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Crompton CSR Foundation
05, Godrej Business District, Pirojshanagar, Vikhroli (West),
Mumbai, Maharashtra- 400079

Date: 29/07/2026

Subject: Final report for Impact assessment of CSR projects supported by Crompton CSR Foundation

Dear Mr. V.A Joseph,

This refers to our [engagement letter/engagement contract] dated 17th November 2025 with Crompton CSR Foundation ("you") ('the Contract').

We appreciate the opportunity to assist Crompton CSR Foundation in providing Impact assessment of 4 CSR projects.

This is our final report as described in the Engagement Contract. The performance of our Services and the report issued to you pursuant to the Services are based on and subject to the terms of the Contract.

This report is solely for your benefit and information and is not to be referred to in communications with or distributed or disclosed for any purpose to any third party without our prior written consent. We have been engaged by you for the Services and to the fullest extent permitted by law, we will not accept responsibility or liability to any other party in respect of our Services or the report.

It has been our privilege to work with you, and we look forward to continuing our relationship with you.

Yours sincerely

Full Signature

Jignesh Thakkar
Partner – ESG, KPMG India
KPMG Assurance and Consulting services LLP



Impact Assessment Report

Jal Jeevan Project

July 2026





Notice to readers

- Our report shall be prepared solely for Crompton CSR foundation. KPMG does not accept or assume any liability, responsibility, or duty of care for any use of or reliance on this report by anyone, other than our Client, to the extent agreed in the Agreement.
- Impact assessment is limited to the projects allocated by Crompton CSR foundation
- OECD-DAC framework has been used in preparing the report as detailed herein. No professional assurance standards ex. ISAE, SSAE etc. have been applied while preparing this report and accordingly the rigors applicable under such standards are not applicable for the scope covered by our report.
- Procedures, analysis and recommendations, if any, are advisory in nature basis the information collected from various sources both publicly and those provided by the client.
- Our observations represent our understanding and interpretation of the facts based on reporting of beneficiaries and stakeholders.
- Our report, by its very nature, may involve numerous assumptions, inherent risks, and uncertainties, both general and specific. The conclusions drawn shall be based on the information available with us at the time of preparing the report.
- We shall not perform an audit and shall not express an opinion or any other form of assurance. Further, comments in our report are not and shall not be intended, nor should they be interpreted to be legal advice or opinion. Client shall be fully and solely responsible for applying independent judgment, with respect to the findings included in the report, to make appropriate decisions in relation to future course of action, if any. We shall not take responsibility for the consequences resulting from decisions based on information included in the report.
- While information obtained from the public domain or external sources has not been verified for authenticity, accuracy, or completeness, we have obtained information, as far as possible, from sources generally considered to be reliable. However, it must be noted that some of these websites/third party sources may not be updated regularly. We assume no responsibility for the reliability and credibility of such information.
- Our work shall be limited to the specific procedures described in this Engagement Letter and shall be based only on the information and analysis of the data obtained through interviews of beneficiaries supported under the program, selected as sample respondents and discussions with Crompton team and stakeholders of the program. Accordingly, changes in circumstances or information available after the review could affect the findings outlined in our report.
- In no circumstances shall we be liable, for any loss or damage, of whatsoever nature, arising from information material to our work being withheld or concealed from us or misrepresented to us by any person to whom we make information requests.
- In accordance with its policy, KPMG advises that neither it nor any of its partner, director or employee undertakes any responsibility arising in any way whatsoever, to any person other than Client in respect of the matters dealt with in this report, including any errors or omissions therein, arising through negligence or otherwise, howsoever caused.
- This report is confidential and for the use of management only. It is not to be distributed beyond the management nor is it to be copied, circulated, referred to or quoted in correspondence, or discussed with any other party, in whole or in part, without our prior written consent, except as per terms of business agreed under the executed contract (ref clause 6.14 – under 'Scope Assumptions' section).
- In connection with our report or any part thereof, KPMG does not owe duty of care (whether in contract or in tort or under statute or otherwise) to any person or party to whom the report is circulated to and KPMG shall not be liable to any party who uses or relies on this report. KPMG thus disclaims all responsibility or liability for any costs, damages, losses, liabilities, expenses incurred by such third party arising out of or in connection with the report or any part thereof.
- By reading our report, the reader of the report shall be deemed to have accepted the terms mentioned hereinabove.



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List of abbreviations

Acronym	Full Form
CNB	Cement Nala Bund
CWG	Core Wall Gabion
CCT	Continuous Contour Trench
CSR	Corporate Social Responsibility
DWA	Drinking Water Availability
ET	Evapotranspiration
FGD	Focused Group Discussion
GIS	Geographic Information System
GLDAS	Global Land Data Assimilation System
GRACE	Gravity Recovery and Climate Experiment
GRACE-FO	Gravity Recovery and Climate Experiment – Follow-On
GWSA	Groundwater Storage Anomaly
KII	Key Informant interview
LST	Land Surface Temperature
LULC	Land Use Land Cover
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
NDVI	Normalized Difference Vegetation Index
NMSA	National Mission for Sustainable Agriculture
OECD-DAC	Organisation for Economic Co-operation and Development – Development Assistance Committee
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
RWH	Rain Water Harvesting
SDG	Sustainable Development Goal
SHG	Self-Help Group
SMI	Soil Moisture Index
SMS	Soil Moisture Storage
SVM	Support Vector Machine
SWS	Surface Water Storage
TWS	Terrestrial Water Storage
TVDI	Temperature Vegetation Dryness Index
VRP	Village Resource Person
WAT	Water Absorption Trench



Executive Summary

This report presents the findings of the impact assessment of the Jal Jeevan Project implemented by Vanarai in Agadgaon and Ratadgaon villages of Ahilyanagar district from FY 2022-2025, Maharashtra. The project aimed to improve water security, groundwater recharge, soil moisture retention, agricultural productivity, and rural livelihoods through integrated watershed development interventions. The assessment adopted a mixed-method approach, including household surveys, stakeholder consultations, field observations, and technical analyses. A total of 66 sampled beneficiary households were covered across the two villages. In addition, remote sensing and geospatial analyses were undertaken to validate the environmental and hydrological impacts of the project.

Below are the key findings based on the sample interactions from the project:*

KEY FINDINGS

Improved Water Availability & Storage Capacity

84% reported a significant increase in water availability in wells and ponds, with water now available for an additional 3–5 months during the dry season.

Improved Soil Moisture and Soil Health

92% reported a significant improvement in soil moisture, while 84% observed reduced soil erosion.

Increased Agricultural Productivity

100% reported an increase in crop yields, supported by improved irrigation access, soil moisture retention, and adoption of better farming practices.

Improved Crop productivity

92% reported improved crop productivity and healthier crop growth, establishment and overall farm performance

Enhanced Household Income

67% of beneficiary households reported a significant increase in income, driven by crop diversification, expanded irrigation, livestock productivity, and horticulture adoption.

Reduced Seasonal Migration

70% reported that migration has completely stopped, while 30% reported significant reduction due to improved livelihood opportunities and farm incomes.

Expansion of Irrigation Access

9/10 reported the ability to cultivate beyond the Kharif season, with access extending to Rabi and, in several cases, part of the Zaid season.

Strengthened Livestock Productivity

92% reported improved livestock productivity and expansion of livestock ownership as a result of improved water availability and fodder access.

A significant number of households (13% to 25%) moved into higher income brackets, with the INR 1.5–2 lakh category recording the highest growth.

**Based on stakeholder analysis*

Executive Summary* - Findings from technical analysis

Agadgaon demonstrated particularly strong ecological outcomes, with agricultural land increasing from 26% to 29%, NDVI values improving from 0.75 to 0.88, and SMI maps indicating enhanced soil moisture retention despite reduced rainfall. These findings reflect improved vegetation health, reduced soil erosion, and expansion of cultivated land.

Ratadgaon demonstrated particularly strong livelihood and water security outcomes, with groundwater trends improving from -7.15 cm/year to +1.40 cm/year and water availability extending until May–June for a majority of households. These improvements translated into enhanced irrigation access, higher incomes, and a significant reduction in migration.

Across both villages, technical assessments and beneficiary feedback highlight substantial improvements in groundwater recharge, soil moisture, vegetation health, agricultural productivity, livestock development, and adoption of sustainable farming practices, contributing to strengthened livelihood security and climate resilience.

Outcome Area	Agadgaon	Ratadgaon
Water Availability During Dry Season	Moderate	High
Irrigation Access Across Seasons	Moderate	High
Groundwater Recharge & Recovery	High	High
Soil Moisture Improvement	High	High
Reduction in Soil Erosion	High	Moderate
Vegetation Health (NDVI)	High	Moderate
Cultivated Area Expansion (LULC)	High	Moderate
Crop Yield Improvement	High	High
Income Enhancement	Moderate	High
Livestock Productivity	High	High
Reduction in Migration	Moderate	High



High- Strong evidence from survey and technical assessments



Moderate- Positive improvements observed

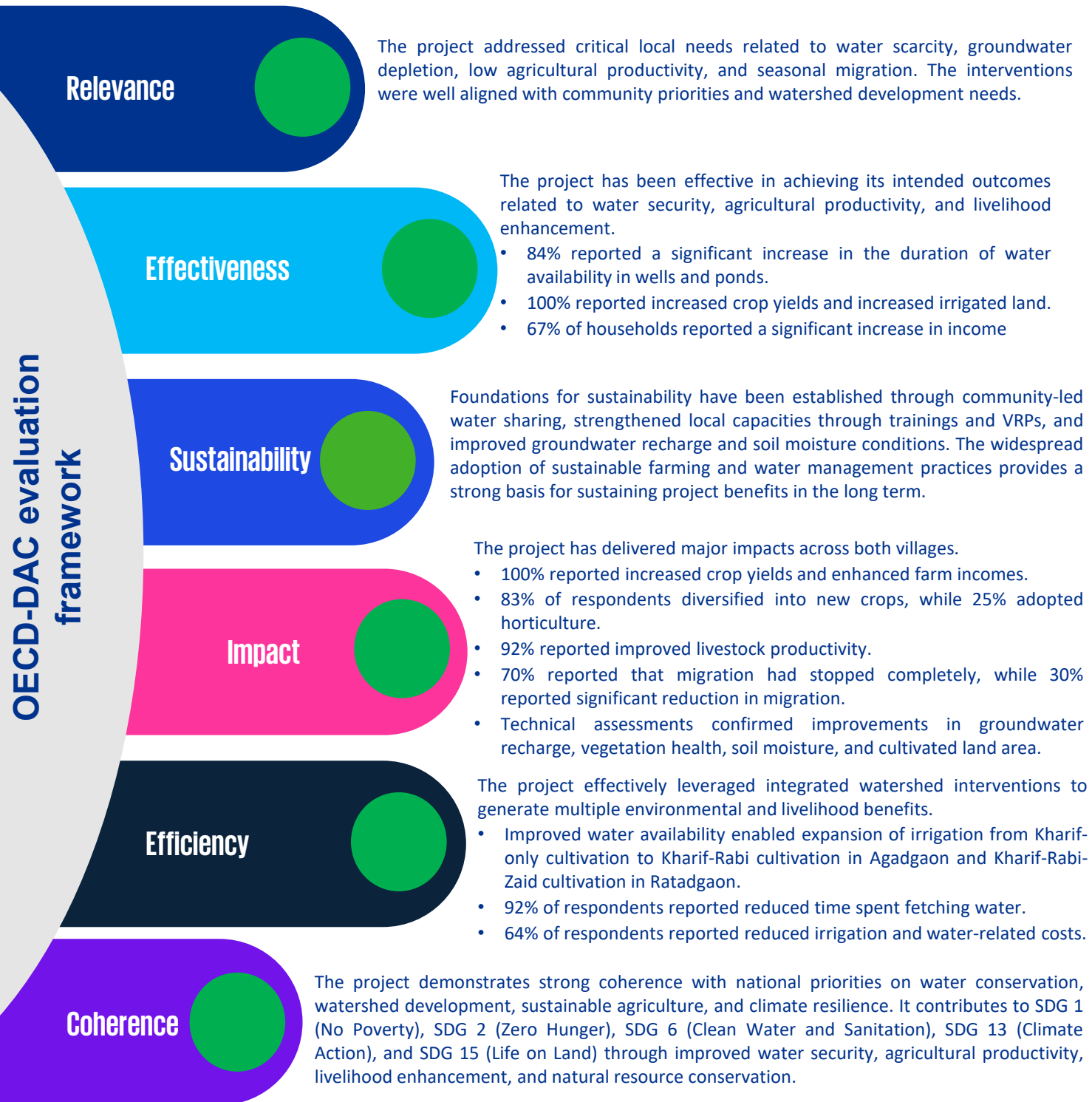


Emerging - Initial positive changes observed

**Based on stakeholder and technical analysis*

OECD-DAC Evaluation:

The various components/outcomes of the program were evaluated using the OECD DAC criteria, which include relevance, effectiveness, efficiency, impact, and sustainability. The findings of the study are categorized as follows:



Does not meet expectation



Partially meets expectations



Meet expectations

01

Introduction



About Crompton Foundation

This report assesses the impact of the Crompton CSR Foundation-supported Jal Jeevan Project implemented by Vanarai in Agadgaon and Ratadgaon villages of Ahilyanagar district, Maharashtra. The project aimed to improve water security, enhance groundwater recharge, strengthen soil and water conservation, increase agricultural productivity, and improve rural livelihoods through integrated watershed development interventions. This section provides an overview of the Crompton CSR Foundation, the water and livelihood challenges faced by farming communities in the project area, and the need for watershed-based interventions to enhance climate resilience, sustainable agriculture, and long-term livelihood security.

Crompton CSR Foundation (CCF) is a not-for-profit organization of Crompton Greaves Consumer Electricals Limited. The Foundation was established with the objective of undertaking and supporting initiatives of social importance, in alignment with Crompton's Corporate Social Responsibility Policy. CCF focuses on community-centric development with particular emphasis on education, gender equity, and inclusive growth. Through its CSR initiatives, the Foundation seeks to contribute meaningfully to national development priorities and advance outcomes aligned with the United Nations Sustainable Development Goals (SDGs).

Corporate Social Responsibility (CSR) at Crompton Foundation

Crompton CSR Foundation's CSR philosophy is to make measurable contributions to inclusive, equitable, and sustainable development, guided by the responsible application of technology for social good. The Foundation's unwavering focus lies in four critical thematic areas where technology has the potential to make a positive impact on the future of humanity and the well-being of the planet. Through its CSR interventions, Crompton CSR Foundation seeks to strengthen access to quality education, promote sustainable livelihoods through skill and entrepreneurship development, support water conservation and environmental sustainability, and deliver community care and humanitarian response where required.

These initiatives reflect the Foundation's vision of fostering holistic community development and empowering vulnerable and marginalized communities using scalable, technology-enabled solutions. Aligned with national development priorities and the United Nations Sustainable Development Goals (SDGs), Crompton CSR Foundation undertakes its social responsibility initiatives with a focus on long-term impact and inclusive growth. The Foundation's CSR initiatives are centred around the following thematic areas¹:



**Water
Conservation**



**Skill
entrepreneurship
and development**



Community Care



**Employee
Engagement**

Source-

1. CSR Annual Report 2024-25: Connecting, Crompton Greaves Consumer Electricals Limited



Global Context

Water scarcity and soil degradation are interconnected global challenges that significantly threaten environmental sustainability and human livelihoods. Over two billion people worldwide lack access to safe drinking water, and nearly half of the global population experiences severe water scarcity for at least part of the year¹. Climate change has intensified these issues by disrupting rainfall patterns, increasing the frequency of droughts, and accelerating the depletion of freshwater resources. At the same time, unsustainable land-use practices and excessive groundwater extraction have pushed many regions toward a condition where water demand exceeds renewable supply. Soil degradation further aggravates the crisis, with around 1.7 billion people living in areas where declining soil quality and erosion are reducing agricultural productivity¹. In hilly regions with intense rainfall, rapid surface runoff leads to severe soil erosion, limiting water retention and worsening water scarcity.

India represents one of the most water-stressed countries due to the imbalance between limited water resources and high population pressure. The country holds only about 4% of global freshwater resources while supporting nearly 18% of the global population, and nearly 600 million people face high to extreme water stress. Water availability is heavily dependent on the monsoon, which is highly variable and often results in uneven rainfall distribution². Much of the rainfall is lost as surface runoff instead of contributing to groundwater recharge. Groundwater plays a crucial role, providing about 85% of rural drinking water, but excessive and unregulated extraction has led to declining water tables and long-term water insecurity. Additionally, agriculture consumes nearly 80–85% of total water resources, and inefficient irrigation practices further intensify the depletion of water reserves³.

Maharashtra Context

Maharashtra faces significant water stress due to uneven rainfall distribution, climate variability, and overdependence on groundwater. While regions like Konkan receive heavy rainfall, many interior and plateau regions in Marathwada experience seasonal droughts. Irregular monsoons and repeated drought events have led to declining agricultural productivity and water insecurity.



Groundwater Depletion:

Heavy reliance on groundwater for irrigation, combined with the cultivation of water-intensive crops and inefficient water use, has significantly lowered water levels.



Runoff & Soil Erosion:

Hilly terrain causes high surface runoff, limiting groundwater recharge, while excess rainfall leads to soil erosion—reducing soil fertility, moisture, and overall agricultural productivity.

Sources:

1. United Nations. (n.d.). *Water – At the center of the climate crisis*.

2. ScienceInsights. (2025). *India's water scarcity: Causes, impacts, and management*.

3. Kapoor, A., & Anand, M. (2024). **Addressing groundwater depletion crisis in India: Institutionalizing rights and technological innovations**. Economic Advisory Council to the Prime Minister.

Agadgaon and Ratadgaon Context (Ahilyanagar District)

Agadgaon and Ratadgaon represent a typical case of “water scarcity amid adequate rainfall.” Despite being located in a medium to high rainfall zone, their ridge-line and hilly location leads to rapid runoff of rainwater. Instead of percolating into the ground, water flows downstream, limiting groundwater recharge and storage.

Major Challenges



High Surface Runoff (Ridge-line location)

Due to hilly terrain, rainwater flows quickly downhill instead of soaking into the soil, resulting in low groundwater recharge.



Severe Soil Erosion

Intense rainfall washes away fertile topsoil, reducing soil fertility and lowering agricultural productivity over time.



Low Water Retention & Groundwater Depletion

Lack of recharge structures and poor soil infiltration leads to minimal water storage, causing rapid decline in water availability after the monsoon.



Seasonal Water Scarcity

Water is available only during the monsoon, while winter sees shortages and summer faces acute water crisis.



Declining Agricultural Productivity

Insufficient irrigation water restricts farming to monsoon crops, resulting in low yields and unstable farmer incomes.



Livelihood Stress

Reduced agricultural output and water shortages negatively impact farmers and livestock, increasing financial instability.



Drinking Water Crisis

Wells and local sources dry up during summer, forcing households to struggle for basic water needs.



About Jal Jeevan Project

The Jal Jeevan Agadgaon Water Cluster Project is a watershed development initiative implemented in the villages of Agadgaon and Ratadgaon in Ahilyanagar district. The project focuses on addressing critical issues of water scarcity, soil erosion, and low agricultural productivity through sustainable natural resource management practices.

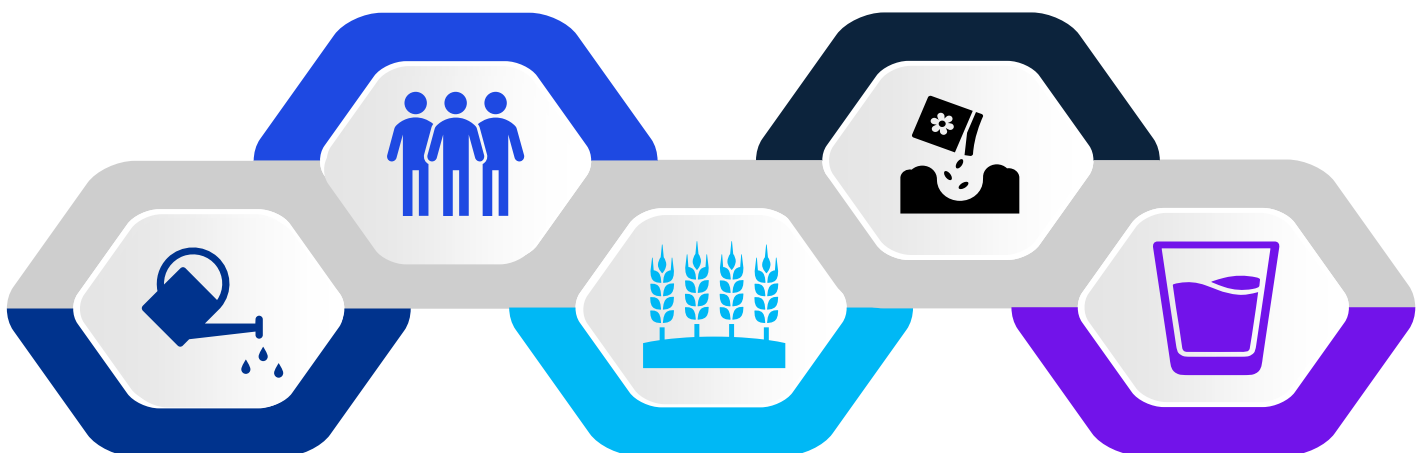
Despite receiving moderate to high rainfall, the villages face water stress due to high runoff, poor water retention, and inadequate groundwater recharge. The project aims to improve water availability by adopting integrated soil and water conservation measures. By strengthening water storage, reducing soil erosion, and enhancing groundwater recharge, the project seeks to create a resilient ecosystem. It also aims to improve agricultural productivity, support livelihoods, and ensure long-term water security for local communities.



Project Objectives

Enhancing Community Participation: To promote active involvement of local communities in sustainable watershed development, as well as in the long-term management and maintenance of resources.

Soil and Water Conservation: To prevent soil erosion, improve soil moisture, increase groundwater levels, and conserve vegetation and biomass within the watershed area.



Expanding Irrigation Coverage: To increase assured irrigation and bring more land under cultivation by ensuring reliable and sustainable water availability.

Improving Agricultural Productivity and Livelihoods: To enhance agricultural productivity and farmer incomes through improved Kharif and Rabi crop yields and the promotion of orchard-based livelihoods.

Ensuring Drinking Water Security: To ensure year-round availability of safe drinking water for households and livestock, and to reduce dependence on tanker water supply.

Project Outputs*

The Program Outreach section summarizes the reach of the watershed development and natural resource management initiative implemented for FY 2022-2025. The project focused on enhancing water availability, strengthening soil and water conservation, improving groundwater recharge, and supporting sustainable livelihoods through the creation and restoration of key natural resource management assets.

2 villages transformed through integrated watershed and natural resource management interventions.

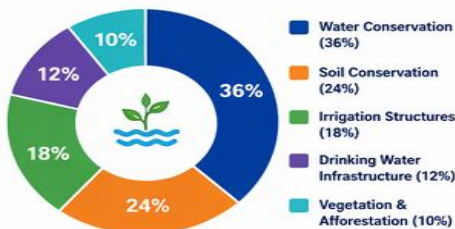


4,149 lives strengthened through improved water availability, agricultural productivity, and climate resilience.

KEY OUTPUT ACHIEVEMENTS

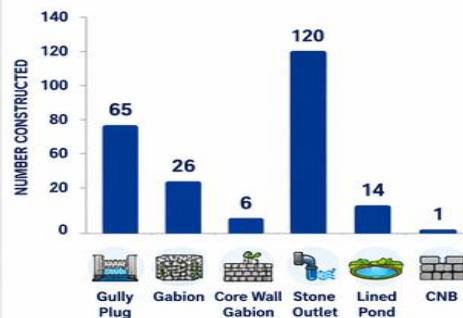
 AREA TREATMENT 26,000 CUM	 STONE OUTLETS 120 NOS	 GULLY PLUGS 65 NOS	 LOOSE BOULDER STRUCTURES 48 NOS	 GABIONS 26 NOS	 CORE WALL GABIONS 6 NOS	 NEW CNB 1 NO
 DRINKING WATER STRUCTURES 2 Solar Pumps + 1 Tank	 RAINWATER HARVESTING STRUCTURES 2 NOS	 LINED PONDS 14 NOS	 DESILTATION WORK 50,653 CUM	 PITCHING WORK 10,400 SQ.M	 REPAIR OF OLD WHS 4 NOS	 SEEDING 80 HA

INTERVENTION MIX (BY CATEGORY)

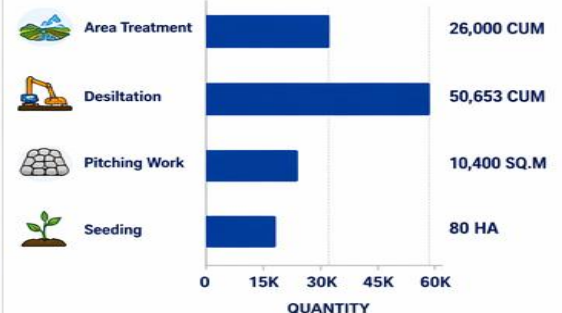


INSIGHT: Majority of interventions focused on watershed treatment, soil conservation and water harvesting structures.

INFRASTRUCTURE CREATION (BY TYPE)



NATURAL RESOURCE MANAGEMENT OUTPUTS



Stone Outlets Created



Gabions Created



CNB Created



Lined Pond Created



CWG Created



DWA Created



*Information sourced from Vanrai Annual reports.

02

Approach & Methodology



Objective of the study

This impact assessment study employed the OECD-DAC evaluation framework, a globally recognized approach for evaluating social impact initiatives. The framework facilitates a qualitative analysis of the effectiveness, relevance, and sustainability of development interventions. The assessment was guided by six core criteria: relevance, coherence, effectiveness, efficiency, impact, and sustainability. The following overview outlines how each of these criteria was applied within the context of the project.



Interaction with farmers at Agadgaon Village

Asks: Will the benefits last over time?

Assesses: It assesses whether the benefits of the project are likely to continue after external support of funding ends.

Asks: Is the project achieving its intended results?

Assesses: It measures the extent to which the project has achieved its intended objectives and delivered its expected outcomes.

Asks: Is the project addressing the right needs?

Assesses: It examines how well the project addresses the actual needs, the local context, and broader development goals, ensuring it is meaningful and responsive to the community and stakeholders.

Asks: What difference has the project made?

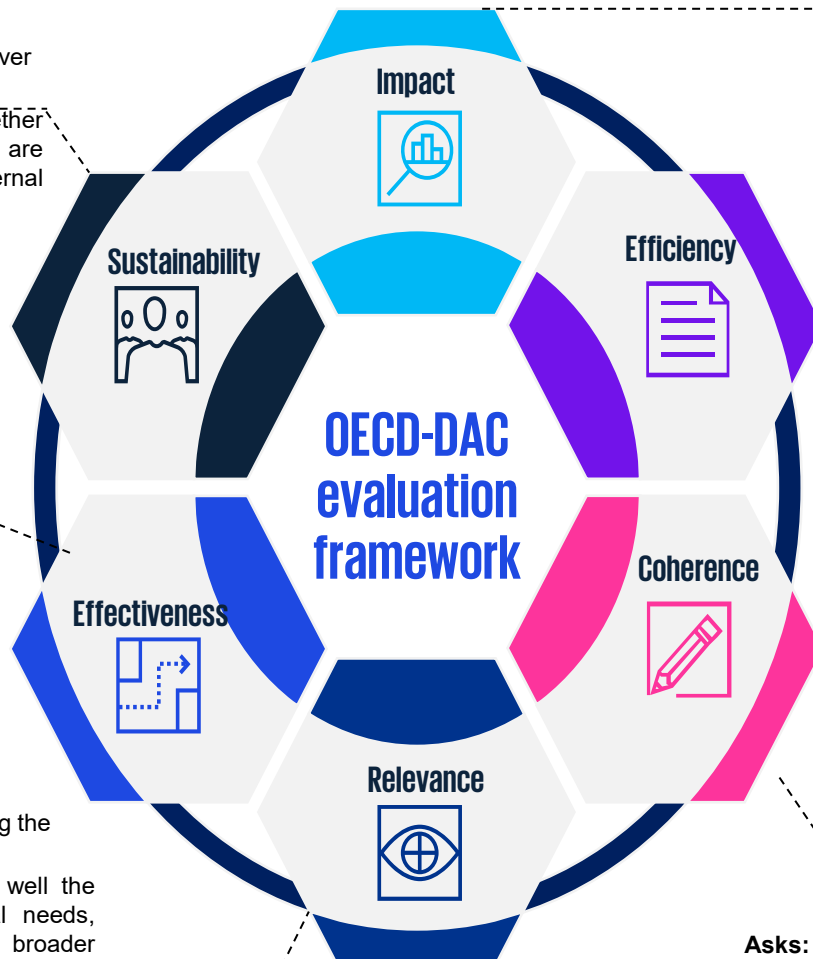
Assesses: It examines the broader, long-term effects of the project, both positive and negative on individuals, communities, and the ecosystem.

Asks: How well does the project utilized the project optimally?

Assesses: It analyses how well the project complements or aligns with other policies, interventions, SDGs and programs within the same context or sector.

Asks: How compatible is the project or the intervention with other interventions in a country, sector or institutions?

Assesses: It analyses how well the project complements or aligns with other policies, interventions, SDGs and programs within the same context or sector.



Approach of the study



This section details the approach, methodology, and sampling techniques employed to conduct an in-depth evaluation of the Jal Jeevan Project. The study was designed to capture both qualitative and quantitative insights ensuring a comprehensive assessment of the project's impact and effectiveness.

- **Literature review:** A thorough review of existing program documents, project reports, MoU, and secondary literature was conducted to build a foundational understanding of the program context and identify the gaps it aims to address. Based on these insights, a Theory of Change was developed to guide the evaluation.
- **Survey Design:** A survey tool was developed, grounded in the objectives and intended outcomes of the study. It was designed to capture qualitative and quantitative data on the impact and utilization of watershed development interventions and to understand beneficiaries' perspectives on how the project has influenced water availability, agricultural productivity, livelihood opportunities, livestock development, income levels, and overall quality of life.
- **Survey Distribution:** A survey tool was developed, grounded in the objectives and intended outcomes of the study. It was designed to capture qualitative data on the impact and utilization of water conservation interventions on the community's lives, as well as to understand the perspectives of households regarding how the project has influenced water availability, agricultural practices, livelihood opportunities, and overall resilience.
- **Interviews:** Structured, semi-structured interviews and Focus Group Discussions (FGDs) were conducted with key stakeholders, offering quantitative and qualitative insights. These stakeholders included farmers, PRI members, program team.
- **Data Analysis:** All responses captured were analyzed against the OECD DAC framework utilizing the defined outcomes of the intervention study.
- **Technical Analysis:** Few detailed Technical analysis were conducted for this project to provide scientific validation and strengthen the evidence base for the environmental interventions undertaken under this project and triangulating with our thematic analysis. Some of those are:

A. Land Use and Land Cover (LULC) Classification: This analysis mapped changes in watershed productivity, vegetation growth and habitat stability, enabling accurate spatial quantification, which will help to understand the ecological restoration and urban greening outcomes of the project.



B. Surface and Groundwater Assessment: Through remote sensing indices and piezometric observations, this helped to quantify recharge efficiency, water availability, and seasonal resilience. It enables the client to understand how restoration interventions have contributed to water conservation and improved hydrological balance.

C. Vegetation Health Report: Assessment of vegetation vigor and stress levels using remote sensing indices such as NDVI (Normalized Difference Vegetation Index) and EVI (Enhanced Vegetation Index). These indices helped to identify areas of healthy vegetation versus stressed zones, enabling targeted restoration efforts.

D. Rainfall Analysis: Evaluation of rainfall patterns, variability, and anomalies within the watershed using historical and real-time precipitation data. This analysis supports understanding seasonal trends and identifying drought-prone periods.

E. Water Stress Severity Levels: Estimating periods under water scarcity and stress using hydrological modeling and remote sensing indicators. This provides insights into seasonal resilience and vulnerability to drought.

- **Synthesis and Reporting:** The findings from the literature review and analysis of the data collected were synthesized to develop a comprehensive understanding of the program's impact. The synthesis process identified key themes, trends, and potential gaps, providing actionable insights for enhancing the program outcomes. The results of the study are compiled in this report, encompassing key findings and actionable recommendations.

Tools for the study

A combination of tools was utilized to ensure accurate and reliable data collection during the study:

- **Focus Group Discussions (FGDs):** Conducted with farmers to capture collective perceptions and the broader impact of the Project.
- **Key Informant Interviews (KIIs):** Conducted with project team, VRPs, PRI members to gain insights into the Project implemented by Vanrai team. These interviews aimed to understand the broader impact of the project from the perspective of observers rather than direct beneficiaries.
- **In depth Interviews:** In depth interviews were conducted with farmers for the understanding of the project outcomes and broader impact.

The image displays three overlapping survey forms used for stakeholder engagement. The top form is titled 'Stakeholder Survey - Community Profile' and includes sections for 'Project Name', 'Location', 'Date', and 'Interviewer'. The middle form is titled 'Stakeholder Survey - Project Impact' and includes sections for 'Project Name', 'Location', 'Date', and 'Interviewer'. The bottom form is titled 'Stakeholder Survey - Project Impact' and includes sections for 'Project Name', 'Location', 'Date', and 'Interviewer'. The forms are overlaid with a large green text box that reads 'Stakeholders Survey Tools'.

Sampling methodology and sample size

The sample size for the study was determined using random sampling ensuring a structured and representative sample population to engage secondary stakeholders such as program team, PRI members, farmers, trainers selected for their relevance and ability to provide informed insights.

A total of 66 interviews were conducted, capturing diverse stakeholder perspectives. This included:

- 6 key informant interviews were conducted with program team, village resource person, PRI members
- 40 in depth interviews and 4 FGDs (5 person each) were conducted with farmers to understand their pre post situation and the current set of challenges and development they have seen.

Identified Stakeholders	Tools Utilized	Sample Covered
Program Team	Key informant interviews	02
Farmers	In depth interviews Focus group discussion	60
Village Resource Person	Key informant interviews	02
PRI members	Key informant interviews	02
Total		66

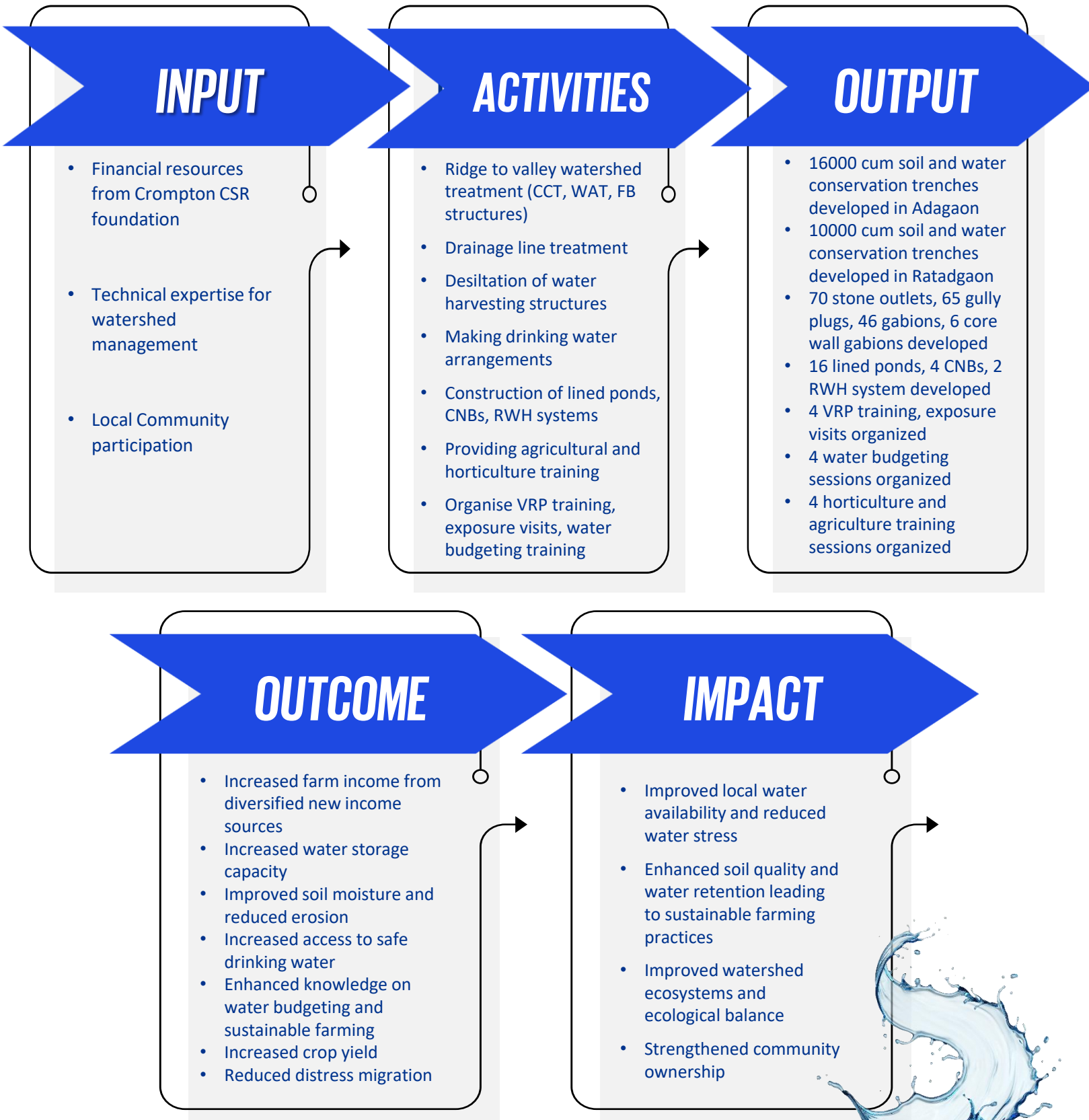
Ethical considerations for data privacy

For the data collection process, KPMG has adhered to ethical considerations for data privacy:

- I. **Informed consent:** All participants were briefed about the purpose of data collection and asked for consent before participating.
- II. **Confidentiality:** Personal identifiers were removed or anonymized to protect participants' identities.
- III. **Secure data storage:** All collected data has been stored in secure, access-controlled environments to prevent unauthorized access.
- IV. **Limited access:** Only authorized personnel involved in the project have access to the project data.
- V. **Use of data:** Data is used solely for research and project evaluation purposes, in line with the consent provided by participants.



Theory of change: Jal Jeevan



03 Findings



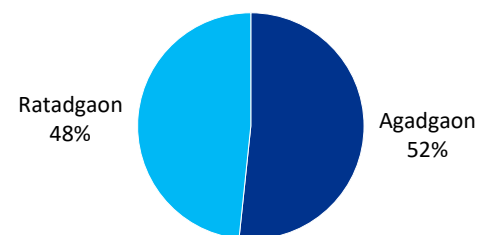
Findings

As part of the Impact Assessment Study, a sample of 60 beneficiary households from the Jal Jeevan Water Cluster Project was surveyed, comprising households from Agadgaon and Ratadgaon villages. The sample included both male and female farmers and was interviewed using a structured survey tool to assess the project's impact on water availability, groundwater recharge, agriculture, livelihoods, and overall community well-being. This section presents the key findings of the assessment, highlighting the project's contribution towards reducing water stress, improving agricultural productivity, strengthening livelihood opportunities, and enhancing the resilience of rural households.

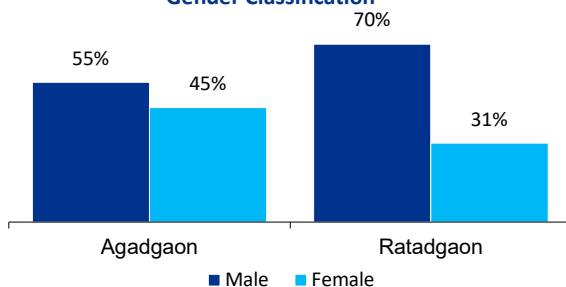
Demographic Profile

The study covered a total of 60 beneficiary households across the two project villages. Of these, 31 respondents (52%) were from Agadgaon and 29 respondents (48%) were from Ratadgaon, ensuring near-equal representation from both villages and providing a balanced perspective on the project's outcomes and impacts.

Village level Representation



Gender Classification

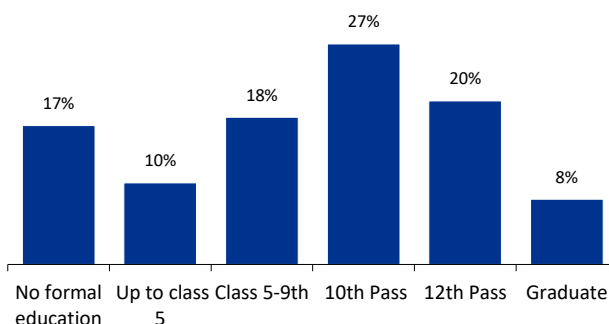


The study covered 62% male and 38% female. Village-wise, Agadgaon had a relatively balanced gender representation, with 17 male respondents (55%) and 14 female respondents (45%). In Ratadgaon, male respondents constituted 69% (20 respondents) of the sample, while female respondents accounted for 31% (9 respondents). The inclusion of both male and female beneficiaries provided diverse perspectives on the project's impact on water availability, agriculture, and livelihoods.

This reflects a strong dependence on agriculture as the main livelihood source and highlights the importance of sustainable water and soil conservation interventions for enhancing farm productivity and resilience.

100% of respondents are self-owned landholders

Educational Qualifications



The educational profile of respondents indicates a moderate level of educational attainment among beneficiary households. More than one-fourth of the respondents (27%) had completed secondary education (10th pass), making it the largest educational category. Overall the findings suggest that while a majority of beneficiaries possess basic to secondary-level education, a notable share of the population continues to have limited formal educational exposure.

Landholding pattern

2% of respondents were large farmers, with landholdings exceeding 10 hectares.

20% of respondents were medium farmers, cultivating between 4–10 hectares of land.

28% of respondents were semi-medium farmers, owning between 2–4 hectares of land

27% of respondents were small farmers, with landholdings ranging from 1–2 hectares.

23% of respondents were marginal farmers, owning less than 1 hectare of cultivable land.

A comparison of the two villages shows that Ratadgaon had a higher proportion of small and semi-medium farmers, while Agadgaon had a greater concentration of marginal farmers and the only large farmer in the sample. Despite these differences, the overall landholding pattern indicates that the beneficiary population is predominantly composed of marginal, small, and semi-medium farmers (78%), with landholdings below 4 hectares. This reflects a community that largely depends on small-scale agriculture and is therefore more vulnerable to water scarcity, erratic rainfall, and climate-related risks, highlighting the importance of the watershed interventions implemented under the project.

100% of respondents reported farming as a source of income

42% of respondents supplemented their income through wage labour

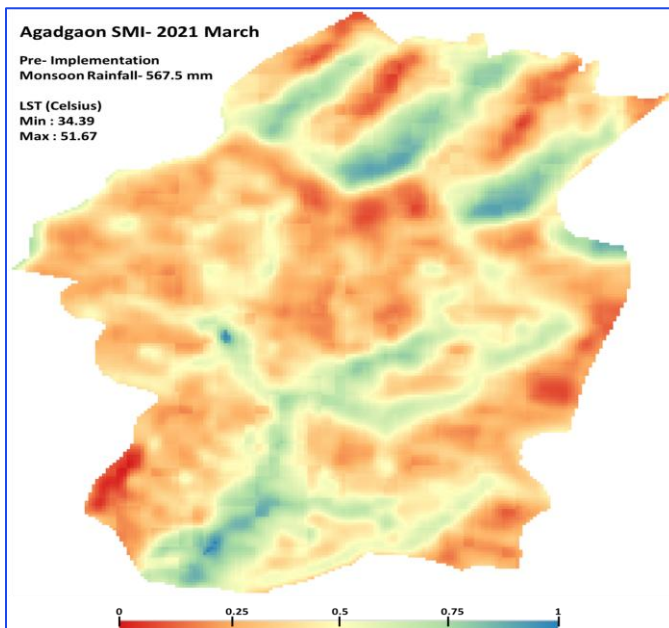
17% of respondents earned additional income from small businesses and local enterprises

It was observed that while agriculture was the primary source of livelihood for all surveyed households, many farmers reported diversifying their income through labour work especially marginal and small farmers and small businesses to manage seasonal and economic uncertainties. This indicates that while farming remains the backbone of the local economy, many households rely on multiple income sources to support their livelihoods.

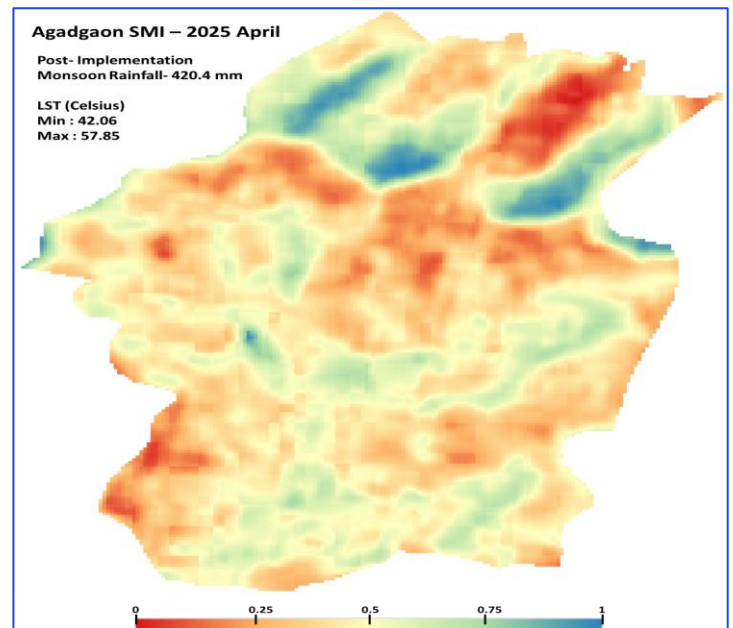
Interaction with farmers at their farms in Ratadgaon Village



Increased water storage capacity



SMI Map of Agadgaon of 2021



SMI Map of Agadgaon of 2025

As shown in Table 1, Agadgaon experienced severe water stress conditions both before and after project implementation, reaching Stress Level 5, which indicates an extended period of consecutive dry months with minimal rainfall. The rainfall analysis further shows that monsoon rainfall declined from 567.5 mm in 2021 to 420.4 mm in 2025. Despite lower rainfall and continued high water stress, the SMI maps (2021–2025) reveal a noticeable increase in blue and green patches and a reduction in orange and red patches. This indicates improved soil moisture retention across the watershed. The findings suggest that the watershed interventions enhanced groundwater recharge and enabled the village to maintain better moisture conditions even under severe water stress.

Row Labels	Agadgaon Rainfall					
	2020	2021	2022	2023	2024	2025
January	0	3.8	0	3.9	4	1.5
February	0	0	0	0	0	1.9
March	0.3	0	0	3.6	0	0
April	3.4	7.5	0	9.7	6.1	0
May	18	49.7	8.2	8.9	15.7	95.8
June	121.3	73.4	70.6	41.6	114.3	54.4
July	80.5	75.3	79.2	97.4	68.8	39.6
August	40.1	33.8	36.3	8.3	49.2	56.7
September	180.5	162.6	141.4	144	101.9	222.5
October	123.7	42.4	133	6.6	58.1	23.7
November	3.8	14.7	3.8	44.3	6.3	7.2
December	0	5.5	4	4.1	0	0

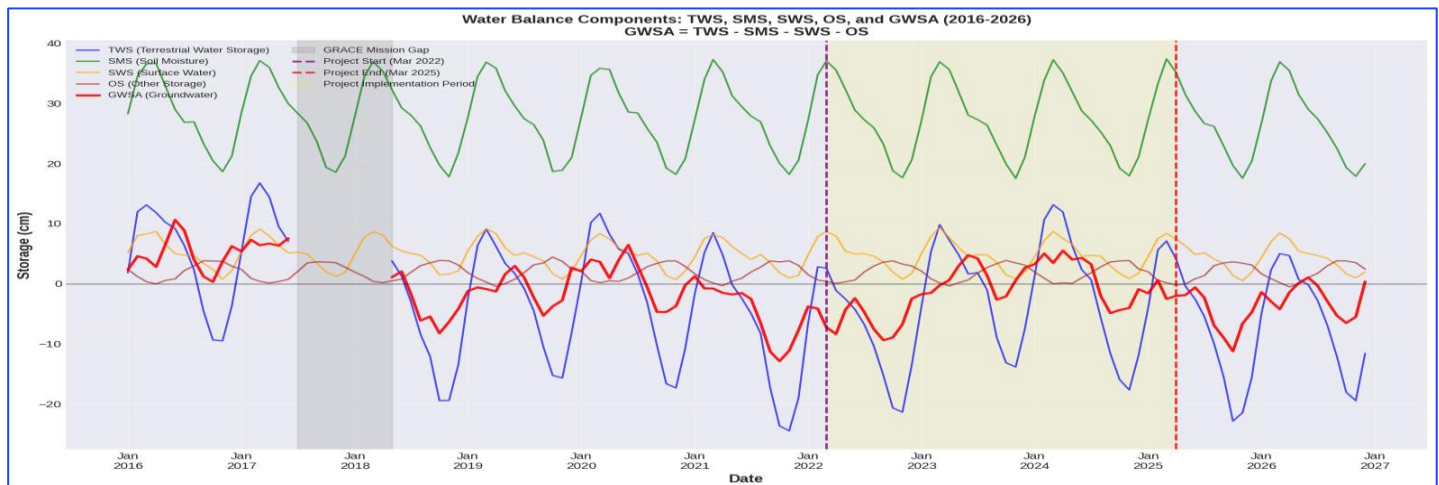
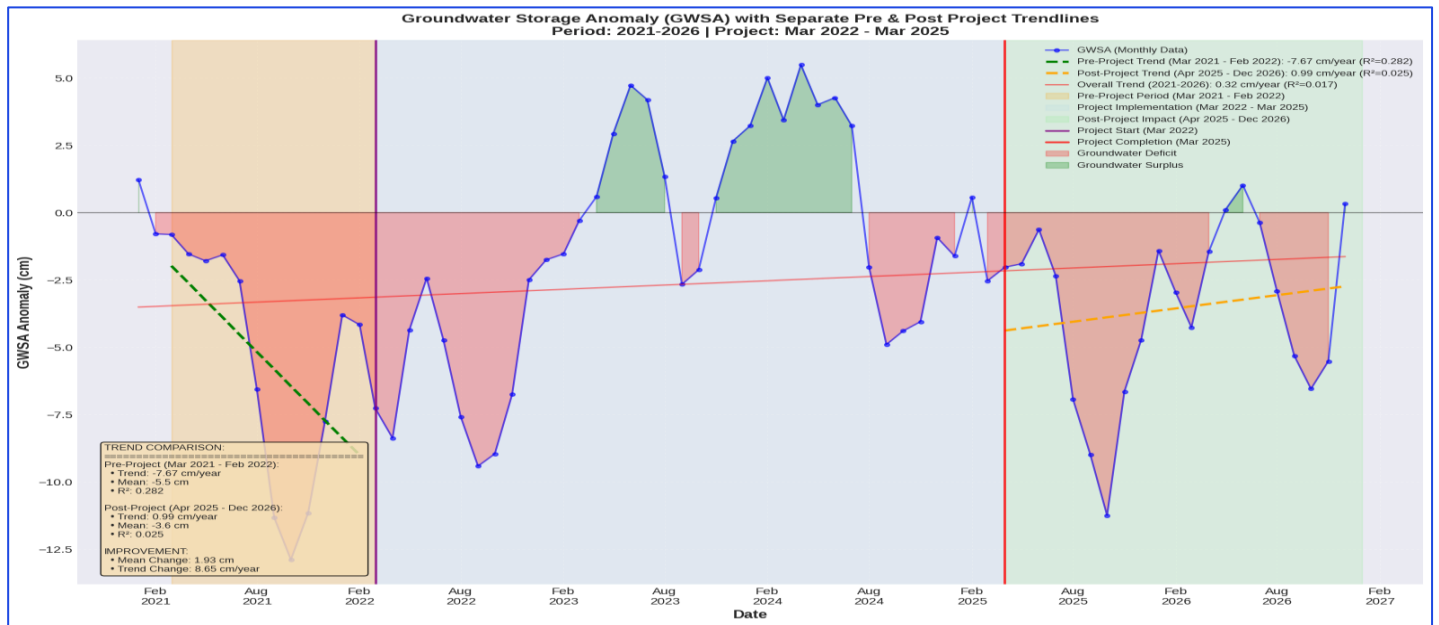
Table 1: Rainfall & Stress Analysis

Agadgaon			
Severity Level	Pre-implementation months	Post-implementation months	Seasonal Difference (more than 2 months - not considered)
1	2022-January	2025- December	1
2	2022-February	2026- January	1
3	2021- January	2026- February	1
4	2021- February	2026- March	1
5	2021- March	2025- April	1

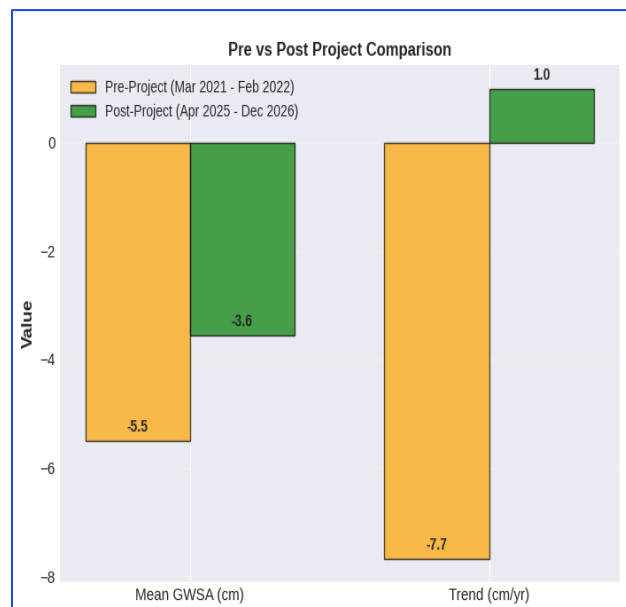
Table 1.1: Severity levels

The Severity Level (L1–L5) represents the intensity of water stress based on the number of consecutive months receiving less than 5 mm of rainfall. It is used to identify how long the area has remained under dry conditions. Higher severity levels indicate prolonged moisture stress and greater pressure on soil moisture, groundwater, and vegetation.

Groundwater Storage Graph of Agadgaon

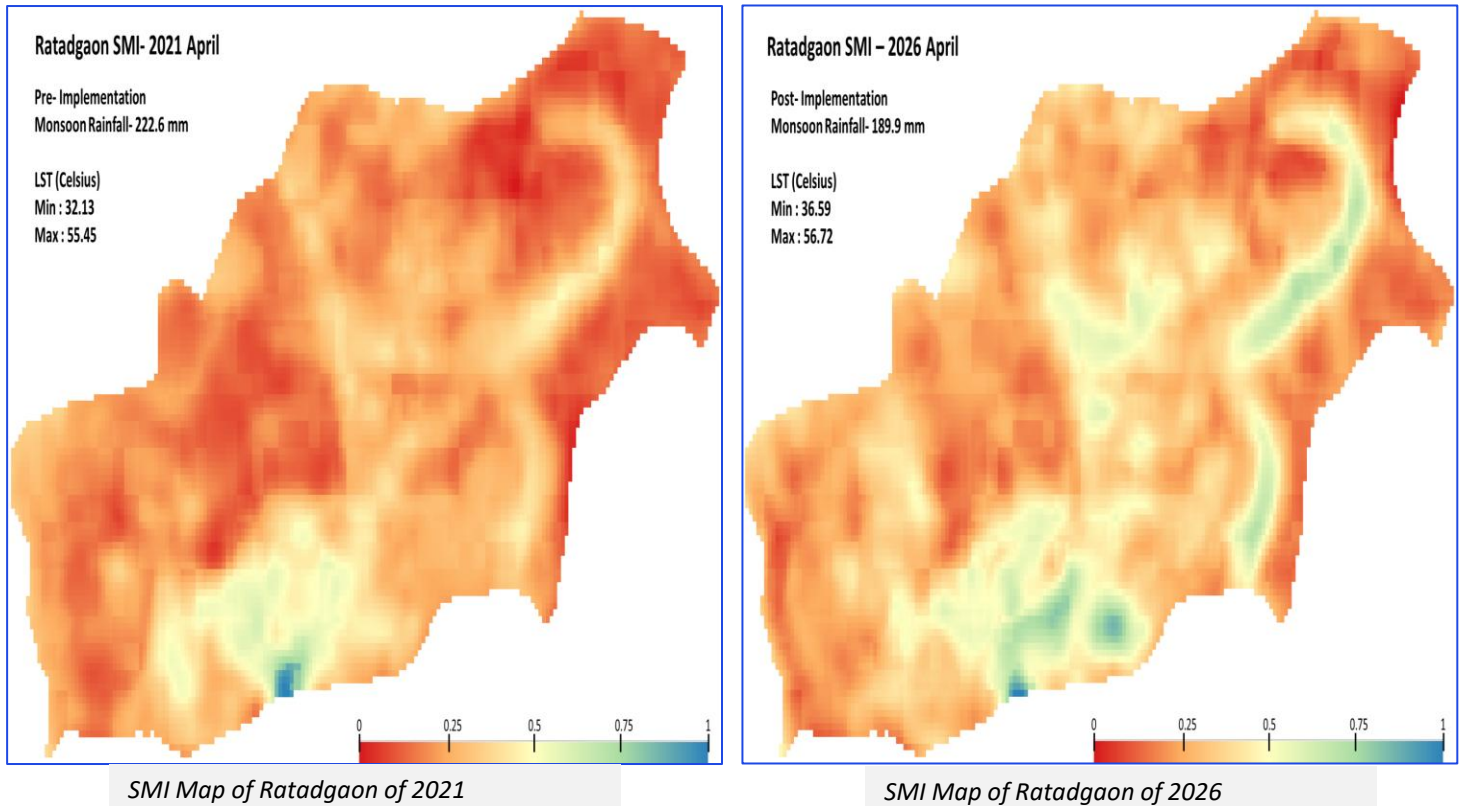


Water Balance Graph of Agadgaon



Trend Analysis Graph of Agadgaon

As shown, Agadgaon was experiencing a significant decline in groundwater storage before project implementation, with a Groundwater Storage Anomaly (GWSA) trend of -7.67 cm/year. Following the watershed interventions, this trend reversed to +0.99 cm/year, representing a net improvement of 8.65 cm/year. The mean groundwater storage anomaly also improved from -5.5 cm to -3.6 cm from 2022 to 2026. The Water Balance Components graph further shows a gradual stabilization of groundwater conditions during and after the project period, with reduced groundwater deficit phases and improved recovery cycles. Together, these findings indicate enhanced groundwater recharge and increased water storage capacity within the watershed.



As shown in Table 2, Ratadgaon continued to experience even more severe water stress conditions, reaching Stress Level 6, reflecting prolonged dry periods and minimal rainfall. The rainfall analysis shows that monsoon rainfall declined from 222.6 mm in 2021 to 189.9 mm in 2026. However, the SMI maps (2021–2026) show an increase in moisture-rich blue and green zones and a reduction in dry orange and red areas compared to the baseline period. Despite lower rainfall and higher stress levels, soil moisture conditions improved, indicating that the watershed interventions strengthened water retention and groundwater recharge within the village.

Row Labels	Ratadgaon Rainfall - Monthly Data						
	2020	2021	2022	2023	2024	2025	2026
January	0	0.4	0	0.4	0.4	0.5	0
February	0	0	0	0	0	0.6	0.4
March	0	0	0	1.5	0	0	0
April	1.4	3.1	0	3.7	2.3	0.0	4.1
May	6.5	18.1	2.8	3.1	6.0	35.8	
June	47.5	28.7	25.8	17.1	45.3	22.0	
July	31.4	28.7	29.6	37.6	24.6	13.9	
August	16.7	14.1	15.2	3.7	20.5	23.9	
September	70.1	61.8	50.1	54.4	38.8	82.5	
October	46.9	15.3	49.4	3.0	22.3	9.2	
November	1.8	5.9	1.5	17.6	2.7	2.5	
December	0	2.2	1.4	1.4	0	0	

Table 2: Rainfall & Stress Analysis

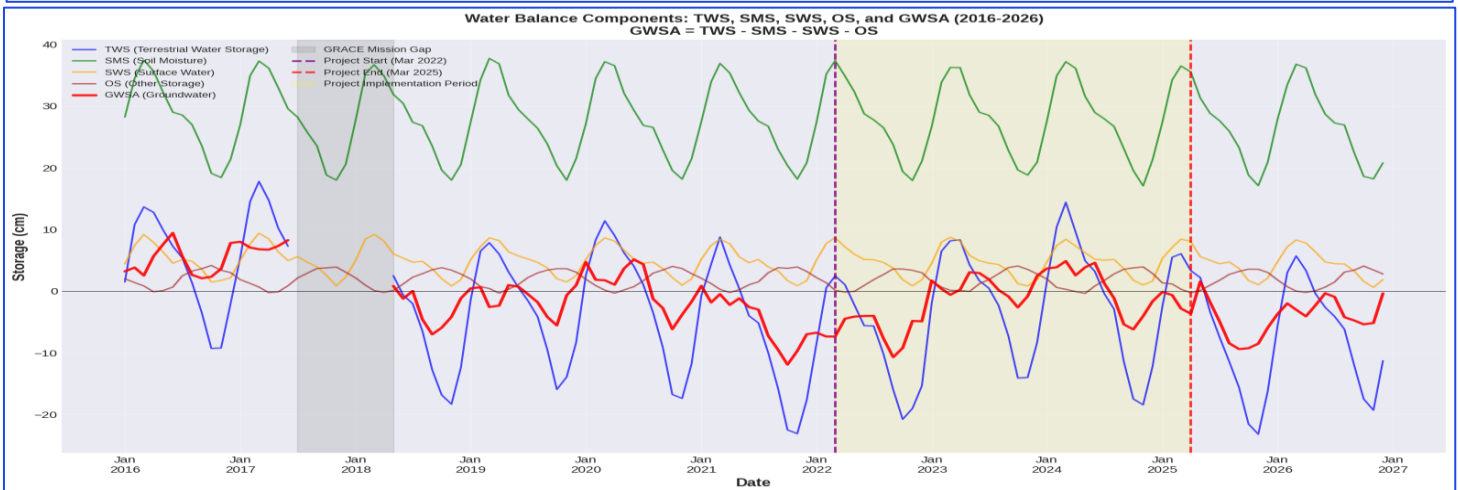
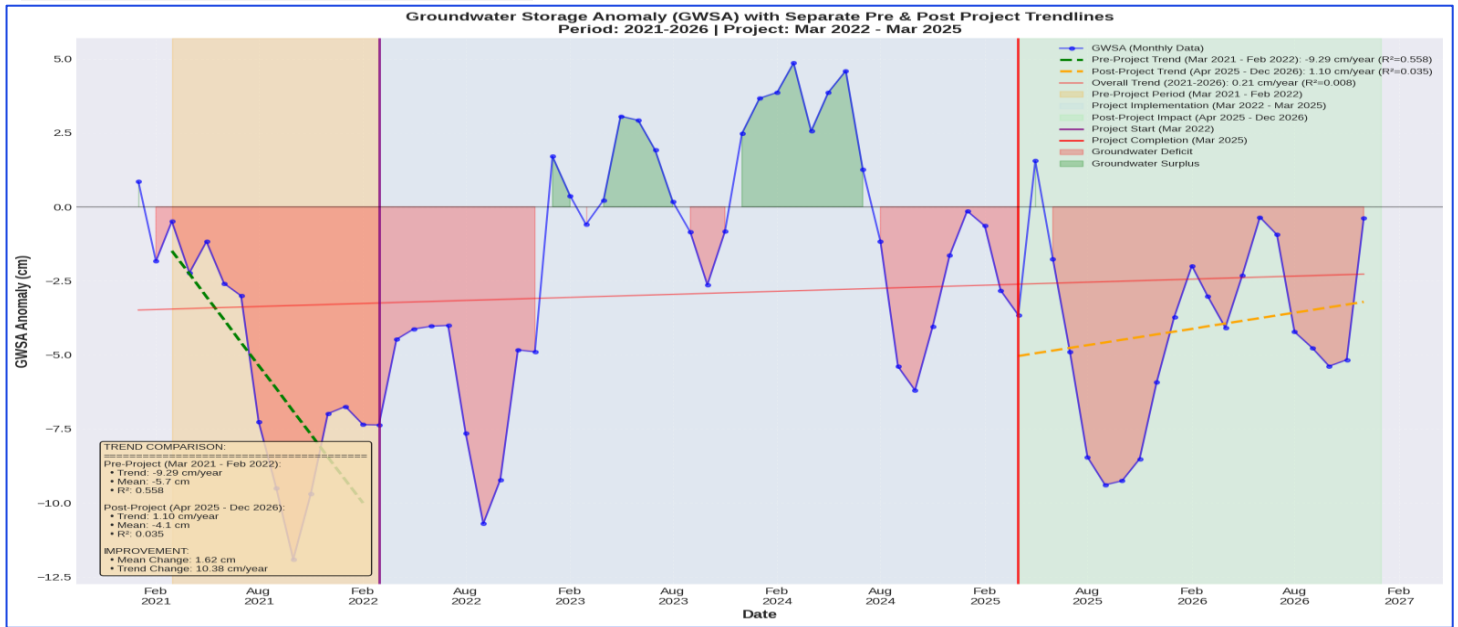
Ratadgaon			
Severity Level Rainfall below 5mm	Pre-implementation months	Post-implementation months	Seasonal Difference (more than 2 months - not considered)
1	2021- December	2025- November	1
2	2022- January	2025- December	1
3	2022-February	2026- January	1
4	2021-February	2026-February	0
5	2021-March	2026-March	0
6	2021- April	2026- April	0

Table 2.1: Severity levels

The Severity Level (L1–L6) represents the intensity of water stress based on the number of consecutive months receiving less than 5 mm of rainfall. It is used to identify how long the area has remained under dry conditions. Higher severity levels indicate prolonged moisture stress and greater pressure on soil moisture, groundwater, and vegetation.



Groundwater Storage Graph of Ratadgaon



Water Balance Graph of Ratadgaon



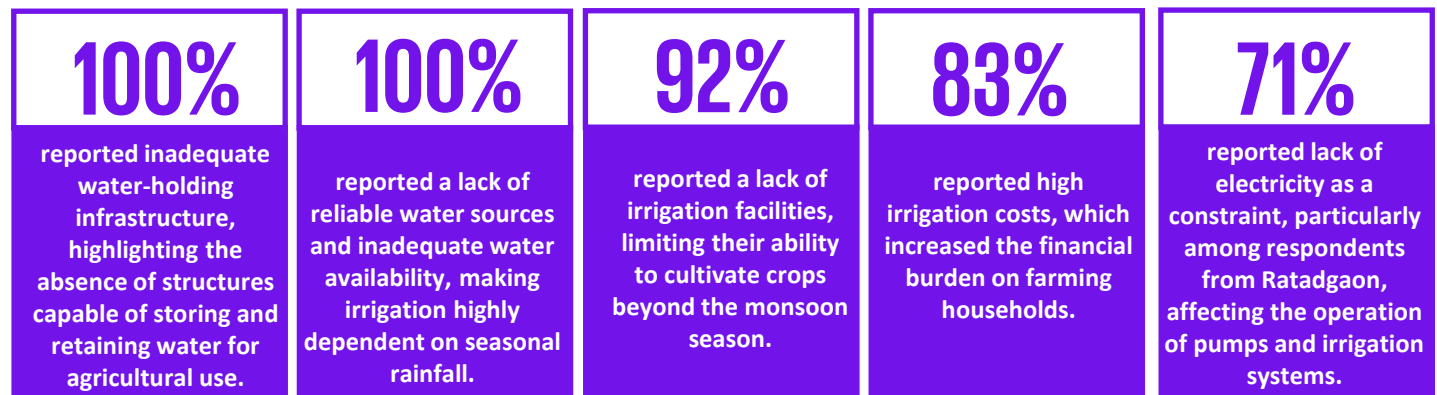
As shown, Ratadgaon experienced a groundwater depletion trend of -9.29 cm/year prior to project implementation. Following the intervention, the trend improved to +1.1 cm/year, resulting in a net improvement of 10.38 cm/year from 2022 to 2026. The Water Balance Components analysis also indicates improved groundwater stability, with fewer prolonged deficit periods and stronger recharge cycles during and after the project period. These results suggest that the watershed interventions strengthened groundwater recharge and contributed to sustained groundwater recovery in the village.

Trend Analysis Graph of Ratadgaon

Thus, this series of remote sensing and geospatial analyses conducted to assess changes in water availability, groundwater storage, and moisture conditions across the project villages highlights the project's contribution towards improving water security and strengthening climate resilience.

- ❑ Despite experiencing lower rainfall and prolonged dry periods, both Agadgaon and Ratadgaon showed improved soil moisture conditions, indicating enhanced moisture retention within the watershed.
- ❑ Groundwater depletion trends reversed significantly following project implementation, with Agadgaon and Ratadgaon recording improvements of 8.65 cm/year and 8.55 cm/year respectively, reflecting substantial groundwater recovery.
- ❑ The combined Water Stress, Soil Moisture Index (SMI), and Groundwater Storage analyses suggest that the watershed interventions enhanced the villages' capacity to capture, store, and retain water, resulting in improved long-term water security and resilience to drought conditions

Challenges faced pre intervention by farmers



The findings highlight that inadequate water infrastructure and limited water availability were the most significant barriers to irrigation before the project. The absence of reliable water sources, coupled with insufficient irrigation facilities and high irrigation costs, restricted agricultural productivity and crop diversification. These challenges underline the need for watershed interventions aimed at improving water storage, recharge, and year-round access to irrigation water.

Pre - Intervention

100%

respondents relied primarily on wells and borewells for irrigation, with limited water storage infrastructure and high dependence on groundwater availability.

Post - Intervention

100%

Farmers reported they now access multiple water storage and recharge structures, including CNBs, lined farm ponds, RWH structures improving water availability and reducing dependence on a single source.

This highlights that the project enabled a shift from reliance on traditional groundwater sources to a diversified water storage system, strengthening water security and irrigation access across both villages.

Duration of Water Availability During the Dry Season

Village	Pre-Intervention	Post-Intervention
Agadgaon	100% of respondents reported water availability only till December–January	65% reported water availability till March–April ; 35% reported availability till May
Ratadgaon	100% of respondents reported water availability only till January–February	69% reported water availability till May–June ; 31% reported availability till April–May

Overall broadly it indicates that:

- Prior to the project, water sources in both villages typically dried up by December–February, leading to severe water stress during summer months.
- After the intervention, water availability extended by approximately 3–5 additional months, allowing farmers to access water well into the dry season.
- Ratadgaon reported longer water retention, with nearly 70% of households having access to water until May–June, while in Agadgaon most households reported availability until March–April.
- This indicates improved water storage capacity and groundwater recharge, enabling households to meet irrigation and domestic water needs for a significantly longer duration

AGADGAON

100%

of respondents reported that before the project, irrigation was available only during the Kharif season. Following the intervention, all respondents reported access to irrigation during both Kharif and Rabi seasons due to improved water availability.

RATADGAON

100%

of respondents reported that irrigation was earlier limited to the Kharif season. After the project, all respondents reported access to irrigation during Kharif and Rabi seasons, with water availability extending into a few months of the Zaid season, enabling cultivation for a longer duration of the year.

84%

of respondents reported a significant increase in the duration of water availability in wells and ponds.

16%

of respondents reported a slight increase in water availability duration following the intervention.

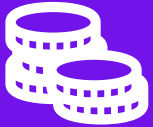
84% of respondents reporting a significant increase and 16% reporting a slight increase water availability post intervention. Farmers also observed improvements in groundwater levels. In Ratadgaon, well water levels that were earlier found at depths of 100–150 ft are now available at 80–100 ft, while borewell levels improved from 50–70 ft to 40–50 ft. Similarly, in Agadgaon, respondents reported that well water levels improved from 150–200 ft to 120–150 ft, and borewell water levels from 120–140 ft to around 80–100 ft. These findings indicate enhanced groundwater recharge and improved water security across both villages.



Reduced Time & Effort in Accessing Water

92% of respondents reported a reduction in time spent fetching water.

- Farmers shared that activities that earlier took 3–4 days can now be completed in 1–2 days due to improved water availability and proximity to water sources.



Lower Water-Related Costs

64% of respondents reported a reduction in water-related expenses.

- Improved water availability reduced dependence on water tankers and external water sources, leading to household savings.



Improved Livestock Productivity

92% of respondents reported increased milk and livestock productivity.

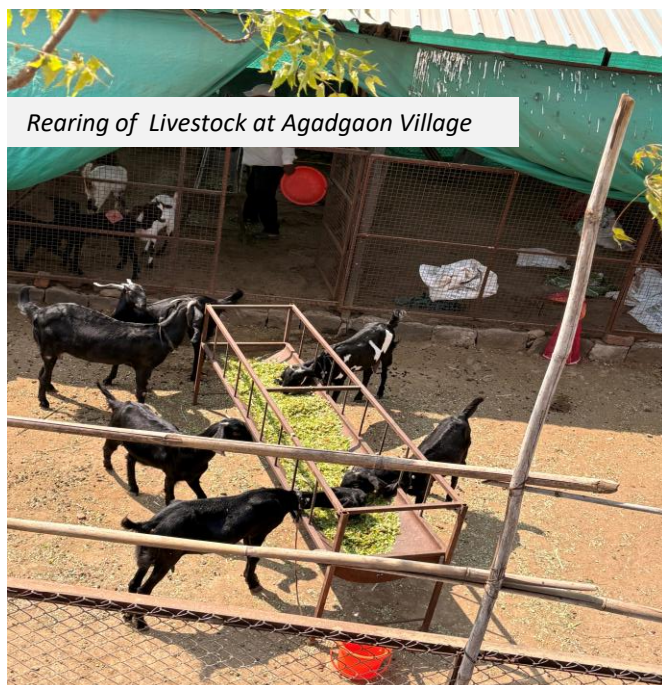
- Better water availability and improved fodder production supported healthier cattle, buffaloes, and goats, contributing to higher livestock-based incomes.



Reduced Drudgery for women

100% of respondents reported that improved water availability has reduced drudgery for women.

- Easier access to water has reduced the time and physical effort spent on fetching water for household and livestock needs.

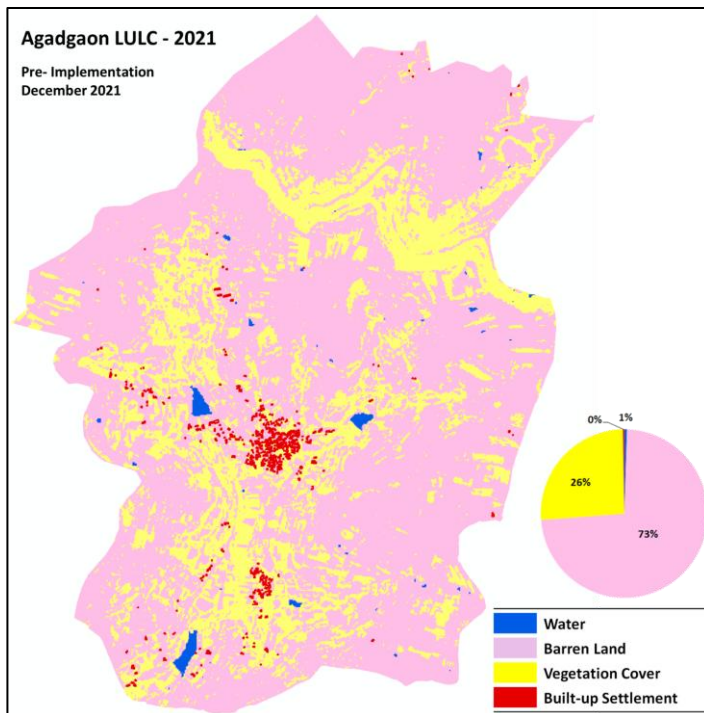


Rearing of Livestock at Agadgaon Village

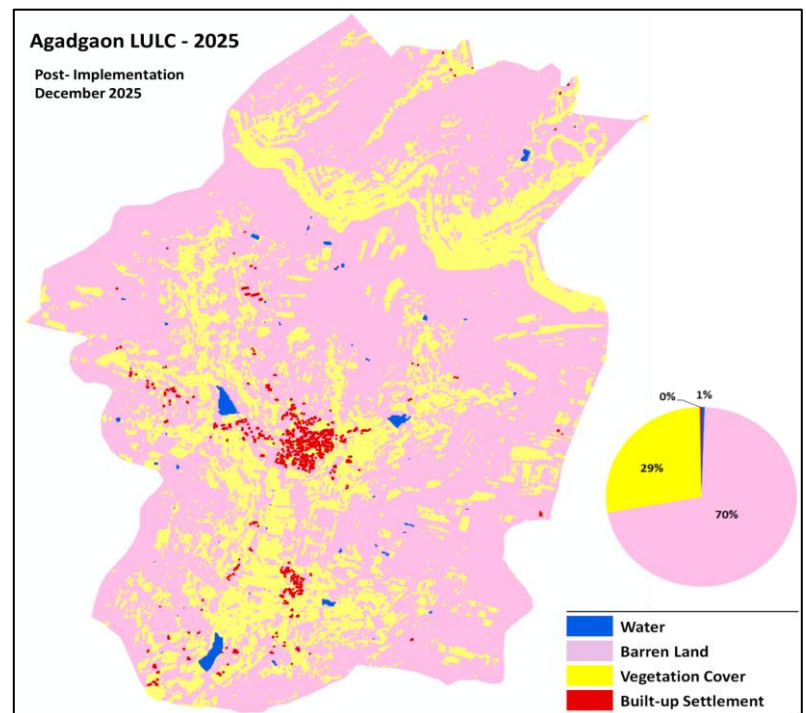


Interaction with female beneficiaries at Ratadgaon Village

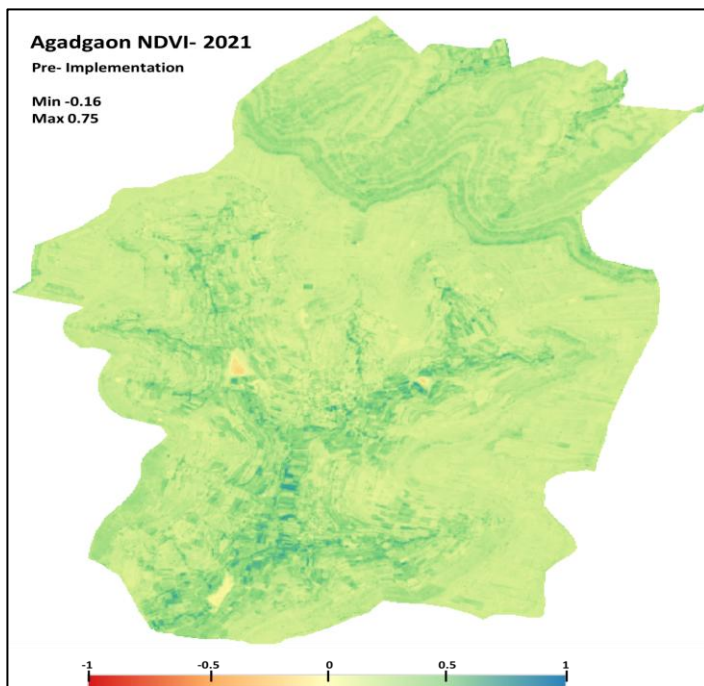
Improved Soil Moisture , Reduced Erosion & Higher Crop Yield



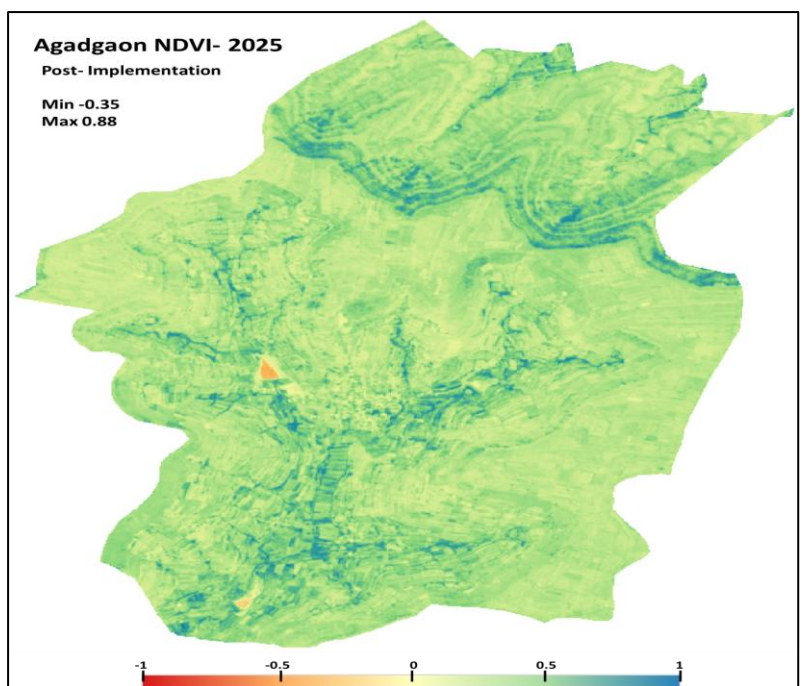
LULC Map of Agadgaon in 2021



LULC Map of Agadgaon in 2025

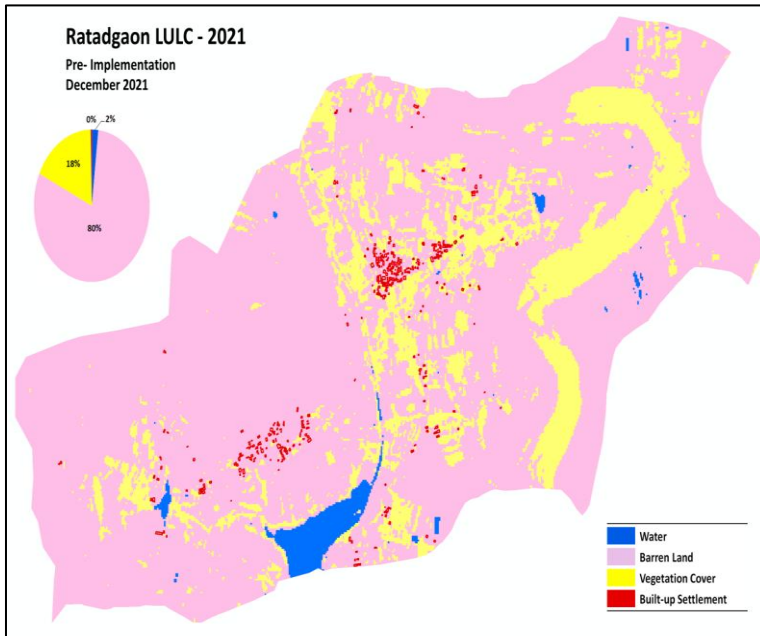


NDVI Map of Agadgaon in 2021

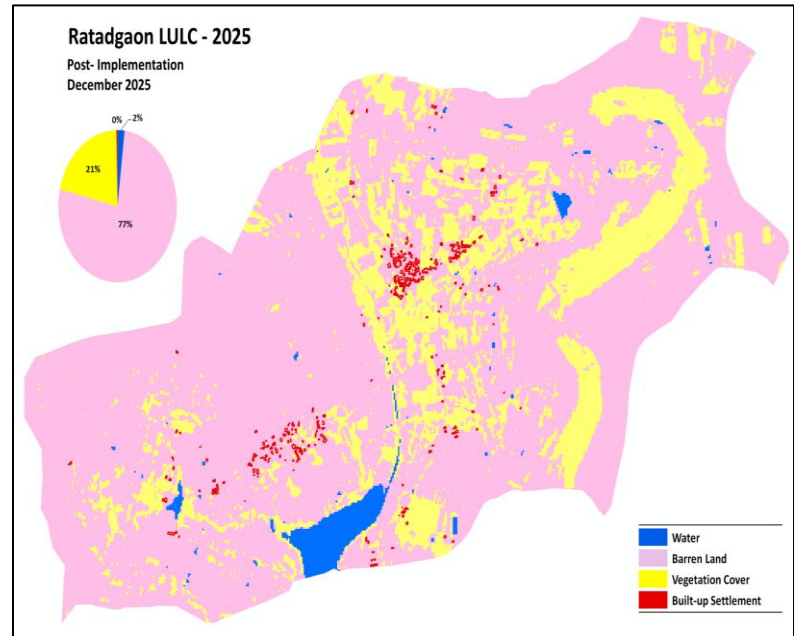


NDVI Map of Agadgaon in 2025

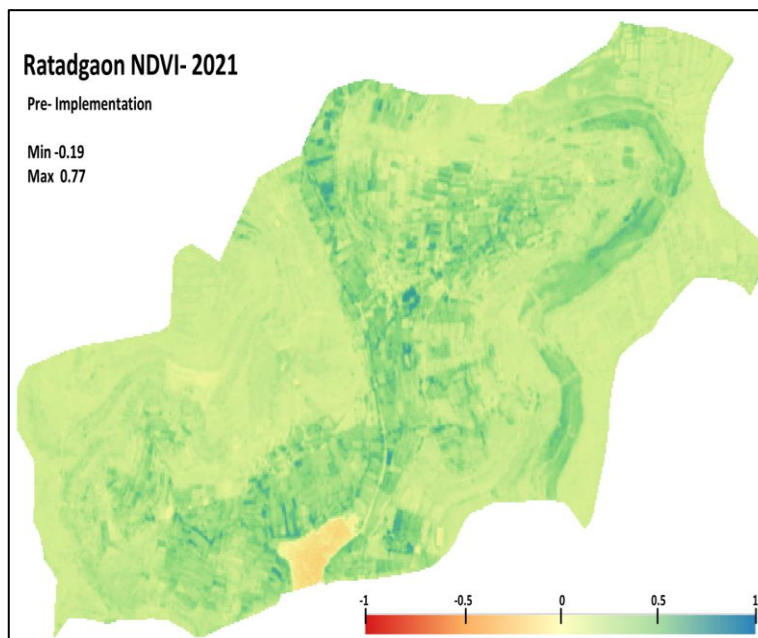
In Agadgaon, the LULC analysis shows an increase in agricultural land from 26% in 2021 to 29% in 2024, accompanied by a reduction in fallow land from 73% to 70%. Similarly, the NDVI analysis shows a substantial increase in vegetation vigor, with maximum NDVI values increasing from 0.75 to 0.88. The post-intervention maps also reveal a wider spread of healthy vegetation and improved water retention across the landscape. These findings suggest that increased soil moisture availability and reduced runoff have enabled more land to be brought under cultivation while supporting healthier crop growth and improved productivity.



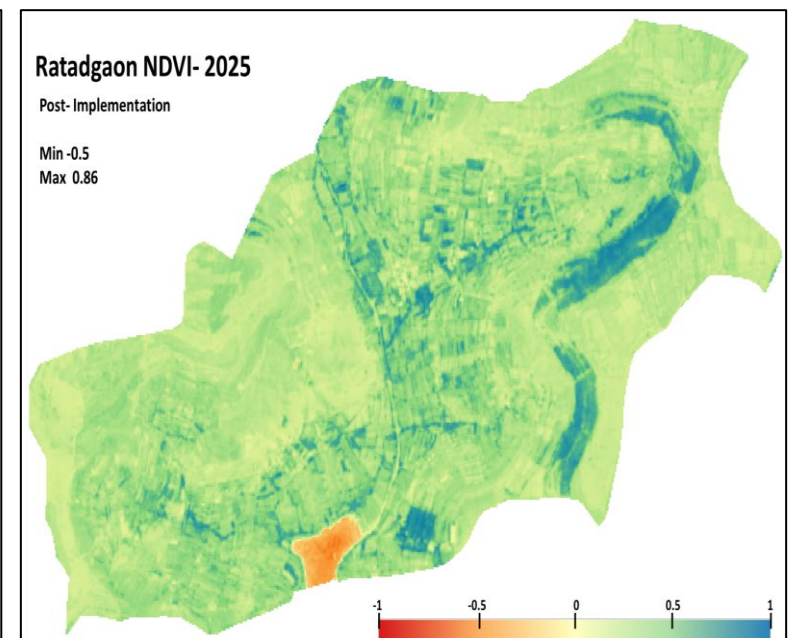
LULC Map of Ratadgaon in 2021



LULC Map of Ratadgaon in 2025



NDVI Map of Ratadgaon in 2021



NDVI Map of Ratadgaon in 2025

In Ratadgaon, the LULC analysis indicates the gradual conversion of previously fallow and water-stressed land into productive agricultural areas from 18% to 21%. The NDVI analysis further highlights a significant improvement in vegetation health, with maximum NDVI values rising from 0.77 to 0.86. The expansion of dense vegetation corridors and healthier crop cover reflects improved soil moisture retention and reduced soil erosion within the watershed. Improved water availability has enabled better crop establishment and growth, creating more favorable conditions for agricultural production.

Together, the LULC and NDVI analyses provide evidence that watershed interventions have enhanced soil moisture, reduced land degradation, and created conditions conducive to higher crop productivity and sustainable agricultural growth in both the villages.



92%

reported a significant improvement in soil moisture on their farms after the interventions.

8%

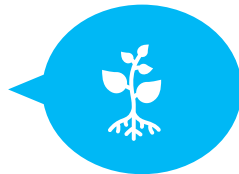
reported a slight improvement in soil moisture levels on their farms after the intervention

The findings suggest that area treatment interventions have been highly effective in improving soil moisture retention across beneficiary farms. Enhanced moisture availability has helped reduce runoff and soil erosion, improved soil health, and created better conditions for crop growth. These findings are further validated by the LULC, NDVI, Water Stress, and Soil Moisture Index (SMI) analyses, which indicate improved vegetation health, expansion of cultivated land, better moisture retention, and enhanced water availability across both villages. Together, the results demonstrate that the interventions have contributed to increased agricultural productivity and strengthened resilience to dry spells and water stress.



100%

reported better soil moisture retention, indicating improved water-holding capacity and availability of moisture for crops over a longer duration.



92%

Reported improved crop stand and crop establishment, reflecting healthier growing conditions and better crop performance.



84%

reported reduced soil erosion, suggesting that interventions such as bunding, trenching, pitching, and vegetative measures have helped minimize topsoil loss and runoff.

Farmers reported adopting sustainable soil health practices such as **mulching and crop rotation** after participating in agricultural training sessions conducted under the project. Beneficiaries noted that these practices have helped improve soil moisture retention, maintain soil fertility, and support healthier crop growth. The adoption of these practices reflects enhanced awareness of sustainable farming methods and improved soil management among farmers.

100%

reported increased crop yields during the Kharif season.

84%

reported increased yields during the Rabi season

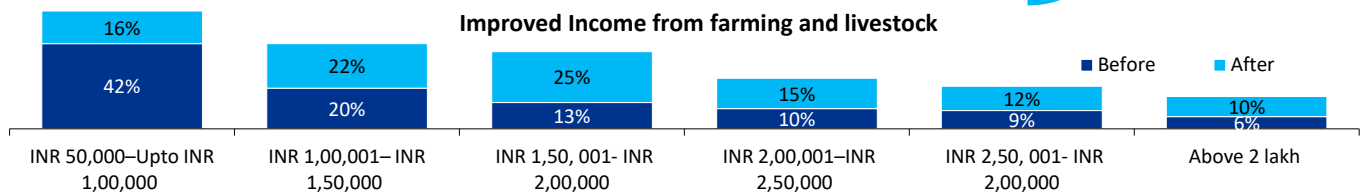
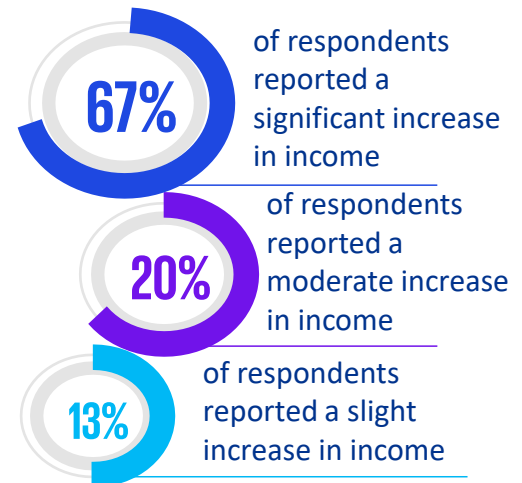
15%

reported yield improvements during the Zaid season

The findings indicate that yield improvements were most prominent during the Kharif season, while improved water availability also enabled a substantial share of farmers to increase production during the Rabi season. This reflects the project's contribution to enhancing cropping intensity, extending cultivation beyond the monsoon period, and improving overall agricultural productivity and improved income levels.

Increased farm income from diversified new income sources

The findings indicate a positive impact of the project on household incomes, with 87% of respondents reporting either a moderate or significant increase in income. The highest gains were observed among farmers with larger landholdings and greater irrigation access. The 13% who reported only a slight increase were largely marginal and small farmers, whose limited land size restricted immediate income growth despite improvements in water availability. Overall, the results suggest that enhanced water security and agricultural productivity have strengthened livelihoods and created opportunities for further income growth in the project villages.



The income bracket analysis indicates a clear upward movement in annual household earnings, as reported by farmers, following the project intervention. Beneficiary households primarily cultivate soybean, jowar, maize, hulga, and vatana, with some also engaged in horticulture, while income sources include both farming and livestock activities across agricultural seasons. The substantial decline in the lowest income category and the increase in middle- and higher-income groups reflect the positive effects of improved water availability, enhanced irrigation access, and higher agricultural productivity. While marginal and small farmers reported relatively lower income gains, many have progressed into higher income brackets, indicating improved livelihood security and resilience. Compared to the benchmark reported by NSO for agricultural year 2018-19 Maharashtra average agricultural household income¹ of approximately INR 1.38 lakh per annum, a growing proportion of project beneficiaries have surpassed this benchmark, demonstrating the project's contribution to increased farm incomes and strengthened rural livelihoods.

100% of respondents identified improved water availability as the primary factor behind increased household incomes.

84% of respondents diversified from traditional rainfed crops like jowar, matki, hulga to higher-value crops such as vegetables and cash crops (soybean, maize, onion, wheat etc)

92% of respondents reported higher livestock productivity and increased livestock ownership due to improved water availability.

25% of respondents adopted horticulture crops such as orange, chikoo, pomegranate, Custard apple, guava, generating higher-value & long-term income opportunities.

This highlights that improved water availability has been the primary enabler of livelihood diversification through crop diversification, promoting horticulture, enhancing livestock-based incomes, and reducing dependence on traditional rainfed farming systems which has resulted in income growth among beneficiary households.

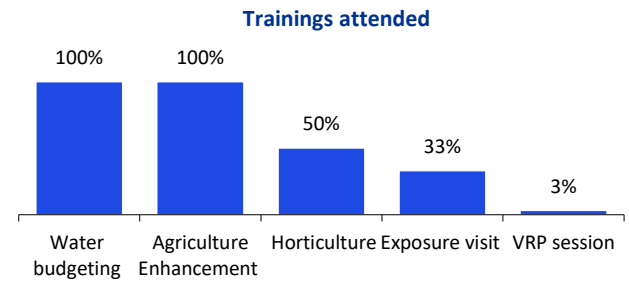
Source:

1. Press Information Bureau. (2022, December 16). Income of farmers (Release ID: 1884228). Government of India, Ministry of Agriculture & Farmers Welfare.



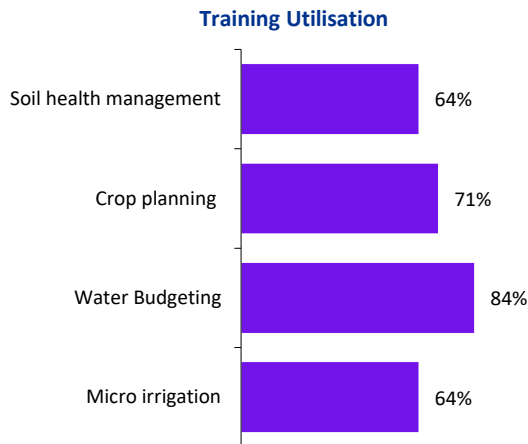
Enhanced knowledge on water budgeting and sustainable farming

The findings indicate strong participation in capacity-building activities, particularly on water budgeting and agricultural enhancement. The trainings have contributed to improved awareness of sustainable farming practices, crop diversification, water management, and soil health, supporting the long-term sustainability of project outcomes.



92%

of respondents rated the trainings as “Very Useful” on the scale of 5 highlighting their relevance and practical value for farmers. The high satisfaction levels indicate that the training interventions were well-received and effectively strengthened farmers’ knowledge and capacity in water management and sustainable agriculture. The adoption of improved farming practices further demonstrates the practical applicability of the training sessions at the farm level.

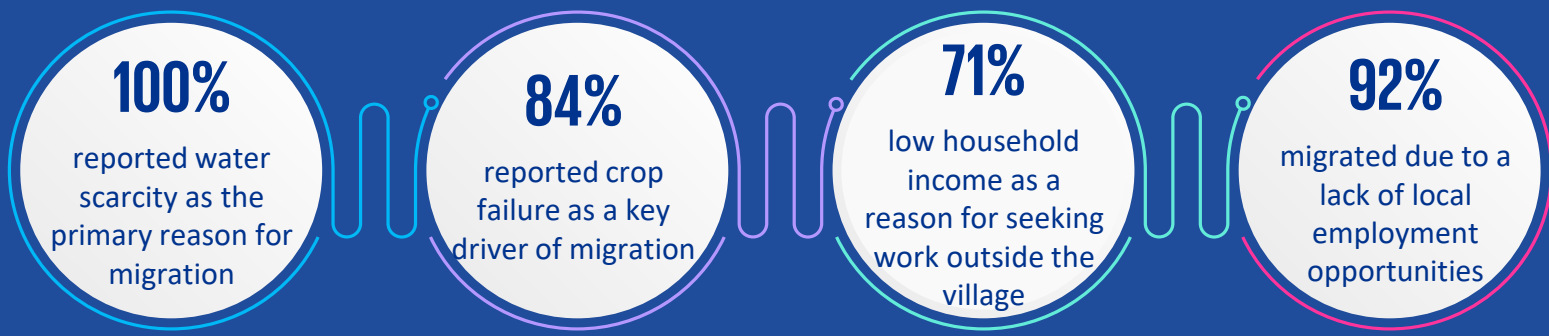


It was observed that the training programmes have led to the widespread adoption of improved agricultural and water management practices among beneficiary farmers. 84% reported adopting water budgeting practices, while 71% adopted crop planning and 64% adopted soil health management practices. Additionally, 64% of respondents reported adopting micro-irrigation techniques to improve water-use efficiency. These findings suggest that the training interventions were highly effective in translating knowledge into practice, enabling farmers to make better decisions regarding water use, crop selection, and sustainable farm management.

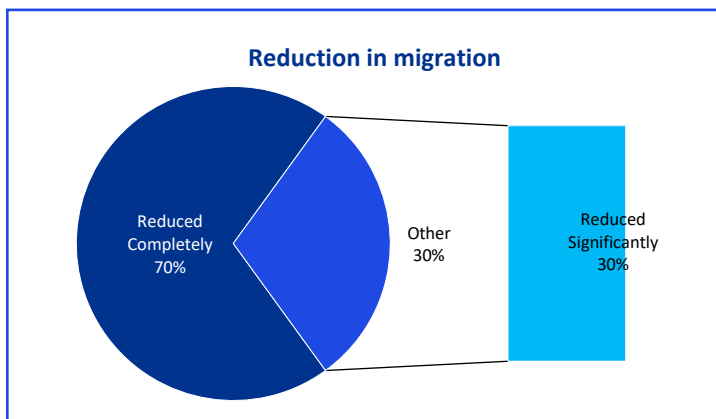
The high adoption of water budgeting practices has translated into several positive changes in farm planning and water management. Farmers reported the following benefits:

- ☐ Selected crops based on available water resources, reducing the risk of crop failure.
- ☐ Planned Rabi and summer crops according to stored water availability, enabling better crop planning.
- ☐ Adopted soil testing practices to better understand soil nutrient requirements and optimize input use.
- ☐ Improved irrigation timing and reduced water wastage through efficient water use practices
- ☐ Adopted community-based water sharing and collective management of limited water resources and storage structures.
- ☐ Managed summer water shortages more effectively, ensuring water availability for both agricultural and household needs.

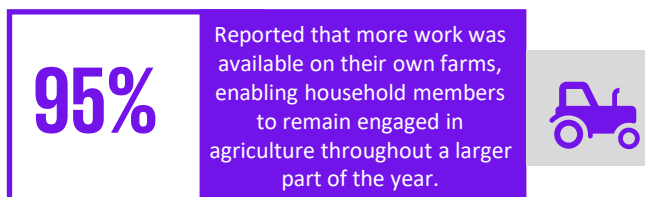
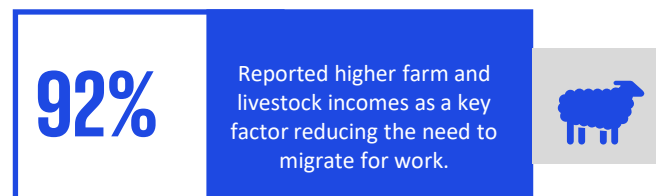
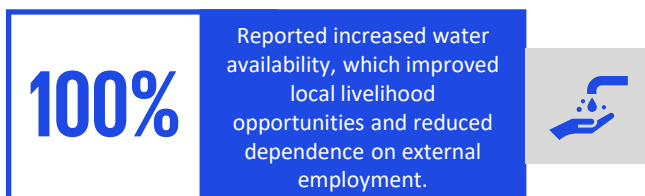
Reduced Distress Migration



The findings indicate that migration was primarily driven by water scarcity and its impact on agriculture. Limited water availability led to crop failures, reduced farm incomes, and fewer local livelihood opportunities, forcing many households to seek seasonal employment outside the village.



The findings suggest that improved water availability, increased agricultural productivity, and enhanced livelihood opportunities have substantially reduced the need for seasonal migration. This impact was particularly more pronounced in Ratadgaon, where longer water availability, greater access to irrigation across multiple seasons, and stronger livelihood improvements contributed to a more significant reduction in migration among beneficiary households.



Farmers reported the following positive changes following the reduction in migration:

- ❖ More time spent with family, leading to greater household stability and stronger social relationships.
- ❖ Improved farm and livestock management, as family members were available to actively participate in agricultural activities.
- ❖ Greater focus on children's education, resulting in better school attendance and continuity in learning.
- ❖ Improved overall well-being, with more time for rest, family responsibilities, and community participation, contributing to reduced stress and a better quality of life.



Name: Saveram

Background:

Saveram, a farmer from Agadgaon, owns 8 acres of agricultural land and has traditionally depended on farming for his livelihood. Before the watershed interventions, farming was largely dependent on the monsoon, with irrigation available only during the Kharif season. Limited water availability, inadequate irrigation infrastructure, and recurring crop losses restricted agricultural productivity and income. Water scarcity also affected livestock productivity and created pressure on households to seek alternative livelihood opportunities.



Stories from Ground

Turning Point

The turning point came with the implementation of water conservation and recharge structures, including desilted tanks, lined farm ponds, and rainwater harvesting recharge systems. Improved water availability, coupled with participation in Agriculture Enhancement, Horticulture, and Exposure Visit trainings, enabled Saveram to adopt better farming practices such as crop planning, drip irrigation, soil testing, fertilizer management, and crop rotation. With water now available for more than eight months, cultivation expanded from only Kharif to both Kharif and Rabi seasons. Improved water security also encouraged him to start mango horticulture and expand livestock activities.

Impact

The interventions have significantly transformed Saveram's livelihood. His annual income increased from approximately INR 1.3 lakh to INR 2.5–3 lakh, driven by improved crop yields, diversified farming practices, livestock productivity, and better market opportunities.

Access to reliable irrigation reduced the time spent managing water from three days to one day, while improved soil moisture and better crop planning enhanced yield consistency and reduced crop losses. The family also benefited from increased food availability, improved livestock health, and additional income from horticulture, livestock activities and small grocery shop. Importantly, migration from the household has stopped completely. With improved livelihood opportunities available locally, the family now spends more time together, can focus on children's education, and devote greater attention to farm and livestock management.



"Earlier, my family depended only on the monsoon and could cultivate crops during one season. Water scarcity affected both farming and livestock. Today, water is available for a much longer period, allowing us to cultivate more crops, start mango plantation, and improve our livestock. Our income has increased significantly, migration has stopped, and we can now focus on our children's education and our future."

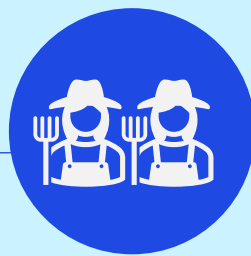
-- Saveram



Name: Sukanya & Chaya

Background:

Sukanya and Chaya are from Agadgaon, own approximately 6 acres of agricultural land each and have traditionally relied on agriculture as their primary source of livelihood. Prior to the project, limited water availability restricted cultivation largely to monsoon-dependent crops, resulting in lower agricultural productivity and annual incomes of around INR 1 lakh. Water scarcity also increased the burden of irrigation management and household water collection, leaving less time for farming, family responsibilities, and personal well-being.



Stories from Ground

Turning Point

The turning point came with the implementation of watershed interventions that improved water availability and groundwater recharge across the village. Improved irrigation access, combined with agricultural training and better water management practices, enabled both farmers to diversify their farming systems and utilize their land more productively. With greater water availability, they expanded beyond traditional crops and began cultivating vegetables and higher-value cash crops such as soybean and onion. Improved water security also supported the expansion of livestock activities, allowing them to increase the number of goats and buffaloes owned by their households.

Impact

The improved availability of water transformed both agricultural production and household livelihoods. Crop diversification, increased cultivation, and higher livestock productivity led to a significant rise in household income, with annual earnings increasing from approximately INR 1 lakh to INR 2 lakh.

They reported that improved irrigation access reduced the time and effort previously spent managing water for farming activities. With less time devoted to irrigation and water collection, they were able to focus more on crop management, livestock care, family responsibilities, and their children's well-being.

The increase in water availability also improved fodder production and livestock health, leading to higher productivity from goats and buffaloes. In addition, improved farm incomes strengthened household food security and overall quality of life.



"Earlier, most of our time was spent managing water and worrying about whether crops would survive. Today, we can grow vegetables, soybean, and onion, rear more goats and buffaloes, and earn a much better income. Since irrigation has become easier and water is available for a longer period, we have more time for farming, our children, and our family. We feel healthier, less stressed, and more secure about our future."

-- Sukanya and Chaya

Project Alignment to UN SDGs

The Jal Jeevan– Water Cluster Project contributes to sustainable water resource management through watershed development, groundwater recharge, and soil conservation interventions. By addressing water scarcity, improving agricultural productivity, strengthening climate resilience, and restoring degraded natural resources, the project directly supports SDGs creating long-term environmental and socio-economic benefits for rural communities.

Key SDGs supported

SDGs	Target/ Subsection	How it aligns
 1 NO POVERTY	Target 1.4 – Equal access to economic resources and basic services Target 1.5 – Build resilience of vulnerable communities	Increased agricultural productivity and reliable water access improve livelihood security and reduce vulnerability to drought and climate-related shocks.
 2 ZERO HUNGER	Target 2.3 – Double agricultural productivity and incomes of small-scale food producers Target 2.4 – Ensure sustainable food production systems	Improved irrigation coverage, soil moisture conservation, and water availability support higher Kharif and Rabi yields, increased cropping intensity, and improved farm incomes.
 6 CLEAN WATER AND SANITATION	Target 6.4 – Increase water-use efficiency and ensure sustainable freshwater supply Target 6.6 – Protect and restore water-related ecosystems	The project enhances groundwater recharge, improves water retention, creates water storage structures, and ensures year-round drinking water availability for households and livestock.
 13 CLIMATE ACTION	Target 13.1 – Strengthen resilience and adaptive capacity to climate-related hazards	Soil and water conservation measures improve drought resilience, enhance water security, and help communities adapt to climate variability and erratic rainfall.
 15 LIFE ON LAND	Target 15.3 – Combat desertification and restore degraded land Target 15.1 – Conserve terrestrial ecosystems	The project reduces soil erosion, restores watershed functions, improves vegetation cover, and promotes sustainable land management practices.

Project Alignment to National and Local priorities

The project directly addresses critical challenges faced by Agadgaon and Ratadgaon, including soil erosion, groundwater depletion, seasonal water scarcity, low agricultural productivity, and drinking water shortages. By improving water retention, recharge, irrigation access, and livelihood opportunities, the project supports sustainable rural development and strengthens the resilience of farming communities in Ahilyanagar district.

National Policy / Mission	What It Says	How program aligns
Jal Shakti Abhiyan (Catch the Rain)	Promotes rainwater harvesting, groundwater recharge, watershed development, and water conservation to address water stress.	The project creates recharge and water storage structures, reduces runoff, and improves groundwater availability through watershed interventions.
Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) – Watershed Development Component	Focuses on enhancing soil and water conservation, increasing water-use efficiency, and expanding irrigation coverage in rain-fed areas.	Soil conservation measures, moisture retention interventions, and improved water availability support increased irrigation and agricultural productivity.
Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	Encourages natural resource management, drought-proofing, and creation of durable community assets in rural areas.	The project strengthens rural infrastructure through watershed development, soil conservation, and water harvesting assets that provide long-term community benefits.
National Mission for Sustainable Agriculture (NMSA)	Aims to make agriculture more resilient through efficient water management, soil health improvement, and climate adaptation.	Improved groundwater recharge, increased soil moisture, erosion control, and better water access help farmers adapt to climate variability and improve farm productivity.
Maharashtra Water Conservation Initiatives (e.g., Jalyukt Shivar)	Focuses on making villages water secure through watershed treatment, groundwater recharge, and rainwater harvesting.	The project directly supports the state's objective of reducing water scarcity by enhancing water retention, improving recharge, and ensuring year-round water availability.

04

Conclusions and Recommendations



Conclusions and Recommendations

The impact assessment of the Jal Jeevan Water Cluster Project demonstrates significant progress in improving water security, groundwater recharge, soil moisture retention, agricultural productivity, and rural livelihoods in Agadgaon and Ratadgaon villages. Through integrated watershed development interventions, including soil and water conservation structures, groundwater recharge measures, capacity-building initiatives, and community participation, the project has contributed to increased water availability, improved farm incomes, enhanced crop productivity, and reduced seasonal migration.

The project has successfully strengthened the resilience of farming households by enabling year-round access to water, supporting crop diversification, promoting sustainable agricultural practices, and improving livelihood opportunities. Technical assessments, including Groundwater Storage Analysis, Water Stress Analysis, LULC, and NDVI assessments, further validate the positive environmental impacts of the interventions through improved groundwater trends, enhanced soil moisture, increased vegetation health, and expansion of cultivated land. While the project has delivered substantial benefits, there remains an opportunity to further consolidate these gains through continued promotion of horticulture, climate-resilient agricultural practices, and community-led water resource management. The following recommendations are therefore aimed at strengthening the long-term sustainability and scalability of project outcomes.

Promote Expansion of Horticulture and High-Value Crops

While the project has encouraged some farmers to adopt horticulture and diversify into higher-value crops, there remains an opportunity to further expand these practices, particularly among small and marginal farmers. Continued technical guidance, access to quality planting material, and support for market linkages can help farmers maximize the benefits of improved water availability and create more sustainable long-term income sources.

Scale Up Climate-Resilient Agricultural Practices

The adoption of practices such as water budgeting, crop planning, mulching, crop rotation, soil testing, and micro-irrigation demonstrates the positive impact of the project's capacity-building efforts. However, there is scope to further strengthen and scale up these practices across all beneficiary households to improve water-use efficiency, enhance climate resilience, and ensure the long-term sustainability of agricultural productivity gains.

Scaling Up Watershed Development Initiatives

The positive hydrological and ecological outcomes observed in the study suggest that similar watershed development interventions can be scaled up across water-stressed regions. Long-term rainfall data, drought severity records, groundwater depletion trends, and satellite-based water stress indicators should be used to identify priority watersheds. Targeting areas with recurrent rainfall deficits and prolonged dry periods can maximize the effectiveness of watershed investments and enhance climate resilience, agricultural sustainability, and water security at a larger landscape scale.

Thank you



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