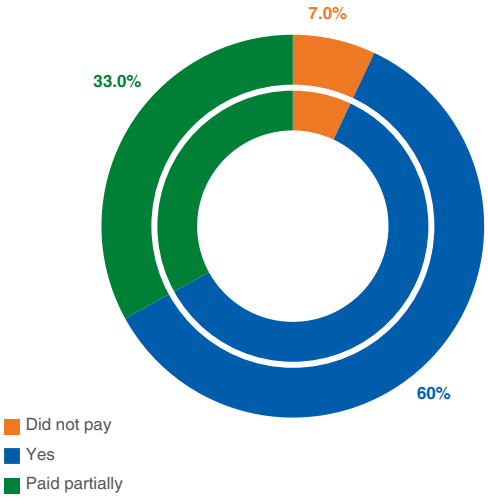
CHART 38: DISTANCE TRAVELLED TO REACH MMU (KM)



According to the data, 51.3% of the beneficiaries travel more than 15 kilometres to access MMU services, highlighting the significant geographical challenges faced by rural communities, particularly the elderly. While 35.6% travel between 6 and 15 km, only 13% live within a 5 km radius. This emphasises the MMU's vital role in bridging healthcare gaps, though access remains difficult for senior citizens.

> "Currently, the MMU has reached Suni Band, which is 15 kilometres away. Travelling such a long distance is difficult for a senior citizen over the age of 60, particularly for the elderly. If the MMU could come closer to our village, it would be much more convenient. Our village is surrounded by six others, and bringing the MMU here would greatly benefit all of us by providing easier access to essential healthcare services."
>
> **Ratan Singh Bora, 62-year-old ex-sarpanch of Village Shimal Kanya**

CHART 39: DID YOU PAY FOR THE SERVICES YOU AVAILED?



60%

of the MMU beneficiaries paid for their services, 33% made partial payments, and only 7% were given free services. It is important to note that AAK and MMU services are subsidised, offering quality healthcare at a lower cost than private providers. While MMU services remain available, ongoing support is required to ensure affordability for economically vulnerable populations.

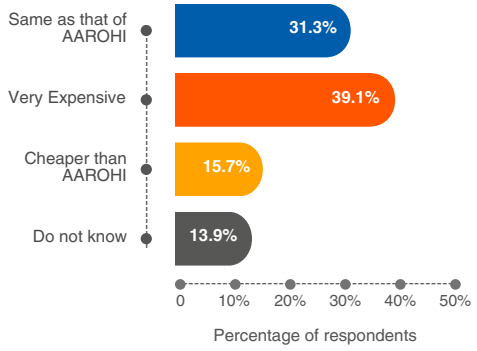
"At Aarohi, we have a provision that waives the entire treatment cost for patients based on their financial situation. However, we do not strictly adhere to the BPL criteria. Because we have been working in this area for a long time, we are familiar with the financial situations of most families. To ensure fairness, we consult with our village health workers, who have extensive knowledge of the community. If a patient truly cannot afford the treatment, we waive the entire cost. Every month, approximately 10-25% of patients receive a full waiver of their treatment costs."

Dr. Pankaj Tiwari, Executive Director Aarohi

"It brings me great pleasure and satisfaction to help those in need. Aarohi strives to provide high-quality healthcare services at low costs, ensuring that everyone can afford them. For example, we provide root canal treatment (RCT) for ₹1,200-₹1,500, while private healthcare providers charge ₹5,000-₹6,000. Our goal is to ensure that no one is denied basic healthcare due to financial constraints. We remain committed to making quality treatment available to everyone, regardless of money."

Dr. Mukul Bisht, Dentist at Aarohi

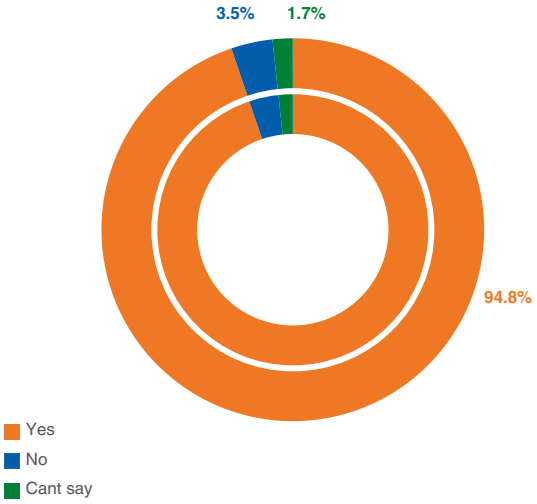
CHART 40: COST COMPARISON OF OTHER CENTRES VS. AAROHI MMU



39.1%

of the respondents consider other healthcare centres to be significantly more expensive than Aarohi MMU, while 31.3% believe the costs are similar. Only 15.7% believe alternative centres are cheaper, while 13.9% are unaware of the cost differences. This emphasizes MMU's affordability and accessibility, underscoring its role in providing cost-effective healthcare to underserved communities.

CHART 41: SATISFACTION WITH THE MMU SERVICES



94.8%

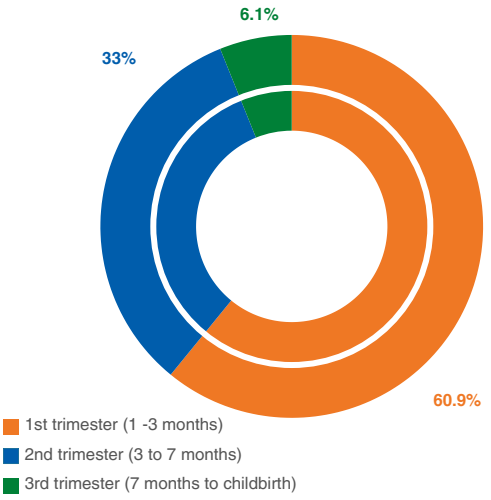
of the respondents were satisfied with MMU services, demonstrating a high level of acceptance and trust in the healthcare provided. This demonstrates MMU's effectiveness in providing quality healthcare to underserved communities, reinforcing its position as a critical healthcare provider in remote areas.

"With Bajaj's support, we have significantly improved our infrastructure, upgraded MMU services, and implemented modern medical equipment such as digital X-ray and ultrasound. However, in order to ensure the continuity of these services, ongoing financial support is required. We are committed to expanding our healthcare model to other underserved areas, provided we receive long-term support from partners such as Bajaj and other stakeholders."

Mr. Kavi Kumar Nagrajan

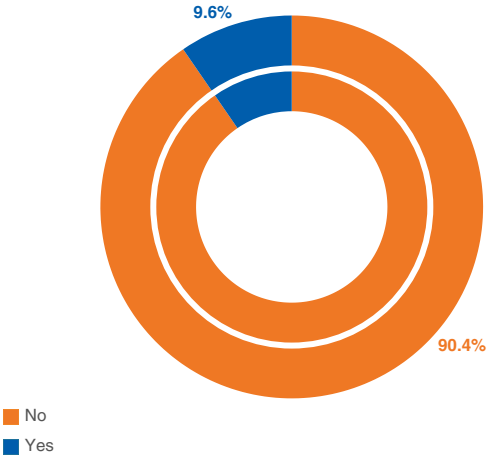
MATERNAL HEALTH AND PREGNANCY CARE

CHART 42: TRIMESTER (AT THE TIME OF MMU VISIT)



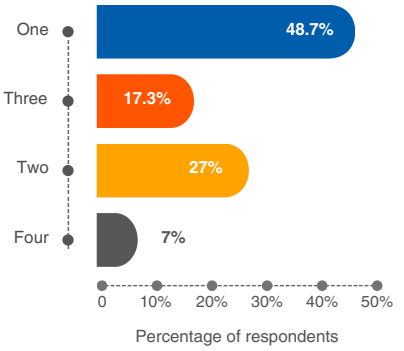
60.9%
of the pregnant beneficiaries used MMU services during the first trimester, 33% in the second trimester, and only 6.1% in the third trimester. This demonstrates the MMU's critical role in promoting early antenatal care, ensuring timely screenings, and improving maternal and foetal health outcomes in remote rural areas.

CHART 43: DID YOU REGISTER WITHIN THE FIRST 12 WEEKS OF YOUR PREGNANCY?



90.4%
of the pregnant beneficiaries registered for antenatal care within the first 12 weeks of their pregnancy, indicating high awareness and early health-seeking behaviour.

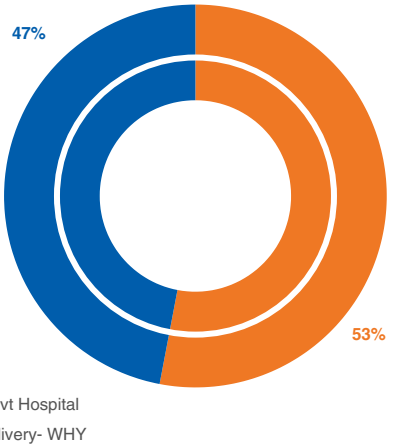
CHART 44: NUMBER OF ANC CHECK-UPS RECEIVED FROM THE MMU TEAM IN THE VILLAGE



The data show that 48.7% of the pregnant beneficiaries received only one ANC check-up from the MMU team, 27% received two, and 17.3% received three check-ups. Only 7% had four ANC visits, indicating gaps in regular maternal health monitoring. Strengthening ANC follow-ups is critical to providing comprehensive maternal care to rural beneficiaries.

DELIVERY AND POSTNATAL CARE

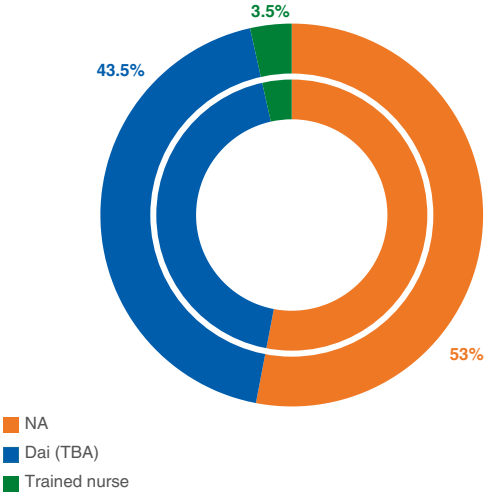
CHART 45: PLACE OF CHILDBIRTH



53%
of the beneficiaries chose institutional deliveries at government hospitals, while 47% chose home deliveries. The high rate of home deliveries indicates potential barriers such as distance, lack of transportation, or traditional preferences. Raising awareness and increasing access to institutional delivery services is critical for improving maternal and neonatal health outcomes.

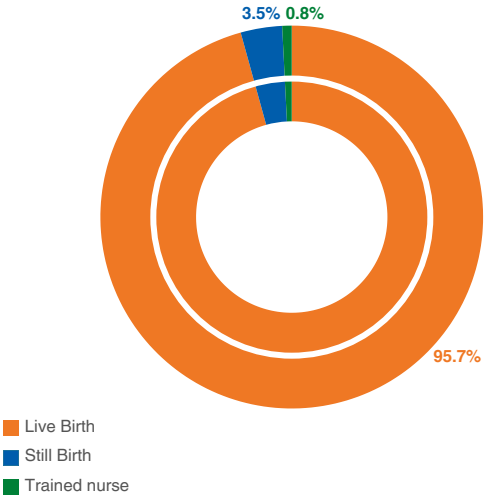
> As an ANM, I've seen a remarkable shift in maternal health awareness over the years, largely thanks to Aarohi's efforts. Previously, most deliveries were carried out at home with no professional assistance. Today, the majority of births take place in healthcare facilities or at home under the supervision of trained Traditional Birth Attendants (TBAs) or Swasthya Karnis. This is a significant accomplishment. Aarohi's ongoing awareness programs have played a critical role in improving maternal and child health in our villages, making safe deliveries a top priority.
>
> **Neha Mehra, ANM**

CHART 46: ASSISTANCE RECEIVED DURING HOME DELIVERY



Out of the 47% of the beneficiaries who had home deliveries, 43.5% were assisted by a traditional birth attendant (Dai), while only 3.5% received care from a trained nurse. This highlights the reliance on informal childbirth support and emphasizes the importance of increased awareness and access to skilled maternal healthcare services to ensure safer deliveries.

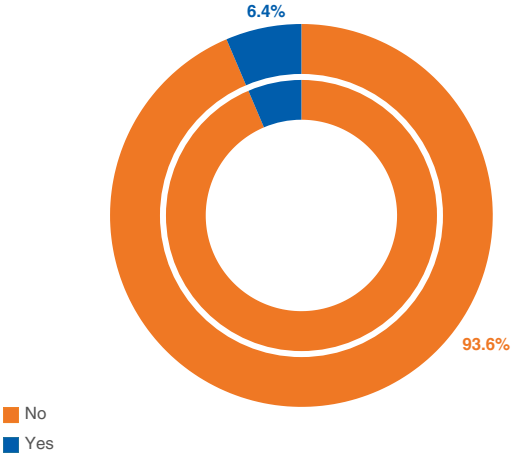
CHART 47: CHILDBIRTH RATES



95.7%

of the pregnancies resulted in live births, 3.5% had stillbirths, and 0.8% of newborns died shortly after birth. While the majority resulted in live births, the presence of stillbirths and neonatal deaths emphasises the importance of ongoing maternal and neonatal healthcare interventions to improve birth outcomes and reduce preventable losses.

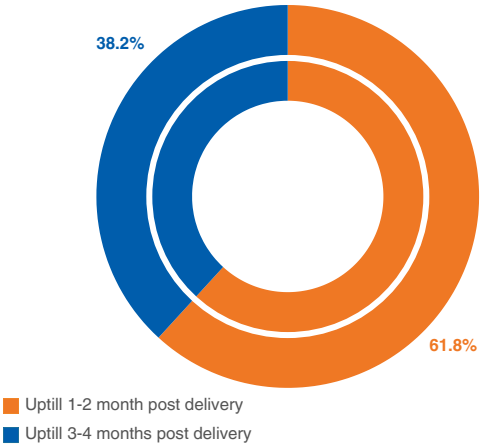
CHART 48: POST-DELIVERY COMPLICATIONS IDENTIFIED AT MMU



93.6%

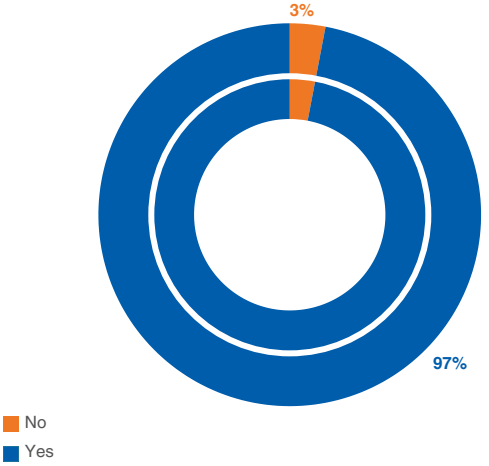
of the mothers who had live births experienced no post-delivery complications, while 6.4% reported complications identified at the MMU. This demonstrates the efficacy of MMU services in ensuring safe deliveries and postpartum care while also emphasizing the importance of ongoing monitoring and timely medical intervention for those experiencing complications.

CHART 49: DURATION OF PNC (POSTNATAL CARE) SUPPORT AVAILED FROM MMU POST-DELIVERY



61.8%
of mothers received postnatal care (PNC) from the MMU for up to 1-2 months after delivery, with 38.2% continuing to receive care for 3-4 months. This emphasizes Aarohi's critical role in providing postnatal care, ensuring maternal and newborn well-being, and addressing potential postnatal health issues.

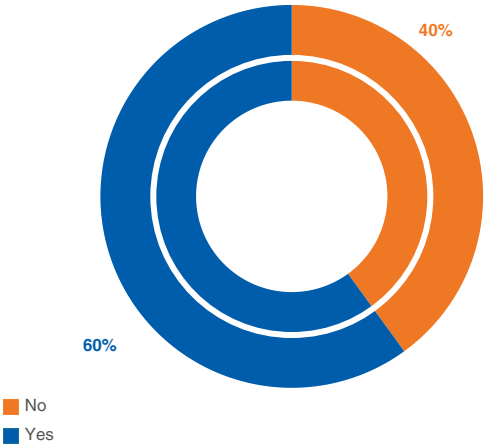
CHART 50: IMPACT OF TIMELY REFERRAL



97%
agreed that timely referrals from Aarohi helped prevent serious health issues, with only 3% disagreeing. This demonstrates the efficacy of Aarohi's referral system in promoting safer maternal outcomes.

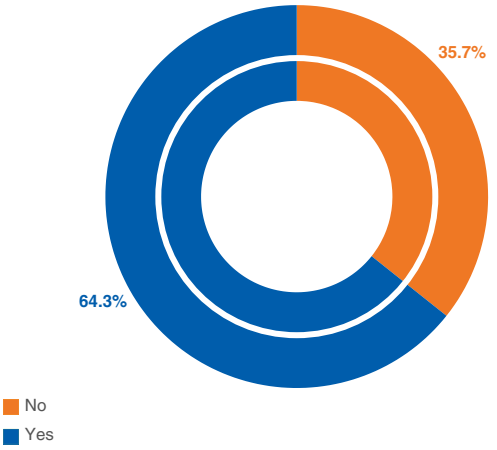
INFANT AND CHILD HEALTH

CHART 51: INITIATION OF BREASTFEEDING WITHIN ONE HOUR OF BIRTH



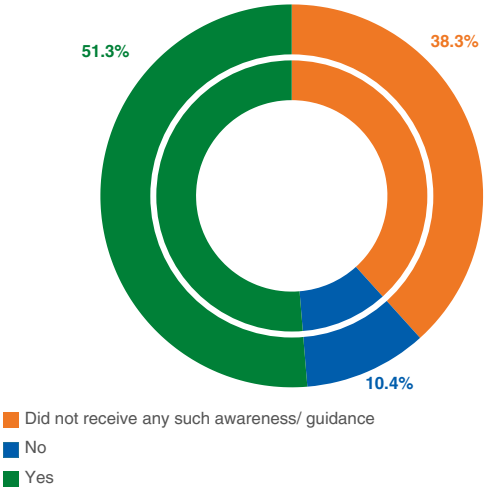
The data reveals that while 60% of mothers initiated breastfeeding within one hour of birth, 40% did not follow this crucial practice, underscoring the need for greater awareness and support around timely initiation of breastfeeding.

CHART 52: COUNSELLING ON CHILD IMMUNISATIONS AT MMU



64.3%
of the respondents received child immunisation counselling at the MMU, highlighting the organisation's role in promoting essential healthcare practices. However, 35.7% did not receive this counselling, indicating a lack of awareness. Strengthening outreach efforts and providing comprehensive counselling can help to increase immunisation rates and improve child health outcomes in the community.

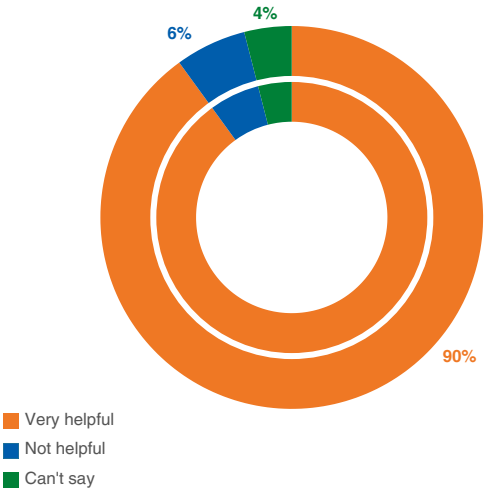
CHART 53: GUIDANCE AND AWARENESS PROVIDED BY THE AAROHI TEAM IN THE IDENTIFICATION OF COMMON ILLNESSES AND MALNOURISHMENT IN CHILDREN



51.3%

of the respondents received guidance from the AAROHI team on identifying common illnesses and malnutrition in children, which helped to improve child health outcomes. However, 38.3% did not receive such awareness, and 10.4% specifically stated that they did not benefit.

CHART 54: GUIDANCE FROM THE ASHA/SK/AAROHI TEAM IN THE FIRST SIX MONTHS OF CHILDBIRTH

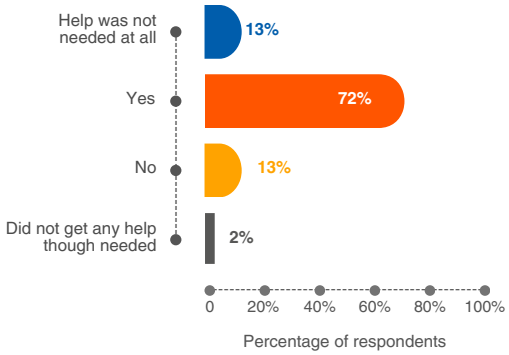


90%

of the respondents found ASHA, SK, or the AAROHI team's guidance to be extremely helpful in understanding their child's health and growth needs during the first six months. This demonstrates the effectiveness of the assistance provided.

IMPACT OF SUPPORT FROM AAROHI AND OTHER HEALTHCARE WORKERS

CHART 55: WHETHER COUNSELLING & SUPPORT GIVEN BY THE AAROHI TEAM FOR INFANT AND YOUNG CHILDREN FEEDING PRACTICES WAS HELPFUL

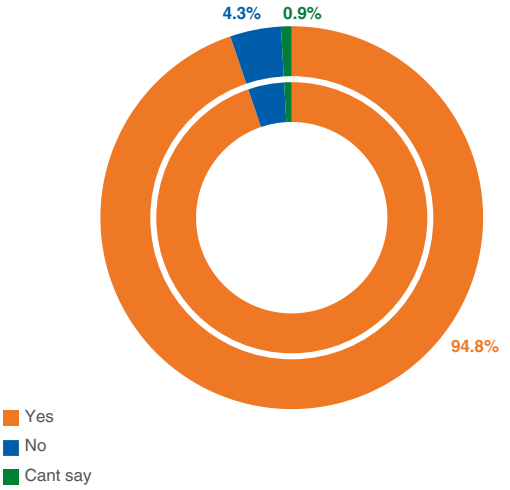


72%

of the respondents found the AAROHI team's counselling and support beneficial to their infant and young child feeding practices. While 13% did not require assistance, the same proportion (13%) did not find it beneficial.

> "The MMU is like a mobile hospital, providing essential services such as ultrasound, blood tests, and more. It has been a great boon for us, ensuring quality healthcare at our doorstep. We eagerly await its visits, and all the villagers make use of its invaluable services for their well-being."
>
> **Krishna Ram, 52-year-old Village Jaand**

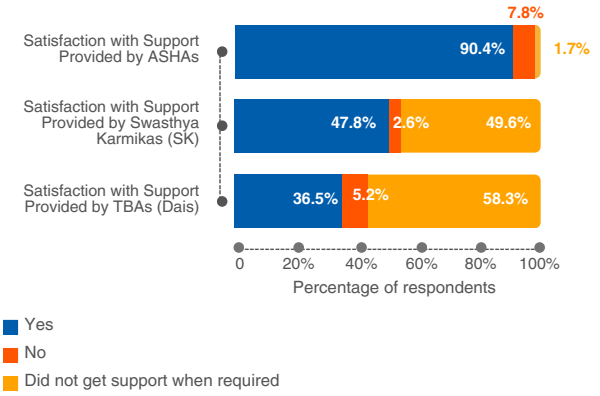
CHART 56: WHETHER ABLE TO MAINTAIN GOOD HEALTH CONDITION DURING PREGNANCY DUE TO SUPPORT FROM THE AAROHI TEAM



94.8%

of the respondents were able to maintain good health during their pregnancy due to the AAROHI team's support. This demonstrates the effectiveness of AAROHI's interventions in promoting maternal health and well-being during pregnancy by providing ongoing guidance and healthcare support.

CHART 57: SATISFACTION WITH SUPPORT PROVIDED BY ASHAS, SWASTHYA KARMI (SK), AND TBAS (DAIS)



90.4%

of the respondents were satisfied with the assistance provided by ASHAs, while 47.8% and 36.5% were satisfied with Swasthya Karmikas (SK) and Traditional Birth Attendants (TBAs), respectively. However, a significant percentage (49.6% for SKs and 58.3% for TBAs) reported not receiving assistance when needed. This demonstrates a strong reliance on ASHAs for maternal and child healthcare while also highlighting gaps in the availability and accessibility of SKs and TBAs, necessitating greater reach and responsiveness.

> As Sarpanch of the village, I prioritise staying informed about social initiatives in our community. Aarohi has played an important role in raising health awareness by organising numerous health fairs for men and women. Their innovative approach, which employs street plays and slogans, makes complex health information understandable, even to those who are illiterate. Aarohi's presence is invaluable, as the nearest quality healthcare facility is in Haldwani, 125 kilometres away. I sincerely appreciate their dedication and support.
>
> **Mr. Lalit Mohan Singh, 35, Sarpanch**

The MMU intervention has significantly improved maternal and child healthcare access in remote areas by ensuring timely antenatal care, institutional deliveries, and necessary postnatal care. High levels of satisfaction (94.8%) demonstrate its effectiveness, particularly in early pregnancy registration, breastfeeding initiation (60%), and immunisation counselling (64.3%). However, gaps persist in affordability, home deliveries (47%), and unaddressed health worker support. Increased outreach, affordability, and skilled birth assistance can all help MMU be more effective. Overall, MMU provides a critical lifeline for underserved communities, improving health outcomes.

IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Improved access to quality healthcare services, leading to better health outcomes.
- Enhanced awareness about preventive healthcare, hygiene, and nutrition.
- Reduced chances of maternal and infant mortality through institutional deliveries and antenatal care.

FAMILY LEVEL

- Reduced financial burden on families due to affordable healthcare services.
- Improved health of family members, leading to increased productivity and livelihood security.
- Greater awareness and adoption of healthy practices within households.

COMMUNITY/VILLAGE LEVEL

- Strengthened healthcare systems with better coordination between ASHAs, health workers, and healthcare institutions.
- Enhanced community resilience through access to emergency healthcare and awareness campaigns.
- Improved sanitation and hygiene practices, reducing the spread of communicable diseases.

DISTRICT LEVEL

- Strengthening of local healthcare infrastructure, including MMUs and WHRCs.
- Capacity building of healthcare workers, leading to better service delivery.
- Reduction in disease burden through timely interventions and preventive measures.
- Development of a sustainable healthcare model that can be replicated in other districts.

NATIONAL LEVEL

- Alignment with national health goals and programs such as Ayushman Bharat and National Health Mission.
- Reduced chances of maternal and child mortality rates contributing to national health indicators.
- Scalable and replicable healthcare models for improving rural health services.

SUSTAINABILITY OF THE PROJECT

The sustainability of Aarohi's healthcare initiative in rural Kumaon, Uttarakhand, relies on several factors, including financial stability, operational efficiency, community engagement, and integration with government health systems.

FINANCIAL SUSTAINABILITY

The primary strengths of this project's sustainability are the individual donors, Aarohi's own corpus fund, and the nominal fees charged for each service. This varied strategy improves financial stability; however, reliance on external funding poses sustainability challenges.

Enhancing long-term funding collaborations with corporations, governments, and philanthropic organisations is crucial. Participation in government health initiatives such as Ayushman Bharat provides financial assistance to beneficiaries while ensuring the delivery of services.

OPERATIONAL SUSTAINABILITY

Operational costs continue to pose a significant challenge to the sustainability of this project. When corporate funding ends, sustaining services at the same level becomes challenging, particularly as community expectations and healthcare demands increase. Aarohi has implemented a cost-effective strategy to address this challenge by regulating the operations of the Mobile Medical Unit (MMU) on an alternating basis, thereby minimising operational expenses, upgrading medical infrastructure, and optimising resource utilisation.

The integration of digital health records and systematic documentation enhances efficiency, reduces administrative costs, and improves patient management. Enhancing MMU outreach to remote villages and ensuring the provision of specialised doctors and emergency services, including ambulance facilities, will markedly improve accessibility and long-term outcomes. These measures are crucial for maintaining and expanding the healthcare model while addressing the changing healthcare needs of the community.

COMMUNITY AND HUMAN RESOURCE SUSTAINABILITY

Community participation serves as a fundamental component of sustainability. Enhancing the effectiveness of Mothers' Groups and adolescent health groups via consistent training and participatory decision-making will empower local communities. Ongoing capacity-building initiatives for health workers, such as ASHA and Swasthya Karni, will promote the retention of skilled professionals and improve service quality.

GOVERNMENT INTEGRATION AND POLICY ALIGNMENT

The project aligns with key national health goals and Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being). Integration with government health programs and utilisation of public health infrastructure will ensure the initiative's sustainability beyond donor support. Collaboration with the local health department for referrals and co-management of cases will decrease financial and operational burdens.

FUTURE PROSPECTS AND SCALABILITY

With Bajaj's support, the project has made significant progress, including MMU expansion, medical equipment upgrades, and service outreach. However, maintaining and expanding these services requires ongoing financial support. Aarohi is willing to replicate this model in other underserved areas if sufficient funding is secured. Additionally, expanding services such as menstrual health interventions and maternity wards at AAK can have a greater impact.

CONCLUSION

The project has shown significant effects on rural healthcare delivery; however, its long-term sustainability relies on financial stability, operational efficiency, community involvement, and policy integration. A strategic focus on donor engagement, digital transformation, government partnerships, and the expansion of healthcare services will secure the ongoing success and growth of this initiative.

"For the past five years, Bajaj has been a key donor, supporting not only our healthcare initiatives but also our livelihood projects. We are deeply grateful for their unwavering support, which has allowed us to create a holistic healthcare model that meets the needs of rural communities. Moving forward, we hope to receive their support specifically for our menstrual health initiative, which is a critical area of focus. Furthermore, with Bajaj's continued partnership, we are eager to replicate our successful healthcare model in other regions, thereby increasing access to quality healthcare for underserved communities.

Dr. Pankaj Tiwari, Executive Director, Aarohi)"

CHAPTER 7
RECOMMENDATIONS

(Source: based on the interaction with different stakeholders)

Diversify funding sources by forming long-term partnerships with corporations, government agencies, and philanthropic organisations, as well as developing a structured donor engagement strategy to ensure recurring contributions.

Register with Ayushman Bharat and other government initiatives to gain access to subsidised or free healthcare services, making them more affordable and accessible.

Improve the functionality of Mothers' and Adolescent Health Groups by offering regular training and encouraging participatory decision-making to foster community ownership.

Implement a digital health record system to effectively track patient progress and service utilisation, digitise project documentation for better data management, and strengthen the feedback mechanism to continuously assess and improve service quality.

Efforts should be made to increase awareness and provide better guidance in identifying common childhood illnesses and malnutrition. Increased awareness and access to institutional delivery services, as well as improved outreach efforts, can lead to better maternal and neonatal health outcomes. Furthermore, encouraging consistent community participation through interactive sessions can result in a more knowledgeable and health-conscious community.

Increasing the capacity of Aarohi Arogya Kendra (AAK) with more beds will improve accessibility and service delivery.

Enhance the role of Frontline Workers (FLWs) in providing both emotional and medical support to beneficiaries. Strengthening counselling sessions and addressing existing gaps in trust and awareness among community members can significantly improve maternal health outcomes under the WHRC initiative.

COMMUNITY PERSPECTIVES

- Ensure that specialised doctors are available 24 hours a day, seven days a week at AAK, increase the number of doctors to improve service delivery and establish an ambulance service to enable timely medical intervention, particularly in remote mountain areas where delays can be critical.
- Establish a maternity ward at AAK to ensure safe deliveries and expand MMU services to additional villages in the Okhalkanda block, reducing travel challenges for seniors and others who require regular medical attention.

CHAPTER 8
CONCLUSION

The "Bringing Quality Healthcare to Rural Kumaon, Uttarakhand" project, implemented by Aarohi with the support of Bajaj Auto Ltd, has successfully improved maternal and child health services, strengthened community engagement, and raised awareness of preventive healthcare. The Mobile Medical Unit (MMU), Aarohi Aarogya Kendra (AAK), and Women's Health and Resource Centres (WHRCs) have all played important roles in providing essential health services, reducing pregnancy-related complications, and empowering women through education and support.

While the project has made significant progress, challenges such as sustainability, geographical barriers, and the need for specialised healthcare services still exist. Strengthening government ties, broadening outreach, and establishing long-term funding partnerships will be critical to sustaining and expanding its impact. Overall, the initiative has had a long-term impact on rural communities, encouraging a culture of good health and well-being.

IMPACT ASSESSMENT REPORT

WINGS OF DOON

Implementing partner – Aasraa Trust

Release Date: 31-03-2025

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

AY	Academic Year
BAL	Bajaj Auto Limited
CAL	Computer-Aided Learning
CBZ	Chemistry, Botany, Zoology
CBOs	Community-Based Organisations
CSR	Corporate Social Responsibility
FGD	Focus Group Discussion
FY	Financial Year
GPS	Government Primary School
ICT	Information and Communication Technology
INR	Indian Rupee
IT	Information Technology
NEP	National Education Policy
NGO	Non-Governmental Organisation
NIOS	National Institute of Open Schooling
OECD-DAC	Organisation for Economic Co-operation and Development - Development Assistance Committee
OBC	Other Backward Classes
PG	Post Graduate
RPMV	Rajkiya Purva Madhyamik Vidhyalaya
SC	Scheduled Caste
SDGs	Sustainable Development Goals

SHGs	Self-Help Groups
ST	Scheduled Tribe
STEM	Science, Technology, Engineering, and Mathematics
SWOT	Strengths, Weaknesses, Opportunities, and Threats
USK	Unnayan Shiksha Kendra

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The Wings of Doon program, initiated by Aasraa Trust with support from Bajaj Auto Limited (BAL) under its CSR initiative, aimed to provide after-school remedial education for children from marginalised communities in Dehradun. Running from November 2019 to March 2023, the program addressed the academic challenges faced by first-generation learners, ensuring they received the necessary support to stay in school and improve their educational outcomes.

Many of these children come from families struggling with financial insecurity, living in overcrowded conditions with limited access to learning resources. Wings of Doon provided structured remedial classes, digital learning opportunities, and holistic development interventions, including nutrition and medical care, to bridge the gaps in their education and overall well-being.

This report presents the program's impact on academic performance, retention rates, and digital learning adoption. It highlights how community collaborations, structured learning support, and targeted interventions contributed to meaningful changes in the lives of the children and their families.

PROJECT DETAILS

Implementation year
November 2019 – March 2023

Assessment year
FY 2024-25

Implementing Partner
Aasraa Trust

Project location
Dehradun, Uttarakhand

Beneficiaries
Over 1,100 children enrolled in government schools.

Budget
₹257.36 Lakhs

Alignment with SDGs
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
10 REDUCED INEQUALITIES

PROJECT ACTIVITIES

REMEDIAL LEARNING

Provided remedial classes in core subjects across 8 government schools.

Introduced The Silver Lining Project to facilitate online learning for children without digital access.

Conducted structured assessments and evaluations.

DIGITAL AND TECHNOLOGY INTEGRATION

Implemented Computer-Aided Learning (CAL) for interactive learning experiences.

Distributed 64 smartphones and 24 tablets, ensuring 96.27% student connectivity for online learning.

HEALTH AND NUTRITION INTERVENTIONS

Provided daily nutritional supplements, including milk and bananas, to all students.

Ensured access to medical check-ups, immunisations, and emergency healthcare support.

INTERACTING WITH A STUDENT FROM GPS BANJARAWALA, WINGS

PARENTAL AND COMMUNITY ENGAGEMENT

Conducted awareness sessions and counselling for parents on supporting their children's education.

Strengthened partnerships with organisations like Lotus Petal Foundation, Project Rangeet, and Nature Vidya to enhance learning opportunities.

Emergency COVID-19 Support:

- Distributed 14,000 emergency ration kits to families in need.
- Developed alternative learning solutions, including take-home education kits and telephonic engagement for students lacking digital resources.

FIELD TEAM ENGAGES WITH THE STUDENTS FOR PROGRAM AWARENESS

Key Findings

Sample Size - 230

ACADEMIC PERFORMANCE AND LEARNING OUTCOMES

87.2%
of the students secured first division and 27% secured second division in their board exams in AY 2022-23.

54.6%
of the students reported high confidence in attending regular classes after receiving remedial support.

99.6%
of the students reported improvement in reading, writing, and comprehension skills.

63%
of the students found improved listening skills to be immensely helpful in understanding core subjects.

SOCIO-EMOTIONAL WELL-BEING

72.7%
of the students felt highly motivated due to parental encouragement.

61.3%
of the students participated in sports, 42.2% in painting, and 33% in music.

67.4%
of the students felt extremely happy attending school in new uniforms and warm clothing.

DIGITAL LEARNING

92.6%
of the students participated in Computer-Aided Learning (CAL) classes.

27.2%
of the students participated in coding programs, and 13.1% explored website development.

41.8%
of the students found web-based e-learning extremely helpful, and 51.2% found it somewhat helpful.

HEALTH, NUTRITION, AND WELL-BEING

56.5%
of the students were very happy receiving nutrition supplements.

75.7%
of the students found medical aid helpful, and 96.1% felt protected after receiving immunisation.

FUTURE ASPIRATIONS AND HIGHER EDUCATION READINESS

50.9%
of the students felt highly confident in pursuing higher education.

98.7%
of the students reported motivation to continue their studies beyond school.

38 students have enrolled in higher education, with 11 pursuing STEM-related courses.

Key Impacts

Sample Size - 230

ACADEMIC GAINS LEADING TO STRONGER EDUCATIONAL TRAJECTORIES

Students have demonstrated improved academic performance. The improvement in board exam results reflects the effectiveness of remedial learning support and structured assessments. Increased confidence in learning has enabled many students to transition successfully into mainstream education.

SOCIO-EMOTIONAL GROWTH AND COMMUNITY ENGAGEMENT

Students now actively participate in school activities, and parents are more engaged in their children's education. The program has built student confidence, improved communication skills, and strengthened family support structures.

BRIDGING THE DIGITAL DIVIDE AND EXPANDING CAREER PATHWAYS

Through Computer-Aided Learning (CAL) and coding programs, students have gained exposure to digital literacy and STEM subjects. Increased participation in technology-driven learning prepared students for higher education and interest in STEM careers.

IMPROVED HEALTH AND EDUCATIONAL STABILITY

Access to nutrition support, medical check-ups, and essential school supplies has significantly reduced absenteeism. The provision of warm clothing, uniforms, and education kits has helped maintain student engagement, particularly for those from economically vulnerable backgrounds.

HIGHER EDUCATION AND VOCATIONAL READINESS

Increased enrolment in STEM courses, professional diplomas, and industry-aligned training programs reflect the program's success in aligning academic efforts with long-term career aspirations.

RESILIENCE AND LEARNING CONTINUITY DURING COVID-19

The program's emergency ration support, digital learning initiatives, and education kits ensured that students remained engaged despite pandemic-related disruptions. The integration of remote learning tools and mobile-based education has built resilience in learning systems, providing students with continued access to education even in crisis situations.

83.9%
of the students benefitted from emergency ration support during COVID-19.

84.8%
of the students received education kits to continue learning during school closures.

88.3%
of the students were able to continue their education through WhatsApp learning groups.

87.8%
of the students benefitted from mobile recharge support, ensuring regular academic check-ins.

195 students received storybooks, stationery, and craft materials through education kits.

INTERACTION WITH A STUDENT FROM GOVT UPPER PRIMARY SCHOOL,REST CAMP, WING

03. OECD FRAMEWORK

RELEVANCE

The Wings of Doon initiative directly addresses the educational challenges of marginalised children in urban slums, aligning with the learning needs of first-generation learners, migrant children, and those at risk of dropping out. By integrating remedial support, digital education, and career guidance, the program ensures holistic student development, responding effectively to the socio-economic realities of its target population.

COHERENCE

The program aligns with the following SDGs, including:

Additionally, the program aligns with the following National programs:

- **NEP 2020**
- **Beti Bachao Beti Padhao**

EFFECTIVENESS

The initiative has successfully improved student learning outcomes, with increased board exam pass rates, enhanced foundational literacy, and higher digital competency. The remedial support model has bridged learning gaps, while parental engagement efforts have strengthened home learning environments. Despite these successes, sustaining long-term digital learning adoption and career transitions remains a challenge.

EFFICIENCY

The program has utilised resources effectively, ensuring high student participation in after-school support. Collaboration with government schools and vocational training institutes has optimised financial and infrastructural resources. However, limited access to personal digital devices and internet connectivity at home remains a barrier to maximising learning efficiency.

IMPACT

The program has positively influenced students' academic performance, confidence, and career aspirations. Increased participation in STEM education, digital learning, and higher education enrolments demonstrates a long-term shift in learning trajectories. Additionally, students from low-income and migrant backgrounds now have greater access to mainstream education, reducing drop-out risks and enabling sustainable academic progress.

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

SUSTAINABILITY

The initiative has built institutional linkages with schools, vocational institutes, and higher education organisations, ensuring continued support for students. However, economic instability, parental illiteracy, and migration patterns pose sustainability challenges. Strengthening government partnerships, alumni mentorship networks, and scholarship support will be critical for maintaining long-term impact.

CHAPTER 4
INTRODUCTION

FGD parents GPS Rest camp

NEED OF THE PROGRAM

The Wings of Doon program, a collaboration between Bajaj Auto Ltd. and Aasraa Trust, was initiated to provide after-school remedial education for children from marginalised communities in Dehradun. Launched in November 2019, the program aimed to address critical gaps in learning, particularly for first-generation learners, by offering structured academic support, digital learning opportunities, and holistic child development interventions.

The need for Wings of Doon arose from the persistent challenges faced by children in urban slum areas: Lack of access to quality education, inadequate study environments at home, and limited academic support. Many of these children, whose parents work in informal and low-paying jobs, struggle with retention and learning continuity, leading to high drop-out rates and poor academic performance. Recognising these challenges, Aasraa Trust conceived of an intervention that would not only reinforce classroom learning but also provide nutritional and health support to ensure the overall well-being of participating students.

With support from Bajaj Auto Ltd., Wings of Doon implemented a multi-faceted strategy, incorporating remedial education, digital learning, teacher capacity building, and parental engagement to create a sustainable impact. The program particularly emphasised the use of technology in education through initiatives such as The Silver Lining Project, which provided digital learning resources to students who lacked access to online education.

OBJECTIVES OF THE PROGRAM

To improve foundational learning and academic performance of first-generation learners through structured after-school remedial support.

To bridge the digital divide by integrating technology-aided learning for children in marginalised communities.

To promote overall child well-being by incorporating nutrition, medical support, and socio-emotional learning interventions.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling.

With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – AASRAA TRUST

Aasraa Trust, established in 2009, is a Dehradun-based non-profit organisation dedicated to the empowerment of street and slum children through education, skills training, nutrition, and healthcare. The trust works to break the cycle of poverty by ensuring that vulnerable children have access to quality education and opportunities for self-sufficiency.

Aasraa Trust adopts a comprehensive approach to child development, integrating classroom learning with digital education, remedial support, and vocational training.

INTERVIEW WITH PROGRAM MANAGERS

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited assigned SoulAce to conduct a study on the work undertaken by Aasraaa Trust and assess the impact of the remedial learning initiative in government schools of Dehradun.

OBJECTIVES OF THE STUDY

To assess improvements in academic performance among students receiving after-school support.

To evaluate changes in confidence and communication skills through extra-curricular activities and parental support.

To analyse the impact of digital learning initiatives on student engagement and learning outcomes.

To examine the role of health and nutrition support in student attendance and well-being.

To track students' higher education aspirations and access to career guidance.

MIXED METHODS APPROACH

The impact assessment study adopted a comprehensive mixed-methods strategy, blending quantitative and qualitative approaches to offer a more intricate understanding of the project's impact. Quantitative methods involve structured surveys administered to a sample of beneficiaries selected through simple random sampling. Qualitative methods included in-depth interviews, focused-group discussions and case studies. These methods aim to gather insights into the project's impact from diverse perspectives and to triangulate findings for robust assessment.

APPLICATION OF QUANTITATIVE TECHNIQUES

In the quantitative aspect, the study utilised structured surveys administered through stratified random sampling and purposive sampling. This approach ensures representative data collection and allows for statistical analysis to measure the project's effectiveness in providing financial support to students for continuing higher education without interruptions.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods include in-depth interviews conducted with key stakeholders. These interviews aim to gather detailed insights into operational improvements, challenges encountered, and overall perceptions of the process of the project. Qualitative data enriches the study by providing contextual understanding and personal viewpoints crucial for evaluating project impact.

ENSURING TRIANGULATION

The quantitative research findings were cross-validated with the insights derived from the qualitative research. The report was structured to reflect this triangulation, enhancing the reliability of the findings.

RESEARCH DESIGN

Name of the project

Wings of Doon

Implementing agency

Aasraa Trust

Research design used

Descriptive Research

Sampling technique

Stratified Random Sampling & Purposive Sampling

Sample size

230

Qualitative method used

Semi-structured questionnaire, open-ended interviews, Focus Group Discussion (FGD) and Case Study

KEY STAKEHOLDERS

- Students
- Parents
- Teachers
- Government Public Schools
- School Management Committee
- Aasraa Trust
- Bajaj

STUDY TOOLS

Questionnaires for primary beneficiaries: Structured questionnaires were designed after reviewing the project details for each focus area, with predefined indicators established prior to conducting the surveys.

Questionnaires for stakeholders: A semi-structured questionnaire was developed for each type of sample of this group. Stakeholders were identified across the focus areas.

ETHICAL CONSIDERATIONS

The impact evaluation adhered to a strong ethical framework, ensuring responsible and ethical research practices. Participants' rights and well-being were prioritised at every stage of the study. Informed consent was obtained by clearly explaining the study's objectives, procedures, potential risks, and benefits, allowing participants to make fully informed decisions after addressing any questions. Confidentiality was strictly maintained, with data securely stored, accessible only to authorised personnel, and participant identities protected through anonymisation or coding techniques. Participation was entirely voluntary, free from any form of coercion, ensuring autonomy and respect for individual choice. Participants were consistently treated with respect, dignity, and fairness, with their well-being prioritised. Support or assistance was readily available whenever needed to ensure their comfort and safety throughout the research process.

CHAPTER 6
ANALYSIS OF THE PROGRAM DESIGN

This chapter provides an in-depth analysis of the design and implementation strategy of the Wings of Doon program. The analysis draws on quantitative and qualitative data gathered through a mixed-methods research approach conducted by SoulAce, supplemented by stakeholder interviews and beneficiary insights.

CONTEXT AND PROGRAM OVERVIEW

The urban slum communities of Dehradun face educational and socio-economic challenges that hinder children's academic progress and personal development. Key issues include:

LIMITED ACCESS TO QUALITY EDUCATION

Many children are first-generation learners who struggle with foundational skills due to inadequate support at home and in schools.

DIGITAL DIVIDE

A significant proportion of children lack access to digital learning tools, further widening the education gap.

HEALTH AND NUTRITION DEFICIENCIES

Malnutrition and limited access to healthcare impact students' cognitive development and overall well-being.

The Wings of Doon program was designed to bridge these gaps through after-school remedial education, digital learning, and holistic child development interventions.

PROGRAM MODEL AND THEORY OF CHANGE

The program follows a community-driven model, placing schools, parents, and local stakeholders at the centre of planning and implementation. The model integrates academic reinforcement, digital learning, and socio-emotional development through three key components:

Component	Activity	Focus Area
Remedial Education	• Subject-wise remedial support • Concept reinforcement • Teacher capacity building	Improvement in academic performance
Digital Learning	• Computer-aided learning (CAL) • Distribution of digital devices • Online education modules	Bridging the digital divide
Holistic Development	• Nutritional support • Healthcare check-ups • Parental counselling sessions	Student well-being and community engagement

THEORY OF CHANGE

INPUTS
- Teacher Training
- Student enrolment
- Digital resource allocation
- Nutritional support

→

OUTPUTS
- Increased student participation
- Improved foundational learning
- Greater digital literacy

→

OUTCOME
- Higher retention rates
- Enhanced academic performance
- Improved student confidence.

→

IMPACT
- Reduced drop-outs
- Strengthened Accessibility to Higher
- Education
- Personal Growth

IMPLEMENTATION STRATEGY

The implementation of the Wings of Doon program was structured to ensure community participation and long-term sustainability. This section outlines the key steps, stakeholders, and strategies involved in the process.

Strategy	Key Steps in Implementation
Student Enrolment and Needs Assessment	Identified children from marginalised communities and conducted baseline assessments to determine their academic levels.
Remedial Education Implementation	Provided subject-specific support in Hindi, English, Math, and Science with a structured after-school tutorial system.
Digital Learning and CAL Integration	Implemented Computer-Aided Learning (CAL) with interactive digital tools, providing devices to students for enhanced learning engagement.
Health and Nutrition Support	Ensured daily nutritional supplements, regular health check-ups, and emergency medical care for all enrolled students.
Parental and Community Engagement	Conducted awareness sessions, parent-teacher meetings, and counselling sessions to strengthen parental involvement in children's education.
Teacher Training and Capacity Building	Provided regular training workshops for teachers on inclusive pedagogy, digital learning tools, and student engagement strategies.
Monitoring and Evaluation	Conducted periodic assessments and student progress tracking through standardised testing and qualitative feedback from teachers and parents.

STAKEHOLDER INVOLVEMENT

Stakeholder	Role
Students	Actively participated in remedial education, digital learning programs, and extra-curricular activities.
Teachers and Educators	Delivered remedial instruction, provided mentorship, and engaged in continuous professional development to improve teaching methodologies.
Community Organisations and Partners	Assisted in outreach efforts, facilitated community engagement activities, and provided additional learning resources for students.
Government Schools	Provided physical space, aligned school schedules with remedial classes, and collaborated in student assessment and progress tracking.
Parents and Guardians	Engaged in regular counselling sessions, attended parent-teacher meetings, and provided home-based support for children's continued learning.
Aasraa Trust	Designed and implemented the program, ensuring quality education delivery and student well-being through structured remedial and digital learning initiatives.

COVID-19 Response and Community Support

Distributed emergency ration kits, implemented remote learning strategies, provided phone recharges, and engaged community volunteers for outreach during school closures.

CHAPTER 7
KEY STUDY FINDINGS AND IMPACTS

This chapter presents an in-depth assessment of the impact and effectiveness of the Wings of Doon program based on quantitative and qualitative data gathered from students, parents, teachers, and Aasraaa Trust. It provides insights into the socio-economic profile of beneficiaries, academic progress, confidence building, digital learning exposure, and overall well-being. The analysis integrates student-reported data, field observations, and stakeholder testimonials to highlight measurable improvements and persisting challenges.

GEOGRAPHICAL COVERAGE

The Wings of Doon project operates within the urban slums of Dehradun, Uttarakhand, focusing on areas with significant educational and socio-economic challenges. As of the 2011 Census, about 27.58% of the population resides in slum areas. The Wings of Doon project collaborates with several government schools. These schools cater to children who come from extremely impoverished backgrounds and are mostly rag pickers, beggars, addicts, runaways, and orphans.

STUDENT OUTREACH

Wings of Doon Initiative: The initiative provides structured remedial education and Computer-aided learning (CAL) opportunities to students. The program ensures a safe and nurturing environment where they can receive one-on-one intensive academic instruction and support as well as encouragement to help them overcome their challenges.

Direct Beneficiaries

S.No.	Centres	Nov'19-Mar'20	Apr'20-Mar'21	Apr'21-Mar'22	Apr'22-Mar'23
1	Govt. Junior High School - 55 Rajpur Road	174	218	134	134
2	Sanatan Dharm Inter College (Bannu)	106	130	134	134
3	Govt. Primary School - Chukkhuwala – II	176	181	160	160
4	Govt. Primary School - Rest Camp	105	113	102	102
5	Govt. Upper Primary School - Rest Camp	61	91	75	75
6	Govt. Primary School – Araghar	99	148	141	141
7	Govt. Upper Primary School – Araghar	100	111	108	108
8	Govt. Primary School – Banjarawala	118	174	206	203
	Total	**939**	**1,166**	**1,107**	**1,104**

(Source: Project Closure Report Nov 2019-March 2023)

AFTER-SCHOOL TUTORIAL AND HOMEWORK SUPPORT PROGRAM

The Wings of Doon initiative includes 8 after-school tutorial and homework support programs across Dehradun. These programs are essential for students who lack conducive home environments for studying, such as desks, proper lighting, or academic guidance. The initiative ensures that students receive structured curriculum support, homework assistance, and reinforcement of classroom learning.

Education Centres Under Wings of Doon Initiative			
JUNIOR WINGS AT SNEHA DOON ACADEMY	Govindgarh	191 children	Nursery to Class 8
JUNIOR WINGS AT UNNAYAN SHIKSHA KENDRA (USK)	Kanwali	190 children	Nursery to Class 5
JUNIOR WINGS AT ABDUL KALAM SCHOOL	Azad Colony	35 children	Nursery to Class 5
JUNIOR WINGS AT RAJKIYA PURVA MADHYAMIK VIDHYALAYA (RPMV)	Rajpur Road	220 children	Classes 1 to 8
JUNIOR WINGS AT WELHAM BOYS' SCHOOL	Chuna Bhatta	110 children	Nursery to Class 5
WINGS AT SHRI GURU RAM RAI PUBLIC SCHOOL	Bindal	122 children	Class 1 to Class 12
SENIOR WINGS AT SUMMER VALLEY SCHOOL	Suraj Basti	100 children	Class 4 to 9
SENIOR WINGS AT CNI INTER COLLEGE	Paltan Bazar	100 children	Class 8 to 12

(Source: Wings of Doon Concept Note for Bajaj Auto Limited)

KEY COLLABORATIONS UNDER WINGS OF DOON INITIATIVE

The Wings of Doon project collaborates with several organisations to introduce innovative educational interventions. These collaborations focused on areas such as digital learning, environmental education, literacy promotion, and teacher capacity building.

Key Collaboration	Intervention	Schools Covered	No. of Beneficiaries
Silver Lining Project	Focused on digital learning and remote education, this initiative provided tablets, mobile learning applications, and online modules to bridge the digital divide.	All Bajaj Wings Centres	1,101 students
Project Rangeet	Implemented the Social, Emotional & Ecological Knowledge (SEEK) curriculum, fostering holistic child development through interactive learning.	7 Government Schools	773 students

Key Collaboration	Intervention	Schools Covered	No. of Beneficiaries
Code-A-Thon	Promoted coding and STEM education by engaging middle school students in computational thinking and programming skills.	All Bajaj Wings Centres	Grade 4-8 Students
Nature Vidya Initiative	Introduced activity-based learning modules on biodiversity, climate awareness, and sustainability practices.	GPS Rest Camp and GPS Araghar	Primary Students (Grade 3-5)

(Source: Project Closure Report Nov 2019-March 2023)

OTHER KEY INITIATIVES

LOTUS PETAL FOUNDATION

Focused on English language skill development at GPS Rest Camp & GPS Banjarawala, benefiting 81 students.

PRATHAM BOOKS READING CAMPAIGN

Enhanced literacy and reading comprehension in 4 primary schools, reaching 420 students.

LIBRARY BOOKS BY SANSKRITI SOCIETY

Established book donation and library setups at GPS Araghar and GPS Banjarawala, benefiting 200+ students.

TINKERING LAB

Encouraged hands-on STEM learning at Govt. Upper Primary School, Araghar, targeting middle school students.

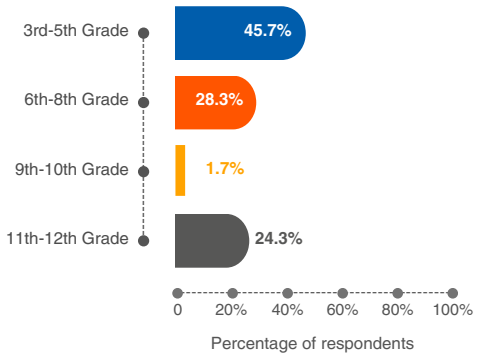
TEACHER TRAINING

Provided pedagogical skill enhancement workshops across all Wings Centers, training 74 teachers.

SOCIO-ECONOMIC PROFILE OF RESPONDENTS

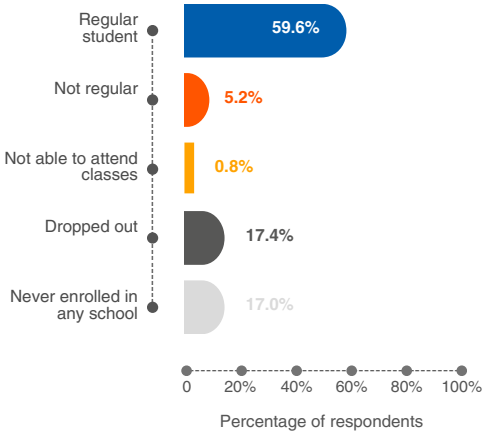
STUDENT LEARNING LEVELS

CHART 1: GRADE DISTRIBUTION



The data reflects a broad distribution of student grades, with 45.7% in Grades 3-5 and 28.3% in Grades 6-8. The sample has a majority of students in primary school, followed by middle school and then students in 11-12th standard with 24.3%.

CHART 2: SCHOOL ENROLMENT BEFORE JOINING AASRA



The chart shows that 59.6% of respondents were regular students before joining the Aasraa program. 17 % of respondents had never attended any school before enrolling in Wings of Doon, whereas 17.4 % of respondents were drop-outs.

Field Note Observation:

The program acts as a primary point of access to education for the children, offering foundational literacy programs, interactive learning materials, and teacher mentorship to help them catch up with their peers.

CHART 3: HIGHEST GRADE DURING ENROLMENT AT AASRA

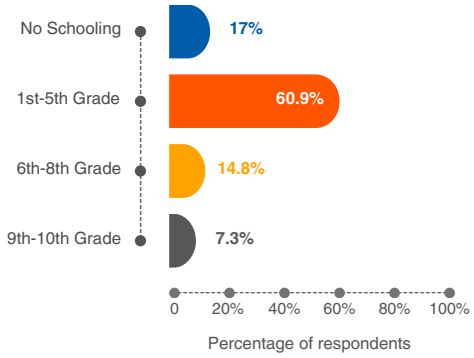
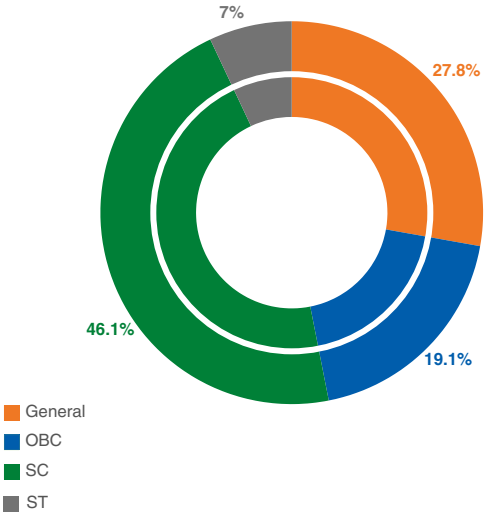


Chart 3 reveals that although a significant part of the sample has schooling experience, only 60.9% had completed up to Grade 5 before enrolling in the after-school program, and 17% of students had no prior schooling experience.

STUDENT INTERACTION AT GPS REST CAMP

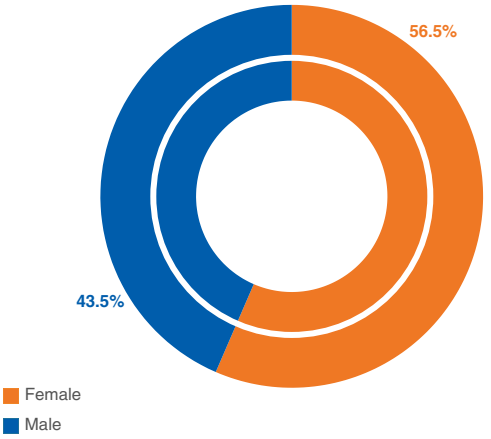
INCLUSIVITY

CHART 4: SOCIAL CATEGORIES



The chart indicates that the program caters significantly to historically underrepresented communities. Almost half of the respondents belong to the Scheduled Caste (SC) category, followed by the General category (27.8%), the Other Backward Classes (OBC) 19.1 %, and 7% from the Scheduled Tribe (ST) category.

CHART 5: GENDER DISTRIBUTION



With 56.5% of respondents being girls, the initiative ensures gender-inclusive educational access.

Field Notes Observation:

Girls from marginalised backgrounds often face higher drop-out rates due to socio-cultural and economic constraints. Wings of Doon tackles this challenge by creating safe and inclusive learning spaces. The program also works with families to address gender biases, emphasising the importance of continued education for girls.

FIRST GENERATION LEARNERS AND LOW PARENTAL EDUCATION

CHART 6: FATHER'S EDUCATION LEVEL

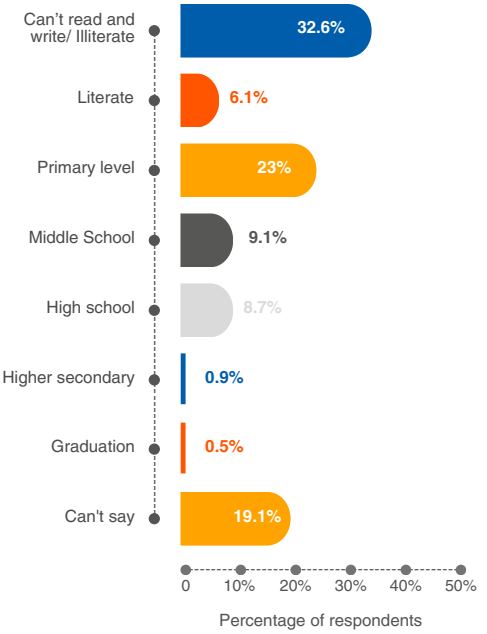
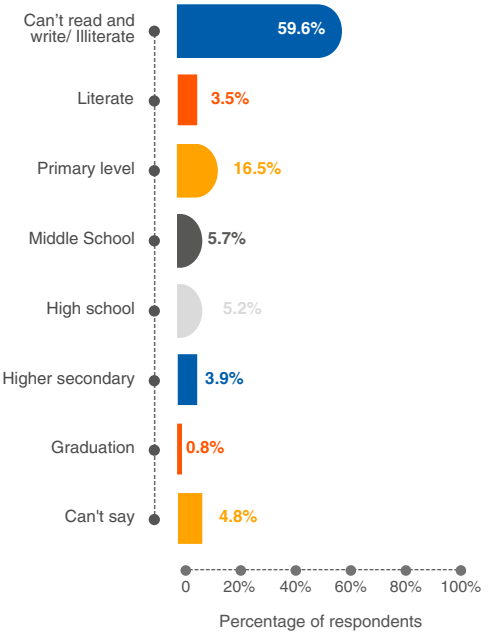


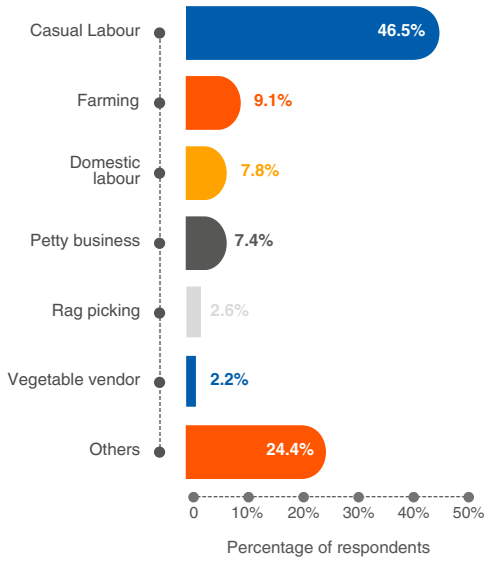
CHART 7: MOTHER'S EDUCATION LEVEL



The majority of students enrolled in the program come from families where both parents have minimal formal education. Charts 6 and 7 show that 32.6% of fathers and 59.6% of mothers are illiterate. Only 23% of fathers and 16.5% of mothers have completed primary education, and less than 10% of parents have studied beyond high school.

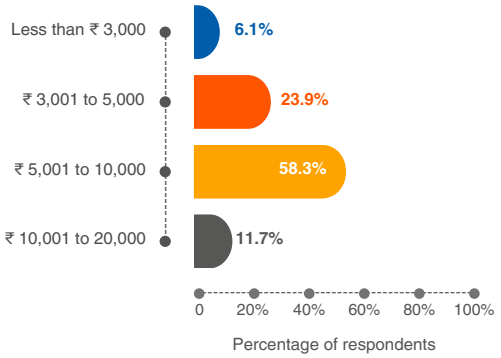
ECONOMIC VULNERABILITIES AND MIGRANT STUDENT POPULATION

CHART 8: PRIMARY OCCUPATION



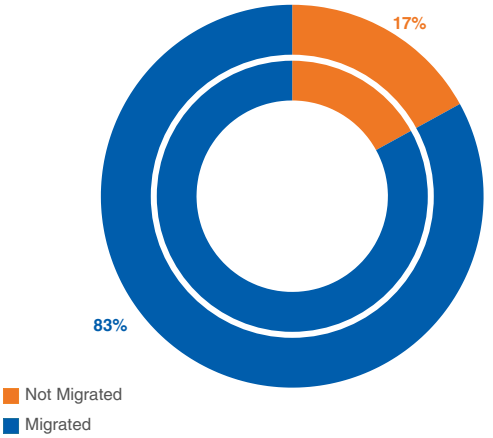
46.5%
of families rely on casual labour, while others work in domestic labour, petty businesses, and agriculture.

CHART 9: AVERAGE MONTHLY INCOME



The chart reveals that only 11.7% of the families have an income between Rs. 10,001 to Rs.20,000 per month. The majority, 58.3% of families, earn between ₹5,001 and ₹10,000 per month, with the rest earning even less.

CHART 10: MIGRATION HISTORY OF FAMILIES



83%
of respondents belong to migrant families, whereas only 17% of the respondents are locals.

Field Note Observation:
The occupational profile and the monthly income distribution indicate that a large proportion of families rely on unstable, low-paying jobs, which often necessitate frequent migration in search of work.

Migration directly impacts children's education, leading to disrupted schooling and learning gaps. The Wings of Doon initiative is strategically designed to counteract these disruptions by providing stable learning environments for migrant children. Through remedial education and a structured learning program, the initiative ensures that students continue their education despite relocation.

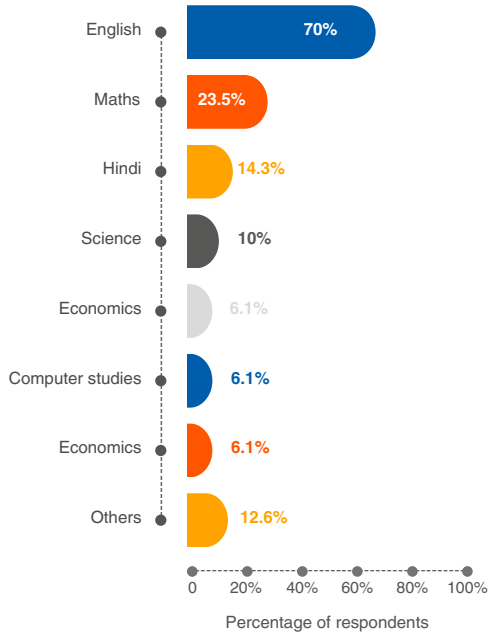
Mobile learning centres and flexible academic interventions allow children to integrate seamlessly into new educational settings, preventing further setbacks in their learning journeys.

KEY IMPACTS

STRENGTHENING FOUNDATIONAL LEARNING

The Wings of Doon initiative has played a crucial role in improving students' academic performance, conceptual clarity, and language skills, as evident from both self-reported data and structured academic progress assessments.

CHART 11: SUBJECT-WISE TUTORIAL SUPPORT

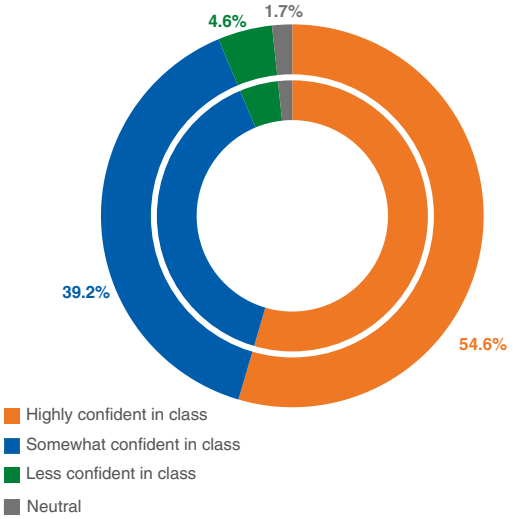


English was the most sought-after subject; students also received remedial assistance in other core areas. 70% receiving English assistance, 23.5% in Math, and 14.3% in Hindi. This aligns with student progress reports, which show improvements in both language comprehension and numerical proficiency.

Testimonial – Ruby (Parent of Arsh, Grade 5)

Before Aasraa, my son Arsh had no proper guidance for his studies. He used to struggle with reading and writing, and I was unable to help him. Our financial situation made it difficult to think beyond daily survival. The bus service helps him attend daily, and the after-school tuition in Maths, English, and Hindi has made a big difference in his learning. Earlier, he lacked confidence, but now he speaks clearly and interacts with his classmates. Receiving warm clothes and medical care was also a blessing for us. The teachers are supportive, and I can see a bright future for my son. I never imagined such a wonderful opportunity for him.

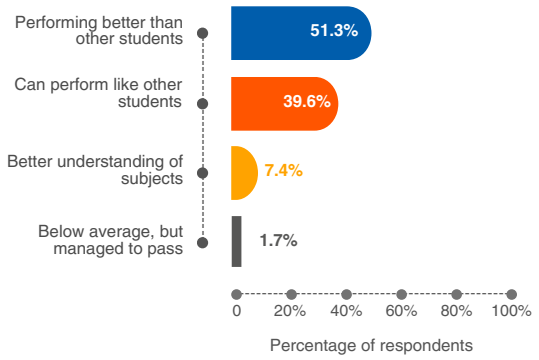
CHART 12: CONCEPT CLARITY AND CONFIDENCE IN SCHOOL



54.6%
of students felt highly confident attending regular classes after receiving remedial lessons. Only 4.6% of students reported minimal improvement in their confidence level.

Field Note Observation:
The survey data regarding the improved level of confidence in the project beneficiaries is further supported by student rankings in final exams, where 51% secured first division and 27% second division in 2022-23 (Result of the Final Assessment - Session 2022-23). The active involvement of trained facilitators and structured assessment cycles helped build a strong foundation in core subjects. The teacher training workshops on differentiated instruction and remedial teaching strategies played a vital role in ensuring subject-specific support tailored to student needs.
(Source: Project Closure Report Nov 2019-March 2023)

CHART 13: IMPACT ON OVERALL SCHOOL PERFORMANCE



51.3%

of students reported performing better than their peers, while 39.6% felt they were at par with classmates.
This is validated by average score improvements observed in post-intervention assessments conducted by Aasraa, which indicate a consistent rise in students achieving 60% and above. The use of activity-based learning, student-centred pedagogies, and regular progress tracking contributed to this positive shift.

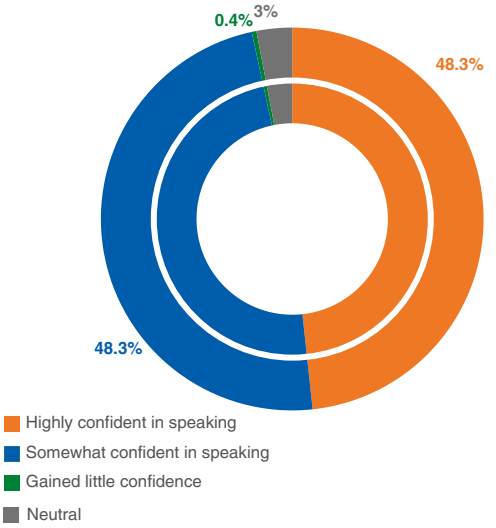
Testimonial – Moti Singh
(Parent of Vivek, Grade 7)

Before joining Aasraa, my son Vivek would sometimes work with me to support our family. His education was never a priority because survival was more important. But when we heard about Aasraa, we decided to give him a chance. The program provides a school bus, which makes it easy for him to attend regularly. The extra classes in Maths, English, and Hindi have helped him catch up with other students. Earlier, he was very shy, but now he has developed confidence and speaks well with others. The program also provided medical care, warm clothing, and immunisation, which was a big help for us. The teachers are supportive, and I feel proud to see my son improving in his studies.

SOCIO-EMOTIONAL WELL-BEING AND CONFIDENCE DEVELOPMENT

Alongside academic improvements, the program has contributed significantly to building student confidence, communication skills, and social engagement.

CHART 14: SPEAKING AND COMMUNICATION SKILLS



48.3%

of students reported feeling highly confident in speaking, and another 48.3% gained some confidence. The introduction of language learning interventions such as Jolly Phonics and Active English books played a significant role in this improvement. Additionally, role-play sessions, peer discussions, and drama-based storytelling activities facilitated greater language retention and fluency.

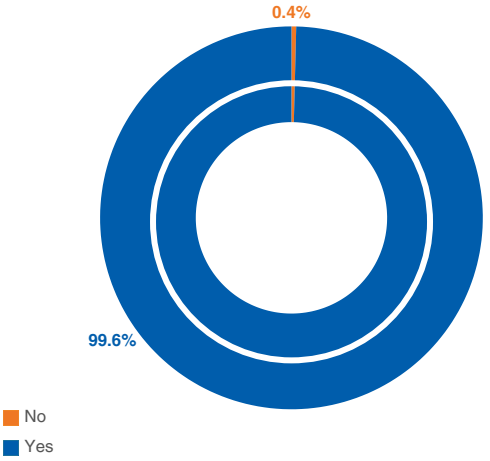
Testimonial – Baby Devi (Parent of Raved, Grade 5)

I got to know about the Aasraa program through a community worker, and I am so grateful for it. Before joining, my son Raved used to spend most of his time roaming around and sometimes helped me with household chores. Our financial situation made it impossible for me to support his education properly. Aasraa changed everything for us. The free transport service made it easier for him to attend regularly, and the after-school tuition in Maths, English, and Hindi helped him catch up with other students. Earlier, he had difficulty understanding lessons, but now he is improving day by day. His confidence has grown, and he can communicate much better. I feel so happy when I see him excited about learning. The warm clothes, medical care, and immunisation provided by the program were also a big relief for us.

Testimonial – Vinod (Program Manager)

As a Program Manager overseeing two centres and 200 students, I have witnessed the transformational impact of the Aasraa initiative. Many students, initially struggling with academics, have significantly improved their subject understanding and confidence through after-school remedial support. Engagement with parents and government schools has strengthened the learning environment, ensuring that students receive consistent academic and emotional support. The WINGS of Doon program has not only provided structured learning but also nurtured aspirations, helping children envision a future beyond their socio-economic constraints.

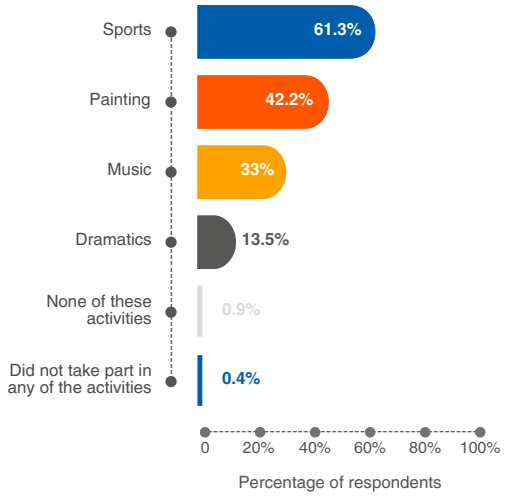
CHART 15: IMPROVED READING, WRITING, AND COMPREHENSION



99.6%

of students reported an improvement in their comprehension skills. The language skills improvement metrics assessed that regular reading circles, exposure to graded storybooks, and structured literacy interventions ensured sustained improvement.

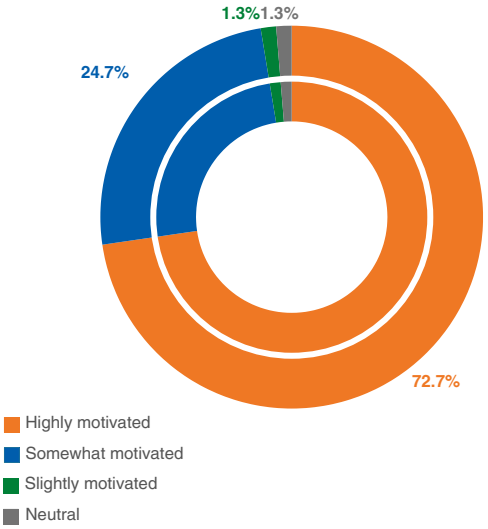
CHART 16: PARTICIPATION IN EXTRA-CURRICULAR ACTIVITIES



61.3%

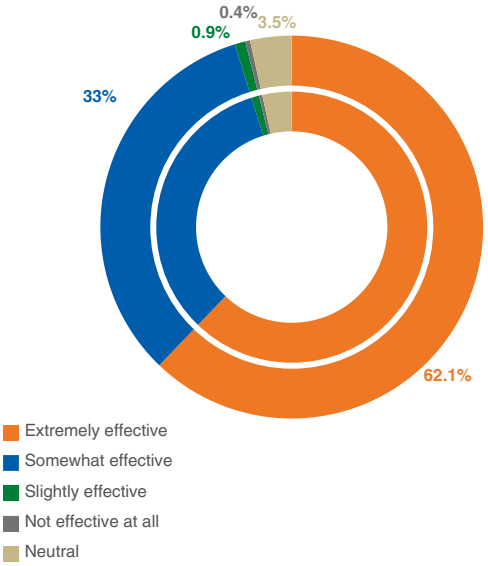
of students participated in sports, 42.2% in painting, and 33% in music, enhancing confidence, social interaction, and leadership skills. The program's emphasis on multi-sensory learning and inclusive education models ensured holistic development.

CHART 17: PARENTAL SUPPORT AND ENCOURAGEMENT



72.7%
of students felt highly motivated due to parental encouragement.

CHART 18: PARENTAL SUPPORT AND ENCOURAGEMENT

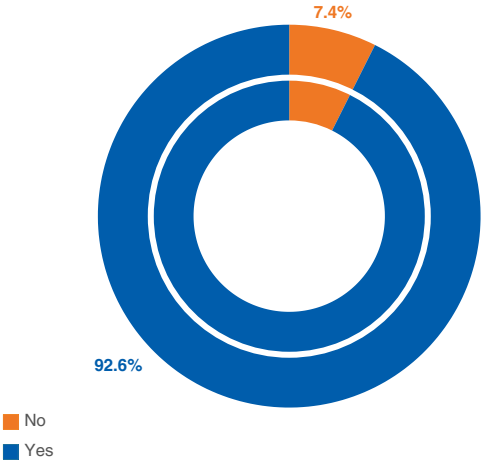


62.1%
reported parental support in adapting to school. Charts 17 and 18 indicate a positive shift in household attitudes toward education. The parent-teacher meeting feedback reveals that community engagement meetings, parental counselling sessions, and workshops on at-home learning support strengthened family involvement.

INTEGRATION OF DIGITAL LEARNING AND TECHNOLOGICAL EXPOSURE

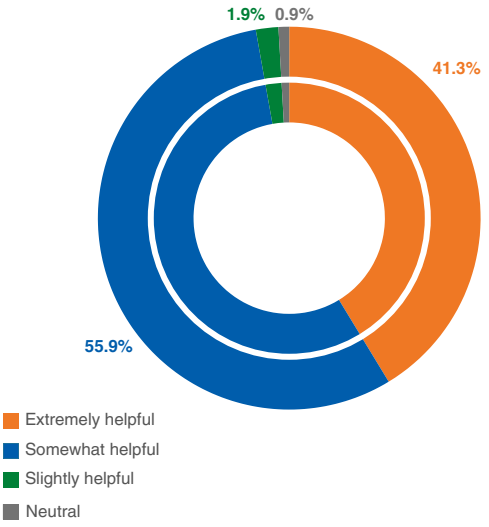
Digital interventions such as Computer-Aided Learning (CAL) and web-based e-learning have played a pivotal role in helping students strengthen subject comprehension and gain exposure to career-oriented skills.

CHART 19: PARTICIPATION IN DIGITAL LEARNING



92.6%
of students attended CAL classes.

CHART 20: EFFECTIVENESS OF DIGITAL LEARNING



41.3%
found the CAL classes extremely helpful in strengthening basic subject concepts, whereas 55.9% of students found it only somewhat helpful.

FOCUS GROUP DISCUSSION (FGD) WITH TEACHERS

Demographic Overview: The focus group discussion included five experienced teachers: Vaishali, Shabnam, Anita, J.S. Bisht, and Pushpa Chauhan, all of whom have been associated with the Wings of Doon program for at least four years.

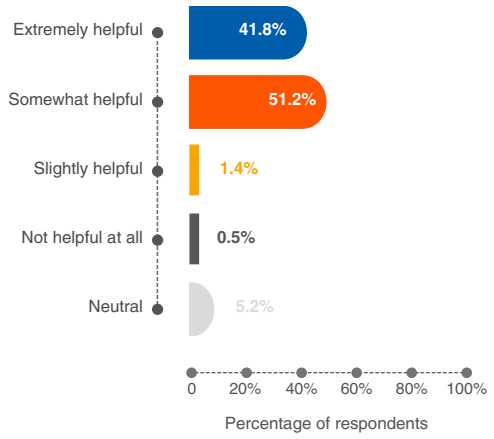
Educational Progress and Teaching Strategies
Teachers observed that most students came from mobile learning setups or under-resourced schools, struggling with basic literacy and numeracy. Over time, remedial interventions, phonetic techniques, and interactive TLM helped students improve academically, with reported score increases of 10-25%.

Effectiveness of Digital Learning Tools
Teachers highlighted the integration of digital learning platforms, including Computer-Aided Learning (CAL), Tinkering Lab activities, and Project Range[1] [2] et, as key contributors to student engagement and concept clarity. Training sessions helped them effectively implement interactive teaching tools, making lessons more dynamic and accessible for students. Strengthening parental awareness of digital literacy and remote learning tools was highlighted as an area for improvement.

Program Impact and Recommendations
Teachers noted that students have successfully integrated into mainstream schools, overcoming initial hesitation and learning gaps. They suggested expanding digital training for teachers to maximise the effectiveness of e-learning tools and blended learning approaches while also enhancing long-term student tracking to measure sustained progress.

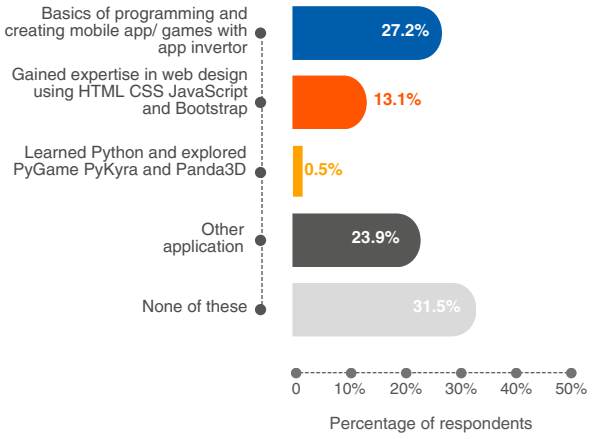
FGD WITH COMMUNITY MEMBERS

CHART 21: EFFECTIVENESS OF WEB-BASED E-LEARNING



41.8%
found digital learning extremely helpful, and 51.2% found it somewhat helpful. This highlights how technology integration has enhanced classroom learning and retention. Blended learning strategies, self-paced learning modules, and gamified assessments encouraged student engagement.

CHART 22: CODING AND DIGITAL LITERACY



27.2%
of the students participated in programming courses, while 13.1% explored website development under the Code-A-Thon initiative. This indicates an increased interest in digital skills, further aligning with emerging career pathways.

Field Note Observation:

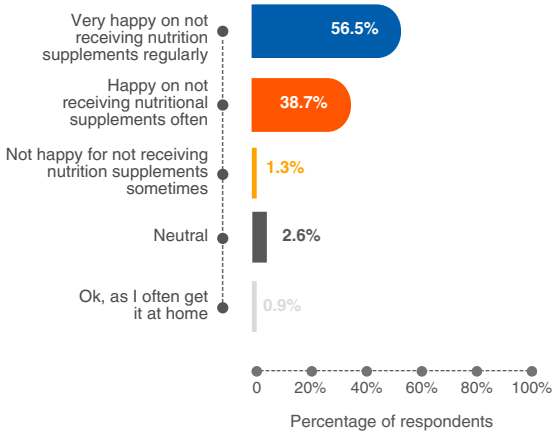
Growing interest in STEM and coding skills among students has been observed. Student digital literacy report highlights that hands-on coding boot camps, computational thinking workshops and career guidance sessions strengthened students' digital competency. Increased participation in digital learning modules fostered higher engagement.

(Source: STEM Learning Outcomes and Student Digital Literacy Report in Project Closure Report Nov 2019-March 2023)

HEALTH, NUTRITION, AND WELL-BEING

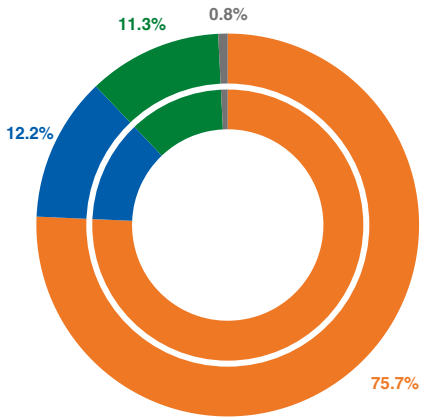
Holistic student development includes adequate nutrition, medical care, and emotional well-being. The findings show that nutritional support and medical interventions have significantly contributed to student health.

CHART 23: NUTRITIONAL SUPPORT



56.5%
of students were very happy receiving nutrition supplements, as they lacked regular access to these. Mid-day meal supplementation and school-based nutrition awareness sessions contributed to improved dietary habits.

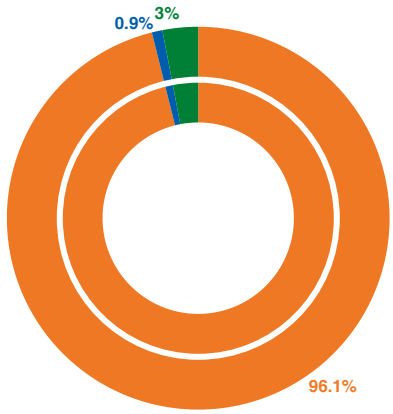
CHART 24: EFFECTIVENESS OF MEDICAL SUPPORT



- Very helpful, as got treatment whenever needed
- Somewhat helpful as got treatment most often when needed
- Not at all helpful as never got treatment
- Neutral as rarely got ill

75.7%
found medical aid helpful and readily available, followed by 12.2% reporting that they received treatment when they needed it.

CHART 25: EFFECTIVENESS OF IMMUNISATION



- Yes
- No
- Did not get any immunisation

96.1%
felt protected after receiving immunisation under the program, as per Chart 24. Regular health check-ups, partnerships with local health authorities, and vaccination drives ensured holistic health coverage.

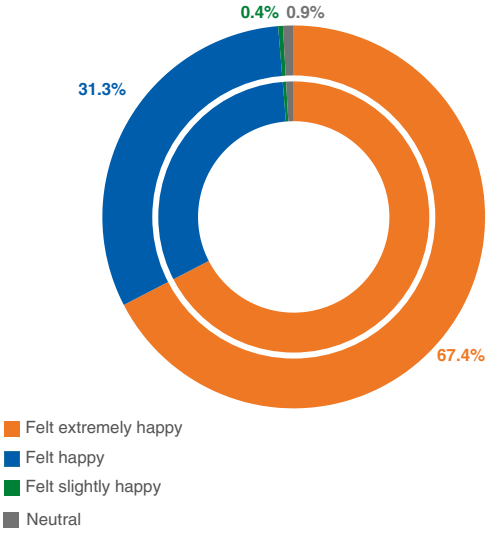
Testimonial – Srishti (Program Manager)

Managing three centres with over 400 students, I have seen how critical health and nutrition support is for a child's learning and development. Many students come from families that struggle to provide regular meals, affecting their ability to focus in class. Through the provision of milk, bananas, warm clothing, and regular medical check-ups, we have observed a noticeable improvement in student attendance, energy levels, and overall well-being. Parents have expressed their relief knowing that their children are not only receiving education but also the nourishment and healthcare they need to thrive. The holistic approach of Aasraa ensures that children are physically and mentally prepared to succeed.

Field Note Observation:

Analysis from the Wings of Doon quarterly reports indicates a direct relationship between student health and academic engagement. The findings suggest that consistent access to nutrition and healthcare interventions positively influenced school attendance rates, with students demonstrating higher retention and reduced absenteeism (Health and Attendance Correlation - Closure Report). The findings also highlight that improved nutritional intake contributed to enhanced cognitive function and concentration levels, leading to greater classroom engagement and better subject performance outcomes (Impact of Nutrition on Learning - Closure Report).

CHART 26: IMPACT OF UNIFORMS AND WARM CLOTHING



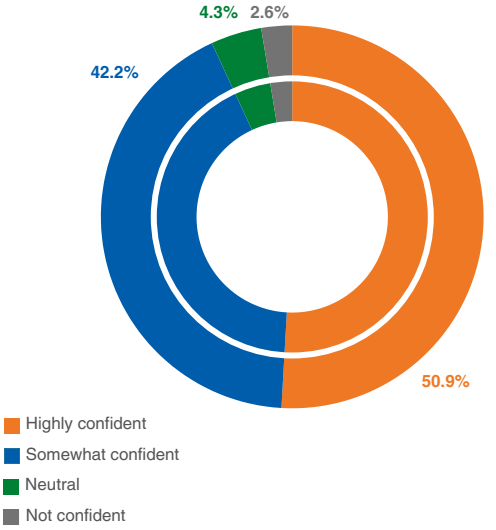
67.4%
of students felt extremely happy wearing new uniforms, reinforcing the importance of basic necessities in creating a sense of belonging. Clothing distribution drives and winter preparedness campaigns ensured students remained protected and engaged in schooling.

STUDENT INTERACTION FROM GOVT. PRIMARY SCHOOL - CHUKKHUWALA-2

FUTURE ASPIRATIONS AND HIGHER EDUCATION READINESS

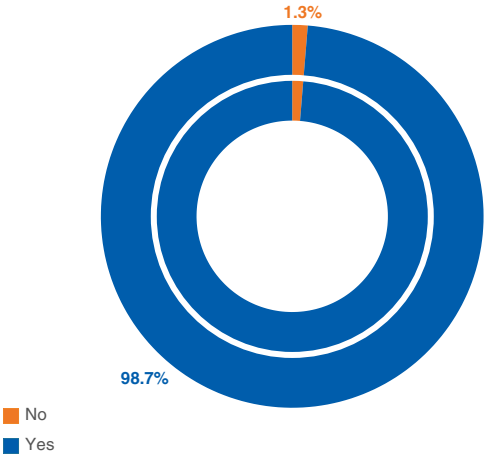
The Wings of Doon initiative has significantly impacted students' aspirations and preparedness for higher education.

CHART 27: HIGHER EDUCATION READINESS



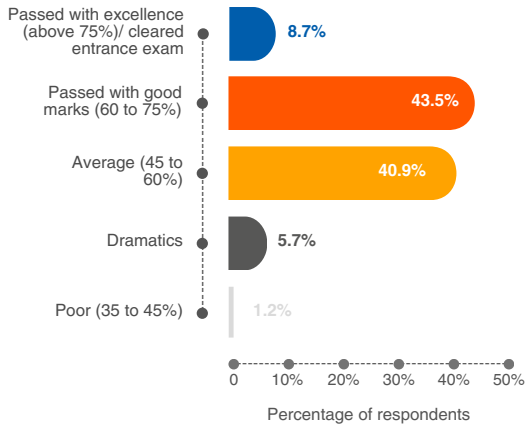
50.9%
of students felt highly confident about pursuing higher education. The career guidance workshops, exposure visits, and scholarship assistance programs have played a major role in shaping student aspirations.

CHART 28: MOTIVATION TO CONTINUE EDUCATION



98.7%
of students reported motivation to continue education.

CHART 29: BOARD EXAM PERFORMANCE



With many securing above 60% in their board exams. Structured mentoring, career mapping sessions, and subject-specific coaching have contributed to student success.

Board examination results from partner schools validate the program's role in academic preparedness and structured mentoring. In 2022-23, 100% of students from Government Girls Inter College and 94% from Sanatan Dharm Inter College passed, with several students securing first honours and first divisions. The highest recorded scores were 86% in Class 10 and Class 12, demonstrating a steady rise in high-achieving students. These outcomes align with structured assessments, individualised learning plans, and subject-specific coaching, reinforcing the program's effectiveness in improving board exam performance.

(Source: Board Exam Results – Closure Report)

STUDENT INTERACTION AT GOVT. PRIMARY SCHOOL - ARAGHAR, WINGS

TABLE 1: HIGHER EDUCATION ENROLMENT

DETAILS OF STUDENTS PURSUING HIGHER EDUCATION			
S.No.	Course	College/Institute	Students
1	B. Sc. (PCM) & B.A.	Doon Business School, Dehradun	3
2	B. Tech. CS & B. Tech. Electronics & Communication	Bipin Tripathi Kumaon Institute of Technology, Dwarahat	2
3	B.A.	Uttarakhand Open University	6
4	B.Com.	Dakpather	1
5	B.Com.	Dolphin Institute, Dehradun	1
6	B.Com. Honours	Tula's Institute, Dehradun	1
7	B.Sc. (CBZ)	DAV (PG) College, Dehradun	1
8	B.Sc. (Microbiology), BCA	Uttarakhand College of Science & Technology, Dehradun	2
9	B.Sc. CS	D.D. College, Dehradun	3
10	B.Sc. IT, B.Sc. Food Technology, B.Sc. (CS)	Dev Bhoomi Uttarakhand University, Dehradun	3
11	B.Tech. Artificial Intelligence & Machine Learning	JB Institute of Technology, Dehradun	1
12	Bachelor in Physical Education	Jaspal Rana Institute of Education and Technology, Dehradun	2
13	Beauty & Wellness	Him Jyoti Vocational Institute, Dehradun	1
14	Certificate course in Hotel Management	The RIMT Hotel Management College, Dehradun	2
15	Coding & programming	HCL TechBee	2
16	Diploma in Medical Laboratory Technology	Alok Ahuja Diagnostic Centre, NIOS	1
17	Diploma in Medical Laboratory Technology	Ahuja Path Lab	1

DETAILS OF STUDENTS PURSUING HIGHER EDUCATION			
18	Diploma in Hotel Management/Front office specialisation	Amazon Institute of Hotel Tourism & Management, Dehradun	2
19	Done coding course from Nav Gurukul Academy, Bengaluru	Government Girls Inter College, Dehradun	1
20	B.Com. (Private)	Self-sponsored, 3rd year ongoing, doing job in packaging dept, Rusan Pharma Co. Selaqui	1
21	Preparing for Agniveer	Self-sponsored, taking coaching from Shristi Institute, Karanpur	1
	Total Students		38

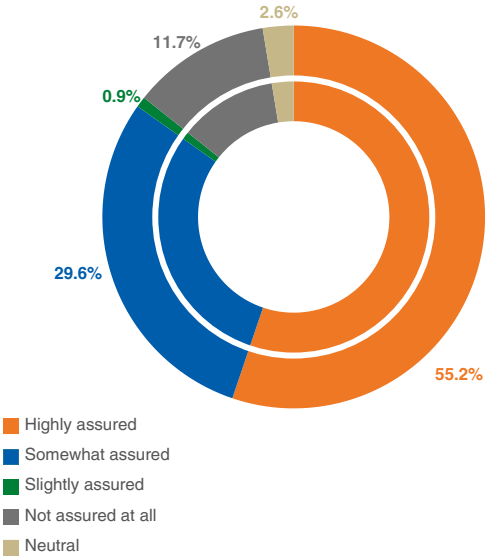
(Source: Project Closure Report Nov 2019-March 2023)

The transition of 38 students into higher education highlights the program's long-term impact on academic aspirations and career readiness. A strong STEM focus is evident, with 11 students pursuing B.Tech. and B.Sc. programs in AI, Computer Science, Microbiology, and IT, alongside vocational enrolments in medical technology, hospitality, and coding. Career counselling and institutional linkages have broadened academic pathways, ensuring students access to both higher education and industry-relevant skills.

COVID-19 EMERGENCY SUPPORT AND RESPONSE

During the COVID-19 pandemic, the program played a critical role in ensuring learning continuity and providing essential support to students and their families.

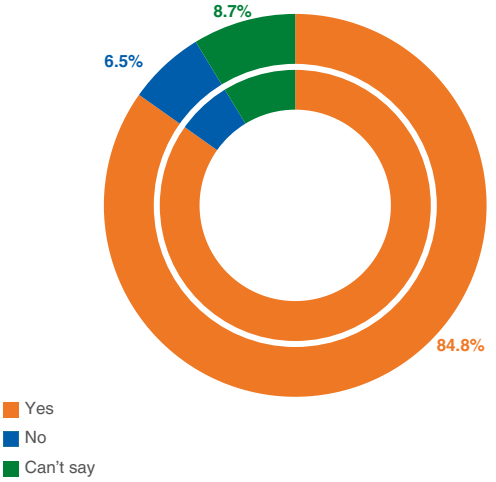
CHART 30: ASSURANCE WITH EMERGENCY COVID-19 SUPPORT



55.2%
of students felt highly assured, and 29.6% felt somewhat assured due to Aasraa's support during the crisis.

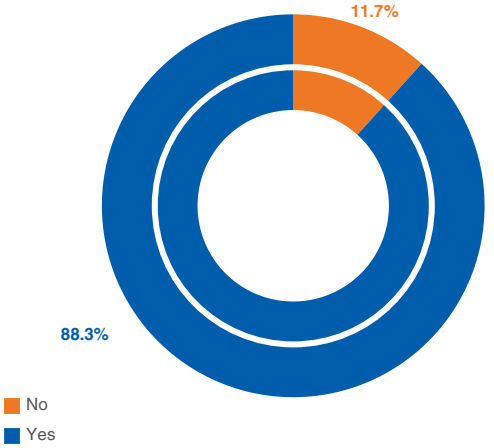
STUDENT INTERACTION AT GOVT. PRIMARY SCHOOL - BANJARAWALA, WINGS

CHART 31: USEFULNESS OF EDUCATION KITS



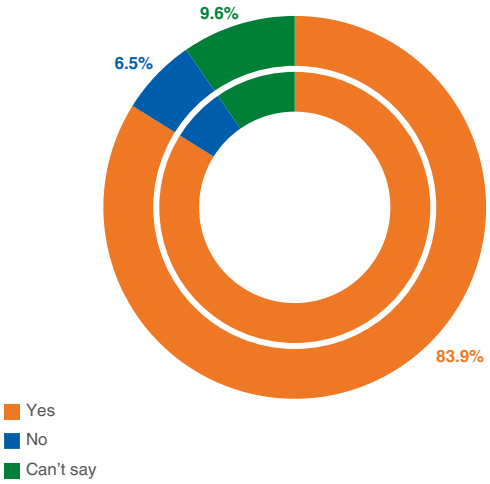
50.9%
of students received education kits. The COVID-19 emergency education kit provided essential learning materials to ensure continuity in education during school closures. The kit included storybooks, stationery, arts and crafts materials, activity worksheets, and subject-specific learning resources to support at-home learning.
(Source: COVID-19 Emergency Response – Closure Report)

CHART 32: DIGITAL ACCESS



88.3%
participated in online learning via WhatsApp groups. The provision of mobile recharges, self-learning materials, and teacher check-ins ensured students remained engaged in their studies.

CHART 33: EMERGENCY RATION SUPPORT



83.9%

of students said they benefitted from emergency ration packs, ensuring food security during the crisis. Collaboration with local communities and NGOs enabled the distribution of essential food supplies. The COVID-19 emergency ration kit was designed to provide essential food security to families during the lockdown. It included rice, wheat flour, pulses, cooking oil, sugar, salt, spices, and dry ration items, ensuring sustained nutrition for households facing economic hardship.

(Source: COVID-19 Emergency Response – Closure Report)

Testimonial – Munna (Parent of Aleena, Grade 5)

My daughter Aleena had a tough time in school before joining Aasraa. She found it difficult to understand subjects, and I couldn't afford private tuition. When I learned about this program, I immediately enrolled her. The free transportation provided by Aasraa ensures her safety, and she never misses a day of school. The Aasraa team also helped us during COVID-19 by providing us with ration support. I am truly grateful for this program because it has given my child an opportunity to succeed in life.

FGD WITH STUDENTS

CASE STUDY 1: PREETI'S JOURNEY FROM STRUGGLES TO SUCCESS

Preeti, a 14-year-old girl from an urban slum, faced severe financial constraints that hindered her access to education. Her parents, daily wage labourers, prioritised survival over schooling, and Preeti often assisted in household chores and her father's small stall. Lacking basic learning materials and confidence, she struggled with foundational subjects.

Through community mobilisation efforts, the Aasraa team convinced her parents to enrol her in the program, providing free transportation, after-school support, and medical care. Preeti received structured remedial education in English, Hindi, and Mathematics, along with digital literacy training. She also participated in the Computer Masti program, which improved her digital literacy. Interactive teaching techniques, nutritional support, and regular health check-ups improved her overall well-being, leading to a significant boost in confidence and academic performance.

Preeti now actively participates in school activities and even competes at district-level sports events. Her parents, who once hesitated to send her to school, now encourage others in the community to prioritise education.

CASE STUDY 2: AMAN'S PATH TO EDUCATION AND CONFIDENCE

Aman, a 13-year-old boy, lived in extreme poverty with his widowed mother, who worked as a housemaid. To support his family, Aman worked odd jobs and was on the verge of dropping out of school permanently. His weak academic foundation, poor nutrition, and lack of confidence made learning difficult.

Aman was identified by the Aasraa team and enrolled in the program after extensive discussions with his mother. With free transportation, after-school tuition, and nutritional support, he began attending school regularly. Synthetic phonics training enhanced his reading skills, while Computer-Aided Learning (CAL) made lessons interactive and engaging. Medical check-ups and vaccinations further improved his health and school attendance.

Aman's confidence grew as he excelled in his studies and participated in the Tinkering Lab, developing problem-solving skills. He now aspires to continue his education, with his mother expressing gratitude for the program's role in securing his future.

IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- **Academic Achievement**: 51% of the students secured first division in board exams, reflecting improved subject mastery through structured remedial support.
- **Digital Competency:** 92.6% of the students participated in Computer-Aided Learning (CAL), enhancing digital literacy and exposure to STEM fields.
- **Career Confidence:** 50.9% of the students expressed strong confidence in pursuing further education, demonstrating an increased awareness of career pathways.

HOUSEHOLD LEVEL

- **Parental Engagement:** 72.7% of the students reported high motivation due to parental encouragement, signifying stronger household support for education.
- **Health and Nutrition:** Regular nutrition support and medical interventions contributed to reduced illness-related absenteeism.
- **Financial Empowerment:** Families of students pursuing vocational courses and STEM careers foresee long-term financial stability through skill-based education.

COMMUNITY LEVEL

- **Community Engagement:** The initiative has strengthened community participation, school engagement, and local capacity-building efforts.
- **Inclusive Learning:** Aasraa's after-school programs created an inclusive environment, ensuring students remain engaged beyond regular school hours.

DISTRICT LEVEL

- **Educational Transformation:** The program has contributed to Dehradun's education landscape by enhancing digital access, remedial education, and after-school learning, setting a replicable model for urban slum interventions.
- **School Collaboration:** Strengthened partnerships with government and private schools have resulted in better academic outcomes and holistic development opportunities for students.

STATE LEVEL

- **Technical Advancement:** Increased student enrolment in B.Tech, B.Sc., and vocational programs aligns with Uttarakhand's state vision for technical education and workforce development.
- **Student Well-being:** The provision of sanitation facilities, medical care, and nutrition programs complements state initiatives on student well-being.

NATIONAL LEVEL

- **Alignment with National Educational Missions:** The initiative supports NEP 2020 objectives by integrating foundational learning, digital literacy, and career guidance.
- **Women and Girl Empowerment:** Higher enrolment of female students in STEM and vocational education aligns with the Beti Bachao Beti Padhao initiative and national gender equity goals.
- **Resilience to Educational Disruptions:** The COVID-19 digital learning support, education kits, and mobile recharges ensured continued learning, reinforcing the importance of digital inclusion in crisis response strategies.

KEY CHALLENGES AND BARRIERS

(Source: Based on analysis of Annual Report 2022-23, Project Closure Report Nov 2019-March 2023, and a study conducted with students)

INSTITUTIONAL CHALLENGES

The initiative faced limited school-level integration due to inconsistent coordination between stakeholders. While after-school remedial programs improved student performance, mainstream teachers' involvement in tracking student progress remained low, impacting the sustainability of learning gains.

PARENTAL AWARENESS AND ENGAGEMENT

Despite increased parental support (72.7%), many parents lack the literacy skills to assist children with their studies at home. As 59.6% of mothers and 32.6% of fathers are illiterate, at-home learning remains a challenge, limiting the full impact of educational interventions.

DIGITAL LEARNING BARRIERS

While 92.6% of the students participated in Computer-Aided Learning (CAL), limited access to personal devices at home hindered self-paced learning. Additionally, students with no prior digital exposure struggled to adapt to web-based learning environments.

LANGUAGE AND FOUNDATIONAL LEARNING GAPS

A significant portion of students entered the program with severe learning gaps, particularly in language skills. As per the study conducted with students, 63.5% faced challenges with spelling and grammar, while 55.2% struggled with reading comprehension[1] [2] , leading to slower academic progress.

GENDER-SPECIFIC BARRIERS

Although more girls are now accessing education, social norms and domestic responsibilities continue to affect their attendance and engagement. Adolescent girls, in particular, face higher drop-out risks due to household duties and early marriage pressures.

HIGHER EDUCATION AND FINANCIAL CONSTRAINTS

While 38 students enrolled in higher education, many from economically weaker backgrounds face financial difficulties in sustaining their education beyond school. Limited scholarships and awareness of financial aid options remain barriers to long-term academic continuity.

COVID-19 LEARNING DISRUPTIONS

Despite emergency interventions, students who lacked stable internet access struggled with remote learning. 11.7% of students were unable to study through WhatsApp learning groups, leading to learning gaps that required additional remedial interventions upon school reopening.

08. SWOT ANALYSIS

STRENGTHS

- The multi-tiered academic approach, integrating classroom learning, after-school support, and digital interventions, strengthens student retention and subject comprehension.
- Collaboration with government and private schools has enhanced mainstream education linkages, ensuring continuity in learning beyond the program.
- Integration of Computer-Aided Learning (CAL) and STEM exposure broadens career pathways and digital literacy.
- The program design incorporates parental engagement models, fostering a supportive learning ecosystem for students from first-generation learner households.

WEAKNESSES

- The digital learning component remains underutilised due to infrastructural challenges and varying levels of student familiarity with technology.
- Parental engagement remains inconsistent, particularly in households where digital access and literacy levels are low.
- Despite exposure to career guidance, higher education transition remains a challenge due to financial constraints and limited access to scholarships.

OPPORTUNITIES

- Strengthening digital learning ecosystems through improved device accessibility can enhance self-paced learning outcomes.
- Expanding thematic areas beyond education, such as life skills training, financial literacy, and climate resilience education, can create a more holistic student development model.
- Developing specialised mentorship programs in collaboration with higher education institutions and alumni networks can support long-term career mapping.

THREATS

- High rates of migration and economic instability pose challenges to student retention, disrupting continuity in learning.
- Limited access to digital infrastructure at home may hinder the long-term adoption of digital learning methods.
- Parental engagement barriers, stemming from low literacy levels and unfamiliarity with structured learning processes, impact at-home academic support.

9. SUSTAINABILITY

The program has created an ecosystem of support through community participation, a remedial learning approach, and partnerships with local stakeholders, ensuring its impact continues beyond the project period.

SCHOOL READINESS

The program's remedial approach has equipped children with foundational literacy and numeracy, ensuring the transition to formal schooling. The academic improvements observed indicate the program's sustainability in mainstreaming children for school readiness.

LONG-TERM ASPIRATIONS

Career mapping sessions, scholarships, and counselling have supported secondary students in pursuing higher education and vocational training. Career guidance sessions, higher education support, and exposure visits have led to 38 students enrolling in undergraduate programs and vocational training, indicating a shift towards sustainable education and economic mobility.

SUSTAINED PEDAGOGICAL PRACTICES

The focus on teacher professional development in delivering digital education has strengthened classroom learning. The workshops equipped teachers with skills to use digital resources, ensuring that classroom learning remains interactive and engaging even after project completion. Regular capacity-building workshops ensured teachers effectively used interactive TLMs and phonetic methods to improve conceptual clarity.

SUSTAINED DIGITAL LEARNING PRACTICES

The Computer-Aided Learning (CAL) initiative and Project Rangeet provided students with practical exposure to technology, enabling independent learning beyond the program duration. Students developed foundational computer skills, digital literacy, and familiarity with online learning, aligning them with the National Education Policy's (NEP, 2020) emphasis on digital learning.

PARENTAL AWARENESS AND SUPPORT

Regular Parent-Teacher Meetings (PTMs) and community engagement encouraged parents to prioritise education. This interaction helped bridge the gap between home and school, leading to improved support for student learning at home.

EDUCATIONAL CONTINUITY AMID MIGRATION CHALLENGES

Given the high rate of seasonal migration, the program's emphasis on continuous enrolment, transportation support, and digital education has provided children from migrant families with a stable learning environment. Overall, the program reduced child drop-outs.

RESILIENCE DURING COVID-19 CRISIS

Through the COVID-19 response initiatives, the program provided ration kits, educational materials, and phone recharges, ensuring continued learning during school closures. Parents reported that regular engagement with the Aasraa team reduced their sense of uncertainty. Continued learning during this crisis situation ensured that children were not left out in their learning journey.

CHAPTER 10
RECOMMENDATIONS

Provide community-based digital learning centres or shared device models to bridge the gap for students without personal access to technology.

Introduce structured mentorship programs and strengthen linkages with vocational training institutes to support students transitioning into higher education and employment.

Develop simplified, literacy-friendly resources and interactive workshops to enhance parental support in children's education.

Expand collaboration with government schemes and corporate CSR initiatives to secure financial aid, scholarships, and employability-linked training.

Develop an alumni network to mentor current students and create long-term engagement models that sustain program impact beyond direct interventions.

Establish mobile learning resources and flexible academic support models to cater to students impacted by seasonal migration.

Introduce an Annual Day Program in the community where students can exhibit their learning progress through presentations on topics of interest, self-made models, storyboards, and digital projects. The event can also feature extra-curricular performances, sports demonstrations, and interactive learning stalls, creating a mela-like atmosphere that actively involves parents, teachers, and community members. This initiative will not only celebrate student achievements but also strengthen community engagement and emotional investment in the program.

Develop initiatives to involve BAL employees, such as inviting them to participate, mentor or attend the annual day event to witness the program's impact first-hand. This can enhance stakeholder buy-in and provide an opportunity for employees to contribute to community development.

CHAPTER 11
CONCLUSION

The Wings of Doon initiative has successfully improved educational access, foundational learning, and career readiness for marginalised students in Dehradun. By integrating remedial education, digital learning, and vocational training, the program has bridged learning gaps and strengthened student engagement in mainstream education.

Despite challenges such as economic instability and migration, the initiative has demonstrated tangible improvements in academic performance, digital literacy, and higher education enrolments. Strengthening parental engagement, expanding financial aid, and enhancing digital access will be crucial for ensuring long-term impact and sustainability.

IMPACT ASSESSMENT REPORT

MACDERMID ALPHA OF EXCELLENCE IN ADVANCED ELECTRONICS MANUFACTURING AND SKILLS DEVELOPMENT

Implementing Organisation - COEP Technological University

Release Date: 31-03-2025

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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ABBREVIATIONS

AI	Artificial Intelligence
AOI	Automatic Optical Inspection
BAL	Bajaj Auto Limited
BARTI	Babasaheb Ambedkar Research and Training Institute
COE	Centre of Excellence
COEP TECH	COEP Technological University
CoE-AEM	Centre of Excellence in Advanced Electronics Manufacturing
CSR	Corporate Social Responsibility
EMS	Electronics Manufacturing Services
FGD	Focus Group Discussion
IoT	Internet of Things
ITI	Industrial Training Institute
JABIL	Jabil Circuit India
MAHJYOTI	Mahatma Jyotiba Phule Research & Training Institute
MSME	Micro, Small & Medium Enterprises
PCB	Printed Circuit Board
R&D	Research and Development
SARTHI	Chhatrapati Shahu Maharaj Research, Training and Human Development Institute
SMT	Surface Mount Technology

EXECUTIVE SUMMARY

PROJECT BACKGROUND

India's growing electronics manufacturing sector faces a critical shortage of skilled professionals. The government of India aspires for the country to become a global leader in the manufacturing space of semiconductors and circuit boards. Basis the same, a lot of impetus and focus has been realigned towards facilitating and promoting the growth of the manufacturing market for semiconductors and circuit boards, especially Surface Mount Technology (SMT) and Printed Circuit Board (PCB) assembly, which form the basis for technology and devices in the modern era. However, a large gap exists between the need and the availability of highly specialised machines and even more critical skilled workers and professionals who are not just adept but highly skilled in the production of exceptionally high-quality PCBs and SMTs that can be sold at competitive prices in the global markets.

To address this gap, the Centre of Excellence in Advanced Electronics Manufacturing and Skills Development (CoE-AEM) was established at COEP Technological University. This highly purposeful and strategic initiative is a collaborative effort between Bajaj Auto Ltd., Jabil Circuit India, MacDermid Alpha Electronics Solutions, and other industry partners, aiming to create a robust ecosystem for skill development and industry-academia collaboration with a mission of facilitating India meet its objective of becoming a pioneer and global leader in this space.

ADVANCED ELECTRONIC MANUFACTURING UNIT

The BAL CSR-funded project also aligns with national policies linked to initiatives such as Make in India, Atmanirbhar Bharat, and the Production Linked Incentive (PLI) Scheme, which focuses on the strengthening of domestic manufacturing, boosting exports, and thereby reducing reliance on imported parts that are cost-intensive. By providing state-of-the-art training in SMT processes, the CoE-AEM equips students, professionals, and MSMEs with the cutting-edge skills that are essential for India's emerging and fast-growing electronics sector. It is imperative to remember that these SMTs and PCBs are not just the future of electronic devices such as mobile phones, medical devices, or robotic devices but are the main components of green/e devices, the automobile industry, and almost every device in today's modern and technologically advanced world and ways of life. While there is enough impetus, support and provisioning done for the acceleration of manufacturing of such components, it is very critical to concomitantly build and nurture the skills of the workforce that would manufacture, innovate, and work with such niche and ever-evolving and nascent markets; requiring continuous upskilling and learning thus, helping keep pace with the newer technologies and market requirements.

India has two such COEs that help foster and nurture the skills required for the manufacturing of such components. The Pune-based CoE-AEM is one of the two such centres and stands as a model for industry-academia collaboration, bridging the skill gap in electronics manufacturing and fostering self-reliance. With strong industry support and advanced training infrastructure, it plays a pivotal role in developing a skilled workforce, supporting startups, and enhancing India's global competitiveness in electronics manufacturing.

COE FACULTY DEMONSTRATING MACHINE OPERATION

PROJECT DETAILS

Project Name
MacDermid Alpha of Excellence in Advanced Electronics Manufacturing and Skills Development

Implementation year
FY 2021-2023

Assessment year
FY 2024-25

Implementing Partner
COEP Technological University

Beneficiaries
Youth from middle and low socio-economic backgrounds

Number of beneficiaries
33

Project Budget
₹100 Lakhs

Location
Pune, Maharashtra

Alignment with SDGs

Alignment with National Programs:

- Make in India
- Skill India
- Digital India
- Atmanirbhar Bharat
- National Policy on Electronics (NPE)
- Startup India
- Production Linked Incentive (PLI) Scheme

PROJECT ACTIVITIES

ESTABLISHMENT OF AN ADVANCED ELECTRONICS MANUFACTURING FACILITY

Setting up a state-of-the-art lab with industry-grade equipment for advanced electronics manufacturing.

Incorporation of the latest technologies and processes to improve precision and efficiency.

SKILL DEVELOPMENT AND TRAINING PROGRAMS

Conducting training programs for students, faculty, and industry professionals on advanced electronics manufacturing.

Developing hands-on workshops to enhance practical knowledge.

Specialised training in soldering, PCB manufacturing, and assembly processes.

RESEARCH AND DEVELOPMENT (R&D) IN ADVANCED ELECTRONICS

Encouraging collaborative research between academia and industry.

Working on new materials, processes, and automation in electronic manufacturing.

Developing innovative solutions to enhance efficiency and sustainability in electronics manufacturing.

INDUSTRY COLLABORATION AND KNOWLEDGE EXCHANGE

Organising seminars, conferences, and expert talks to facilitate knowledge sharing.

Promoting internships and industry interactions to bridge the academia-industry gap.

Supporting startups and entrepreneurs in electronics manufacturing.

SUPPORT FOR GOVERNMENT AND INDUSTRY STANDARDS COMPLIANCE

Ensuring compliance with national and international electronics manufacturing standards.

Providing consultancy for organisations to adopt best practices.

ENHANCEMENT OF EMPLOYMENT OPPORTUNITIES

Preparing a skilled workforce for the electronics and semiconductor industry.

Providing career guidance and industry connections for students and professionals.

Key Findings

Sample Size - 22

45.5%
of the trainee-reporters interacted with were less than 20 years old.

59.1%
of the respondents interacted with were females.

45.5%
of the respondents were diploma holders, 22.8% were Ph.D holders, 9.1% had completed their XIIth, and the remaining 22.7% were either B.E., B. Tech., or M. Tech qualified.

100%
of the respondents who enrolled for the course had completed their course.

81.8%
of the respondents rated the training infrastructure as excellent.

90.9%
of the respondents rated the SMT equipment as excellent, indicating industry-standard facilities.

81.8%
of the respondents reported being highly satisfied with the program.

86.4%
of the respondents rated faculty support as excellent, ensuring high-quality learning.

81.8%
of the respondents said they received full sponsorship, alleviating financial barriers for economically weaker sections to seek such niche and in-demand skilling courses.

4.5%
of the respondents interacted with said they had secured jobs post-training, while 54.5% were still seeking jobs, highlighting the need for stronger placement support and market connections.

36.4%
of the respondents said they were highly confident post the training and were keen to become master trainers.

Key Impacts

Sample Size - 22

31.8%

of the respondents said they were already employed at the time of undergoing training and hence did not need placements, and 54.5% were actively seeking jobs.

77.3%

of the respondents rated hands-on training as excellent, emphasising the effectiveness of practical learning and content and pedagogy designed for the program.

95.5%

of the respondents acknowledged being among the early learners in SMT production, positioning them as pioneers in the market and potential for the industry.

The SMT production facility supports MSMEs and startups but needs to build an ecosystem and garner momentum from the larger players who would be the bulk recruiters for such skills.

Inspired by IIT Madras' MSME model, the centre is expected to benefit over 200 MSMEs and many larger players in the coming years, thus catering to the global markets.

Training on cutting-edge SMT equipment (Pick & Place Machines, Reflow Ovens, AOI Systems) aligns with industry demands, making those skilled and trained from this COE more aligned and viable for seeking a job as well as earning a livelihood while looking at growth and future perspectives simultaneously.

The curriculum and pedagogy of project and program delivery include emerging technologies such as 5G, IoT, and Embedded Systems, ensuring relevance to future industry trends. This makes the beneficiary students of this project more sought after by the markets for creating positive yet disruptive changes for growth and social betterment.

CHAPTER 1
INTRODUCTION

SoulAce Team interaction with CoE staff members

The Centre of Excellence in Advanced Electronics Manufacturing (CoE-AEM) was established to address India's growing need for skilled professionals in Surface Mount Technology (SMT) and PCB assembly. With India emerging as an electronics manufacturing hub, this initiative bridges the skill gap by offering industry-aligned training to students, engineers, and professionals. Hosted at COEP Technological University, CoE-AEM is a collaborative effort between academia and industry, supported by Bajaj Auto Ltd., Jabil Circuit India, MacDermid Alpha Electronics Solutions, and Sierra Electronics.

The program provides hands-on training using cutting-edge SMT equipment like Pick & Place Machines, Reflow Ovens, and AOI Systems. Industry collaborations offer trainees internships, exposure, and direct recruitment opportunities. Financial accessibility is ensured through funding from Bajaj Auto Ltd. and support from SARTHI, BARTI, and MAHAJYOTI, enabling underprivileged trainees to access quality education.

Designed for long-term sustainability, CoE-AEM enhances employability, supports MSMEs and startups, and strengthens India's self-reliance in electronics manufacturing. It serves as a model for industry-academic collaboration, reinforcing India's ambition as a global electronics hub.

OBJECTIVES OF THE PROGRAM

ESTABLISH A CENTRE OF EXCELLENCE (COE)

in collaboration with MacDermid Alpha to focus on advanced electronics manufacturing.

FACILITATE SKILLS DEVELOPMENT

in the field of electronics manufacturing through training programs and knowledge sharing.

PROVIDE STATE-OF-THE-ART INFRASTRUCTURE

and technological support to promote research and development in advanced electronics manufacturing.

STRENGTHEN THE INDUSTRY-ACADEMIA COLLABORATION

to improve workforce employability and enhance technical capabilities in the domain.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT THE IMPLEMENTING PARTNER: COEP TECHNOLOGICAL UNIVERSITY

COEP Technological University, formerly the College of Engineering Pune (COEP), is one of India's oldest and most prestigious engineering institutions, established in 1854. A unitary public university under the Government of Maharashtra, it excels in technical education, research, and industry collaborations.

COEP Tech offers undergraduate, postgraduate, and doctoral programs across engineering disciplines, emphasising industry-aligned education, hands-on training, and research-driven learning. It plays a crucial role in India's industrial growth through cutting-edge research and centres of excellence in Advanced Electronics Manufacturing, Robotics, Artificial Intelligence, and Smart Manufacturing. The Centre of Excellence in Advanced Electronics Manufacturing (CoE-AEM) at COEP bridges academia and industry, fostering skill development and innovation. Collaborations with Bajaj Auto Ltd., Jabil Circuit India, and MacDermid Alpha Electronics Solutions provide students with real-world exposure, internships, and industry placements. With a strong focus on innovation, academic rigour, and global outreach, COEP Tech continues to shape India's engineering and technological landscape, driving advancements in education, research, and industrial progress.

CHAPTER 2
RESEARCH METHODOLOGY

Bajaj Auto Limited commissioned SoulAce to conduct an impact assessment study for the MacDermid Alpha of Excellence in Advanced Electronics Manufacturing and Skills Development project, a CSR initiative under the Skill Development & Livelihood Enhancement theme. Implemented in collaboration with COEP Technological University, the program focuses on building technical skills in Surface Mount Technology (SMT), PCB assembly, and electronics manufacturing. It provides industry-aligned training, particularly for underprivileged individuals, enhancing employability and supporting India's Make in India mission.

The study evaluates the immediate and long-term impact of the program on trainees, industry collaborations, and India's electronics manufacturing ecosystem. Using a mixed-methods approach, integrating qualitative and quantitative research, the assessment examines the program's effectiveness, efficiency, and contribution to workforce development. The findings highlight its role in strengthening India's self-reliant electronics sector and bridging the skill gap in advanced manufacturing.

OBJECTIVES OF THE IMPACT ASSESSMENT STUDY CONDUCTED

The primary objectives of the study were:

To evaluate the impact of the CoE-AEM program on trainee beneficiaries in terms of skill development, employment outcomes, and industry readiness.

To assess the overall effectiveness of training methodologies, pedagogy, program design, and their implementation in providing hands-on experience in Surface Mount Technology (SMT), PCB assembly, and electronics manufacturing.

To analyse the efficiency of financial support mechanisms and the role of funding partners in ensuring accessibility, especially for the economically weaker sections.

To understand industry alignment and employer perspectives, identify hiring patterns among industry partners and, thus, areas of improvement for further skill development.

To assess the sustainability and scalability of the program by examining partnerships, infrastructure utilisation, and long-term viability.

To identify key challenges and areas for improvement to enhance the future and further effectiveness of the program.

RESEARCH METHODOLOGY ADOPTED: MIXED METHODS APPROACH TO CONDUCTING IMPACT ASSESSMENT.

QUALITATIVE TECHNIQUES AND METHODS APPLIED

Qualitative methods were used to gain deeper insights into the experiences, challenges, and outcomes of the program for beneficiaries. This approach included:

In-depth Interviews (IDIs)

Conducted with faculty, program managers, industry partners, and key stakeholders to assess program execution and industry alignment.

Focus Group Discussions (FGDs)

Held with trainees and faculty members to understand the perceived impact of the training on skill development and career prospects.

Case Studies

Document the transformation of selected trainees who successfully secured employment or progressed in their careers due to the program.

FGD WITH THE COE'S STAFF MEMBERS

QUANTITATIVE TECHNIQUES AND METHODS APPLIED

Quantitative primary data was collected and analysed to measure the tangible impact of the program.
This included:

Surveys and Structured Questionnaires

Designed for trainees and faculty to assess infrastructure quality, training effectiveness, and employment outcomes.

Statistical Analysis

Conducted to evaluate course completion rates, placement rates, salary increments, and financial accessibility.

Pre- and Post-Training Assessments

Evaluating skill improvement in Surface Mount Technology (SMT) line production, PCB assembly, and industry-specific competencies.

INTERACTION WITH THE PROGRAM COORDINATOR

ENSURING TRIANGULATION

To ensure the accuracy and credibility of findings, triangulation was implemented by cross-validating data from multiple sources:

COMPARISON OF QUALITATIVE AND QUANTITATIVE FINDINGS

Analysing interviews and surveys to identify common patterns.

DATA VERIFICATION FROM DIFFERENT STAKEHOLDERS

Cross-checking information from trainees, faculty, and industry partners to ensure consistency.

REVIEW OF PROGRAM DOCUMENTS AND REPORTS

Evaluating training logs, placement records, and financial assistance reports to support primary data.

DESIGN SNAPSHOT

Name of the project

MacDermid Alpha of Excellence in Advanced Electronics Manufacturing and Skills Development

Implementing partner

COEP Technological University

Research design used

Descriptive research design

Sampling technique

Random sampling and purposive sampling

Sample Size

22

Project Coverage

22 trainee respondents

2 Faculties

01 Project Coordinator

1 Industry Expert

Qualitative methods used

Semi-structured interviews, testimonials, and focus group discussion (FGD) with beneficiaries, along with key stakeholders

KEY STAKEHOLDERS

- Trainees
- Faculty Members
- Industry Partners
- Program support partners

STUDY TOOLS

Questionnaires for primary beneficiaries

Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys. Stakeholders were identified across the focus areas. Semi-structured questionnaires and focus group discussions were conducted with the project staff.

INTERACTION WITH THE PROGRAM TEAM

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. Adhering rigorously to ethical principles of research, the study prioritised the rights and well-being of participants throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Crucially, participation was fully voluntary, free from coercion or pressure, underscoring the importance of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

COEP TRAINING HALL

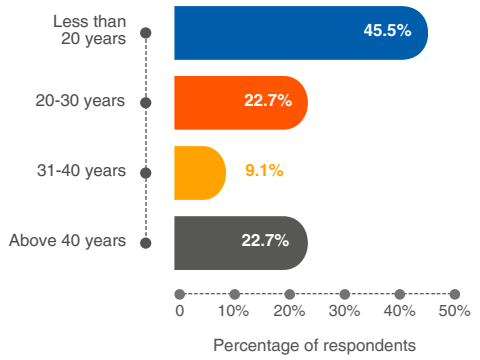
CHAPTER 3
KEY FINDINGS AND IMPACTS

The CoE-AEM initiative demonstrated significant effectiveness in preparing and nurturing workforce development for the manufacturing of electronics and aligned parts. This assessment provides a comprehensive analysis of the program's impact on trainees, infrastructure, financial accessibility, and employment prospects. The findings highlight successes and challenges in implementing SMT training, supported by quantitative data from assessments, surveys, and stakeholder interactions.

The analysis of the data collected from the primary survey showcased the program's inclusivity, with diverse participant demographics in terms of age, gender, and economic background.

DEMOGRAPHY

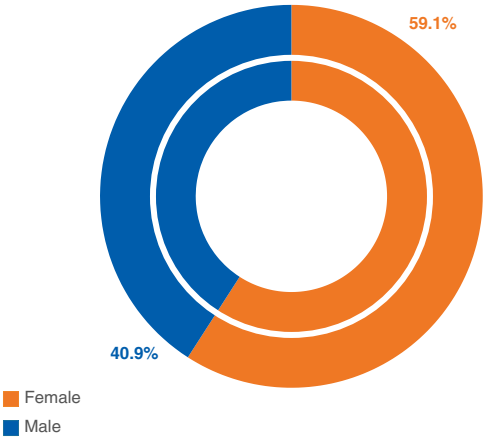
CHART 1: AGE DISTRIBUTION OF RESPONDENTS



45.5%
of student trainees (respondents) were under 20 years old, indicating strong engagement from young learners, while 22.7% are in the 20-30 years age group, reflecting early-career professionals seeking industry-ready skills.

Additionally, 22.7% of the respondents were above 40 years of age, suggesting strong participation from mid-career professionals looking to upskill. The diverse age range highlights the program's inclusivity, supporting both fresh graduates and experienced professionals in advancing their expertise in SMT manufacturing.

CHART 2: GENDER



Traditionally, technical fields such as SMT have been male-dominated, but this initiative is successfully breaking barriers and empowering more women to build careers in advanced electronics manufacturing. However, it was seen that 59.1% of the trainee respondents interacted with were females, and 40.9% were males.

This indicates that the CoE-AEM program has been successful in promoting gender diversity among professionals in the electronics manufacturing industry and arena, which was one of the main objectives of the program and its vision.

During focus group discussions, participants shared that they came to know about the program through word-of-mouth, faculty recommendations, online professional networks, and the Sarathi web portal of the Government of Maharashtra. This indicates the effectiveness of multiple outreach channels that were leveraged to attract and enrol diverse participants.

CHART 3: EDUCATIONAL QUALIFICATIONS

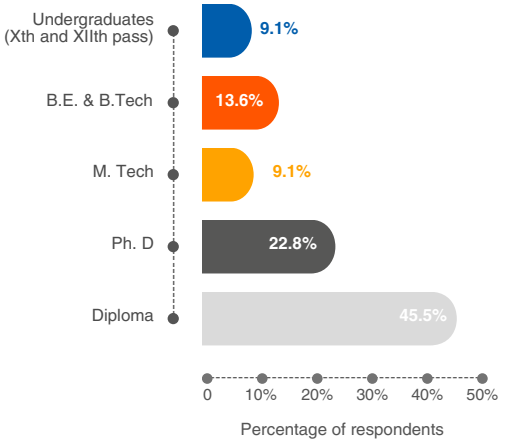


Chart 3 highlights the diverse educational backgrounds of the trainees, wherein 45.5% of the trainees were diploma holders, 22.8 % were PhDs, 9.1% were Master's degree (M.Tech) degree holders, and 13.6% were bachelor's degree holders (B.E. and B.Tech). Only 9.1 % of the trainees were undergraduates (Xth and XIIth pass).

This variation in academic qualifications demonstrates the program's ability to cater to individuals across different levels of expertise, from early-career professionals to highly educated researchers.

The significant number of diploma holders indicates that the program is well-suited for hands-on learners looking at entry into the industry, while the enrollment of Ph.D. candidates indicates the value of advanced SMT knowledge in research and academia.

CHART 4: ANNUAL FAMILY INCOME

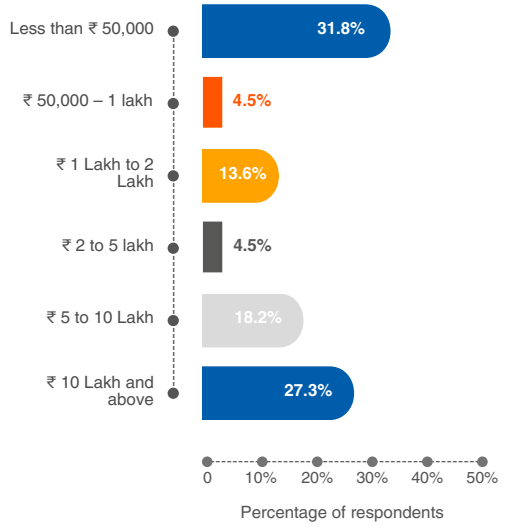


Chart 4 provides insight into the economic backgrounds of the respondents.

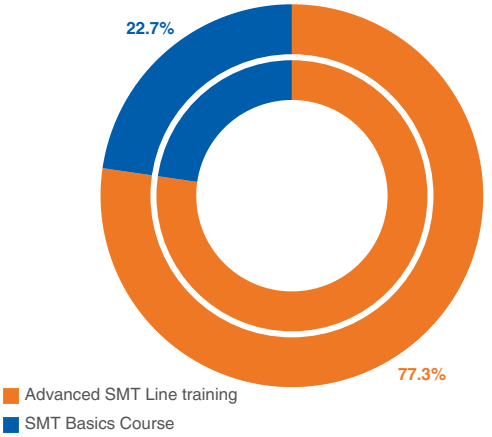
31.8%

came from families earning less than ₹50,000 annually, thus indicating a strong outreach and ability of the program to enrol the student-beneficiaries from the economically weaker sections.

Additionally, 27.3% of participants were from the annual income group of ₹10 lakhs and above, demonstrating the program's potential to also attract skilled professionals seeking career advancements in this space.

This mix highlights the program's ability and innate inclusive nature, ensuring accessibility for learners across different socio-economic backgrounds as envisaged.

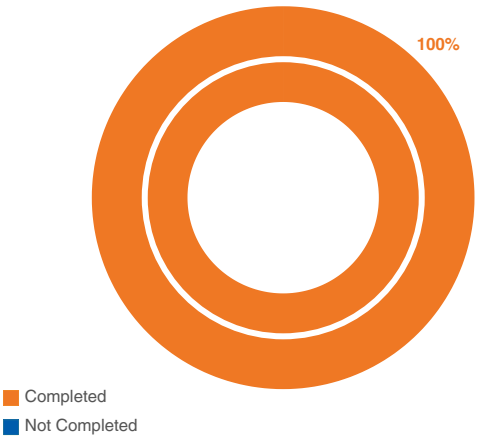
CHART 5: COURSE (ENROLMENT) PREFERENCE



It was seen that 77.3% of respondents had enrolled in the Advanced SMT Line Training course, making it the most sought-after course. 22.7% of respondents' participation in the SMT Basics Course suggests that while some trainees prefer foundational knowledge, the majority were inclined towards advanced technical proficiency. This preference for higher-level training indicates the increasing industry demand for skilled professionals in SMT line operations, PCB manufacturing, and quality control, demonstrating the relevance of the program's curriculum in meeting market needs.

During focus group discussions, participants highlighted that the course covered Electronic Manufacturing Standards, PCB Handling, Solder Paste Printing, Pick and Place Machine (PPM) Operations, Reflow Soldering, and Automatic Optical Inspection (AOI) techniques. They found the training well-structured, with hands-on exposure to industry-relevant SMT equipment.

CHART 6: COURSE COMPLETION RATES

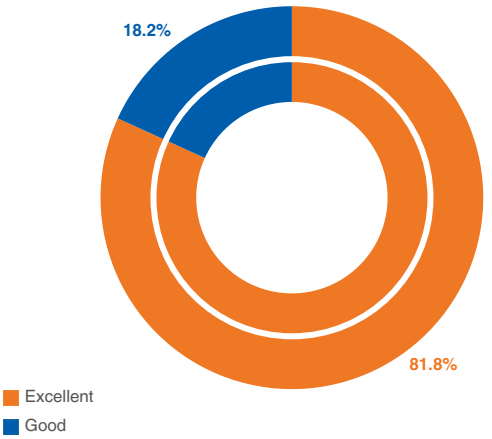


100%

of the respondents said that they had completed the course, highlighting the program's effectiveness in engaging participants throughout the training. This remarkable achievement underscores the commitment of both the trainees and the faculty, ensuring that every participant successfully gains the necessary skills in SMT production before course completion. The high completion rate further establishes the credibility of the training module and its alignment with industry expectations.

> "The establishment of the MacDermid Alpha Center of Excellence in Advanced Electronics Manufacturing and Skills Development has been a transformative initiative. This program has successfully laid the groundwork for bridging the gap between academic learning and industry requirements. By providing hands-on training in Surface Mount Technology (SMT), we are equipping students and professionals with essential skills for the electronics manufacturing sector. Over the next decade, this centre has the potential to train and place thousands of skilled professionals, thereby creating significant employment opportunities and supporting startups in prototyping and manufacturing"
>
> **Dr. Deeplaxmi Niture, Project Coordinator**

CHART 7: QUALITY OF INFRASTRUCTURE FACILITIES



81.8%

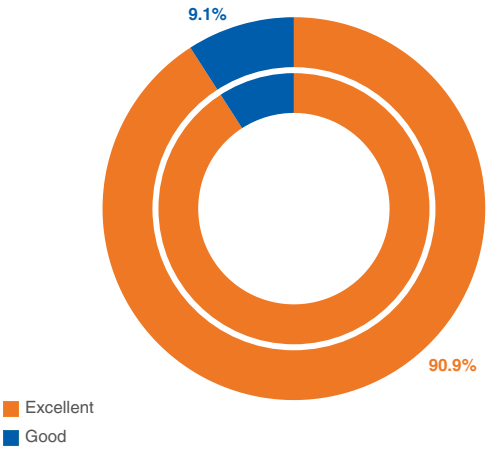
of respondents rated the infrastructure at CoE-AEM as excellent, while the remaining 18.2% considered it good.

This positive feedback indicates that the centre provides a conducive learning environment equipped with high-end facilities.

The outstanding infrastructure ensured that trainees receive real-world exposure to SMT line production, reinforcing their practical competencies in the electronics manufacturing sector.

During focus group discussions, participants appreciated the faculty support, mentioning that instructors had strong backgrounds in PCB manufacturing, SMT process development, and electronics assembly, ensuring a well-guided learning experience.

CHART 8: RATING OF STATE-OF-THE-ART EQUIPMENT



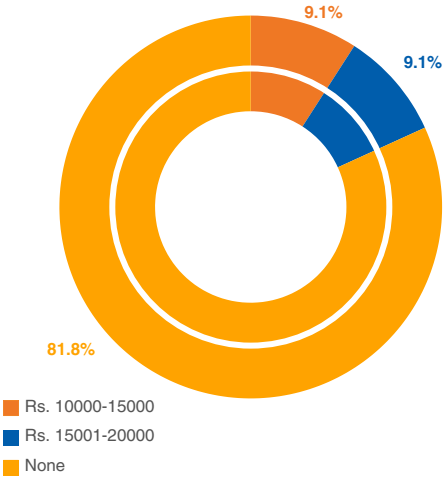
90.9%

of the respondents rated the advanced equipment at CoE-AEM as excellent, with 9.1% rating it good.

The strong endorsement of the equipment quality reflects the training centre's commitment to industry standards. Having access to cutting-edge SMT machinery and tools enhances trainees' hands-on experience, making them job-ready for careers in electronics assembly and PCB manufacturing.

During focus group discussions, some participants felt that more time should be allocated for hands-on practice, as limited hours made it challenging for everyone to gain in-depth practical exposure.

CHART 9: COURSE FEE PAYMENT



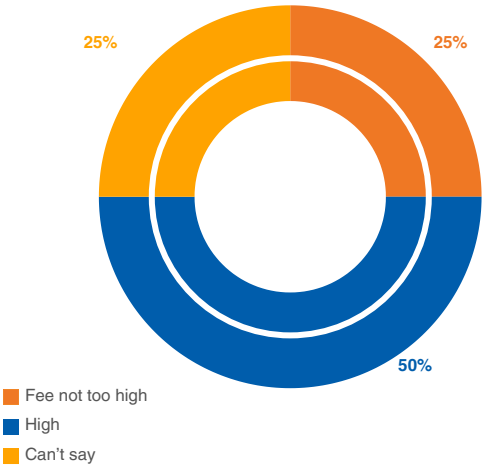
81.8%

of the trainees said that they did not pay any course fees, as they had received financial support and benefits from the partners supporting the initiative. Among those who did pay their fees, 9.1% paid between ₹10,000 and ₹15,000, while another 9.1% paid between ₹15,001 and ₹20,000.

Thus, the differential cost structure ensured that the financial ability did not restrict the accessibility or become an impediment to undergoing the training, thus ensuring that the economic constraints do not become a barrier for deserving candidates.

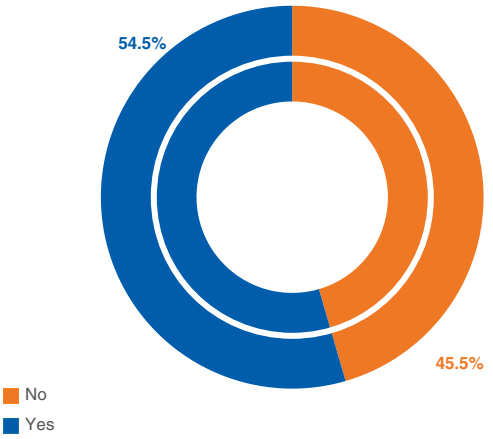
During focus group discussions, some participants found the ₹15,000 + 18% GST fee affordable, while others suggested scholarship opportunities to support economically weaker students.

CHART 10: PERCEPTION OF COURSE FEE AFFORDABILITY



While assessing the perception of the respondents who paid fees, it was seen that 50% felt that the course fees were high, while 25% considered it affordable, and the remaining 25% were uncertain about how they perceived the fees. These insights suggest that while the program remains largely accessible due to scholarships, there is a need to explore additional funding mechanisms, such as government-backed financial aid or industry sponsorships, to make it even more inclusive for self-funded participants.

CHART 11: RESEARCH CONDUCTED TO FIND AVAILABILITY OF SIMILAR COURSES

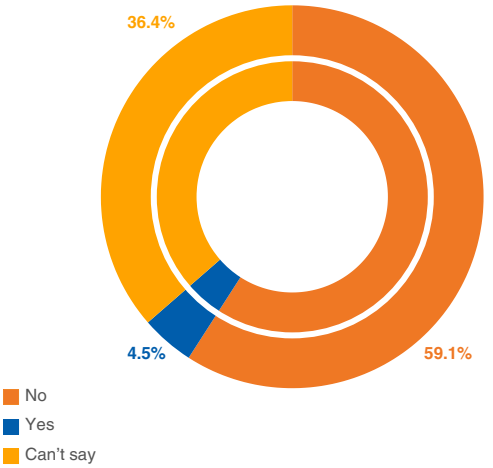


54.5%

of the respondents said they had actively researched similar training courses before enrolling at the CoE-AEM, and 45.5% said they did not conduct any research and joined directly. This suggests that a significant portion of participants recognise the specialised and unique nature of this training, reinforcing its value in the job market. The program's growing reputation as a premier SMT training centre strengthens its ability to draw participants organically.

> The demand for SMT-trained professionals is rising as India expands its electronics manufacturing industry. This program equips trainees—from ITI graduates to engineers—with industry-ready skills, preparing them for jobs in PCB assembly, quality control, and production supervision. Companies like Jabil Circuit India and Syrma are actively seeking such skilled professionals. Moreover, the centre's accessibility to MSMEs and startups fosters entrepreneurship and innovation. By continuously evolving with industry needs, this initiative is empowering India's workforce and positioning the country as a global leader in electronics manufacturing. I am proud to contribute to this nation-building effort.
>
> **Dr. Sudarshan Natu, Professor, COEP Tech**

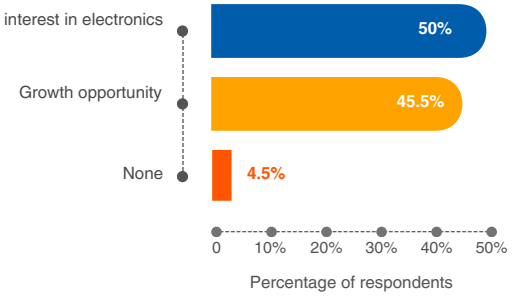
CHART 12: AVAILABILITY OF SIMILAR COURSES IN OTHER INSTITUTES



59.1%

of respondents interviewed said that they did not find any similar courses on the internet, indicating that CoE-AEM is filling a crucial skills gap in SMT training. Additionally, 36.4% were unsure, suggesting limited awareness about competing programs. Only 4.5% confirmed the presence of alternative courses, further reinforcing the program's uniqueness and its necessity in the electronics manufacturing sector.

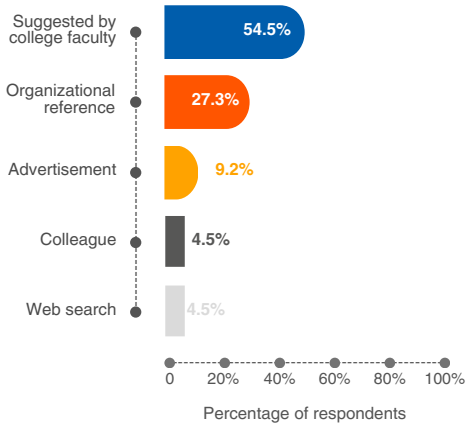
CHART 13: MOTIVATION FOR ATTENDING THE TRAINING



50%

of the trainees said they were motivated because of their individual and personal interest in electronics, while 45.5% perceived the course as an opportunity for career growth. Thus, indicating a strong alignment of the program with both passion-driven learners and career-oriented professionals, ensuring a diverse and engaged cohort. It is also indicative of how the market opportunities are perceived by a select few who see the potential for career growth.

CHART 14: SOURCE OF INFORMATION ABOUT THE COURSE

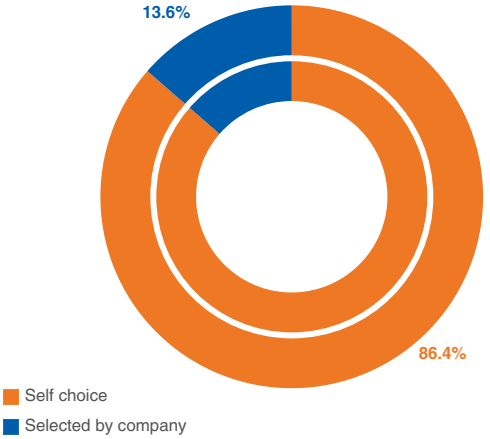


54.5%

of participants said they had learnt about the program through college faculty members, while 27.3% were introduced via an organisation. Other sources, such as advertisements, web searches, and word-of-mouth, played minor roles, demonstrating the effectiveness of academic partnerships in promoting this specific technical training. It also indicates that there is a dire need for the program to actively engage with colleges and universities to promote this program, thus making it more competitive and increasing the quality bar of the program as an outcome of the competitiveness.

CONFERENCE HALL AT COE

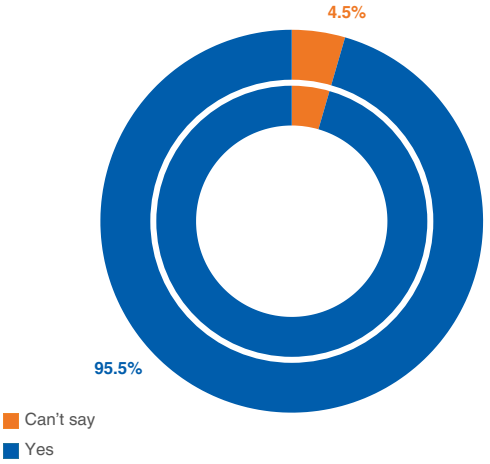
CHART 15: SOURCE OF PROGRAM ENROLLMENT



86.4%

of participants said that they had enrolled in this course program due to their personal choice, while 13.6% said they were nominated by their company and hence had joined. This indicates that the programs have a strong appeal among individual learners. It is important to reinforce this credibility in the market as an option for further advanced training for career growth and industry readiness.

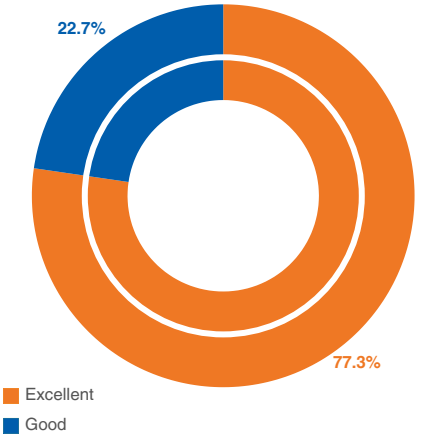
CHART 16: GAINED VALUABLE SKILLS AND KNOWLEDGE THROUGH THE COURSE



95.5%

of the respondents confirmed acquiring valuable skills, thus demonstrating the effectiveness of the program in enhancing technical expertise. This strong outcome highlights the program's success in equipping trainees with industry-relevant competencies that improve employability and career prospects in SMT manufacturing.

CHART 17: RATING OF HANDS-ON EXPERIENCE ON THE STATE-OF-THE-ART EQUIPMENT



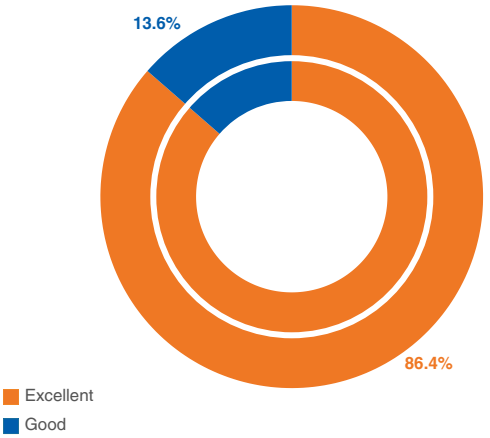
77.3%

of the trainee respondents rated their hands-on experience as excellent, while 22.7% found it good.

This positive feedback emphasises the high-quality practical training approach of the program, ensuring that trainees gain real-world experience on advanced SMT equipment.

These ratings validate the institution's commitment to providing an interactive and industry-aligned learning experience.

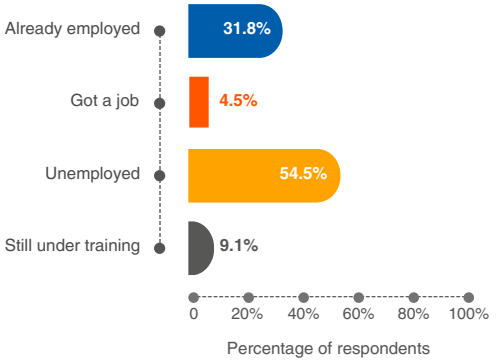
CHART 18: RATING OF FACULTY SUPPORT IN LEARNING SMT LINE PRODUCTION PROCESS



86.4%

of the respondents rated faculty support as excellent, while 13.6% rated it as good, thus indicating that the quality of teaching by the expert instructors ensured that the trainees received quality guidance throughout the program. The faculty's support also played a crucial role in bridging the gap between theoretical knowledge and practical applications, making the program effective in skill development.

CHART 19: EMPLOYMENT STATUS AFTER COMPLETING THE COURSE



31.8%

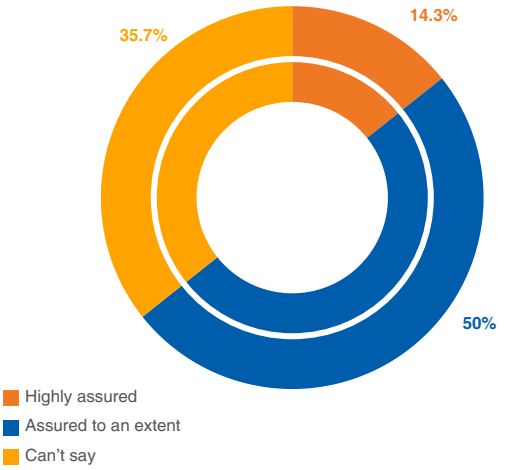
of the respondents were employed at the time of undertaking the program and training, while 4.5% secured jobs post-training.

However, a majority, consisting of 54.5% of the students who were interacted with, were still seeking employment. This suggests that additional job placement support and a strong need for investing in the fostering and strengthening of industry connections are necessary to improve the employment and employability of the students as the desired outcome.

The remaining 9.1% of the trainees who were interacted with were still under training, which also indicates ongoing learning and gradual transition into the workforce.

During focus group discussions, participants expressed confidence in applying their skills, especially in Reflow Soldering, AOI systems, SMT Programming, and PCB Assembly Techniques, which enhance their employability in the electronics manufacturing sector.

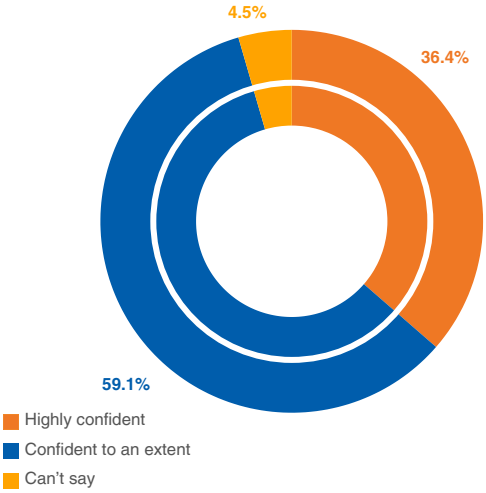
CHART 20: ASSURANCE OF GETTING A JOB AFTER TRAINING COMPLETION



50%

of those seeking jobs felt assured to an extent, while 14.3% said they were highly assured about the probability of securing employment post their training. However, 35.7% of the trainees remained uncertain, highlighting the need for stronger industry partnerships and career guidance initiatives. By increasing networking opportunities and employer collaborations, the program can further solidify employment prospects for its trainees.

CHART 21: CONFIDENCE LEVEL POST TRAINING



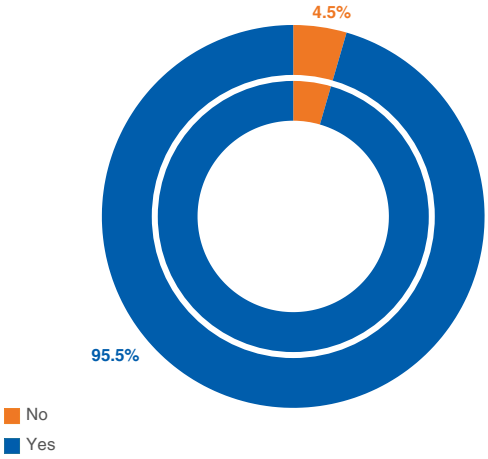
36.4%

of the respondents felt highly confident in becoming a Master trainer post the completion of their course. 59.1% said they felt confident, but only to an extent, about becoming master trainers. This indicates that the majority of participants believe in their ability to mentor others and transfer their acquired knowledge. It also indicates that the quality of mentorship by the experts was so good that the students were inspired to become Master trainers after the completion of their course.

During focus group discussions, employed participants mentioned that while the training did not lead to immediate salary hikes, they expected 10-20% growth in future appraisals due to enhanced SMT expertise.

COE SMT LINE SETUP 2

CHART 22: AWARENESS OF BEING EARLY SMT LINE LEARNERS

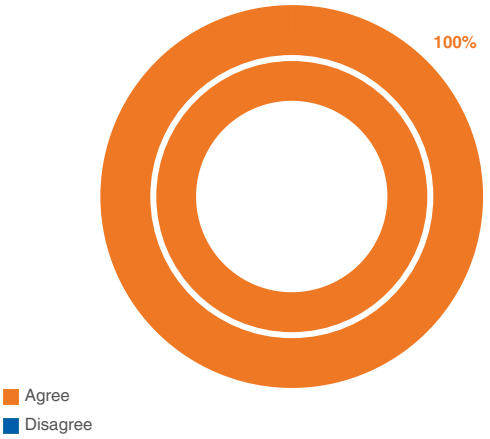


95.5%

of the respondents acknowledged that they are among the early learners in SMT production, demonstrating the pioneering role of this program in India's electronics manufacturing sector. This awareness fosters a sense of responsibility among participants to lead advancements in the field and positions them as frontrunners in the growing SMT workforce.

> "The Centre of Excellence in Advanced Electronics Manufacturing at COEP has significantly contributed to developing a skilled workforce for India's growing electronics industry. By providing specialised training in Surface Mount Technology (SMT) and supporting MSMEs with access to advanced prototyping facilities, the program aligns perfectly with the 'Make in India' initiative. By providing hands-on training and access to advanced manufacturing facilities, the program is creating a highly skilled workforce while empowering MSMEs with resources that were previously inaccessible. I am proud to have been part of this initiative since its inception, assisting in its conceptualisation and growth. With India's increasing focus on local electronics manufacturing, this program is set to play a crucial role in shaping the future of the sector."
>
> **Dr. Ravi Bhatkal, Managing Director (India), Element Solutions Inc.**

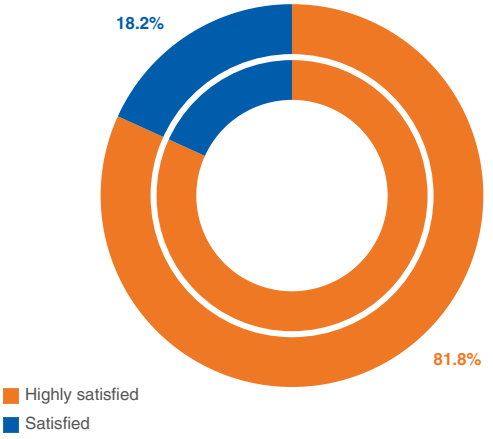
CHART 23: SENSE OF PRIDE IN CONTRIBUTING TO THE "MAKE IN INDIA" INITIATIVE



100%

of trainees agreed they are contributing to the "Make in India" initiative, reflecting a strong alignment with the national mission of boosting local manufacturing and reducing import dependency. This sense of purpose among trainees highlights the broader impact of the program, not just on individual career growth but also on strengthening India's electronics manufacturing capabilities.

CHART 24: OVERALL SATISFACTION WITH ATTENDING THE COURSE



81.8%

of the participants reported that they were highly satisfied with the course, while 18.2% said they were just 'satisfied' with the training program. This large percentage of satisfaction confirms that the program met the expectations of the trainees regarding the delivery of the curriculum, hands-on experience, support, career support, and impact. High satisfaction levels also suggested that the training methodology and infrastructure are well-aligned with industry requirements, making the trainees confident in their newly acquired skills.

During focus group discussions, participants recommended extending the program with internship or on-the-job training opportunities in collaboration with Tier 1 EMS manufacturers, and they emphasised that the visibility of the program could be enhanced through industry seminars, collaborations with technical universities, and CSR-funded scholarships.

IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Trainees gained hands-on experience in SMT processes, enhancing their job readiness.
- Participants developed skills in PCB assembly, soldering, and SMT troubleshooting, increasing their employability.
- Some trainees received interview calls from EMS providers and electronics manufacturing companies.
- Employed participants anticipated salary hikes (10-20%) due to their enhanced SMT expertise.
- Trainees expressed pride in contributing to the "Make in India" initiative.

INDUSTRY LEVEL

- The program is bridging the skills gap in the electronics manufacturing industry, supplying trained SMT professionals.
- It helped startups and MSMEs access advanced prototyping and manufacturing facilities, reducing dependence on costly external services.
- Companies like Jabil Circuit and Sierra saw an increased demand for trained professionals, which this program supports.
- Strengthened industry-academia collaboration, ensuring course content aligns with evolving industry needs.

NATIONAL LEVEL

- Supports the Make in India and Atmanirbhar Bharat initiatives by strengthening India's electronics manufacturing capabilities.
- Reduces reliance on imports by equipping the local workforce with high-tech manufacturing skills.
- Aligns with PLI (Production Linked Incentive) and Semicon India programs, fostering domestic electronics production.
- Contributes to India's competitiveness in PCB, semiconductor, and chip manufacturing.

COMMUNITY LEVEL

- The program enabled social mobility by training individuals from economically weaker backgrounds.
- Sponsored candidates from underprivileged communities benefited from financial aid and technical upskilling.
- Provided career growth opportunities to mid-career professionals and fresh graduates alike.
- Expanded access to SMT training in regions beyond Pune, making high-tech skills available to diverse socio-economic groups.

UNIVERSITY LEVEL

- Positioned COEP as a leading technical institute for SMT training, comparable to IIT Madras.
- Enhanced COEP's industry partnerships and CSR collaborations, attracting funding and technical support.
- Faculty members gained expertise in SMT, strengthening their research and training capabilities.
- Generated revenue through training fees, facility rentals, and partnerships, ensuring financial sustainability.

GOVERNMENT & POLICY LEVEL

- Encouraged government support for technical education and influenced policies on vocational training.
- Attracted CSR funding from companies like Bajaj Auto, promoting industry-backed skill development.
- Helped meet national workforce development goals in the electronics sector.

TECHNOLOGICAL LEVEL

- Introduced trainees to state-of-the-art SMT equipment, ensuring high standards of technical learning.
- Facilitated innovation in electronic prototyping and manufacturing, boosting India's tech ecosystem.
- Encouraged advanced research in SMT production through collaborations between academia and industry.

CASE STUDY
Dr. Vidya More – Driving Excellence in Electronic Manufacturing Training

Dr. Vidya More is an accomplished assistant professor with 30 years of academic experience who has been instrumental in shaping this specialised training program in electronic manufacturing over the past four years.

Her deep understanding of technical education and industry needs has helped refine the program, making it a bridge between academia and the fast-evolving electronics sector.

Recognising the critical skill gap in modern electronics, Dr. More actively contributed to structuring a hands-on training curriculum focused on Surface Mount Technology (SMT)—a fundamental process in electronic manufacturing. She played a key role in ensuring that the program not only imparts theoretical knowledge but also provides practical exposure that prepares students for industry demands.

Dr. More has been deeply involved in mentoring students, ensuring they acquire job-ready skills. Her experience in academia allows her to tailor the learning process, making it accessible, engaging, and aligned with real-world applications. She takes pride in the fact that many trainees from the program have successfully transitioned into the electronics manufacturing industry.

Beyond student training, Dr. More has been a strong advocate for supporting Micro, Small, and Medium Enterprises (MSMEs). Under her guidance, the program has facilitated access to cutting-edge prototyping and production equipment, allowing MSMEs to develop, test, and refine their products without large capital investments. This initiative has fostered innovation and entrepreneurship, helping smaller businesses remain competitive in the rapidly evolving electronics sector.

Dr More underscores the exceptional quality of infrastructure and equipment at the training centre, emphasising that it is one of only two such advanced facilities in India. She believes that this exclusivity makes the centre a valuable national asset, providing world-class training and technological access that is otherwise scarce in the country. Her leadership in bridging the academic-industry gap, enhancing student employability, and empowering MSMEs highlight her commitment to advancing technical education and strengthening India's electronic manufacturing ecosystem.

MACHINE OPERATION BY COE'S STAFF

04. OECD FRAMEWORK

RELEVANCE

The Centre of Excellence in Advanced Electronics Manufacturing (CoE-AEM) is highly relevant to India's industrial and economic priorities, addressing the growing demand for skilled SMT professionals. By providing industry-aligned training and supporting MSMEs and startups, the program ensures direct applicability to India's electronics manufacturing sector.

COHERENCE

The program is well aligned with the following Sustainable Development Goals (SDGs): Alignment with SDG Goals:SDG 4: Quality Education; SDG 8: Decent Work and Economic Growth; SDG 9: Industry, Innovation, and Infrastructure; SDG 11: Sustainable Cities and Communities; SDG 12: Responsible Consumption and Production, SDG 17: Partnerships for the Goals.

Project Alignment with National Initiatives:

- Make in India
- Skill India
- Digital India
- Atmanirbhar Bharat
- National Policy on Electronics (NPE)
- Startup India
- Production Linked Incentive (PLI) Scheme

EFFECTIVENESS

The training program boasts a 100% course completion rate, high trainee satisfaction, and well-equipped SMT training labs. However, job placement success remains a challenge, with only 4.5% securing jobs post-training, while 54.5% are still seeking employment.

EFFICIENCY

The project budget has been efficiently utilised to provide the scholarship, with 81.8% of trainees receiving full sponsorship. The program maintains high-cost efficiency, yet scalability concerns remain, particularly in funding faculty expansion, administrative improvements, and industry outreach. A revenue model, such as charging MSMEs for prototyping services, could enhance long-term efficiency.

IMPACT

The initiative has positively impacted India's electronics manufacturing ecosystem, equipping trainees with industry-relevant skills and fostering SMT adoption among MSMEs. However, the low post-training employment rate (4.5%) suggests a need for stronger job placement support and career counselling. Strengthening employer engagement and tracking long-term employment outcomes would improve its measurable impact.

SUSTAINABILITY

The long-term sustainability of CoE-AEM depends on diversifying funding sources and reducing reliance on CSR grants. The project's plan to scale from 33 to 1,000 trainees annually is ambitious and requires government incentives, industry-backed scholarships, and commercial partnerships. A hybrid CSR + fee-based model for corporates could make the program financially self-sustaining.

CHAPTER 5
RECOMMENDATIONS

To ensure the long-term sustainability, scalability, and effectiveness of the CoE-AEM program, key recommendations have been identified. These focus on expanding outreach, strengthening industry partnerships, ensuring financial sustainability, enhancing training methodologies, and addressing regulatory challenges.

EXPANDING OUTREACH AND AWARENESS

Limited awareness about SMT training and career prospects remains a major challenge. A stronger outreach strategy through digital marketing, industry networking, and educational collaborations will help attract more trainees. Targeted awareness programs in engineering colleges, ITIs, and diploma institutes will enhance participation, especially from rural and economically weaker backgrounds.

STRENGTHENING INDUSTRY COLLABORATION AND PLACEMENT SUPPORT

While partnerships with Jabil Circuit India, MacDermid Alpha, and Sierra Electronics exist, expanding collaborations with more electronics manufacturers and MSMEs will boost job placements. An Industry Advisory Board should be established to provide real-time insights into skill demands, industry trends, and emerging technologies, ensuring curriculum relevance. Industrial internships and on-the-job training modules should be expanded to enhance job readiness and employability.

ENSURING FINANCIAL SUSTAINABILITY

A self-sustaining revenue model should be developed by leveraging facility rentals, prototype development services, PCB manufacturing, and industry-sponsored training programs. Engagement with government skill development schemes and CSR funding will provide long-term financial stability.

ENHANCING TRAINING CURRICULUM AND FACULTY DEVELOPMENT

The Trainer model should be expanded to keep faculty updated with the latest SMT technologies. Greater emphasis on hands-on training through real-world case studies, SMT troubleshooting, and industrial problem-solving will enhance practical learning. Integration of AI and IoT applications in electronics manufacturing will future proof the curriculum and prepare trainees for emerging technologies.

ADDRESSING ADMINISTRATIVE AND REGULATORY HURDLES

Streamlining the import process for high-end SMT equipment through policy advocacy and government partnerships will reduce delays. Simplifying enrolment and certification procedures will enhance accessibility and participation.

By implementing these recommendations, CoE-AEM can enhance its impact, boost employability outcomes, and align with India's vision for self-reliance in electronics manufacturing. A structured strategy focusing on industry needs, financial viability, and technological advancements will solidify its position as a leader in electronics manufacturing skill development.

CHAPTER 6
SUSTAINABILITY

The sustainability of the MacDermid Alpha Centre of Excellence (CoE) at COEP Technological University is ensured through a multifaceted approach encompassing financial viability, industry collaboration, and skill-building for long-term impact.

The centre generates revenue through multiple streams, including training fees, industry-sponsored courses, and equipment rentals for MSMEs and startups needing access to advanced Surface Mount Technology (SMT) facilities. Additionally, the SMT production line is made available for prototyping and small-scale manufacturing, providing a steady income while supporting India's growing electronics sector. The conference room and training halls are also rented out to further sustain operational costs.

Industry partnerships play a critical role in sustainability. Key stakeholders such as Bajaj Auto Ltd., MacDermid Alpha, Jabil, and other electronics manufacturers contribute by funding equipment, offering expert mentorship, and facilitating placements. The involvement of organisations like SARTHI, Anveshak Technologies, BARTI, and MAHAJYOTI ensures continuous student mobilisation and financial aid for economically disadvantaged trainees.

By training 250+ professionals annually, with plans to scale up to 1,000, the CoE aligns with the Make in India initiative, addressing the workforce gap in electronics manufacturing. The program also supports MSMEs by providing affordable access to high-end SMT prototyping, reducing dependency on imports.

Challenges, such as outreach to eligible trainees and hands-on training time, are being addressed by improving marketing efforts and extending practical exposure. Overall, the CoE is positioned as a self-sustaining initiative that strengthens India’s electronics ecosystem through skill development, industry integration, and financial sustainability.

CHAPTER 7
CONCLUSION

The Centre of Excellence in Advanced Electronics Manufacturing (CoE-AEM) stands as a transformative initiative in India's skill development ecosystem, addressing the critical need for trained SMT professionals in the electronics sector. With state-of-the-art training infrastructure, strategic industry partnerships, and strong financial backing, the program has set new benchmarks in hands-on technical education and workforce readiness.

SMT LINE STAFF INTERACTION WITH SOULACE TEAM

Supported by Bajaj Auto Ltd., Jabil Circuit India, MacDermid Alpha, and Sierra Electronics, CoE-AEM has successfully bridged the gap between academia and industry. Its industry-aligned curriculum ensures that trainees gain job-relevant skills, enhancing their employment prospects while offering MSMEs and startups access to advanced SMT equipment. These contributions have positioned CoE-AEM as a key enabler of India's electronics manufacturing growth.

The program's impact is evident in high trainee satisfaction, a 100% course completion rate, and growing industry engagement. By fostering innovation, entrepreneurship, and skill development, CoE-AEM is empowering individuals while strengthening India's electronics ecosystem. However, further efforts are needed to scale training capacity to 1,000 professionals annually, enhance outreach, ensure financial sustainability, and improve industry placement opportunities. Addressing awareness gaps and faculty development will be crucial for long-term success.

With continued investment, strategic planning, and strengthened government-industry collaboration, CoE-AEM has the potential to become a national model for skill development, directly supporting the Make in India vision and fostering India's self-reliance in electronics manufacturing.

COLLEGE OF ENGINEERING TEAM

IMPACT ASSESSMENT REPORT

INTEGRATED RURAL AND URBAN DEVELOPMENT PROGRAM

Implementing Organisation - Jankidevi Bajaj Gram Vikas Sanstha

Release Date: 31-03-2025

SoulAce

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
FY	Financial Year
JBGVS	Jankidevi Bajaj Gram Vikas Sanstha
VDC	Village Development Committee
RF	Revolving Fund
PHC	Primary Health Centre
SHG	Self-Help Group
BaLA	Building as a Learning Aid
NGO	Non-Governmental Organisation
SDGs	Sustainable Development Goals

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

Bajaj Auto Limited and Bajaj Finance Limited undertook the Integrated Rural and Urban Development Program to address the challenges brought by the COVID-19 pandemic in the community. Jankidevi Bajaj Gram Vikas Sanstha, as the implementing partner, executed the project in both rural and urban areas through institution building, capacity building and localised planning at the grassroots, engaging with COVID-19-affected communities. This report presents a thorough assessment of the activities conducted in the 'rural' context. The IRDP program aims to drive holistic community development through strategic interventions in governance, financial inclusion, livelihood enhancement, water conservation, and environmental sustainability. By strengthening village institutions, empowering women, and improving infrastructure, the program fosters sustainable economic and social growth. The program embraced a participatory approach, involving local governance structures like Village Development Committees to empower communities to ensure shared responsibility and ownership. With a special focus on supplementing most activities with complementary training, this initiative underscores the company's strong commitment to creating meaningful and lasting impacts on vulnerable populations through community-driven development.

BENEFICIARY INTERACTION AT GADAG GAON (KHED)

PROJECT DETAILS

Implementation year
FY 2021-2023

Assessment year
FY 2024-25

Implementing Partner
Jankidevi Bajaj Gram Vikas Sanstha-JBGVS

Beneficiaries
Underprivileged communities from rural villages

Location
Multiple, Maharashtra

Project Budget
₹951 Lakhs

Alignment with SDGs

PROJECT ACTIVITIES

COMMUNITY DEVELOPMENT INITIATIVE

- Creating awareness in the community regarding their own development.
- Mobilisation of the community in community-based institutions like Village Development Committees, Farmer Producer Companies, etc. and their capacity building.
- Development and capacity building of paraprofessionals at the community level.
- Preparation of village development plans (VDPs) and their implementation methodology, ensuring the community's physical and financial contribution.
- Focus on the poor and economically weaker sections with special emphasis on women and children.

BAJAJ EDUCATION INITIATIVE

- Providing support for the development of school infrastructure. i.e., school rooms, sanitation complexes, libraries, sports equipment, science labs, etc.
- Capacity building of School Management Committees (SMCs), students and teachers.
- Ensuring active engagement of all sections of the village community in school development.

BAJAJ HEALTH INITIATIVE

- Focus on preventive healthcare through awareness generation, training, etc., with special emphasis on antenatal care (ANC) and postnatal care (PNC).
- Providing healthcare services at the doorstep of the poor through mobile clinics.
- Organising special health check-up camps in project areas.
- Improving sanitary conditions of rural and urban areas.
- Providing safe drinking water in selected villages.

LIVELIHOOD (ON-FARM AND NON-FARM)

Supporting livelihood activities, including on-farm and off-farm activities.

Following a revolving fund model to provide seed capital support for SHGs and individual entrepreneurs.

ENVIRONMENT

Undertaking water resource development activities like desilting of percolation tanks, nallas, earthen nala bunds, minor irrigation tanks, construction/renovation of cement nala bunds, KT Weirs, etc.

In-situ soil and moisture conservation through farm bunds, plantation, etc.

Promotion of efficient water use techniques.

Formation of Water User Groups and building their capacities from the point of view of the sustainability of assets created.

FGD - VIRHAM (KHED)

Key Findings

Sample Size - 150

DEMOGRAPHICS

The survey had 52% of the female respondents as compared to 48% of male respondents.

50% of the respondents belonged to the Other Backward Classes category, followed by the Open category (36%).

90% of the respondents were engaged in farming as their primary source of sustenance.

Preparation of village development plans (VDPs) and their implementation methodology, ensuring the community's physical and financial contribution.

33.3% of the respondents earned a monthly income between Rs. 5000 and Rs. 10,000, while 27.3% of them earned between Rs. 3000 and Rs. 5000. 21.3% of them earned between Rs. 10,000 and Rs. 20,000.

41.3% of the respondents were marginal farmers owning less than 1 hectare of land, followed by 30% of them being small farmers owning 1 to 2 hectares. 11.3% of them did not own any agricultural land.

COMMUNITY DEVELOPMENT INITIATIVE

48.7% (73 beneficiaries) of the respondents were members of the village development committee or the revolving fund management committee.

Out of these 68 respondents, 52.9% mentioned 'connecting the community member to available resources/welfare schemes' as their major role, while 19.1% of them identified community issues and reported them to the VDC for action.

93.2% (68 beneficiaries) of them received training as a service provider by the Village Development Committee.

38.3% of the respondents reported that their VDC held more than Rs. 1,00,000 to be used as a revolving fund for the community, whereas 32.9% of them highlighted that the amount held was between Rs. 10,000 and Rs. 30,000.

COMMUNITY DEVELOPMENT INITIATIVE

28.7% of the respondents mentioned that their family member was part of the Self-Help Group.

83.7% of the respondents received training on the management of Self-Help Groups, and 83.3% of them implemented the learnings.

Others cited market fluctuations, crop losses due to pest infestations, and unforeseen financial crises such as medical emergencies as reasons for their failure to make payments

44.2% of the respondents received revolving funds for their livelihood generation activity.

94.7% of the respondents repaid the revolving fund received, which is higher than the data reported by the implementing agency (78% recovery rate in Gokulwadi village, 90% in Varzadi village).

WATER CONSERVATION INITIATIVES

Out of 64 respondents who stated that water conservation activities had been conducted in their villages, 67.2% reported that new drinking water schemes or pipelines were introduced in most areas to improve the quality of drinking water.

The creation of rock tanks and the installation of RO plants were also done, as mentioned by 26.6% and 21.9% of the respondents, respectively.

68.8% of the respondents mentioned that new irrigation lines or repair of existing ones were done in their area.

PLANTATION INITIATIVES

32.7% of the respondents (49 beneficiaries) revealed that tree plantation activities were conducted in their village.

Out of these respondents, 83.7% also received additional special training on plantation practices.

36.7% of respondents stated that up to 50 plants were planted in their area, while 26.5% reported fewer than 10 plants. Additionally, 24.5% of respondents observed the plantation of more than 100 plants

Out of these plantations, 69.4% of the respondents claimed a survival rate of above 50% of the plants. This finding corroborates the 70-80% survival rates of plantation trees, as mentioned by the project team.

LIVESTOCK RAISING

92.6% of the respondents (50 beneficiaries) highlighted that they engage in livestock raising as a supplementary form of income generation activity besides farming.

79.6% of the respondents mentioned that they received funds for additional livestock procurement. 41.9% of them received an amount above Rs. 30,000, followed by 18.6% of them receiving between Rs. 20,000 and Rs. 30,000.

The majority of the respondents (67.4%) purchased 1-2 livestock with the funds received.

HEALTH AND SANITATION INITIATIVES

Among the 59 respondents who mentioned the presence of Bajaj Health initiatives in their village, 93.2% of the respondents were a part of the health camps organised by the project team.

Basic services like providing referrals for admission of COVID-19 patients, medicine and mask distribution, and vaccination were received by 49.2%, 42.4%,3.4% and 1.7% of the respondents, respectively.

Camps also led to the creation of awareness around the use of masks, vaccinations, social distancing, sanitiser use, nutrition, checks, symptoms, and prevention of spread for 96.6% of the respondents.

To enhance the status of cleanliness and hygiene in the village, soak pits were constructed for wastewater disposal in or near the homes of 25.3% of the respondents (38 beneficiaries).

EDUCATION INITIATIVES

Out of the 58 respondents who reported the presence of Bajaj Education Initiatives in the village, 34.5% of the respondents were members of the PTM team.

Shiksha Protsahan Kendra was also created as part of the project to bridge the gap between formal education and the community's educational needs.

Among the respondents, 79.3% confirmed that BaLA (Building as Learning Aid) paintings were done on the walls of schools in their villages. Additionally, 65.5% reported the construction of new classrooms, while 48.3% stated that they benefited from a newly constructed school in their area

85% of them attended the parent-teacher meetings regularly.

Key Impacts

Sample Size - 150

IMPROVED RURAL DEVELOPMENT OUTCOMES

64.4% of the respondents highlighted improved knowledge and skills for community development to be the foremost benefit of VDC membership, whereas, for 27.4% of the respondents, improved access to better resources and services was the biggest benefit.

8.2% of the respondents mentioned increased participation in decision-making processes as the most beneficial aspect for them.

82.2% of the respondents feel that there are mechanisms in place for collective action.

Better financial management and resource utilisation were some of the major impacts of the village development plans, as mentioned by 88.2% of the respondents. 76.5% of them thought that there was a significant improvement in infrastructure and services, while 69.1% of them believed that the plans had increased community involvement and ownership.

Adequate Collective leadership and the presence of systems for good governance were experienced by 69.9% and 67.1% of the respondents, respectively.

LIVELIHOOD INTERVENTION

53.3% of the respondents reported an increase in income of up to Rs. 3000 through various income generation activities, while 30% of them reported it to be between Rs. 3000 and Rs. 5000. 16.7% of them saw a rise in income by more than Rs. 5000.

60.5% of the respondents highlighted that they earn an average additional income of less than Rs. 5,000 through all income-generating activities (SHG, Livestock farming, etc.). 37.2% of them earned between Rs. 5,000 and Rs. 10,000.

WATER CONSERVATION INITIATIVES

85.9% of the respondents agree that the intervention has resulted in the availability of good and pure potable water.

The irrigation coverage has led to an increase of 10 to 20% in crop yield for 35.5% of the respondents, followed by a 20-unit to 30-unit increase for 29% of them and a significant increase of above 50% yield for 25.8% of them.

For 83.8% of the respondents (37 beneficiaries), the intervention has increased the coverage of irrigated land by 10 to 20%, while it has increased by 20 to 50% for 16.2% of them.

PLANTATION INITIATIVES

57.1% of the respondents believe that they have received additional earnings or benefits from the plants.

LIVESTOCK RAISING

55.6% of the respondents reported an increase in income by Rs. 3,000 to Rs. 5,000, followed by an increase of less than Rs. 3,000 for 35.2% of them. 9.2% saw an increase between Rs. 5,000 and Rs. 10,000.

Among the respondents who used the fodder seeds, 44.4% of the respondents agreed to have saved between Rs. 1000 and Rs. 2,000 due to the availability of fodder seeds through the project. 22.2% of them believed they had saved between Rs. 3,000 and Rs. 5,000.

ORGANIC FARMING AND KITCHEN GARDEN ACTIVITIES

Boosted plant growth and yield were highlighted as the major benefits of vermicomposting by 88.9% of the respondents.

Kitchen gardens provided supplementary nutritional food to 85.7% of respondents, while 57.1% reported that they helped reduce the cost of buying vegetables from the market and increased the availability of fresh, tasty, home-grown produce.

Other key benefits include boosting the quality of the produce (taste, size, etc.), reducing or eliminating the use of chemical fertilisers, leading to more savings, and easy application in the fields with no side effects on soil or water tables, as mentioned by 72.2% of the respondents.

71.4% of the respondents reported saving between Rs. 1,000 and Rs. 2,000 since they did not have to buy vegetables and fruits from the market.

HEATH AND SANITATION INITIATIVES

Increased awareness and understanding of diseases leading to reduced incidences of major illnesses was reported as the major benefit of the health camps by 93.2% of the respondents.

The soak pits helped in solving the problem of disposal and discharge of wastewater in the open, as revealed by 73.7% of the respondents.

57.6% of the respondents believed that these special camps helped prevent the contracting and spreading of the COVID-19 infection.

EDUCATION INITIATIVES

79.3% of the respondents felt that their child is happier and more positive now.

69% of them saw an improvement in their child's language skills.

75.9% of the respondents found that their child has improved mathematical skills.

69% of the respondents felt that their child is more social and interactive now.

03. OECD FRAMEWORK

Relevance Coherence Effectiveness Efficiency Impact Sustainability

RELEVANCE

The program aligns with the pressing needs of the underprivileged rural communities. With social inequalities being exacerbated during the pandemic, evident through a lack of livelihood options and inaccessibility to healthcare systems, the project becomes a significant step towards the rebuilding of communities. By undertaking multiple initiatives to promote community development and income generation, improving access to healthcare and sanitation, and addressing educational needs, the program has been able to work towards creating better living conditions for underserved populations, especially in the farm sector. The demographic indicator of 90% of the respondents being farmers, with 41.3% of them being marginal farmers with less than 1 hectare of land, underscores the economic and social vulnerability of these respondents and highlights the relevance of such integrated programs for these communities.

COHERENCE

The program showed strong alignment with the following Sustainable Development Goals (SDGs):

SDG 1 (No Poverty): The program contributed to poverty reduction by distributing revolving financial capital and other necessary resources aimed at promoting livelihood generation through community involvement (VDC and SHGs).

SDG 2 (Zero Hunger): Supporting agricultural activities and introducing kitchen gardens has enhanced food security.

SDG 3 (Good Health and Well-being): Strengthening rural health services ensures access to healthcare at all levels. Infrastructure support, especially for the COVID-19 response, alongside awareness programs, improved community health literacy and pandemic preparedness.

SDG 4 (Quality Education): Quality school infrastructure and engagement of parents in school governance enhance learning outcomes.

SDG 6 (Clean Water and Sanitation): The construction of water conservation structures like RO plants and drip irrigation facilities, alongside maintenance activities like nala desilting, is aimed at ensuring the availability of clean and potable water and improved groundwater levels. The construction of soak pits ensured that the wastewater was discharged through proper channels.

SDG 8 (Decent Work and Economic Growth): Creating income-generating opportunities supported families in recovering from the economic crisis induced by the pandemic.

SGD 10 (Reduced Inequalities): Strengthening rural health services reduced disparities in healthcare access, while providing infrastructural support to rural educational institutions ensured equitable learning opportunities.

SDG 11 (Sustainable Cities and Communities): By empowering village institutions for self-reliant development, the program made communities more resilient.

S**DG 13 (Climate Action):** Soil conservation efforts directly addressed climate resilience by enhancing soil quality, resulting in higher agricultural yields.

SDG 15 (Life on Land): The program's focus on planting native trees promotes biodiversity.

The program demonstrated strong alignment with several key national goals and initiatives:

- **National Rural Livelihood Mission:** The program's approach to creating local income generation opportunities through various farm activities resonated with NRLM's idea of livelihood creation.
- **National Water Mission:** The construction of water conservation structures and groundwater recharge initiatives was in line with the National Water Mission's objectives of promoting sustainable water resource management.
- **National Rural Health Mission:** Health camps are especially focused on the management of the COVID-19 pandemic and addressing public health concerns.
- **Clean India Mission (Rural):** The creation of soak pits aligns with the mission's goal of introducing comprehensive solid and liquid waste management across rural India.
- **National Action Plan on Climate Change (NAPCC):** The program's afforestation, soil conservation, and sustainable water management efforts were coherent with the NAPCC's mission to promote ecological sustainability and climate resilience.
- **The National Education Mission:** Quality educational infrastructure promotes equitable learning resources for all students in accordance with the goal of this mission.

EFFECTIVENESS

The program was effective in achieving its key objectives, as evidenced by several impactful results:

- **Community participation rates:** 48.7% of the respondents were members of Village Development Committees (VDCs), ensuring community ownership and participation.
- **Local capacity building:** 93.2% of the respondents received training from VDCs, enhancing local capacity-building efforts.
- **Participatory planning:** 75.3% of the respondents actively contributed to Village Development Plan preparation.
- **Livelihood Training and Implementation:** 83.7% of the respondents received training on income generation activities, and 83.3% successfully implemented their learnings.
- **Availability and repayment of seed funds:** 44.2% of the respondents accessed financial capital through revolving funds, with a high loan repayment rate of 94.7%.
- **Drinking water security:** 85.9% of the respondents reported the availability of good and pure potable water through the new drinking water schemes.
- **Agricultural coverage:** Agricultural coverage increased by 10–20% for 83.8% of respondents.
- **Crop output:** A significant increase of above 50% in crop yield was noted by 25.8% of the respondents.
- **Increased income:** 55.6% of the respondents reported an increase in income by Rs. 3,000 to Rs. 5,000, while 57.1% of the respondents received additional earnings or benefits from the plantation initiative.
- **Health awareness:** 93.2% of the respondents noted increased awareness and understanding of diseases, leading to reduced incidences of major illnesses.
- **Involvement of parents in a child's education:** 34.5% of the respondents were members of the PTM team, and 85% of them attended the parent-teacher meetings regularly.

EFFICIENCY

The program's efficiency is evident in its structured approach that ensures each stage contributes effectively to the overall impact. Human resource optimisation is demonstrated through active community participation with village development committees efficiently handling resource allocation. The program's design is also cost-effective, with a high repayment rate, suggesting proper fund utilisation and financial expertise. The involvement of local communities in planning and governance activities through collective action mechanisms contributes to streamlined operational capabilities.

IMPACT

The program has generated substantial short-term and long-term socio-economic and environmental impacts:

Short-Term Impacts

- **Community Engagement and Participation:** The project has successfully mobilised community members, particularly through the establishment of Village Development Committees (VDCs) and Self-Help Groups (SHGs). Their involvement in decision-making processes, strengthened by prior training, has resulted in the introduction of community development initiatives, reflecting ownership and accountability.
- **Livelihood Enhancement:** Through the disbursal of revolving funds to SHGs, the project has enabled the beneficiaries to initiate income-generating activities. As a result, a substantial proportion of them reported an increase in household income, with earnings primarily reinvested in agriculture and livelihood activities.
- **Improved Access to Water and Sanitation:** The implementation of new drinking water schemes, pipelines, and RO plants improved access to potable water. Additionally, irrigation facilities were enhanced through Nala deepening, percolation ponds, and drip irrigation, increasing agricultural productivity in the short term.
- **Environmental Conservation Efforts:** The plantation drive led to the planting of trees, improving green cover in the region. Training on plantation practices contributed to environmental awareness and better survival rates of newly planted trees.

Medium-Term Impacts

- **Strengthened Governance and Institutional Mechanisms:** The establishment of VDCs and SHGs ensured sustainable community-led development. The project has laid a strong foundation for long-term self-reliance and community leadership, reflected through the present involvement of members in decision-making and financial management.
- **Sustainable Economic Growth:** The revolving fund model not only provided financial assistance in times of need but also instilled financial discipline among the members, as evidenced by the high loan repayment rates. This will contribute to a cycle of continuous financial support, reducing economic vulnerability and enhancing income stability for marginalised households in the long run.
- **Improved Agricultural Productivity:** With increased irrigation coverage and improved water conservation methods, farmers experienced enhanced crop yields. This will result in better food security, higher income levels, and greater economic resilience for farming households.
- **Health and Well-being:** Access to clean drinking water and improved sanitation facilities significantly reduced waterborne diseases. Complementing these services and conducting regular health check-ups will improve health outcomes and contribute to increased productivity through reduced medical expenses and an overall enhanced quality of life for community members.

- **Environmental Sustainability:** The plantation activities and soil and water conservation initiatives will have lasting benefits in combating soil erosion, improving biodiversity, and mitigating the effects of climate change.
- **Infrastructure Development:** The construction of essential community infrastructure, including village schools, water tanks and soak pits, will serve the coming generations, ensuring sustained improvements in overall living conditions.

SUSTAINABILITY

The program's long-term sustainability is reinforced by the presence of multiple factors, including community ownership, institutional mechanisms, and reliable financial models.

- **Local Capacity Building:** Development of local capacity to adopt sustainable practices in resource management, fostering behavioural change and resilience within the community.
- **Community Ownership:** VDCs and SHGs ensure continuous governance and resource allocation sanctioned by trained local leaders. Moreover, infrastructural projects are handed over to the local governmental bodies for further maintenance, enhancing accountability.
- **Participatory approach:** The creation of village development committees and SHGs and the involvement of parents in school management committees enhance participation and incorporate multiple views in the decision-making process.
- **Revolving Funds:** The disbursal of revolving funds in the form of loans results in financial sustainability as repayment allows for ongoing support for community enterprises. However, the sustainability of the project is threatened due to unclear lines of communication between stakeholders.
- **Infrastructure Investments:** Infrastructural support in the fields of education, water conservation, and sanitation improves long-term resource availability.

Suggestions Made by Stakeholders:

- **Regular Training and Capacity Building:** Continuous skill development for community members in areas like water management, sustainable agriculture, and SHG operations.
- **Community Ownership:** Increase involvement of the community at every stage of the project to strengthen their sense of responsibility and ownership.
- **Resource Availability:** Ensure a timely supply of resources and materials to avoid delays in implementation.

CHAPTER 4
INTRODUCTION

Interaction with the School Principal -Karanjawne

BACKGROUND AND NEED OF THE PROGRAM

Supported by Bajaj Auto Limited, the project is a crucial step towards addressing social inequalities exacerbated by the global pandemic. The upsurge in the number of COVID-19 cases pushed the country into a state of economic lockdown, with migrant workers being heavily impacted through the loss of their livelihoods. The strain on local health and medical resources also increased as these workers returned to their villages. The process took a heavy toll on the lives of people involved in the farm sector, rendering them more vulnerable than ever before. With schools being shut down and a lack of digital learning resources, student learning outcomes became abysmally low. Inadequate means of livelihood threatened nutrition and food security for the children.

To mitigate these issues, JBGVS undertook the exercise of institution building, capacity building, and localised planning at the grassroots, engaging with COVID-19-affected communities. These activities primarily included a range of farm and non-farm opportunities for the in-migrants, which would help them to suitably build their capacities to address the aftermath of the pandemic. Therefore, with the goal of building resilient communities, the project promoted integrated development strategies to improve the lives of marginalised communities.

OBJECTIVES OF THE PROGRAM

COMMUNITY DEVELOPMENT INITIATIVES

To establish and empower vibrant village institutions (formal/ non-formal), which are owned by the community and work towards the their holistic, self-reliant, and sustainable development.

COMMUNITY DEVELOPMENT INITIATIVES

To ensure quality school infrastructure in program areas, promoting a healthy school environment and improving sanitation and safety for children.

To improve the learning outcomes of school children.

To engage parents with school administration through active participation in School Management Committees.

To develop the personality and skills of children through non-formal education.

BAJAJ HEALTH INITIATIVE

To improve the health status of villagers/ people residing in rural and urban areas.

To strengthen the rural health service chain from Gram Panchayats to the District level by equipping them with required infrastructure support, especially to fight COVID-19.

Special emphasis on awareness creation about COVID-19 in villages/ urban areas in association with local government authorities.

LIVELIHOOD (ON-FARM AND NON-FARM):

Creation of livelihood support opportunities for families/households affected by the aftermath of COVID-19

ENVIRONMENT

To conserve soil and water in program areas, with the aim of securing drinking water in villages and ensuring life-saving irrigation for agriculture and horticulture.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER - JANKIDEVI BAJAJ GRAM VIKAS SANSTHA-JBGVS

Established in 1987 by the Bajaj Group, Jankidevi Bajaj Gram Vikas Sanstha (JBGVS) is a non-profit organisation dedicated to the holistic development of rural areas in the country. It aims to empower rural communities using sustainable and participatory approaches inspired by the vision of the late Jankidevi Bajaj, a renowned social reformer and Gandhian. With its core philosophy of self-reliance and public ownership, the organisation works across multiple thrust areas, including education, health, livelihood, and women's empowerment. It seeks to integrate traditional wisdom with modern solutions, ensuring that development is context-specific and inclusive. The organisation primarily operates in Maharashtra, Rajasthan, and Uttarakhand, covering numerous villages and impacting thousands of lives.

INTERACTION WITH A BENEFICIARY

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited commissioned SoulAce to assess the impact of its CSR initiative by conducting a study on the work done by JBGVS on developing integrated development strategies for marginalised rural communities.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

To evaluate the immediate impacts of the implemented program and assess the enduring impacts of the program.

To measure the extent to which the program has contributed to the overall community development of these rural areas.

To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders, such as community members, local Panchayat members and project staff, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- the community members yielding statistical insights and identifying trends. By employing a mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries, stakeholders, and those responsible for project implementation. Engaging stakeholders like community members, local Panchayat officials, members of institutions like Village Development Committees, Water-User Groups, as well as project staff through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of improvements in the overall living conditions through the interventions done by the JBGVS team. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques are employed to evaluate the project and impact through data analysis objectively. Surveys and questionnaires are utilised to collect numerical data on various indicators from beneficiaries of each program. By collecting such data after the intervention about the project and its effects, the enhancements it has facilitated can be assessed. These quantitative methods provide a measurable approach to gauge the project and outcomes and evaluate its success through statistical evidence.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including field notes, interviews with beneficiaries, interactions with community and institution members, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact.

Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method. Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

DESIGN SNAPSHOT

Name of the project

Integrated Rural and Urban Development Program

Implementing agency

Jankidevi Bajaj Gram Vikas Sanstha

Research design used

Descriptive research design

Sampling technique

Random and Purposive sampling

Sample size

150 beneficiaries

Qualitative methods used

Case studies, semi-structured interviews, and focus group discussions with beneficiaries and key stakeholders

KEY STAKEHOLDERS

- Beneficiaries
- Community members
- Local Panchayat Officials
- Village Development Committee members
- SHG members
- Water Management Committee members
- Project Staff

STUDY TOOLS

Questionnaires for primary beneficiaries – Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys. Questionnaires and focus group discussion guide for the beneficiaries and stakeholders – A semi-structured questionnaire and focus group discussion guide were developed for each type of sample of this group. Stakeholders were identified across the focus areas. Semi-structured questionnaires and focus group discussions were conducted with local Panchayat officials, community and institution members, and project staff.

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. Adhering rigorously to ethical principles of research, the study prioritised the rights and well-being of participants throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Crucially, participation was fully voluntary, free from coercion or pressure, underscoring the importance of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

LIMITATIONS

Various aspects of the study design were largely impacted by several limitations. For example, the sampling across project locations was done based on the field locations chosen by the implementing agency. It was difficult to capture the project impact even in these locations as the implementing agency could not mobilise the beneficiaries due to a lack of on-ground presence after project completion. Furthermore, it was difficult to garner project information (with reference to the project locations, beneficiaries per project, and overall mobilisation process) as the person/s involved in the project are not a part of the organisation.

INDICATORS USED

Impact Area	Indicators
Mobilisation and Outreach	Beneficiary selection
Village Governance and Leadership	VDC Membership status and engagement
	Capacity Building & Training
	Revolving Fund corpus
Financial Inclusion through Livelihood Generation	SHG membership status
	Training and implementation
	Revolving Fund availability and repayment rates
	Income Level Increase
Water availability	Access to Clean Drinking Water
	Irrigation Facilities
	Agricultural Productivity Enhancement
Healthcare accessibility	Camps attended
	Incidence of diseases
Environmental Sustainability	Soil Testing
	Survival rates of trees
	Food Security
Educational Improvement	Infrastructure enhancement
	Learning outcomes

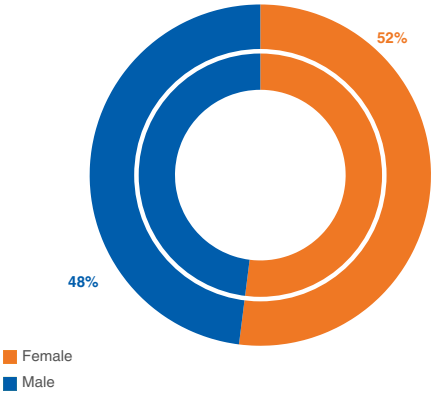
CHAPTER 6
KEY FINDINGS AND IMPACTS

FGD-Deshmukhwadi (Khed)

This chapter synthesises findings from primary data sources to assess the program's overall impact and efficacy. It incorporates both qualitative and quantitative data collected through comprehensive surveys and in-depth stakeholder interactions. A single household survey was used to collect information for all project activities across sample project locations. The data captured in these surveys gives an overview of the project impact; however, due to the limitations of project details and beneficiary data, the findings have been combined and commonly presented for all project locations. The key findings and impact of each of the projects have been highlighted below.

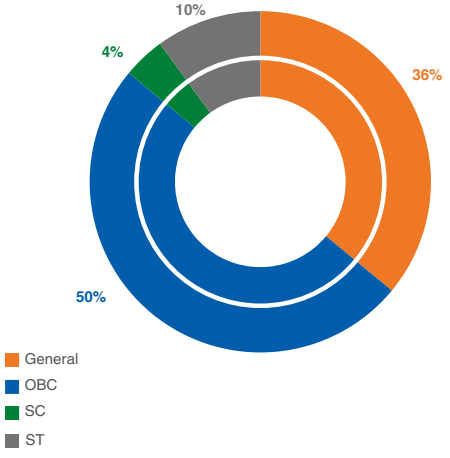
DEMOGRAPHICS, INCOME AND LAND OWNERSHIP STATUS

CHART 1: GENDER-WISE DISTRIBUTION



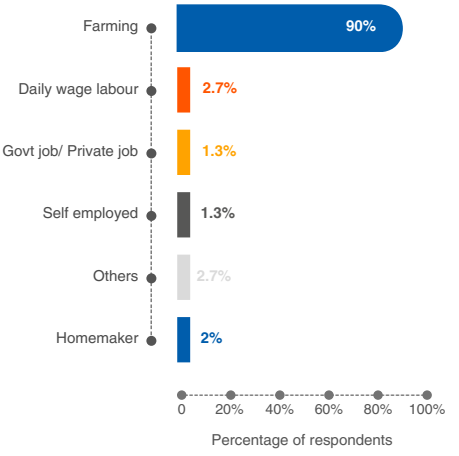
The survey saw higher participation from women (52%) than men (48%).

CHART 2: SOCIAL CATEGORY



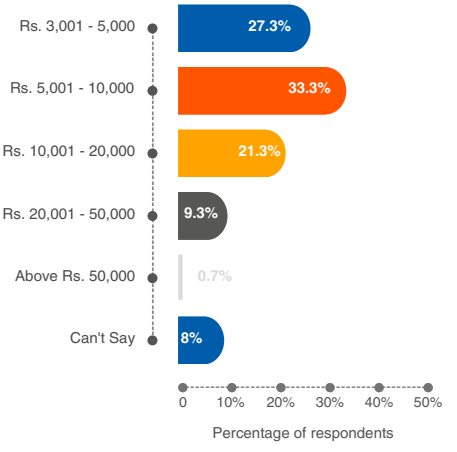
50%
of the respondents belonged to the Other Backward Classes category, forming the majority group in the survey, followed by the Open category (36%).

CHART 3: PRIMARY OCCUPATION OF THE HEAD OF THE FAMILY



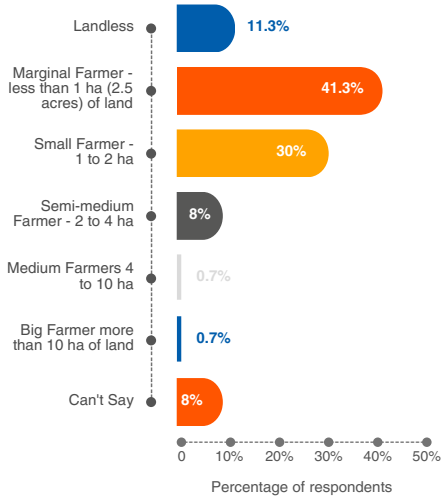
90%
of the respondents were engaged in farming as their primary source of sustenance.

CHART 4: MONTHLY HOUSEHOLD INCOME



33.3%
of the respondents earned a monthly income between Rs. 5000 to Rs. 10,000, while 27.3% of them earned between Rs. 3000 and Rs. 5000. 21.3% of them earned between Rs. 10,000 and Rs. 20,000. 9.3% of respondents earned between Rs. 20,000 to Rs. 50,000, and only 0.7% of the respondents said that they earned more than Rs 50,000 per month.

CHART 5: LAND OWNERSHIP



41.3%
of the respondents were marginal farmers owning less than 1 hectare of land, followed by small farmers owning 1 to 2 hectares (30%). 11.3% of them did not own any agricultural land.

Group discussion with beneficiaries from Velhe underscored that migration of the youth to the nearest cities, no community work, unemployment, inadequate income generation activities and lack of knowledge in livestock management remained the main problems of the villages earlier.

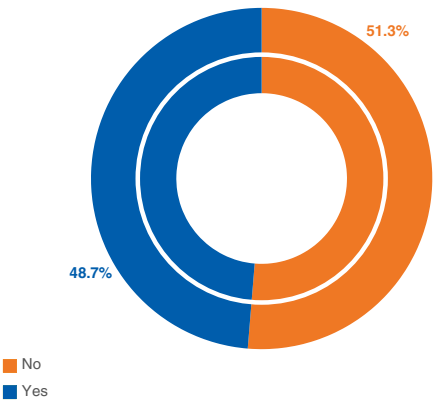
INTERACTION WITH A BENEFICIARY (DESHMUKHWADI)

INTERACTION WITH A TEACHER (AKURDI)

KEY FINDINGS

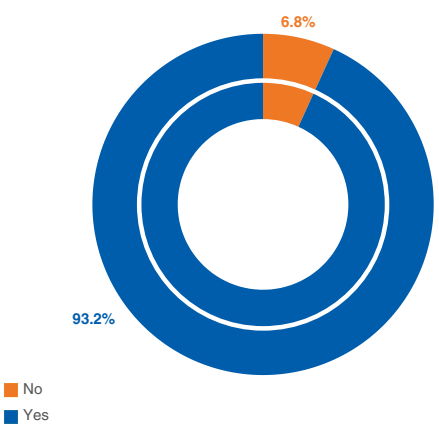
COMMUNITY DEVELOPMENT INITIATIVE

CHART 6: MEMBERSHIP IN VILLAGE DEVELOPMENT COMMITTEE (VDC) OR REVOLVING FUND MANAGEMENT COMMITTEE DURING PROJECT DURATION



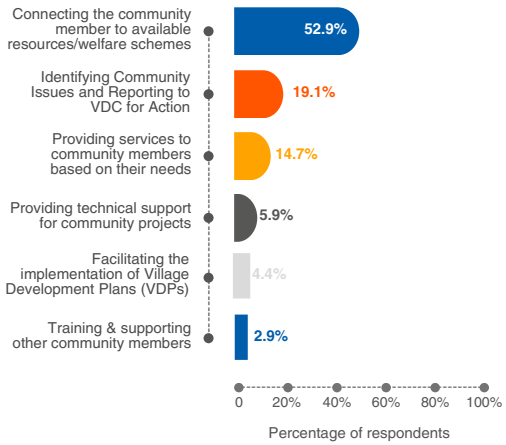
48.7%
(73 beneficiaries) of the respondents were members of the village development committee or the revolving fund management committee.

CHART 7: RECEIVED TRAINING AS A SERVICE PROVIDER BY THE VILLAGE DEVELOPMENT COMMITTEE (VDC)



93.2%
(68 beneficiaries) of them received training as a service provider by the Village Development Committee.

CHART 8: ROLE AS A SERVICE PROVIDER TRAINED BY THE VDC

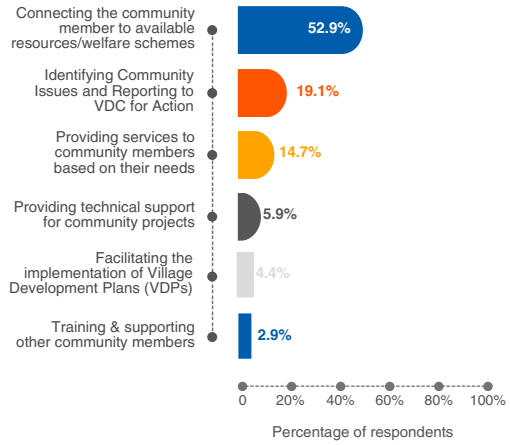


Responsibilities as Service Provider: Out of these 68 respondents, connecting the community member to available resources/welfare schemes was the major role played by 52.9% of the respondents, while 19.1% of them identified community issues and reported them to the VDC for action.

Interview with the project implementation head highlights that VDCs were trained on participatory village planning, documentation, revolving fund management, and their overall roles and responsibilities. Additionally, exposure visits of women groups and VDC members were conducted to learn good agricultural practices, explore new business opportunities, and learn from existing businesses.

Village Development Committees (VDCs) actively ensure regular VDC meetings, documentation, management of Revolving Fund-based livelihood promotion programs, conflict resolution and right beneficiary selection for livelihood programs. They also conduct regular reviews of work progress to ensure the community's active participation and contribution towards collective village developmental goals.

CHART 9: ROLE AS A SERVICE PROVIDER TRAINED BY THE VDC



Out of these 68 respondents, connecting the community member to available resources/welfare schemes was the major role played by 52.9% of the respondents, while 19.1% of them identified community issues and reported them to the VDC for action.

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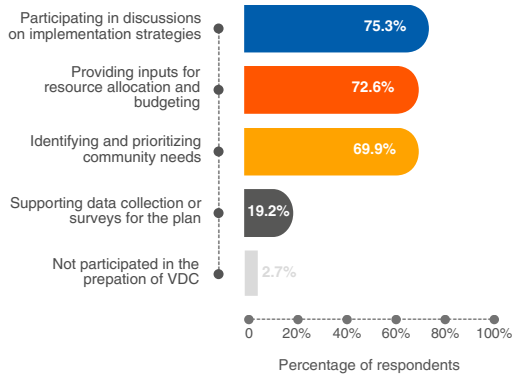
Excerpt from a FGD with SHG members in Sonde Karla, Velhe Taluka

"Yes, we went on an exposure visit to Baramati to learn about farming and business development. We got useful ideas about better farming methods and ways to earn more income."

CHART 7: ROLE AND CONTRIBUTION IN PREPARING THE VILLAGE DEVELOPMENT PLAN (VDP)



Participating in discussions on implementation strategies was a major activity undertaken by 75.3% of the respondents, while 72.6% of them provided inputs for resource allocation and budgeting. 69.9% of the respondents identified and prioritised community needs during the process.

Discussions with the VDC members revealed information about the multiple community development initiatives undertaken by the VDC. These included the promotion of animal husbandry, construction and maintenance of the village school, construction of a water tank for potable water, the establishment of flour mills, health plan implementation, plantation set-up, distribution of toys in Anganwadi, construction of toilets and improved water and sanitation facilities.

Excerpt from a FGD with VDC members in Deshmukhwadi, Khed

"The formation of SHGs and Gram Sangh has brought the community together, helping us support each other and work towards more income generation activities. The activities and interventions helped us learn about development initiatives, increased our participation in community affairs, and strengthened our ability to tackle village issues. As a VDC team, we gained confidence in solving problems and improving our community."

CASE STUDY

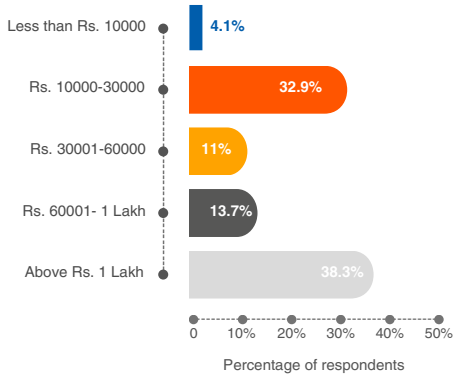
Subhash Navle, a 34-year-old resident of Wahagaon-Khed village, was appointed as a Community Resource Person (CRP) under Bajaj's development initiatives. Through this role, Subhash gained valuable knowledge, developed leadership skills, and confidently managed Village Development Committees (VDCs) at the Taluka level.

Before joining Bajaj's program, he found it difficult to actively engage in community development activities. However, with the training and support he received, he is now a key contributor to various initiatives, making a meaningful impact. His dedication has earned him the position of Vice Sarpanch of his village, a role that fills both him and his family with immense pride.

Wahagaon-Khed was once geographically and economically disadvantaged, forcing many youths to migrate to cities for better opportunities. However, following the dam project, positive changes have begun to take shape. Unlike others, Subhash chose to stay back and work towards the betterment of his village, and today, he is proud to witness people returning home to rebuild the community.

With Bajaj's continued support, the village is now embracing sustainable business models, including a dairy supply system that boosts the local economy.

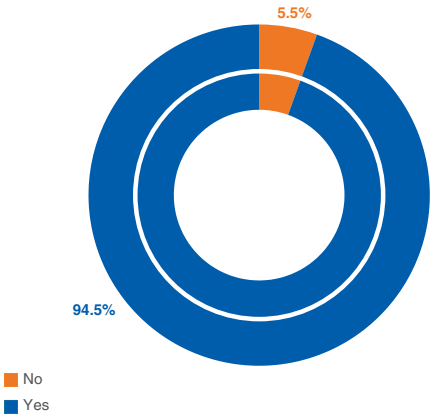
CHART 10: AMOUNT HELD BY VDC FOR REVOLVING FUND DISBURSEMENT TO COMMUNITY MEMBERS



38.3%

of the respondents reported that their VDC held more than Rs. 1,00,000 to be used as a revolving fund for the community, whereas 32.9% of them highlighted that the amount held was between Rs. 10,000 and Rs. 30,000. This difference in amount was owed to the overall substantial needs of the village, with more amounts being disbursed in the most marginalised villages.

CHART 11: ON-TIME REPAYMENT OF LOANS BY THE MEMBERS



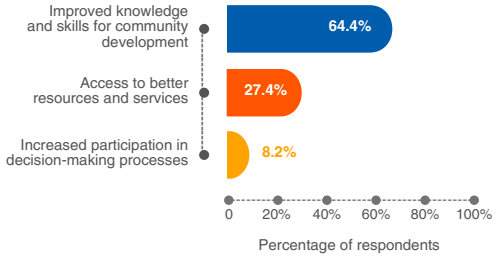
The revolving fund given to community members as loans are repaid to the respective VDCs, as per 94.5% of the respondents.

A revolving fund is a sum of money that can be used to finance a group on the condition that any loans taken out must be repaid, so the fund is available again. Revolving funds can help self-help groups (SHGs) meet their members' credit needs.

INTERACTION WITH THE SARPANCH - VIRHAM (KHED)

KEY IMPACTS

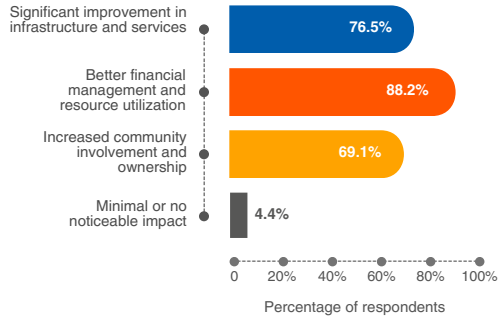
CHART 12: MOST SIGNIFICANT BENEFIT OF VILLAGE DEVELOPMENT COMMITTEE (VDC) MEMBERSHIP



64.4%

of the respondents highlighted improved knowledge and skills for community development to be the foremost benefit of VDC membership, whereas, for 27.4% of the respondents, improved access to better resources and services was the biggest benefit. 8.2% of respondents mentioned increased participation in decision-making processes as the most beneficial aspect for them.

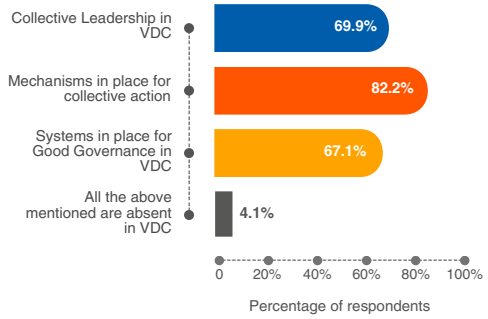
CHART 13: IMPACT OF VILLAGE DEVELOPMENT PLANS (VDPS) ON THE COMMUNITY



Better financial management and resource utilisation were among the major impacts of the village development plans, as mentioned by 88.2% of the respondents. 76.5% of them thought that there was a significant improvement in infrastructure and services, while 69.1% of them believed that the plans had increased community involvement and ownership.

The community helped make the project successful by taking part in planning and decision-making. They provided labour, shared local materials, and worked together to solve problems, making the work easier and faster.

CHART 14: STATEMENTS ABOUT THE VILLAGE DEVELOPMENT COMMITTEE (VDC), THE RESPONDENTS AGREE WITH



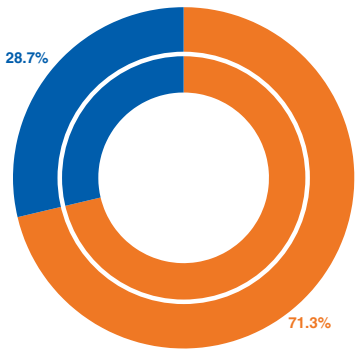
With regard to the village development committee, 82.2% of the respondents feel that there are mechanisms in place for collective action. Adequate collective leadership and the presence of systems for Good Governance were experienced by 69.9% and 67.1% of the respondents, respectively.

INTERACTION WITH A PARENT

KEY FINDINGS

LIVELIHOOD INTERVENTION

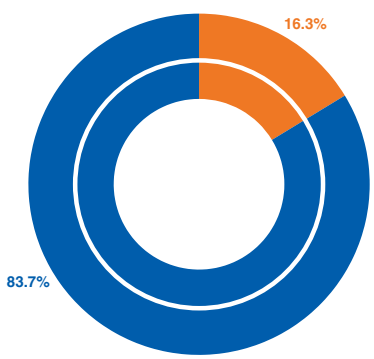
CHART 15: FAMILY MEMBERS' PARTICIPATION IN SELF-HELP GROUP (SHG) DURING THE PROJECT TENURE



No
Yes

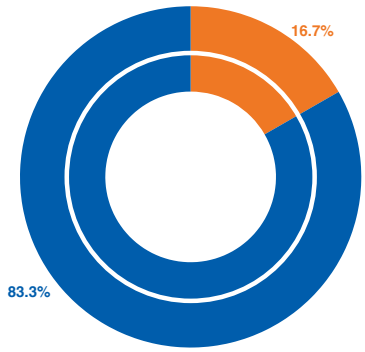
28.7%
(43 beneficiaries) of the respondents mentioned that their family member was part of the Self-Help Group during the project. These members received training on topics like conflict resolution in groups, saving and credit data updating, bank linkages and business opportunity identification.

CHART 16: TRAINING RECEIVED ON LIVELIHOODS AND INCOME GENERATION



No
Yes

CHART 17: IMPLEMENTATION OF THE TRAINING RECEIVED



No
Yes

83.7%
(36 beneficiaries) of the respondents received training on topics related to livelihood and income generation, such as animal husbandry and agriculture, effective strategies for running a group, information on small businesses, identifying business opportunities and implementing livestock farming projects alongside training on tailoring and information about various businesses and financial assistance. 83.3% of them implemented the learnings from these training sessions to achieve their desired income generation goals.

Interviews with the SHG members revealed that the objectives of the training sessions were to understand the revolving fund model, documentation and record keeping, roles and responsibilities of members of the revolving fund management committee, etc. Discussions with the project implementation team also underscored that the agenda of these training sessions was the importance of the Panchasutra of SHG, bank linkage, livelihood development through SHGs, and conflict resolution in groups.

The Panchsutra of SHG refers to the five core principles of a Self-Help Group. These principles are regular meetings, regular savings, regular internal lending, regular repayment, and good bookkeeping (proper books of account).

CHART 18: RECEIVED REVOLVING FUND FOR INCOME GENERATION ACTIVITY

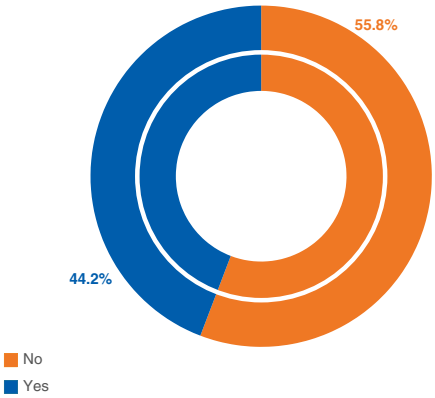
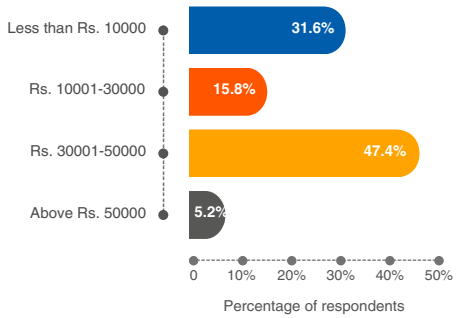


CHART 19: AMOUNT RECEIVED AS A REVOLVING FUND FOR INCOME GENERATION ACTIVITY



44.2%

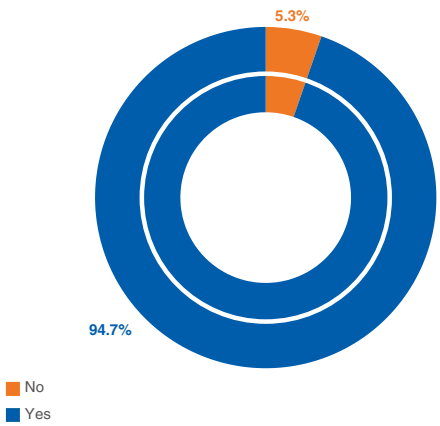
(19 beneficiaries) of the respondents received revolving funds for their livelihood generation activity. 47.4% of them received loans between Rs. 30,000 and Rs. 50,000, while 31.6% of them received less than Rs. 10,000. Only 5.2% of the respondents received loans above Rs. 50,000.

However, respondents also highlighted that the disbursal of revolving funds in Khed was discontinued at one point due to the shift of organisational policies. The implementation team from JBGVS handed over the responsibilities of running the revolving fund program to another organisation (Chaitanya Foundation), which charged heavy interest on an earlier zero-interest seed fund/loan. No consultation was done with the stakeholders before making this shift, which led to resentment among the villagers.

Another significant challenge highlighted by the respondents included the unfair distribution of revolving funds to beneficiaries. Nevertheless, the implementation team had clear selection criteria, which included the needs of the person, attendance consistency in meetings, and economic ability for repayment.

> "The revolving fund (RF) system was complex; for example, if a villager received 40k for a cow costing 1 lakh, they had to manage the remaining amount themselves. This made it difficult for many to complete the process and caused challenges in implementing the fund effectively. Many of them take out loans from banks and families."
>
> **Sarpanch, Karanjvihire, Khed**

CHART 20: WHETHER THE REVOLVING FUND RECEIVED WAS REPAID



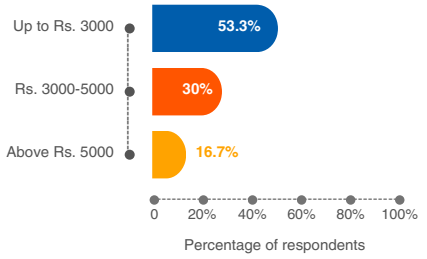
Among those who received the revolving fund, 94.7% of the respondents repaid the revolving fund received, highlighting a low default rate among the surveyed respondents.

This finding substantiates the project implementation team's data on recovery rates across implementation sites (78% recovery rate in Gokulwadi village, 90% in Varzadi village). Pradip Ajab Singjarwal from the Gokulwadi project field team also added that while the repaid loans were primarily used for providing new loans to members and covering group administrative costs, families unable to repay cited challenges such as market fluctuations, losses due to pest infestations on their farms, and unforeseen financial crises like medical emergencies.

KEY FINDINGS

LIVELIHOOD INTERVENTION

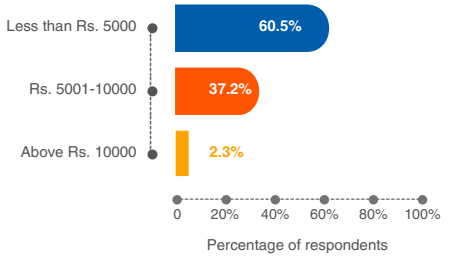
CHART 21: MONTHLY EARNINGS FROM THE INCOME GENERATION ACTIVITY



53.3%

of the respondents reported an income of up to Rs. 3000 through various income generation activities, while 30% of them reported it to be between Rs. 3000 and Rs. 5000. 16.7% of them saw a rise in income of more than Rs. 5000. Beneficiaries highlighted that the additional income from these activities was primarily utilised for agriculture, animal husbandry, livelihood activities, and meeting daily household needs.

CHART 22: MONTHLY AVERAGE TOTAL ADDITIONAL INCOME ACROSS ALL ACTIVITIES (SHG, GSF, LIVESTOCK FARMING, ETC)

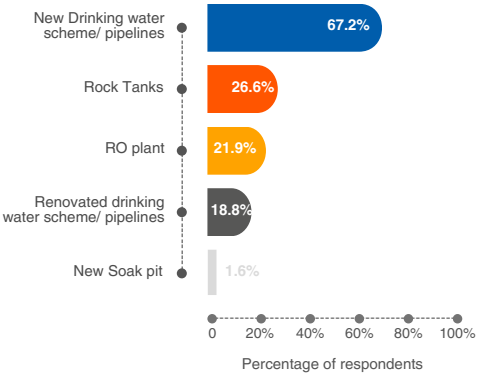


60.5%

of the respondents highlighted that they earn an average additional income of less than Rs.5,000 through all the income-generating activities (SHG, Livestock farming, etc.). 37.2% of them earned between Rs. 5,000 and Rs. 10,000. This shows substantial income support to the beneficiaries.

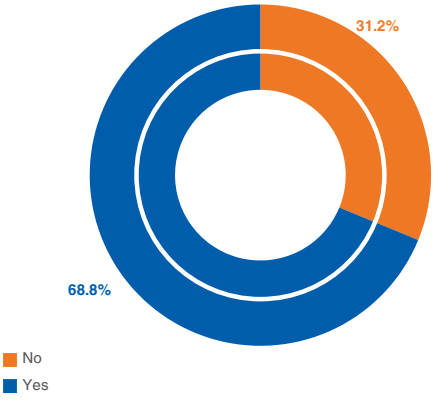
WATER CONSERVATION ACTIVITIES

CHART 23: INTERVENTIONS IMPLEMENTED IN THE VILLAGE



Out of a survey of 64 respondents who mentioned that water conservation activities were conducted in their villages, new drinking water schemes/pipelines for improving the quality of drinking water were introduced in most of the areas, as reported by 67.2% of the respondents. The creation of rock tanks and the installation of RO plants were also done, as mentioned by 26.6% and 21.9% of the respondents, respectively.

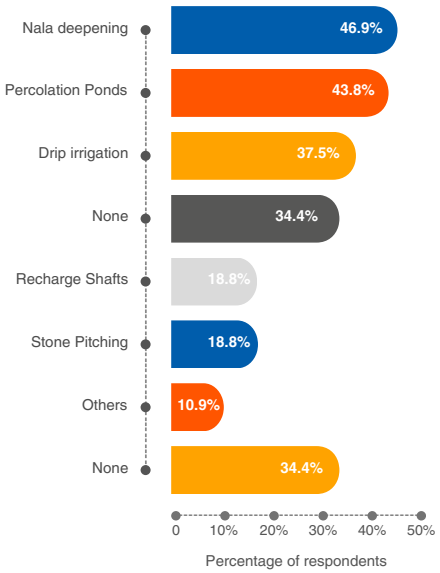
CHART 24: IMPLEMENTATION OF NEW IRRIGATION LINES OR REPAIR OF EXISTING ONES



68.8%

of the respondents mentioned that new irrigation lines or repair of existing ones were done in their area. Apart from this, major interventions included Nala deepening, construction of percolation ponds, and installation of drip systems.

CHART 25: INTERVENTIONS IMPLEMENTED IN THE VILLAGE



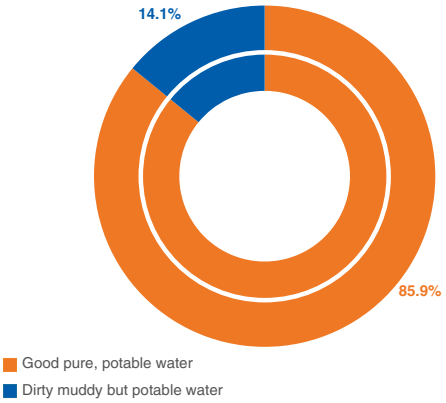
Alongside these activities, water management groups in the villages were also constituted to maintain these water structures.

Testimonial

Before the project was implemented, water scarcity was a constant struggle for our community. The wells often ran dry during critical periods, leaving farmers unable to irrigate their crops adequately. This not only reduced agricultural productivity but also forced many families to rely on unreliable or distant water sources for daily needs. The lack of water availability created financial instability, as farming was the primary source of income for most villagers. Moreover, the absence of community collaboration meant that people worked in isolation, without shared resources or collective solutions.

-Baban Gavli, Gram Panchayat Member, Shahapur Banjar village

CHART 26: QUALITY OF THE WATER RECEIVED



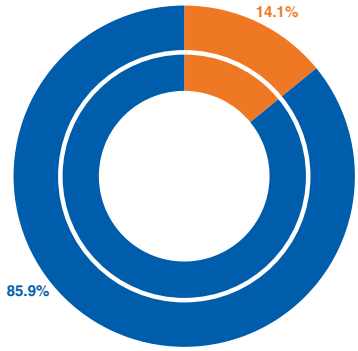
The majority of the respondents (85.9%) agree that the intervention has resulted in the availability of good and pure potable water.

During the group discussions with beneficiaries and local government officials, the SoulAce team found out that the availability of clean and potable water has significantly improved the health of community members by reducing waterborne diseases, epidemics, and infectious illnesses. It also enhanced the economic condition and quality of life by eliminating water scarcity, reducing the burden on women, and improving sanitation. Access to sufficient water has led to a healthier community with fewer conflicts and better living standards. Water Management Groups have also enhanced the efficiency of water usage in the village.

Excerpt from FGD with community members of Virham village, Khed

"Yes, a storage tank was built in our village, which allows us to get a consistent supply of water for daily use. It has also reduced the effort required to fetch water from faraway areas."

CHART 29: SATISFACTION WITH DRINKING AND IRRIGATION WATER ACTIVITIES IN THE VILLAGE



No
Yes

85.9%
of the respondents are satisfied with the overall drinking and irrigation water activities in the village.

DISCUSSION WITH THE STAFF AT PHC

KEY FINDINGS

PLANTATION ACTIVITIES

CHART 30: PLANTATION OF TREES DONE IN THE VILLAGE

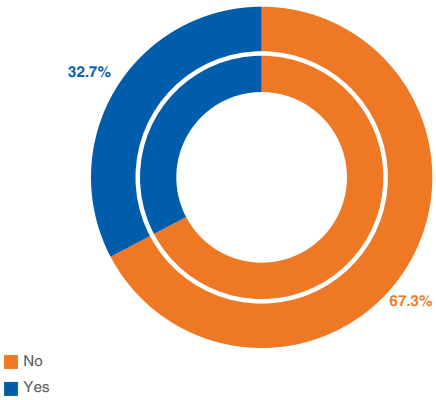
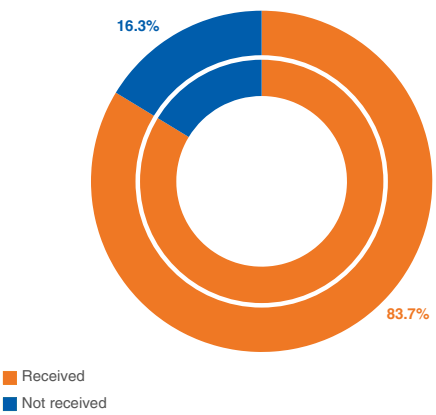


CHART 31: MONTHLY AVERAGE TOTAL ADDITIONAL INCOME ACROSS ALL ACTIVITIES (SHG, GSF, LIVESTOCK FARMING, ETC)



32.7%

of the respondents (49 beneficiaries) revealed that tree plantation activities were conducted in their village. Out of these respondents, 83.7% also received additional special training on plantation practices.

CHART 32: NO. OF THE PLANTATION DONE DURING THE PROJECT DURATION

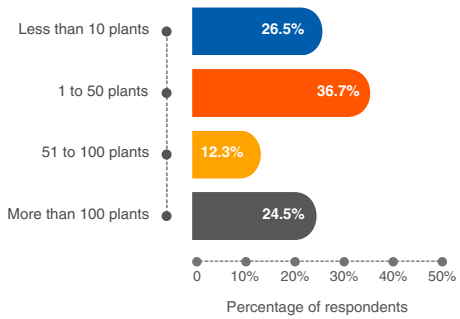
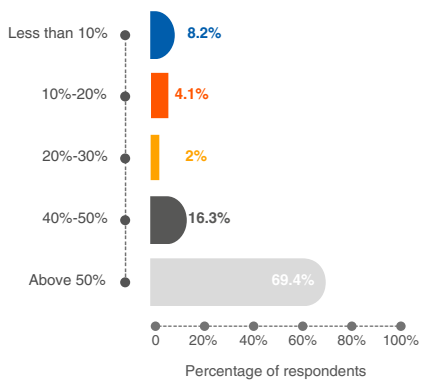


CHART 33: SURVIVAL RATE OF PLANTED TREES AND SAPLINGS



36.7%

of the respondents mentioned that up to 50 plants were planted in their area, while 26.5% of them reported the number of plants to be less than 10. 24.5% of the respondents witnessed the plantation of more than 100 plants.

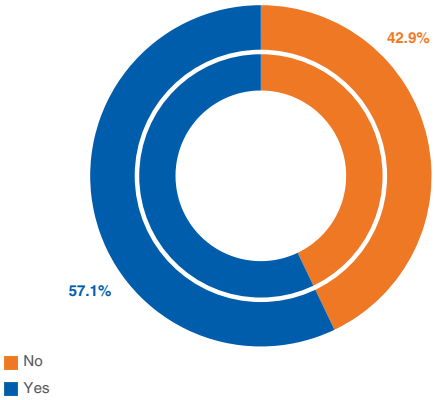
Out of these plantations, 69.4% of the respondents claimed a survival rate of above 50% of these plants. This finding corroborates the 70-80% survival rates of plantation trees, as mentioned by the project team.

While the mango and guava trees have had the highest survival rates, the bamboo plantation has been quite successful as well. The lemon and chikoo trees are contributing positively to the environment and local economy.

Farmers were also given detailed training on how to properly care for their trees and plants. The training included instructions on fertilisation, irrigation systems, and protecting plants from common pests and diseases.

KEY IMPACTS

CHART 34: ADDITIONAL EARNINGS OR BENEFITS FROM PLANTS/TREES

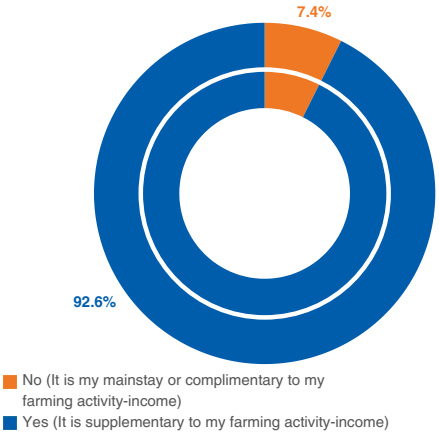


57.1%
of the respondents believe that they have received additional earnings or benefits from the plants.

Discussions with community members revealed that the trees and plants have brought multiple benefits, like providing fruits, flowers, firewood, and materials for making fertilisers. These resources, along with cleaner air and more rainfall, have helped improve crop yields and overall living conditions, improving quality of life.

LIVESTOCK FARMING

CHART 35: WHETHER LIVESTOCK FARMING AS A SUPPLEMENT TO FAMILY FARMING ACTIVITIES



92.6%
of the respondents (50 beneficiaries) highlighted that they engage in livestock raising as a supplementary form of income generation activity besides farming.

BENEFICIARY INTERACTION AT KARANJAWNE (VELHE)

CHART 36: WHETHER RECEIVED FUNDS FOR ADDITIONAL LIVESTOCK PROCUREMENT DURING PROJECT DURATION

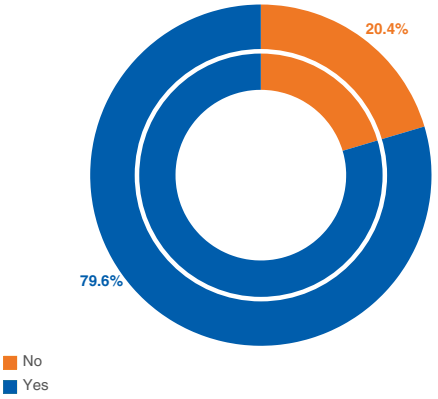


CHART 37: AMOUNT RECEIVED FOR ADDITIONAL LIVESTOCK PROCUREMENT

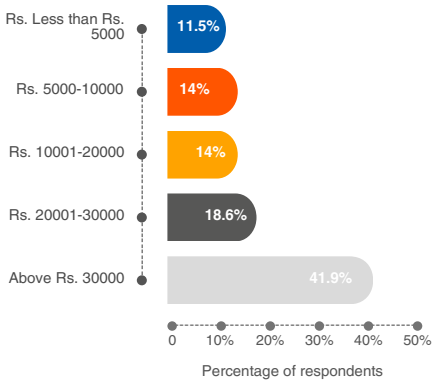
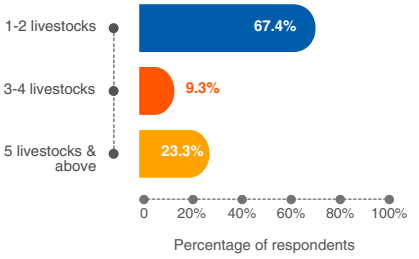


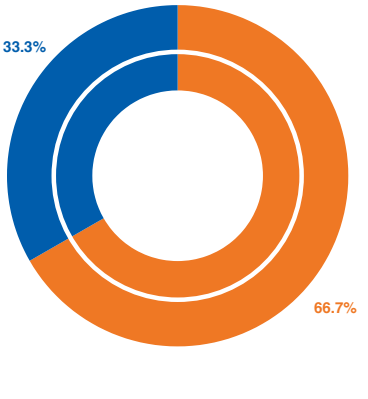
CHART 38: NO. OF LIVESTOCK PURCHASED



79.6%

of the respondents mentioned that they received funds for additional livestock procurement. 41.9% of them received an amount above Rs. 30,000, followed by 18.6% of them receiving between Rs. 20,000 and Rs. 30,000. The majority of the respondents (67.4%) purchased 1-2 livestock with the funds received.

CHART 39: UTILIZATION STATUS OF DISTRIBUTED FODDER SEEDS

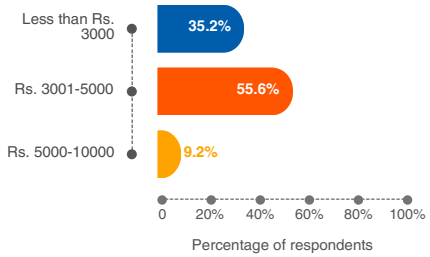


33.3%

of the respondents used fodder seeds for livestock consumption.

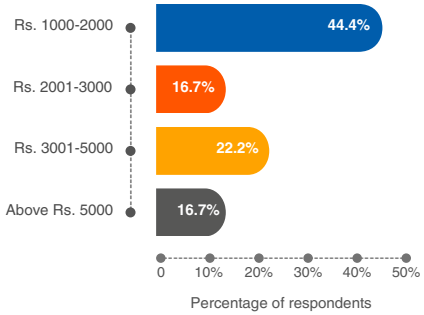
Our research team's interviews with beneficiaries highlighted that there was a shortage of fodder during COVID-19, and fodder seeds were provided. While the seeds helped farmers grow more fodder, the overall shortage was not fully solved. The distribution helped mitigate some of the issues, but the demand for fodder still exceeded the available supply.

CHART 40: ADDITIONAL INCOME GENERATED FROM MANAGED LIVESTOCK



55.6%
of the respondents reported an increase in income by Rs. 3,000 to Rs. 5,000, followed by an increase of less than Rs. 3,000 for 35.2% of them. 9.2% saw an increase between Rs. 5,000 and Rs. 10,000.

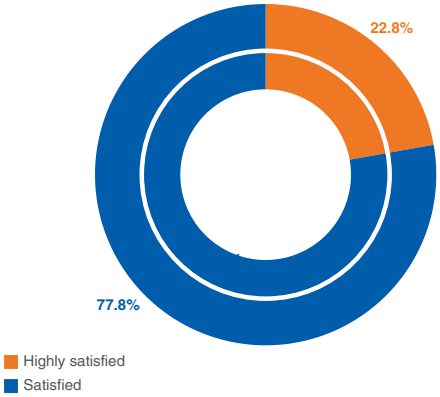
CHART 41: PERCEIVED COST SAVINGS FROM USING DISTRIBUTED FODDER SEEDS



Among the respondents who used the fodder seeds, 44.4% of the respondents agreed to have saved between Rs. 1000 and Rs. 2,000 due to the availability of fodder seeds through the project. 22.2% of them believed they had saved between Rs. 3,000 and Rs. 5,000.

In an interview with the project field team, Mr. Pradip Singjarwal (field team member and VDC member) also mentioned that a cattle feed manufacturing unit was set up in the Gokulwadi village and is still functional in the community. The unit has been instrumental in addressing the fodder shortage by providing a consistent supply of nutritious feed to farmers. It has had a significant impact on improving livestock performance, particularly during dry seasons when natural fodder is scarce.

CHART 42: LEVEL OF SATISFACTION WITH LIVESTOCK DEVELOPMENT INITIATIVE



77.8%
of the respondents were satisfied with the livestock development initiative, while 22.2% of them were highly satisfied.

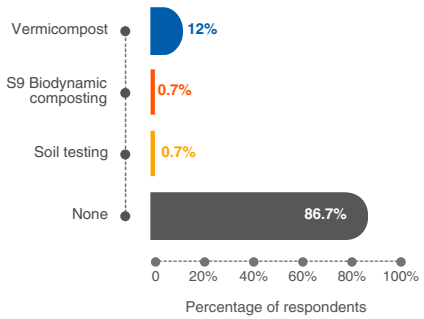
During the interviews with the beneficiaries, it was brought out that the veterinary camps, organised as part of these initiatives, provided valuable knowledge on livestock health, disease symptoms, and proper care. Participants learned about vaccination, feeding, and managing various health issues in animals, which enhanced awareness and improved livestock management. Additionally, financial assistance and guidance on buying healthy animals were offered to support better livestock farming practices.

INTERACTION WITH THE STUDENTS AT OTA, AKURDI

KEY FINDINGS

ORGANIC FARMING AND KITCHEN GARDEN ACTIVITIES

CHART 43: FARM ACTIVITIES IMPLEMENTED UNDER THE PROJECT



Out of the 20 respondents who highlighted that farm activities were conducted in their village, 12% of the respondents (18 beneficiaries) were a part of the vermicomposting activity undertaken during the project.

CHART 44: INITIATION OF KITCHEN GARDENS WITH TRAINING AND GUIDANCE FROM THE PROJECT

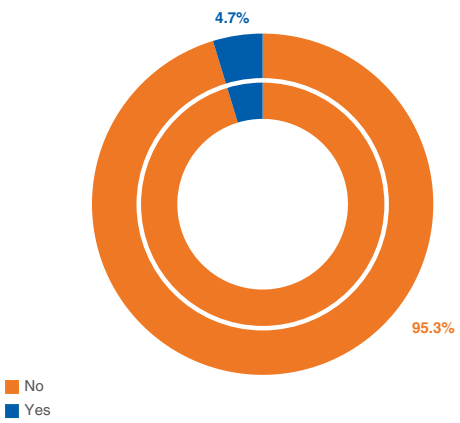
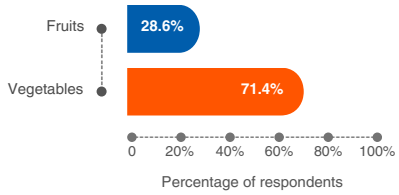


CHART 45: TYPES OF PLANTS GROWN IN THE KITCHEN GARDEN



Kitchen Garden Set-up: 4.7% of the respondents (7 beneficiaries) initiated kitchen gardens after receiving training and guidance from the project.

Variety of plants: 71.4% of the respondents grew vegetables in their kitchen garden, while the rest grew fruits.

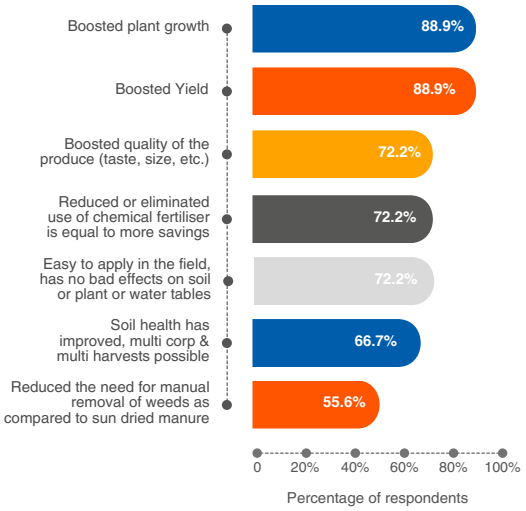
Alongside kitchen gardens, training was also conducted on the preparation of natural fertilisers like Amrit Jal, vermicomposting, and S9 Biodynamic composting.

The seeds and plants for kitchen gardens were primarily distributed for free through the organisation, at training camps, and at local fertiliser shops. Some were also provided by the village community as part of organic farming and kitchen gardening initiatives.

Interactions with community members from Varzadi village underscored that the training on preparing Amrit Jal using natural ingredients like leaves from neem, peepal, acacia, cotton, and cow urine with curd helped shift farmers towards natural farming practices, reducing the use of artificial fertilisers and promoting sustainable agriculture.

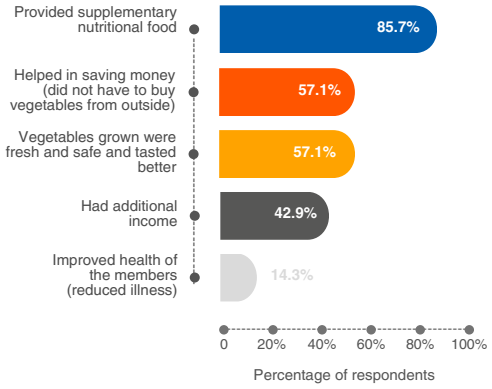
The use of Amrit Jal significantly reduced the reliance on chemical fertilisers, promoting organic farming and improving crop health. It also led to softer soil, better yields, and a decrease in pest infestations. As a result, there was a reduction in farming costs, including medication and fertilisers, improving the overall economic condition of farmers.

CHART 46: BENEFITS AND IMPACT OF VERMICOMPOST ON FARMING PRACTICES



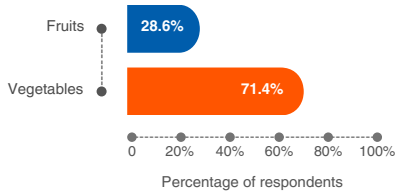
Boosted plant growth and yield were highlighted as the major benefits of vermicomposting by 88.9% of the respondents. Other key benefits include boosting the quality of the produce (taste, size, etc.), reducing or eliminating the use of chemical fertilisers, leading to more savings, and easy application in the fields with no side effects on soil or water tables, as mentioned by 72.2% of the respondents.

CHART 47: IMPACT OF KITCHEN GARDENS ON BENEFICIARIES



The kitchen garden provided supplementary nutritional food to 85.7% of the respondents, while it helped in saving the costs of procuring vegetables from the market and enhanced the availability of fresh and tasty home-grown vegetables for 57.1% of the respondents.

CHART 48: APPROXIMATE MONTHLY SAVINGS FROM KITCHEN GARDEN FRUITS AND VEGETABLES

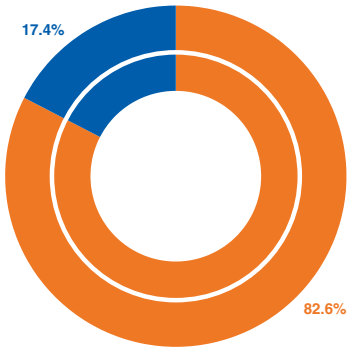


71.4%

of the respondents reported saving between Rs. 1,000 and Rs. 2,000 since they did not have to buy vegetables and fruits from the market.

> Around 40 kitchen gardens were successfully implemented across the project villages. The current status of these gardens is very promising, with many families continuing to maintain them and grow a variety of vegetables year-round. The health and well-being of beneficiaries have improved as a result of these gardens. Families now have access to fresh and organic vegetables, which has led to improved nutrition and overall health. These gardens have also contributed to reducing the costs of purchasing vegetables, benefiting families economically.
>
> **Raghunath Umaji Narode, Community member, Varzadi village**

CHART 49: LEVEL OF SATISFACTION WITH ORGANIC FARMING EFFORTS UNDER THE PROGRAM



Satisfied
Highly Satisfied

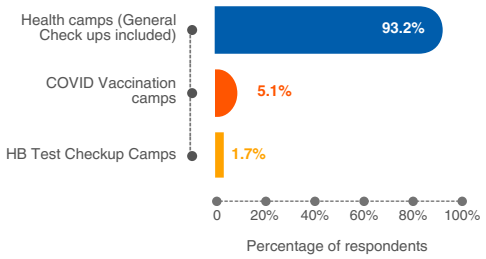
82.6%
of the respondents were satisfied with the organic farming efforts undertaken by the program team.

INTERACTION WITH THE SCHOOL PRINCIPAL

KEY FINDINGS

HEALTH AND SANITATION INITIATIVES

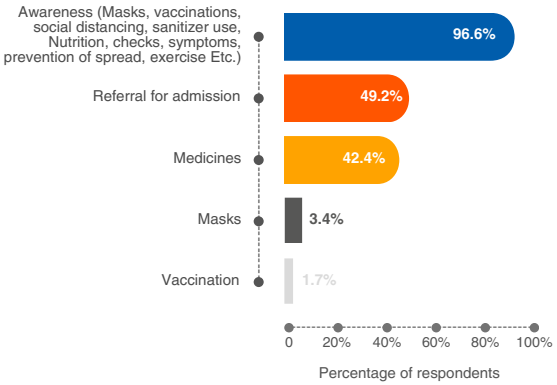
CHART 50: HEALTH INITIATIVES UNDERTAKEN IN THE VILLAGE



Among the 59 respondents who mentioned the presence of Bajaj Health initiatives in their village, 93.2% of the respondents were a part of the health camps organised by the project team.

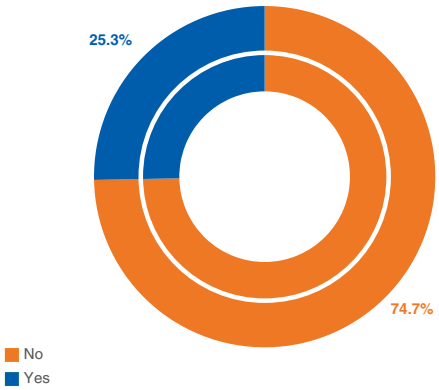
Discussions with the beneficiaries highlighted that these general health check-up camps provided regular health screenings, including blood tests, sugar checks, and vaccinations. These camps also focused on creating public awareness about common and epidemic diseases, their prevention, and timely treatment. Free medical services were offered, and villagers were educated on maintaining good health practices and improving overall well-being.

CHART 51: SERVICES RECEIVED FROM COVID-19 COMMUNITY CAMPS



Basic services like providing referrals for admission of COVID-19 patients, medicine and mask distribution, and vaccination were received by 49.2%, 42.4%,3.4% and 1.7% of the respondents, respectively. Camps also led to the creation of awareness around the use of masks, vaccinations, social distancing, sanitiser use, nutrition, checks, symptoms, and prevention of spread for 96.6% of the respondents.

CHART 52: SOAK PIT CONSTRUCTION FOR WASTEWATER DISPOSAL IN OR NEAR THE HOME



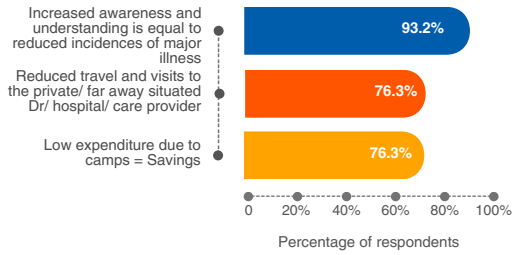
To enhance the status of cleanliness and hygiene in the village, soak pits were constructed for wastewater disposal in or near the homes of 25.3% of the respondents (38 beneficiaries).

A soak pit is specifically designed to collect and slowly release grey water waste water into the ground through its porous structure, allowing the soil to naturally filter and absorb the water.

SHAHAPUR KANJAR TOILET BLOCK FOR SCHOOL

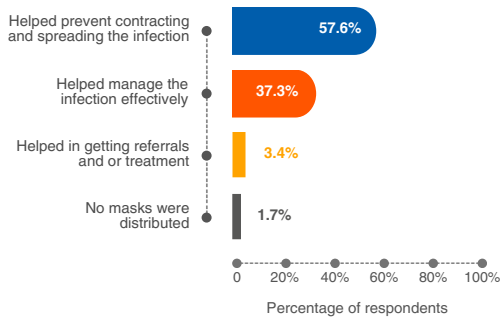
KEY IMPACTS

CHART 53: BENEFITS RECEIVED FROM THE HEALTH CAMPS



Increased awareness and understanding of diseases, leading to reduced incidences of major illnesses, was reported as the major benefit of the health camps by 93.2% of the respondents. This was followed by a reduction in travel time and financial expenses, along with low expenditure on medical check-ups.

CHART 54: BENEFITS GAINED FROM COVID-19 COMMUNITY CAMPS TO THE RESPONDENTS AND THEIR FAMILIES



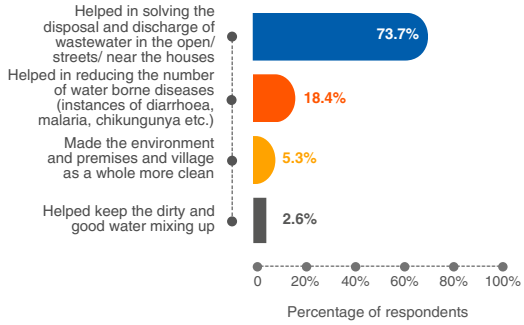
57.6%

of the respondents believed that these special camps helped prevent the contracting and spreading of the COVID-19 infection.

> "In the village, general health check-up and HB test check-up camps were held, with 4 health camps organised throughout the year. These camps provided free health services, including screenings for blood sugar, blood pressure, and haemoglobin levels. The results of the camps showed a significant number of villagers had issues like iron deficiency and high blood pressure, which were addressed through counselling and follow-up treatments. As a result, there was an increase in health awareness and early diagnosis of potential health problems, leading to improved community health overall.
>
> **Umaji Narode, Community member, Varzadi village**
>
> "

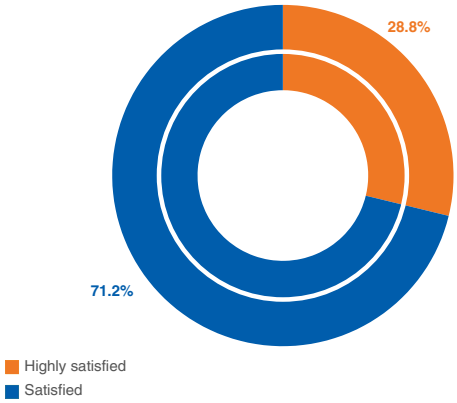
> "Awareness camps on COVID-19 prevention and the importance of vaccination were organised in the village, reaching out to both adults and children. During these camps, the community was educated on the signs and symptoms of COVID-19, how to prevent its spread, and why getting vaccinated is crucial. The outcome of these sessions was highly effective, with vaccination uptake increasing significantly and the village adopting more COVID-19 appropriate behaviours, such as regular handwashing and mask-wearing. This resulted in fewer COVID-19-related cases in the community, which was a direct impact of the increased awareness."
>
> **Pradip Singjarwal, VDC member, Gokulwadi village**
>
> "

CHART 55: IMPACT OF SOAK PIT CONSTRUCTION



The soak pits helped in solving the problem of disposal and discharge of wastewater in the open, as revealed by 73.7% of the respondents.

CHART 56: SATISFACTION LEVEL WITH HEALTH INITIATIVES IN THE VILLAGE



71.2%

of the respondents were satisfied with the health initiatives undertaken in their village.

INTERACTION WITH SARPANCH (KARANJVIHIRE KHED)

KEY FINDINGS

EDUCATION INITIATIVES

CHART 57: WHETHER A MEMBER OF THE PTM TEAM (PARENTS)

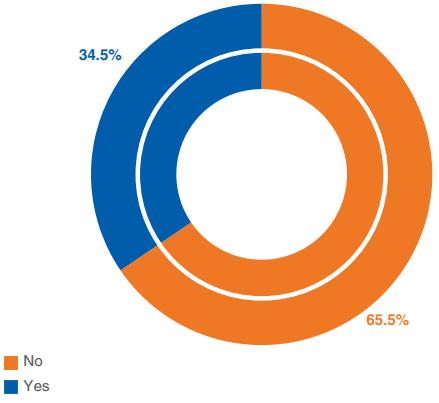
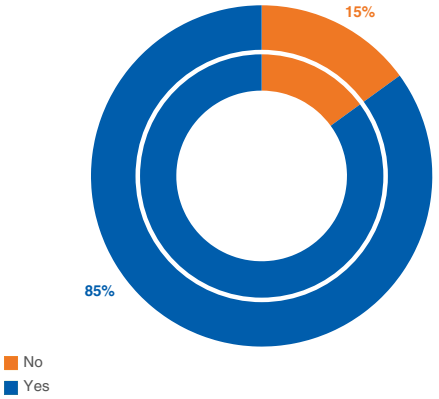
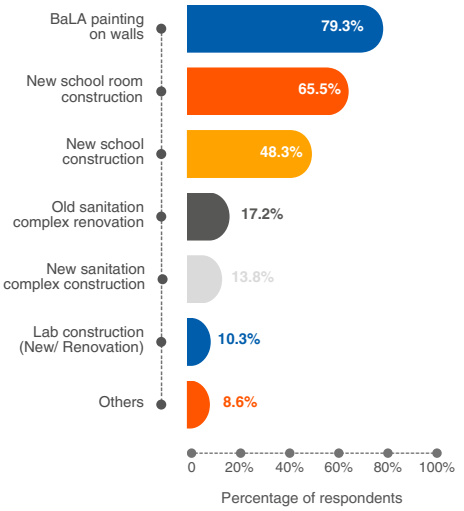


CHART 58: WHETHER ATTENDING PARENT-TEACHER MEETINGS REGULARLY



Out of the 58 respondents who reported the presence of Bajaj Education Initiatives in the village, 34.5% of the respondents were members of the PTM team, and 85% of them attended the parent-teacher meetings regularly.

CHART 59: EDUCATION INITIATIVES CARRIED OUT IN THE SCHOOL IN THE VILLAGE



79.3%

of the respondents confirmed that BaLa paintings were done on the school walls in their village, followed by new classroom construction for 65.5% of them. 48.3% of them benefited from the new school constructed in the area.

Shiksha Protsahan Kendra was also created as part of the project. The role of the SPK was to bridge the gap between formal education and the community's educational needs. It served as a supplementary learning space where students could receive additional academic support, especially in subjects they found challenging.

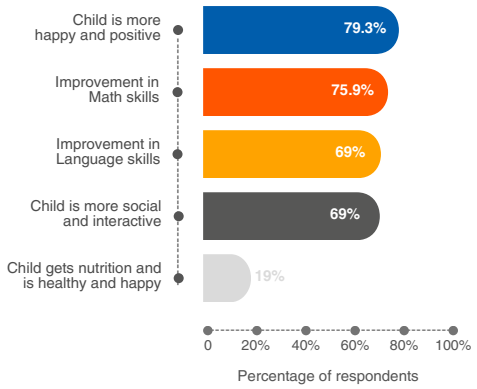
CASE STUDY

Rahul Prakash Waghmare, a 7th-grade student at Z.P. Cluster School, Panshet Velhe, hails from the Katkari tribal community, where economic hardship and social challenges are a daily reality. While his father struggles with alcoholism, his mother is the sole breadwinner, and their family survives on fishing and daily wage labour.

Despite these adversities, Rahul's resilience and determination set him apart. The facilities and support provided by his cluster school have transformed his life, offering him not just education but also the confidence to dream big. He is passionate about running, and despite having to travel 12 kilometres daily, he remains committed to both academics and athletics.

Rahul's dedication has led him to win a district-level championship in running, often competing barefoot. His teachers play a pivotal role in encouraging his participation in sports, recognising his talent, and motivating him to push his limits. Their unwavering support has instilled in him the belief that he can achieve great things beyond the limitations of his circumstances.
Determined to break free from the cycle of hardship, Rahul aspires to build a brighter future for himself.

CHART 60: IMPACT OF ENROLMENT IN "SHIKSHAPROTSAHAN KENDRA" (SPK) ON CHILD



Perceived benefits of Shiksha Protsahan Kendra:

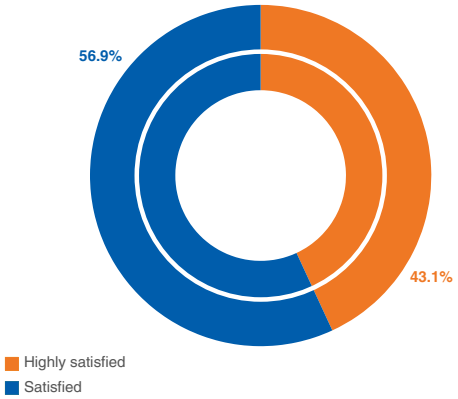
Positivity: 79.3% of the respondents felt that their child is happier and more positive now.

Learning Outcomes: 75.9% of the respondents found that their child has improved mathematical skills, while 69% of them saw an improvement in their child's language skills.

Behavioural: 69% of the respondents felt that their child is more social and interactive now.

As highlighted by community members in the discussions, the Kendra was also crucial in increasing awareness about the importance of education, particularly among families who had limited access to resources or struggled with educational challenges at home.

CHART 61: SATISFACTION LEVEL WITH THE SUPPORT PROVIDED IN THE SCHOOL



Perceived Overall Satisfaction: 56.9% of the respondents were satisfied with the support provided in the schools.

SHG PRESIDENT WITH SOULACE TEAM

KEY CHALLENGES AND BARRIERS

INITIAL RESISTANCE FROM THE COMMUNITY

There was initial apprehension among the beneficiaries in areas where the organisation did not have any previous footprints. This was tackled through extensive community mobilisation efforts. Some community members were also hesitant to adopt new technologies or business models due to a traditional mindset.

LACK OF RESOURCES

Delays were caused by limited financial resources and the unavailability of skilled labour. Weather conditions, such as heavy rains, interrupted construction activities and agricultural interventions.

COMMUNICATION GAPS

Communication gaps occasionally arose between project teams and villagers, requiring extra efforts to align goals and expectations.

07. SWOT ANALYSIS

STRENGTHS

- **Comprehensive Approach:** The program works to mitigate the social distress of underprivileged communities and takes a holistic approach towards community advancement through various livelihood, education, health, infrastructure, and financial inclusion initiatives.
- **Targeted intervention:** It focuses on marginalised communities with limited or no resources, which have been further impacted by the pandemic.
- **Multi-Sectoral Interventions:** The program design encompasses a wide range of initiatives such as livelihood generation, school infrastructure improvement, drinking water availability, and irrigation facilities.
- **Capacity-building efforts:** For most of the initiatives, the program undertakes capacity-building sessions to strengthen the community members with complementary knowledge and skills.
- **Public-Private Collaboration:** Handing over public infrastructure projects to the local government after completion ensures sustainability in the long run.
- **Efficient utilisation of resources:** The project has created a cadre of committee members and SHG members who can efficiently manage the revolving funds and ensure repayment for further investments.
- **Established Trust with Bajaj:** The organisation has garnered trust through its proven positive impact of past initiatives, which makes it easier for them to implement these initiatives.

WEAKNESSES

- **Lack of clear communication:** The program team did not communicate policy changes to the beneficiaries, particularly during the transfer of ownership of the revolving funds initiative, which has caused resentment.
- **Insufficient expectation setting:** The inability to clearly highlight the selection criteria for beneficiary selection for various initiatives has led to the creation of negative sentiment among the beneficiaries.
- **Infrastructure and Resource Delays:** The scarcity of human resources, particularly during certain seasonal months, resulted in the delay of timelines of infrastructural support initiatives.
- **Coordination Issues:** As highlighted by the beneficiaries, coordinating with multiple stakeholders was a challenge, given the vast scope of the project.
- **Transition Issues:** When Bajaj's work was handed over to another organisation, the new entity's performance was unsatisfactory, leading to halted revolving fund activities and stalled livelihood projects.

THREATS

- **Community Divisions:** Unequal benefit distribution, along with suspicions around biased beneficiary selection, may lead to tensions and a lack of trust in the process.
- **Implementation Risks:** Poor performance by newly implementing organisations can negatively impact the project's reputation and progress.

OPPORTUNITIES

- **Digital Innovations:** Leveraging new technological platforms for education, telemedicine, and financial services can enhance reach and impact.
- **Skill Diversification:** Expanding vocational training to include new trades can create more employment opportunities.
- **Replication and Scaling:** The model can be adapted in other rural regions facing similar challenges, increasing national-level impact.

CHAPTER 8
RECOMMENDATIONS

GENERAL

- **Establish clear lines of communication**: Streamlining communication channels would prevent miscommunication or unnecessary delays in information sharing.
- **Implement a Robust Data Management System**: Establish a more structured and accessible Management Information System (MIS) to improve data tracking and facilitate timely impact assessments.

FOR LIVELIHOOD PROJECTS (INCLUDING LIVESTOCK RAISING)

- **Develop Market Linkages:** Establish strong connections with markets to ensure farmers can sell their produce at competitive prices, supporting economic sustainability and increasing farmer income in future phases.
- **Value-Addition Centres:** Set up shared infrastructure for processing, packaging, and value addition to agricultural and livestock produce.

FOR HEALTH INITIATIVES

- **Menstrual Health Support:** Provide low-cost sanitary pads through SHG-run enterprises and install disposal units (incinerators).

FOR THE PLANTATION INITIATIVE

- **Agroforestry Promotion:** Encourage farmers to integrate trees with crops to improve soil fertility and reduce water dependency.
- **Biodiversity Protection:** Identify and protect native flora by creating community-managed green zones

FOR EDUCATION INITIATIVES

- **Integrate technology:** The project should look at integrating digital tools in the process of teaching.
- **Teacher Training Programs:** Capacity building of teachers would enhance the delivery of educational content in classrooms.

CHAPTER 9
SUSTAINABILITY

Sustainability is a major aspect of success for any rural development program, as it ensures that the impacts of the project continue to benefit the community for a long period of time, even after program completion. The integrated rural development program, supported by Bajaj Auto Limited, focused on improving the socio-economic conditions of rural beneficiaries through multiple community-based initiatives. The findings from the impact assessment are used to analyse how these activities have contributed to the long-term sustainability of the project.

COMMUNITY OWNERSHIP AND PARTICIPATION

By developing local capacity through training, the community is empowered to continue the work independently. The presence of well-trained leaders and active committees ensures that the project objectives are sustained without external support. The findings from the impact assessment highlight the community's involvement (48.7% of respondents actively participating in VDCs and 75.3% engaging in discussions on village development strategies), which further results in the ownership of future development strategies.

THE ROLE OF REVOLVING FUNDS AND LIVELIHOOD GENERATION

The revolving fund mechanism creates a self-sustaining cycle of lending and repayment, ensuring that financial resources remain available for future generations. The fact that 44.2% of respondents received revolving funds and 94.7% of them repaid these funds indicates trust in the system. Additionally, by supporting livelihood activities, the project enhances economic independence and reduces dependency on external aid, ensuring financial sustainability over time.

INFRASTRUCTURE AND ENVIRONMENTAL SUSTAINABILITY

The project has made a significant contribution to improving local infrastructure, with 85.9% of respondents gaining access to clean drinking water and 83.8% seeing an increase in irrigated land by 10-20%. Along with this, the training received in water and soil management practices like irrigation and vermicompost has resulted in the reduction of environmental stress on local resources.

EDUCATIONAL AND SOCIAL SUSTAINABILITY

The project’s investment in educational infrastructure, such as BaLa paintings and new classrooms, has enhanced the learning environment for children. Additionally, 75.9% of respondents reported that their children showed improved mathematical skills, while 69% noted an improvement in language skills. By improving the educational outcomes for these children, the project has invested in the community’s future. Education would better equip these individuals to make informed decisions about various aspects of personal and community life.

CHAPTER 10
CONCLUSION

The Integrated Rural Development Program has proven to be a well-designed and efficient model of rural development. Its sharp focus on the holistic advancement of underprivileged communities guides the project activities, leading to long-term sustainability and effectiveness. The project has been able to deliver key results in multiple areas, including livelihood generation, healthcare accessibility, and strengthening local governance. The key strength of the program lies in its deep community involvement, which fostered local ownership and ensured that sustainable practices were adopted and maintained. Despite its successes, the program faced certain challenges, such as implementation delays due to resource availability and miscommunication among stakeholders, pointing to areas for enhancement. Recommendations include strengthening communication channels and implementing efficient monitoring systems to avoid errors. On the whole, the program has presented itself as a reliable model of development, which can be utilised by others with some contextual modifications. Ongoing support and a few course corrections will ensure better results, clearing the path for the success of such community-driven initiatives.

IMPACT ASSESSMENT REPORT

CONSTRUCTION OF ADDITIONAL CLASSROOMS IN AURANGABAD POLICE PUBLIC SCHOOL, AURANGABAD

Implementing Partner – Aurangabad Police Public School Trust (APPST) via JBGVS

Release Date: 31-03-2025

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

APPST	Aurangabad Police Public School Trust
BAL	Bajaj Auto Ltd.
CSR	Corporate Social Responsibility
FGD	Focus Group Discussion
FY	Financial Year
JBGVS	Jankidevi Bajaj Gram Vikas Sanstha
NEP	National Education Policy
OECD	Organisation for Economic Cooperation and Development
RTE	Right to Education Act
SDGs	Sustainable Development Goals
SMC	School Management Committee
SSA	Samagra Shiksha Abhiyan
STEM	Science, Technology, Engineering, and Mathematics

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The "Construction of Additional Classrooms in Aurangabad Police Public School, Aurangabad" project, supported by Bajaj Auto Ltd. (BAL) and Jankidevi Bajaj Gram Vikas Sanstha (JBGVS) and implemented by the Aurangabad Police Public School Trust (APPST), aimed to improve educational infrastructure by addressing space constraints and inadequate learning conditions. The project was undertaken to provide a more conducive environment for students and teachers, resulting in improved educational outcomes.

A total of 98.3% of students regularly attended classes in the newly constructed classrooms, with 100% reporting improved focus and an enhanced learning experience. Additionally, 99.4% of the students reported improved student-teacher interactions. Looking ahead, the project intends to expand infrastructure and implement maintenance mechanisms to ensure long-term benefits. Strengthening stakeholder collaboration and securing ongoing support will be critical for long-term impact. This initiative supports SDG 4 (Quality Education) and national education policies by promoting inclusive and equitable learning opportunities.

PROJECT DETAILS

Implementation year

FY 2021 - 23

Assessment year

FY 2024 - 25

Implementing Partner

Aurangabad Police Public School Trust (APPST) and JBGVS

Project locations

Aurangabad Police Public School, Maharashtra

Beneficiaries

Students, teachers and community

Number of beneficiaries

1,260

Budget

₹178.85 lakhs

Alignment with SDGs

- SDG 4: Quality Education
- SDG 10: Reduced Inequalities
- SDG 17: Partnerships for the Goals

National Goals

- National Education Policy (NEP) 2020
- Right to Education Act (RTE Act) of 2009
- Samagra Shiksha Abhiyan (SSA)

PROJECT ACTIVITIES

- Need Assessment
- Stakeholder Engagement
- Finalising and Appointment of Architect
- Appointment of Contractor through tender
- Construction of Additional Classrooms
- Getting the Completion Certificate
- Commencement of classes
- Capacity Building and Training of Teachers
- Sustainability Planning

Key Findings

98.3%
of the respondents attended classes in the newly constructed classrooms.

100%
of the respondents reported better focus and ease of studying in the new classrooms.

94.4%
of the respondents observed improvements in attendance and academic performance due to better classroom infrastructure.

100%
of the respondents noted improved student-teacher interactions and overall teaching quality.

99.4%
of the respondents acknowledged that the new classrooms enhanced teacher comfort and interaction with students.

Sample Size - 200

Key Impacts

- Enhanced Learning Environment.
- Increased Motivation and Confidence.
- Stronger Student-Teacher Relationships.
- Greater Inclusivity.
- Positive Community Perception.
- Boost in Teacher Morale.
- Support for Long-term Academic Growth.

03. OECD FRAMEWORK

Relevance | Coherence | Effectiveness | Efficiency | Impact | Sustainability

RELEVANCE

The initiatives have demonstrated high relevance by addressing space constraints and preventing disruptions in learning schedules. The school's limited capacity to accommodate students constrained admissions and impacted education quality, highlighting the need for improved infrastructure. With the construction of ten new classrooms, the school's enrollment increased by 25%, providing students with a better learning environment, improving student-teacher ratios, and enhancing overall academic experiences.

COHERENCE

The project aligns with global and national education priorities, helping to achieve SDG 4 - Quality Education through improved school infrastructure and increased classroom access. It directly supports SDG 4.1, which calls for all children to have access to free, equitable, and high-quality education. It also promotes SDG 10 (Reduced Inequalities) which ensures equal learning opportunities for students from diverse backgrounds. and SDG 17 (Partnerships for the Goals) which engages multiple stakeholders to create sustainable educational improvements. At the national level, it is in alignment with India's NEP 2020, Samagra Shiksha Abhiyan (SSA), and the RTE Act of 2009, which emphasise universal education and enhanced educational quality. By improving facilities, the project promotes inclusive and equitable education, resulting in long-term academic and social impact.

EFFECTIVENESS

The project's effectiveness is demonstrated by its ability to improve the learning environment. Teachers reported increased engagement, and student attendance improved significantly after the classrooms were constructed. Furthermore, the construction of four toilet blocks significantly improved sanitation and hygiene, creating a healthier and more conducive school environment.

EFFICIENCY

Despite minor administrative delays, the construction was completed within the specified timeframe. Efficient space utilization and cost-effective planning minimized resource wastage by optimizing materials, labor, and expenses. At the same time, the project maximized impact by improving classroom conditions, enhancing student-teacher ratios, reducing absenteeism, and creating a more conducive learning environment, ultimately leading to better educational outcomes..

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

IMPACT

The impact has been significant, with an increase in school admissions, higher attendance rates, and improved academic performance. The school's reputation in the community has improved, and parents are more confident in sending their children to an institution with better infrastructure. Teachers have also reported higher job satisfaction as they can now conduct classes more smoothly without space constraints or logistical challenges.

SUSTAINABILITY

While the new infrastructure has significantly improved the learning environment, maintaining classroom conditions over time necessitates a set budget. If maintenance is not prioritised, infrastructure quality may suffer, limiting long-term benefits. Furthermore, financial uncertainties may have an impact on future expansion plans, limiting the school's ability to accommodate its growing student population.

CHAPTER 4
INTRODUCTION

SoulAce Team on field at Aurangabad Police Public School

NEED OF THE PROGRAM

Quality school infrastructure is critical in providing a conducive learning environment for children. The Aurangabad Police Public School, run by the Aurangabad Police Public School Trust, serves students from underprivileged backgrounds and aims to provide them with a quality education. However, the increase in student enrollment has led to a shortage of classrooms, creating learning environments that hinder effective teaching and learning. Constructing additional classrooms is essential to addressing this challenge.

With the help of Bajaj Auto Ltd. (BAL) and Jankidevi Bajaj Gram Vikas Sanstha (JBGVS), this initiative ensured that students had enough space for academic activities, resulting in better learning outcomes. Furthermore, a well-equipped school environment increases student engagement, lowers dropout rates, and promotes overall development. The project aligns with the Bajaj Education Initiative's goal of improving school infrastructure, which will eventually contribute to the long-term goal of empowering underprivileged children through quality education.

OBJECTIVE OF THE PROGRAM

- Construct additional classrooms in Aurangabad Police Public School to accommodate the increasing number of students and provide a conducive learning environment.
- Support better academic performance by providing a structured and well-equipped learning environment.
- Ensure that children from underprivileged backgrounds have access to quality education and improved school facilities.
- Facilitate students' participation in extracurricular activities by providing sufficient infrastructure and resources.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation

ABOUT JANKIDEVI BAJAJ GRAM VIKAS SANSTHA (JBGVS)

Jankidevi Bajaj Gram Vikas Sanstha (JBGVS) was established in 1987 and named after Padma Vibhushan Jankidevi Bajaj. Its mission is to bridge the urban-rural divide through integrated rural development. The organisation aligns its initiatives with the United Nations' Sustainable Development Goals. JBGVS works to improve rural communities in 110 villages through five key areas: education, health and hygiene, economic, environmental, and social development.

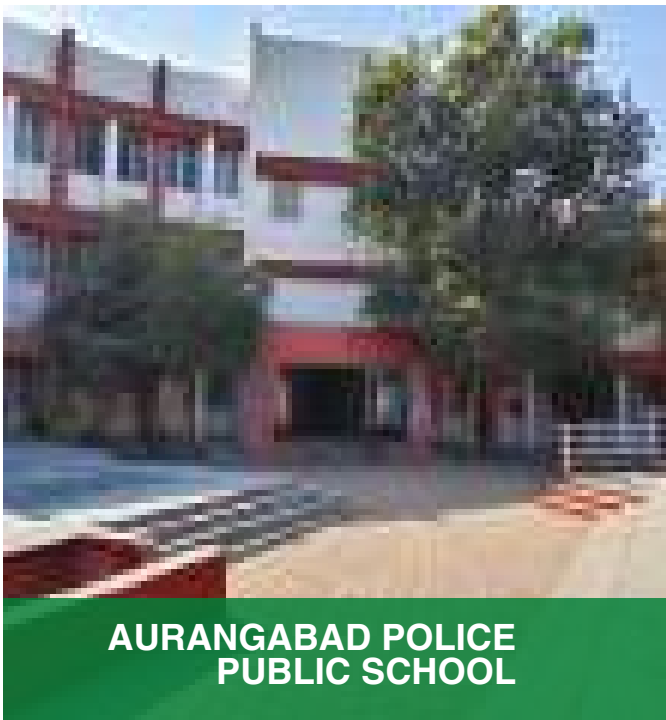
JBGVS serves as the Bajaj Group's CSR arm, implementing need-based interventions developed in consultation with local communities.

The organisation serves as a catalyst, empowering rural communities by addressing poverty, promoting gender equality, and encouraging human and natural resource development while ensuring ecological sustainability.

ABOUT NGO PARTNER- AURANGABAD POLICE PUBLIC SCHOOL TRUST (APPST)

The Aurangabad Police Public School Trust (APPST) is a charitable organisation set up by the Aurangabad Police Commissionerate in Maharashtra, India. The trust oversees the Aurangabad Police Public School, which is dedicated to providing quality education to children from underprivileged backgrounds. The school follows the Maharashtra State Board curriculum and focuses on academic excellence, character development, and social responsibility.

APPST plays an important role in improving educational opportunities by providing access to modern infrastructure, well-trained faculty, and extracurricular activities. In addition to managing the school, the trust supports various community development initiatives and offers financial assistance to deserving students. Its mission is to empower children through education, allowing them to create a brighter future. By fostering a holistic learning environment, APPST contributes to the region's overall social and educational development, which is consistent with the larger goals of equity and inclusive education.



CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited assigned SoulAce to conduct a study on the work done by the Aurangabad Police Public School Trust (APSST) and assess the impact of its CSR initiative on various aspects, including infrastructure improvements, student development, and community engagement, measuring the effectiveness of interventions in enhancing learning outcomes and overall school performance.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

- To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.
- To measure the extent to which the program has enhanced educational quality, infrastructure, student development, and community engagement.
- To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- students and teaching staff, yielding statistical insights and identifying trends. By employing the mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries and stakeholders like those responsible for project implementation. Engaging these stakeholders through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of improvements in the overall skilling and employability of the beneficiaries through the intervention. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques are employed to evaluate the project and impact through data analysis objectively. Surveys and questionnaires are utilised to collect numerical data on various indicators from beneficiaries of each program. These quantitative methods provide a measurable approach to gauge the project and outcomes and evaluate its success through statistical evidence.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including field notes, interviews with beneficiaries, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact. Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method.

Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

DESIGN SNAPSHOT

Name of the project

Construction of Additional Class Rooms in Aurangabad Police Public School, Aurangabad

Implementing agency

Aurangabad Police Public School Trust (APPST)

Research design

Descriptive research design

Sampling technique

Purposive and random sampling

Sample size

200 beneficiaries

Qualitative methods used

Semi-structured interviews, testimonials and focus group discussions with beneficiaries along with key stakeholders

KEY STAKEHOLDERS

- Students, the primary beneficiaries
- Families of Beneficiaries and Community Members
- Teachers and School Staff
- Project Implementation team

STUDY TOOLS

Questionnaires for primary beneficiaries- Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys. Stakeholders were identified across the focus areas. Semi-structured questionnaires and focus group discussions were conducted with the project staff.

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. Adhering rigorously to ethical principles of research, the study prioritised the rights and well-being of participants throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Crucially, participation was fully voluntary, free from coercion or pressure, underscoring the importance of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

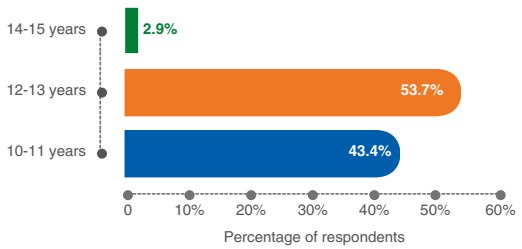
FOCUS GROUP DISCUSSION WITH THE SCHOOL STAFF

CHAPTER 6
KEY FINDINGS AND IMPACTS

This chapter compiles and analyses data from multiple sources to evaluate the overall impact and effectiveness of the program. It integrates qualitative and quantitative insights gathered through extensive surveys and detailed interactions with stakeholders. Drawing on diverse viewpoints, the chapter provides an in-depth analysis of how well the program has met its intended goals and contributed to long-term sustainability.

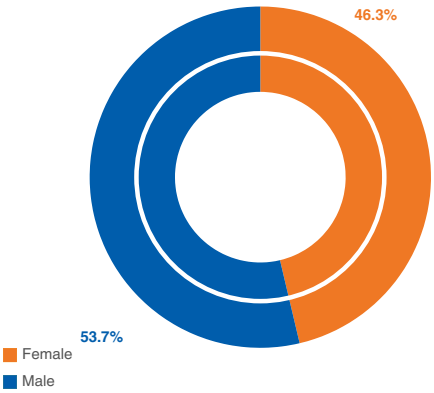
DEMOGRAPHIC INFORMATION

CHART 1: AGE OF THE RESPONDENT



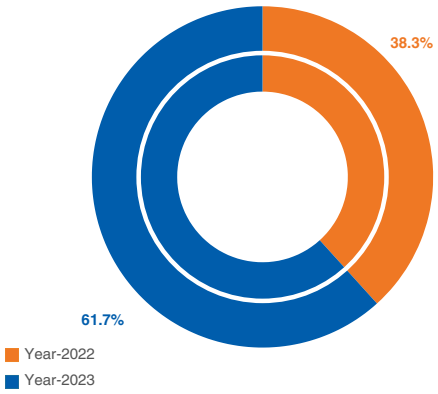
The majority of the respondents (53.7%) are aged 12-13 years, followed by 43.4% aged 10-11 years, indicating that the majority of students benefiting from the new classrooms are in middle school, which is an important stage for developing a strong academic foundation. Only 2.9% are 14-15 years old, indicating a lower representation from secondary or upper secondary classes.

CHART 2: GENDER



The gender distribution of the respondents is nearly balanced, with 53.7% male and 46.3% female students, promoting an inclusive learning environment. The improved infrastructure improves all students' academic experiences by ensuring equal access to quality education and creating a more conducive environment for learning and overall development.

CHART 3: YEAR OF NEW CLASSROOM CONSTRUCTION

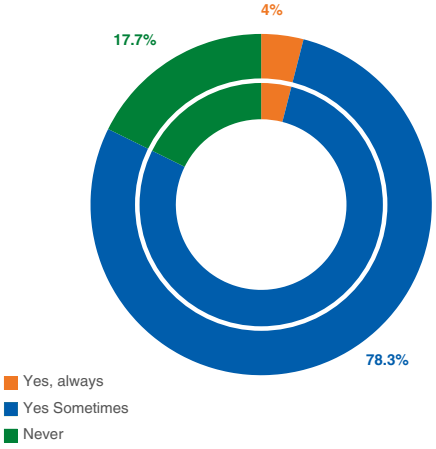


According to the data, 61.7% of the respondents reported newly constructed classrooms in 2023, while 38.3% reported improvements in 2022. This reflects the project's phased implementation, which gradually improves learning environments and academic conditions for a growing number of students.

FIELD TEAM WITH THE NGO REPRESENTATIVE

CHALLENGES FACED BEFORE CLASSROOM CONSTRUCTION

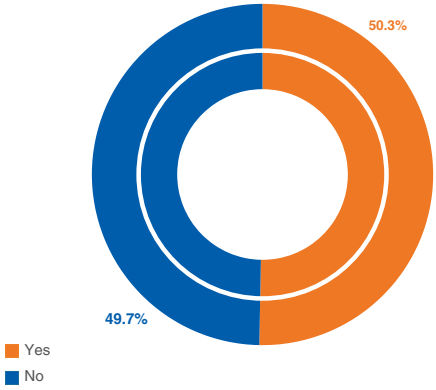
CHART 4: LEVEL OF DISCOMFORT EXPERIENCED IN OLD, CRAMPED CLASSROOMS



According to the data, 78.3% of the respondents reported sometimes discomfort in the old, cramped classrooms, while 4% reported constant discomfort. 17.7% of the respondents reported that they did not face any issues. This confirms that there was a genuine need for improved infrastructure, as inadequate space had a negative impact on students' comfort, focus, and overall learning experience before the construction of the new classrooms.

A school clerk and a parent of two students emphasised the importance of newly built classrooms at Aurangabad Police Public School. Before construction, overcrowding caused discomfort for both students and teachers. The respondent proposed additional improvements, such as better hygiene, outdoor spaces, and more extracurricular activities.

CHART 5: FREQUENCY OF MISSING A SEAT DUE TO LATE ARRIVAL AT SCHOOL

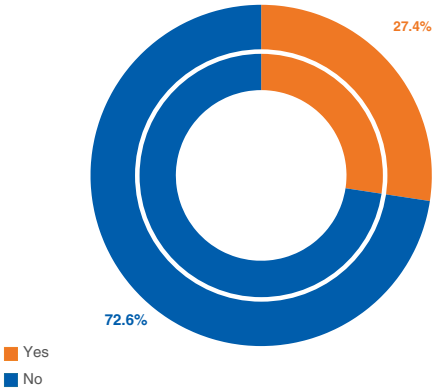


The data show that 50.3% of respondents struggled to find a seat due to late arrival, highlighting the challenges faced before the new construction and emphasizing the need for improved classroom infrastructure to accommodate all students effectively

"Mr. Prashant Laxminarayan Merkar, a 51-year-old parent and police sub-inspector, provided insight into the impact of newly constructed classrooms at Aurangabad Police Public School. Before construction, classrooms lacked adequate seating, but the project, which was supported by JBGVS, significantly improved infrastructure, increasing student enrolment and attendance. Even though he was not a member of the (School Management Committee) SMC, he actively participated in school meetings. He sees additional opportunities for improving education quality and implementing advanced learning methods.

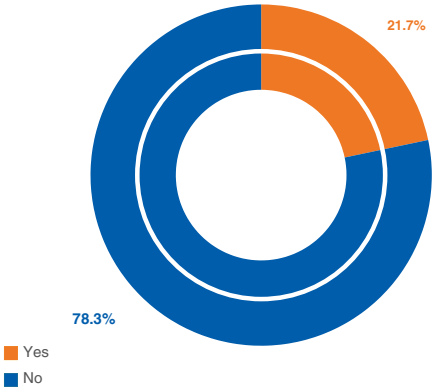
- Mr. Prashant Laxminarayan Merkar"

CHART 6: FREQUENCY OF SITTING OUTSIDE THE CLASSROOM DUE TO LACK OF AVAILABLE SEATS



The data indicate that 27.4% of students had to sit outside the classroom due to a lack of available seats, highlighting the limitations of existing infrastructure before the new construction. This suggests that a significant portion of students faced disruptions in their learning experience, potentially affecting their engagement and academic performance. However, 72.6% of students did not encounter this issue, indicating that while the problem was not universal, it was still substantial enough to warrant intervention. The addition of new classrooms has likely addressed this challenge, ensuring a more inclusive and conducive learning environment for all students.

CHART 7: INSTANCES OF CLASSES BEING HELD IN ALTERNATE LOCATIONS DUE TO SPACE CONSTRAINTS



According to the data, 21.7% of the respondents had to attend classes in different locations due to space constraints, which disrupted the learning process. However, 78.3% did not experience this problem. The construction of new classrooms has mitigated this issue, resulting in a stable and conducive learning environment.

"Palavi Prafful Saraf, the parent of a Grade 4 student at Aurangabad Police Public School, I have seen a remarkable improvement since the construction of new classrooms supported by JBGVS in 2021-22. Earlier, poor lighting and broken desks made learning difficult, but now, my child enjoys a comfortable and well-equipped environment. Attendance and enrolments have increased, and I hope for further enhancements, including more classrooms for higher grades and better learning resources."

- Palavi Prafful Saraf

INTERACTION WITH A STUDENT FROM AURANGABAD POLICE PUBLIC SCHOOL

CURRENT INFRASTRUCTURAL FACILITY AT SCHOOL

Facility	Availability	Details
Toilets	Yes	8 blocks (6 for students, 1 for staff, 1 for teachers)
Water Connection in Toilets	Yes	Available
Rooms for Teachers and Support Staff	Yes	A dedicated pantry was available
Principal's Room	Yes	A separate principal room was available
Library	Yes	The library was available
Computer Room	Yes	A computer room was available
Smart Class	Yes	Smart class was available
Playground	Yes	The playground was available
Boundary Wall	Yes	A boundary wall was present
Drinking Water Sources and Stations	Yes	Water purifiers were available
Electricity Connection and Fittings in Classrooms	Yes	Tube lights, fans, and other fittings were available
Classroom Furniture	Yes	Benches and chairs were available

Source: Primary Data

The school is well-equipped with the necessary infrastructure, fostering a positive learning environment. The sanitation needs are adequately met with eight toilet blocks, including separate facilities for staff and teachers. The students have access to modern learning resources through a library, computer room, and smart classroom. Additionally, a separate principal's room and a pantry for teachers and support staff enhance administrative efficiency. A playground encourages physical activity, while water purifiers and electricity fittings ensure basic necessities are met. However, the absence of information on STEM labs, an auditorium, and an indoor playroom highlights potential areas for future development.

"At Aurangabad Police Public School, limited classroom space was affecting the learning environment, making it challenging for students to stay engaged. Through continuous efforts and discussions in SMC meetings, we secured much-needed support from JBGVS, which enabled the construction of well-built classrooms. This improvement has significantly enhanced student attendance, engagement, and overall academic performance. The SMC played a crucial role in facilitating this support, and I strongly recommend further investments in teacher training and technology to maximize the benefits of our upgraded infrastructure.

- Satish. Kaglival, Principal, Aurangabad Police Public School"

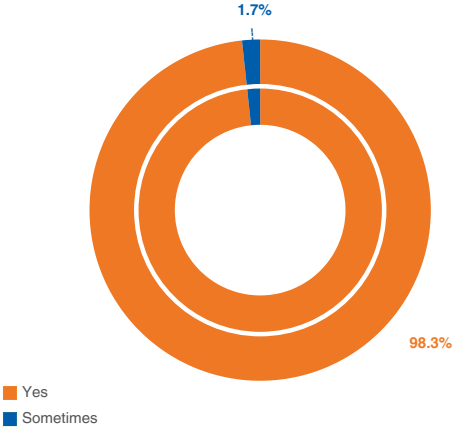
CASE STUDY
A MOTHER'S PERSPECTIVE

Mrs. Sunita Verma, mother of two children in grades 5 and 3, was deeply concerned about the school's learning environment, as limited classroom space, poor ventilation, and inadequate seating affected her children's ability to concentrate and study comfortably. The construction of new classrooms brought a significant transformation, providing a more spacious and well-ventilated setting that enhances student focus and engagement. With improved infrastructure, students now show greater interest in learning, fostering a more positive academic experience.

FIELD TEAM INTERACTING WITH STUDENTS

IMPACT AFTER CLASSROOM CONSTRUCTION

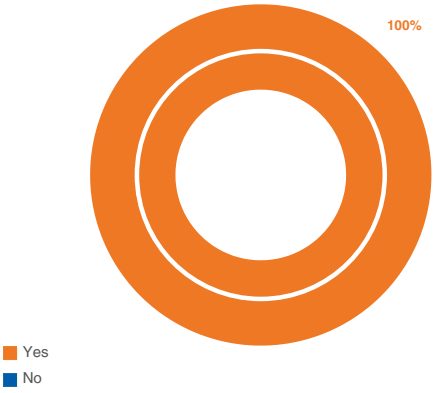
CHART 8: CLASSES ATTENDED IN THE NEWLY CONSTRUCTED CLASSROOM



According to the data, 98.3% of the respondents regularly attend classes in the newly constructed classrooms, with only 1.7% doing so on occasion. This demonstrates the successful implementation of improved infrastructure, resulting in a better learning environment and enhanced academic experiences for the vast majority of the students.

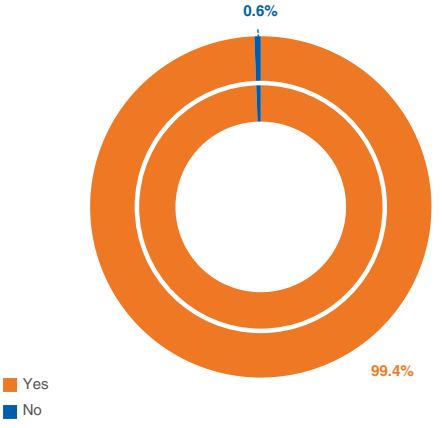
> I was constantly concerned with my children's education. They would frequently return home, frustrated by the noise and cramped classrooms. However, since the new classrooms were built, I've noticed a significant difference. They are more enthusiastic about school, and their academic performance has improved significantly.
>
> **- Shaikh Memon Asma**

CHART 9: IMPROVEMENT IN FOCUS AND EASE OF STUDYING IN NEWLY CONSTRUCTED CLASSROOMS



According to the data, all respondents reported improved focus and ease of study in the newly constructed classrooms. This demonstrates the significant positive impact of the improved infrastructure, which creates a more conducive learning environment for students, improving concentration, engagement, and overall academic performance.

CHART 10: IMPROVEMENT IN ATTENDANCE AND ACADEMIC PERFORMANCE DUE TO BETTER CLASSROOM FACILITIES

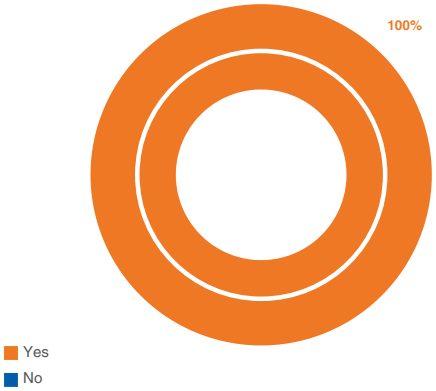


According to the data, 99.4% of the respondents reported higher attendance and academic performance as a result of improved classroom conditions. This emphasises the importance of improved infrastructure in creating a conducive learning environment, lowering absenteeism, and positively impacting students' educational outcomes and overall academic growth.

"Teaching has become far more effective since the new classrooms were constructed. Students can now sit comfortably, allowing me to explain concepts with fewer interruptions. Their interest in learning has grown, and I can now incorporate interactive activities to make lessons more engaging and effective.

- Mrs. Meena Sharma, a Mathematics teacher"

CHART 11: ENHANCEMENT IN TEACHING QUALITY AND STUDENT-TEACHER INTERACTIONS IN NEW CLASSROOMS

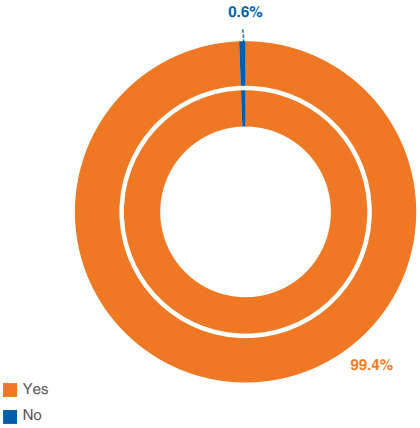


According to the data, 100% of the respondents reported improved teaching quality and student-teacher interactions. This demonstrates the positive impact of improved infrastructure on effective teaching, engagement, and the creation of a more interactive and supportive learning environment for students.

"Before the new classrooms were built, managing classes was an ongoing challenge due to limited space. We frequently had to hold lessons in corridors and common areas. The new classrooms have completely transformed our school, resulting in a more encouraging learning space. Student engagement has improved, and admissions have risen significantly.

- Mrs. Geeta Damodaran, Headmistress"

CHART 12: IMPACT OF NEW CLASSROOMS ON TEACHER COMFORT AND INTERACTION



The data show that 99.4% of respondents reported that the new classrooms enhanced teacher comfort and interaction. The improved infrastructure has fostered a more supportive teaching environment, enabling educators to engage students more effectively and enhance the quality of education and overall learning experiences.

"After observing the poor learning conditions, the SMC actively looked for funding. The addition of new classrooms completely transformed our school. Previously, cramped spaces and irregular schedules made teaching difficult. With the new infrastructure, students now have a more comfortable learning environment, and teachers can conduct lessons without interruption. The improved facilities have also increased student enrolment and attendance. The new classrooms have resulted in lower absenteeism, increased student engagement, and improved academic performance. Seeing these positive changes, we intend to expand our infrastructure even further to improve the learning experience for all.

- Ranjit Das, Principal and SMC Representative"

CASE STUDY
MR. RANJIT DAS

As Principal of Aurangabad Police Public School, I am grateful to JBGVS for supporting the construction of new classrooms. Before this intervention, our school faced significant challenges due to limited space, requiring students to study in cramped and uncomfortable conditions. The lack of classrooms had an impact on attendance, learning outcomes, and overall student well-being.

The newly constructed classrooms have resulted in a remarkable transformation. Students now have a more comfortable and supportive learning environment, which has boosted engagement, attendance, and overall academic performance.

Teachers can manage their classes more effectively, giving parents greater confidence in their children's education.

This initiative has left a lasting impression on our school and community. On behalf of our students, teachers, and parents, I sincerely appreciate your generous support and look forward to continuing our collaboration for the betterment of education.

IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Improved learning environment leading to better academic performance.
- Increased student engagement and attendance.
- Enhanced teacher-student interaction, leading to better understanding and retention.
- Reduced stress for teachers, allowing them to conduct lessons more effectively.

FAMILY LEVEL

- Parents feel more confident about their children's education and prospects.
- Families experience a reduced financial burden as improved access to education within the locality eliminates the need to seek admission in distant schools.

COMMUNITY/ VILLAGE LEVEL

- Increased trust in the school system has resulted in higher enrollment rates.
- Improved literacy levels within the community.
- Enhanced community participation in school activities and decision-making processes.

DISTRICT LEVEL

- Improved access to education has contributed to lower dropout rates in the district.
- The model has the potential to be replicated in other schools across the district.

STATE LEVEL

- Contribution to state-level educational goals and policies.
- Strengthened infrastructure development programs in rural and urban schools.

NATIONAL LEVEL

- Improved education quality, contributing to national development goals.
- Reduction in education disparity across different regions of the country.

KEY CHALLENGES AND BARRIERS

(Source: based on the interaction with different stakeholders)

INFRASTRUCTURE CHALLENGES

- Issues such as material shortages and supply chain disruptions affected the project timeline.
- During construction, classes had to be relocated to temporary spaces, affecting learning continuity.

ADMINISTRATIVE AND REGULATORY BARRIERS

- Securing permissions from local authorities (Municipal Corporation, Panchayat, SMC) was time-consuming.
- Aligning interests among school management and local administration posed difficulties.

07. SWOT ANALYSIS

STRENGTH

- Enhanced infrastructure resulted in an improved learning environment.
- Increased Student Enrolment.
- Higher Attendance and Academic Performance.
- Community Recognition and Trust.

WEAKNESSES

- Additional infrastructure like STEM labs and auditoriums is still lacking.
- Dependence on external support makes sustainability a challenge.
- Long-term maintenance is necessary to keep the infrastructure in good condition.

OPPORTUNITIES

- The scope for further infrastructural expansion, such as labs and recreational spaces, can be developed.
- Smart classrooms and digital tools can be incorporated for better education quality.

THREATS

- Sustainability of Infra without a proper maintenance budget, classroom conditions may deteriorate over time.
- Delays in approvals and administrative hurdles can impact future expansion projects.

08. SUSTAINABILITY

The newly constructed classrooms at the Police Public School have significantly improved space availability and enhanced the overall academic experience. This project has addressed the immediate need for additional learning spaces, creating a favourable educational setting for both students and teachers. To ensure these benefits are sustained beyond the initial implementation and after the project's exit, a comprehensive plan has been put in place to uphold infrastructure quality and foster community ownership.

STRUCTURED MAINTENANCE AND UPKEEP

A key component of ensuring sustainability after the project's exit is the establishment of a structured maintenance plan. The school administration, in collaboration with the School Management Committee (SMC), has implemented regular inspections, minor repairs, and cleaning schedules to maintain the classrooms' longevity. A portion of the school's annual operational budget is allocated specifically for maintenance, ensuring that upkeep continues without dependence on external funding. This proactive approach prevents infrastructure deterioration and safeguards the improved learning conditions achieved through the project.

STAKEHOLDER ENGAGEMENT AND COMMUNITY OWNERSHIP

Stakeholder engagement plays a critical role in sustaining the project's impact. The project team has worked closely with school authorities, teachers, and the local community to instill a sense of ownership over the new infrastructure. The SMC facilitates community participation in decision-making, ensuring that local voices are heard and fostering long-term accountability. Additionally, student-led initiatives, such as cleanliness drives and classroom care programs, promote responsibility and encourage a culture of maintenance and care.

LONG-TERM IMPACT OF THE PROJECT

The impact of the project extends beyond physical infrastructure. By addressing overcrowding and providing modern, well-equipped classrooms, the initiative supports better academic performance, increases student engagement, and enhances teacher effectiveness. The success of this initiative has also sparked discussions about future infrastructure developments, such as expanding facilities for higher grades and improving educational resources like books and technology. With increased enrolment and better student outcomes, the need for ongoing investment and support becomes even more apparent.

CHAPTER 9
RECOMMENDATIONS

Allocating a dedicated budget for regular maintenance of classrooms and facilities will help ensure their long-term sustainability and effectiveness.

Introducing smart classrooms and e-learning resources can improve students' educational experiences while bridging learning gaps.

Strengthening parent-teacher associations and encouraging local participation can help the program last longer and have a greater impact.

CHAPTER 10
CONCLUSION

The "Construction of Additional Classrooms in Aurangabad Police Public School" is an important step towards improving educational infrastructure and creating a conducive learning environment. The initiative has provided students with improved academic opportunities, increased engagement, and enhanced student-teacher interactions. This project demonstrates how strategic investments in education can result in long-term change by aligning with national education priorities and global goals such as SDG 4 (Quality Education). As the school grows, ongoing efforts in infrastructure maintenance, policy support, and collaborative stakeholder engagement will be critical. This initiative lays a solid foundation for quality education, paving the way for future generations to thrive and ensuring that every child, regardless of background, has access to a nurturing and empowering learning space.

IMPACT ASSESSMENT REPORT

VIKAS MITRA

Implementing partner – Jnana Prabodhini

Release Date: 31-03-2025

SoulAce

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
FY	Financial Year
BAL	Bajaj Auto Limited
NCERT	National Council of Educational Research and Training
NGO	Non-Governmental Organisation
SDGs	Sustainable Development Goals

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

The Vikas Mitra program, implemented by Jnana Prabodhini and supported by Bajaj Auto Limited, addresses two critical gaps in the current education landscape: the persistent challenge of low learning outcomes among students, particularly in underserved regions and the absence of structured life skills education that nurtures personal and interpersonal development. By working closely with students, teachers, and schools, the program combines interactive teaching techniques with relevant curriculum-linked content, ensuring that learning is both engaging and impactful.

FGD WITH STUDENTS

PROJECT DETAILS

Implementation year
FY 2019-23

Assessment year
FY 2024-25

Implementing Partner
Jnana Prabodhini

Project locations
20 Upper Primary Schools, 10 Secondary Schools and 3 Junior Colleges in the following three clusters in Velhe Tehsil (Pune, Maharashtra)

- Kelad, Kodapur, Pasali, Velhe
- Margasani, Sakhar, Vajeghar
- Mangadari, Vinzar, Ambavane, Dapode

Number of beneficiaries
1100 Students

Project Budget
₹140 lakhs

Alignment with SDGs
4 QUALITY EDUCATION
10 REDUCED INEQUALITIES

Alignment with National programs

The program components are in alignment with the objectives of several Government of India initiatives:

- Samagra Shiksha Abhiyan

PROJECT ACTIVITIES

15 Regular Interventions (each of 1.5 hrs) on Learning skills and Life Skills for all 1100 students of 20 upper primary, 10 secondary and 3 colleges.

6 full-day Academic Inputs for Competitive Exam Preparation to 15 % selected students from 1100 students with follow-ups of an additional hour in regular sessions alongside providing additional material for practice.

The 2 days residential camp for academic revision, doubt clearing and confidence building prior to Competitive Exam.

4 days Leadership Inputs to 15 % selected students from 1100 students followed by monthly leadership tasks to be performed in their schools.

1 Field Visit to enhance their perspective for 15% selected students from 1100 students.

Interschool/Intercollege innovative competitions are held once each semester on multiple dimensions.

School Enrichment Components such as library books and kits provided to each school.

To create interest in learning and awareness about social issues and motivation for self-development, a bimonthly magazine and specially designed activity books were provided to all 1100 students.

3 one day camp for Teachers to enhance their teaching skills and knowledge.

1 Parents awareness session was conducted so that they are aware of the Vikas Mitra program and its objectives and will provide extended support. It will also address effective parenting practices.

Student assessments were conducted to track progress.

Key Findings

Sample Size - 215

PROJECT ACTIVITIES

The survey saw the participation of 50.7% male respondents and 49.3% female respondents.

55.4%

of the respondents belonged to the age group of 14-15 years, while 28.8% of them were between 12-13 years of age. 15.8% of them were between 16-17 years of age.

Major pre-intervention learning challenges, as mentioned by the respondents, included difficulties in reading comprehension (54.9%), lack of vocabulary (49.8%), trouble with spelling and grammar (42.8%), difficulty in communication (31.2%), writing (26.5%) and hesitation in speaking (23.7%).

84.7%

of the respondents highlighted that they learnt more than two craft skills through the program intervention.

71.6%

of the respondents participated in the competitions organised under the Vikas Mitra Program.

47%

of them (101 respondents) were selected for the Prajna Vikas Program.

67.3%

of the respondents (68 respondents) participated in the field visits during the program.

PROJECT ACTIVITIES

The teachers received 5 to 6 training sessions for the scholarship program at the Competitive Examination Centre at Jnana Prabodhini.

Key Impacts

Sample Size - 215

STUDENTS

Some of the post-intervention skills gained by the students include comprehension skills (43.3%), dictation writing (23.3%), measurement and classification techniques (12.6%) and map reading (12%).

Post-program, high improvement was reported in reading, observation, and questioning skills (59%), and listening, comprehension, memory Skills, and study Methods (60.9%).

85.5%
of the respondents reported that the intervention helped them in properly writing their exams, while 94.0% of them reported it to be extremely helpful in enhancing their learning ability and academic performance. .

63.8%
of the respondents mentioned that the intervention's Project-Based learning model highly improved their understanding of science subjects and highly motivated 57.1% of them to read.

57.8%
of the respondents felt highly confident after participating in the competitions held under the banner of the intervention.

90.1%
of the respondents found the workshops conducted under the Prajna Vikas Program to be extremely helpful for the State Board Scholarship exam preparation. Out of the 101 Prajna Vikas respondents, 29.7% (30 respondents) received the scholarship.

Prajna Vikas program was extremely helpful for developing social responsibility and leadership skills (89.1%) and for improving overall studies (84.1%)

95.3%
of all the respondents reported that the entire program made learning more enjoyable and interesting.

71.2%
of all the respondents felt highly confident about their future studies due to the efforts of the program.

TEACHERS

The qualitative interviews conducted with teachers highlight that the teachers' training workshops significantly improved their teaching methods and helped increase student engagement and subject delivery.

03. OECD FRAMEWORK

Relevance | Coherence | Effectiveness | Efficiency | Impact | Sustainability

RELEVANCE

The program seeks to address the educational challenges of marginalised students from remote villages. It works on bridging learning gaps such as comprehension (reading, writing, speaking) and vocabulary deficits, as highlighted by 54.9% and 49.8% of students, respectively. It not only aims at improving learning skills but also inculcates various life skills such as personality development and leadership. Overall, the program is relevant in improving the aspects of the three 'L's required in a student's life- Learning, Leadership and Life dimensions, through non-formal educational inputs.

COHERENCE

The program is well aligned with the following Sustainable Development Goals (SDGs):

SDG 4: Quality Education: The program supports inclusive and equitable quality education by providing necessary general and specialised (Prajna Vikas) training to the students, which would help them achieve better educational outcomes.
SDG 10: Reduced Inequalities: The program works towards reducing inequalities by providing learning and life skills training coming from socially and economically marginalised families. Moreover, through the distribution of teaching-learning material in the form of educational kits and library books, the program reduces the inequitable distribution and availability of educational resources.

The program is also coherent with the national agenda for skilling:
The program also supports the goals of Samagra Shiksha Abhiyan by focusing on promoting quality education, bridging social and gender gaps, and strengthening teacher training.

EFFECTIVENESS

The effectiveness of the program, as evaluated against its key objectives, presents several positive outcomes:
For Students:
Joyful learning engagement and future readiness: 95.3% of the students reported learning had become more enjoyable and interesting, while 71.2% of the respondents felt highly confident about their future studies.
Skill Gains: 94% of students reported improvement in overall academic ability, while 85.5% improved their handwriting skills; 88.8% had gained public speaking confidence.
Life Skills Development: Over 89% of students attributed improved self-development and life goal clarity to the program.
Prajna Vikas Success Rate: A 31% success rate in scholarship exams shows tangible academic outcomes in the form of securing financial support for education.

EFFICIENCY

The program's efficiency was rooted in the needs-based design of the project and the involvement of multiple stakeholders in the process. Given its previous involvement in these areas, the implementing agency has rightly recognised the absolute needs of the students and teachers. They have also taken State and local education departments into confidence to avoid any roadblocks during the implementation phase. Even though obtaining permissions from the State education department was a time-consuming process, the team overcame the challenge with persistent efforts and the support of local education officials. Moreover, the selection of students was done using specified criteria at each level of the program to ensure minimum dropout rates. The resource persons (Shikshan doots) were also appointed after careful consideration to ensure the proper delivery of content and smooth implementation.

IMPACT

The Vikas Mitra program has led to significant improvements among students, who have become more confident, actively participating in competitions and field visits. They are now more motivated, curious, and academically focused, especially in Math, Science, and English. Many have secured scholarships for further education, under the Prajna Mitra program. Teachers have enhanced their teaching skills, using more engaging, hands-on methods, while parents have become more supportive, with reduced concerns about their children's education and relief from financial burdens due to scholarships

SUSTAINABILITY

The program has taken several steps to promote sustainability such as training of teachers, providing infrastructure support through teaching learning materials and the development of training manuals. Nevertheless, regular follow-up and refresher trainings for teachers, periodic review of teaching learning material for continued relevance and upgradation, and scope for feedback integration would enhance the sustainability of these efforts. Moreover, it is important to embed the training manuals into the academic planning and structure of the school to ensure usage.

CHAPTER 4
INTRODUCTION

FGD with students at Rule School

India has a significant glaring disparity between its rural and urban regions, which is one of the major causal factors for migration. As individuals with limited skills migrate from villages to cities, the pressure on these urban areas increases while leaving behind, creating ghost towns in the rural context. Ultimately, bridging this divide rests upon providing quality education that equips rural students to thrive in today's knowledge-driven society so that they may prosper. However, the present school education system in such areas remains largely rooted in outdated methods, emphasising rote memorisation and a lack of training in critical thinking, further compounded by the absence of educational exposure.

The areas of intervention under this project are predominantly aspirational villages, which require focused attention. Hilly terrain and low population density pose significant challenges in accessing educational facilities, and awareness of the importance of education is limited. Government-aided schools often lack the budgetary resources to support students' holistic development, limiting the cultivation of essential life and learning skills. To address these concerns, the project aims to instil these skills and attitudes in students at both the school and college levels.

OBJECTIVES OF THE PROGRAM

To reach students from socially marginalised, geographically, and economically backward communities, offering them a hope for a better life.

To utilise the organisation's extensive research and field experience in teaching-learning methodology, leadership, and life skills development by reaching out to larger sections of the deprived community.

To nurture the high-potential students in terms of academics and leadership qualities.

To prepare handbooks, training manuals and training inputs for teachers for the sustainability of the program.

To develop a model of enriched learning which can be replicated in other parts of the State.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields.

Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – JNANA PRABODHINI

Founded in 1962 by the visionary psychologist and educator Dr. V.V Pendse, Jnana Prabodhini is an organisation that works to contribute to the process of national resurgence through 'man-making education', a concept deeply rooted in the Hindu philosophy of 'Dharm-Sansthapana' (establishment of righteous values). Realising the interconnectedness of various social and development aspects of society, it takes a holistic approach to work across multiple sectors, including education, research, rural development, healthcare, women empowerment, and national integration. Jnana Prabodhini's mission revolves around the development of human potential, with a particular focus on nurturing the youth of India. The organisation is committed to refining the physical, mental, intellectual, and spiritual qualities of individuals, believing that this comprehensive development is essential for fostering positive social leadership.

INTERACTION WITH THE PROJECT COORDINATOR

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited assigned SoulAce to conduct a study with the aim of assessing the impact of its CSR initiative in providing life skills education to school students.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

- To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.
- To measure the extent to which the program has contributed to the development of a holistic model of leadership and life skill training for students.
- To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders- parents, school teachers, local Panchayat and education department officials, facilitators, and the project implementation team, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- students, yielding statistical insights and identifying trends. By employing a mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries and stakeholders like parents, teachers, headmasters, local Panchayat and education department officials, and the project implementation team. Engaging these stakeholders through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of improvements in the overall educational learning and experience of the beneficiaries through the intervention. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques are employed to evaluate the project and its impact objectively through data analysis. Surveys and questionnaires are utilised to collect numerical data on various indicators from student beneficiaries of the program. By analysing the data gathered, the project and its effects and the enhancements it has facilitated can be assessed. These quantitative methods provide a measurable approach to gauge the project and outcomes and evaluate its success through statistical evidence.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including field notes, interviews with multiple stakeholders like beneficiaries, parents, school teachers and headmasters, facilitators, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact.

Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method. Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

RESEARCH DESIGN

Name of the project

Vikas Mitra

Implementing agency

Jnana Prabodhini

Research design

Descriptive research design

Sampling technique

Stratified Random and Purposive sampling

Sample size

215 students

Qualitative methods used

Semi-structured interviews, testimonials, case studies and focus group discussions with beneficiaries along with key stakeholders

KEY STAKEHOLDERS

- Beneficiaries (Students)
- School Teachers/Headmasters
- Parents
- Local Panchayat Officials
- Local Education Department Officials
- Facilitators
- Project Implementation Team

STUDY TOOLS

Questionnaires for primary beneficiaries – Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys. Stakeholders were identified across the focus areas. Semi-structured interviews and focus group discussions were conducted with other stakeholders.

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. Adhering rigorously to ethical principles of research, the study prioritised the rights and well-being of participants throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Crucially, participation was fully voluntary, free from coercion or pressure, underscoring the importance of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

CHAPTER 6
KEY FINDINGS AND IMPACTS

This chapter compiles and analyses data from multiple sources to evaluate the overall impact and effectiveness of the program. It integrates quantitative insights gathered through extensive surveys with students and qualitative findings, gleaned through our detailed interactions with stakeholders (teachers and parents). Drawing on diverse viewpoints, the chapter provides an in-depth analysis of how well the program has met its intended goals and contributed to long-term sustainability.

DEMOGRAPHIC INFORMATION

CHART 1: AGE COMPOSITION OF THE RESPONDENTS

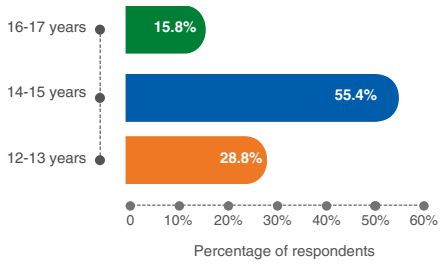


CHART 2: GENDER COMPOSITION OF THE RESPONDENTS

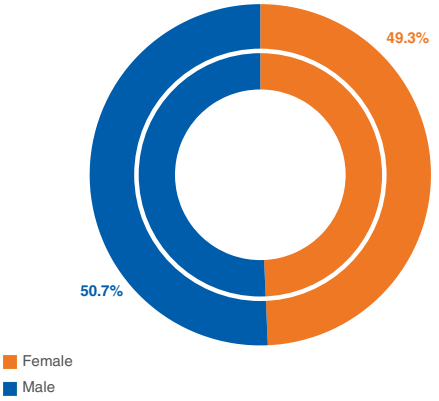
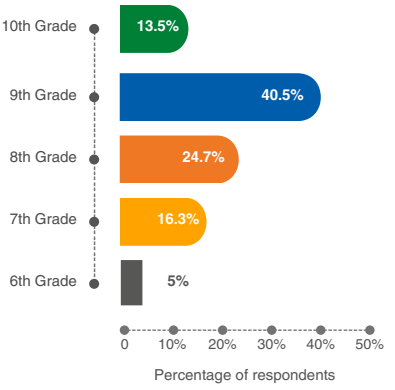


CHART 3: PRESENT GRADE OF THE RESPONDENTS



Age: 55.4% of the respondents belonged to the age group of 14-15 years, while 28.8% of them were between 12-13 years of age. 15.8% of them were between 16-17 years of age.

Gender: The survey saw the participation of 50.7% male respondents and 49.3% female respondents.

Present Grade: 40.5% of the respondents were presently studying in the 9th Grade, while 24.7% of them were in the 8th Grade. 16.3% of them were studying in 7th Grade, followed by 13.5% of them who were in class 10th.

DISCUSSION WITH THE PROJECT COORDINATOR, SUREKHA NATEKAR, HIGHLIGHTED THE ENTIRE PROCESS OF CONCEPTUALISING AND IMPLEMENTING THE PROGRAMME IN THE TARGET SCHOOLS OF THE AREA

Permissions were obtained for the Vikas Mitra program following a structured approach- the National Council of Educational Research and Training (NCERT) helped them to align their efforts with national educational standards and guidelines.

The District Education Department was contacted to obtain approval and ensure the program was recognised and supported at a broader level.

The Block Local Education Department was contacted to obtain approval and ensure the program was recognised and supported at a broader level.

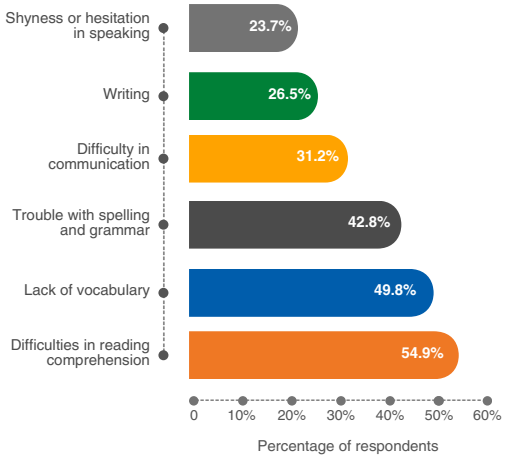
The target schools were selected on the basis of the following criteria:

- 20+ students in attendance
- Willingness to engage in the program.

Post identification of schools, a formal letter from the education department was sent to these schools to further establish collaboration and ensure transparency in our operations.

INTERACTION WITH THE TEACHERS

CHART 4: MAIN CHALLENGES IN LEARNING AND UNDERSTANDING LANGUAGE (READING, WRITING, SPEAKING) BEFORE THE PROGRAM

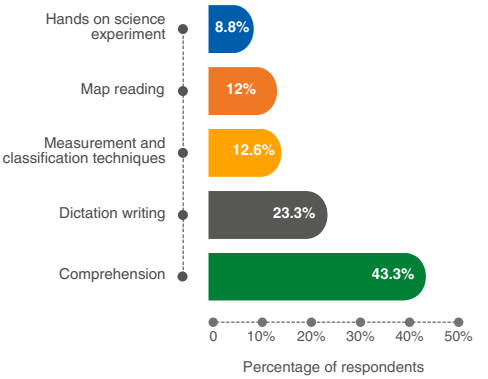


Major Learning Challenges: Difficulties in reading comprehension and lack of vocabulary were reported as the major learning challenges before the intervention, by 54.9% and 49.8% of respondents, respectively. This was followed by challenges like trouble with spelling and grammar and difficulty in communication, as mentioned by 42.8% and 31.2% of the respondents, respectively. Writing was considered a challenge by 26.5%, and 23.7% of the respondents reported hesitation in speaking.

An interview with Deepali Dhodake, School Headmaster of ZP School Sarpale, revealed that the pre-intervention learning gaps among students were quite significant, especially after the pandemic. Many struggled with reading fluency, writing skills, and comprehension. Their basic math application was also weak, making it difficult for them to solve even simple problems. The lack of regular schooling during the pandemic affected their confidence and learning habits, leading to a drop in academic performance. Students needed structured support, interactive learning methods, and regular practice to regain their lost skills and build a strong foundation.

The interviews with other school Headmasters also highlighted another significant challenge of school dropouts. They underscored that the main reason for students leaving school was the lack of opportunities in the village, which led families to migrate to cities like Pune in search of better education and livelihoods.

CHART 5: SKILLS GAINED UNDER THE PROGRAM



Skills Gained: 43.3% of the respondents gained comprehension skills under the program, while 23.3% of them learnt dictation writing. Measurement and classification techniques and map reading were skills learnt by 12.6% and 12% of respondents, respectively.

Discussion with the Program Head underscored that the learning sessions are conducted by trained facilitators (Shikshan Doots) who have either completed their B.Ed. (Bachelor of Education) or MSW (Master of Social Work) degrees. These facilitators are selected through an interview process that allows the implementation team to evaluate their teaching skills, passion for working with students, and ability to contribute to the program's goals. The facilitators are further monitored through their classroom deliverables.

CHART 6: IMPROVEMENT IN READING, OBSERVATION, AND QUESTIONING SKILLS

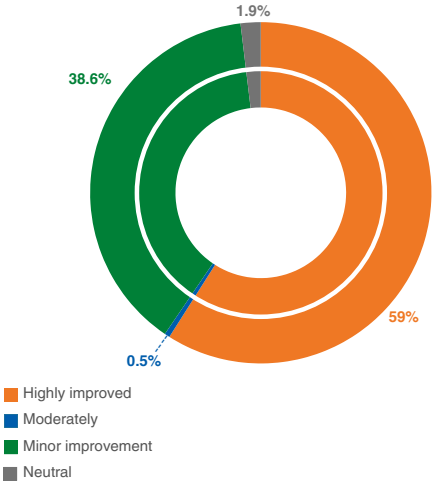
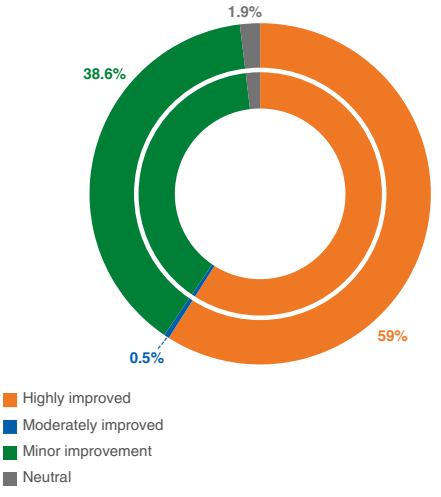


CHART 7: IMPROVEMENT IN LISTENING, COMPREHENSION, MEMORY SKILLS, AND STUDY METHODS



Perceived improvement in the following skills:

- **Listening, Comprehension, Memory Skills, and Study Methods:** 59% of the respondents mentioned that their reading, observation, and questioning skills have highly improved, while 38.6% of the respondents reported minor improvement

CHART 8: IMPACT OF HANDWRITING SKILLS

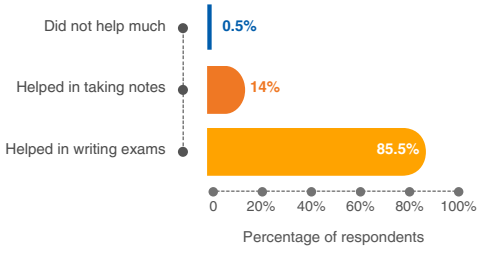


CHART 9: IMPACT OF PROJECT-BASED LEARNING ON UNDERSTANDING SCIENCE SUBJECTS

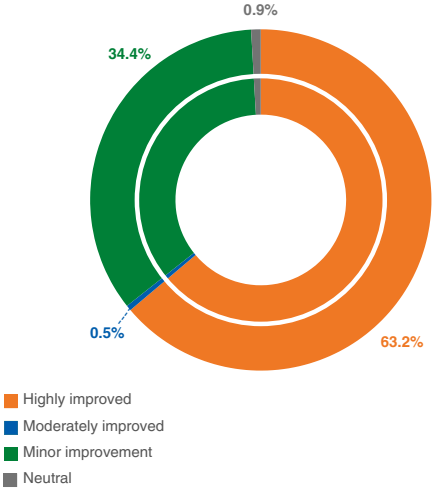
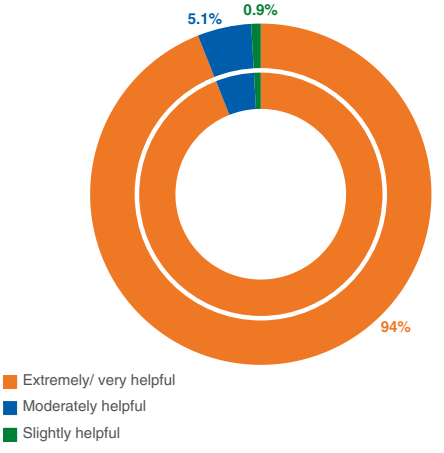


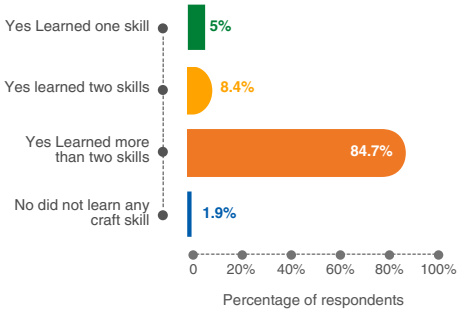
CHART 10: IMPACT OF LEARNED SKILLS ON OVERALL LEARNING ABILITY AND ACADEMIC PERFORMANCE



Perceived impact on the following skills:

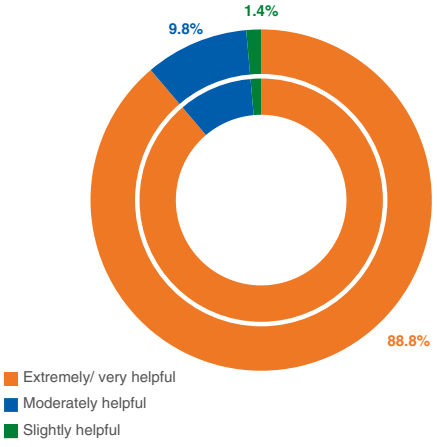
- **Handwriting Skills:** 85.5% of the respondents reported that the intervention helped them in properly writing their exams, while it helped 14% of them to take notes efficiently.
- **Understanding Science Subjects:** 63.2% of the respondents mentioned that the intervention's Project-Based learning model highly improved their understanding of science subjects, while 34.4% of them reported somewhat improvement.
- **Overall Ability and Academic Performance:** 94% of the respondents feel that the program has been extremely helpful in enhancing their learning ability and academic performance.

CHART 11: CRAFT SKILLS LEARNT



Craft Skills Learnt: 84.7% of the respondents highlighted that they learnt more than two craft skills. These skills included making kites, Akashkandil (lanterns), and rakhi, painting lamps, and engaging in paper crafts like box making, toran, and decoration. Some students also created best-out-of-waste crafts, rubber crafts, and science projects. Many activities were related to Diwali celebrations, such as painting diyas and making festive decorations.

CHART 12: CONFIDENCE GAINED IN PUBLIC SPEAKING THROUGH SESSIONS



Confidence Gained: 88.8% of the respondents reported that the public speaking sessions were extremely helpful in gaining confidence during public speaking.

CASE STUDY
SHRUSHTI KAMBLE IS A 6TH-GRADE STUDENT

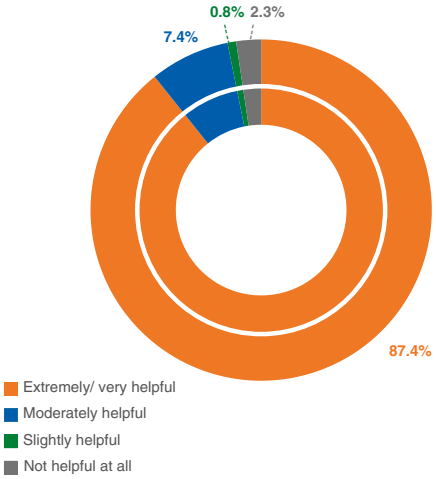
Shrushti Kamble is a 6th-grade student from a poor family. She grew up with her mother, following her parents' divorce. Even though her mother wanted to send her to school, she couldn't afford the education. So, Shrushti stayed with her grandparents, who took care of her expenses and made sure she could continue her studies.

When Shrushti joined the Vikas Mitra program, it helped her a lot. One of her biggest challenges was learning English. At first, English was very difficult for her, but with the support from the trainers, she started to improve. The program offered one-on-one help to explain things better, which made learning more manageable. English grammar, which once seemed impossible, is now something Shrushti can understand with practice.

Before joining Vikas Mitra, Shrushti was very shy and had trouble speaking in front of others. But after taking part in sessions like "Who Am I?" and others to build confidence, she started to open up. These sessions helped her feel more comfortable in school and sparked her interest in learning. She started coming to school every day with more excitement and enthusiasm.

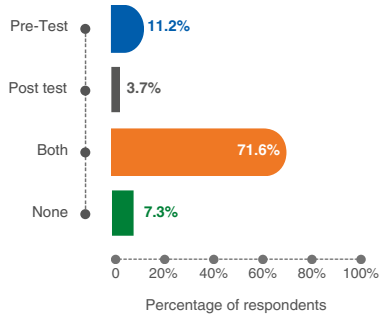
For Shrushti, the Vikas Mitra program has been fun and inspiring. It has helped her not only with her studies but also with growing as a person. She now feels more confident in her abilities and looks forward to learning new things every day.

CHART 13: IMPACT OF SELF-DEVELOPMENT AND CAREER ORIENTATION SESSIONS ON LIFE GOALS



Impact on Life Goals: 89.2% of the respondents reported that the Self-Development and Career Orientation Sessions were extremely helpful in deciding life goals.

CHART 14: PARTICIPATION IN PRE- AND POST-TESTS ON INTERVENTION TOPICS



Participation in Assessment: 71.6% of the respondents mentioned that they participated in both pre- and post-assessments on Intervention topics. 11.2% of them took only the pre-test, while 3.7% of them took only post-intervention tests. 7.3% did not appear for any assessment.

The organisational data on the assessment scores reveal that:

- Higher primary group of students showed a percentage increase of 18.83% in basic writing, 20.81% improvement in word power and 15.52% in creative writing skills. On the other hand,
- Secondary school students demonstrated a percentage increase of 11.86% in basic writing , 19.51% in word power and 27.14% in creative writing.
- As evident through these findings, high levels of improvements are seen in writing skills in both the groups. Basic writing skills have improved significantly in primary students and their skill levels are almost at par with secondary school students but there is still scope for improvement. Creative writing skills have improved more in the secondary students' group as compared to the primary student group.
- Reading comprehension has increased more in the higher primary group (15.63%) but a large number of students are still lacking in reading skills.
- A significant improvement in all the three areas of self-awareness (social, attitude and emotional) was witnessed. Higher primary students demonstrated a 13.72% increase in social awareness, 23.12% improvement in their attitude, 13.12% increase in emotional awareness. Meanwhile, there was a 13.47% percentage increase in social awareness, 23.37% improvement in attitude and 10.39% increase in emotional awareness among the secondary group of students.

Interview with Indrayani Gaikawad, an expert senior resource person for training in the educational department at the Tehsil level, highlighted that the program has played a crucial role in conducting effective student evaluations, helping identify learning gaps and improving academic performance.

Interviews with facilitators (Shikshan Doots) revealed that initially, the academic levels of the students were quite low, but by the end of the program, they observed a significant improvement of around 30-40% in academic scores.

One of the most noticeable changes was in shuddha lekhan (accurate writing), along with better handwriting and improved listening skills. They also saw growth in their leadership abilities, comprehension, discipline, and attention span.

Overall, the students became more confident and engaged in their learning process.

> I was involved in conducting pre- and post-tests for students. In the beginning, many students struggled with reading fluently and had difficulties with writing. Their understanding of basic academic concepts was also weak. After the intervention, I observed steady improvement in their reading, writing, and comprehension skills. With regular practice and guidance, they became more confident in their learning.
>
> **- Jayashree Tanaji Shilekar, Shikshan Doot, ZP School Vanzdare**

CHART 15: RECEIVED THE MAGAZINE "CHHATRA PRABODHAN SUBODH"

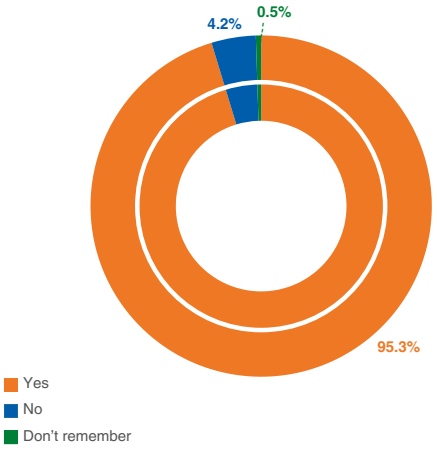
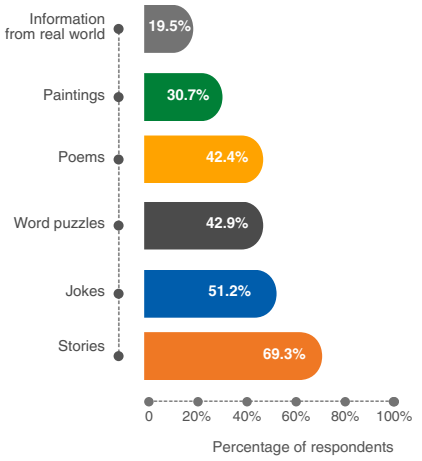
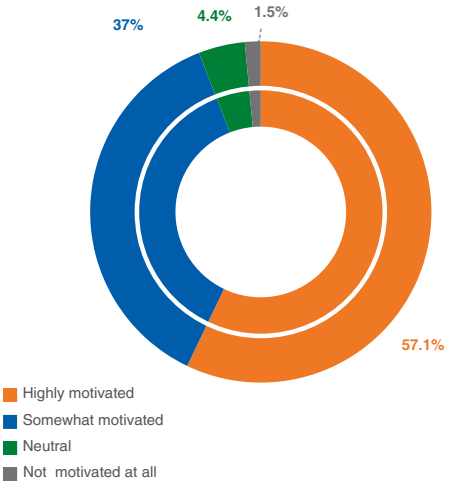


CHART 16: MOST ENJOYED CONTENTS OF THE MAGAZINE



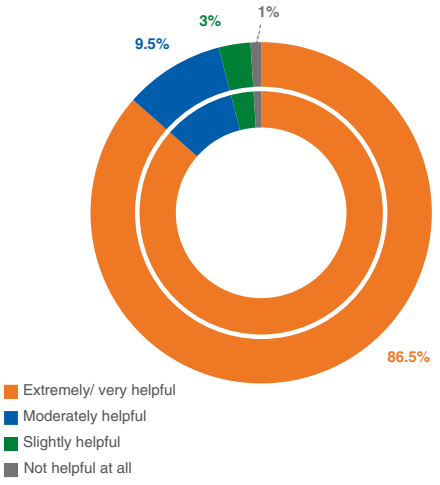
Magazine Received & Content Enjoyed: 95.3% of the respondents received the 'Chhatra Prabodhan Subodh' magazine. 69.3% of those who received the magazine mentioned that they mostly enjoyed the stories published in it, while 51.2% of them liked the published jokes.

CHART 17: MOTIVATION TO READ BOOKS AND MAGAZINES



Motivation to Read: 57.1% of the respondents highlighted that the intervention has highly motivated them to read, while 37% of them feel somewhat motivated.

CHART 18: USEFULNESS OF CALENDARS WITH CREATIVE AND INNOVATIVE TASKS



Utility of Calendars: 86.5% of the respondents feel that the creative calendars distributed under the project were extremely helpful.

Discussion with the teachers showed that the materials provided under the project, such as microscopes, maps, task calendars, practice worksheets, questionnaires, and books, were used effectively to enhance student learning. The microscope helped in hands-on science experiments, making concepts more engaging. Maps were utilised for geography lessons, improving spatial understanding. The task calendar ensured structured activities, while practice worksheets and questionnaires reinforced learning and assessment. Books provided additional reference material, supporting deeper subject understanding.

CHART 19: PARTICIPATION IN COMPETITIONS ORGANISED UNDER THE VIKAS MITRA PROGRAM

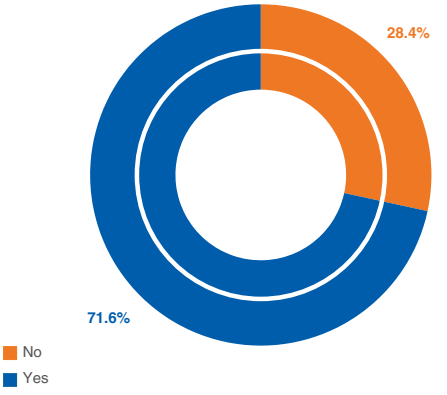
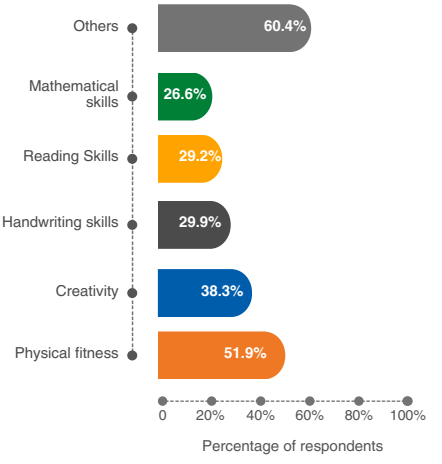
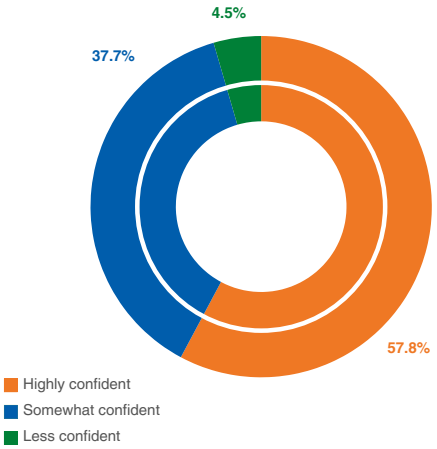


CHART 20: TYPES OF COMPETITIONS PARTICIPATED IN



Participation in Competitions: 71.6% of the respondents reported participating in the competitions organised under the Vikas Mitra Program. 51.9% of them (80 respondents) participated in physical fitness competitions, while creativity competitions were attended by 38.3% of them. Some of the other competitions which saw substantial participation included handwriting skills (29.9%), reading skills (29.2%), and mathematical skills (26.6%).

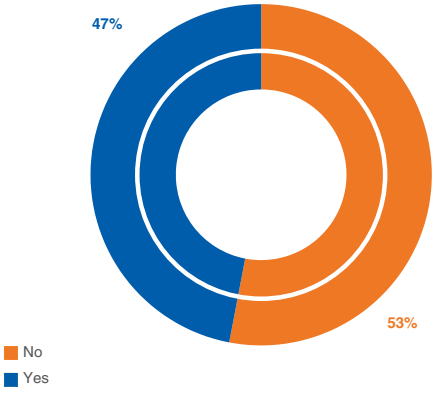
CHART 21: CONFIDENCE LEVEL AFTER PARTICIPATION



Perceived Impact on Confidence Level: 57.8% of the respondents revealed that they felt highly confident after participating in these competitions, while 37.7% of them felt somewhat confident.

Discussions with teachers highlighted that the students who participated in competitive exams showed great improvement in their performance and confidence levels. They do not hesitate to talk to any outsiders. Moreover, their stage fright has decreased, and they have imbibed ways to enhance their stage presence.

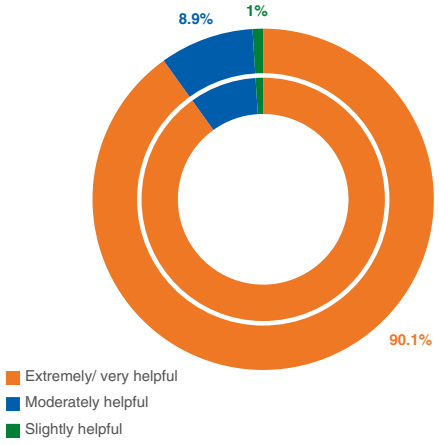
CHART 22: WHETHER SELECTED FOR THE PRAJNA VIKAS PROGRAM



Selection: Out of all the respondents, 47% of them (101 respondents) were selected for the Prajna Vikas Program. An interview with the program coordinator highlighted that these students were selected based on student-parent interest, motivation level, and commitment to putting in extra effort to succeed.

The Prajna Vikas Program comprises concentrated inputs on Academics and Leadership provided to high-potential students (15% of the total batch of 1100 students) to prepare for competitive exams and develop leadership skills. These selected students are also encouraged to help co-learners on academic topics and conduct various activities in the school.

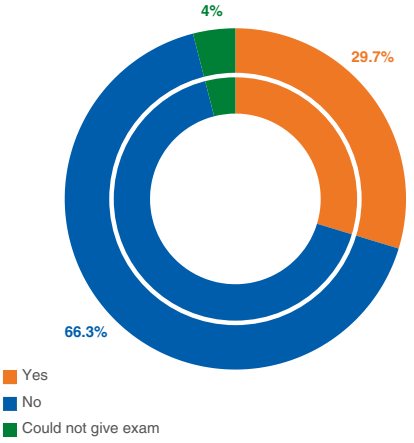
CHART 23: USEFULNESS OF WORKSHOPS FOR STATE BOARD SCHOLARSHIP EXAM PREPARATION



Utility: 90% of the respondents found the workshops conducted under the Prajna Vikas Program to be extremely helpful for State Board Scholarship Exam Preparation.

> "The program helped students prepare for the scholarship exam, which was a wonderful initiative. I believe that the Shikshan Doot model is very beneficial for the students. I remember that during the pandemic, these Shikshan Dots helped students in the communities to continue their studies."
>
> **- Devram Gaikwad, Centre Head, Education Department, ZP Pune**

CHART 24: SUCCESS IN OBTAINING THE SCHOLARSHIP



Success Rate: Out of the respondents who received the training under the Prajna Vikas Program, 30% of them (30 respondents) received the scholarship, 66% of them did not secure the scholarship, and 4% of them did not appear for the scholarship examination. Therefore, the effective rate of success, according to our study, is 31%.

Discussing the scholarship preparation program, the Program Head recalled how the pandemic has exacerbated the gaps in the education ecosystem and it took them quite a lot of time to address these gaps through continuous handholding. The program team offered substantial support to the students and finally saw outstanding results, with three students even making it to the merit list at the state level.

CHART 25: IMPACT OF ACADEMIC INPUTS FROM PRAJNA VIKAS PROGRAM ON OVERALL STUDIES

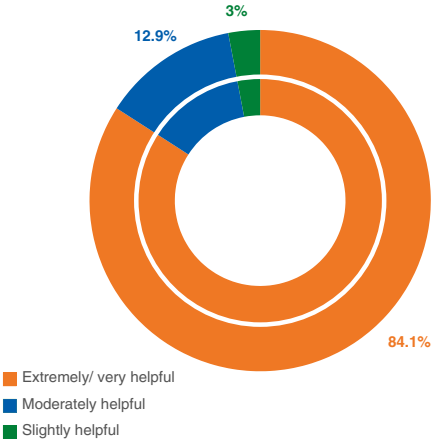
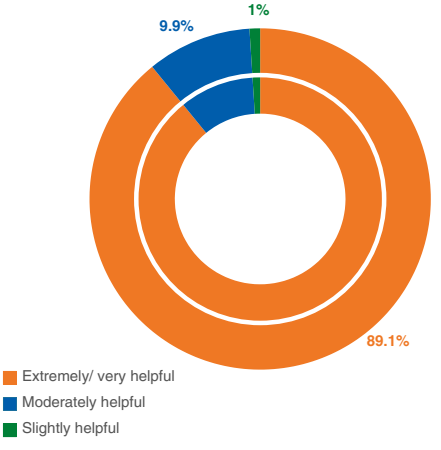


CHART 26: DEVELOPMENT OF SOCIAL RESPONSIBILITY AND LEADERSHIP SKILLS THROUGH PRAJNA VIKAS PROGRAM



Perceived Impact on the following:

- Overall Studies: 84% of the respondents found the academic inputs from the Prajna Vikas Program to be extremely helpful in their overall studies, while 13% of them considered it moderately helpful.
- Development of Social Responsibility: 89% of the respondents believed that the Prajna Vikas Program was extremely helpful in developing social responsibility and leadership skills, while 10% of them felt that it was moderately helpful.

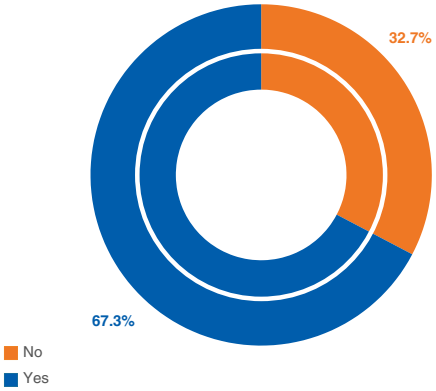
CASE STUDY

Tanmay Sachin Gaikwad, now a 10th-grade student, began his educational journey with the Vikas Mitra program when he was in 5th Grade. At that time, he faced significant academic challenges, particularly in subjects like Math and Science, and found himself struggling at a very low level.

Though Tanmay and around 60 other students initially struggled and failed the scholarship exam in the first-year 5th grade scholarship, the Vikas Mitra program team did not give up on them. They continued to provide coaching and guidance throughout the following years, even up until Tanmay reached the 8th Grade. After two years of intense support, Tanmay's perseverance paid off when he finally earned a scholarship and made it to the state merit list. This achievement was a significant turning point for him, especially considering his earlier struggles.
The Vikas Mitra program's focus on improving confidence in difficult subjects, especially Math and Science, helped Tanmay tremendously. As Tanmay now faces his 10th-grade board exams, the Vikas Mitra program continues to support him by organising study camps focused on exam preparation. They have provided training on how to write exams effectively and manage stress through yoga and meditation, which have helped him stay calm and focused during the exam period.

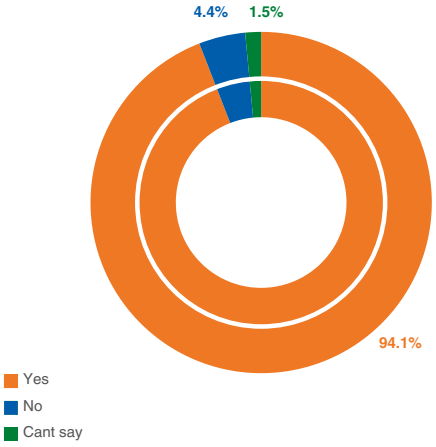
Thanks to the Vikas Mitra program, Tanmay has developed leadership skills, has become more self-reliant, and is now dreaming of becoming a scientist. He credits the program for shaping his future and helping him achieve things he never thought possible.

CHART 27: PARTICIPATION IN FIELD VISITS DURING THE PROGRAM



Field Visits: 67.3% of the respondents (68 respondents) participated in the field visits during the program. An interview with the Program Head revealed that each year, a theme is decided for the visits. During one such visit, students explored the metro system, where they learned how it operates and interacted with metro staff. They were also taken to manufacturing sites such as Chitale (dairy) manufacturing unit.

CHART 28: IMPACT OF FIELD VISITS ON PERSPECTIVE ENHANCEMENT



Perceived Impact: Out of those who participated, 94.1% of the respondents felt that the visits enhanced their perspective about the world.

Interview with Subhas Walhekar, Headmaster, Raje Shiv Chatrapati Vidyalay, Sonde Mathna underscored that Field visits were highly effective in broadening students' perspectives, providing practical learning experiences, and increasing their curiosity and engagement.

A significant impact of these visits was highlighted by the mothers of the students during a Focus Group Discussion. They mentioned that they have started seeing the world through their children's eyes, further revealing how after every visit, students come back home and share their learnings with great enthusiasm. They also appreciated how these visits facilitate new learnings for their children

> "Since we live in rural areas and work as agricultural labourers, we cannot take them outside to explore. We also have limited resources. I suggest that more field and study visits be included."
>
> **- Meena Rajendra Shinde, Parent**

CHART 29: THE PROGRAM MADE LEARNING MORE ENJOYABLE AND INTERESTING

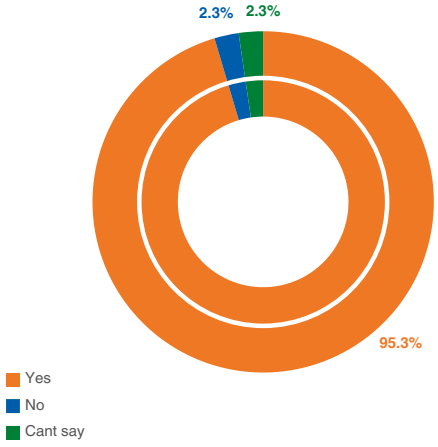


CHART 30: PREPAREDNESS FOR HIGHER STUDIES AFTER THE PROGRAM

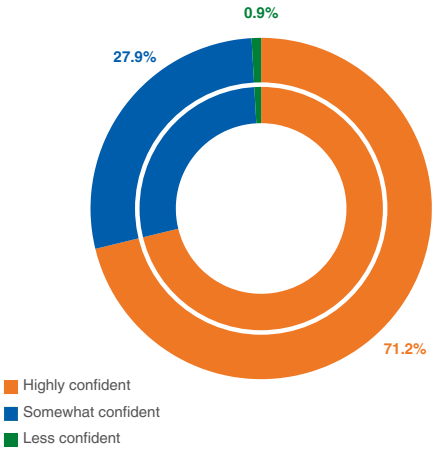
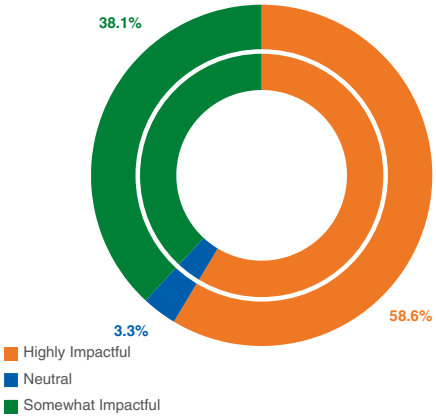


CHART 31: OVERALL IMPACT OF THE PROGRAM



Perceived Impact:

Joyful Learning: 95.3% of the respondents reported that the entire program made learning more enjoyable and interesting.

Future Preparedness: 71.2% of the respondents felt highly confident about their future studies due to the efforts of the program.

Overall, 58.6% of the respondents feel that the program was highly impactful, and 38.1% of them feel it was somewhat impactful.

INTERACTION WITH THE PROJECT TEAM

CASE STUDY

Deepali Nathu Sangale is currently in 10th Grade, but she joined Shree Shivaji Veer Bajirao Pasalkar High School, Panshet, in 9th grade. She was raised in a single-parent household by her mother, who is divorced. Deepali's mother works in a canteen, but her job is not permanent, and she only earns around 5,000 to 8,000 rupees per month. Deepali also has a younger brother, and her mother struggles to provide both care and skills to her children, making life quite difficult. They come from a marginalised community and do not own land or have any other sources of income. If her mother's work shuts down, she sometimes has to spend months searching for a new job, which often leaves the family without a stable income for long periods.

To ensure that Deepali could continue her education, her mother enrolled her in a government hostel near the school. Things began to change when Deepali joined the Vikas Mitra program in 9th grade.

After participating in the program, Deepali started to grow more confident and began dreaming about a career in the police force. The Vikas Mitra program provided Deepali with valuable support in many ways. One of the key sessions was “Who Am I?” which helped her understand herself better and boosted her self-esteem. She also learned how to focus more on her studies and received help with Math and Science, subjects that she had struggled with. These sessions gave her the confidence to approach her academics with a positive mindset.

The program also offered craft sessions, where Deepali learned to make things like boxes, kites, and charts. This hands-on experience was not only fun but also helped her develop new skills. One of the most impactful parts of the program was the Dnyan Subodh magazine, which helped Deepali discover a love for reading. Initially, she was very poor at reading, but thanks to the program’s support and resources, she has made significant progress.

QUALITATIVE FINDINGS

SESSIONS WITH TEACHERS

Interviews with teachers and school Headmasters highlighted that:

- The teachers' training workshops were highly effective in improving teaching methods, student engagement, and subject delivery.
- The teachers visited the Competitive Examination Centre at Jnana Prabodhini, Pune, and received training for the scholarship program.
- A total of 5 to 6 training sessions were conducted, each lasting one day for the scholarship program.
- These workshops helped teachers adopt new strategies, interactive teaching techniques, and better assessment methods, leading to more engaging and effective classroom learning for students to achieve in scholarship.

Moreover, the program on the primary education training included topics like:

- Techniques including group discussions
- Practice paper solving
- Preparing own questions
- Concepts of Mathematics and English, and a few tricks to deliver these topics effectively
- Use of a microscope

The facilitator also oriented them on:

- Their role in the program
- How to use a session plan
- Demonstration
- Storytelling
- Project updates and review
- Problem-solving and concern-sharing
- Material/kit distribution
- Use of an app for reporting

FGD WITH STUDENTS

> The training was highly effective as it provided valuable insights into exam patterns, student preparation strategies, and techniques to enhance learning outcomes. It helped me better support students in their academic journey and guide them in scholarship enrolment and exam readiness.
>
> **- Vandana Joshi, Teacher, ZP School Sonde Sarpale**

> The training introduced us (teachers) to new teaching methodologies. We implemented these strategies in classrooms, and the results were good. The training empowered us to create more engaging and effective lesson plans, making classroom teaching more interactive and productive.
>
> **- Pramila Gulabrao Jadhav, Teacher, ZP Primary School, Vanzdare**

Sessions with Parents: The interviews reveal that the parents' awareness sessions were designed to inform parents about the Vikas Mitra program's objectives, vision, and activities. The session also highlighted how the program could help students stay connected with their studies during challenges like the COVID-19 pandemic.

Parents were encouraged to participate, ask questions, and understand how the program could positively impact their children's growth and learning.

Moreover, to ensure transparency and enhance parent engagement, consent for every exposure visit and study tour is obtained from them.

SOULACE TEAM INTERACTING WITH THE PARENTS

"Whenever I find time, I attend parent-teacher meetings. I met the program team at the beginning of the academic year. They shared all of our plans, and I granted them permission to participate in the activities because it was beneficial for my daughter. School teachers and the principal have become very approachable and always share my child's strengths and weaknesses while suggesting improvement areas.

- Jija Datta Chorghe, M/o Pranita Datta Chorghe (Grade 7th)"

"I attended the awareness session, where they shared about program benefits. I also attended parent-teacher meetings where I met the program team. Teachers share details about my child's strengths, weaknesses, and areas for improvement regularly.

- Meena Rajendra Shinde, M/o Rajani Rajendra Shinde (Grade 10th)"

YOUNG SCIENTISTS OF VELHE SCHOOL DEMONSTRATING AN EXPERIMENT

KEY CHALLENGES AND BARRIERS

The following challenge was faced during the implementation phase of the program:

NAVIGATING BUREAUCRATIC STRUCTURES

One of the major challenges faced was the time-consuming nature of obtaining permissions. Since the program team was working within a government framework, they had to follow a multi-step process that required approval from various levels of government authority.

LOW STUDENT ENGAGEMENT IN THE INITIAL PHASES

Ensuring student participation was challenging, as many students came from underprivileged backgrounds, leading to low attendance or lack of interest initially.

NATURAL CALAMITY

The COVID-19 pandemic disrupted the offline nature of the program, and various alternate methods had to be deployed to ensure the continuation of learning activities.

INTERACTION WITH THE FACILITATORS

07. SUSTAINABILITY

The long-term sustainability of the Vikas Mitra program has been thoughtfully integrated into its design through capacity building, resource support, and student-centred development.

CAPACITY BUILDING OF TEACHERS

One of the most sustainable aspects of the program is the intensive training and continuous professional development provided to school teachers. These sessions focus on equipping teachers with innovative, child-centric, and contextually relevant teaching techniques aimed at improving learning outcomes. As a result, teachers become long-term enablers of quality education, even after the program period ends. With enhanced capacity, they can continue to drive academic growth, build life skills, and inculcate leadership-building activities in the school ecosystem independently.

INFRASTRUCTURE AND RESOURCE SUPPORT

To complement the training of teachers, the program has ensured the provision of high-quality teaching-learning materials (TLM), such as worksheets, creative calendars, and microscopes. These resources are not one-time-use materials; they have been designed for reusability and adaptability across academic sessions and classes. Their availability at the school level means that future cohorts of students will continue to benefit from enriched classroom practices.

DEVELOPMENT OF TRAINING MANUALS

The creation of structured and easy-to-use teacher training manuals and activity guides has been a strategic move to institutionalise the program. These manuals provide a clear roadmap for replicating the sessions in future years and adapting them for new batches.

ENHANCED STUDENT CAPABILITIES FOR LIFELONG IMPACT

By focusing on improving foundational competencies such as reading comprehension, confidence, communication, and goal-setting, the program empowers students with skills that have a long-term impact on their academic and personal growth. These skills stay with students and influence their life journeys beyond the classroom.

Together, these elements ensure that the program creates community ownership and individual empowerment, which are all critical pillars of sustainability.

CHAPTER 8
RECOMMENDATIONS

Based on our multi-stakeholder interactions and understanding of other similar educational interventions, the following recommendations are proposed to strengthen the program

INTRODUCTION OF STRUCTURED READING ENHANCEMENT MODULES

- Introduce a graded reading program with multilingual, interest-based reading material.
- Create and facilitate peer reading groups and story circles to create an immersive reading environment.

DEVELOP A ROBUST MENTORSHIP MODEL FOR PEER-TO-PEER LEARNING

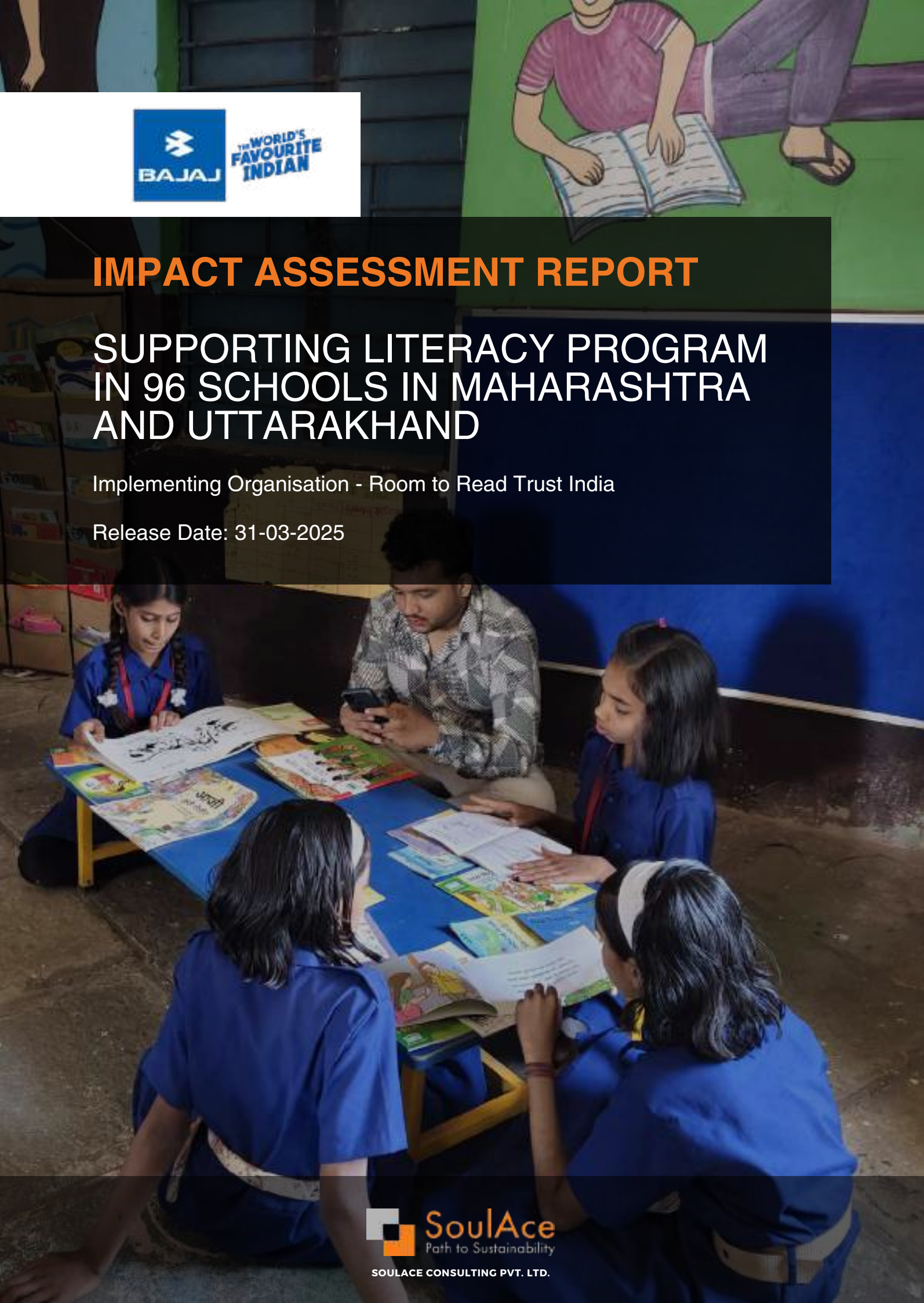
- Pair mentors (Chhatra Mitras) with younger students for academic help, confidence-building, and goal-setting.
- Recognise mentors through certificates or school-wide acknowledgement to sustain motivation.

EXPAND THE SCOPE OF CAREER ORIENTATION AND LIFE GOAL SETTING

- Include local professionals and alumni in guest sessions and Q&A formats.
- Provide simple tools for goal-setting and tracking, such as ‘My Career Journal’.

CHAPTER 9
CONCLUSION

The Vikas Mitra program has been a significant step toward nurturing holistic development among students from marginalised communities. By focusing on enhancing learning outcomes and integrating essential life skills, the program has empowered children not just academically but also socially and emotionally. The multi-pronged approach—consisting of teacher training, provision of innovative teaching-learning materials and student-centric activities—has collectively contributed to creating a vibrant and engaging learning environment. The emphasis on peer learning, student participation, and goal-setting has also created a sense of agency and motivation among students, encouraging them to take charge of their learning journey. Overall, the program has laid a strong foundation for long-term behavioural and attitudinal change among students.



IMPACT ASSESSMENT REPORT

SUPPORTING LITERACY PROGRAM IN 96 SCHOOLS IN MAHARASHTRA AND UTTARAKHAND

Implementing Organisation - Room to Read Trust India

Release Date: 31-03-2025

SoulAce
Path to Sustainability

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

BAL	Bajaj Auto Limited
CLMC	Child Library Management Committee
FGDs	Focus Group Discussions
GEP	Girls' Education Program
IDIs	In-Depth Interviews
RTR	Room To Read
SMC	School Management Committee

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

Room To Read (RTR) India Trust, with the financial support of Bajaj, started its literacy project in Maharashtra and Uttarakhand in 2019. It was carried out in two states across India: Maharashtra and Uttarakhand. The project sites for implementation were Aurangabad district (Aurangabad, Gangapur, and Paithan blocks) in Maharashtra and Uddham Singh Nagar district (Khatima and Sitarganj blocks) in Uttarakhand.

The RTR project has played a pivotal role in creating a conducive environment for the promotion of literacy activities among students studying in government schools by setting up libraries on government school premises. Libraries have thus resulted in ensuring a rich experience of access to literature, stories, educational material, and level-appropriate books that are friendly, along with a safe environment that is necessary for inculcating reading habits among children.

The project, through this engagement with the CSR of BAL, has successfully addressed four (4) key areas that are essential to the development of literacy skills, a habit of reading and gaining more knowledge, and their overall development. This was implemented alongside teacher training and development activities, as well as efforts to create safe and child-friendly learning environments. It also included the procurement and provision of quality reading materials. Additionally, family and community engagement activities were carried out to ensure that the reading habit among children is sustained through motivation and shared participation with family or community members. Additionally, specific educators in these schools were selected and trained to ensure effective literacy instruction and the management of the library. Reading Campaigns were organised annually in communities to sensitise various stakeholders about the importance of building reading habits amongst children in the early years and their role in facilitating the same.

The COVID-19 outbreak posed challenges that were never envisaged by any technology, program, or strategy. This resulted in the disruption of education along with the cessation of services and systems globally. Such a unique scenario called for innovative methods to mitigate and transform the delivery of educational content through and using virtual platforms and the adoption of a blended teaching and learning approach. The reopening of schools in the subsequent period further worsened the already existing learning gaps. These gaps now needed to be addressed through special and additional remedial classes, along with study and learning materials that required the development of specific teaching resources. Thus, RTR ensured and provided Tarang (student handbooks) and Shikshak Sandarshika (teacher handbooks) to offer structured support to students, minimize learning gaps, and help them engage with reading and gain knowledge without the pressure of studying, formal education, or performance.

With 62 libraries set up in Maharashtra and 34 libraries in Uttarakhand, RTR established a total of 96 libraries in the year 2019 alone. The organisation has also procured and distributed 129,287 books covering varied subjects and age groups across these 96 libraries over three) years. This included digital content and digital books, including 30 flipbooks, 34 read-aloud video stories, 40 audio games and worksheets, which were shared using school-based WhatsApp groups during the lockdown. A toll-free IVR facility was set up and provided students with a wide array and range of interesting stories to read from and engage with. Additionally, 16 television series and 24 radio episodes were broadcast to engage parents and students, and that collective learning was achieved. Literacy kits were also distributed to those who did not have access to online resources.

Through this project, a total of 62 head teachers, 91-point teachers, and 122 regular teachers underwent training in Maharashtra. Additionally, 102 head teachers and 73-point teachers were trained in Uttarakhand. 9 government officials in Maharashtra and 13 in Uttarakhand were engaged with, and their participation and support to the project as key stakeholders was sought.

PROJECT ACTIVITIES

PRELIMINARY GROUNDWORK

- Preliminary Groundwork
- Site verification.
- Seeking approvals from the government and local administrative authorities.
- Finalising the school list with the government.
- Hiring of project staff.
- Purchase of furniture.
- Book selection, procurement, and delivery.

TRAINING & FORMATION OF COMMITTEES

- Training of head teacher, point teacher, literacy facilitator, librarians, and monitoring staff on library management and instruction programs.
- Establishing a Child Library Management Committee.
- Establishing a School Management Committee that integrates the library as an essential component in the schooling system.

KEY ACTIVITIES

- Community engagement.
- Summer reading camps.
- Observing special days such as International Literacy Day and Children's Day.
- Refresher training for teachers.
- Creating digital content in the form of flipbooks, read-aloud video stories, audio games, worksheets, toll-free IVR facilities, and broadcasting of TV and radio episodes.
- Distribution of literacy kits.

PROJECT DETAILS

Implementation year

2019-2023

Assessment year

FY 2024-2025

Implementing Partner

Room to Read India Trust

Number of beneficiaries

15,083

Project Budget

₹684 Lakhs

Location

Maharashtra	District Aurangabad: Blocks Aurangabad, Gangapur, and Paithan
Uttarakhand	District Udham Singh Nagar: Blocks Khatima and Sitarganj

Alignment with SDGs

Key Findings

Sample Size - 225

66.67%
of the participants belonged to the categories of Scheduled Caste, Scheduled Tribe, and Other Backward Classes.

50%
of the participants had farming as their key family occupation, indicating the prevalence of an agrarian economy.

100%
of the participants were informed that there were enough books in the library, and new books were regularly added to the stock.

100%
of the children found the library spacious, well-ventilated, well-lit and had the provision of a fan, thus indicating a sound library infrastructure.

76%
of the participants reported that each class had been assigned a fixed time schedule to use the library on a daily basis.

86%
of the students were aware, and 76.9% were members of the Child Library Management Committee, which was created as a part of the project activities.

84.4%
of the children were aware of the digital learning platform www.literacycloud.org and used it at least once in 2-3 days or weekly. Thus, awareness and usage of the digital learning platform were considerably high.

51.6%
of the children found the books as per their level of understanding. However, 47.6% of the children found the books to be lower than their level of understanding. This was especially true for the older children in the age group of 12 to 14 years.

66%
of the children carried books home for reading, wherein parents, siblings, and other family members also read along with them. Thus, the project has encouraged reading habits at home while also ensuring family reading time.

Key Impacts

Sample Size - 225

IMPROVED READING SKILLS

Children experienced improvement across different aspects of reading skills. These included vocabulary – 63%, reading speed – 21%, more confidence in reading abilities – 14%, and better reading in academic subjects – 2%.

IMPROVED PERFORMANCE

94% of the children were informed of improved performance owing to improved reading skills.

IMPROVED KNOWLEDGE ACQUISITION

96% of the students stated that improved reading skills resulted in them acquiring greater knowledge.

EFFECTIVE HANDLING OF LIFE SITUATIONS

90% of the respondents reported that better reading skills equipped them to deal with life situations effectively.

IMPROVED SCHOOL ATTENDANCE

98% of the students stated that visiting the library to read books worked as an incentive for them to attend school regularly,and thus informed them of improved school attendance.

IMPROVED THOUGHT PROCESS

98% of the respondents witnessed clarity in their thought process as a result of diligent reading habits.

IMPROVED COMMUNICATION WITH PEERS ON VARIED SUBJECTS

94% of the respondents engaged in meaningful discussions with their peers on varied subjects, owing to better reading habits and resultant knowledge gain.

INCREASED PARENTAL APPRECIATION

60% of the respondents were informed of receiving better appreciation from their parents on account of improved reading skills; another 39% were asked by their parents to focus more on academic subjects.

03. OECD FRAMEWORK

RELEVANCE

The RTR library project, supported through the CSR of Bajaj Auto Limited, had significant relevance to the needs and aspirations of the state and nation: to improve the literacy rates and levels of education among school-going children in the project implementation sites. The initiative also ensured that children continue to be engaged and interested in education and do not drop out of school and the library work as an incentive for these children to come back, read and learn more.

The library is also relevant as it helped and played a vital role in promoting reading habits among all children, irrespective of age and levels and varied capacities to read and socio-economic backgrounds from grades I to IX.

COHERENCE

The project closely aligns with SDG 4, SDG 5, SDG 10, SDG 11

The Program also reflected strong coherence with national initiatives:

- National Education Policy (NEP)
- National Mission on Libraries (NML)
- Samagra Shiksha
- National Digital Library of India (NDLI)
- Rashtriya e-Pustakalaya,

EFFECTIVENESS

The RTR-implemented 'Supporting Literacy Program In 96 Schools In Maharashtra' project was found to be effective in the schools of implementation. The project helped anchor and foster healthy reading habits among school going children across all grades from I to IX, in the Zilla Parishad schools. The effective and efficient implementation of community and family members participation in the strategy and model, ensured the effective implementation of the objectives.

EFFICIENCY

The project was efficient due to its inherent and efficient program design to incorporate program-parent-community partnerships and further improvement of the initiative through the formation of the Library Management Committee.

All of these initiatives, together in association with the local administrative and school and teacher support, ensured that the project objectives of increasing the reading time and access to quality reading material were achieved. The milestone of incorporating fixed school-classroom hours into the regular timetable is a hallmark of the efficiency.

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

IMPACT

The 'Supporting Literacy Program In 96 Schools In Maharashtra' project had a significant impact on the quality and lives of children who benefited from quality access and safe reading spaces through the project initiatives. The program also sparked an interest among students in reading books and literature in additional languages such as English and Hindi. This expanded their ability to learn new concepts and broadened their knowledge base. The opportunity to take books home and read to their family members strengthened family bonding and interaction. In turn, this helped the community and parents to support and sustain the initiative.

SUSTAINABILITY

The program, through its design, had inculcated sustainability. Its operations were designed to ensure that the responsibility and ability of the initiative to continue would be embedded within the community and ecosystem created.

The program's design helped ensure the continuity of the initiatives. However, the external dependency on book restocking and the financing for the procurement of the books has come to a standstill upon the closure of the project and funding in the 96 schools. This has left the students, community members and parents looking forward to such an initiative being revived.

CHAPTER 4
INTRODUCTION

SoulAce Team in Assembly Giving Students Instructions

PROJECT NEED & BACKGROUND

Room to Read India Trust, with the financial support of Bajaj, implemented a student literacy program to augment and improve the learning outcomes of children from remotely located schools in Maharashtra and Uttarakhand in 2003. The project was carried out in the following geographies:

Sr No.	Block	District	State	Libraries	State-wise Libraries
1	Aurangabad	Aurangabad	Maharashtra	16	62 in Maharashtra
2	Gangapur	Aurangabad	Maharashtra	40	
3	Paithan	Aurangabad	Maharashtra	6	
4	Khatima	Uddham Singh Nagar	Uttarakhand	9	34 in Uttarakhand
5	Sitarganj	Uddham Singh Nagar	Uttarakhand	25	

The project has played a pivotal role in creating a conducive environment for the promotion of literacy activities among the students through the establishment of libraries in government schools, therefore providing students with a literature and knowledge-enriched experience of reading and learning. The libraries were equipped with level-appropriate books and a student-friendly and safe environment for inculcating a habit of reading among young minds. Post completion, the infrastructure was then handed over to the school authorities as a part of the project phase-out strategy that was designed and incorporated early on towards attaining sustainability.

This project also provided an opportunity to work closely with governments to integrate library services and books into their pedagogy, curriculum, and instructions for teaching, learning, and building supplementary learning materials. Room to Read's Literacy Program addresses four key areas that are essential to students' literacy development:

- teacher training and development
- safe and child-friendly learning environments
- quality reading material, and
- family and community engagement

Working together in these areas will help improve the learning levels of children, which is a major and immediate objective of the project to ensure that children can read fluently with comprehension. Additionally, educators in these schools were trained in effective literacy instruction and library management techniques. Each project school in Uttarakhand has also received instructional materials (such as teacher guidebooks and pupil books), and school libraries will be established within the existing school infrastructure to greatly expand students' access to quality reading materials.

The global COVID-19 outbreak led to global systemic collapse. This included the closure of schools and academic institutions for the complete academic year of 2020. This was during the project tenure that commenced in 2019; it affected the implementation, blueprint, and outcomes that were initially strategised. These unprecedented changes resulted in the commissioning of changes to the strategy, implementation design, and adaptations. To address the learning losses due to school closure, Room to Read adopted multiple innovations to reach out to students and to ensure that even during the school closure, students get some exposure to quality literature/ learning time. Bajaj's financial support and timely approvals for the innovations also played a critical role in reaching out to the beneficiaries.

PROJECT OBJECTIVES

The Literacy Project, implemented in 96 schools in Maharashtra and Uttarakhand, followed a four-fold objective:

PROVISIONING OF QUALITY READING MATERIAL

To identify, procure, and provide appropriate reading material for the children to strengthen their reading skills. As schools shut down in March 2020 due to COVID-19, RTR created response materials to mitigate student learning gaps. The material was created in a blended digital and non-digital format. The digital content included flipbooks, read-aloud video stories, audio games, and student worksheets. The material was disseminated to students via school-based WhatsApp groups.

SAFE AND CHILD-FRIENDLY LEARNING ENVIRONMENT

To ensure a safe and child-friendly learning environment through digital content as well as the distribution of print material, with the active involvement of parents and teachers. 'Family Reading Time' was encouraged through simple and doable techniques.

TRAINING AND DEVELOPMENT OF TEACHERS

To undertake capacity building of teachers through training, focusing on early literacy intervention, comprehensive literacy, reading components, reading activities, and 'Home as a Learning Space.

ENGAGEMENT OF COMMUNITY AND GOVERNMENT

To cultivate and nurture relationships with community and government officials to provide constant support to students in developing reading habits. The officials from the education department meet regularly to update them on the challenges and achievements of projects and seek permission for teacher training. To engage communities with the libraries, Room to Read set up a Library Management Committee composed of parents and celebrated various events such as Children's Day and International Literacy Day by inviting parents to the libraries.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting its commitment to serving society. In March 2024, the Bajaj group came together with Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelling its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, and animal welfare projects for the sustainable development of the community and the nation.

ABOUT ROOM TO READ INDIA TRUST

Room to Read India was officially established in 2003 and presently has programs in ten states – Chhattisgarh, Delhi NCR, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Uttarakhand, and Uttar Pradesh. It focuses on providing quality education within communities based on scientific rigour and evidence-based, measurable outcomes. It has created a model that can be replicated, localised, and sustained by government schools, local communities, and central and state governments.

RTR has two (2) flagship programs:

1. **Girls' Education Program (GEP),** which provides Life Skills education, resources, and mentorship support to girls from grades 6 to 12 belonging to economically disadvantaged communities and
2. **Literacy Program,** which enables primary school children to become independent readers and lifelong learners.

The year 2023 marked the highest number of custom projects for Room to Read India. Partnering with different donors, they delivered strategic interventions across different districts at scale. Their customised projects helped in reaching 2.3 lakh students with educational material and support and also trained more than 25,000 teachers to deliver their unique methodology, pedagogy and learning methods.

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited has assigned SoulAce to conduct an impact assessment study of the literacy project implemented in the states of Maharashtra and Uttarakhand. RTR, through its project, aimed to create a conducive, safe, and child-friendly environment for the promotion of literacy activities among students studying in government schools by setting up libraries on government school premises.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

To assess the impact of various literacy activities carried out in school libraries on children in terms of reading habits, academic performance, knowledge acquisition, life skills building, and constructive thought process.

To ascertain the effectiveness of various training carried out for point teachers, head teachers, instruction teachers, librarians, and the project team, in acquiring the skills required to carry out literacy activities with children innovatively and undertake library management.

To assess the sustainability of the project from the perspective of scalability and replicability.

USE OF MIXED METHODS APPROACH

The evaluation adopted a mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth, complementary exploration of the quantitative subjective experiences and viewpoints of key stakeholders, such as students, teachers, parents, and project staff, offering a nuanced grasp of their perspectives. The quantitative methods, on the other hand, facilitated the gathering and analysis of numerical data obtained from the beneficiaries and stakeholders identified, thus yielding statistical insights and identifying trends.

By deploying the mixed methods approach, the evaluation aimed to leverage the strengths of both qualitative and quantitative assessment techniques, thus resulting in the collection of robust and comprehensive insights and data. This holistic approach was identified to be pivotal in providing a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted impact assessment and the ability to evaluate the sustainability quotient while identifying gaps for further improving the project, making it more robust and effective in meeting its stated objective(s).

QUANTITATIVE TECHNIQUES AND METHODS APPLIED

Quantitative techniques were used to evaluate the project and its direct and objective impact through data collected and analysed using statistical tools. The various specifically designed surveys and questionnaires were created and utilised to collect data on various specific indicators from the beneficiaries and stakeholders. The data thus collected and analysed provided an insight into the project, its effectiveness, and the areas for improvement. The quantitative methods used also provided a measurable approach to gauge the project outcomes and evaluate its success through a statistical perspective towards scalability, sustainability, and replicability.

QUALITATIVE TECHNIQUES AND METHODS APPLIED

Qualitative methods were used to elicit insights into the real-life experiences, viewpoints, and stories of beneficiaries, stakeholders, and those responsible for project implementation, which cannot be revealed through querying and quantitative methods. Meaningful engagement with the stakeholders, like students, teachers, school staff, parents, and project staff, through in-depth interviews and focus group discussions allowed for a comprehensive examination of the changes from a human-centric approach.

The method thus facilitated the exploration and understanding of improvements in the overall reading habits of students through the intervention done by the Room to Read India Trust. By capturing the realities and narratives of those involved, the qualitative approach helped gain a nuanced understanding of the project and its impact through the lens of the beneficiaries and stakeholders themselves.

DESIGN SNAPSHOT

Name of the project

Supporting literacy project in 96 schools in Maharashtra and Uttarakhand

Implementing agency

Room to Read India Trust

Research design used

Descriptive research design

Sampling technique

Stratified Random and Purposive sampling

Sample size

225

Qualitative methods used

Semi-structured interviews, testimonials from beneficiaries and stakeholders

KEY STAKEHOLDERS

- Children in the age group of 8 to 14 years studying in government schools
- Point teachers
- Head teachers
- Instruction teachers
- Parents
- Community
- Project staff

STUDY TOOLS

- Defining stakeholders to be interacted with (Student beneficiaries, parents, teachers, school staff, and project staff)
- Development of a structured questionnaire (per stakeholder type)
- Review of project details (for each focus area)
- Setting and reviewing critical performance indicators before conducting the surveys
- Development of guides for semi-structured questionnaires, focus group discussions and beneficiary interactions
- Documentation of testimonials collected from the stakeholders who interacted.

ETHICAL CONSIDERATIONS

The impact evaluation conducted was guided by a set of ethical frameworks that ensured the study was conducted responsibly and ethically. Adherence to the ethical principles of research resulted in prioritising the rights and well-being of participants throughout the process of interactions and data collection.

Informed consent was taken, and comprehensive information about the study and its objectives, procedures, potential risks, and benefits was provided to participants, thus allowing them to make an informed decision about their participation and involvement after the questions were addressed. Robust and standard measures and methods to uphold the confidentiality and privacy of stakeholders who participated were implemented. The data was stored and made accessible only to authorised personnel, and the identities of the respondents were masked using standard anonymisation techniques.

The processes thus ensured that all participation:

I.Voluntary in nature

II.Free from coercion or pressure

III.Underscored the importance of autonomy and respect for individual choice at all times

Throughout, participants were treated with respect, dignity, and fairness, with their well-being being the top priority. They were also provided with necessary support or assistance, such as the option to not respond or withdraw mid-way through the interaction was also provided.

CHAPTER 6
KEY STUDY FINDINGS AND IMPACT

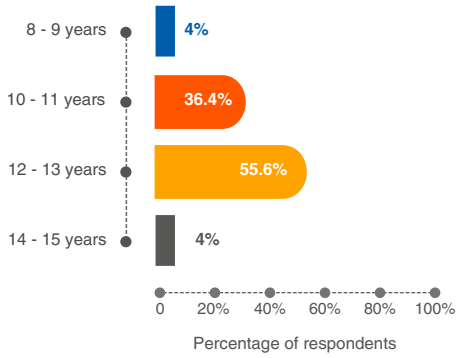
The project implementation led to several key impacts through the strategic and meticulously aligned implementation with the project design. The key findings and impact of the various activities carried out in creating a conducive environment for the promotion of literacy activities among the students at government schools are listed below.

GEOGRAPHICAL COVERAGE

The study covered the sample size from villages of Babulgaon, Gajgaon, Girnera Tanda, Satara, Shendra, and Takali Kadam, located in Aurangabad district in Maharashtra.

TARGETED GROUP: SOCIO-ECONOMIC & DEMOGRAPHIC PROFILE

CHART 1: GENDER-WISE DISTRIBUTION

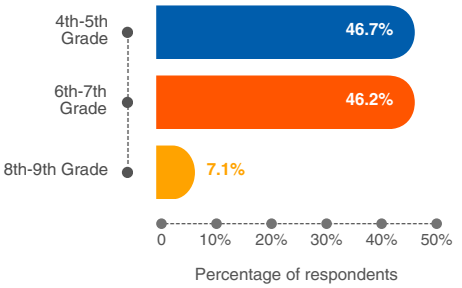


55.6%
of the student-respondents were in the age group of 12-13 years and studied in Grades 7 and 8, another 36.4% were from the age group of 10-11 years across grades 5 and 6. These two grades comprised the majority of the student beneficiaries who were interacted with for the assessment study. The remaining 4.2% and 4% of the student beneficiaries were from grades 3 (age group 8-9) and age group 14-15 (grades 9 and 10).

OUTREACH AND INCLUSIVITY

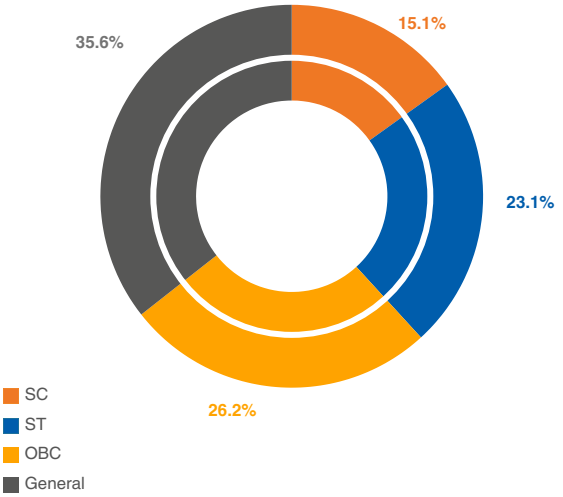
The primary beneficiaries of the project were children in the age group of 8 to 15 years who were studying in government schools in villages in the Aurangabad block in Maharashtra and the Uddham Singh Nagar block in Uttarakhand.

CHART 2: GENDER



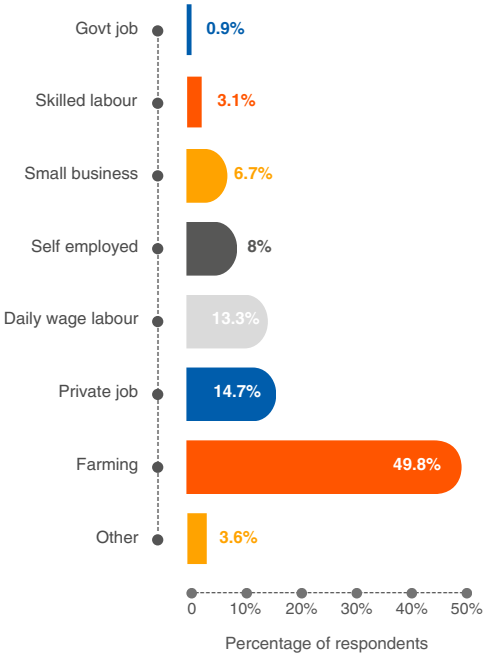
58%
of the respondent beneficiaries who interacted with the assessment were females, and the remaining 41.3% were males.

CHART 3: SOCIAL CATEGORY



A varied percentage of the caste categories of respondents interacted with was observed. 15.1% belonged to Scheduled Castes, 23.1% were Scheduled Tribes, and 26.2% were from the Other Backward Classes. 35.6% of the respondents were from the General category.

CHART 4: FAMILY OCCUPATION



49.8%

of the students who interacted with them said their parents were farmers, followed by 14.7% who were in private jobs, and 13.7% were daily wage workers. This insight indicates that most of the student beneficiaries of the project belonged to low-socio economic tiers, thus aligning with the overarching objective of the project to maximise the benefits of education from the most disadvantaged strata of society.

Impact of Three strategic pillars of the project

Libraries for children, especially, need a strong and foundational basis of a physical infrastructure that provides not just storage and facilitation of books to be read and or exchanged but also provides safe as well as conducive environments that encourage young and curious minds to explore and learn while growing. The provision of adequate seating, access, and lighting and the facilitation of the above through well-strategized and managed planning are also essential.

RTR had strategized its operations and objective of BAL CSR to maximise the reach and access to quality education and material that facilitates learning. The libraries that were implemented through the project were visited and noted to be spacious with adequate, good facilities and infrastructure, well-ventilated, and well-lit.

The library was observed to be well stocked with books, with new books being added to the existing literature collection on a regular basis. The students were assigned fixed timings for reading and accessing the library during class hours as a part of their daily school timetable. It was reported that the students visited the library on a frequent basis, once every two or three days. It was noted that the students would carry books home, which further boosted their reading habits and ensured continuity. It also was reported to have encouraged family bonding and co-reading time during non-school hours, thus improving the efficiency and participation of family and community through these indirect but essential reinforcements that are crucial for the sustainability of favourable habits that are also milestones in the encouragement of and facilitation of education as seen in this project.

The digital learning platform that was implemented as a part of the project during the COVID-19 lockdowns and physical restrictions was observed to be well used for accessing a variety of content through the application that was specially created. This ensured that children were able to access and continue to nurture their interest in reading and learning, thus not discontinuing education even if they were not able to access physical books, which is often seen and known to be the precursive and inducing factor for dropping out of school, especially in remote and rural areas.

Below are insights from the physical assessment of the library through the lens of the 3 pillars of the project and interactions with the beneficiaries and stakeholders of the project.

SOULACE TEAM INTERACTING WITH A STUDENT

PILLAR I: PHYSICAL INFRASTRUCTURE AND AVAILABILITY OF BOOKS

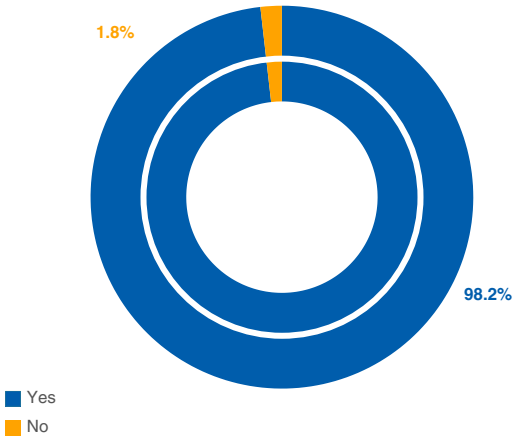
A. INFRASTRUCTURE OF THE LIBRARY

All the respondents who interacted said they found the library to be spacious, well-ventilated, well-lit, and having provision of fans, thus indicating the implementation and building of a safe and conducive library infrastructure.

This helped the students, as well as the parents, gain confidence in the project's activities to access the libraries and utilise the facilities and the books that were within the premises, supported through this project.

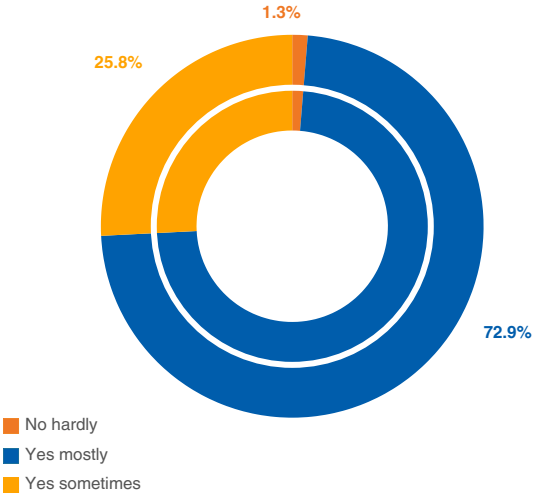
B. BOOKS IN THE LIBRARY

CHART 5: SUFFICIENT BOOKS IN LIBRARY



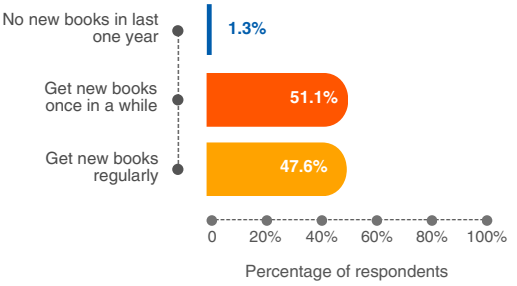
98.2%
of the participants said they were satisfied and that there were enough books in the library.

CHART 6: FOUND A BOOK TO READ



72.9%
of the participants said that they knew about the books archived in the library. and they were able to find and access the books they wanted to read with ease.

CHART 7: NEW BOOKS ADDED TO THE LIBRARY



47.6%
mentioned that they were aware that new books were added to stock on a regular basis, and 51.1% said that new books were added once in a while, indicating a good and healthy turnover of books on the shelves.

These together indicate the fulfilment of the basic requirement, ensuring that children whose reading and learning skills are being reinforced through strategic project activities which are re-engaged on a continuous basis in order to be efficient and effective.

Voice of Respondents The school has made efforts to keep the library clean, organised, and child-friendly. Books are arranged properly, and there are rules in place to ensure students feel comfortable while reading.

FGD, Parents of Zilla Parishad Primary School, Village Babulgaon, Taluka Aurangabad, Distt Aurangabad, Maharashtra

DIGITAL ADOPTION

The COVID-19 pandemic created a complete disruption of conventional methods of teaching and learning across the world. The project schools faced the same outcomes as they were also under the lockdown vigil and in remote and rural interiors of India.

The RTR project adopted agile methods and developed a platform and an application through which learning materials were made available to the students to ensure continuity of learning, especially in uncertain times such as the pandemic. The adoption of these digital tools, coupled with the adaptation of pedagogy and other learning methods by teachers, ensured children were engaged continuously and on a regular basis. This ensured that students did not undergo unlearning and lost their interest, therefore leading to a discontinuity in education.

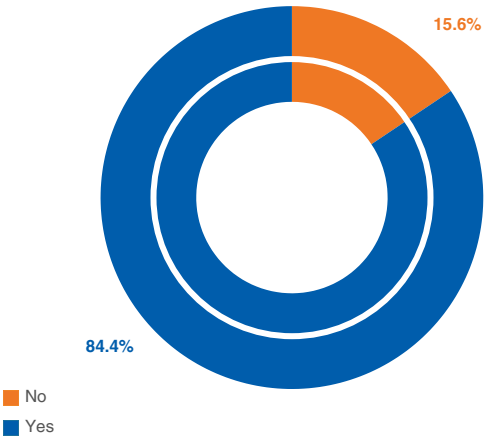
The following are insights from the assessment of the adoption and tools that were created and used for the digital adoption for learning under the project. Stakeholders, including students and teachers, were interacted with, and collective insights were shared in the section below.

SOULACE TEAM INTERACTING WITH THE PARENTS

SOULACE TEAM INTERACTING WITH TEACHERS

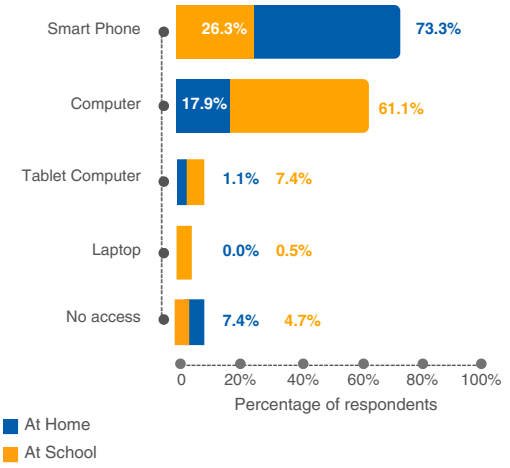
A. AWARENESS AND USAGE

CHART 8A: AWARENESS OF DIGITAL PLATFORM



84.4%
of the students said they were aware and had used the digital learning platform

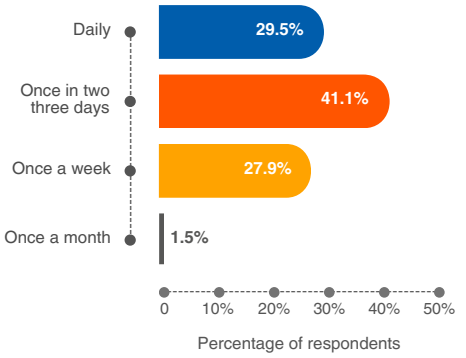
CHART 8B: DEVICES USED TO ACCESS THE ONLINE DIGITAL PLATFORM AT HOME AND SCHOOL



73.3% of the respondents said they used smartphones at home, and 26.3% used smartphones at school to access the digital platform. 61.1% accessed the platform in schools through computers, with 17.9% accessing the platform via a computer from home. 12.1% said they had no access to the platform due to the non-availability of either a smartphone or a computer at school and/or at home.

This small but significant percentage of students is important from the perspective of efficiency and efficacy of the project, as they had a break or discontinuation in their learning due to the non-availability of tools to access the digital learning platform. It is therefore important to keep a tab on such students and their performance and inclination to continue education as a direct result of the break in education during the pandemic.

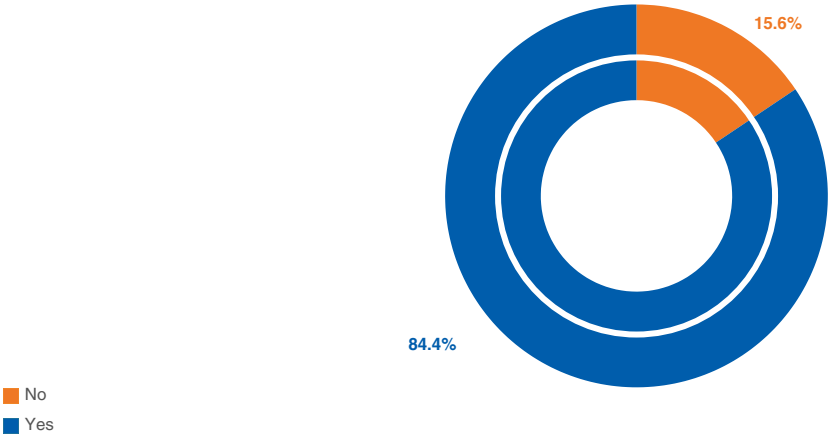
CHART 9: FREQUENCY OF ACCESSING DIGITAL PLATFORM



Usage of the platform varied widely, with 29.5% using it daily while 41.1% said they used the platform once in 2-3 days, and 27.9% said they used it on a weekly basis. It can, therefore, be said that the awareness and usage of the digital learning platform were considerably high.

B. TYPE OF CONTENT ACCESSED ON THE PLATFORM

CHART 10: DIGITAL ACCESS AND AWARENESS



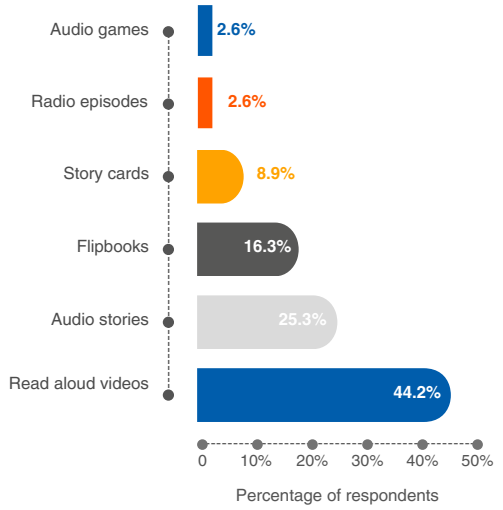
190 out of the 225, or 84.44% of the respondents, said they used the digital learning platform for accessing a wide variety of content. Based on the interactions, it was understood that 44.2% used it to access read-aloud videos, 25.3% listened to audio stories, 16.3% read flipbooks and 8.9% accessed story cards. Only 2.6% of the respondents said they accessed audio games and radio episodes linked to the content and learning material uploaded on the platform.

While the overall acceptance and popularity of the platform and the learning material uploaded on the platform can be easily qualified as good and its utilisation high (84.4% access rates), it is pertinent to note and keep in mind that these specific interventions have the high capacity and potential for larger target outreach and penetration, provided only if the basics of infrastructure, hardware and facilities are available. When extrapolating this insight, the learning is that projects need to provision for facilities before providing intervention through the digital mode, without which the efficacy and effectiveness would remain limited and curtailed to only a select few with the facilities.

SOULACE TEAM WITH THE TEACHERS OF TAKLI KADIM SCHOOL

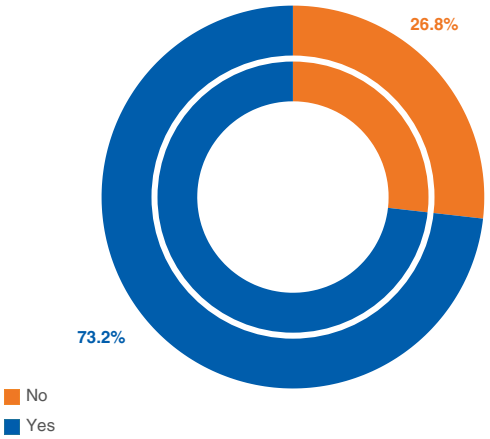
C. DISSEMINATION OF INFORMATION ABOUT DIGITAL PLATFORMS THROUGH WHATSAPP

CHART 11: MATERIALS TO ACCESS ON DIGITAL PLATFORM



WhatsApp was another widely used medium that was used for the dissemination of learning material among students during the COVID-19 pandemic. With its huge subscription base, utilisation, and ease of use, it was leveraged by and spread awareness about the digital learning platform. This ensured that children who were left without knowledge about the specially crafted and enabled platforms, applications and or tech-based material were not left out and could be sensitised and informed about accessing the learning material through the designated digital platform.

CHART 12: INFORMATION ABOUT DIGITAL PLATFORM RECEIVED VIA WHATSAPP



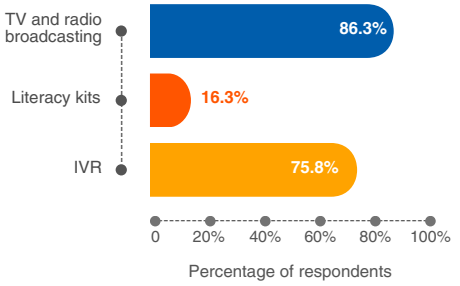
73.2%

of the respondents said they received information about the digital platform on their WhatsApp, helping them understand and log in to the platform based on the information received through WhatsApp.

It is important to remember that, unlike other projects that were run globally, where WhatsApp was leveraged to disseminate the content and learning material, this project leveraged the social media application only for spreading awareness and knowledge about the RTR-dedicated learning platform that hosted all the learning material. Hence, the direct attribution of WhatsApp in ensuring the continuity of learning cannot be analysed and interpreted.

D. USE OF NON-PLATFORM MODES OF LEARNING

CHART 13: NON PLATFORM MEDIUM USED FOR ACESSING LEARNING MATERIAL



COVID-19 has led not only to a global but also systemic breakdown. As a result of the sudden onset and uncertain time period of the pandemic, projects and programs developed and adopted agile methods to reach remotely located and especially disadvantaged communities with digitally and technologically enabled solutions to meet the specific needs of populations.

While RTR created and shared the learning material with all students through their dedicated learning platform, many resorted to accessing learning materials from a mixed and varied set of options, which were co-enabled to ensure that children were able to access materials that were not curtailed to the access of technology and or availability of the internet.

As many as 75.8% said they used the toll-free IVR, and 86.3% enjoyed content broadcast through TV and radio. Thus, the majority of the students used one or another online learning resource that was enabled to ensure that no child was left behind.

Voice of the Respondent

The program adapted well to the COVID-19 challenges by promoting digital learning amongst children to ensure continued learning. Parents were asked to assist children in setting up home-based reading corners. Recorded video lessons were made available to the children. The content was made available in audio format. Children were attracted to animated stories and heard with interest. Digital content ensures self-paced learning by accessing content anytime and from anywhere.

Kolse Bahgwan Hanumant, Point Teacher, Zilla Parishad Primary School, Village Babulgaon, Taluka Aurangabad, Distt Aurangabad, Maharashtra

ENABLEMENT AND FACILITATION OF READING AND LEARNING THROUGH A CONDUCIVE ENVIRONMENT

A safe and child-friendly environment is critical for children to access and use the library and facility built through this project. The availability of age-appropriate books and the facilitation of incorporating an official reading-library time in the class timetable, along with the provisioning of carrying books home for extended reading, gave the students a much-needed added motivation and impetus to further strengthen, reinforce and continue the reading habits inculcate along with encouraging the family to support and participate in the reading time.

Voice of the Respondents

The library has been a bright and engaging learning space for children. It has proper ventilation and lighting. There are relaxed reading corners with cushions and mats. Library rules are strictly followed to ensure discipline. Books and furniture are regularly checked for repair and maintenance. Students have been made responsible for the regular upkeep of books. They are appointed as monitors to help maintain discipline in the library.

Sunita Nananware, Point Teacher, Zilla Parishad School, Village Babulgaon, Taluka Aurangabad, Distt Aurangabad, Maharashtra

FIELD TEAM INTERACTING WITH THE STUDENTS

A. ADVOCACY FOR DEDICATED TIME ALLOCATION FOR THE USE OF THE LIBRARY IN THE CLASS TIMETABLE

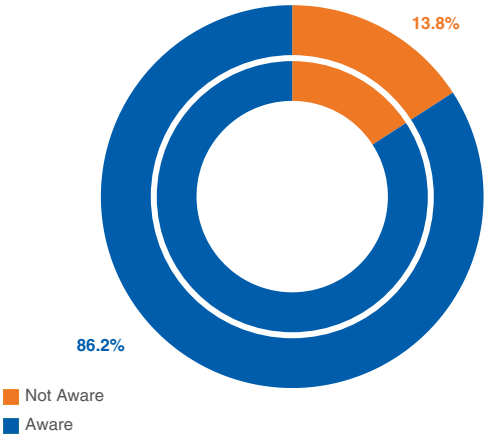
Implementation and imbibing activities and habits that are inculcated are the first and foremost steps in ensuring the sustainability of the efforts undertaken for long-term and lasting change. The project adopted a specific strategy to achieve the objective by actively engaging with the school administrative authorities, thus ensuring that a specific and fixed number of hours are regularly incorporated into the timetable of all students. This imbibing of additional reading hours into the formal academic structure is seen as a milestone that was achieved through continuous and positive engagement and reinforcement with the local administrative and school leads, parents, and community.

The assessment and interaction with the students indicated that 76% were aware of and acknowledged the assigned additional fixed hours being incorporated into their regular school-time schedule to use the library on a daily basis. This also indicates that the school administration recognised and gave due recognition to the importance of building reading habits among children.

INTERACTION WITH A TEACHER

B. CHILD LIBRARY MANAGEMENT COMMITTEE

CHART 14: AWARENESS ABOUT THE CHILD LIBRARY MANAGEMENT COMMITTEE



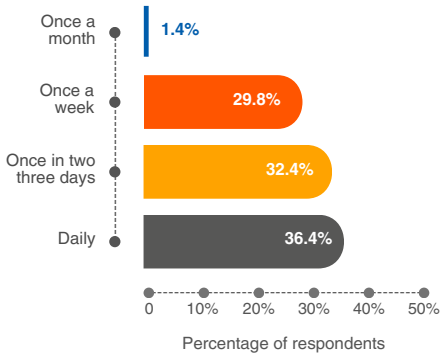
In order to ensure the sustainability of an initiative and activity of the project, certain activities are incorporated through strategy and implementation. To ensure the sustenance of reading habits using a democratic and empowering approach, the project incorporated responsibility taking, initiative leading and compliance through community sensitisation, interactions with SMC members, and, most importantly, empowerment of the students themselves. A child library management committee was facilitated and created with a dedicated set of students to ensure the promotion of reading as a habit and maintain the library records, as well as its maintenance and ownership. 86% of the student respondents said they were aware of the Child Library Management Committee, and 77% of them were members of it.

Voice of the Respondent

The students in the committee promoted reading culture by suggesting books to their peers. They helped in arranging books and maintaining records. By engaging other students in the library activities, they created a sense of ownership among them. The students on the committee gave constant feedback on the library needs to the teachers. Peer motivation promoted reading habits amongst fellow students.

C. FREQUENCY OF LIBRARY VISITS

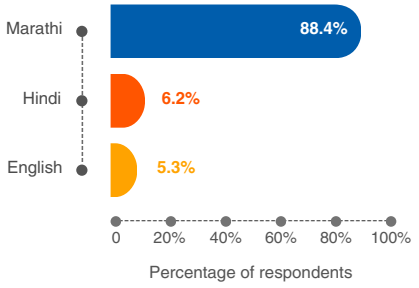
CHART 15: FREQUENCY OF LIBRARY VISITS



For the initiative to be successful, it is essential to understand the frequency of visits to the library. 36.4% of the respondents said they visited the library daily, 32.4% visited once in two to three days, and 29.8% said they went to the library and read books once a week. The insight from this interaction indicates the success of the project in inducing reading habits among the student beneficiaries as envisioned.

D. MOST COMFORTABLE LANGUAGE TO READ BOOKS

CHART 16: MOST COMFORTABLE LANGUAGE TO READ BOOKS



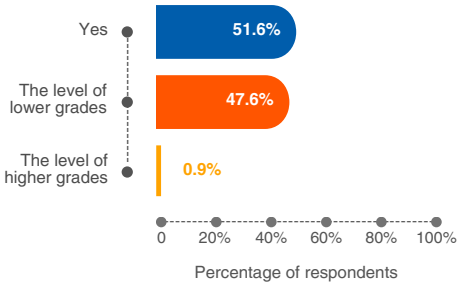
Books of familiar language and interest areas are known to not just inculcate but also sustain the habit of reading that is initiated. For the success of the project initiatives to sustain, books in the language of preference, familiarity, and learning (Marathi) were introduced and archived in the RTR libraries.

In addition to the language of preference, books in English and Hindi were also provided in the library. 88.4% of the respondents said that Marathi was the most comfortable language in which they preferred to read books. This was followed by 6.2% preferring Hindi books and 5.3% preferring to read books in English.

Although a small percentage of the respondents preferred to read books of languages beyond their mother tongue or academic instruction (Marathi), the insight that few students took to reading newer or multiple languages in the schools is very encouraging as it indicates the level of and the ability of reading as a habit to influence learning and growing.

E. AVAILABILITY OF BOOKS AS PER AGE AND LEVEL OF UNDERSTANDING

CHART 17: AVAILABILITY OF BOOKS SUITED TO THE LEVEL OF UNDERSTANDING



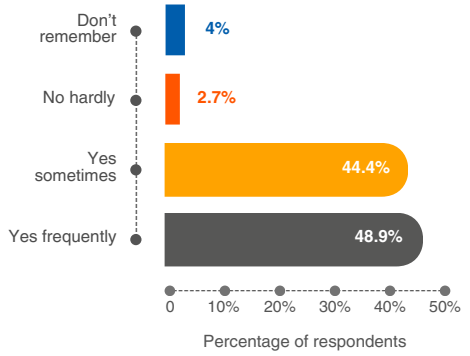
Engaging children in reading and enabling their habits to become regular is vital for the efficiency and effectiveness of intervention. RTR, through its interventions, ensured that the library did not store and procure books only as per the language of preference but also as per age and level of understanding. This unique approach helped to sustain students' interest in reading as they moved through the grades and increased their levels and capacities to read and understand books.

51.6% of the students said the books were appropriate for their level of understanding, 47.6% felt the books were lower than their level of understanding, and 0.9% felt the books were above their level of understanding and grade-matched level of reading and comprehension.

Insights from this indicate that most of the students who accessed and read books regularly felt the books were not aligned with their skill or grade-matched levels of reading and comprehension. This is important as it indicates that there is a gap in the ability of the project to ensure that the books being stocked and restocked regularly are aligned with the student's needs and abilities, as there is a strong possibility of students losing their interest in reading because they feel the books are not adding value to their learning and the effort is too low.

F. LOWER GRADES VISITING THE LIBRARY (GRADES 1 & 2 ONLY)

CHART 18: FREQUENCY OF VISIT LIBRARY WHEN IN GRADE 1& 2



Inculcating reading habits among young minds is a strategy to ensure the inculcation of the reading habit along with curiosity and learning new and different things. 48.9% of the respondents from grades 1 and 2 interacted with, said that they visited the library frequently, 44.4% of the students visited the library sometimes, 2.7% did not visit, and 4% do not recollect visiting the library.

It is important and encouraging to note that due to the intervention of the literacy project, 97% of the children attended school because they got the opportunity to read more books. This encouraging and positive insight from the report indicates that the interventions were effective from a long-term perspective and, hence, can be said to have a clear and positive impact on the lives of the student beneficiaries in the project.

G. READING HABITS AT HOME

CHART 19: COME TO SCHOOL REGULARY BECAUSE STUDENTS GET TO READ BOOKS

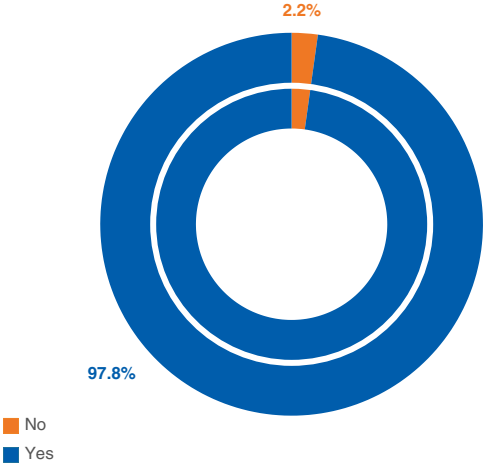


CHART 20: FAMILY MEMBERS ENCOURAGED TO READ BOOKS

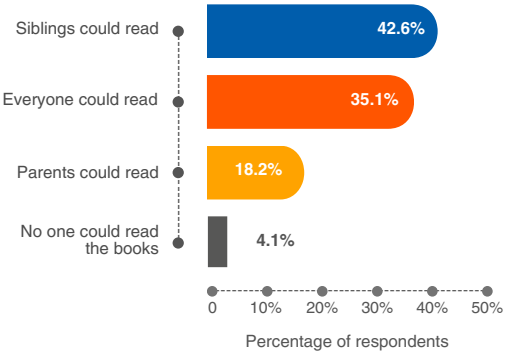
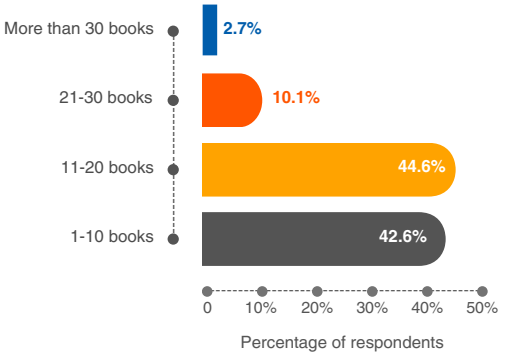


CHART 21: NUMBER OF BOOKS TAKEN HOME IN LAST 3 MONTHS



Family, peers, and siblings have a key and critical role in the sustenance of habits formed.

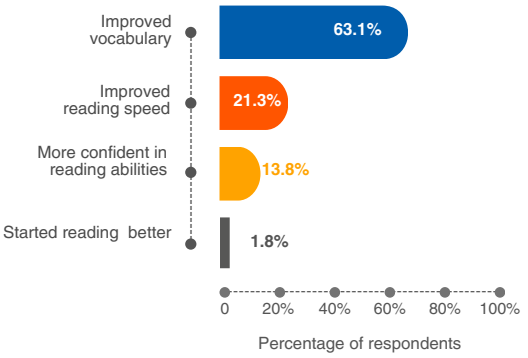
It is encouraging to note that 66% of the respondents said that they carried books from the library to their homes for reading. 45% said that they issued 11 to 20 books in the last three (3) months. Respondents who carried books home said that their family members, such as siblings, parents, and other family members, encouraged them to read the books from the library along with them. Thus, it can be said from the data-based insights that the project was indeed able to encourage and successfully inculcate reading habits, as well as enable active participation from the community, family, and at home, therefore ensuring the sustainability objectives of the project.

KEY IMPACT(S) OF THE PROJECT

The key impact of the project activities was assessed through eight key parameters and activities of the project implementation. Insights from all the parameters indicated a noteworthy improvement in the level of learning as well as reading as a habit.

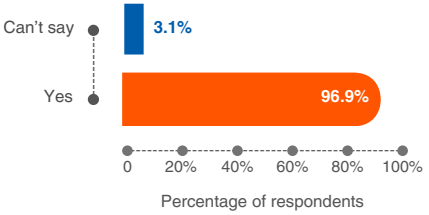
Key impact findings as per the eight parameters were:

CHART 22: IMPROVED READING SKILLS



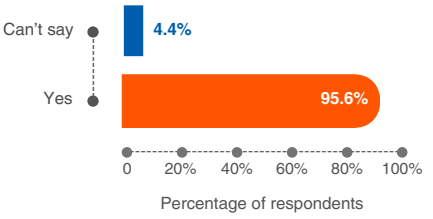
Respondents mentioned several areas of improvement in terms of their reading skills. 63.3% said their vocabulary had increased, 21.3% said their reading abilities and speed had improved and that they were not only able to read fast, but 13.8% said that they were able to read more confidently as well, and 2% said their reading abilities and comprehension of academic subjects had improved because of the project and its interventions.

CHART 23: IMPROVED PERFORMANCE



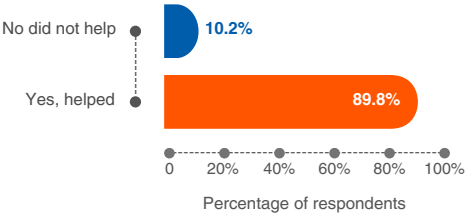
96.9%
of the respondents said that their performance overall in school had improved owing to the improved reading skills through the project.

CHART 24: IMPROVED KNOWLEDGE ACQUISITION



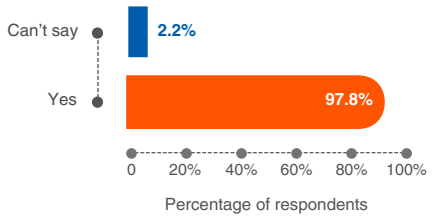
95.6%
of respondents stated that improved reading skills resulted in them acquiring greater knowledge.

CHART 25: EFFECTIVE HANDLING OF LIFE SITUATIONS



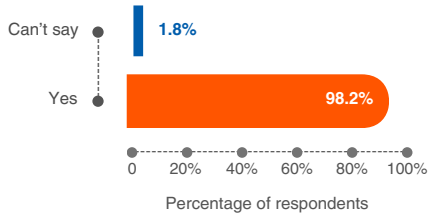
89.8%
of the respondents said that the improved reading skills equipped them to deal with life situations more effectively.

CHART 26: IMPROVED SCHOOL ATTENDANCE



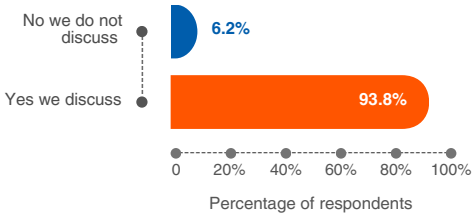
Visiting the library to read books worked as an incentive for 97.8% of the respondents who started to attend school regularly and thus were informed of improved attendance.

CHART 27: IMPROVED THOUGHT PROCESS



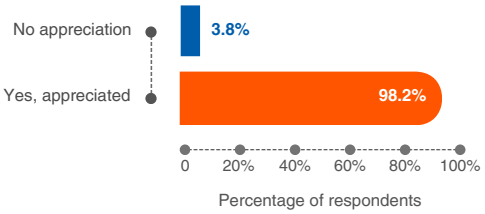
98.2%
of the respondents said their thinking process had improved as a result of diligent reading habits.

CHART 28: IMPROVED COMMUNICATION WITH PEERS ON VARIED SUBJECTS



Better reading habits and resulting knowledge gain enabled 93.8% of the respondents to engage in meaningful discussions with their peers on varied subjects.

CHART 29: INCREASED PARENTAL APPRECIATION



98.2%
of the respondents said their parents appreciated them and supported them when they started reading books from the library when they got home.

Voice of Respondents

Children read fluently with understanding; they perform better in all subjects. They can grasp concepts quickly, participate actively in class, and develop strong problem-solving skills.

Maroti Appa Gaidhane, President, School Management Committee, Village Babulgaon, Taluka Aurangabad, Distt Aurangabad, Maharashtra

INTERACTION WITH THE TEACHER

CASE STUDY

SMITA NARAYAN PULLEWAR, SMC MEMBER, ZILLA PARISHAD CENTRAL PRIMARY SCHOOL, VILLAGE GAJGAON, TALUKA AURANGABAD, DISTT AURANGABAD, MAHARASHTRA

The library has become an active learning space where students regularly engage with books. This has significantly increased their interest in reading, leading to better academic performance and a more supportive school environment. It is designed to be child-friendly, with colourful books, age-appropriate reading materials, and interactive storytelling sessions that make learning enjoyable for students.

Reading habits have kindled an inquisitiveness among the children. They now ask more questions, explore different books, and show greater interest in learning beyond their textbooks. It has improved their critical thinking skills. Students learn to analyse information, express opinions clearly, and develop a strong personality with better communication skills.

The community has played a vital role by donating books and providing financial assistance for the maintenance of the library. The SMC works closely with the school to ensure the library remains open and accessible to all students even after RTR withdraws.

RTR provided books and training, but after their withdrawal, financial support is needed to maintain the library, repair books, and add new reading materials. There should be more involvement from parents and local leaders in library activities. If they actively participate in reading sessions and book donations, students will develop a stronger reading culture at home as well.

ROLE OF RELEVANT STAKEHOLDERS

The other relevant stakeholders in the entire ecosystem included local panchayats, parents, families, the school principal, teachers, facilitators, and librarians. Each of them has played a significant role in the establishment of libraries and their infrastructure, regular maintenance, equipping them with age-appropriate books on a regular basis, and encouraging regular reading habits amongst the children.

Parental involvement in the Child Library Management Committee helped in monitoring library usage to ensure students benefited from it.

They helped in maintaining books and replacing the damaged and soiled ones, and they encouraged children to borrow books to take them home. Awareness sessions were conducted with the community members to generate awareness about the benefits of reading as a habit among children. Parents among the community members who knew how to read and write served as role models for the children by reading books to them during school visits. They also contributed to the organisation of reading events and book fairs along with other members of the CLMC.

GROUP DISCUSSION

Teachers also played a significant role by assuming responsibility for encouraging children to read more, especially during school hours. They were also involved in the regular upkeep and maintenance of books and library infrastructure. They actively participated in various reading events and special days and adopted and implemented creative ways to make reading fun, especially for the younger children. They worked with the parents and the community members to spread awareness about the importance of inculcating reading habits among children, especially the younger ones, at an early age. They helped in the integration of lessons into their teaching in the school. They took part in the regular training sessions that helped them upgrade their skills as facilitators for change.

Government officials recognised the importance of reading habits in children and supported the integration of library services and books into curriculum and instruction hours.

Thus, teachers, parents, community members, government officials, and local panchayat worked in collaboration to permit, set up and maintain the library with adequate infrastructure and books.

They worked together to orient children towards building reading habits. Teachers conducted reading sessions during school hours, and parents encouraged reading at home.

Special events such as Literacy Day and book fairs were organised to promote and motivate the students to read books and academically aligned literature and material for improving their knowledge base.

Awareness sessions held with the community helped make the initiative owned and led so that the effort and activities remain sustainable beyond the CSR funding from BAL and intervention from RTR. Book donations have been encouraged in the community, additionally ensuring the continuity of the initiative. The participation and contribution of the Local Panchayat to raise funds for long-term sustainability also had an impact, which was achieved through this project.

Voice of Respondents

The panchayat has played a role in encouraging more children to use the library by organising reading sessions and promoting awareness among parents about the importance of reading. It has helped in advocating for more government support for library resources.

FGD, Parents of Zilla Parishad Primary School, Village Babulgaon, Taluka Aurangabad, Distt Aurangabad, Maharashtra

FGD WITH THE PARENTS

GATHERING INFORMATION FROM RESPONDENTS

SOULACE TEAM CONDUCTING FGD WITH TEACHERS

CHAPTER 7
RECOMMENDATIONS

The BAL-funded project of creating and supporting the habit of reading through the library with RTR as a partner can be said to be successful and has had a long-lasting and positive impact; certain gaps were identified during the impact assessment conducted and have been shared as suggestions and recommendations for change. These, if incorporated into the existing project, would further ensure the effectiveness and efficiency of the project's outcomes.

The list of recommendations is as follows:

BOOKS IN THE VERNACULAR MEDIUM

88.4% of the respondents were comfortable and accessed Marathi medium books and literature from the library. The reason being Marathi was the local language and also the language of academic learning. Hence, the suggestion to increase the number of books and types and subjects in Marathi needs to be looked into and made available in the library.

REGULAR UPGRADATION OF BOOKS

It was observed that the more senior students in the school found the books in the library to be of a lower level than their understanding and capacity. It is therefore recommended that the type and level of books being restocked in the library be given more emphasis and attention in order to ensure the availability of age and learning-level-appropriate books for the students (for the age group of 12 to 14 years). This will ensure the minimisation, or the mitigation of redundant books being archived and read, while also helping the students maintain and sustain their interest, curiosity and learning by continuing to access the library's books. This also indirectly prevents these students from dropping out of school, as was indicated as one of the key factors in bringing the children to come and attend school on a regular basis while sustaining the efforts undertaken this far through the project.

INTERACTIVE READING SESSIONS

Library access and impetus are suggested to have reinforcement as a strategy to ensure students continue to come and access books and read. This can be accomplished by having interactive storytelling sessions that could be led by the instructors initially and be relayed as a task to the senior student members, who then could conduct the storytelling sessions, therefore improving their confidence in reading, narrating and public speaking, which are vital for effective communications and evolving into professionals. Additionally, age-appropriate literature could be reworked to have in-depth reflective and discussion sessions with role plays, inviting students to give their interpretations of the literature studied. This would ensure participation, attention, and understanding of the subject topic while facilitating creative participation (role plays/ recital/ narration), thinking, assimilation of the topic and ability to imbibe applicative learning. These, if induced, would help students understand subjects better and make more definite and well-informed career and higher education choices. Participation from parents could also be included in these sessions, ensuring more indigenous participation and contribution to their children's educational and learning journey.

FINANCIAL ASSISTANCE FOR CHILDREN

It is suggested that the community and panchayat members should come together to provide scholarships or financial assistance through community co-contribution for education (fees, buying library books, etc.), especially for children from poor families, so that they are also able to continue their education without bottlenecks or breaks due to financial issues.

REFRESHER TRAINING FOR TEACHERS

It is recommended that repeated and regular refresher training on library maintenance and administration for teachers and community members be conducted to ensure the library is effectively used and maintained. This will also help orient teachers towards the new, additional books and literature in the library, which could be incorporated in their teaching materials or encourage the students to refer to the books for reinforcing their learning as an integral part of education, rather than considering it as an additional or library-time-linked task.

ADDITIONAL DIGITAL LEARNING RESOURCES

It has been suggested that BAL-CSR could approach RTR to leverage the existing digital portal to provide additional digital reading and literature content, which could further accentuate the engagement levels and allow students to access reading material from across a cloud-based digital library (RTRs own or partnership with other organisations who provide digital library access for free or minimal costs). This suggestion is an add-on to the existing physical library and would not cost RTR any further operational overheads.

A stand-alone computer in the library could help students with no access to the internet/ portal or device access the online content during school and library hours.

The additional digital material and literature would help ensure that students who like to read and focus on increasing their language skills beyond Marathi to that of Hindi and, or English have the resource of reading and learning material (for example, ranging from language phonics for beginners to age-aligned literature or story books in different languages); which is necessary for making correct career or educational choices and learning more towards becoming successful professionals.

The current model requires constant and continuous financial support to procure additional books and maintain the physical copies, as well as the management of the library. The recommended additional digital access would also help address the issues of long-term financial sustainability and viability, and multiple development partners in that particular geography could be leveraged to achieve the same.

08. SUSTAINABILITY

After RTR's withdrawal, the SMC and local leaders have taken responsibility for library maintenance, motivating parents to support reading activities and organising community efforts to sustain book availability. However, securing funding for regular library upkeep remains a concern. In certain schools, maintaining a steady supply of new books and ensuring regular library sessions has been difficult.

Though the school teachers have undergone multiple training sessions on book levelling, engaging other teachers, creating a child-friendly environment, and library management, refresher training is constantly required to upgrade their overall skills.

School and community ownership will ensure the sustainability of the project in the long run.

Additional reinforcement of the existing physical library with that of a digital library would alleviate the issue of the sustainability of the efforts and impact achieved thus far.

CHAPTER 9
CONCLUSION

Projects with the potential for impact have an innate need to remain sustainable and viable. It is known that community-invested projects and projects with the responsibility and participation of community members continue their operations and execution of the impact and change initiated. However, programmes and projects that do not strategise for the financial viability and sustainability of operations face challenges that go beyond simple cessation of the work and the goodness done. More often than not, such situations lead to the genesis of newer and interim solutions that ensure continuity of projects, until mid or long-term solutions addressing the viability evolve indigenously.

The withdrawal of RTR's operations in the schools led the SMC and local leaders to take the lead and responsibility for maintaining the existing library that was set up in the various project locations.
The SMC and committee members motivated parents to co-fund, support reading activities, and organise community efforts to sustain book availability. However, securing funding for regular library upkeep remains a concern.
In certain schools, maintaining a steady supply of new books and ensuring regular library sessions was seen to be difficult or even stalled, resulting in the loss of time for the students to study and read, and the impact created thus far.

Though the school teachers underwent multiple training sessions on book levelling, engaging other teachers, creating a child-friendly environment, and library management, refresher training was recognised to be a constant and continuous requirement in order to upgrade their overall skills.

There is an imminent need for funding of the activity, or part funding of the activity, or facilitating partnerships to ensure the continuity of the library in the schools. While sustainability in this project has a heavy financial implication, ways and methods to innovatively reduce the dependency on external funding through innovative community ownership models and co-funding will be necessary to ensure the sustainability of the project and its initiatives so far for the immediate, short, and long run.

IMPACT ASSESSMENT REPORT

SUPPORT FOR TEACH FOR INDIA FELLOWSHIP

Implementing Partner: Teach to Lead

Release Date: 31-03-2025

SoulAce
Path to Sustainability
SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
FGD	Focus Group Discussion
FY	Financial Year
NEP	National Education Policy
PCMC	Pimpri Chinchwad Municipal Corporation
PMC	Pune Municipality Corporation
PTM	Parent-Teacher Meeting
SDGs	Sustainable Development Goals
SMC	School Management Committee
TTL	Teach to Lead

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

In collaboration with Bajaj Auto Limited, Teach to Lead (TTL) launched the Teach for India Fellowship program to address the persistent challenges in delivering quality education in government and low-resource private schools in Pune, Maharashtra. The initiative aimed to improve student learning outcomes by strengthening the quality of education and equipping fellows with essential teaching and leadership skills. 75 fellows were selected in the year 2020-21 who were supported for three years.

Through this program, fellows not only enhanced their teaching expertise but also gained valuable experience, inspiring many to pursue long-term careers in education. Additionally, the program contributed to broader social empowerment by fostering better learning environments and promoting educational equity. Students, in turn, showed enhanced academic performance, developed a keen interest in learning, and gained greater self-confidence.

PROJECT DETAILS

Implementation year
FY 2020 - FY 2023

Assessment year
FY 2024 - FY 2025

Implementing Partner
Teach to Lead

Project location
Pune, Maharashtra

Beneficiaries
40 schools in Pune

Budget
₹590 Lakhs

Alignment with SDGs

The program also aligns with Government of India programs like:
National Education Policy (NEP)

PROJECT ACTIVITIES

Identification and recruitment of the fellows.

Training of fellows on pedagogy skills and practical teaching.

Placement of fellows as dedicated teachers in identified schools.

Continuous mentoring and support provision to fellows.

Monitoring and assessment of student learning outcomes.

Community engagement to encourage parental involvement in education.

Key Findings

Sample Size - 30

Nearly three-fourths (76.7%) of the respondents in the study were in the age group of 25-30 years, and the rest of the respondents were below the age of 25.

70%

of the respondents were female, and the rest were male.

Over two-thirds of the fellows have completed postgraduate studies, with around 60% holding an M.A. or M.Sc. Additionally, 30% are graduates, including 23.4% with a B.A. or B.Sc.

While 40% of the respondents had both knowledge and experience in teaching, 30% possessed theoretical knowledge but lacked practical experience. The remaining 30% neither possessed prior knowledge nor experience in teaching.

23.3%

of the fellows felt very confident in teaching before the intervention, while 33.3% had little or no confidence. Additionally, 43.3% reported having some confidence, before the training.

Before training, less than half (43.4%) of the fellows had little or no leadership skills, while 33.3% reported having some leadership skills, and nearly one-fourth (23.3%) of the respondents reported having good leadership skills.

More than three-fourths (76.7%) of the respondents reported that they were placed in schools of their choice.

Nearly 93.3% of the respondents cited students' disadvantaged backgrounds as a major challenge, while 90% struggled with weak reading and comprehension skills. Additionally, 76.7% noted poor performance in core subjects.

53.3%

of the respondents felt highly successful in leveraging the strengths of school faculty, including teachers and head teachers, to enhance student learning. Additionally, 43.3% reported being successful to some extent.

More than half (56.7%) of the fellows reported being very successful in motivating teachers by applying the insights gained from their training.

70%

of the fellows found the mid-year step back extremely helpful for assessing progress and ensuring they were on the right track, while nearly one-fourth (23.3%) found it very helpful.

All the fellows were satisfied with the results of the midterm and end-term assessments.

More than half (56.7%) of the surveyed fellows reported that students' learning time has doubled due to blended learning, followed by 40% who reported that it has increased to some extent.

More than three-fourths (76.7%) of the respondents reported that they were placed in schools of their choice.

Nearly 93.3% of the respondents cited students' disadvantaged backgrounds as a major challenge, while 90% struggled with weak reading and comprehension skills. Additionally, 76.7% noted poor performance in core subjects.

Key Impacts

Sample Size - 30

86.7%
of the respondents reported that the five-week training program was positively impactful.

Closer to two-thirds of the respondents (63.3%) reported that after attending the training, they acquired an effective teaching and leadership mindset because of the training program.

Grassroots exposure proved crucial for fellows in understanding India's education system, with 63.3% finding it extremely useful and 30% considering it very useful.

50%
of the respondents reported that monthly school meetings helped in resolving various issues, whereas the other half felt that they were useful to some extent.

46.7%
of the respondents found the Leadership Development Journey (LDJ) conversations extremely useful in clarifying the connection between teaching and leadership, while another 46.7% found them very useful.

After the intervention, 70% of the fellows noted significant improvement in math scores, with 26.7% seeing very high gains. Similarly, 50% observed substantial progress in reading and comprehension, while 43.3% reported very high improvement.

Fellows reported that engaging teaching methods significantly increased student attendance, with 70% observing a notable improvement.

Nearly 90% of the fellows observed greater parental participation, strengthening home learning environments.

Enhanced leadership, teaching skills, and career clarity, with 80% of fellows choosing to continue in the education sector.

Strengthened collaboration between schools, parents, and communities, fostering a more supportive learning ecosystem.

CHAPTER 3
INTRODUCTION

FGD with Teach for India Fellows

NEED OF THE PROGRAM

India's education system faces multiple challenges, particularly in ensuring quality education in schools. In various regions, access to high-quality education remains a major hurdle for many children. Despite efforts to enhance educational reach, numerous students—especially those from marginalised backgrounds—struggle to fully benefit from available learning opportunities. Financial constraints, lack of awareness, inadequate resources, and substandard educational services contribute to high dropout rates and poor academic performance. These challenges are further worsened by inadequate infrastructure and minimal exposure to modern teaching methods, leading to learning gaps that hinder academic progress and perpetuate cycles of poverty.

According to the Annual Status of Education Report (ASER), a critical concern is the widespread presence of single-teacher schools. As of 2024, around 8% of Indian schools operate with only one teacher.

The 2024 ASER report further highlights that over 50% of Class 5 students struggle to read a Class 2-level text. Additionally, numeracy skills among secondary students continue to fall short, impacting their proficiency in mathematics and science. The report also underscores the reliance on traditional, one-way teaching methodologies, which negatively affect students' learning outcomes.

In response to these challenges, Teach to Lead, with support from Bajaj Auto Limited, implemented a program to address these critical issues. This initiative supported 75 fellows over three years, equipping them with essential teaching skills and a deeper understanding of the systemic challenges within education. These trained fellows served as full-time teachers in under-resourced English-medium government schools and low-income private schools in Pune, Maharashtra. The program aimed to enhance student learning outcomes and bridge educational gaps in these communities.

OBJECTIVES OF THE PROGRAM

To enhance student learning outcomes in low-resource schools by improving the quality of education.

To support fellows in becoming full-time teachers by strengthening their capacity in effective teaching practices.

ABOUT BAJAJ AUTO LTD.

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting its commitment to serving society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelling its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, and animal welfare projects for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – TEACH TO LEAD

Teach to Lead is a nonprofit organisation committed to enhancing the quality of education in underprivileged communities across India. It strives to empower teachers and cultivate leadership among them, driving long-term, systemic improvements in the education sector. The organisation's mission is to build a movement of leaders dedicated to eradicating educational inequity in India. Through its fellowship programs, Teach to Lead recruits and trains passionate individuals to work as full-time teachers in under-resourced schools. These fellows receive comprehensive training in modern teaching methodologies, classroom management, and leadership skills to enhance student learning outcomes. The organisation works closely with schools, teachers, and local stakeholders to address critical challenges such as low literacy levels, outdated teaching practices, and inadequate infrastructure.

TEACH FOR INDIA OFFICE

CHAPTER 4
RESEARCH METHODOLOGY

Soulace team interacting with Students from Epiphany School

Bajaj Auto Limited assigned SoulAce to conduct a study to assess the impact of the fellowship program on enhancing student learning outcomes in under-resourced English-medium government schools and low-income private schools across Pune, Maharashtra.

OBJECTIVES OF THE STUDY

The primary objectives of the study were to:

- To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.
- To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders, such as students, fellows, school administration and project staff, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- the community members yielding statistical insights and identifying trends. By employing a mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multi-faceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries, stakeholders, and those responsible for project implementation. Engaging stakeholders like students, fellows, school administration and project staff through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of improvements in the lives of the students in terms of better educational outcomes through the intervention done by Teach to Lead. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques are employed to evaluate the project and its impact objectively through data analysis. Surveys and questionnaires are utilised to collect numerical data on various indicators from beneficiaries of each program. By collecting such data after the intervention, the project and its effects and the enhancements it has facilitated can be assessed. These quantitative methods provide a measurable approach to gauge the project and outcomes and evaluate its success through statistical evidence.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including field notes, interviews with beneficiaries, interactions with community members, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact. Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method. Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

DESIGN SNAPSHOT

Name of the project

Support for Teach for India fellowship

Implementing agency

Teach to Lead

Research design used

Descriptive research design

Sampling technique

Random and Purposive sampling

Sample size

30 fellows

Qualitative method used

Semi-structured interviews, testimonials and focus group discussion (FGD) with beneficiaries along with key stakeholders

KEY STAKEHOLDERS

- Fellows
- Students
- Parents
- School administration
- Implementing Partner & Project team

STUDY TOOLS

Questionnaires for primary beneficiaries – Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys. – A semi-structured questionnaire and focus group discussion guide were developed for secondary beneficiaries and stakeholders. Stakeholders were identified across the focus areas. Semi-structured questionnaires and focus group discussions were conducted with students, fellows, school administration and project staff.

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. Adhering rigorously to ethical principles of research, the study prioritised the rights and well-being of participants throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Crucially, participation was fully voluntary, free from coercion or pressure, underscoring the importance of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

Mr. Saurabh Agarwal, Sr. Manager- mentioned that the classroom observations were conducted weekly or biweekly during the first six months to track fellows' progress. These sessions provided constructive feedback, helping fellows refine their teaching methods and improve their effectiveness in the classroom.

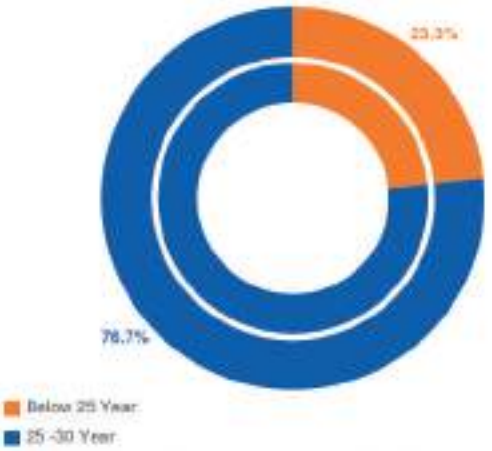
FIELD TEAM INTERACTING WITH THE TEACHERS AT EPIPHANY SCHOOL

CHAPTER 5
KEY FINDINGS AND IMPACTS

This chapter focuses on the findings from primary data sources to assess the program's overall impact and efficacy. It incorporates both qualitative and quantitative data collected through comprehensive surveys and in-depth stakeholder interactions. By leveraging insights from multiple perspectives, the chapter provides a detailed summary of the extent to which the program has achieved its targeted outcomes and contributed to long-term sustainability.

DEMOGRAPHIC INFORMATION

CHART 1: AGE GROUP-WISE DISTRIBUTION



The majority of the respondents (76.7%) are aged 25-30 years years, followed by 23.3% below 25 years

CHART 2: GENDER-WISE DISTRIBUTION

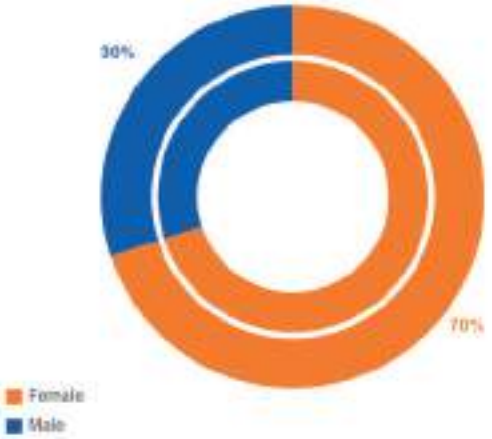


Chart 2 shows that more than half, i.e. 70%, were females, while 30% were males.

CHART 3: QUALIFICATION OF RESPONDENTS

Demographics: Nearly three-fourths (76.7%) of the respondents in the study were in the age group of 25-30 years, and the rest of the respondents were below the age of 25. 70% of the respondents were female, and the rest were male. In terms of the educational background of the fellows, more than two-thirds have completed postgraduate studies, with around 60% holding an M.A. or M.Sc. Additionally, 30% have completed graduation, with nearly a quarter (23.4%) earning a B.A. or B.Sc. The proportion of fellows with BBA and B.Tech degrees is relatively lower.

PRE- AND POST-INTERVENTION SCENARIO

KNOWLEDGE AND SKILLS FOR TEACHING STUDENTS

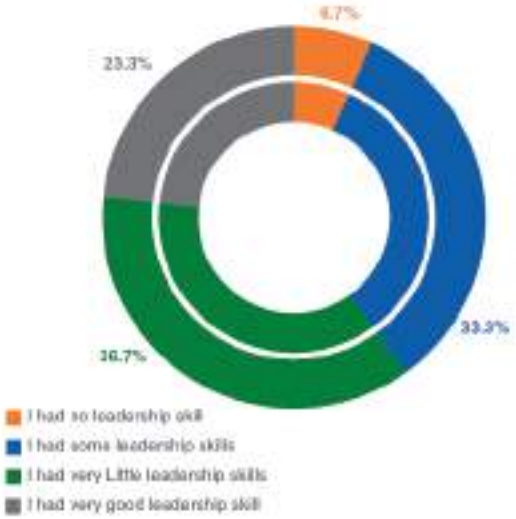
CHART 4: GRADE DISTRIBUTION

Chart 4 shows the diverse backgrounds of fellows before the intervention. While 40% had both knowledge and experience in teaching, 30% possessed theoretical knowledge but lacked practical experience. The remaining 30% had neither prior knowledge nor experience in teaching.

CHART 5: CONFIDENCE IN TEACHING CHILDREN BEFORE TRAINING

The chart shows that 59.6% of respondents were regular students before joining the Aasraa program. 17 % of respondents had never attended any school before enrolling in Wings of Doon, whereas 17.4 % of respondents were drop-outs.

CHART 6: LEADERSHIP SKILLS IN EDUCATION BEFORE TRAINING



- Chart 5 shows that only 23.3% of fellows felt very confident in teaching before the intervention, while 33.3% had little or no confidence. Additionally, 43.3% reported having some confidence, highlighting a general lack of confidence in teaching before the training.
- Chart 6 shows leadership skills in education before training. Less than half (43.4%) of fellows had little or no leadership skills, (23.3%) of the respondents reported having very good leadership skills, and 33.3% reported having some leadership skills, indicating that most fellows lacked strong leadership abilities before the intervention.

Field discussions with stakeholders further supported these findings, showing that prior to the project, most fellows lacked knowledge of education and pedagogy. Some faced confidence issues in the beginning, while some lacked the leadership skills required to teach.

> "Before joining the Teach for India fellowship, I was confident in my leadership abilities but had no practical teaching experience. Initially, I struggled with applying my leadership skills in the classroom, as I had subject knowledge but lacked an understanding of educational methodologies."
>
> **- Neha Kamat, Fellow**

QUALITATIVE DISCUSSIONS, ALONG WITH FEEDBACK FROM STAKEHOLDERS, HIGHLIGHTED THE FOLLOWING PRE-INTERVENTION CONDITIONS

- Classroom participation was minimal, with traditional teaching methods being largely one-sided. Students were passive learners, rarely interacting with teachers or engaging in discussions.
- Many students faced difficulties in fundamental subjects, particularly in reading, comprehension, and English-speaking skills. Their confidence in using English as a medium of communication was low. Additionally, math scores were consistently weak, indicating a struggle with numerical literacy. Participation in science competitions and other academic events was also limited.
- Student attendance in schools was irregular, with many students frequently missing classes.
- Parents had little or no engagement in their children's academic progress. Many were unaware of their children's learning needs and how to support their studies at home.
- Before the intervention, students had few opportunities to develop communication skills, confidence, and leadership abilities. Shy students remained hesitant to speak up in class, and there was little encouragement for self-expression or participation in extracurricular activities.

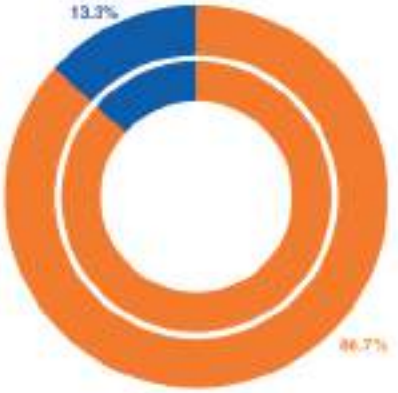
INTERACTION WITH STUDENTS SUPPORTED BY FELLOWS FROM TEACH FOR INDIA

TRAINING OF FELLOWS ON PEDAGOGY SKILLS AND PRACTICAL TEACHING

The training of fellows in pedagogy and practical teaching was a key indicator of the intervention's effectiveness, especially given their diverse backgrounds in the education sector. The 5-week training program was a crucial aspect of the intervention, ensuring fellows were equipped with effective teaching strategies. It was customised based on grade levels and classroom contexts, with separate training modules for elementary and higher-grade teachers. This helped fellows address subject-specific challenges and adapt their teaching accordingly.

The training focused on student engagement techniques and outcome-driven instruction. Fellows learned to make lessons interactive and relatable while following the state board syllabus. It also integrated modern teaching methods, technology, and practical strategies to enhance student involvement.

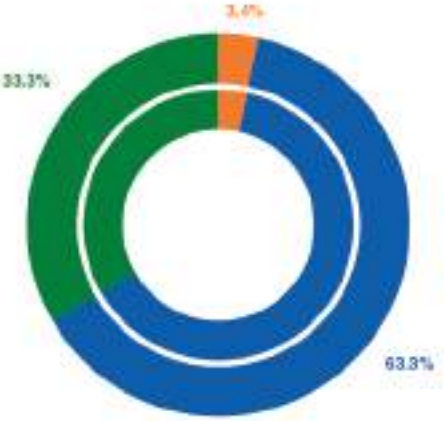
CHART 7: IMPACT OF FIVE-WEEK TRAINING ON PEDAGOGY SKILLS FOR TEACHING YOUNG CHILDREN



Highly impactful
Somewhat impactful

Chart 7 shows that 86.7% of respondents reported that the five-week training program was positively impactful. This was further confirmed through discussions with implementers, who noted that the comprehensive training prepared fellows well, boosting their confidence and equipping them with the necessary tools to navigate classroom challenges effectively.

CHART 8: EFFECTIVENESS OF TRAINING IN DEVELOPING TEACHING AND LEADERSHIP MINDSET



Effective in teaching but lack leadership mindset
Yes to a large extent
Yes to some extent

Chart 8 shows that closer to two-thirds of respondents (63.3%) reported that after attending the training, they acquired an effective teaching and leadership mindset because of the training program to a larger extent. Additionally, 33.3% found it effective to some extent.

Focus group discussions with fellows highlighted the training's strong impact on their confidence and teaching abilities. The program combined theoretical knowledge with practical application, giving fellows pedagogical clarity and hands-on experience through summer school. They also reported that real-time exposure helped them understand classroom dynamics and student behaviour.

> "The training was a transformative experience for me. Coming from a non-education background, I was initially unsure about how to manage a classroom and engage students effectively. However, the structured approach of the training, combined with hands-on practice during summer school, gave me the confidence and clarity I needed. Learning alongside fellows from diverse backgrounds broadened my perspective on the different challenges in education. The sessions on behaviour and classroom management were particularly impactful, helping me build stronger connections with my students. This training not only prepared me for teaching but also helped me grow as a leader and problem-solver."
>
> **Rameshwar Khairnar, Teach for India fellow**

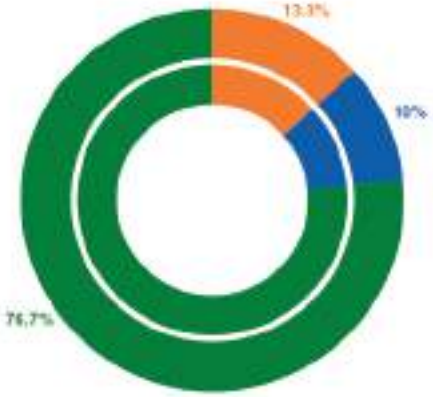
PLACEMENT OF FELLOWS AS DEDICATED TEACHERS OF IDENTIFIED SCHOOLS

A key component of the intervention was placing trained fellows in schools as full-time teachers for two years. Fellows took on full responsibility for classroom instruction, applying their training to adapt teaching methods, manage classrooms, and address learning gaps. They also reported that lesson planning, developed during training, played a crucial role in improving student engagement and learning outcomes.

Discussions with the implementation team indicated that fellows were effectively placed as full-time teachers in PMC/PCMC and private schools in Pune. Placements were primarily based on fellows' preferences, with opportunities to express their choices. Final assignments were made by matching their subject expertise with the schools' requirements. The intervention team ensured a balanced approach, considering both school needs and fellows' strengths to enhance their impact.

Fellows also confirmed this, with more than three-fourths (76.7%) reporting that they were placed in schools of their choice, as shown in Chart 9.

CHART 9: PLACEMENT SATISFACTION



76.7%

of the respondents reported receiving placements of their choice, while 13.3% were unable to provide a response. The remaining 10% stated that no placements were provided

ADOPTING SCHOOL CIRCUMSTANCES

CHART 10: DIFFICULTY LEVEL OF CIRCUMSTANCES AT ASSIGNED SCHOOL

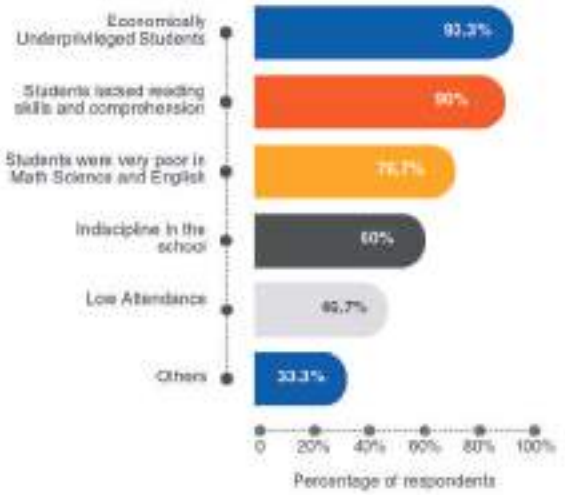
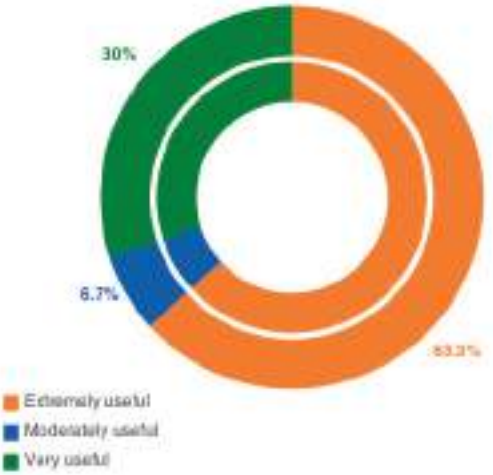


Chart 10 shows the difficulties faced by fellows in their assigned schools. The majority (93.3%) reported that students' disadvantaged backgrounds posed significant challenges. 90% of the fellows struggled with students' weak reading and comprehension skills, making it difficult to teach effectively. Additionally, poor performance in core subjects like Math, Science, and English (76.7%) pointed to deep-rooted learning gaps. Beyond academics, issues like indiscipline, low attention span of students, difficulty among students to communicate, lack of teachers' interest in teaching, and low attendance further complicated classroom management.

> "Joining the Teach for India fellowship has been a transformative journey. While I was confident in my leadership skills, I lacked hands-on teaching experience. Stepping into the classroom was both exciting and challenging, but witnessing my impact on students changed everything. The fellowship taught me resilience, adaptability, and the realities of grassroots education. I faced setbacks, learned to adjust, and discovered new ways to inspire and support my students. This experience not only strengthened my teaching abilities but also deepened my understanding of the education system at its core."
>
> **- Anagha Kerrian, fellow**

CHART 11: USEFULNESS OF EXPOSURE TO GRASSROOTS REALITIES OF INDIA'S EDUCATION



- Chart 11 shows the significance of grassroots exposure for fellows in understanding India's education system. Nearly two-thirds (63.3%) found it extremely useful, while 30% considered it very useful, highlighting the importance of firsthand experience in helping fellows understand challenges and adapt their teaching strategies effectively.

Focus group discussions with fellows reinforced these findings, revealing that school conditions varied based on factors like family background, community literacy levels, and school staff support. Fellows noted that challenges differed between their first and second years. In their first year, especially in government (PMC) schools, they struggled with misalignment in teaching methods, accountability, and classroom execution, making it difficult to apply their training effectively. However, in the second year, placements in private English-medium schools run by iTeach School provided better alignment with teaching methodologies, leading to a smoother and more effective experience. Despite this, many students were still behind grade level, limiting the time available to fully implement teaching strategies.

Further, qualitative discussions with fellows highlighted that to overcome the challenges, they regularly reminded themselves of the course's purpose and stayed focused on their goals. They relied on support from colleagues, experienced fellows, mentors, and school teachers to navigate difficulties. Additionally, they also noted that they built cooperation and trust with students, creating a more positive and effective learning environment.

PARTNERING WITH SCHOOL FACULTIES

CHART 12: UTILISATION OF SCHOOL FACULTY STRENGTHS FOR STUDENT IMPACT

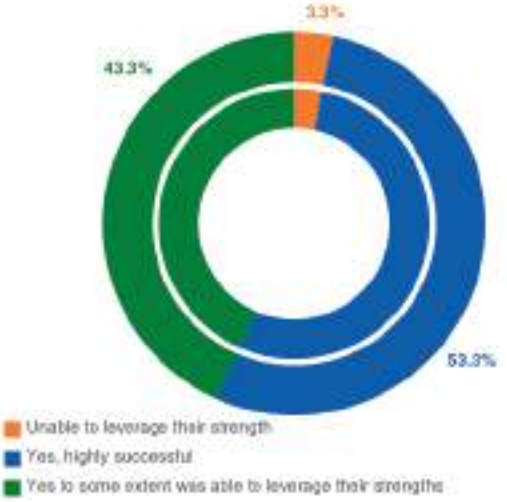


Chart 12 shows that more than half of the respondents (53.3%) felt highly successful in leveraging the strengths of school faculty, including teachers and head teachers, to enhance student learning. Furthermore, 43.3% reported being successful to some extent, indicating that collaboration with school staff played a significant role in enhancing the overall impact on students.

CHART 13: SUCCESS IN MOTIVATING TEACHERS USING COURSE LEARNINGS

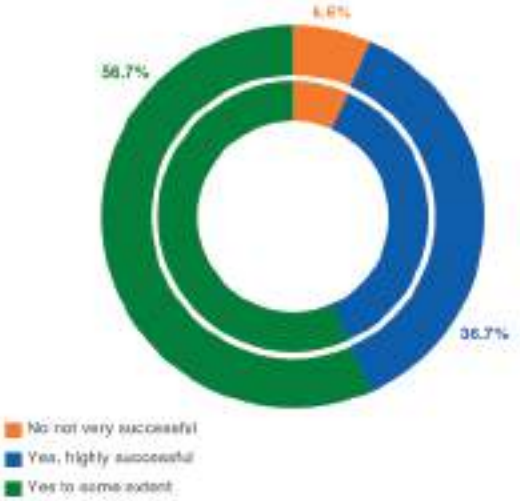


Chart 13 shows that 36.7% of the fellows indicated they were very successful in motivating teachers by applying what they learned from the course. Additionally, over half more than half (56.7%) of the fellows reported being successful to some extent in motivating teachers by applying the insights gained from their training, indicating the effectiveness of their learning in fostering positive engagement among teachers.

CHART 14: IMPACT OF MONTHLY SCHOOL TEAM MEETINGS ON ADDRESSING ISSUES

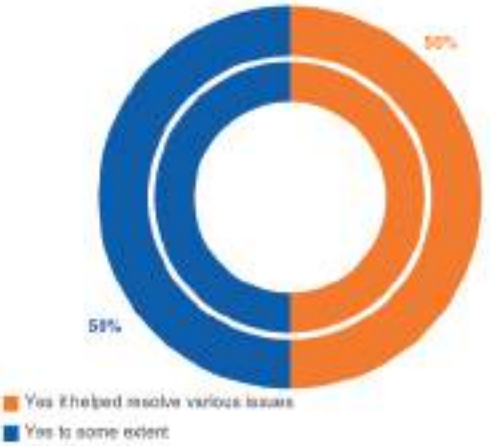


Chart 14 shows the impact of monthly school team meetings on addressing issues. All the respondents reported that these meetings helped in resolving issues.

Focus group discussions with fellows confirmed these findings, highlighting various strategies they used to collaborate with school faculty. They worked closely with teachers and head teachers on classroom management, student grouping based on learning levels, and seeking faculty input to enhance student engagement. They also reported that open communication, regular feedback, and active involvement in student progress discussions helped build trust and cooperation within the school.

Discussions with school faculty have also highlighted the important role fellows played in bringing out the best in students and even in teachers. They noted that fellows played a vital role in strengthening both teaching and administrative functions within the school. They introduced interactive teaching methods, helping bridge learning gaps and increase student engagement. Beyond academics, they organised extracurricular activities like drama and competitions, creating a more dynamic learning environment.

INVOLVEMENT OF PARENTS

A key aspect of the intervention was actively engaging parents in their children's education and overall well-being. By fostering regular communication between teachers and parents, the program aimed to create a supportive learning environment beyond the classroom. Parent-teacher meetings, home visits, and workshops were conducted to help parents understand their child's academic progress and encourage their active participation in learning.

CHART 15: PARENTAL FEEDBACK ENCOURAGEMENT DURING MONTHLY PTMS

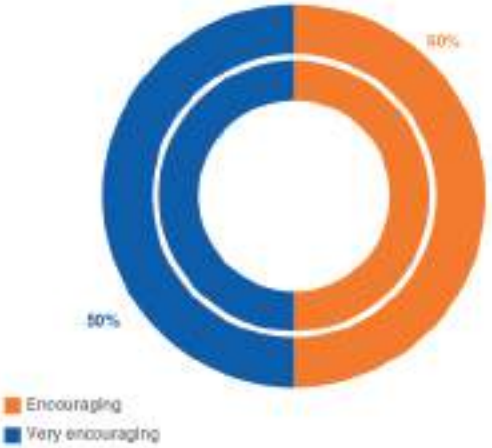


Chart 15 shows that all the fellows found parental engagement during monthly meetings to be encouraging. Over time, fellows built strong relationships with parents, earning their trust in their children's education. This growing involvement was a direct result of fellows' initiatives and was seen as a rewarding aspect of their work.

> "Building relationships with parents was challenging at first, but over time, I developed a strong bond with them. Now, parents trust me and believe that their children attend school because they truly enjoy learning. One memorable moment was when a mother hesitated to send her child during half-day sessions, thinking they would only play. When I assured her that I would be teaching, she simply said, 'I trust you, if you're teaching, then I'll send him.' That trust has been one of the most rewarding aspects of this journey."
>
> **- Pratiksha Kadam, fellow**

Focus group discussions with parents revealed that they regularly attend parent-teacher meetings, where various aspects of their child's development are discussed. They shared that feedback is provided from different perspectives—ranging from academic performance and achievements to subject-specific suggestions and areas needing improvement. Additionally, discussions often include students' interests, challenges they face, and even their mental and emotional well-being. Focus group discussions with parents have highlighted that they usually attend parent-teacher meetings, where different aspects of their children's growth are discussed. Parents highlighted that the feedback from teachers was encouraging, as they observed improvements in their children's studies, confidence, and participation in extracurricular activities. Fellows also encouraged parents to be more involved in their children's learning process.

Parents, during a focus group discussion, shared that "The fellows encouraged us to be more involved in our children's learning. At first, we didn't realise how important our role was, but after seeing our children's progress and excitement for studies, we started paying more attention. We began helping them with homework, attending school meetings, and communicating more with teachers. This involvement made a big difference in our children's confidence and learning."

Parents also shared that, beyond regular parent-teacher meetings, fellows visited students' homes to provide personalised feedback on their children's progress. These visits encouraged parents to be more involved in their child's education. They appreciated the fellows' efforts in recognising students' achievements while also highlighting areas for improvement.

During the focus group discussions, parents emphasised the need to improve school infrastructure, including well-equipped classrooms, libraries, and sanitation facilities. They also suggested that providing school transportation services or community-based transport solutions would support regular student attendance, especially for those who have to travel long distances.

SUPPORT FROM SCHOOL MANAGEMENT AND IMPLEMENTATION TEAM

Qualitative discussions with various stakeholders, including fellows, revealed that the level of support from school management varied, often depending on the effectiveness of the School Management Committee (SMC). In schools with weaker SMCs, fellows took the initiative to engage parents, assign them roles, and strengthen participation. In contrast, strong SMCs actively monitored teachers' performance, improving accountability and punctuality. These committees also provided a valuable platform for fellows to address challenges and enhance school conditions.

During focus group discussions, fellows shared positive experiences about the guidance they received. One fellow highlighted how school staff provided crucial support in handling students, bridging learning gaps, and effectively communicating with parents. Another fellow emphasised the importance of collaboration, explaining how involving co-teachers in decision-making, student grouping, and classroom management significantly improved the learning environment. The collective support from TTL management and school staff played a key role in ensuring effective teaching and problem-solving.

Beyond academics, fellows, with the support of schools, actively engaged students in extracurricular activities to promote holistic development. These activities included sports, drama, dance, singing, and yoga sessions. Students also participated in talent competitions, debates, Model United Nations, and public speaking sessions. Additionally, science exhibitions, career awareness programs, art competitions, and exposure visits were organised, fostering 21st-century skills and overall growth among students.

> "These two years as a fellow have been truly life-changing. The constant support and handholding from mentors, co-fellows, and school staff played a crucial role in this journey. Regular check-ins, constructive feedback, and collaborative problem-solving sessions helped me navigate challenges and refine my teaching strategies. The training sessions and guidance from the implementation team ensured that I was never alone in facing difficulties, making me more confident and effective in the classroom. I am incredibly grateful to TFI for giving me the opportunity to learn and grow in different settings. This journey has been an eye-opener, and I will always cherish it."
>
> **- Aditi Sharma, Fellow**

VIRTUAL INTERACTION WITH TEACH FOR INDIA FELLOWS

LEADERSHIP DEVELOPMENT JOURNEY (LDJ) OF FELLOWS

The Leadership Development Journey (LDJ) is a core component of the fellowship, focusing on building leadership skills alongside teaching. Rooted in the "Teaching as Leadership" model, it helps fellows develop both pedagogical expertise and the ability to drive meaningful change in their communities. The intervention aims to help passionate fellows to become leaders.

Every six months, fellows participate in an LDJ conversation, where they reflect on their growth as leaders by summarising their experiences and progress. From day one, data is tracked to help fellows assess their leadership journey. While the fellowship serves as a short-term goal, leadership remains the long-term focus.

Mr. Tushar Jha, Senior Manager, emphasised the significance of the Leadership Development Journey in the fellowship, highlighting that fellows working with marginalised communities encounter unique challenges. The program is designed to equip them with leadership skills to navigate these complexities effectively. Through city conferences, exposure sessions, and learning circles, fellows are encouraged to step into leadership roles, building confidence, expanding their perspectives, and deepening their understanding of leadership in education. He noted that the fellowship goes beyond teaching—its core aim is to develop leaders who can create lasting impact both inside and outside the classroom. The structured approach ensures that fellows gain skills beyond teaching, preparing them to influence education and community development in the long run.

FIELD TEAM INTERACTING WITH PROGRAM MANAGER

CHART 16: USEFULNESS OF LDJ CONVERSATIONS IN CONNECTING TEACHING AND LEADERSHIP

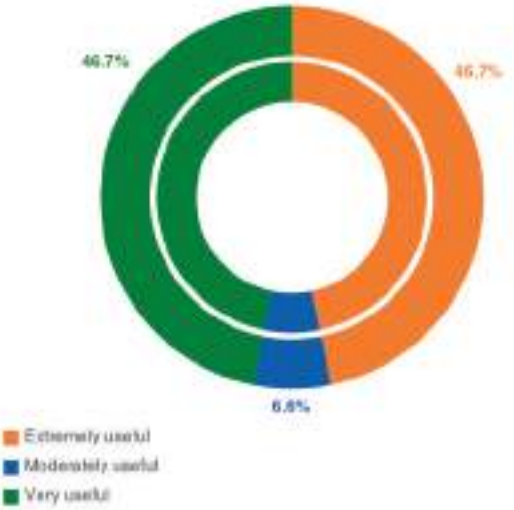


Chart 16 shows that nearly half (46.7%) of respondents found the Leadership Development Journey (LDJ) conversations extremely useful in clarifying the connection between teaching and leadership, while another 46.7% found them very useful.

CHART 17: IMPACT OF LEADERSHIP TEAM MEETINGS ON LEADERSHIP SKILL DEVELOPMENT

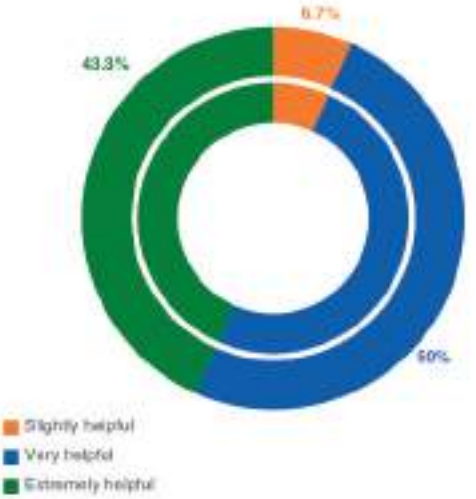


Chart 17shows that half of the respondents felt that the leadership team meetings on leadership skill development of fellows were very useful, whereas 43.3% found it extremely helpful.

Focus group discussions with fellows further reinforced these findings. Fellows shared that LDJ conversations boosted their confidence and helped them develop essential leadership skills.

Engaging with various stakeholders reduced their initial fears and improved their communication abilities. Through multiple leadership opportunities, they gained a stronger sense of responsibility and initiative. A key realisation was that leadership begins when students trust and believe in them. Over time, as they gained experience, teaching became more effective, and they grew into confident communicators and leaders..

> "In the Leadership Development Journey (LDJ) conversations, I gained confidence, leadership skills, and the ability to engage with stakeholders effectively. One impactful experience was initiating a community centre in Janta Vasahat to support vulnerable students. Initially, I hadn't considered this, but understanding the community's needs pushed me to act. By involving parents and community members, we created a collective effort for student education. This journey has strengthened my sense of responsibility and belief in the power of grassroots change."
>
> **- Ankita Shaw, 27-year-old fellow**

INTERACTION WITH FELLOWS

MONITORING AND EVALUATION

Monitoring and evaluation played a key role in assessing the effectiveness of the fellowship and ensuring continuous improvement. Regular assessments, feedback mechanisms, and data-driven insights helped track fellows' progress, student learning outcomes, and overall program impact.

Discussions with program implementors highlighted the monitoring process of fellows. In terms of monitoring the fellows, each fellow is assigned a program manager, who visits the school on average twice a week. During these visits, the program manager observes how the fellows are performing in the classroom and provides feedback based on their observations. This feedback helps in planning the next steps and addressing any challenges. Additionally, fellows submit assessments and lesson plans that are reviewed by the program manager. The program manager also meets with fellows in person to discuss their progress, ensuring that they are on track and supporting their development.

For fellows, the mid-year step back is a crucial evaluation process that allows them to reflect on their progress, assess strengths, and identify areas for improvement. It provides an opportunity to step away from daily tasks and critically analyse their growth and learning.

CHART 18 HELPFULNESS OF MIDYEAR STEP BACK IN PROGRESS AND GOAL ALIGNMENT

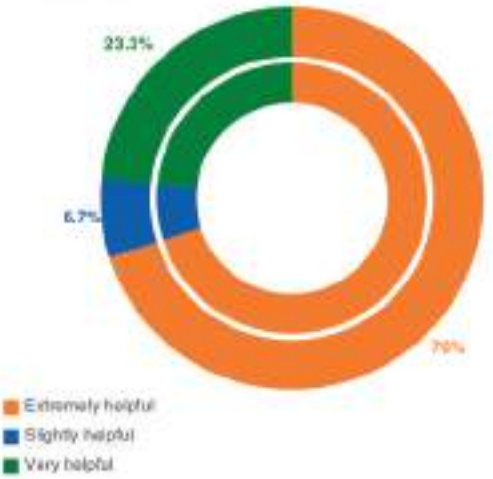


Chart 18 shows that 70% of fellows found the mid-year step back extremely helpful for assessing progress and ensuring they were on the right track, while nearly one-fourth (23.3%) found it very helpful, highlighting the importance of structured reflection in helping fellows reassess goals, refine strategies, and enhance their overall effectiveness in the classroom.

> The mid-year step back serves as a transformative experience for fellows, providing a much-needed pause to reflect on their journey, assess growth, and realign goals. Through self-reflection and feedback, they gain clarity on their strengths, skills, and areas for improvement. The retreat helps fellows formulate their personal theory of change, reinforcing their passion and commitment to the movement. Engaging in these conversations over two years continuously refines their perspective, keeping them motivated and connected to the larger purpose. Most fellows usually leave feeling rejuvenated, with a clearer vision for their role in driving meaningful change in education.
>
> **- Saurabh Agarwal, Sr. Manager- Regional**

For students, the midterm assessment measures key academic indicators, helping fellows gauge educational outcomes and adjust teaching strategies accordingly.

CHART 19: SATISFACTION WITH MIDTERM AND END-TERM ASSESSMENT RESULTS

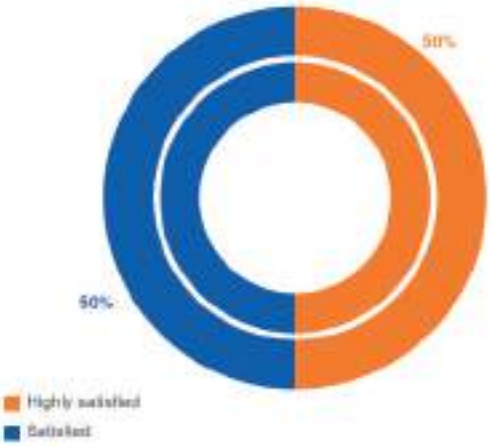


Chart 19 shows that all the fellows were satisfied with the results of the midterm and end-term assessments. Many attributed their satisfaction to noticeable improvements in students' reading, writing, comprehension, and confidence. Increased participation and curiosity about learning were also key factors. However, some fellows expressed disappointment in not being able to support every student equally, especially those who struggled more.

They also emphasised that understanding students' thought processes and challenges helped them adapt their teaching methods, create personalised lessons, and keep students engaged. This approach not only enhanced learning outcomes but also boosted students' confidence and overall progress.

> I faced many challenges from a young age. I lost my mother when I was 3 years old, and my father did not support me. My grandmother raised me and fought for my legal adoption, but it was a difficult time for me. I felt sad and struggled in school, scoring very low marks. Everything changed when Anantu Bhaiya, my fellow, started teaching me. He encouraged me, supported me, and helped me believe in myself. Slowly, I gained confidence and improved in my studies. Today, I am one of the top students in my class. I am very thankful to my fellows for helping me. Without them, I would not be where I am today.
>
> **- Riya Parchure, a student of 7th grade**

FGD WITH STUDENTS

EXPERIENCE DURING COVID – 19

During the COVID-19 lockdown, schools remained closed, and education transitioned to virtual platforms. Students were provided with tablets to continue their studies, while online learning and training sessions were conducted for fellows to adapt to digital teaching methods. Fellows were upskilled in using platforms like Zoom and other virtual tools for effective online classroom management, virtual PTMs, and interactive learning activities.

During a discussion with the project implementation team, it was noticed that to bridge the access gap, the team took proactive steps to ensure uninterrupted learning. Partnerships with various organisations helped provide devices to students, and specialised online teaching modules were developed. Technology training was offered to both students and fellows to enhance digital literacy. Additionally, community centres were established as alternative learning spaces for students lacking internet access or devices at home. These efforts ensured that learning continued despite the challenges posed by the pandemic. This data discrepancy was also evident in focus group discussions with students; they shared that online classes were challenging due to a lack of mobile phones and internet access. Fellows also highlighted several difficulties faced during remote learning. While the project adapted to online education during COVID-19, its success depended on the availability of devices. Some students could continue their studies with minimal disruptions, but others struggled with poor internet connectivity and limited digital literacy, affecting their learning experience.

Despite these challenges, the devices played a crucial role in maintaining communication with students, sharing learning materials, and ensuring the continuity of the project. Efforts were made to provide additional resources or alternatives where possible, but the overall impact varied depending on students' access to technology and support systems. While there were setbacks, these devices proved valuable in sustaining learning during difficult times. Fellows emphasised that learning devices helped bridge educational gaps, ensuring consistency in studies and keeping students engaged. Many students remained connected to academics, and technology sparked their interest in learning. For some, it was a lifeline to education during a crisis, while others experienced limited benefits due to a lack of access.

The organisation implemented a blended learning approach during the COVID period, combining synchronous online or in-person classes with asynchronous self-study packets. This approach ensured that students could continue their education effectively despite the challenges.

> Focus group discussions with parents highlighted that "The device was very helpful. Since there were no face-to-face classes, it allowed our children to continue their studies. It helped them stay connected with their lessons and teachers.

CHART 20: INCREASE IN LEARNING TIME DUE TO BLENDED LEARNING

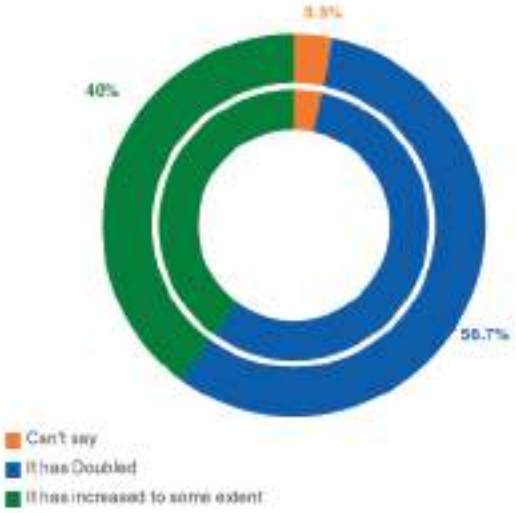


Chart 20 shows that more than half (56.7%) of surveyed fellows reported that students' learning time has doubled due to blended learning, followed by 40% who reported that it has increased to some extent indicating a positive learning impact.

> The organisational data shows that via blended learning, the students are getting ~18 hours of weekly instruction compared to a national average of 0-9.5 hours.
>
> *(source: TTL project closure report)*

CHART 21: LEVEL OF IMPROVEMENT IN STUDENTS' READING SKILLS, COMPREHENSION, AND MATH SCORES AFTER INTERVENTION

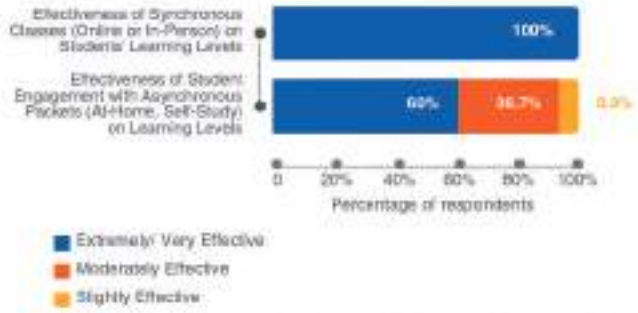


Chart 21 shows the fellows' impressions of the effectiveness of synchronous and asynchronous learning methods on students' learning levels. All fellows reported that synchronous classes, including online or in-person sessions, were extremely effective.

However, only 60% of fellows found self-study (asynchronous learning) to be highly effective, followed by 36.7% who found it moderately effective, indicating that self-study was less effective compared to structured online or in-person classes.

This finding was further supported by qualitative discussions with students, who shared that self-study at home was often challenging. They expressed feelings of boredom and confusion due to a lack of clarity in basic concepts, which their parents—many of whom were illiterate—were unable to help with. While the asynchronous learning packets, which included worksheets, reading materials, and exercises, allowed students to practice at their own pace, many struggled without teacher guidance. Additionally, some students lacked a proper study space at home, while others, having returned to their native places, lost interest as they assumed schools would not reopen.

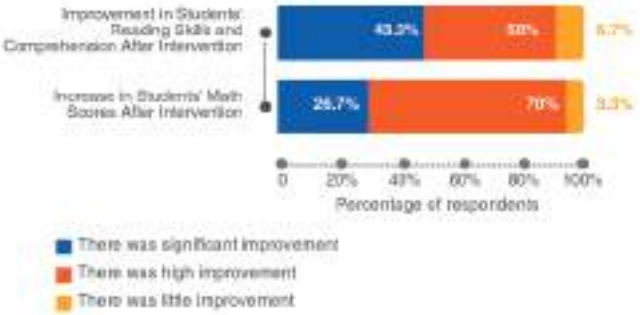
TEACH FOR INDIA OFFICE

KEY IMPACTS

IMPROVED STUDENTS' LEARNING OUTCOMES

Following the project intervention, a notable increase in students' academic progress was seen.

CHART 22: LEVEL OF IMPROVEMENT IN STUDENTS READING SKILLS, COMPREHENSION AND MATHS SCORE AFTER INTERVENTION



Before the intervention, qualitative discussions with stakeholders—including teachers, parents, fellows, and students—revealed that students struggled with reading skills, comprehension, and math, leading to a lack of interest in studies. However, after the intervention, 70% of fellows reported a significant improvement in students' math scores, and 26.7% reported very high improvement. Similarly, half of the respondents observed substantial progress in students' reading skills and comprehension, and 43.3% reported very high improvement in their reading and comprehension skills, indicating that the intervention played a crucial role in enhancing students' foundational learning.

Qualitative interactions with school teachers highlighted a significant positive impact on students' performance. Fellows' dedication to both teaching and leadership contributed to noticeable academic progress, particularly in math and science, where students initially struggled. Reading skills and comprehension also improved, though progress varied. These findings were further reinforced through interactions with students. During a focus group discussion, they shared, "We improved in reading, writing, and math. We also learned English, speaking skills, and new ways to solve problems. There was a drastic change in our reading and comprehension. Initially, we struggled with reading English, but now we feel confident. We also take part in debates and essay writing after didi's intervention." This indicated the positive impact of the intervention on students' academic growth.

During the focus group discussion, parents mentioned, "We have seen significant improvement in our children's reading ability. Earlier, they struggled with basic words, but now they can read fluently and understand texts. Their overall interest in studies has also increased, along with better scores. Many children used to find Marathi difficult and were afraid of English because of their background. But thanks to the efforts of the fellows, they have improved in tough subjects like English and Math.

IMPROVED ATTENDANCE OF STUDENTS

The engaging teaching strategies, frequent reading activities, and creative learning approaches implemented by the fellows significantly enhanced students' confidence and comprehension. As a result, students developed a clearer understanding of concepts, which increased their motivation to attend school regularly. This improvement in confidence and interest in learning led to higher attendance rates.

CHART 23: IMPACT OF INTERVENTION ON STUDENT ATTENDANCE

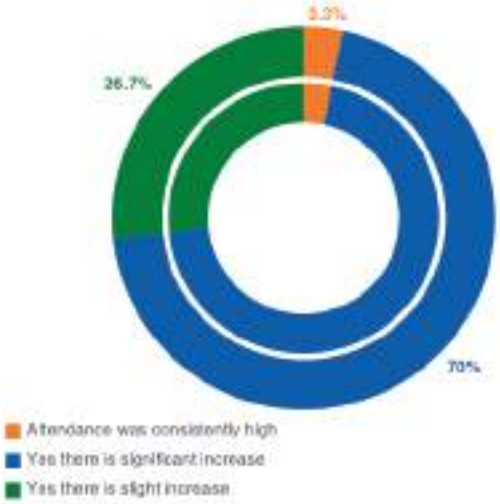


Chart 23 shows a significant improvement in student attendance. Earlier, they used to miss classes often due to lack of interest, family responsibilities, or financial struggles.

However, after the intervention, 70% of the fellows reported a significant increase in student attendance, while an additional 26.7% reported some improvement. This improved attendance was the result of a bond with the children, making education engaging and meaningful.

This finding was further corroborated by interactions with stakeholders, who shared that prior to the program, students lacked interest in learning, leading to low attendance. However, both school administrators and parents observed a significant improvement in attendance. TFI fellows played a crucial role in this change by using innovative teaching methods to make learning engaging. They also ensured regular attendance by consistently following up with absent students through phone calls and home visits, fostering a stronger connection between students and their education.

Focus group discussions with students revealed a positive shift in their attitude toward school. One student shared, "Earlier, we used to miss school, but now we come regularly because we enjoy learning and look forward to school every day.

Focus group discussions with students highlighted the diverse opportunities they gained through the program. One student shared, "We got exposure to the outside world and participated in extracurricular activities like drama, cricket, and stage performances. We work on crafts, skits, and cultural programs such as singing and debate competitions. With the help of didi and bhaiya (fellows), we also prepare for various intercity competitions."

The field research team noted several key improvements in students' lives resulting from the intervention, as revealed through discussions:

An increase in discipline and improved behaviour among students.

Students became more responsible, respectful, and actively engaged in the learning process.

IMPROVED CONFIDENCE AND CREATIVITY AMONG STUDENTS

CHART 24: STUDENT IMPROVEMENTS RESULTING FROM THE INTERVENTION

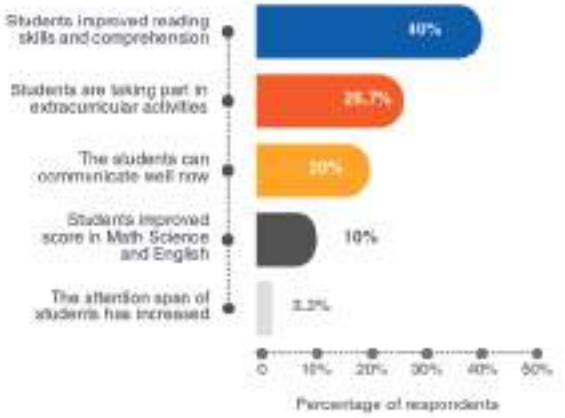


Chart 24 shows that 40% of the fellows reported improvements in students' reading and comprehension skills, while over a quarter (26.7%) observed increased student participation in extracurricular activities. Additionally, 20% of fellows reported improvements in students' communication skills due to the intervention, suggesting that the program not only enhanced academic learning but also contributed to students' overall confidence and personal development.

Interactions with stakeholders have revealed substantial changes in the students. Parents reported that their children, who were initially shy and hesitant to speak, have become more confident. Previously struggling with communication and stage fear, these students now participate actively in activities and express themselves more effectively. The support from the fellows, combined with experiences like drama, cultural programs, and school visits, has not only improved their academic performance but also enhanced their life skills.

Moreover, even teachers have reported noticeable changes among students. They highlighted that increased students' interest in studies through engaging methods and activities. Students became more curious, participated actively, and showed enthusiasm for learning. Their personality also developed, with improved confidence, communication skills, and leadership. Many shy students started taking the initiative, showing overall growth in academics and personal development. These transformations underscore the broader positive impact of the intervention on both the academic and personal growth of the students.

INCREASED PARENT'S INVOLVEMENT IN STUDENTS' EDUCATION

The program has had a profound impact on the involvement of parents in children's education. School teachers and administration have reported significant increases in parents' participation; visits made parents feel more confident and supported. This involvement of parents in their children's education not only helped students gain confidence but also helped enhance their overall family bonds.

CHART 25: IMPACT OF EFFORTS ON PARENTAL INVOLVEMENT IN CHILDREN'S STUDIES

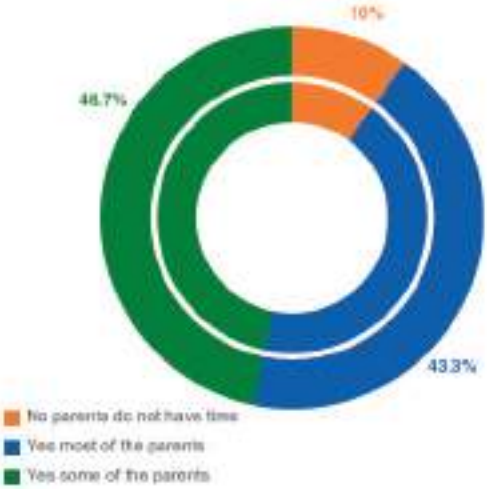


Chart 25 shows that 43.3% noted active participation by parents in their children's studies, and nearly half of the fellows (46.7%) reported some level of parental involvement; qualitative discussions with stakeholders further supported this, revealing that the program fostered a positive family environment. Parents reported feeling more confident and supported, which strengthened overall family cohesion.

Insights from Parents:

During focus group discussions, parents shared that they regularly attended PTMs and found teachers' feedback encouraging. They noticed improvements in their children's academics, confidence, and participation in extracurricular activities. Fellows also encouraged parents to be more engaged in their children's learning, leading to increased involvement at home.

School Administration Perspective:

Discussions with school administrators highlighted that parents highly valued the TTL fellows' contributions. Many credited the fellows for addressing trauma-related issues through home visits and classroom interventions. These efforts reassured parents, making them feel more involved and supported. Some even attributed their children's regular school attendance to the fellows' encouragement and positive influence.

Focus group discussion with school administration that "We have seen a significant increase in parental involvement, which has positively impacted students' learning. Parents now attend PTMs regularly and take an active interest in their children's progress, both academically and in extracurricular activities. Many parents, who were previously less engaged, now monitor their child's studies more closely. The home visits by fellows have played a crucial role in building trust and encouraging parents to participate in their child's education.

SCHOOL BUILDING

STRENGTHENED LEADERSHIP AND TEACHING SKILLS

The intervention has significantly enhanced the leadership and teaching skills of the fellows, which has played a crucial role in their overall growth and effectiveness. Through continuous training, mentorship, and hands-on experience, fellows have developed stronger classroom management, communication, and problem-solving skills.

CHART 26: CONFIDENCE IN EXPANDED KNOWLEDGE OF EDUCATION AND SOCIAL DEVELOPMENT

Chart 26 shows that more than half (56.7%) of the surveyed fellows reported a significant increase in their confidence and knowledge in the education and social development sectors due to training and two years of teaching experience. Furthermore, 43.3% stated that their confidence increased beyond their expectations. This also indicates the effectiveness of the program in building expertise and leadership in these areas.

Example of a successful partnership by a fellow:

Before Diwali, a fellow encountered a substance abuse issue in their class. With three fellows placed in the school, they were unsure how to handle it. One fellow suggested reaching out to a community de-addiction counsellor, which proved invaluable. This collaboration led to an informative session that helped the fellows understand the issue and how to address it effectively. The experience highlighted the importance of networking with community stakeholders and inspired the fellows to plan future sessions with parents and local organisations for continued support.

CHART 27: SUCCESS IN BUILDING A NETWORK OF PARTNERS, STAKEHOLDERS AND PEERS

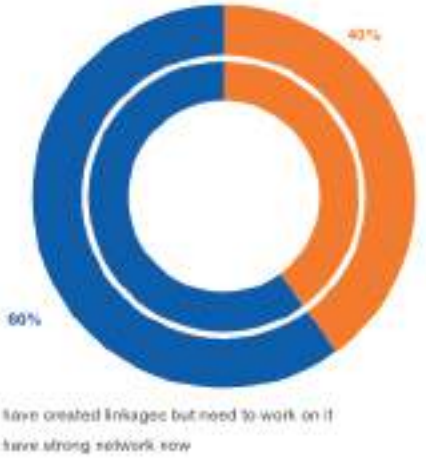


Chart 27 shows that 60% of respondents reported developing a strong network of partners, stakeholders, and peers through two years of successful fellowship. Meanwhile, 40% indicated that they had established these connections but still needed to strengthen them further. This indicates enhanced leadership qualities and the ability to collaborate effectively.

CHART 28: OVERALL PROJECT IMPACT ON PERSONAL GROWTH AND STUDENT LIVES

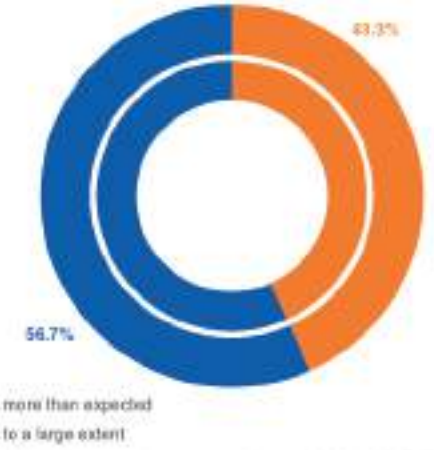


Chart 28 shows that more than half (56.7%) of the fellows reported that their experience in the project had a significant impact on their lives, and 43.3% of the fellows reported that their experience in the project had a very high impact on their lives. The project increased their ability to positively influence students, indicating the program's effectiveness in fostering both personal and professional growth.

Field discussions with fellows revealed significant personal and professional growth. Initially, many struggled with fears of leadership and addressing student challenges. However, through hands-on experience, they developed a deeper understanding of educational issues and learned effective problem-solving strategies. The project also greatly enhanced their self-confidence, empowering them to take on teaching roles with greater assurance and impact.

INCREASED INTEREST IN PURSUING A CAREER IN EDUCATION

CHART 29: CLARITY ON CAREER PATH AFTER TRAINING

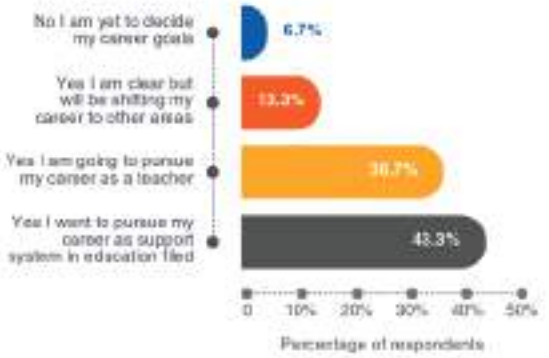


Chart 29 shows that a significant majority of fellows (80%) have developed a clear interest in continuing their careers in education. Among them, 43.3% aspire to contribute as part of the education support system, while 36.7% aim to become teachers. This reflects the program's positive influence on fellows' career aspirations and its impact on shaping future teachers and education leaders.

CHART 30: ATTENDANCE AT INTERNAL OR EXTERNAL CAREER FAIR FOR OUTGOING FELLOWS

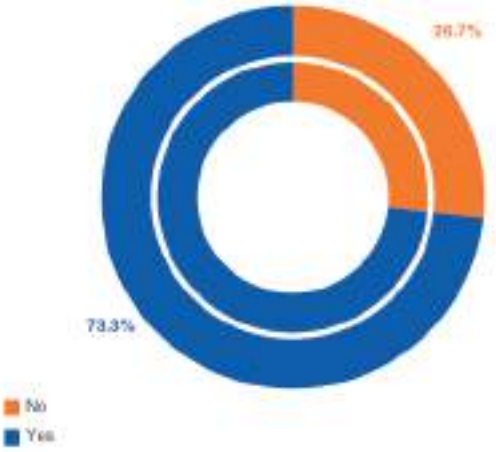


Chart 30 shows that closer to three-fourths (73.3%) of fellows reported that they had attended the Internal or External Career Fair conducted for outgoing fellows.

CHART 31: CAREER FAIR IMPACT- THE OPPORTUNITY TO WORK IN THE EDUCATION SECTOR

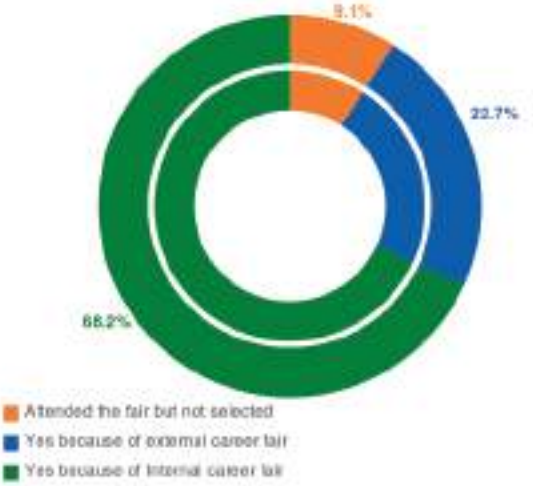


Chart 31 shows that over two-thirds (68.2%) of respondents who attended the internal career fair secured opportunities to work in the education sector. Additionally, 22.7% found similar opportunities through external career fairs. This highlights the effectiveness of career fairs in connecting fellows with potential career pathways in education.

CHART 32: ROLE IN BUILDING A LARGER MOVEMENT FOR EQUITY IN EDUCATION

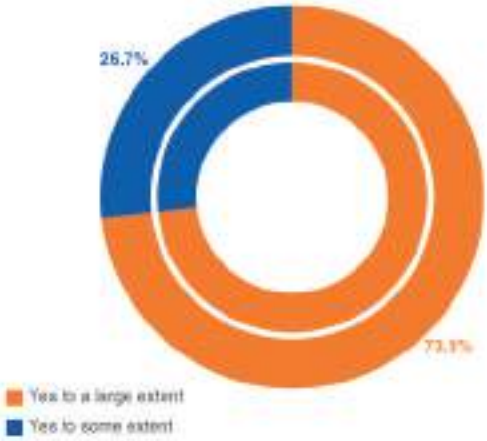


Chart 32 shows that nearly three-fourths (73.3%) of the fellows reported that they identified their role in building a larger movement for equity in education to a significant extent, indicating a strong commitment to driving systemic change in the education sector.

The program has notably empowered fellows to take education-related field roles. Fellows reported the project's success as women's participation as a key indicator, as shared by a participant from a focus group discussion: "In my experience, the fellowship has not only improved my teaching skills but also deepened my understanding of the education system at its core. Most importantly, it has helped me discover my passion. It has shown me how education can transform lives and has inspired me to continue working toward meaningful change in this field. This experience has shaped me both personally and professionally, and I am deeply grateful for the lessons, growth, and impact it has brought into my life.

CHART 33: SATISFACTION WITH EFFORTS FOR HOLISTIC DEVELOPMENT OF UNDERPRIVILEGED STUDENTS

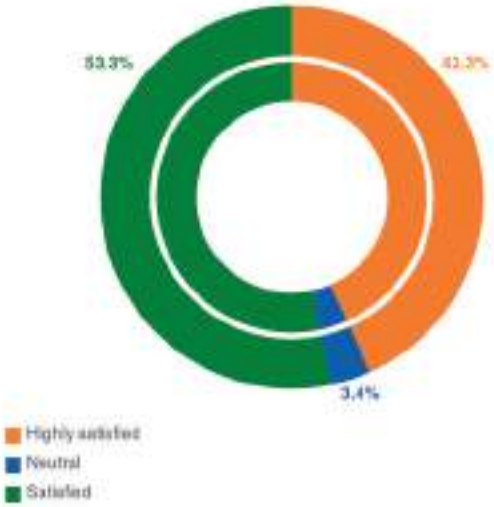


Chart 33 shows that more than half (53.3%) of the fellows reported being satisfied with their efforts in ensuring that students from weaker sections of society have access to holistic development, helping them progress toward transformative learning. Additionally, 43.3% were highly satisfied, showing the program's effectiveness in fostering inclusive and impactful education.

INTERACTION WITH THE PARENTS

06. IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Enhanced leadership, teaching expertise, and career clarity of fellows.
- Improved student outcomes in Mathematics.
- Improved reading competency of students.

FAMILY LEVEL

- Increased parental involvement fostered stronger support systems.
- Improved students' learning environments at home.

SCHOOL LEVEL

- Improved student attendance in schools.
- Increased participation of students in extracurricular activities.
- Improved school environment with interactive learning methods.

COMMUNITY LEVEL

- Greater awareness and engagement of local stakeholders in education.
- Strengthened collaboration between schools, parents, and community leaders to support student learning.

STATE LEVEL

- Contribution to local education policies through improved student outcomes and innovative teaching methods.
- Strengthened the education ecosystem by fostering leadership and teacher development.

NATIONAL LEVEL

- Alignment with national education initiatives to enhance literacy and numeracy skills.
- Contribution to educational equity by improving learning outcomes in underserved communities.
- Support for nationwide efforts to build a skilled and empowered workforce through quality education.

CASE STUDY 1

Bhagyashree Jadhav, a mechanical engineer, developed a deep connection with the Teach for India (TFI) fellowship due to her personal experiences and those of her siblings. Witnessing the impact of TFI on her siblings motivated her to pursue a career in education. Initially considering a teaching-related venture, Bhagyashree realised she lacked an understanding of India's educational framework. She joined TFI to gain knowledge and make a meaningful impact on education.

During her fellowship, Bhagyashree received significant support from fellow teachers and mentors, focusing on leveraging her strengths and addressing her weaknesses. She refined her skills in relationship management and stakeholder engagement, challenging her assumptions about creativity and innovation. Bhagyashree learned to adapt teaching methods to suit individual students' needs, which allowed her to grow both personally and professionally.

Bhagyashree's experience with TFI profoundly impacted her career aspirations and understanding of education. She gained profound insights into education, child development, and community growth. Her experience transformed her career aspirations, solidifying her commitment to education for the next decade. Bhagyashree now aims to apply her skills to create lasting impacts on children's lives and contribute to community betterment through education.

CASE STUDY 2

Geetika Kumar's journey to Teach for India (TFI) was sparked by a desire to create meaningful change in education. With a Master's in Journalism and Mass Communication, she spent five and a half years as a content writer before transitioning into education. Encouraged by her manager during a job search, Geetika applied for the TFI fellowship and was selected. Since joining in May 2023, she has found her experience both transformative and rewarding.

Before TFI, Geetika had no teaching experience, but the training program provided her with a comprehensive understanding of India's education landscape and the role of TFI fellows in creating long-term change. She learned to develop curricula, create lesson plans, and solve problems effectively. Once in the classroom, Geetika formed strong bonds with her students and co-teachers, experiencing moments she will never forget. Throughout her fellowship, Geetika discovered that being a changemaker involves personal transformation and taking others along on the journey. She realised that education empowers individuals and communities and requires involvement from all walks of life. Geetika also developed skills in stakeholder management, fundraising, and engagement, which have been instrumental in her growth as a leader in the education sector.

As her fellowship nears its end, Geetika reflects on her personal and professional growth. She has gained a deeper understanding of how education impacts both students and communities. Geetika is eager to continue her journey in education, ensuring every child has access to quality education.

CASE STUDY 3

Sonali Jaiswal, a 7th-grade student at Sant Gadge Maharaj Municipal School in Pune, comes from a socio-economically weak background. As a migrant family, her family faced numerous challenges, including financial difficulties and a strained home environment. Despite these obstacles, Sonali's life took a positive turn when Gitika, a Teach for India fellow, began teaching her.

Initially, Sonali struggled emotionally and lacked confidence. However, Gitika's support and encouragement helped her gain confidence and excel in her studies, particularly in Math and English. Gitika not only impacted Sonali's academic performance but also motivated her parents to recognise the importance of education. This led to Sonali participating in various activities, which boosted her self-esteem and pride. Sonali's experience with Gitika has inspired her to dream big. She now aspires to become like Gitika, helping others in the same way she was helped.

07. OECD FRAMEWORK

RELEVANCE

The program effectively addressed the critical challenges faced by students in under-resourced government and low-income private schools in Pune, Maharashtra. It aimed to improve student learning outcomes by enhancing the quality of education while simultaneously equipping fellows with essential teaching skills to support their transition into full-time educators. By fostering student engagement, encouraging critical thinking, and implementing innovative teaching strategies, the initiative tackled learning gaps and traditional lecture-based instruction. Strengthening teacher capacity not only improved classroom learning but also contributed to building a more inclusive and effective education system in the region.

COHERENCE

The program showed strong alignment with the following Sustainable Development Goals (SDGs):

The program also reflected strong coherence with national initiatives:
National Education Policy (NEP) 2020: The program's emphasis is on fostering experiential learning, multilingualism, and student-centric approaches to education.

EFFECTIVENESS

The program successfully met its core objectives, leading to significant improvements in student learning outcomes and teacher capacity. Data from assessments and stakeholder feedback highlighted notable progress in students' reading comprehension, math proficiency, and overall academic performance. Additionally, the fellows developed strong teaching and leadership skills, enabling them to create engaging and student-centred learning environments. Increased parental involvement and improved student attendance further reinforced the program's effectiveness.

EFFICIENCY

The program demonstrated strong efficiency through a structured implementation approach that ensured alignment with its objectives. The selection of fellows was streamlined through partnerships with local institutions, enabling a more targeted recruitment process. Efficiency was further enhanced by leveraging school networks and educational stakeholders to provide ongoing mentorship and training, ensuring that fellows received continuous professional development. This collaborative approach not only optimised resource utilisation but also fostered a sense of accountability among teachers and administrators.

Index : 5 Points - Very High ; 4 Points - High ; 3 Points - Moderate ; 2 Points - Low ; 1 Point - Very Low

IMPACT

The program had a significant impact on the education ecosystem by driving meaningful improvements in student learning, teacher capacity, and community engagement. By equipping fellows with effective pedagogical strategies and leadership skills, the initiative fostered a more engaging and student-centred learning environment in under-resourced schools, boosting learning outcomes. The program also played a crucial role in strengthening the teaching workforce, as many fellows pursued long-term careers in education, contributing to systemic change. The positive ripple effects extended to the broader community, promoting equitable access to quality education and inspiring a new generation of teachers and learners.

SUSTAINABILITY

The program's sustainability is anchored in community engagement and capacity building within the education sector. By equipping fellows with strong teaching and leadership skills, the initiative ensures a lasting impact on schools beyond their tenure. The program also fosters collaboration between fellows, school administrators, and local stakeholders, creating a support network that continues to enhance teaching quality. Additionally, by involving parents in their children's education and strengthening school management practices, the initiative promotes long-term improvements in student learning. Many fellows choose to remain in the education sector, contributing to systemic change. The program's emphasis on professional development, mentorship, and stakeholder collaboration ensures that its benefits extend beyond the immediate intervention, making it a sustainable model for future educational initiatives.

08. SUSTAINABILITY

The long-term success of the Teach for India Fellowship Program, supported by Bajaj Auto Limited, depends on its sustainability across institutional, educational, economic, and social dimensions. Institutionally, the program built a strong foundation by training fellows with teaching and leadership skills. Ongoing mentoring and support helped create a dedicated group of teachers committed to improving education in under-resourced schools. Collaborating with schools and communities further strengthened this foundation, making sure resources and knowledge are shared effectively.

In terms of education, the program focused on enhancing learning outcomes through innovative teaching methods and skill-building. Fellows encouraged students to develop skills like critical thinking, problem-solving, and leadership, setting the stage for lasting educational improvement.

Economically, the program helped create a skilled workforce in the education sector. The training and leadership skills gained by fellows improved their career prospects and ability to drive positive change in education.

Socially, the program promoted educational equity by focusing on marginalised communities and under-resourced schools. Engaging parents and communities helped build a supportive learning environment, empowering students and encouraging a culture of learning.

CHAPTER 9
RECOMMENDATIONS

IMPROVEMENT IN SCHOOL INFRASTRUCTURE

The program should focus on enhancing school infrastructure, including well-equipped classrooms, libraries, and sanitation facilities. Additionally, arranging school transport services or community-based transport solutions will help ensure regular student attendance, particularly for those travelling long distances.

INTEGRATE CAREER COUNSELLING

Beyond academic support, the program should extend its reach to students beyond Grade 10 by introducing career counselling and vocational training. This will equip students with essential skills, provide guidance on future career paths, and prepare them for higher education or employment opportunities.

STRENGTHENING FELLOW PLACEMENT AND SUPPORT

Ensuring stability in fellow placement is essential for continuous student engagement and learning. Longer fellowships should be encouraged to prevent disruptions while consistent placement minimises learning gaps.

ADDRESSING LEARNING GAPS IN MATHS AND READING

While there has been progress in improving students' math and reading skills, some still face challenges. To bridge these gaps, the program should implement targeted remedial programs for students requiring additional support. Personalised learning strategies tailored to individual needs will enhance comprehension and retention, ensuring that every student can achieve fundamental literacy and numeracy skills.

DATA COLLECTION AND MONITORING

A structured monitoring and evaluation framework should be established to track student progress and measure program effectiveness. Ensuring timely data collection and comprehensive reporting will provide valuable insights for continuous improvement and impact assessment. By implementing these recommendations, the program can enhance its long-term impact, improve student outcomes, and create a sustainable model for educational transformation.

CHAPTER 10
CONCLUSION

Teach to Lead, in partnership with Bajaj Auto Limited, implemented the Teach for India fellowship program to tackle the longstanding challenges of quality education in government and low-resource private schools in Pune, Maharashtra. The initiative focused on improving student learning outcomes by enhancing the quality of education and equipping fellows with the skills needed to become effective full-time teachers. By strengthening their teaching practices, the program not only supported academic growth but also fostered leadership development among fellows, encouraging their continued engagement in the education sector. With a holistic approach, the program combined academic learning with creative and interactive teaching methods to make education more engaging and impactful. The program led to significant improvements in student learning, particularly in mathematics and reading competency. Fellows played a crucial role in bridging educational gaps and inspiring students to develop critical thinking and problem-solving skills. Through the program, fellows developed strong teaching and leadership skills, gaining valuable experience that encouraged many to pursue long-term careers in education.

IMPACT ASSESSMENT REPORT

FIND, SUPPORT, AND GROW SOCIAL ENTREPRENEURS

Implementing Organisation - Social Entrepreneurs Foundation India (UnLtd India)

Release Date: 31-03-2025

SoulAce

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

CSR	Corporate Social Responsibility
FY	Financial Year
BAL	Bajaj Auto Limited
UI	Unlimited India
SE	Social Enterprise
FCRA	Foreign Contribution (Regulation) Act
NGO	Non-Governmental Organisation
SDGs	Sustainable Development Goals

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

Conducted on a national scale, the Find, Support, and Grow Social Entrepreneurs program is a collaborative effort of Bajaj Auto Limited and Social Entrepreneurs Foundation India (UnLtd India) directed towards strengthening the social enterprise ecosystem in India. The project aimed at building organisational and leadership capacities of 24 social enterprises across a period of 2.5 years. By addressing key gaps in mentorship, organisational development, and resource access, the incubation programs empower social entrepreneurs to create scalable, high-impact solutions which drive sustainable development.

INTERACTION WITH THE BENEFICIARIES OF HAMARI SILAI FOUNDATION

PROJECT DETAILS

Implementation year
FY 2021-2023

Assessment year
FY 2024-25

Implementing Partner
Social Entrepreneurs Foundation India (UnLtd India)

Beneficiaries
Social entrepreneurs

Number of beneficiaries
23

Project Budget
₹244 Lakhs

Location
Pan India

Alignment with SDGs

Alignment with National Programs:

- Skill India Mission
- Start-up India Initiative

PROJECT ACTIVITIES

Identification and selection of potential social entrepreneurs through strategic collaborations.

Signing of the MoU along with the onboarding and induction of these social entrepreneurs.

Training and mentorship for a period of 9 months for each cohort, including boot camps, mentorship sessions and workshops for learning.

Key Findings

Sample Size - 20

55%

of the respondents belonged to the age group of 30-40 years, while those between 40-50 years and less than 30 years formed 20% of each of the total respondent sample.

65%

of the respondents had previous experience in business or entrepreneurship.

55%

of the Enterprises were operational for more than 5 years, while 40% of them have been operational for 3-5 years.

40%

of the social enterprises operated at the local level, focusing on specific communities or regions. Around 30% had a pan-India presence, 25% were active across multiple regions, and only 5% extended their operations internationally

45%

of the enterprises were small-sized with only 6-15 employees, while 25% of them were micro-enterprises with a workforce of 1-5 employees.

95%

of the respondents mentioned the desire for capacity building as the foremost motivating factor for joining the incubator program. 90% of them were drawn by the program's scope for building networks, followed by 85% of them wanting to support their scaling process and structured development.

All the respondents unanimously felt that the social media promotion campaigns provided sufficient updates about the program.

60%

of the respondents reported excellent clarity about the process of application, review, and interview.

75%

of them were very satisfied with the selection process.

The 1-day virtual induction seminar provided a clear program overview, set expectations, and unlocked networking opportunities for 95% of the respondents. 85% of them came to know more about the support offered by the program and its overarching goals.

80%

of the respondents got clarity on their responsibilities.

95%

of the respondents felt that the Organizational tracker helped them to understand their organisational strengths. 85% of them believed that it helped them identify areas of improvement, gauge baseline metrics, evaluate team capacity and set clear organisational and personal goals.

85%

of the respondents viewed the self-assessment as an extremely valuable exercise for gaining insights.

60%

of the respondents felt that the topics covered in the 3-Day UI Boot Up workshops were highly relevant, while 25% of them thought it to be mostly relevant.

85%

of the respondents felt that the webinars and group mentoring sessions were highly engaging.

80%

of the respondents felt that the site visits were extremely helpful in providing on-ground insights to the implementation team members.

55%

of the respondents found the crowdfunding workshop, conducted in collaboration with Milaap, to be extremely useful, while 35% of them found it moderately useful.

90%

of the respondents felt that the one-on-one coaching calls were highly effective in addressing their specific challenges.

Key Impacts

Sample Size - 20

ORGANISATIONAL DEVELOPMENTS

75%
of the respondents, the site visits helped the respondents of the implementation team to identify the day-to-day operational challenges faced by their organisation.

The visits allowed the respondents of the program implementation team to assess the enterprise's resource needs and accordingly provide guidance to 65% of the respondents.

The insights gained during the visits helped 70% of the respondents to improve their program design and delivery to better meet their community's needs.

The site visits facilitated more targeted and specific support from the program implementation team based on our on-ground realities in 70% of the cases.

75%
of the respondents reported that the crowd funding workshop, conducted in association with Milaap, provided useful insights into best practices for running effective crowdfunding campaigns.

The session helped 90% of the respondents understand the features and functionalities of crowdfunding platforms, specifically Milaap 360.

It opened up new possibilities for raising funds and diversifying funding sources for 90% of the respondents.

The workshop helped 80% of the respondents to refine their strategy for planning and executing successful crowdfunding campaigns.

70%
of the respondents, the session provided guidance on how to connect with potential donors and build trust in their crowdfunding campaigns.

LEADERSHIP SKILLS

95%
of the respondents agreed that they acquired skills and knowledge to run their enterprise.

85%
of the respondents believed that the program was extremely effective in preparing them to deal with sector-specific social issues.

95%
of the respondents mentioned that the program helped them increase the organisation's visibility and outreach.

90%
of the respondents highlighted that it improved their business and social impact model.

85%
of the respondents agreed that it helped them build or strengthen partnerships with other organisations.

03. OECD FRAMEWORK

Relevance | Coherence | Effectiveness | Efficiency | Impact | Sustainability

RELEVANCE

The incubation program effectively addresses the needs of early-stage social entrepreneurs, with a majority of the respondents joining for capacity building, networking, and structured scaling. The program supported enterprises in key social impact sectors such as health, livelihood, education, and inclusive development. Given that a large proportion of the enterprises have been operational for a relatively short duration of time, the program's focus on enterprises in the "build" phase aligns well with its intended impact.

COHERENCE

The program is well aligned with the following Sustainable Development Goals (SDGs):

The program is also coherent with the national agenda for driving change through social enterprises:

- The program also supports the goals of the Start-up India initiative by supporting entrepreneurs and building a robust start-up ecosystem in the social domain.
- It also aligns with the objectives of the Skill India Mission, which fosters the presence of skill development training programmes that help bridge the gap between industry demands and skill requirements.

EFFECTIVENESS

The effectiveness of the program, as evaluated against its key impact indicators, presents notable positive outcomes:

SCOUTING FOR A TARGETED NUMBER (24) OF SOCIAL ENTREPRENEURS

24 NGOs were selected for the incubation support program across 2 cohorts of July 2021 and July 2022 through a rigorous selection process. The rigorous four-stage selection process ensured high-quality participants, with a majority expressing high satisfaction and having excellent clarity on the process. However, the final stage of the project witnessed the presence of one dropout, reducing the number to 23 SEs.

PROGRAM TRAINING & DELIVERY

The implementation team has been able to deliver the program components effectively, as evidenced by the high level of engagement in boot camps and the success of personalised coaching sessions in providing tailored support for financial planning, leadership, and operations. Moreover, the deep insights and tailored mentorship plans resulting from on-site visits have added to the successful output for the participants. A large percentage of the respondents found the growth tracker useful for understanding their organisational strengths in setting clear goals and assessing team capacity, which corroborates the effectiveness of the program.

ACCELERATING THE GROWTH OF ENTREPRENEURS AS EFFECTIVE LEADERS

A majority of the respondents highlighted the major growth of acquired skills and technical knowledge about enterprise growth and operation, and its effectiveness in preparing them to deal with sector-specific social issues. This testifies to the success of the program in impacting the personality of the entrepreneur.

ACCELERATING THE GROWTH OF THE ENTREPRENEURS' IDEAS/VENTURES INTO HIGH-IMPACT AND SUSTAINABLE INITIATIVES ON THE GROUND

The program team's effort of capacity building has led to the improvement in the organisational operations of the entrepreneurs, and all of them concur that it enhanced their management capability. Networking emerged as one of the biggest benefits for these organisations, with a majority of them capitalising on networking systems developed through the program. A significant percentage of them also highlighted that it helped them improve their social impact model.

EFFICIENCY

The program's efficiency was rooted in its structured approach of utilising sectoral networks in scouting for eligible candidates as well as delivering program content. Despite COVID-19 restrictions and a lack of suitable applications, the implementation team was able to search for talented social entrepreneurs and meet the deliverables of the program. Moreover, the improvisation in the duration of the program (from 12 months to 9 months) due to the uncertainty related to overall organisational funding suggests strategic pivots in the program implementation phase. A strong suit of the program delivery included the on-site visits made by the team to the work location of entrepreneurs. This activity informed changes in the mentorship plans, preventing wastage of time and resources.

IMPACT

The incubation program has successfully fostered capacity building, operational improvements, and network expansion. The program also fostered confidence and leadership growth, with a majority of the participants reporting increased clarity in decision-making and strategic planning. While some still faced operational challenges, the structured support system enabled them to navigate early-stage hurdles more effectively. Additionally, the program equipped participants with transferable skills in financial management, fundraising, and stakeholder engagement, strengthening their long-term resilience as social entrepreneurs. Despite initial resource constraints, the program has laid a strong foundation for a thriving social enterprise ecosystem by equipping changemakers with the tools and networks necessary for sustained impact. However, a longitudinal analysis of these social enterprises would help dive deeper into the long-term impact created.

SUSTAINABILITY

The sustainability of the program has been partially ensured by a robust selection process, churning out the most eligible candidates and suggesting a successful outcome of the incubation process. While the implementation team has been able to secure funding to run its incubation program for the past 13 years, securing funding through various donors and impact funding agencies, the sustainability of the program is gravely threatened by the short-term engagement of the program in all its aspects (mentorship and funding). Post-program vulnerabilities can negatively impact enterprises, especially those that have long gestation periods.

CHAPTER 4
INTRODUCTION

FGD with sakhi from UnLtd incubation Tapasya

Social enterprises play a pivotal role in addressing India's most pressing socio-economic needs and challenges. However, early-stage social entrepreneurs face significant barriers that hinder their ability to create scalable and sustainable impact. Many social entrepreneurs, particularly from regional and marginalised backgrounds, lack access to proper mentorship and guidance at the initial stages of their journey, thereby struggling with their inability to refine their ideas, navigate operational challenges, and align their initiatives with long-term sustainability goals.

They also lack the expertise needed to establish proper governance structures, comply with legal requirements, and develop effective business models. Moreover, one of the biggest challenges for early-stage social enterprises is the dearth of access to financial and professional networks. The entrepreneurs require connections to funders, impact investors and peer networks to navigate the complexities of social enterprise management. A social incubation program, therefore, is not just beneficial but essential in India to support grassroots innovation and strengthen the country's social entrepreneurship ecosystem.

OBJECTIVES OF THE PROGRAM

To build the capacity of early-stage social enterprises through personalised mentorship and training.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting its commitment to serving society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelising its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, and animal welfare projects for the sustainable development of the community and the nation.

ABOUT NGO PARTNER SOCIAL ENTREPRENEURS FOUNDATION INDIA

Established in 2007, Social Entrepreneurs Foundation India, also known as UnLtd India, is a social incubator that supports early-stage social entrepreneurs who are dedicated to solving some of India's most pressing social and environmental challenges.

It serves to create a nurturing ecosystem for individuals with innovative ideas, helping them develop sustainable solutions that drive long-term social impact. It operates on the belief that social entrepreneurs are the 'catalysts for social change' who have the capability to create scalable solutions for societal problems.

Based on the model of identifying, incubating, and accelerating social enterprises at their most critical early stages, the organisation helps build the capacities of such entrepreneurs and handholds them in their initial journey. Through its efforts, the organisation has been able to empower 300 social entrepreneurs across diverse sectors, including education, healthcare, environmental sustainability, financial inclusion, and women empowerment. These ventures have, in turn, impacted millions of lives, creating jobs, improving livelihoods, and addressing critical development challenges in both urban and rural India.

TEACHER CONDUCTING CLASSESS FOR HEARING IMPAIRED STUDENTS AT TEACH CENTRE IN MUMBAI

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited assigned SoulAce to conduct a study on the work done by Social Entrepreneurs Foundation India and assess the impact of its CSR initiative in the field of skill-building and mentorship of early-stage social entrepreneurs.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

- To evaluate the immediate impacts of the program implemented and assess the enduring impacts of the program.
- To measure the extent to which the program has contributed to empowering early-stage entrepreneurs with the necessary knowledge and skills.
- To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH

The evaluation adopted a comprehensive mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth exploration of the subjective experiences and viewpoints of key stakeholders, offering a nuanced grasp of their perspectives. Concurrently, quantitative methods facilitated the gathering and analysis of numerical data obtained from the beneficiaries- social entrepreneurs, yielding statistical insights and identifying trends. By employing a mixed methodology approach, the evaluation leveraged the strengths of both qualitative and quantitative techniques, resulting in the collection of robust and diverse data. This holistic approach provided a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted assessment.

APPLICATION OF QUALITATIVE TECHNIQUES

Qualitative methods provide insights into the real-life experiences, viewpoints, and stories of beneficiaries and stakeholders like those responsible for project implementation. Engaging these stakeholders through in-depth interviews and focus group discussions allows for a comprehensive examination of observed changes. These methods facilitate a detailed exploration of improvements in the overall entrepreneurial capabilities of the beneficiaries through the intervention. By capturing the lived realities and narratives of those involved, qualitative approaches offer a nuanced understanding of the project and its impact.

APPLICATION OF QUANTITATIVE TECHNIQUES

Quantitative techniques are employed to evaluate the project and its impact through data analysis objectively. Surveys are utilised to collect numerical data on various indicators from beneficiaries of each program. By comparing the data gathered before and after the intervention, the project, its effects, and the enhancements it has facilitated can be assessed. These quantitative methods provide a measurable approach to gauge the project and outcomes and evaluate its success through statistical evidence.

ENSURING TRIANGULATION

To bolster the reliability and validity of its conclusions, the study implemented various triangulation strategies. Data triangulation was achieved by gathering information from diverse sources, including field notes, interviews with beneficiaries, and feedback from project staff. This extensive data collection process facilitated a comprehensive evaluation of the program and its impact. Additionally, methodological triangulation was employed, utilising a range of research methods such as surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method. Through the implementation of these triangulation techniques, the study ensured a robust and dependable analysis, reinforcing the trustworthiness and credibility of its findings.

KEY STAKEHOLDERS

- Beneficiaries (Social Entrepreneurs)
- Project Implementation Team (Coaches and Project Head)

STUDY TOOLS

Questionnaires for primary beneficiaries

Structured questionnaires were developed, and the project details for each of the focus areas were reviewed. Indicators were pre-defined before conducting the surveys. Stakeholders were identified across the focus areas. Semi-structured questionnaires and focus group discussions were conducted with the project staff.

DESIGN SNAPSHOT

Name of the project

Find, Support and Grow Social Entrepreneurs

Implementing agency

Social Entrepreneurs Foundation India (UnLtd India)

Research design used

Descriptive research design

Sampling technique

Stratified and Purposive sampling

Sample Size

20

Qualitative methods used

Semi-structured interviews and focus group discussions with beneficiaries, along with key stakeholders

ETHICAL CONSIDERATIONS

The impact evaluation research was guided by a strong ethical framework, ensuring that the study was conducted responsibly and ethically. Adhering rigorously to ethical principles of research, the study prioritised the rights and well-being of participants throughout the process. Informed consent was meticulously obtained by providing comprehensive information about the study and objectives, procedures, potential risks, and benefits, allowing participants to make informed decisions about their involvement after having their questions addressed. Robust measures were implemented to uphold confidentiality and privacy, with data securely stored and accessible only to authorised personnel and participant identities protected through anonymisation or coding techniques. Crucially, participation was fully voluntary, free from coercion or pressure, underscoring the importance of autonomy and respect for individual choice. Throughout the study, participants were treated with the utmost respect, dignity, and fairness, with their well-being being the top priority and necessary support or assistance provided whenever needed.

WOMEN SHELTER HOME OF URJA TRUST IN MUMBAI

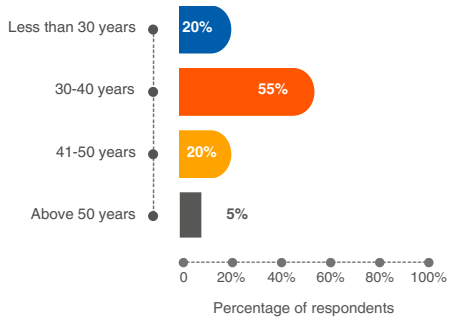
CHAPTER 6
KEY FINDINGS AND IMPACTS

This chapter compiles and analyses data from multiple sources to evaluate the overall impact and effectiveness of the program. It integrates qualitative and quantitative insights gathered through surveys and detailed interactions with stakeholders. Drawing on diverse viewpoints, the chapter provides an in-depth analysis of how well the program has met its intended goals.

The study explored multiple aspects of trainee demographics and past experience while analysing information about their social enterprise to create a comprehensive understanding of their conditions and needs.

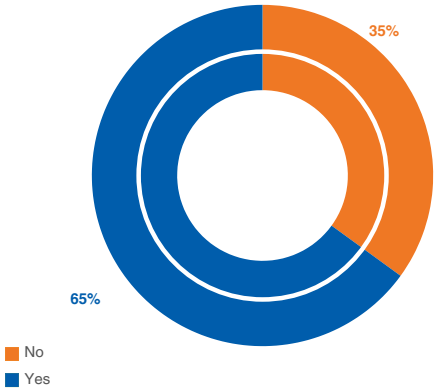
DEMOGRAPHY

CHART 1: AGE GROUP OF THE RESPONDENTS



55% of the respondents belonged to the age group of 30-40 years. Trainees in the age groups of 40-50 years and less than 30 years, formed 20% each of the total respondent base.

CHART 2: PRIOR EXPERIENCE IN BUSINESS OR ENTREPRENEURSHIP



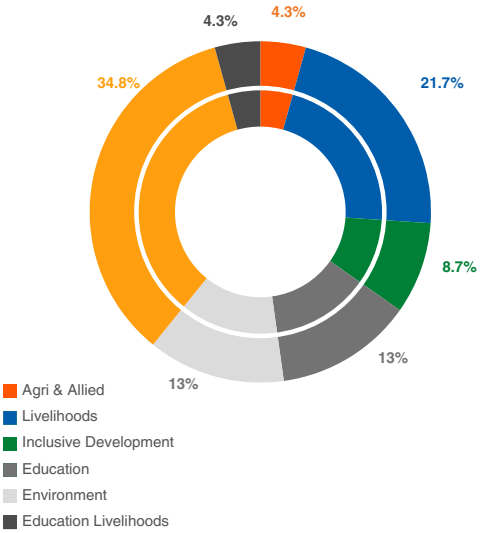
65% of the respondents had previous experience in business or entrepreneurship, as opposed to 35% who did not have any such experience.

Discussions with coaches further highlight the scenario of new joiners. They mentioned that many entrepreneurs initially lacked confidence, struggling with structuring their organisations and articulating their impact.

STUDENTS GETTING COMPUTER EDUCATION AT USF SUPPORTED SCHOOL AT GOVELI

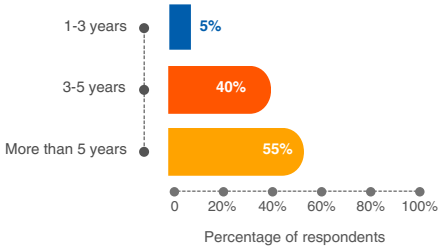
PROFILE OF THE SOCIAL ENTERPRISES

CHART 3: SECTOR-WISE DISTRIBUTION



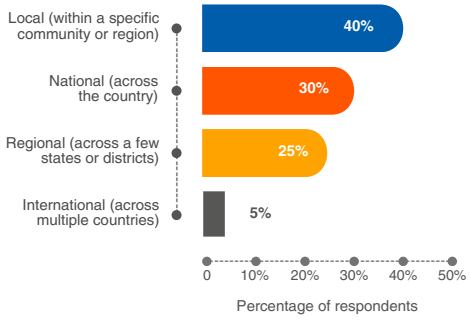
A sectoral assessment of these social enterprises from the program data highlighted that 34.8% of them were engaged in improving health and well-being, while 21.7% of them worked in the livelihood domain. Other domains included education, environment, inclusive development, agriculture and allied activities, and intersections of education and livelihoods.

CHART 4: DURATION OF ENTERPRISE OPERATIONS



More than half (55%) of the Enterprises were operational for more than 5 years, while 40% of them have been operational for 3-5 years. This data supports the conclusion that the program primarily targeted early-stage entrepreneurs.

CHART 5: SCALE OF ENTERPRISE OPERATIONS

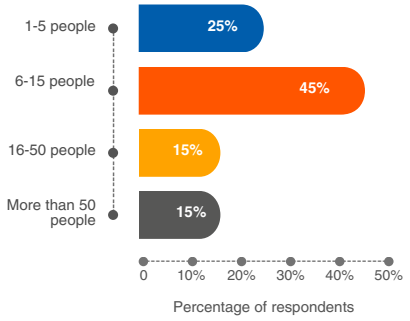


40%

of the social enterprises were local, working within a specific community or region, while 30% were operational on a pan-India basis. 25% of them were multi-regional, while only 5% of them had an international presence.

UNLTD INCUBATION TAPASYA CO FOUNDER TAPAS SUTRADHAR

CHART 6: NUMBER OF EMPLOYEES IN THE ORGANISATION



45%

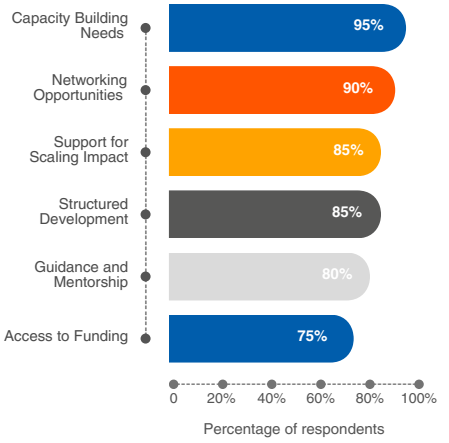
of the enterprises were small-sized with only 6-15 employees, while 25% of them were micro-enterprises with a workforce of 1-5 employees. 15% of these enterprises were moderately sized with 16-50 employees, while an equal percentage of them were large organisations with more than 50 employees.

Interviews with the beneficiaries also highlighted that a large share of these enterprises were in their 'building' phase, focused on working out sustainable solutions and impact creation as opposed to expansion of operations. This aligns with the program data, which mentions that the program supported 21 social enterprises at the Build stage and 3 at the Grow Stage.

> "The initiative was more than just financial assistance—it was about building capacities, providing mentorship, and fostering an ecosystem where innovation and resilience could thrive."
>
> **Anshu Bhatia, Ex-Program Lead/CEO, UnLtd India**

As suggested by Ms. Anshu Bhatia, entrepreneurs found various factors which encouraged them to apply for the program.

CHART 7: MOTIVATION FOR JOINING THE PROGRAM



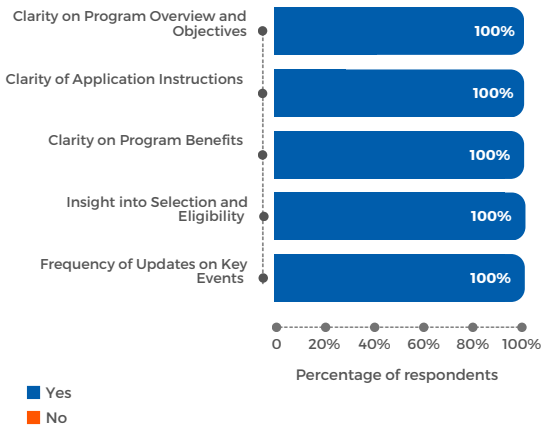
Motivational Factors: 95% of the respondents mentioned the desire for capacity building as the foremost motivating factor for joining the incubator program. 90% of them were drawn by the program's scope for building networks, followed by 85% of them wanting to support their scaling process and structured development. Mentorship and access to funding were also sources of encouragement.

MOBILISATION AND OUTREACH

The program leveraged strong multi-stakeholder partnerships to enhance its mobilisation and outreach efforts. Organisations that worked on sustainable development goals, academic institutions and other non-profit organisations played a key role in spreading awareness and facilitating the scouting of motivated participants. Alongside, the alumni network of the organisation was also tapped to get referrals. Most importantly, online and offline marketing was effectively used to attract applications.

When the respondents were asked about the effectiveness of these outreach campaigns, it was found that all of them shared similar sentiments about the process.

CHART 8: EFFECTIVENESS OF SOCIAL MEDIA CAMPAIGNS AND EMAILERS IN COMMUNICATING PROGRAM DETAILS AND UPDATES

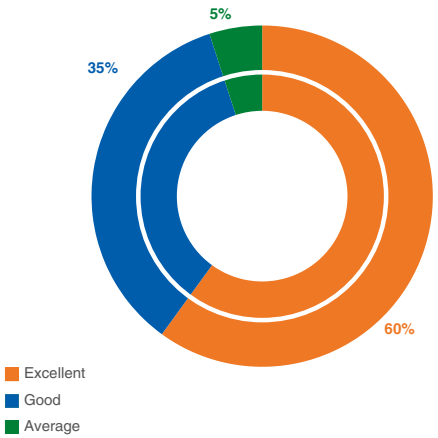


All the respondents unanimously felt that the campaigns provided sufficient updates about key events, gave insights into selection and eligibility criteria for the program, clearly highlighted program benefits, provided clear instructions for application and delivered a comprehensive overview of program objectives and scope.

SELECTION AND INDUCTION OF CANDIDATES

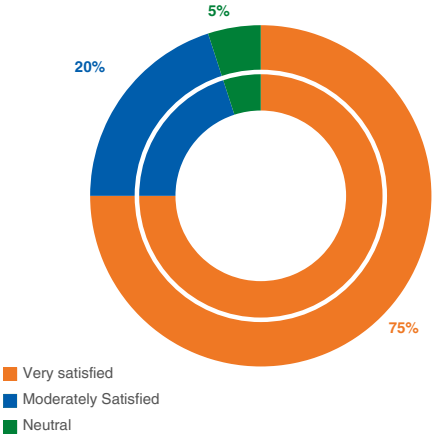
The selection phase of the program comprised 4 stages of selection, namely: review, screening, mock pitches (only for Grow SEs), and final panels.

CHART 9: CLARITY OF THE SELECTION PROCESS



60%
of the respondents had excellent clarity about the process of application, review, and interview.

CHART 10: SATISFACTION WITH THE SELECTION PROCESS FOR THE INCUBATION PROGRAM



75%
of them were very satisfied with the process, while 20% of them were moderately satisfied.

Discussion with the implementation team highlighted that the selection process was rigorous and multi-stage, including application screening, interviews, and final panel reviews. Only a few candidates were shortlisted out of a plethora of applications based on the four key criteria: 'Idea', 'Impact', 'Individual', and 'Incubability.' The presence of external panellists from the supporting organisation (Bajaj Auto Limited) and representatives from various sectors ruled out the possibility of any bias and ensured diversity. They also underscored that a major challenge was ensuring applications from rural entrepreneurs were complete and met the criteria.

APPLICANT ACCEPTANCE RATE & SELECTION CRITERIA

An analysis of the organisational documents shows that a total of 473 applications (279 applications for the 2021 cohort and 194 applications for the 2022 cohort) were received from 23 states of the country. Out of these, 10 applications were shortlisted for the 2021 cohort,while 22 applications were shortlisted for the 2022 cohort, which proves that the overall acceptance rate is 6.8%, much below than the selective acceptance rate of 10% considered as a benchmark for successful social incubation in Asia, as per the AVPN study. For incubators, careful selection means being able to focus limited resources on the strongest business models. The more selective an incubator is when choosing new organisations, the more positive is the incubatees' experience when accessing follow-on funding, for instance, in the form of venture capital.

However, the project only supported 24 out of 32 selected social enterprises.

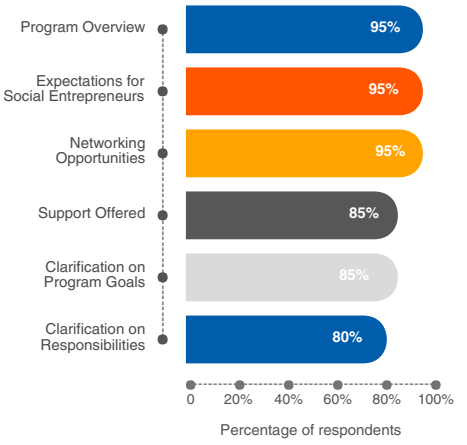
As per the study, Idea and Prototype (early-stage) incubators consistently showed that these three selection criteria were of significant value.

1. Ambition for social impact
2. Commitment to meet an unmet social need
3. Potential to benefit from incubation

Among the three, commitment to meeting an unmet social need and the potential to benefit from incubation tended to be given greater emphasis. The present program's focus on idea, impact, and incubation during the selection process aligns with these three elements. The selection criteria are not just critical to align the incubator with the incubatee, but also in later attracting investors to an incubator and providing follow-on funding for the incubatees.

These candidates attended a one-day virtual induction workshop.

CHART 11: IMPACT OF THE 1-DAY VIRTUAL INDUCTION WORKSHOP ON SETTING EXPECTATIONS FOR THE INCUBATION PERIOD



95%

of the respondents felt that it provided a clear program overview, set expectations, and provided networking opportunities. 85% of them came to know more about the support offered by the program and its overarching goals. 80% of the respondents got clarity on their responsibilities.

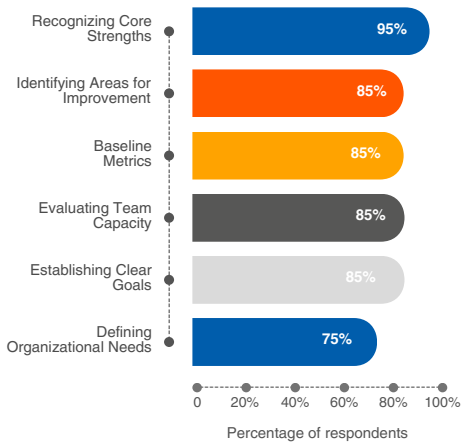
MONITORING & EVALUATION

The organisational growth tracker is a monitoring tool incorporated within the program design to map the progress of social entrepreneurs. Divided into multiple aspects, the form covers assessment questions related to the following markers:

Organisational Development Areas	Leadership Development Areas
Vision & Mission	Communications & Networking
Product & Services	Resilience
Value Chain	Entrepreneurial Growth
Budget	People Management
Standard Operating Processes	
MEL Framework	
People & HR	
Marketing & Communications	
Fundraising	
Legal & Governance	

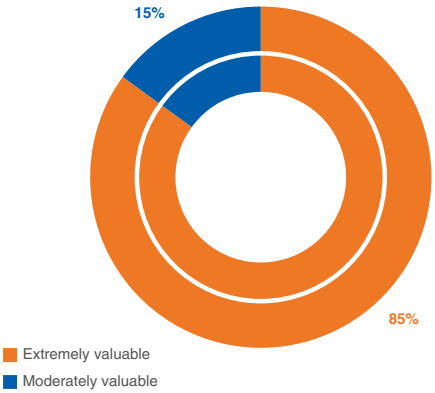
HAMARI SILAI FOUNDATION CENTRE

CHART 12:INSIGHTS FROM GROWTH TRACKER ON ORGANISATIONAL STARTING POINT



Benefits of Baseline Self-Assessment: 95% of the respondents felt that the tracker helped them to understand their organisational strengths, while 85% of them believed that it helped them identify areas of improvement, gauge baseline metrics, evaluate team capacity and set clear organisational and personal goals. It also clarified organisational needs for 75% of them.

CHART 13: SELF-ASSESSMENT INSIGHTS ON ORGANISATIONAL READINESS



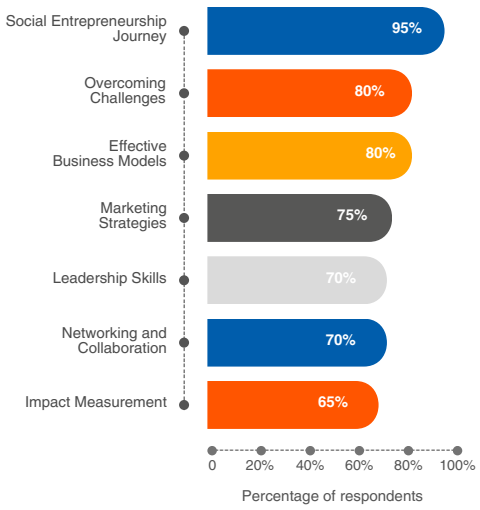
85%
of the respondents viewed the self-assessment as an extremely valuable exercise which provided them crucial insights into understanding their organisation's starting point.

WOMEN LEARNING TAILORING AT HAMARI SILAI FOUNDATION CENTRE IN MUMBAI

TRAINING/MENTORSHIP ACTIVITIES AND THEIR EFFECTIVENESS

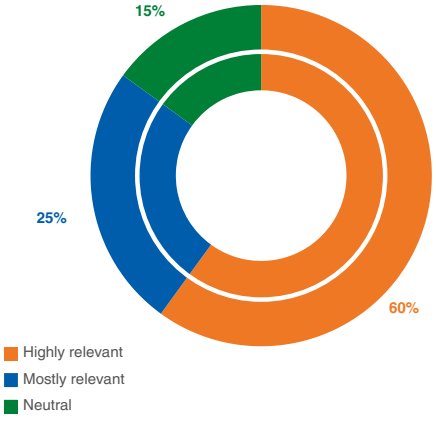
1. RESIDENTIAL WORKSHOP: A 3-DAY UI-BOOTUP RESIDENTIAL WORKSHOP WAS ORGANISED FOR THE COHORTS IN THE PRESENCE OF DISTINGUISHED SPEAKERS FROM THE DEVELOPMENT SECTOR.

CHART 14: TOPICS COVERED IN THE 3-DAY UI BOOTUP RESIDENTIAL WORKSHOP



Topics Covered: The boot camp covered sector-related topics like social entrepreneurship journey, overcoming challenges, effective business models, marketing strategies, leadership skills and networking.

CHART 15: RELEVANCE OF TOPICS COVERED IN THE 3-DAY UI BOOTUP RESIDENTIAL WORKSHOP



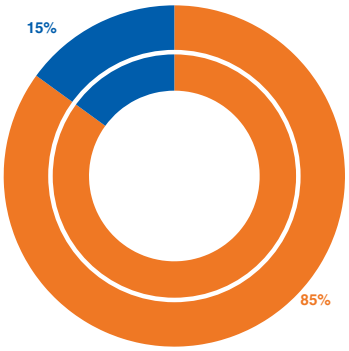
Perceived Relevance: 60% of the respondents felt that the topics were highly relevant, while 25% of them thought it to be mostly relevant.

For the August 2022 cohort, Mr. Tarun Cherukuri, Founder of Indus Action, was called as the expert speaker. He candidly shared his experience and learnings on his start-up journey, as well as his highs and lows, challenges, and how he overcame them.

2. BOOTUP UNLTD

The program spanned 12 structured weeks of capacity building, typically comprising 10 webinars, group mentoring sessions, assignments, and interactive discussions with coaches and mentors across 9 key topics.

CHART 16: LEVEL OF ENGAGEMENT IN WEBINARS AND GROUP MENTORING SESSIONS



Highly engaging
Somewhat engaging

Level of Engagement: 85% of the respondents felt that the webinars and group mentoring sessions were highly engaging.

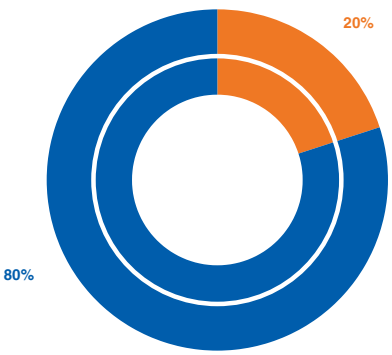
The research team, through their interactions with coaches, also found that the entrepreneurs were highly engaged in the program. Topics such as structured thinking were the most beneficial, particularly in leadership development and business strategy. Webinars and group mentoring sessions were interactive, and entrepreneurs actively participated in discussions, sharing their challenges and learning from peers.

TEACH CENTRE

3. ON-SITE VISITS

The implementation team made visits to the working locations of the selected entrepreneurs and interacted with the stakeholders of the organisations.

CHART 17: EFFECTIVENESS OF SITE VISITS BY UNLTD INDIA TEAM IN PROVIDING ON-GROUND INSIGHTS



Moderately helpful
Extremely helpful

Perceived Effectiveness: 80% of the respondents felt that the site visits were extremely helpful in providing on-ground insights to the implementation team members. This eventually led to a better understanding of ground realities for the coaches.

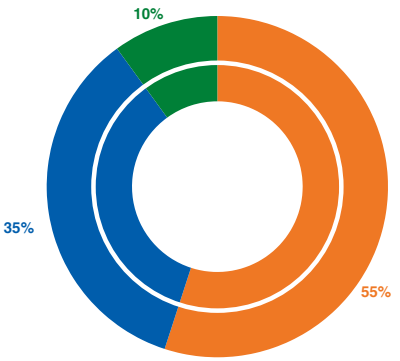
Discussions with the implementation team and coaches revealed that each entrepreneur was visited twice during the program. These visits helped coaches gain deeper insights into the real challenges faced by entrepreneurs and refine their mentorship strategies. Seeing operations first-hand resulted in better problem-solving and strengthening of the entrepreneur-coach relationship.

> “These visits provided deeper insights into their work and challenges. Site visits helped refine their strategies and align them with their impact goals.”
>
> **Dilip Jain, Coach**

4. FUNDRAISING WORKSHOP

A workshop on crowdfunding was conducted in partnership with Milaap, where information was shared on the best practices in crowdfunding, the ways of making it effective, and the features of its recently launched Milaap 360 platform.

CHART 18: EFFECTIVENESS OF CROWDFUNDING WORKSHOP IN PARTNERSHIP WITH MILAAP



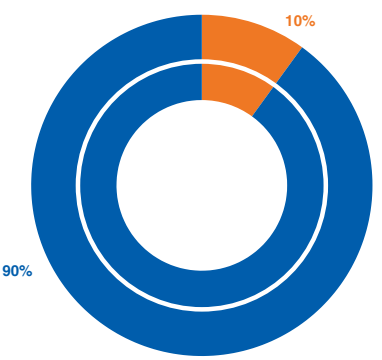
Extremely useful
Moderately useful
Slightly useful

Perceived Effectiveness: 55% of the respondents found the workshop extremely useful, while 35% of them found it moderately useful.

5. PERSONALISED COACHING

One-on-one coaching calls with coaches assigned to a Social Entrepreneur for the tenure of the program were a continuous activity conducted through the 9 months of support.

CHART 19: EFFECTIVENESS OF ONE-ON-ONE COACHING CALLS IN ADDRESSING SPECIFIC CHALLENGES



Somewhat Effective
Highly Effective

Perceived Effectiveness: 90% of the respondents felt that the one-on-one coaching calls were highly effective in addressing specific challenges.

Interviews with coaches highlight that they adopted a personalised approach for supporting each entrepreneur, which involved understanding their specific goals and the context of their work and tailoring mentorship to address these needs. For example, some needed help with financial planning, while others focused more on team building and leadership. They also revealed that some entrepreneurs initially struggled with the academic nature of the assignments, but through encouragement and one-on-one guidance, they began to understand the importance of these tasks in enhancing their organisational capabilities.

> Social Entrepreneurs actively participated in webinars, group mentoring sessions, and assignments. They were eager to learn and share their experiences, which fostered a collaborative learning environment.
>
> **Amitabh Vyas, Coach**

> The mentorship sessions covered strategic planning, leadership development, impact measurement, financial sustainability, and stakeholder engagement. Entrepreneurs demonstrated varying levels of grasp and application. While some leveraged the program to build upon existing work, others experienced pivotal changes in their approach.
>
> **Aparna, Coach**

ROADBLOCKS IN THE IMPLEMENTATION PROCESS

While most of the program activities were conducted adhering to pre-planned timelines, the implementation team faced numerous challenges in ensuring the sustainability of operations. The organisation's pending FCRA approval and the uncertainty induced by pandemic restrictions posed as major roadblocks in the program. However, strategic steps were taken to mitigate the negative impact of these situations.

Through an interview with the ex-program lead, Ms. Anshu Bhatia, the Impact assessment team found that to meet these challenges, the team decided to move to a virtual format, onboarded industry veterans as external coaches and refined their approach to training social entrepreneurs. While the curriculum remained comprehensive, covering everything from entrepreneurial mindset development to impact measurement and compliance, some batches even received advanced training in HR and communication.

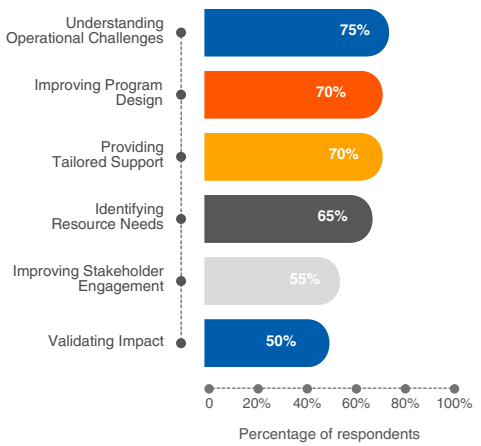
STUDENTS LEARNING COMPUTER EDUCATION AT TEACH CENTRE

KEY IMPACTS

ORGANISATIONAL DEVELOPMENT

ACTIVITY-LED IMPACT- SITE VISITS

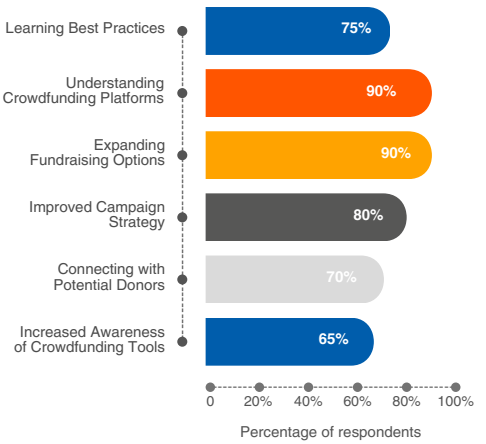
CHART 20: IMPACT OF SITE VISITS BY UNLTD INDIA TEAM IN PROVIDING ON-GROUND INSIGHTS



- **Understanding Operational Challenges:** For 75% of the respondents, the site visits helped the respondents of the implementation team to identify the day-to-day operational challenges faced by their organisation.
- **Improving Program Design:** The insights gained during the visits helped 70% of respondents to improve their program design and delivery to better meet their community's needs.
- **Providing Tailored Support:** The site visits facilitated more targeted and specific support from the program implementation team based on our on-ground realities in 70% of the cases.
- **Identifying Resource Needs:** The visits allowed the respondents of the program implementation team to assess the enterprise's resource needs and accordingly provide guidance to 65% of the respondents.
- **Improving Stakeholder Engagement:** According to 55% of them, the visits provided insights into better engaging with the stakeholders and strengthening relationships.
- **Validating Impact:** The visits helped 50% of the respondents validate the impact of their work in the community, ensuring that they were on the right track to achieving the goals.

ACTIVITY-LED IMPACT- CROWDFUNDING WORKSHOP

CHART 21: HELPFULNESS OF THE CROWDFUNDING WORKSHOP CONDUCTED WITH MILAAP



- **Learning Best Practices:** 75% of the respondents reported that the workshop provided useful insights into best practices for running effective crowdfunding campaigns.
- **Understanding Crowdfunding Platforms:** The session helped 90% of the respondents understand the features and functionalities of crowdfunding platforms, specifically Milaap 360.
- **Expanding Fundraising Options:** It opened up new possibilities for raising funds and diversifying funding sources for 90% of the respondents.
- **Improved Campaign Strategy:** The workshop helped 80% of the respondents to refine their strategy for planning and executing successful crowdfunding campaigns.
- **Connecting with Potential Donors:** For 70% of the respondents, the session provided guidance on how to connect with potential donors and build trust in their crowdfunding campaigns.
- **Increased Awareness of Crowdfunding Tools:** It made 65% of them aware of various tools and techniques of crowdfunding.

The organisational data report highlights the overachievement of the target- '70% of portfolio organisations will report improvement in at least 2 organisational development areas', an impact finding which is further reiterated through the impact assessment survey.

During the impact assessment team's interaction with coaches, they revealed that entrepreneurs demonstrated significant improvements in structuring their organisations, securing funding, and developing governance frameworks. They also emphasised that those who engaged more deeply with the mentorship process saw greater success in implementing sustainable strategies.

PROGRAM-LED OVERALL IMPACT

CHART 22: IMPACT OF THE PROGRAM ON ORGANISATIONAL OPERATIONS, GOALS, CLARITY, AND MANAGEMENT CAPACITY

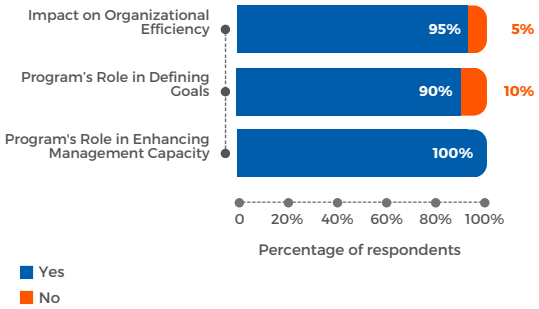
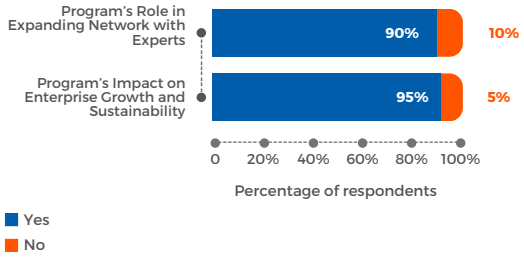


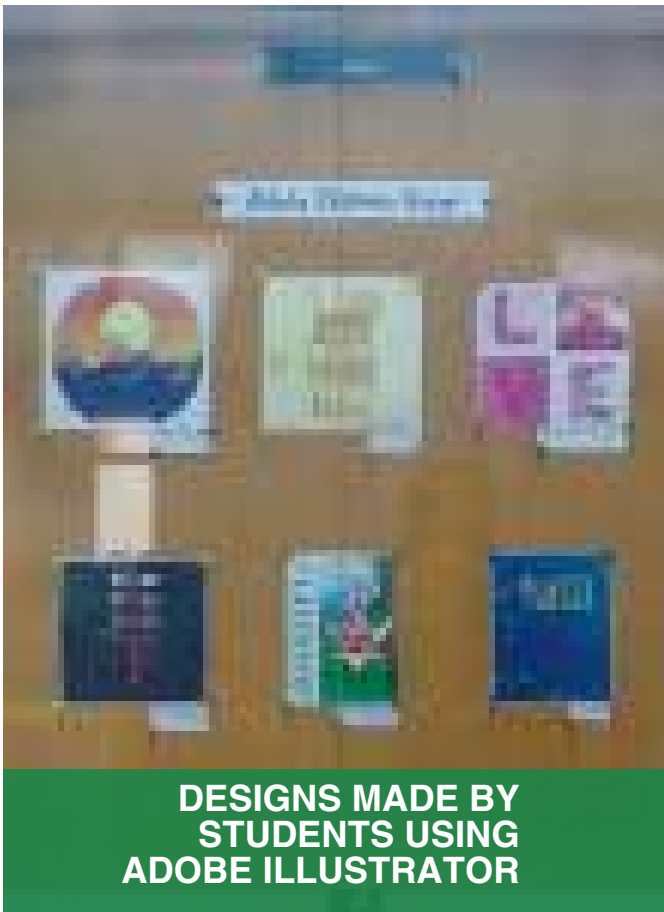
CHART 23: PROGRAM IMPACT ON NETWORKING OPPORTUNITIES AND SOCIAL ENTERPRISE SUSTAINABILITY



- **Management Capacity:** All the respondents agreed that program participation enhanced their capability to manage their organisational work and people.
- **Operations:** 95% of the respondents reported that the program helped them to improve organisational operations.
- **Goal Setting:** 90% of them reported that it provided clarity in figuring out the goals and objectives of their organisation.
- **Sustainability:** 95% of the respondents reported that the program had a positive impact on their organisation's sustainability and growth.
- **Networking:** 90% of the respondents believe that it expanded their networks with social entrepreneurs and industry experts.

According to the AVPN study on Effective Social Incubation (Insights from Asia), network development was ranked as the highest benefit of joining an incubation program, followed by access and connections to investors/funders and securing direct venture funding. 90% of the entrepreneurs have been able to realise the benefits of networking with other stakeholders, while 70% of them could connect with potential donors due to the guidance of the program.

> "Significant improvements have been observed in financial management, compliance, and impact tracking. Entrepreneurs now focus on key metrics, implement structured processes, and are more disciplined in tracking their progress. They are also more strategic in hiring and team management."
>
> **Dilip Jain, Coach**



CASE STUDY

Mohan Rathod, a resident of Ambedkar Nagar, Colaba, witnessed first-hand the struggles of marginalised women in his community. The lack of livelihood opportunities for women folk, resulting in financial dependence and social limitations, was a stark reality for him during his childhood. While working with an NGO focused on children's education and sports, Mohan realised that no organisation was addressing the economic empowerment of women in his locality. Mohan, along with other like-minded individuals, founded the Hamari Silai Foundation in 2020. The organisation was established with the core objective of empowering women by providing them with livelihood opportunities through skill development in tailoring.

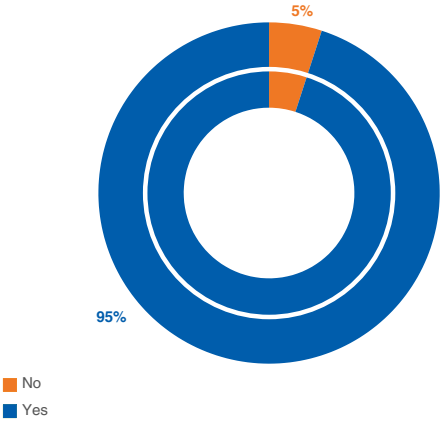
In 2021, he joined the Unlimited India Incubation Program, which proved instrumental in strengthening the foundation's operations. The program helped him in areas such as organisational management, fundraising, scaling up, and strategic planning, providing the much-needed guidance to expand the initiative.

With structured training and support, the Hamari Silai Foundation grew rapidly, training 125 women in tailoring. The foundation not only provides skill training but also assists in job placements, ensuring that women can achieve economic independence.

At present, the Hamari Silai Foundation operates in Mumbai and Yadgir, Karnataka, empowering women both economically and socially. The organisation aspires to expand its reach to more locations in the future, creating sustainable livelihood opportunities for women from marginalised communities.

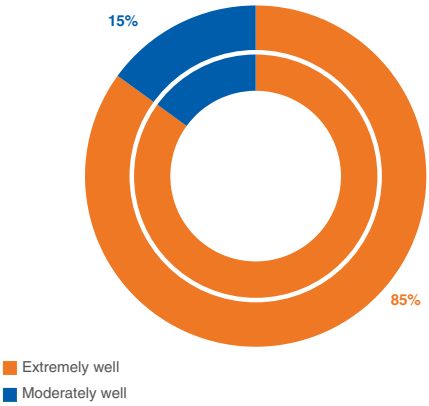
LEADERSHIP DEVELOPMENT

CHART 24: ACQUISITION OF VALUABLE SKILLS AND KNOWLEDGE FOR ENTERPRISE APPLICATION



Acquisition of Skills: 95% of the respondents agreed that they acquired skills and knowledge to run their enterprise.

CHART 25: PROGRAM EFFECTIVENESS IN PREPARING PARTICIPANTS TO ADDRESS SECTOR-SPECIFIC SOCIAL ISSUES



Sector Preparedness: 85% of the respondents believed that the program was extremely effective in preparing them to deal with sector-specific social issues.

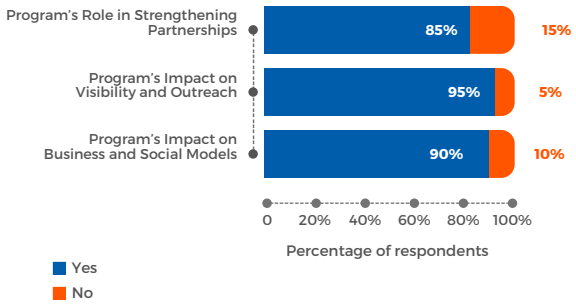
Leadership Development: As evident through the study, this impact testifies to the overachievement of the 70% target of reported improvement in at least 1 Leadership Development area.

> "The program helped me in running the NGO properly, networking with similar organisations and other sector players and raising funds. The personal level coaching helped in honing my leadership abilities."
>
> **Aman Sharma, TEACH, 2021 Cohort**

A similar visible impact was reiterated by the coaches, who confirmed that post-program, the entrepreneurs have developed a stronger leadership mindset. They have now started to think like CEOs, focusing on long-term planning, organisational structure, and stakeholder engagement. Their confidence has increased significantly, and they are more effective in communicating their vision and impact.

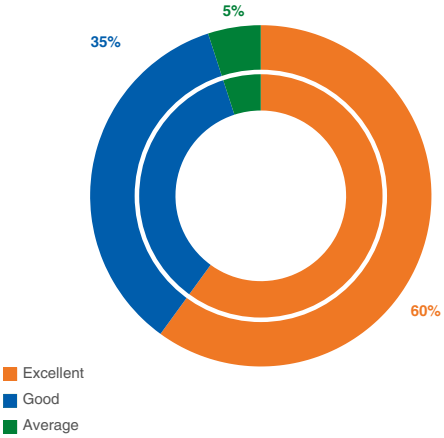
HAMARI SILAI FOUNDATION BUILDING AT COLABA, MUMBAI

CHART 26: PROGRAM IMPACT ON BUILDING PARTNERSHIPS, INCREASING VISIBILITY AND ENHANCING BUSINESS AND SOCIAL IMPACT MODELS



- **Partnership building:** 85% of the respondents agreed that it helped them build or strengthen partnerships with other organisations.
- **Branding and Visibility:** 95% of the respondents mentioned that the program helped them increase the organisation's visibility and outreach.
- **Business model:** 90% of the respondents highlighted that it improved their business and social impact model.

CHART 27: OVERALL SUPPORT ASSESSMENT OF THE UNLTD INDIA INCUBATION PROGRAM



Overall Support Assessment: 60% of the respondents mentioned that the program provided excellent support to them, while 35% of them mentioned that the support was good enough for them. This further corroborates the achieved objective of soliciting a highly satisfactory or satisfactory rating from 80% of the entrepreneurs at the end of 9 months of incubation support.

> "The program helped us to build a deeper understanding of the social problems that we were dealing with and also supported us in acquiring knowledge and building connections. I was a part of the 2021 cohort, and I learned various skills which helped me in the growth and expansion of the organisation."
>
> **Deepali Vandana, URJA Trust, Cohort 2021**

BOARD AT TEACH CENTRE

IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- **Capacity Building & Mentorship:** The program has helped social entrepreneurs gain the necessary means of enhancing skills by providing them with a structured approach to learning, along with one-on-one mentorship. The tools used in the program enabled entrepreneurs to gain real-world insights.
- **Leadership & Strategic Growth:** Through training and self-assessments, the program has led to leadership development, helping social entrepreneurs refine business models, improve resilience, raise funds, and enhance networking.
- **Entrepreneurial Development:** Through networking and expert sessions, entrepreneurs gained critical perspectives on scaling social enterprises.
- **Motivation & Long-Term Vision:** The support system built by the program fostered innovation and resilience, as noted by former program lead Anshu Bhatia, ensuring that entrepreneurs continued to stay committed to their missions.

COMMUNITY LEVEL

- **Improved Access to Services:** With its focus on a range of social issues, these social enterprises work towards filling service gaps in marginalised communities.
- **Community Development:** Social entrepreneurs reinvest in their communities by creating employment opportunities for local community members and developing infrastructure in the area.

STATE LEVEL

- **Innovation and Sustainable Development:** Social enterprises drive innovation in various sectors like healthcare and education, aligning with the State's development goals.
- **Reduction in Poverty and Inequality:** By training entrepreneurs who further work to support marginalised communities, the program has helped to reduce social inequality and bridge economic disparities.

CHAPTER 7
RECOMMENDATIONS

STRENGTHENING RURAL OUTREACH

Positive discriminatory practices for rural enterprises, including providing additional support through pre-application sessions, can increase penetration in rural areas, enhancing the scope of impact.

POST-PROGRAM MENTORSHIP

Extending the coaching sessions for a particular period beyond the duration of the program can mitigate the vulnerability levels of these early-stage enterprises.

SECTOR-FOCUSED TRAINING

As suggested by the coaches, a deep dive into the advanced topics from healthcare, education, and environmental sustainability domains can add value to the learning process.

GREATER FOCUS ON NETWORKING

Expanding opportunities for entrepreneurs to connect with potential partners and investors would enhance their growth potential.

LONGITUDINAL ANALYSIS OF IMPACT

Conduct evaluations post 2 to 3 years of incubation to measure long-term impact and offer additional support where necessary. This assessment method can be further strengthened by using control group comparisons.

CHAPTER 8
SUSTAINABILITY

The 'Find, Support and Grow Social Entrepreneurs' program has provided training, mentorship, and networking opportunities to several aspiring social entrepreneurs. This note delves into the key components of the program that promote its sustainability, using the findings of the impact assessment to substantiate how the activities have contributed to the long-term viability of the enterprises and the program itself.

RIGOROUS SELECTION PROCESS

The low acceptance rate of 6.8% suggests that the selection process effectively filters candidates with high potential. This rigour helps to focus on a few more capable entrepreneurs, enhancing the program's ability to provide targeted support to those with the highest chance of success.

SECTOR-AGNOSTIC SELECTION

The program's sector-agnostic invitation for applications ensures a diverse group of social entrepreneurs, increasing the scope for cross-sectoral learning and collaboration towards solving social problems.

While the program helps its participants to develop leadership qualities and paves the path for long-term organisational development, challenges related to the short-term nature of the program's engagement and the potential vulnerability of enterprises with long gestation periods must be addressed to ensure continued success.

CHAPTER 9
CONCLUSION

The *Find, Support and Grow Social Entrepreneurs* program was designed to help social enterprises achieve operational adequacy through organisational and leadership development. The program offered personalised training and mentorship to early-stage entrepreneurs, which has created a significant impact on the overall journey of these enterprises. The participants have been equipped with technical knowledge and leadership skills, which will continue to foster the growth of these enterprises in the long run. While customised learning, expert sessions and real-time support remain to be the programmatic strengths, the aspect of sustainability can be further strengthened. Overall, the project has been able to create a positive impact on the social entrepreneurship ecosystem through its multiple modes of intervention.

IMPACT ASSESSMENT REPORT

YOJAK: A STEM EDUCATION SUPPORT PROGRAM FOR STUDENTS – SPECIALLY FOCUSING ON GIRL CHILD, TRIBAL & MIGRANTS

Implementing partner – Youth Organization for Joining Action & Knowledge (YOJAK)

Release Date: 31-03-2025

SoulAce

SOULACE CONSULTING PVT. LTD.

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01. ABBREVIATIONS

BAL	Bajaj Auto Limited
CSR	Corporate Social Responsibility
FGD	Focus Group Discussion
FY	Financial Year
MIS	Management Information System
NEP	National Education Policy
NGO	Non-Governmental Organisation
PCMC	Pimpri Chinchwad Municipal Corporation
POSH	Prevention of Sexual Harassment
POCSO	Protection of Children from Sexual Offences
SDGs	Sustainable Development Goals
STEM	Science, Technology, Engineering, and Mathematics
YOJAK	Youth Organization for Joining Action & Knowledge

02. EXECUTIVE SUMMARY

PROJECT BACKGROUND

YOJAK, the Youth Organization for Joining, Action & Knowledge, is a registered non-governmental organisation (NGO) dedicated to fostering positive transformations in both human and environmental well-being; collaborated with Bajaj Auto Limited (BAL) and launched their STEM support and learning initiative aimed at improving the access of students from marginalised groups such as girls, tribal communities, and children of migrant workers; to support and assist them towards pursuing STEM education and pursue a career with Engineering, Computing and or Robotics. The program, with the support of BAL CSR, was implemented across seven learning community-based centres and five in-school-centres, across a total of 12 sites (six cluster and six sub centres) in the Pimpri Chinchwad Municipal Corporation (PCMC) civic administrative area and the Khed block of Pune district, Maharashtra. The project, through its initiatives, helped and supported the transformation of students from grades 8 to 12 through its STEM support program and successful career transformations.

The program fulfilled its objective through two unique modes of delivery to ensure the address outreach of all community members, thereby ensuring meeting the needs of the beneficiaries living in the catchment areas (designated), thereby providing them with the much-required STEM support, scholarships, counselling and career guidance towards successfully securing a seat in the professional courses aimed at. The main and widely used mode of the program implementation focused on centre-based delivery of the various activities and support provided to student-beneficiaries in the communities, while the other leveraged the in-school modality to deliver the STEM-based support to the students within the school in the catchment area itself, thus ensuring maximum coverage of all beneficiaries who were thus able to leverage the benefits offered by the program by enrolling themselves in the program. This aptitude aligns with the larger social development inclusivity-based philosophy of 'No one left behind'.

In order to ensure effective access to all student-beneficiaries in the area, parent-community gatekeeper counsellings, community visits, engagements and support were also provided by the project design and implementation, thus ensuring that parents and decision-makers in the community were entrenched and involved. This also ensured that the implementation strategy got an innate buy-in as well as community-intrinsic support, which is essential and fundamental to sustainability and scalability. Each of these two models has a collective objective of ensuring and providing STEM support to the students while ensuring a holistic growth approach to making them better humans and professionals of tomorrow.

The main goal of the STEM learning centres is to nurture bright young minds from vulnerable backgrounds by providing accessible platforms that help students develop the skills and support needed to pursue careers in STEM fields. The learning centres are also designed to support disadvantaged students by offering academic remedial classes, experiential learning (particularly in STEM subjects), social support, and need-based financial assistance. The school-based intervention focussed on providing underprivileged students with access to quality STEM education, equipping them with the tools, labs, etc., they required to excel in STEM subjects.

The initiative offered a comprehensive approach, including experiential learning, social support, and financial assistance, to foster the overall development of students. As a result, students showed improved academic performance in STEM subjects and gained increased confidence in pursuing careers in Science and Technology.

PROJECT DETAILS

Implementation year

FY 2022 - 23

Assessment year

FY 2024 - 25

Implementing Partner

Youth Organization for Joining Action & Knowledge (YOJAK)

Project locations

Pimpri Chinchwad Municipal Corporation (PCMC) and the Khed block of Pune district, Maharashtra

Total number of beneficiaries across the project through BAL Grant/ funding

1,200

Project Budget

₹216 Lakhs

Alignment with SDGs

The program also reflected strong coherence with national initiatives:

- Beti Bachao Beti Padhao
- STEM (Science, Technology, Engineering, and Mathematics) education
- National Education Policy (NPE)
- POSH (Prevention of Sexual Harassment
- POCSO (Protection of Children from Sexual Offences)

PROJECT ACTIVITIES

Capacity-building workshops for teachers conducted to further enhance their teaching skills, thus further optimise effective student engagement.

Conducting hands-on experiments and practical learning experiences to improve conceptual understanding.

Conducting educational field visits to industries, research centres, and science exhibitions for students to help increase their understanding of the future scope of work given STEM-based career pathways.

Financial assistance for students from disadvantaged backgrounds.

Conducting regular parent-teacher and community-stakeholder meetings to ensure active and collective participation and support in the students' education.

Facilitating career and psychological counselling and providing continuous support to students, parents and community members to ensure program efficiency and the successful implementation of the objective.

Key Findings of the project and Impact on beneficiary population

Sample Size - 300

Component/ Area of work	Indicators	Findings and Outcomes (Sample Size 'N' = 300 students)	Impacts
Career prospects with STEM	Career Counselling and Aptitude Tests	• 80% of the respondents participated in aptitude tests. • 86.6% of the respondents attended career counselling sessions.	• 71.2% of the respondents enrolled in STEM courses after 10th grade. • 92.3% of the beneficiaries experienced a positive impact through the counselling sessions, which helped them in decision making, choosing and pursuing STEM/ science. • 61% of the students in the 10th-grade chose science within 8 months of the project's academic interventions, making the transition to pursue and focus on STEM easier and seamless. • 97.3% said they were confident and able to choose and pursue Science as a stream, post the education counselling sessions given to the students. • 100% 12th-grade pass-outs who had enrolled in the program chose Science, Technical, Vocational, or Engineering fields. • 82.4% of the respondents said that the career counselling sessions conducted helped them make clear and informed choices in their pursuits of career.
Exposure visits and participation	Participation in exposure visits and science exhibitions	• 19.3% of the respondents attended the India Science Festival 2024. • The organisation's data shows that 571 students participated in the Science Park visit. • 415 students participated in the Muktangan visit. • 103 students participated in the RRBCEA visit.	• 61.6% of the respondents who had attended and participated in the exposure visits, reported an increased interest in science after the visit. They also said their their thought process was positively influenced and it gave them the clarity needed for making career-related decisions.
Summer/ Winter Camps	Participation in Camps	• 40.7% of the surveyed attended the summer and / or winter camps. • 77.9% of those who attended the camps said that they had participated and enjoyed drawing activities. • 67.2% of the respondents participated in dancing activities. • 61.5% participated in arts and craft activities	• 82.8% of the respondents said they had a memorable experience at the camp. • 61.5% of the respondents mentioned that the camp activities helped them develop confidence • 50.8% of respondents said that the camps helped them overcome their fears of going out of the house alone and communities to attend overnight camps. • 64.7% of the respondents felt that the extra-curricular activities that they participated in significantly added value to their overall persona and confidence development.

Component/ Area of work	Indicators	Findings and Outcomes (Sample Size 'N' = 300 students)	Impacts
Participation in competitive exams	Participation o f the students in competitive exams	• 35.7% of the beneficiary students had participated in at least one competitive exam or another. • 29.9% of those who participated in these exams qualified successfully.	• 71% of the respondents said they experienced an increase in their confidence and a boost in their competitive abilities after attending the sessions conducted to improve confidence and techniques to participate and qualify in competitive exams • 67.3% of the respondents said that the sessions conducted helped them to prepare for competitive exams, develop academic skills, critical thinking, and overall potential. • 43.9% of the respondents said they experienced positive growth and were able to build their confidence and resilience to appear and perform in competitive exams. • 43% of the respondents saw an overall improvement in their academic performance as an indirect outcome and impact of their participation, attributable to the overall growth and development of the individual/ student.
Life-skill training	Participation activities for Life skill training	• 67% of the respondents had participated in life skills workshops conducted by YOJAK across the centres.	• 72.1% of the beneficiaries reported the sessions to be of immense help in understanding the importance of education and skills. • 55.3% of the respondents learned time management skills. • 48.7% of the respondents experienced improved concentration. • 34.3% of the respondents gained critical thinking abilities and skills
Improving health outcomes	Attending Health camps	• 57.3% of the beneficiary-students had attended the health camps conducted at the YOJAK centres.	• 79.7% of all the student beneficiaries screened said they had received medical support for their treatment after the health check-ups, including awareness, counselling, and spectacles for their weak eyesight. • 98% of those who had attended the health camps reported to have benefited from the services and care received.
Overall improvement	Improvement in academic performance	• 82% of the beneficiary students said that the program activities had helped them in improving their academic performance. • 40.3% of the beneficiary students said that the program interventions helped them clear their entrance exams for higher education, thus contributing to their academic success. • 98% of the beneficiary students said they were satisfied with the overall project intervention(s).	• 60% of the grades XI and XII student-beneficiaries showed a ~30%improvement between the BL and the ML evaluations conducted in their STEM performance. • Of the 1,198 students in grades 8 to 10, the assessment improved by 27% from the Baseline to that of the Midline assessment for the STEM subjects conducted by YOJAK. • 96.7% of the students were satisfied with the STEM classes, particularly with the query resolution sessions conducted and improved understanding of the subject facilitated by the YOJAK teachers in particular

Component/ Area of work	Indicators	Findings and Outcomes	Impacts
Skill development sessions	Critical thinking, problem-solving and career skills development	• 93.7% of the student beneficiaries developed skills for successful career pathways through the YOJAK interventions. • 92% of the student beneficiaries said they had learned skills for solving competitive problems through the program. • 72.3% of the student beneficiaries noted marked improvements in their critical thinking abilities through the intervention.	• 35% of all the student beneficiaries interviewed said they were able to learn and adopt various life skills required for choosing STEM and career pathways through the program interventions.
Financial support for needy beneficiaries	Scholarships given to select, needy students	• 25.7% of the total beneficiaries had received financial support through scholarships.	• The program provided financial assistance to select student beneficiaries from lower economic strata to pursue STEM education, thereby easing the financial strain on the families of the beneficiaries experienced if their children chose STEM education and aligned future career pathways.

SOULACE TEAM MEMBER INTERACTING WITH THE STUDENTS OF JAI BHAVANI MIDDLE SCHOOL, MOHAN NAGAR

03. OECD FRAMEWORK

Relevance Coherence Effectiveness Efficiency Impact Sustainability

RELEVANCE

The STEM education support program by YOJAK, supported by Bajaj Auto Limited, is highly relevant as it addresses the educational needs of marginalised groups, especially girl students. By offering academic support, experiential STEM learning, and financial assistance, the program equips students with the skills to pursue careers in STEM. Implemented across seven learning community-based centres and five in-school centres, across a total of 12 sites (six clusters and six sub-centres) in Pune, Maharashtra. It targets students from grades 8 to 12, directly addressing barriers to education and fostering opportunities for underprivileged students.

COHERENCE

The program is well aligned with the following Sustainable Development Goals (SDGs):

The program also reflected strong coherence with national initiatives:

- Beti Bachao Beti Padhao
- STEM (Science, Technology, Engineering, and Mathematics) education
- National Policy on Education (NPE)
- POSH (Prevention of Sexual Harassment)
- POCSO (Protection of Children from Sexual Offences)

EFFECTIVENESS

The STEM education support program has proven to be highly effective in fostering both academic and personal growth amongst students. By offering practical learning opportunities, exposure visits, and career guidance, students demonstrated significant improvement in subjects like science, math, and english. The program has also sparked a strong interest in pursuing STEM fields, motivating students to explore potential career paths in engineering, robotics, and technology. Additionally, through its financial support and engagement with parents, the program has made education more accessible to marginalised communities. This comprehensive approach has not only boosted students' academic performance but also built their confidence, problem-solving abilities, and involvement in extracurricular activities.

EFFICIENCY

The STEM education support program operates efficiently through strong program-parent partnership and involvement, exposure visits, hands-on science activities, career counselling, and personalised teacher support. Partnership with the government schools, departments to implement at scale; helped reduce costs, while innovative teaching practices, including science fairs and extracurricular activities, enhance learning and engagement.

IMPACT

The STEM education support program has had a significant impact on students, particularly in enhancing their academic performance in science, math, and english. Through hands-on learning experiences, exposure visits, and career counselling, students gained a deeper understanding of these subjects, leading to improved grades and a stronger academic foundation. The program has also sparked greater interest in pursuing STEM subjects, motivating students to explore careers in fields like engineering, robotics, and technology. Additionally, it has boosted students' confidence, helping them overcome challenges such as shyness and self-doubt while encouraging participation in extracurricular activities and competitions.

SUSTAINABILITY

The program incorporates various sustainable elements. The school's emphasis on educating girls and supporting marginalised groups fosters lasting social impact. Partnerships with local organisations further strengthen community connections and resource sustainability.

Continuous teacher development and engagement activities with parents help maintain the program's long-term impact and quality from the sustainability of the project operations perspective. The well-curated and strategized exposure visits and career counselling sessions for the students ensured motivation of the student beneficiaries to pursue further studies in STEM.

CHAPTER 4
INTRODUCTION

Parents FGD at OTA Scheme Centre, Nigadi

Access to quality education remains a significant challenge for many students from marginalised backgrounds. In India, especially, there exists a substantial gap in access to and the quality of education, which are vital to choosing and pursuing careers and becoming economically viable after completing their education. Professional courses and STEM-based careers such as engineering, robotics, computing, and medicine have many aspirants competitively pursuing admission for limited seats in the colleges. Such a competitive arena requires focus, guidance and preparation to secure a seat in such courses.

The more recently introduced National Education Policy (NEP), 2020, has been pivotal in advocating and implementing experiential learning and its integration from an early age. Often STEM subjects require an early and grounded approach that helps in choosing and making correct and specific choices towards pursuing future career pathways. However, for many students in urban slums or rural areas, opportunities to receive guided technical and engineering support and skills are limited. This further widens the already existing gap due to gender and socio-economic divide among those choosing STEM for their further education and in pursuing careers in this area.

Data from the sector (research) available has shown that often projects in the development sector (especially CSR) provide educational support and scholarships to schools and children up to Grade 10, and a few for those pursuing graduation and/or professional courses. This leaves students in grades 11 and 12 (crucial for the foundation of graduation and professional pathways) unsupported, therefore leading to many students not choosing STEM subjects and or aligned careers that are suited to their skills and capabilities. A few of those who continue to pursue these subjects drop out midway through their professional qualification pursuits as they are unclear as to what the futuristic opportunities and possibilities could be.

The Youth Organization for Joining Action & Knowledge (YOJAK), with the support from Bajaj Auto Limited, launched the STEM education support program, that primarily focused on empowering the girl child, tribal, and migrant students by providing easily accessible platforms to enhance and equip them with the necessary skills and support to pursue education and careers in STEM-related fields.

The program emphasises the holistic development of students. It offers remedial classes, experiential learning (particularly in STEM), social support, and need-based financial assistance. The program utilised two distinct models of delivery to address the diverse needs of students and provide STEM support. The first model is focused on in-school interventions, while the other leverages the YOJAK-exclusive community centres that are located within the catchment community of the beneficiaries. The initiatives are implemented across six learning centres located in the Pimpri Chinchwad Municipal Corporation (PCMC) and the Khed block of Pune district, Maharashtra, reaching out to students from 8th to 12th grade.

OBJECTIVES OF THE PROGRAM

The objective of the program is "to improve access to STEM learning opportunities for marginalised students, particularly girls, tribal communities, and children of migrant workers".

Through its two models of implementation (in-school and community-center based), YOJAK, cumulatively ensures the achievement of the broader program objective while addressing the two distinct sub-objectives of:

- Providing comprehensive STEM education, including remedial classes, experiential learning, social support and need-based financial assistance to students, especially from underprivileged backgrounds, through centre-based activities.
- Improving the access and quality of STEM education for underprivileged students through the school setting.

ABOUT BAJAJ AUTO LIMITED

Bajaj Auto Limited, a prominent player in the global automotive industry, is one of India's leading manufacturers of two-wheelers and three-wheelers. Founded in 1945 by Shri Jamnalal Bajaj, the company has established itself as a trusted and innovative brand with over 21 million motorcycles sold in over 79 countries. Headquartered in Pune, Maharashtra, Bajaj Auto is known for its extensive product portfolio that includes motorcycles, scooters, and auto-rickshaws, catering to diverse consumer needs both in India and international markets. It is also India's No.1 motorcycle exporter, with two out of three bikes sold internationally carrying a Bajaj badge. With a rich legacy and a focus on innovation and sustainability, Bajaj Auto continues to shape the future of mobility, both in India and around the world.

In addition to its pioneering contributions in the automotive sector, Bajaj Auto's legacy of social responsibility has always been integral to its ethos, reflecting the commitment to serve society. In March 2024, the Bajaj group came together for Bajaj Beyond and announced a commitment of ₹5,000 crore over the next 5 years to benefit over 2 crore Indians, with a sharp focus on skilling. With this vision, Bajaj Auto is channelizing its CSR resources and expertise into skilling, especially in STEM and related fields. Additionally, Bajaj Auto CSR also contributes to education, health, environment, animal welfare projects, for the sustainable development of the community and the nation.

ABOUT NGO PARTNER – YOUTH ORGANIZATION FOR JOINING ACTION & KNOWLEDGE (YOJAK)

Founded in 2005, YOJAK works to uplift vulnerable communities, including slum dwellers and tribal populations in the Pune district, by providing access to education, healthcare, and livelihood opportunities. YOJAK works on the principle of applying knowledge through collective action to drive community change. The organisation partners with local change-makers such as state and municipal education departments and school principals to implement successful initiatives with proven effect, which are then replicated in other communities and geographies. YOJAK also supports community cohesion through self-help groups and cooperatives, addressing issues such as poverty and environmental conservation while empowering individuals with essential skills and resources.

INTERACTION WITH A TEACHER FROM YOJAK

CHAPTER 5
RESEARCH METHODOLOGY

Bajaj Auto Limited has assigned SoulAce to conduct an impact assessment study for the STEM education support program, a corporate social responsibility (CSR) initiative by the Youth Organization for Joining Action & Knowledge (YOJAK) aimed to provide easily accessible platforms for disadvantaged students, particularly girls, to enhance their skills and receive the necessary support to pursue careers in STEM-related fields.

OBJECTIVES OF THE STUDY

The primary objectives of the study were:

- To evaluate the impact of the program by assessessing the mid and long-term benefits/outcomes of its implementation.
- To assess the sustainability of the project from the perspective of scalability and replicability.
- To provide insights into the strengths and areas for improvement of the program implementation.

USE OF MIXED METHOD APPROACH TO ASSESS THE IMPACT OF THE PROJECT

The evaluation adopted a mixed-methods approach, integrating both qualitative and quantitative research methodologies. The qualitative component allowed for an in-depth complimentary exploration of the quantitative subjective experiences and viewpoints of key stakeholders, such as students, teachers, parents, and project staff, offering a nuanced grasp of their perspectives. The quantitative methods, on the other hand, facilitated the gathering and analysis of numerical data obtained from the beneficiaries and stakeholders identified, thus yielding statistical insights and identifying trends.

By deploying the mixed methods approach, the evaluation aimed to leverage the strengths of both qualitative and quantitative assessment techniques, thus resulting in the collection of robust and comprehensive insights and data. This holistic approach was identified to be pivotal in providing a comprehensive understanding of the project and its impact, ensuring a well-rounded and multifaceted impact assessment and the ability to evaluate the sustainability quotient while identifying gaps for further improving the program, making it more robust and effective in meeting its said objective(s).

QUALITATIVE TECHNIQUES AND METHODS APPLIED

Qualitative methods were used to elicit insights into the real-life experiences, viewpoints, and stories of beneficiaries, stakeholders, and those responsible for project implementation, which cannot be revealed through querying and quantitative methods. Meaningful engagement with the stakeholders like students, teachers, parents and project staff through in-depth interviews and focus group discussions allowed for a comprehensive examination of the changes from a human-centric approach. The method thus facilitated the exploration and understanding of improvements in the overall quality of life of students through the intervention done by the YOJAK. By capturing the realities and narratives of those involved, the qualitative approach helped gain a nuanced understanding of the project and its impact through the lens of the beneficiaries and stakeholders themselves.

QUANTITATIVE TECHNIQUES AND METHODS APPLIED

Quantitative techniques were used to evaluate the project and its direct and objective impact through data collected and analysed using statistical tools. The various specifically designed surveys and questionnaires were created and utilised to collect data on various specific indicators from the beneficiaries and stakeholders. The data thus collected and analysed provided an insight into the project, its effectiveness and the areas for improvisation. The quantitative methods used also provided a measurable approach to gauge the project outcomes and evaluate its success through a statistical perspective towards scalability, sustainability and replicability.

ENSURING TRIANGULATION

To accentuate the reliability and validity of the conclusions arrived at, the study implemented triangulation strategies between the qualitative and the quantitative data collected. The data triangulation was achieved by gathering information from multiple sources of collection, including field notes, interviews with beneficiaries, interactions with community members, and feedback from project staff, which were collectively analysed. This extensive data correlation process facilitated a comprehensive evaluation of the program and its impact and validated the testimonials of benefit, change and gratitude that were received.

The triangulation utilised an additional set of data from surveys, interviews, and focus group discussions. This approach allowed for cross-verification of information and helped mitigate potential biases inherent to any single method otherwise adopted. Through the implementation of the triangulation techniques adopted, the study ensured a robust and dependable analysis and findings, reinforcing the trustworthiness and credibility of the findings.

RESEARCH DESIGN

Name of the project

STEM Education support program for students- specially focusing on girl child, tribal and migrants

Implementing agency

YOJAK

Research design

Descriptive research design

Sampling technique

Stratified Random and Purposive sampling

Sample size

300 students

Qualitative methods used

Semi-structured interviews, testimonials with beneficiaries along with key stakeholders

KEY STAKEHOLDERS

- Girl students
- Tribal and migrant students of 8th to 12th std
- Teachers
- Parents
- Project Staff

STUDY TOOLS

- Defining stakeholders to be interacted with (local Panchayat officials, Student beneficiaries, parents, community members and project staff)
- Development of a structured questionnaire (per stakeholder type)
- Review of project details (for each focus area)
- Setting and reviewing of critical performance indicators before conducting the surveys
- Development of guides for semi-structured questionnaires, focus group discussions and beneficiary interactions
- Documentation of testimonials collected from the stakeholders interacted

ETHICAL CONSIDERATIONS

The impact evaluation conducted was guided by a set of ethical frameworks that ensured the study was conducted responsibly and ethically. Adherence to the ethical principles of research resulted in prioritising the rights and well-being of participants throughout the process of interactions and data collection.

Informed consent was taken, and comprehensive information about the study and its objectives, procedures, potential risks, and benefits was provided to participants, thus allowing them to make an informed decision about their participation and involvement after the questions were addressed. Robust and standard measures and methods to uphold the confidentiality and privacy of stakeholders who participated were implemented. The data was stored and made accessible only to authorised personnel, and the identities of the respondents were masked using standard anonymisation techniques.

The processes thus ensured that all participation:

i. Voluntary in nature

ii. Free from coercion or pressure

iii. Underscored the importance of autonomy and respect for individual choice at all times.

Throughout, participants were treated with respect, dignity, and fairness, with their well-being being the top priority. They were also provided with necessary support or assistance, such as the option to not respond or withdraw mid-way through the interaction was also provided.

CHAPTER 6
ANALYSIS OF THE PROGRAM MODEL

This chapter provides an in-depth analysis of the program's design and its overall effectiveness. The evaluation draws on data primarily sourced from the implementing partner, supplemented by insights gathered from focus group discussions with key stakeholders.

CONTEXT AND PROGRAM OVERVIEW

In collaboration with Bajaj Auto Limited, the STEM Education Support Program was launched in 2023 to create accessible platforms for underprivileged students, with a special focus on girls, to develop their skills and gain the support needed to pursue careers in STEM fields. The program is being implemented across six learning centres in the Pimpri Chinchwad Municipal Corporation (PCMC) and the Khed block of Pune district, Maharashtra, targeting students from grades 8 to 12. Through the six learning centres, the program provides subject-wise remedial classes, experiential STEM learning, and holistic development activities, including yoga, arts, sports, and career counselling. Additionally, scholarships and community engagement initiatives are undertaken to ensure sustained support to the students. Through targeted interventions, the program seeks to enhance academic performance, increase STEM participation, and empower students with the skills and opportunities necessary for higher education and career growth in STEM fields.

PROGRAM MODEL AND THEORY OF CHANGE

The STEM Education Support Program, implemented by YOJAK, follows a phased approach to enhance STEM-learning accessibility and improve academic performance among the select student beneficiaries.
The Theory of Change is rooted in strengthening community learning centres to provide structured STEM education, fostering collaboration with schools, and offering holistic educational support. Students from low socioeconomic backgrounds often do not have access to environments and motivation that help them make correct and clear decisions regarding their education and career thereafter. It is known through social research and observations that these students choose and opt for subjects influenced by peer trends, leading to non-aligned skill-capacity-career and educational pursuits, which further lead to dropouts or taking up small and unrelated jobs to ensure their livelihoods and viability.Thus, by integrating community-led participation, ownership, experiential learning, career counselling, and community engagement, the YOJAK program aims to build the students' confidence and interest in STEM fields while ensuring sustainability of the program efforts from, by, and to the community itself.

The long-term goal of YOJAK is to ensure increased access to quality STEM learning and to have higher student participation in STEM-based courses beyond the 10th and 12th grades and on a sustainable basis with little or no dependency on YOJAK program personnel and or external funding .

IMPLEMENTATION STRATEGY

SET-UP OF COMMUNITY LEARNING CENTRES

A key initiative of the YOJAK-STEM Education Support Program was that of transforming the existing learning centres in Pimpri Chinchwad Municipal Corporation (PCMC) and rural areas of Khed Block into STEM-Community Learning Centers.

Organisation data shows that a total of six STEM-Community Learning Centers were established across Pimpri Chinchwad Municipal Corporation (PCMC) and Khed Block, with four centres in PCMC and two in Khed. Out of 2,160 students surveyed, 1588 students were on board.

In order to reach the most underserved students, the program established six YOJAK-STEM centres in the designated locations. The decision to open the 6 centres was also made in response to the multiple parental requests for learning centres closer to the communities and schools, ensuring greater accessibility and thus addressing their biggest concern area of safety, particularly for girls to and from the community areas they live in.

Additional efforts were undertaken to bridge the gender gap and the rural-urban gap in the admission to these YOJAK STEM learning centres. The list of efforts undertaken is as follows:

Career counselling and mentorship for all and feasibility to interact one-on-one in absolute confidentiality.

STEM subject classes with hands-on experiments.

Encouraging holistic and overall development through activities such as arts, sports, and life skills training.

Furthermore, the centres aimed at empowering students to pursue STEM careers by equipping them with the knowledge, skills, and confidence needed for higher education and professional growth in pursuing science, technology, engineering, and mathematics (STEM) subjects.

TRAINING AND CAPACITY BUILDING OF YOJAK STEM TEACHERS AND STAFF AT THE CENTRES

To deliver high-quality STEM education, the program focuses on teacher training and capacity building in STEM subjects. Teachers participate in regular professional development to strengthen their understanding of STEM concepts, foundational prerequisites, and effective teaching methods. Training sessions emphasise hands-on implementation of STEM principles, encouraging teachers to actively engage students in science experiments and mathematical problem-solving.

Organisation data shows that 32 teachers were trained in STEM.

A key strategy adopted for training and knowledge dissemination of teachers on subjects beyond STEM was that of collaboration with training partners. Partnerships with organisations like Queen's English, Rubaroo, and Prayas were undertaken, and specialised training was provided for the specific topics beyond STEM subjects mentioned:

1. **Rubaroo:**
Educated teachers on child sexual abuse awareness and laws like POSH (Prevention of Sexual Harassment) and POCSO (Protection of Children from Sexual Offenses).

2. **Prayas:**
Provided training on addressing students' queries related to adolescent sexuality, helping teachers understand the physical, emotional, and psychological changes students experience and creating a safe, open environment for discussions.

3. **Queen's English:**
Focused on enhancing English communication skills for better classroom interactions.

HOLISTIC DEVELOPMENT OF STUDENT-BENEFICIARIES

The program aims to enhance the students' overall and holistic development, which includes extra-curricular activities such as art, drama, etc. Other activities, such as sessions on the applicative use of science, were conducted, which helped in making science more fun and simpler for students to engage in. The program fostered a holistic development approach by integrating STEM, arts, and physical activities. The program involved conducting summer camps and winter camps in the community learning centres. The program also included several components, such as:

VEDIC MATH & SCIENCE ACTIVITIES

These sessions helped simplify complex mathematical concepts in science through interactive learning and hands-on experiments. The Vedic Math sessions introduced ancient Vedic techniques that are used to solve calculations quickly, making problem-solving more engaging. Science activities such as experiments like creating volcanoes, exploring chemical reactions, and understanding motion principles, which helped students grasp theoretical knowledge through practical applications, were undertaken. These approaches helped foster curiosity, critical thinking, and a deeper understanding of STEM subjects and their applications, especially in competitive exams.

ROBOTICS & COMPUTER CLASSES

The robotics workshop introduced students to the fundamentals of coding and programming, allowing them to build and operate robots. This hands-on experience helped in the development of logical thinking, problem-solving skills, and technological proficiency. The computer classes introduced helped enhance their digital literacy levels by covering basic computer operations, software tools, and introductory coding concepts. These sessions ensured that the students were well-equipped for the digital age and career progression pathways ahead.

DANCE, MUSIC, & THEATRE

Creative arts play a crucial role in self-expression and cultural appreciation. Dance sessions conducted introduce students to contemporary, hip-hop, and traditional dance forms, improving their coordination, rhythm, and physical fitness. The music classes also provided them with exposure to various musical instruments and genres, enhancing their knowledge base and understanding of melody, harmony, rhythm, and performance skills. Theatre performances conducted helped them build confidence, communication skills, and stage confidence.

INDOOR & OUTDOOR GAMES

The Sports and games conducted promoted teamwork, strategic thinking, and physical fitness. Indoor games that were encouraged were chess, puzzles, and brainteasers to develop cognitive skills and decision-making abilities. Outdoor games and activities such as football, basketball, relay races, and traditional games were encouraged and conducted so as to enhance their physical endurance, coordination, leadership and sportsmanship.

ART AND CRAFT

These sessions provided a platform for students to explore their innate and unexplored artistic talents and express creativity. Activities like painting, sketching, pottery and stone painting helped refine fine motor skills and learn and practice newer artistic techniques. Traditional art forms like rangoli-making introduced students to thematics such as cultural heritage, allowing them to explore and create intricate and colourful designs using natural colour powders. Additionally, the mehendi application session conducted further helped them enhance their artistic precision while celebrating traditional practices and enjoying them.

REMEDIAL CLASSES

Remedial classes provided additional academic support for students lagging in learning concepts in subjects like math, science, and language for skills such as proficient reading and writing and or solving problems, thus offering personalised instruction to bridge learning gaps in the STEM subjects. These initiatives helped equip students with essential skills for academic success and personal growth and participate in competitive exams.

OPPORTUNITIES FOR STUDENTS IN REGARD TO STEM

A key aspect of the program was enhancing students' interest in STEM through exposure visits and science fairs. These excursions provided hands-on learning experiences beyond the classroom, making concepts more practical and engaging.

Visit to Science Park

Students explored various sections at the Science Centre, Auto Cluster Pimpri, including the energy section, fun science section, and a 3D science show.

RRBCEA Visit

103 students visited the Rupa Rahul Bajaj Centre for Environment and Art, where they explored biodiversity, nature, and environmental awareness through art. The nature trail conducted was a unique and mesmerising experience for them.

Science Workshop at Muktangan

A STEM-focused educational trip for 413 students from multiple centres was held from 3rd to 10th February 2023- during the funding tenure. Students engaged in hands-on experiments like building periscopes and experiencing magnetic levitation, reinforcing their understanding of Physics, Chemistry, and Biology.

STUDENT EXPLAINING FEATURES OF ROBOT CREATED IN THE ROBOTICS CLASS TO SOULACE TEAM MEMBER

SCHOLARSHIP FOR NEEDY STUDENT-BENEFICIARIES

142 scholarships were awarded to students according to their academic needs.

The program provided financial assistance to underprivileged students through scholarships towards fees, thus ensuring they continue their education without financial barriers being a reason for dropout.

The process began with reviewing nominations and conducting home visits to confirm the candidates' eligibility. Scholarships were awarded based on a combination of academic performance, financial need, and future potential.

The criteria for selecting students for scholarships included:

Scholarships are awarded based on socio-economic criteria, prioritising students from low-income families, single-parent households, and beneficiaries with disabilities.

The shortlisted/ selected students were required to maintain consistent academic progress to continue receiving support.

Scholarship funds were directly transferred via NEFT to the school, thus ensuring a transparent and efficient process. This initiative helped students stay in school, pursue STEM education, and work towards higher studies and career opportunities in STEM subjects.

PARTICIPATION OF PARENTS

The intervention focused on raising awareness and encouraging active parent participation in their child's education and decision making with respect to their future career pathways. A key strategy was that of involvement and active participation in quarterly parent-teacher meetings, where feedback was gathered, and the parents were engaged in discussions about their child's progress.

To further enhance involvement, the program introduced a buddy system of learning, where parents, older siblings, or even neighbours were encouraged to voluntarily step in as study buddies for the students. Educated parents were encouraged to actively and directly support their child's learning while supporting children of uneducated parents. Similarly, older siblings or friends were encouraged to assist the YOJAK beneficiaries with their studies, ensuring continuous support and creating a collaborative learning environment at home and in the communities.

TABLE 1: PARENTAL PARTICIPATION IN 3 QUARTERLY YOJAK- PARENT MEETINGS

Location	Percentage of Participation					
	No. of parents participated in 1st Parent Meeting	%	No. of parents participated in 2nd Parent Meeting	%	No. of parents participated in 3rd Parent Meeting	%
Rural Centre(Across 4 centers)	53	7%	121	17%	-	-
Urban Centre(Across 8 centers)	86	20%	147	35%	430	57%

HEALTH CHECK-UP CAMPS FOR STUDENTS

The program organised awareness sessions on various topics, including women's health, menstrual hygiene, child sexual abuse, emotional well-being, study skills, motivation, and other life skills for both students and their families. These sessions educated parents on general health issues such as the importance of measuring the height and weight ratios to gauge the correct growth trajectories of their children, calculating BMI, menstrual hygiene practices, and the impact of junk food on the health of their children, as well as topics like skin diseases, oral health, and vision problems and how to prevent them through basic hygiene practices.

- General health check-up camp conducted at 12 Learning Centres.
- Eye Check-up camp covered 1047 students.
- The general Health Check-up camp included 1000 students.
- Installed 6 units of Sanitary Pads vending machines at 6 centres.

During the learning sessions at the Community Learning Centers, it was observed that many beneficiaries had vision problems, such as holding books too close or difficulty reading from a distance. With concerns about the overuse of cell phones during the COVID period, an eye check-up Camp was organised at 12 centres in PCMC and Khed. Additionally, a general health check-up camp was conducted across all centres in partnership with the Infigo Eye Clinic. Those with identified vision issues were given spectacles free of cost, which helped the students immensely as they were able to now read with ease and focus on their studying. Additionally, work on supporting girls' menstrual health was undertaken; thus, 6 sanitary napkin vending machines were installed at 4 centres in Khed and 2 in PCMC as part of a menstrual hygiene initiative.

INTEGRATION OF LIFE SKILLS IN THE CURRICULUM

The program also gave emphasis on the importance of life skills among students. To ensure this, several sessions and activities were conducted. Some of the activities included:

Additionally, psycho-social topics such as Goal Setting, Time Management, Friendship, - Love and attraction, - Good Touch and Bad Touch, - Puberty, - Fear and Self-Confidence - Body Shaming - fun with words, - Self-Study techniques were covered to help them understand these concepts better than shun them as taboo.

CAREER COUNSELLING SUPPORT

The program provided career guidance, particularly for 10th and 12th-grade students, to help them make informed decisions about their future paths. This included conducting aptitude tests facilitated by a specialised technical agency. Career counselling sessions were organised for both students and parents, ensuring they received expert guidance on potential career options based on the individual strengths and interests of the beneficiary students. Further, the project supported students in exploring various education and career streams within the realm of STEM itself.

MONITORING AND EVALUATION

The key aspect of the program is regular monitoring and evaluation of the intervention. The program used a Management Information System (MIS) to track students' performance progress, which was conducted by teachers based on pre-set indicators, including students' academic performance, leadership development, behaviour change, confidence building, and more parameters. These were conducted on a monthly basis to ensure that activities on schedule helped identify the learning gaps and strategise and plan for remedial education on those specific topics.

ROBUST AND ORGANISED METHODOLOGIES: SOPS FOR PROJECT IMPLEMENTATION

All projects need standard SOPs and operational methodologies for efficient and seamless execution of project objectives and activities. The YOJAK- STEM project has its SOPs and methodologies in place that are being well practised on the ground as well. From screening students in the community to enrolling them, tracking their progress, and providing them with scholarships and support, all of these are captured on paper. A shift to digitization has commenced but is observed to be in its nascent stages and requires much support and guidance towards achieving fully automated capturing of all data and project-related information that would be available to all lead and key project personnel at all times.

INTERACTION WITH THE YOJAK TEAM AT DHAVADE VASTI CENTRE

ASSESSMENT OF THE PROGRAM MODEL

RELEVANCE

The program effectively addressed the educational needs of disadvantaged students, especially Girls, to enhance and equip them with the necessary skills and support required to pursue a career in a STEM-related field. The focus on learning centres catered to disadvantaged students by providing them with academic, subject-wise remedial classes with additional experiential learning (especially STEM) and social support, as well as need-based financial support, which made the program even more relevant in the given scenario and place of implementation.

MODEL EFFICIENCY AND IMPLEMENTATION STRATEGY

The implementation strategy was found to be structured well and seen to be effective, focusing on community-based outreach to select needy students from low-income households.

RESOURCE UTILISATION

The program strategically utilised resources to maximise its impact, including comprehensive teacher training to enhance instructional quality. Teacher development sessions focused on innovative teaching methodologies, classroom management, and STEM education to better equip educators were conducted at regular intervals.

MONITORING AND EVALUATION

The program effectively monitored progress using an MIS system for monthly tracking, ensuring continuous oversight.

Note: These inferences are further validated using data collected from surveys, stakeholder interactions, and actual site visits in the subsequent chapter(s).

INTERACTION WITH THE INDIVIDUAL STUDENTS

CHAPTER 7
KEY FINDINGS AND IMPACTS

This chapter compiles and analyses data that was collected and collated through multiple sources to evaluate and understand the overall impact and effectiveness of the program. These insights integrate the qualitative and quantitative information gathered through the many in-depth interactions conducted with the various identified stakeholders. Drawing on these diverse viewpoints, the chapter provides an in-depth analysis of how well the program has met its intended goals and contributed to the long-term sustainability and viability of the positive effects on the beneficiaries and communities.

The study explored multiple aspects of respondents' demographics, occupational status, and income prior to the intervention to create a comprehensive understanding of their conditions and needs. These findings capture broader project-wide findings across the YOJAK STEM program funded by BAL during the funding tenure FY 2023-2024. A total of 300 student beneficiaries (n =300) were interacted with, and the findings and insights from the interactions are given in the section below

DEMOGRAPHIC INFORMATION

CHART 1: GRADE OF THE RESPONDENTS

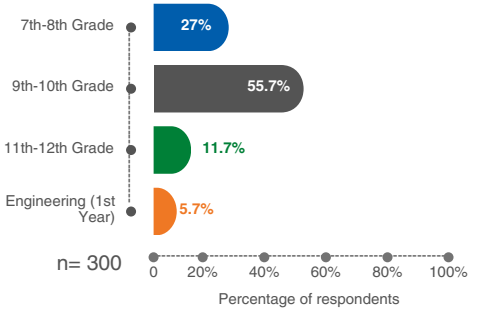


Chart 1 depicts that the majority of the respondents (55.7%) who were enrolled in the project during the funding period are currently in 9th - 10th grade, followed by 27% who were in 7th- 8th grade.

CHART 2: AGE OF THE RESPONDENTS

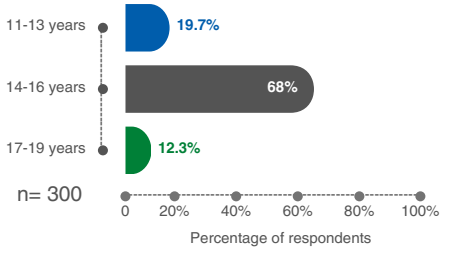


Chart 2 shows that more than two-thirds of the respondents were in the age group of 14-16 years, followed by 19.7% who were in the age group of 11-13 years.

CHART 3: GENDER OF THE RESPONDENTS

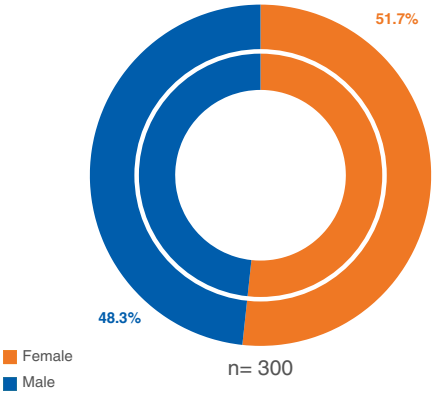
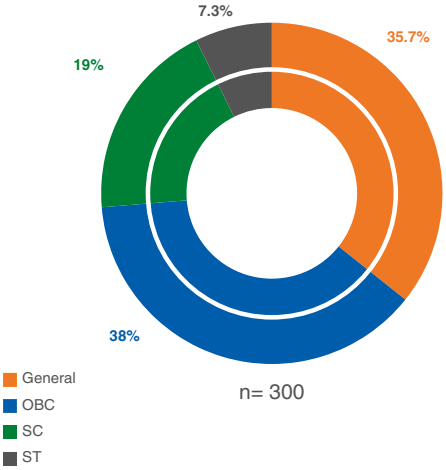


Chart 3 shows that more than half, i.e. 51.7%, were females, while 48.3% were males. Although the objective of the project was to support and promote a continuum of education and STEM subjects for the girl child, it was observed that YOJAK as an organisation was able to go beyond the objective norm of supporting the girl beneficiary and look at students from a neutral perspective thereby giving it a more holistic, equitable angle to ensuring that the needy, deserving students and beneficiaries receive the benefits than gender-based and biased allocation basis. These salient positive aspects make the project more sustainable and robust as it is able to meet the needs of the needy rather than just going by written objectives and SOPs.

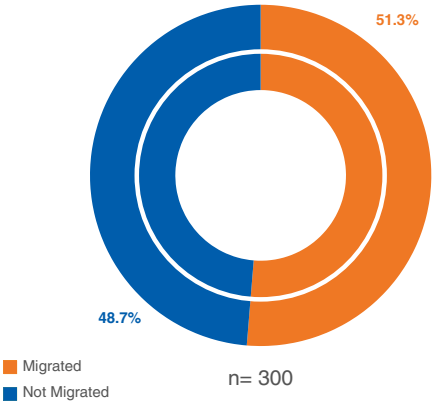
CHART 4: SOCIAL CATEGORY OF THE RESPONDENTS



Data in Chart 4 shows that 38.0% of the 300 respondents were from the OBC category, followed by an almost equal number of student-beneficiaries (35.7%) from the general category. Around 19% were from scheduled caste backgrounds.

The insight from the data is that the majority of the general category student respondents enrolled in this program were children of immigrant parents from the North of India and had migrated to Pune in search of employment and livelihood.

CHART 5: FAMILY MIGRATION FROM OTHER STATES OR CITIES



Upon further querying, it was understood that more than half of the families whose children were beneficiaries of the program (51.3%) were from families that had migrated from other cities or states to Pune, as depicted in Chart 5. While scholarships and fee waivers were provided by YOJAK to families from the reserved categories as a part of their SOP, it was observed that preference and emphasis on socio-economic and affording ability were given more weightage and importance while disbursing and selecting students for receiving the additional support to ensure their continuation in education.

FGD WITH RAJGURU NAGAR CENTRE TEAM

SPECIFIC FINDINGS FOR CENTRE-BASED AND SCHOOL-BASED ACTIVITIES AND THEIR IMPACT ON THE BENEFICIARIES

A. CENTER-BASED ACTIVITIES AND THEIR IMPACTS

The STEM community centres run by YOJAK offered a variety of activities aimed at supporting students, such as career counselling, extra-curricular engagement, and exposure visits related to STEM. The learning centres focused on providing academic support, remedial classes in specific subjects, experiential learning (especially in STEM), and social support, targeting disadvantaged students in a closed, secure environment that helped students focus on their studying and remediate for topics not understood while interacting with peers from other schools in the centre and gaining confidence in themselves.

PRE-INTERVENTION SCENARIO

Discussions with stakeholders, including parents and teachers, revealed several challenges faced by students before the YOJAK intervention had commenced:

- Students were shy, lacked confidence, and appeared fearful and confused about taking STEM subjects and choosing skill-aligned career pathways. Confidence of students was a significant barrier, and their communication skills were underdeveloped.
- Lack of interest in subjects like Science, Math, and English was an area of concern. Parents highlighted that students would fear these subjects and often found them difficult to grasp.
- Behavioural challenges in some student-beneficiaries, such as short-temperedness, before the intervention.
- Little to no hands-on exposure to STEM subjects, with no opportunities for exposure visits or real-world learning experiences to broaden their understanding.
- Absence of activity-based learning opportunities for students.
- Lack of knowledge and hesitancy to attempt competitive exams and seek scholarships to pursue their education.

POST-INTERVENTION SCENARIO

The following set of graphs and data interpretations depict the change in participation, confidence, performance, decision-making.

A. COUNSELLING SESSIONS FOR STUDENTS

CHART 6: PARTICIPATION IN ACTIVITIES AND TESTS TO ASSESS THE NEED FOR COUNSELLING SUPPORT

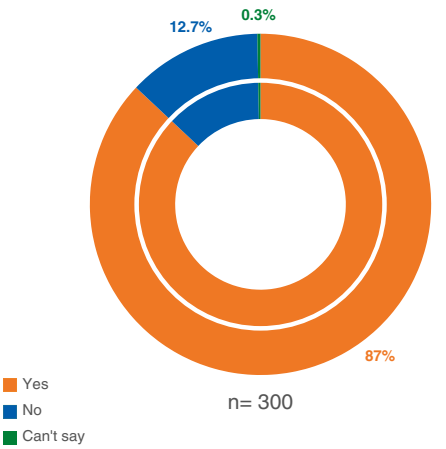


Chart 6 shows that approximately 87% of the candidates participated in activities and tests to assess their need for counselling support, indicating that most students see counselling support as important for their growth, while 12.7% did not participate in these activities and tests.

CHART 7: ACCESS TO ONE-ON-ONE COUNSELLING SUPPORT FROM THE YOJAK TEAM

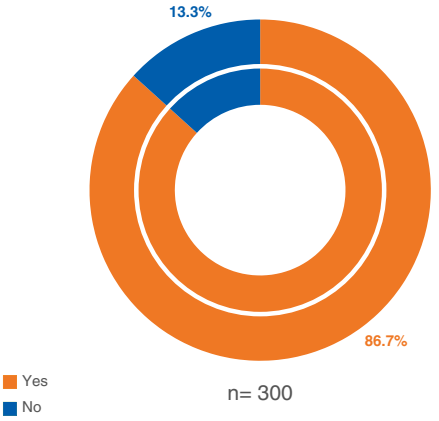


Chart 7 shows that approximately 86.7% of the participants confirmed having access to one-on-one counselling support from the YOJAK team. Participants also reported having the opportunity to openly discuss their feelings and concerns.

98%
of the participants felt stronger, more open and more courageous after the counselling session.

Discussions with the teachers have emphasised the significant impact of counselling on students' overall behaviour and personality. Teachers highlighted that the need-based counselling provided to struggling students allowed them to speak openly and honestly with the counsellor.
This personalised support addressed a range of challenges: academic, emotional, and social, thus helping students identify their issues and receive tailored advice for improvement.

Parents also observed positive changes in the behaviour of their children after accessing counselling services.
In one particular instance of a student with personality and temperament issues had a lot of communication and subsequent adjustment issues at school with her teachers and classmates, as well as at home, with her younger siblings. After attending the YOJAK program and receiving support from the counselling sessions regularly, the student beneficiary saw significant positive change in her mood and ability to communicate and interact with her peers in school. Her parent specifically thanked YOJAK and mentioned that her daughter had grown calmer only and especially after the counselling sessions by the program team. This student, now, listens first before reacting, which has made a noticeable difference in her behaviour.

B. APTITUDE TESTS AND CAREER COUNSELLING

CHART 8: PARTICIPATION IN APTITUDE TEST

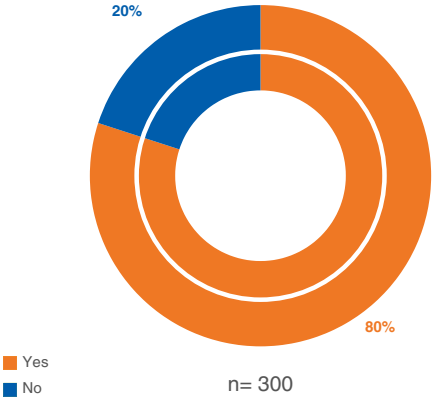
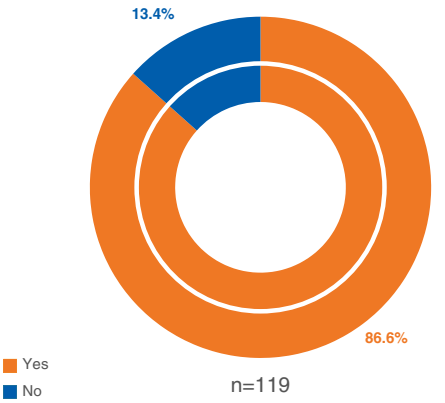


CHART 9: ATTENDANCE IN CAREER COUNSELLING SESSIONS



Charts 8 and 9 indicate that 80.0% of the respondents participated in aptitude tests, while 86.6% took part in career counselling sessions, suggesting that most students are actively engaging in career exploration and self-assessment. Discussions with teachers highlighted the value of psychometric tests, as they provided insights into students' strengths and areas for improvement. These allowed teachers to tailor their teaching methods to better meet student needs. Additionally, these tests played a crucial role in helping students discover their interests and aptitudes, which helped guide them in making informed decisions about their academic paths and future career goals. Discussions with teachers highlighted the value of career counselling sessions for students. These sessions expanded their understanding of the various STEM streams available to them. Before the counselling, many students were only aware of careers in engineering and medicine.

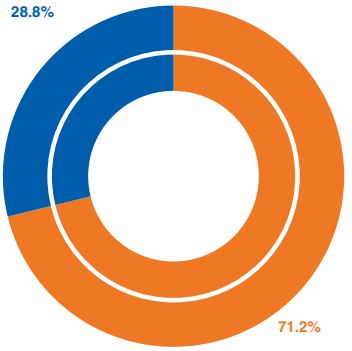
However, through aptitude tests and counselling, they were exposed to a wider range of opportunities, helping them make more informed decisions about their future academic and career paths after 12th.

> Career counselling sessions were very helpful for students; career counselling sessions have greatly helped students in deciding their life goals. It helped them to decide their goals and work hard for them. Previously, they knew only about engineering and the medical stream, but now they are dreaming of becoming space scientists and AI experts.
>
> **-Anita Singh, YOJAK Teacher**

ONE-ON-ONE DOUBT SOLVING SESSIONS BY YOJAK TEACHER

C. CAREER PROSPECTS AFTER 10TH AND 12TH STANDARD

CHART 10: ENROLMENT IN STEM COURSES AFTER 10TH GRADE



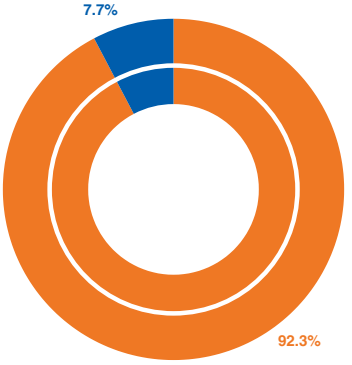
Yes
No

n= 52

Chart 10 shows that after completing their 10th grade, nearly three-fourths of the respondents (71.2%) reported enrolling in STEM courses, indicating a strong interest of students in science and technology fields.

97.3%
of the 37 respondents (grade X and above), reported an increase in confidence, which helped them pursue the science stream due to the STEM learning sessions

CHART 11: IMPACT OF CAREER COUNSELLING SESSION ON DECISION-MAKING



Yes
Not attended

n= 52

Chart 11 shows that among the respondents who chose STEM courses, 92.3% reported that their decision was influenced by the career counselling sessions, highlighting the important role guidance plays in their academic choices. This shows that career counselling helps students explore their interests and make better decisions about their future.

Data from the program records at the YOJAK office between August 2022 to March 2023 showed that 48.0% of 10th-standard students had opted for the Science stream, while 13.0% are awaiting their final round of admissions in science. This brings the total to 61% of students choosing science within eight months of academic interventions. Additionally, 25.0% of students had chosen the Commerce stream with Math and IT subjects.

CHART 12: CHOICE OF SCIENCE, TECHNICAL, VOCATIONAL, OR ENGINEERING STREAM AFTER 12TH GRADE

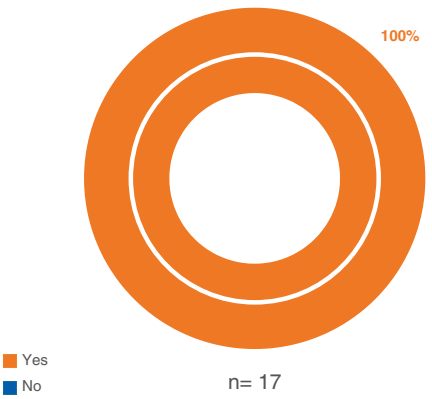
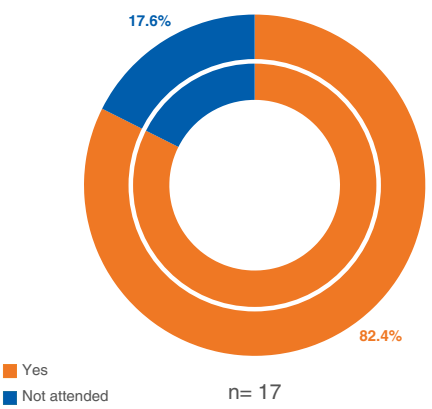


CHART 13: THE EXTENT TO WHICH COUNSELLING SESSIONS HELPED IN DECISION-MAKING FOR 12TH GRADE GRADUATES



Charts 12 and 13 depict that among all the respondents who completed their 12th standard, all of them (100%) chose the science stream (Technical, Vocational, or Engineering). Of these, 82.4% indicated that career counselling sessions played a significant role in influencing their decision to select a particular field. This highlights the key role of career counselling in guiding students toward STEM fields that match their interests and goals, emphasising the need for personalised support in shaping their academic and career paths.

D. EXPOSURE VISITS

CHART 14: PARTICIPATION IN THE SCIENCE WORKSHOP OF INDIA SCIENCE FESTIVAL 2024 (IISER PASHAN)

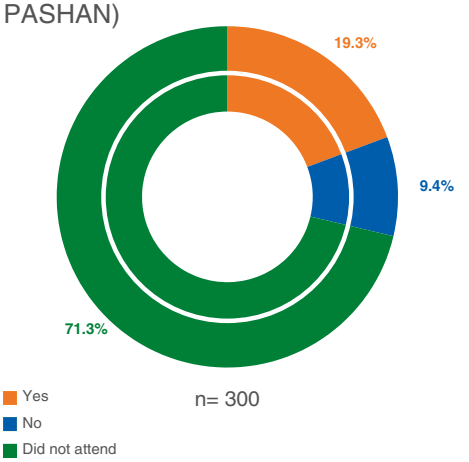


CHART 15: INCREASE INTEREST IN SCIENCE AFTER ATTENDING THE WORKSHOP

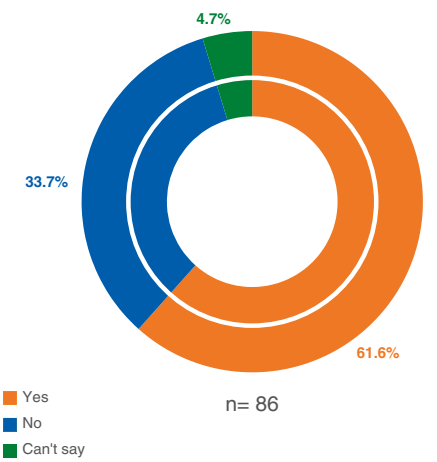


Chart 14 shows that only 19.3% of the surveyed respondents reported attending the India Science Festival 2024. Among those who participated (Chart 15), nearly two-thirds (61.6%) stated that their interest in science increased after attending the workshop. Thus, it highlights the potential for growth in student interest through such events and indicates that barriers to participation should be addressed.

CHART 16: WHETHER RESPONDENTS ENJOYED AND LEARNT FROM EXPOSURE VISIT TO THE TACO PLANT IN CHAKAN

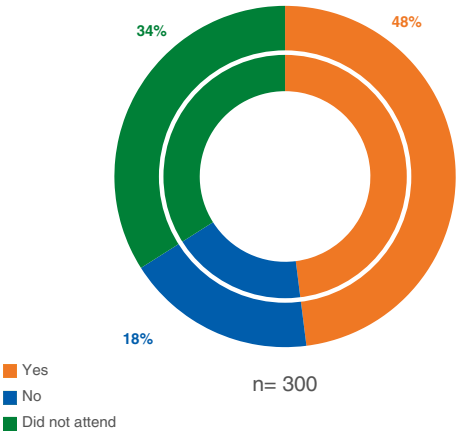
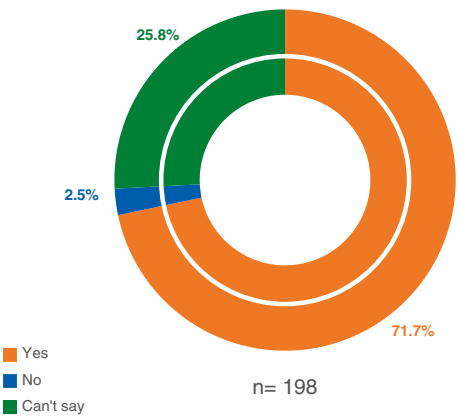


CHART 17: IMPACT OF VISIT ON UNDERSTANDING AND MANUFACTURING PROCESS AND INSPIRATION



Participants also reported gaining practical knowledge in science, technology, and robotics through hands-on experiments, project-building, and problem-solving activities. They highlighted improvements in confidence, explanation skills, and a deeper understanding of scientific concepts and technology.

As part of the program intervention, several exposure visits were conducted, including a visit to the TACO plant in Chakan. Chart 16 shows that nearly half (48.0%) of the respondents reported that they enjoyed and learned a lot from the visit. Chart 17 shows that 71.7% reported that they found the visit impactful as it helped them understand the manufacturing process and it was inspiring for them. This highlights how hands-on training and exposure visits sparked interest and curiosity among students in STEM topics, playing a crucial role in deepening their understanding and motivating them to explore these fields further.

It also increased students' interest in STEM by connecting theory with real-world applications. Hands-on exposure visits and career counselling deepened the understanding and inspired many to pursue STEM careers.

Students also reported that they gained insights into the functioning of machines, robotics, and motors, as well as the manufacturing of vehicle parts and truck sphere components. They also learned about recycling processes, mechanical parts, and the company's new infrastructure model while observing the production of plastic items.

VISIT TO SCIENCE PARK
571 students participated.

VISIT TO MUKTANGAN
415 students participated.

VISIT TO RRBCEA
103 students participated.

Additionally, the organisation's data highlights various exposure visits were designed to enrich students' learning experiences. At the Science Park, students explored sections on energy and fun science and enjoyed a 3D science show. During the RRBCEA Visit, 103 students learned about biodiversity and environmental awareness through art and a nature trail. The Science Workshop at Muktangan engaged 413 students in hands-on experiments, such as building periscopes and experimenting with magnetic levitation, reinforcing their understanding of STEM concepts.

Teachers recognise and appreciate the significant impact of exposure visits on the overall development of their students and are able to help the students recollect and connect the theories to the experiences during the exposure visits. They emphasised that science fairs and visits offered valuable hands-on learning experiences that merged theory with practical application. These opportunities allowed students to witness concepts in action, deepening their understanding. Presenting their projects also boosts their confidence and enhances communication skills. Moreover, exposure visits gave students the chance to interact with experts and peers, expanding their perspectives and sparking greater curiosity in STEM fields.

"I participated in the science fairs and exposure visits, and I believe they had a great impact on the students. These experiences made learning fun and connected theory to real-world applications. By seeing the practical uses of science in big industries and manufacturing, students gained a deeper understanding and developed a genuine interest in the subjects. It boosted their confidence, and they became more curious, asking insightful questions. Visiting such sites broadened their perspectives, and they now have a much clearer vision of how things are made and how science impacts the world."

Sandhya Gawali, Senior teacher

"The Yojak program has had a significant impact on our school, with Yojak teacher periods included in the timetable for two hours daily. This has provided students with additional support in English, Math, and Science. Career counselling has offered valuable exposure to the education sector and helped students choose the right path for their futures. The study tours have broadened their horizons, introducing them to the outside world and current trends. As a result, students' interest in studies has increased, along with their confidence and academic performance. Their career visions have become much clearer. Additionally, the Yojak program has contributed to a rise in school enrollment and has provided teachers with valuable training, which has greatly improved teaching methods."

Mr. Shinde, Principal

Focus group discussions with parents have noted a significant impact of the exposure visits on children's overall growth. Parents emphasised that students enjoy the interactive lessons, which help them understand complex concepts in a fun and practical way. Exposure to real-world experiences through field visits has also expanded their understanding and sparked greater interest in various subjects.

BASELINE-MID-ENDLINE EXAM PAPER VERIFICATION AT SWAMI VIVEKANAND SCHOOL CENTRE

E. HOLISTIC DEVELOPMENT OF STUDENTS

E.1 PARTICIPATION IN SUMMER AND WINTER CAMPS

CHART 18: PARTICIPATION IN SUMMER/WINTER CAMPS

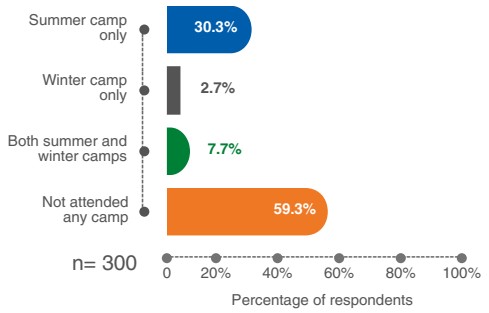


Chart 18 shows that among the surveyed respondents, 40.7% reported attending summer or winter camps. Around 30.3% reported attending the summer camps, and 2.7% of all beneficiaries attending the winter camps held. This suggests a moderate level of engagement in extra-curricular activities among students. However, with more than half of the respondents not attending any camps, it highlights a potential area for increasing participation for students to engage.

CHART 19: ACTIVITIES ENJOYED AT SUMMER/WINTER CAMPS

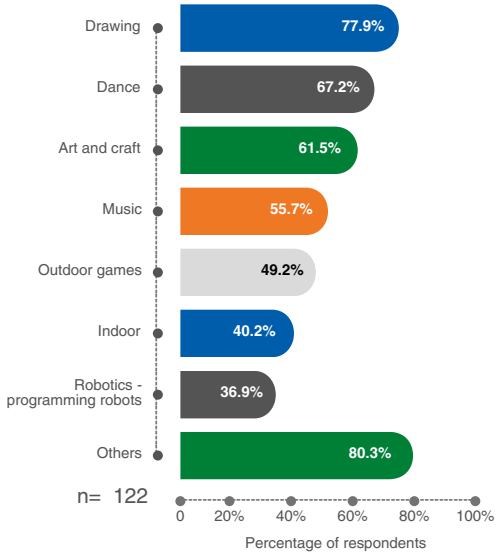


Chart 19 indicates the (trend) range of activities held and enjoyed by participants at the summer/winter camps, which featured extra-curricular options such as drawing, dancing, arts and crafts, robotics, and programming robots. Participants also shared that they acquired various skills during these camps, including arts, acting, dance, and craft, while also focusing on building confidence, setting career goals, and engaging in extra-curricular activities. In addition, they expanded their knowledge in science, programming, and Vedic math.

CHART 20: BENEFITS GAINED FROM ATTENDING THE CAMPS

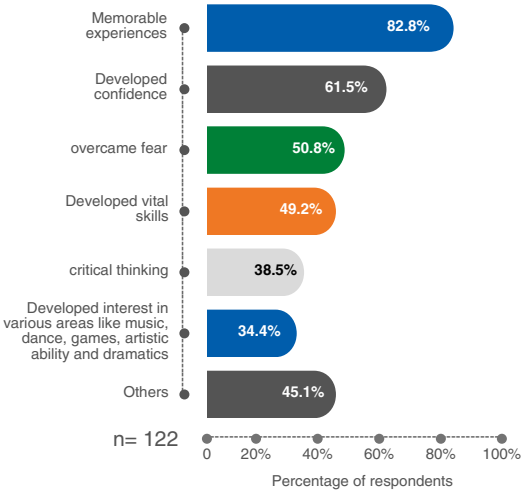


Chart 20 highlights the benefits participants gained from attending the camp, based on multiple response answers. Approximately 82.8% of respondents reported having a memorable experience at the camp. Around two-thirds (61.5%) mentioned that the camp activities helped them develop confidence, while about half (50.8%) shared that they overcame their fears. This highlights the positive impact of the camp on students' personal development, boosting their confidence and development of important skills like critical thinking.

CHART 21: THE EXTENT TO WHICH EXTRA-CURRICULAR ACTIVITIES ADDED VALUE TO KNOWLEDGE AND ACADEMIC PERFORMANCE

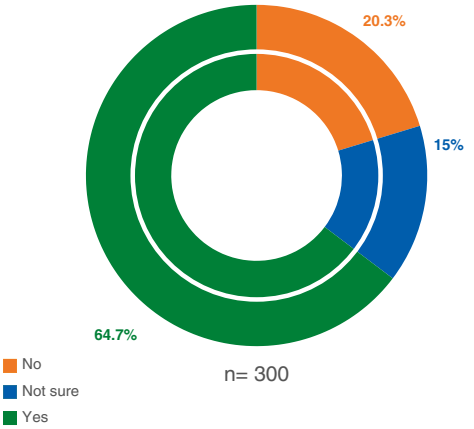


Chart 21 shows that nearly two-thirds of the respondents (64.7%) felt that the extra-curricular activities they participated in significantly added value, as these activities contributed to both their knowledge and academic performance, highlighting the positive role of such activities in enhancing students' learning experiences and overall development.

E.2 INVOLVEMENT IN COMPETITIVE EXAM

CHART 22: PARTICIPATION IN COMPETITIVE EXAMS

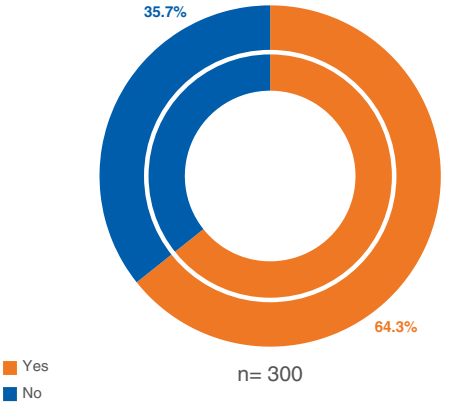
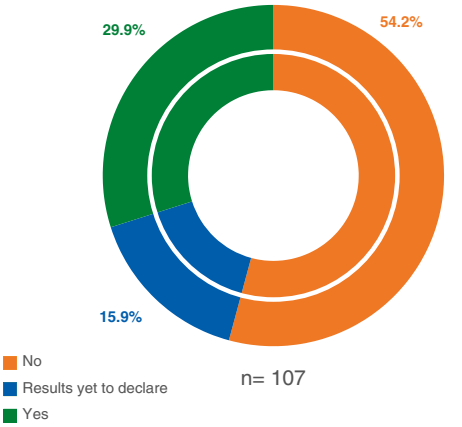


CHART 23: QUALIFICATION IN COMPETITIVE EXAMS



Charts 22 and 23 show that 64.3% of the respondents participated in competitive exams. Among the 107 who took the exam, 29.9% reported that they successfully qualified, while 15.9% awaited results. This data insight highlights the impact of the intervention on students' participation in competitive exams, which increased from little or no attempting competitive exams in the pre-intervention period to 35.7% post-intervention. The data also highlights the immense scope for engaging and motivating more number of students to participate in the competitive exams and aligned opportunities.

CHART 24: BENEFITS GAINED FROM PARTICIPATION IN COMPETITIVE EXAMS

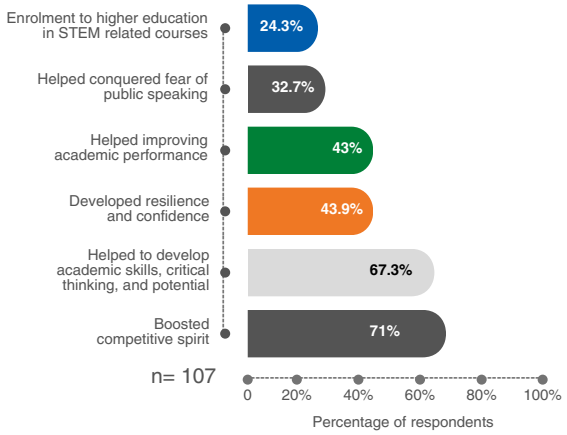


Chart 24 shows the benefits participants gained from taking part in competitive exams. A total of 71% of the respondents stated that it boosted their confidence to attempt competitive exams while giving their best and getting scholarships. Additionally, 67.3% reported that it helped them develop academic skills, critical thinking, and potential. 43.9% mentioned that it contributed to building their confidence and resilience, while 43% indicated that their academic performance improved as a result of their participation. It highlights the significant impact of participation in competitive exams on students' overall development. The program also resulted in enhancing communication skills, leading to improved self-assurance. Students gained clarity on career goals, participated in competitions, and overcame shyness, fostering confidence in public speaking, leadership, and academics.

F. LIFE SKILLS TRAINING

CHART 25: PARTICIPATION OF RESPONDENTS IN LIFE SKILLS WORKSHOP

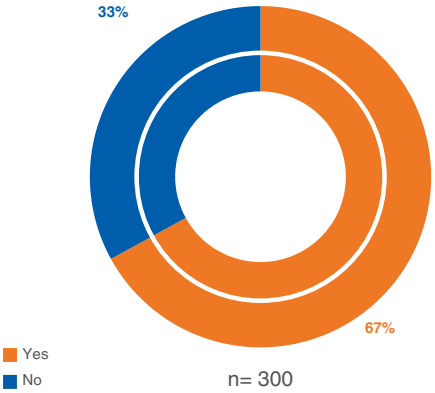


Chart 25 shows that more than two-thirds (67%) of the respondents reported participating in life skills workshops. The findings indicate strong student engagement in programs that enhance personal and practical skills.

Organisational data indicates active student participation in key life skill sessions:

GENDER EQUALITY

60 students attended.

CAREER GUIDANCE

418 students participated across 8 centers.

> I joined the Yojak program in 8th standard, where I attended daily classes in Mathematics, Science, and English. These classes helped me improve my understanding of the subjects and boosted my academic performance. I was able to achieve second rank and a gold medal in the English Olympiad, scoring 49 out of 60. The Yojak program has really helped me grow and develop my skills, and I'm thankful for everything I've learned.
>
> **Gurudev Shashikant Korde, 10th std student**

FGD WITH PARENTS AT OTA CENTRE, NIGDI

CHART 26: WAYS IN WHICH LIFE SKILL SESSIONS HAVE HELPED THE RESPONDENTS

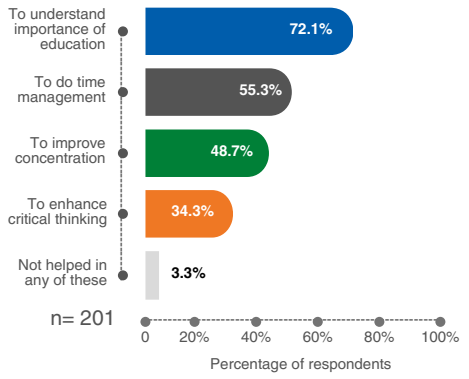


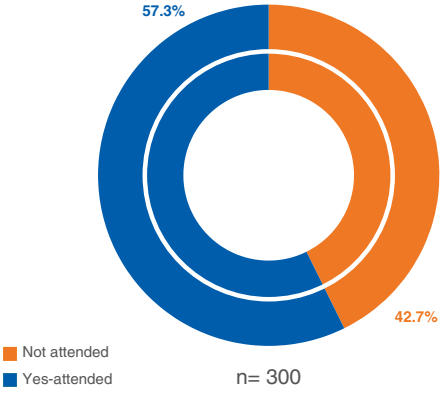
Chart 26 shows the various ways in which life skills sessions have benefited respondents, with multiple responses recorded. A significant 72.1% of the respondents stated that these sessions helped them understand the importance of education. More than half (55.3%) reported learning time management skills, while nearly half (48.7%) mentioned improved concentration. Additionally, 34.3% of respondents reported gaining critical thinking skills. This highlights the positive impact of life skills sessions on students' personal and academic growth.

Discussions with parents and teachers have highlighted that in addition to the core topics, life skills sessions also covered areas such as goal setting, time management, friendship, love and attraction, good touch and bad touch, puberty, fear and self-confidence, body shaming, fun with words, and self-study techniques. These sessions have helped students build confidence and develop essential life skills.

> **Vaishali Sudhir Haral, an English teacher,** shared about life skills training that the program helped students improve their communication skills, which in turn boosted their confidence. Additionally, students learned valuable time management skills. These outcomes were key in enhancing their overall personal development.

G. HEALTH CAMPS

CHART 27: ATTENDANCE IN HEALTH CAMP



As part of the program, health camps for students were organised. Chart 27 shows that among the surveyed respondents, more than half (57.3%) reported attending the health camp, indicating strong participation of students.

98%
of the 172 respondents who attended the health camp expressed satisfaction with the services provided.

CHART 28: SUPPORT RECEIVED FOR TREATMENT AFTER THE CHECK-UP

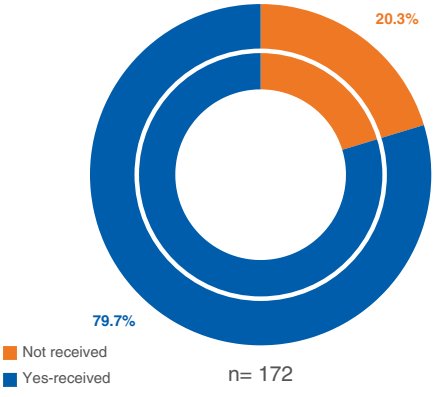


Chart 28 shows that more than three-fourths of the respondents (79.7%) reported receiving support for treatment after the check-up. The support provided included awareness, counselling, and spectacles. This highlights the program's role in promoting student well-being, which can positively impact their academic performance and overall quality of life.

B. SCHOOL-BASED ACTIVITIES AND ITS IMPACTS

The school-based activities were designed to enhance and inculcate the ability of students to align their thinking and approach to STEM subjects and improve their academic performance in subjects such as Mathematics and Science. The program specifically targeted students from grades 8 to 10, aiming to strengthen their conceptual understanding and problem-solving skills in STEM subjects. Through interactive learning methods, hands-on experiments, and remedial sessions, the initiative sought to boost student engagement and help them achieve higher academic scores in Mathematics and Science.

PRE-INTERVENTION SCENARIO

Before the STEM Education Support Program was implemented, a baseline study was conducted by the organisation to assess students' academic proficiency in Mathematics, Science, and English for grades 8 to 10. The study shows the following key highlights:

8th grade:

MATHEMATICS
47% students scored below 35% in the baseline test.

SCIENCE
60% of the students scored below 35%.

ENGLISH
76% of the students scored less than 50%.

9th grade:

MATHEMATICS
51% of the students scored below 35%.

SCIENCE
48% of the students were in the 0 - 35% range.

ENGLISH
46% of the students scored below 35%.

10th grade:

MATHEMATICS
51% of the students started in the lowest range (0-35%).

SCIENCE
42% of the students scored below 35%.

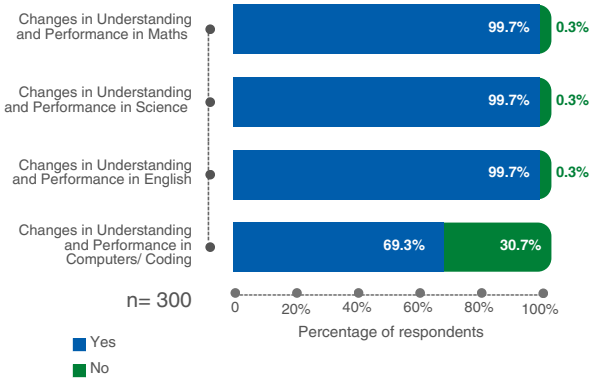
ENGLISH
37% of the students scored less than 35%.

Beyond numerical assessments, qualitative discussions with key stakeholders, including teachers and parents, provided deeper insights into the challenges faced by students. Teachers observed that many students lacked interest in STEM subjects, making it difficult to engage them in learning. Parents also noted that their children struggled with Mathematics, Science, and English before the intervention, leading to consistently low academic performance.

POST-INTERVENTION SCENARIO

A. ACADEMIC PERFORMANCE IN STEM SUBJECTS

CHART 29: CHANGES IN UNDERSTANDING AND PERFORMANCE IN MATHS, SCIENCE, ENGLISH AND COMPUTERS AFTER JOINING THE PROGRAM



Insights from the data in Chart 29 indicate a reported improvement in the understanding and performance in Mathematics, Science, English, and Computer Studies after joining the program. Student beneficiaries were able to acknowledge the impact of the program in improving their ability to score while being able to understand. It is important for students choosing STEM to have a good understanding of the subjects, as it has application in the careers chosen. Hence this data shows the impact of the project in the correct direction of empowering the young minds with an understanding of the subject, therefore being able to score and make correct educational and career-oriented decisions.

An overwhelming 99.7% of students reported enhanced comprehension and achievement in Mathematics, Science, and English. Additionally, 69.3% noted improvements in their understanding and performance in Computer Studies or coding. These improvements align with the program's goal of enhancing academic performance, especially in STEM subjects. The progress in Mathematics, Science, and English shows the program's effectiveness in strengthening foundational knowledge, while the growth in Computer Studies highlights its success in fostering key skills like coding.

CHART 30: LEVEL OF CHANGES IN UNDERSTANDING AND PERFORMANCE IN MATHS, SCIENCE, ENGLISH AND COMPUTERS AFTER JOINING THE PROGRAM

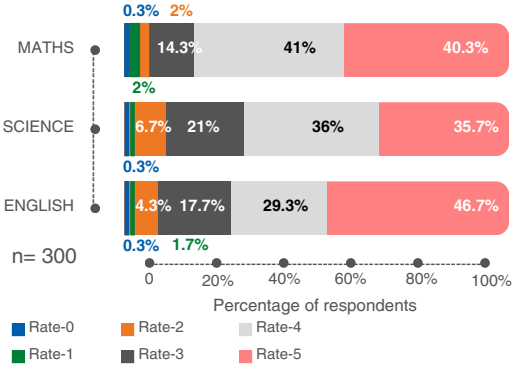


Chart 30 presents students' self-reported rankings of their understanding and performance in subjects like Mathematics, Science, and English. On a scale from 0 (no improvement) to 5 (high improvement), nearly three-fourths (76%) of respondents rated their progress in English at levels 4 and 5. Similarly, 71.7% reported a rating of 4 and 5 for their improvement in science. The highest self-reported improvement was in Mathematics, with 81.3% of students giving a rating of 4 and 5. The high self-reported improvements demonstrate the program's positive impact on student learning, aligning well with the program's objective of reinforcing academic knowledge, especially in STEM subjects.

The organisation's baseline and midline evaluations were conducted for students, with over 60% showing a 30% improvement in their STEM performance. The assessments covered Science, Math, and English for students from 8th to 12th grade. Among 1,198 students from grades 8 to 10, overall performance improved by 27% from the baseline test to the midline test.

TABLE 2: MIDLINE ASSESSMENT OF STUDENTS

Subject	Number of Students	Percentage of students (across 8th-12th grade) with more than 60% improvement in their STEM performance
Maths	825	63
Science	820	63
English	842	65
Overall Performance	857	66

Discussions with school teachers have also highlighted a significant improvement in students' STEM scores after the intervention. Previously, many students struggled with fundamental concepts in mathematics, including basic counting and operations. However, following the intervention, both their interest and performance in these subjects showed noticeable growth. Teachers observed that students became more confident in tackling mathematical problems, leading to improved scores across STEM subjects.

Additionally, interactions with the teachers showed that, students were able to gain an interest in STEM subjects as well as showed improvement and confidence in participating in competitive exams and make well-understood understood decisionswith regards to their career and educational pursuits: which was very different to the pre-intervention period.

> "As a teacher, I take immense pride in my students' academic and competitive exam success. After joining post-COVID, I encountered students struggling with fundamental math skills—basic operations, multiplication tables, and simple calculations. Many had significant learning gaps, so we started from scratch, rebuilding their foundation step by step. Though challenging at first, our dedicated efforts paid off. Students who once scored around 50-60% in their 8th and 9th grades improved remarkably, achieving 80+ in their SSC exams."
>
> **Nilesh Desle, Maths Teacher**

> "I am grateful for the YOJAK program for helping my child improve her school performance. Last year, she scored 45%, and in her last exam, she achieved 65%. Her progress across all subjects has been remarkable."
>
> **Vishal Jijaba Zende, Parent**

Focus group discussions with parents have also revealed similar findings, indicating a significant improvement in students' academic performance after the intervention. Parents observed that their children are now more eager to attend classes and engage with new concepts. Their increased enthusiasm for learning has translated into better understanding and higher academic scores.

CHART 31: ATTENDANCE IN STEM CLASSES FOR MATHS, SCIENCE, ENGLISH AND COMPUTERS

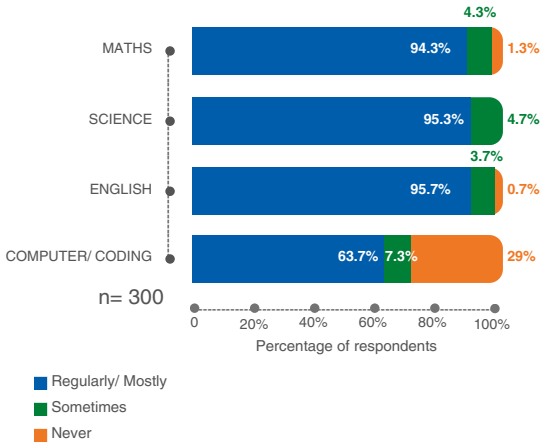


Chart 31 shows that 95.7% of the respondents reported attending English classes regularly, followed closely by 95.3% attending Science classes and 94.3% attending Math classes. However, only 63.7% reported regularly attending computer classes, with approximately 29% never attending computer classes, indicating that while students are highly engaged in core subjects, there is a notable gap in participation in computer classes, highlighting an area for improvement in ensuring consistent attendance and engagement.

The field team noted that the gap in participation in computer classes was due to the non-functionality or unavailability of computers for students. This issue has likely hindered regular attendance and engagement in computer-based lessons.

CHART 32: SATISFACTION WITH STEM CLASSES DUE TO DOUBT RESOLUTION AND SUBJECT UNDERSTANDING

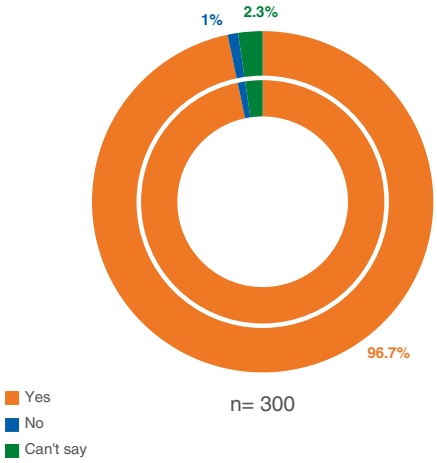


Chart 32 shows that 96.7% of respondents expressed satisfaction with the STEM classes, particularly regarding the query resolution sessions and improved understanding of the subject.

INTERACTION WITH THE PRINCIPAL OF SWAMI VIVEKANAND SCHOOL

B. SCHOLARSHIP FOR NEEDY STUDENTS

The program also included a component focused on providing scholarships to talented students from economically disadvantaged backgrounds who require financial assistance.

CHART 33: SCHOLARSHIP RECIPIENTS AMONG RESPONDENTS

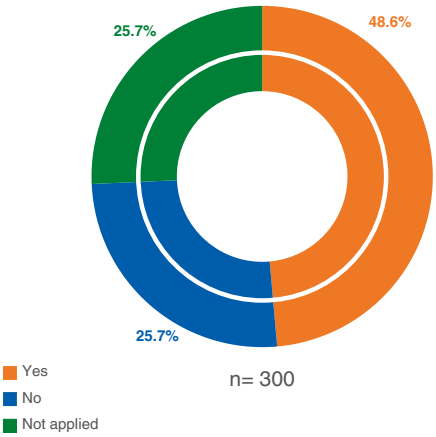


CHART 34: AMOUNT RECEIVED ON SCHOLARSHIP

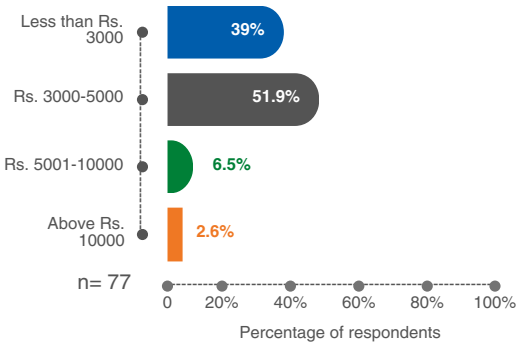


Chart 33 shows that in the student survey, 25.7% reported receiving a scholarship. Chat 34 depicts that among the 77 students who received a scholarship, more than half (51.9%) received between Rs. 3000-5000, while 39% received less than Rs. 3000. This financial support has helped ease the economic burden on families, making education more accessible for students from low-income backgrounds.

Discussions with stakeholders, including teachers, have emphasised that the financial assistance provided through scholarships has been incredibly beneficial for disadvantaged students. It allowed them to focus on their studies without the stress of fees or purchasing books and other materials. This support reduced the financial strain on their families and boosted the students' confidence to continue their education. It also motivated them to perform better and strive for a brighter future. Parents have similarly expressed appreciation for the scholarship program. Many families shared their gratitude for the scholarships, free educational materials, and coaching, which significantly lightened their financial burden.

MECHANISM FOR SHARING MENTAL HEALTH PROBLEM AT RAJGURUNAGAR CENTRE

KEY IMPACTS

A. INCREASED ACADEMIC PERFORMANCE OF STUDENTS

CHART 35: LIFE CHANGES BROUGHT BY THE PROGRAM

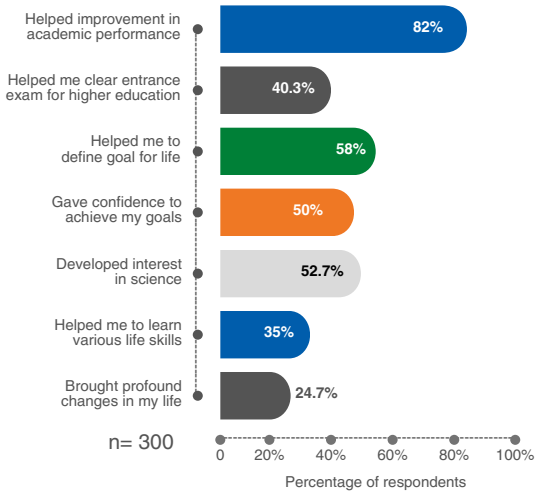


Chart 35 highlights the significant life changes brought by the program for students. A large majority of respondents (82.0%) reported that the program has greatly improved their academic performance. Additionally, 40.3% mentioned that the program helped them clear entrance exams for higher education, further contributing to their academic success.

On a similar note, the organisation's midline data has shown notable progress in STEM subjects. Baseline and midline evaluations revealed that over 60% of students experienced a 30% -improvement in their performance in Mathematics, English, and Science.

CHART 36: IMPACT OF PRACTICAL SESSIONS ON UNDERSTANDING CORE MATHEMATICAL CONCEPTS

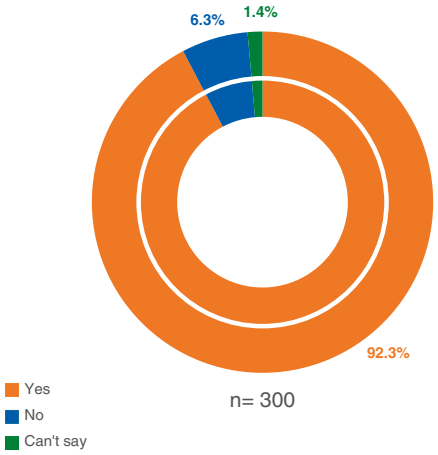


Chart 36 shows that 92.3% of the respondents reported that the practical sessions helped them understand core mathematical concepts. This resulted in improved comprehension and application of mathematical principles, contributing to better academic performance and greater confidence in tackling complex problems.

INTERACTION WITH ALUMNI STUDENTS OF OTA CENTRE, NIGDI

B. INCREASED CONFIDENCE OF STUDENTS

The intervention contributed to increased confidence among students in STEM subjects, particularly Mathematics, English and Science. Teachers observed that students who previously hesitated to engage with problem-solving exercises became more proactive in classroom discussions and attempted challenging questions with greater self-assurance. Parents also noted that their children showed a stronger interest in STEM-related learning, demonstrating a willingness to complete assignments and discuss academic topics at home. The program has also helped students improve their communication skills, which in turn has boosted their confidence.

50%
of the surveyed students reported that the program has given them confidence to achieve their goals.

They have started participating in various competitions and gained clarity about their interests and career goals. Many students have overcome shyness and self-doubt, developing confidence in public speaking, leadership, and interpersonal interactions. Additionally, the program has contributed to increased academic excellence and goal orientation. Students have begun identifying and working toward clear career aspirations, such as pursuing fields like engineering, robotics, and teaching.

98%
of the surveyed students reported the satisfaction with the overall project.

> I have seen a remarkable change in my child since joining the program. They have become more confident, actively participate in class, and no longer hesitate to ask questions. Earlier, they were shy and unsure, but now they speak freely and even take part in competitions.
>
> **Parent of 9th grade. girl student**

C. ENHANCED CRITICAL THINKING, PROBLEM-SOLVING, AND CAREER SKILLS DEVELOPMENT SKILLS

CHART 37: IMPACT OF THE PROGRAM ON CRITICAL THINKING, PROBLEM-SOLVING AND CAREER SKILLS DEVELOPMENT

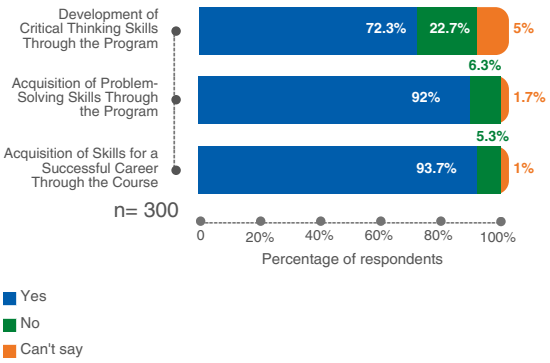


Chart 37 shows that a majority of respondents (93.7%) reported gaining skills for a successful career through the intervention. Additionally, 92% mentioned acquiring problem-solving skills, while nearly three-fourths (72.3%) noted improvements in critical thinking. These findings highlight the positive impact of the program, which blends academic and extracurricular activities to boost students' self-confidence. Participation in science activities, exposure visits, and other activities has helped enhance their communication skills, teamwork, and problem-solving abilities. Life skills training has also helped students develop essential skills like time management. Teachers have observed increased student engagement in class, with students becoming more confident in asking questions and expressing themselves. They also noted that students are now speaking more confidently with teachers. Parents, too, have reported significant improvements in their children's communication skills.

35%
of the surveyed students reported that the program has helped them learn various life skills.

D. REDUCED FINANCIAL BURDEN ON FAMILIES

The program's need-based financial assistance has greatly eased the financial strain on families, making quality STEM education accessible to students from low-income backgrounds. Parents shared that they often struggled to afford education costs, relying on extended family members or borrowing money to cover school fees and related expenses. Many had temporary or unstable jobs, making it even more challenging to manage these costs, especially for families with multiple children. The provision of supportive materials has been a crucial factor in motivating parents to continue their child's education—something they otherwise could not afford.

35%
of the surveyed students reported that the program has helped them learn various life skills.

E. INCREASED INTEREST IN STEM SUBJECTS

The program has significantly boosted students' interest in STEM subjects by bridging the gap between theoretical knowledge and real-world applications. Exposure visits to science festivals, manufacturing plants, and environmental centres provided hands-on learning experiences that deepened students' understanding of STEM fields. These visits, combined with career counselling sessions, sparked a stronger interest in science and technology, with many students expressing a greater inclination toward pursuing STEM careers.

52.7%
of the surveyed students reported that the program has developed an interest in science.

During focus group discussions, parents highlighted that "The YOJAK program has significantly eased our financial burden by sponsoring our child's education. We no longer need to allocate funds for school fees, books, or educational materials, which has reduced the strain on our day-to-day survival needs."

STUDENT EXPLAINING SCIENCE MODELS

IMPACT ACROSS MULTIPLE LEVELS

INDIVIDUAL LEVEL

- Students have reported increased interest and engagement in subjects, particularly Science, Math, and English, due to hands-on activities, exposure visits, and real-world applications of concepts.
- The intervention has significantly boosted students' confidence in classroom interactions, encouraging them to actively participate and engage with their peers and teachers.
- Enhanced engagement in extracurricular activities, such as science fairs and exposure visits, has helped improve students' communication skills, problem-solving abilities, and overall confidence.
- Academic performance in STEM subjects has improved, with many students achieving better grades and showing greater interest in pursuing STEM-related fields.

FAMILY LEVEL

- The program's provision of need-based scholarships has greatly reduced the financial burden on families, making education more accessible and alleviating the strain of school fees and related costs.
- Parental involvement in their children's academic journey has strengthened the bond between them and motivated students to perform better.

SCHOOL LEVEL

- Increased student engagement through hands-on activities has transformed the learning environment into a more interactive and dynamic space, promoting active participation in class discussions and experiments.
- Teachers have adopted more effective and engaging teaching methods, enhancing their ability to connect with students and make lessons more interesting and impactful.

COMMUNITY LEVEL

- The scholarship provision and focus on STEM education for marginalised and vulnerable communities have made quality education accessible to low-income families, reducing the financial strain on parents and allowing them to focus on supporting their children's academic and personal development.
- The program has also created a ripple effect in the community, encouraging more families to prioritise education, especially for girls, and fostering a greater awareness of the importance of STEM education.

STATE LEVEL

- The intervention showcased successful practical science learning methods that emphasise hands-on activities and real-world applications of scientific principles. This may positively influence state-level educational policies and practices.
- Demonstrating improved academic and extracurricular results highlights the potential for scaling similar interventions across the state.

NATIONAL LEVEL

- The intervention aligns with national initiatives by promoting STEM (Science, Technology, Engineering, and Mathematics) education and advancing the objectives of the Beti Bachao Beti Padhao program through its focus on girls' education.

53%

of the surveyed students reported that the program an excellent rating of 5, while 35.7% rated it a 4. The ratings reflect overall satisfaction with the program, with the majority of students finding it highly beneficial.

CASE STUDY 1

Gyanvi Chouhan, a 10th-standard student at Priyadarshani English Medium School, joined the Yojak Education Center a year ago. Despite being a bright and creative student, she lacked confidence in public speaking and struggled to express herself effectively. Some academic concepts, especially in Science and Mathematics, were unclear to her. After enrolling in Yojak, she received personalised academic support that helped strengthen her conceptual understanding. The program also focused on improving her communication skills through interactive sessions, group discussions, and stage activities. Encouraged by her mentors, she participated in competitive exams and Olympiads, gaining valuable experience and self-assurance. Additionally, educational field visits to Tata Automotive and Impress Garden provided her with practical insights that deepened her interest in STEM learning.

Over the past year, Gyanvi has shown remarkable growth. She now confidently speaks on stage, actively engages in discussions, and performs well in competitive exams. These experiences have not only enhanced her academic abilities but also motivated her to set higher goals. The exposure she gained through Yojak has broadened her perspective, fueling her passion for animation and illustration. Gyanvi's family and the teachers at Yojak are proud of her achievements and confident that she will succeed in her ambition to become an animator and illustrator.

CASE STUDY 2

Asmit Kumar's academic journey took a transformative turn when he joined the Yojak Centre in the 9th standard. Coming from a school where individual attention was limited, Asmit often felt his potential remained untapped. Despite his deep interest in science and technology, he lacked the necessary resources and mentorship to explore these fields. Yojak's intervention provided him with structured guidance, hands-on STEM learning, and exposure to new career possibilities. Through interactive sessions, he was introduced to subjects like robotics, coding, and analytical thinking, which fueled his curiosity and broadened his academic interests. The program also helped him build confidence by encouraging participation in competitions and Olympiads, reinforcing his belief in his abilities. With the support of dedicated mentors, he significantly improved his academic performance, scoring 78% in his 10th standard exams.

Asmit's journey didn't stop at academic success. He actively sought learning opportunities beyond the classroom, securing a one-month internship in GIS mapping from ISRO and later earning a student researcher internship with Microsoft. These experiences gave him practical insights and industry exposure, further shaping his career aspirations. With a strong foundation in STEM, Asmit now dreams of pursuing higher education in Artificial Intelligence (AI) and Neuroscience abroad. His mentor at Yojak has been instrumental in guiding him toward this goal, providing career advice and support in planning for international education. Today, Asmit stands as an inspiration in his community, proving that with the right mentorship, opportunities, and determination, even the most ambitious dreams can be realised.

THE WAY FORWARD: ALIGNMENT WITH THE SUSTAINABILITY AND SCALABILITY OF THE PROGRAM

The sustainability of the YOJAK STEM education support initiative is rooted in its comprehensive approach, particularly focusing on empowering girls, tribal, and migrant students with the necessary skills and resources to pursue careers in technical fields. The deep entrenchment of the project within the community makes it more viable and, therefore, sustainable, as the project has designed and ensured the definitive role of the community in the continuum of education of children from its own area. This strategic participative approach has ensured that there is absolute buy-in, responsibility-taking, and ownership of the community towards the centre being run in its community, making it extremely viable from the execution perspective.

The program emphasises the continuous professional development of teachers, high engagement, and often recruitment from the same or similar community set-ups, thus ensuring they stay well-equipped and informed to deliver high-quality education that adapts to the evolving needs of students and educational standards. This has ensured that the precious and now trained and invested resources do not leave the organisation in pursuit of better-paying opportunities. Therefore, making it more stable and strategically sustainable.

The active involvement of parents through regular meetings in the past has allowed them to participate in their children's educational progress, fostering accountability. Furthermore, exposure visits, career counselling, and real-world STEM applications prepare students for future career paths, helping them connect their education to practical job opportunities. These positive flag bearers often are influencers and were observed to be able to influence other family members or mothers to get their children enrolled in the program and pursue education.

The program's long-term sustainability is reinforced by partnerships with local organisations and educational institutions, which provide valuable resources and open doors for further career development, ensuring lasting impact for the students.

Based on the above-mentioned observations and information, the project is high on the sustainability quotient but low on the self-sustaining ability(income), as all services are provided at minimum or no cost to the beneficiaries, and their dependency on them is absolute. Therefore, it will need continued financial support in order to continue functioning, scale up, and or replicate the model elsewhere.

KEY CHALLENGES AND BARRIERS IDENTIFIED

LIMITED PARTICIPATION IN SUMMER/WINTER CAMPS BY STUDENTS

Low participation rates were reported, with only 40.7% of the beneficiaries participating. Given the benefits of attending such (summer and or winter) camps, it has been identified as a barrier challenge in improving the quality and impact of work that is being invested in.

SUSTAINABILITY OF THE FINANCIAL MODEL

While the nominal fee structure has been effective in ensuring that parents value their children's education, sustaining this model over the long term presents several challenges. Many parents have expressed the need for the program to expand its financial assistance to cover or support school fees or scholarships, which have been identified as a major key hurdle.

PEER AND PARENTAL PRESSURE

The influence of parents and peers caused some students to shift their focus from their initial area of interest to other subjects, creating additional challenges in providing appropriate career counselling and guidance and helping them find their skills and areas of choice. Such deviations led to further draining of resources and time and were identified as a recurrent challenge.

TRANSPORTATION ISSUES

Transportation and, therefore, ease of accessing the centres were identified as a challenge that prevented students from attending sessions regularly, hindering their participation and learning outcomes. Also, since the centres are located inside communities, the approach and access were identified as a challenge.

LOW TECHNOLOGY/ COMPUTERS AVAILABILITY

The centre is dependent on laptops and or computers that are provided/donated, making it difficult to train and teach students about computing and programming, which require high hands-on practice.

DEDICATED SPACES FOR COUNSELLING AND INTENSE STUDENT INTERACTIONS

The centres were identified to have limited or no dedicated spaces for counselling and or interacting closely with the student-beneficiaries. This was a deterrent as, many times; privacy is primary for confidentiality in counselling and being able to share information without any threat.

LOW PARTICIPATION OF STUDENTS IN COMPETITIVE EXAMS

The program has faced challenges in increasing student participation in competitive exams, with only about 35.0% of the surveyed students engaging in such exams. This low participation rate highlights a significant barrier to encouraging students to test their skills and fully apply their learning in competitive environments. This participation would also result in the motivation of other students in the community to continue their education and take subjects that are aligned with their skills and interests.

LITTLE OR NO DIGITISATION AND AUTOMATION OF DATA AND INFORMATION

The lack of an established and well-set up MIS system and dedicated personnel was identified as a key challenge in the project. While all systems and processes and SOPs are in place and are being implemented and executed well, the lack of digitisation, dashboards, and availability of all information in one place and to all concerned is a big gap identified.

08. SUSTAINABILITY

CAPACITY BUILDING FOR LONG-TERM IMPACT

The program focuses on developing essential life and career skills such as problem-solving, critical thinking, and decision-making. These foundational abilities ensure that students are well-prepared for future academic and professional challenges, making the program's benefits long-lasting.

HIGH SATISFACTION AND CONTINUED ENGAGEMENT

Students have shown a strong sense of satisfaction and enthusiasm toward the program, particularly appreciating the academic support and interactive STEM sessions. This positive response reflects the program's relevance and its potential to keep students engaged in their learning journeys.

EQUITABLE ACCESS THROUGH FINANCIAL SUPPORT

By providing scholarships to students from low-income backgrounds, the program has helped reduce financial barriers to education. This support ensures that deserving students can continue their studies and pursue careers in STEM without economic constrain.

EXPERIENTIAL AND HOLISTIC LEARNING

Beyond academics, the program integrates exposure visits, camps, and extracurricular activities that help build confidence, curiosity, and social-emotional skills. These experiences contribute to the overall development of students, preparing them for real-world environments.

MEASURABLE ACADEMIC GAINS

The program has led to significant improvements in academic performance, with many students reporting better understanding, increased motivation, and success in competitive exams. These outcomes reflect the effectiveness of the teaching methods and the sustained impact of the intervention.

CHAPTER 9
RECOMMENDATIONS AND IDENTIFIED AREAS OF IMPROVEMENT

STRENGTHEN FINANCIAL ASSISTANCE

The efforts and results that have been achieved thus far are a compendium of all the efforts, time, and investment that have been put in by the YOJAK team. Discontinuation of funding for the project would certainly be a great loss to the student beneficiaries from these communities. In order to continue the STEM-based guidance, education and support given, the project will need continued funding and financial support. The project could look at multi-partner and or CSR or modes of funding such as social investment (SROI-based), but only after being able to ensure 100% digitisation, transparency and operational auditability.

The project should also consider expanding financial assistance to more needy students by roping in alumni who are working and have benefitted from the program and its interventions or increasing their social media and marketing footprints and conducting dedicated fundraising campaigns and outreach activities.

The organisation will need to consider multiple partnerships with external organisations, local businesses, or state/ local admin (government) initiatives to expand financial support for covering school fees and other educational expenses or linkages through government scholarship schemes and or CSR tie-ups (beyond funding). This would help ensure that the program and its benefits remain accessible to all students and overcome the financial constraints of selective scholarship disbursement faced by the YOJAK team.

Sensitisation of the community members and making them aware of the various scholarship schemes available that they need to apply for will also alleviate the stress of continuously sourcing funding to pay fees on YOJAK. This, in turn, would also help address the issue of low participation of these students in competitive and scholarship exams that are very important for their progression.

LOW PARTICIPATION IN COMPETITIVE EXAMS

To address the challenges of limited participation in competitive exams and summer/winter camps, the program should invest in getting a better understanding of the reasons why there is low participation in these camps that are so useful and foundational.

A qualitative check and feedback from stakeholders can provide a deeper understanding of the underlying barriers to participation. Regular and more frequent and periodic interactions with community gatekeepers and stakeholders would help address such issues as the solution would stem from them.

The poor MIS and automation of the project data need to be addressed. The current lack of training of the designated MIS personnel was identified as the clear barrier to this activity. The project could look at getting their personnel trained and upskilled by development sector organisations, etc.

EXPANDING PROGRAM REACH AND ACCESSIBILITY

To expand program reach and accessibility, it is essential to establish more STEM learning centres in underserved rural and tribal areas, ensuring that students, particularly those in remote locations, have access to quality STEM education. Furthermore, enhancing digital learning access by developing STEM e-learning modules, mobile applications, and online mentoring sessions can enable students to engage with STEM subjects beyond physical classrooms, ensuring continuous learning.

ENSURE DEDICATED TIME SLOTS, IF NOT PLACES, FOR COUNSELLING AND INTENSE INTERACTIONS

The lack of infrastructural space is a constant challenge that everyone in Urban and peri-urban areas faces. A dedicated time slot that matches the lunch break/ time slots where the students are few needs to be strategised and leveraged in a more routine and organised way.

STRENGTHEN MONITORING, EVALUATION, AND LEARNING STRATEGY

There is a strong area/ need for strengthening the MIS and M&E systems in the project. Recruitment of dedicated and full-time personnel and investment in basic collaborative software (even free/ open source such as GSuite / Microsoft subscriptions for NGOs) would be ideal. Investment and engagement with a sector-based NGO / organisation to help set up and or visit similar SDG/ sector/ work organisations with a robust MIS and M&E system (suggested by and facilitated for by the funder/ other partners) would be of use and doable. Ensuring all data and information collected for the project is uploaded and available at all times to select personnel through limited access logins will also be useful.

FEW/ LIMITED ACCESS TO LAPTOPS AND/OR SYSTEMS

The project could look at accessing second-hand Laptops and/or systems through CSR partnerships with IT companies that donate laptops after a certain period of usage. This will ensure that the students learning computing and robotics are able to simulate, practice, and learn the subjects more efficiently.

PEER AND PARENTAL PRESSURE

Was observed and identified as a key challenge/ barrier to the execution of the project and its objectives, as these interferences would delay and derail the actual outcomes and impact of the efforts put; in honing the bright young minds towards becoming professionals and economically viable and contributing members of their homes and communities. This can be overcome by early identification and repeated and constant periodical interactions with the parents rather than when episodes occurred, as was observed to be the modus operandi at the time of observation. Early identification and tracking of the family and the student would ensure the deviations would be minimised to a point where the efforts taken by the project that far are not lost or need to be restarted from the start, ensuring compliance and continuity with education.

THE LACK OF DIGITAL RECORDS FOR THE COUNSELLING NOTES

Although not a barrier or a challenge, was identified as an area for improvement and improvisation. Given the scope of scale and replicability, the counselling notes need to be digitised, and access to them needs to be limited to a select few at the management level at all times. This will also ensure that the physical data and notes that are currently being maintained at the centres, if and when damaged or need to be accessed and or audited, can be available to the select few with limited login and or access at all times. This will also ensure continuity of information in case of change or absence of personnel.

CHAPTER 10
CONCLUSION

The STEM Education Support Program, launched by the Youth Organization for Joining Action & Knowledge (YOJAK) with support from Bajaj Auto Limited, has significantly improved access to STEM education for girl-students (especially) from migrant backgrounds and tribal communities in Pimpri Chinchwad Municipal Corporation (PCMC) and the Khed block of Pune district, Maharashtra.

By providing accessible learning platforms, the initiative has equipped students with essential skills and guidance to pursue careers in STEM fields. The program has successfully been able to adopt a holistic approach, integrating experiential learning, academic support, social assistance, and financial aid to foster students' overall development- which is a difficult and rare feat in the space of STEM-focused education in the development sector alone.

A key focus of the program was empowering marginalised students through remedial education, hands-on STEM activities, critical years of learning (grades Xi and XII) and career guidance, which is commendable and a flagship of its kind. By bridging learning gaps and offering real-world applications of scientific concepts, the initiative strengthened students' academic foundations in Science, Mathematics, and English. Exposure visits, interactive workshops, and mentorship further deepened their interest in STEM fields, encouraging many to consider careers in engineering, robotics, and technology, thus empowering themselves to be employed and earn and be able to support themselves and their families and communities in the long run.

The program's impact extended beyond academics, boosting students' confidence and communication skills. Many overcame hesitation and actively participated in competitions and extracurricular activities is commendable and noteworthy. While the initiative successfully enhanced learning outcomes, challenges such as low participation in competitive exams and financial constraints persist.

The need to ensure such initiatives are continued and sustained to ensure impact in terms of the generation of learners is vital and pertinent to the efforts taken to have come this far with respect to programmatic and execution maturity. Such programs have the potential to showcase true impact as their longevity of continuous and dedicated intervention ensures impact over immediate short-run milestones and outcome achievements demonstrated by similar interventions of intermediate and short-term timelines.