Impact Assessment and Social Returns on Investment

Water Resource Management and Community Infrastructure Development Projects by Ambuja Cement Foundation in Baloda Bazaar, Chhattisgarh

Prepared for:

Ambuja Cement Limited

Crisil Intelligence
by S&P Global

Crisil Intelligence

Contents

Executive Summary

Ambuja Foundation has implemented a range of Water Resource Management (WRM) and Rural Infrastructure Development (RID) initiatives in Baloda Bazar, Chhattisgarh, to address water security, livelihood enhancement, and community well-being in 2022-23 and 2023-24. The current report provides a comprehensive Impact Assessment of the Water Resource Management (WRM) and Rural Infrastructure Development (RID) program and Social Returns on Investment (SROI) of the Water Resource Management (WRM) programby the Ambuja Foundation in Baloda Bazaar, Chhattisgarh in 2022-23 and 2023-24.

Study Methodology

The study adopted a mixed-methods approach using both quantitative and qualitative data collection techniques to ensure comprehensive insights.

A total of 252 structured survey interviews were conducted across key stakeholder groups (community members and farmers). In addition, Focused Group Discussions (FGDs) were conducted with stakeholder groups such as community members, water groups, and people with disabilities and Key Informant Interviews (KIIs) were conducted with school teachers and community leaders.

Study Findings:

CRISIL surveyed 252 respondents across 10 villages of Baloda Bazar region. The demographic findings show that the respondents surveyed in the region belonged to marginalized backgrounds with low incomes.

A. Water Resource Management Initiatives

Water Resource Development Process: As per most respondents—ponds (88%) were constructed or deepened in their villages by the Ambuja Foundation, followed by borewells (76%), check dams (14%) and irrigation canals (13%). Additional potential water storage capacity created through water harvesting and recharge structures was 220033 (cubic meters) cum in the year 2022-23 and 2023-24. The awareness of check dams and irrigation canals was high in villages where the work had been undertaken such as Mopar (88%) and Ravan (65%). In terms of maintenance of water structures, most respondents stated that Panchayats (96%) are responsible for maintaining it. All respondents stated that currently there are no maintenance issues with the structures. All respondents also stated that the water was accessible to all community members, highlighting the inclusive nature of the interventions.

- **Ponds:** Prior to the WRM initiative, most respondents (93%) stated that the pond was partially functional. However, after the intervention, 53% of respondents stated that it is fully functional.
- **Borewells:** All community members access the borewells, highlighting the inclusiveness of the intervention. 100% stated that the quality of water from the new borewell is clean and potable.
- **Irrigation Canals:** Around 98% stated that water availability for irrigation has increased due to the irrigation canal.

Impact on Water Availability: The primary source of water for households saw a significant shift towards groundwater sources, with the use of own borewells increasing from 23% to 47% and community borewells rising from 69% to 81%. There is also a notable increase in private water taps, from 38% to 69%, suggesting improved household-level water access. This has led to a decline in long distance travel for water collection, saving the average time spent on water collection from 55 minutes to 12 minutes. As a result, this has also led to an improvement in attendance of students, with an average increase of at least 2 days per month

Water Sufficiency Levels: Before the intervention, only 36% of respondents reported having a very sufficient water supply (enough for drinking, cooking, cleaning, and farming). This percentage increased to 49% after the intervention, reflecting a 12% improvement. Most notable change was in the sufficient category, where households with enough water for daily needs increased from 18% to 48%.

Sustainability of Water Structures: The community suggested to develop proper maintenance structure at community level, plant trees near ponds, and provide support for borewell repairs.

Impact on Agriculture:

- The average irrigated land area increased from 2.70 acres to 3.34 acres, with an average landholding of 3.5 acres among surveyed farmers.
- The use of canal irrigation saw a significant rise from 16% to 64%. Additionally, there was a 16% increase in use of sprinkler irrigation.
- Cropping patterns changed among the respondents. The adoption of double cropping and mixed cropping practices increased by 18% and 4% respectively. The practice of single cropping practice decreased by 22%.

- The primary crops grown remain paddy (100%), wheat (56%), mustard (12%), and gram/chana (8%).
- **Paddy:** The farmers cultivated paddy in 3.2 acres of land. The average yield per acre increased from 13.01 to 14.48 quintals per acre. This increase in productivity contributed to a total revenue increase of ₹12,230.
- **Wheat:** The farmers cultivated wheat in 3.15 acres of land. The average yield per acre increased from 9.86 to 10.38 quintals per acre. This improvement in productivity contributed to a total revenue increase of ₹9029.

Overall Impact: Enhanced water availability has led to significant improvements in multiple aspects of daily life. The most notable impact has been better hygiene and sanitation (79%), followed closely by a 76% reduction in the time spent fetching water, easing the burden on households. Improved access to water has also strengthened community harmony (65%), reducing conflicts over water resources. Additionally, 60% of respondents reported improved health due to fewer waterborne diseases, which has directly contributed to a decline in household medical expenses by ₹1,180.

B. Rural Infrastructure Development Initiatives

Impact of Community Halls and Rangmanch: The construction of these centers has significantly enhanced social, cultural, and administrative engagement in villages. Key uses include social gatherings (93%), cultural events (97%), and awareness programs (87%). About 95% of respondents expressed satisfaction with the facilities, citing better interaction and reduced reliance on external venues. Suggestions included improved lighting, ventilation, and accessibility features.

Impact of CC roads: The development of cement concrete (CC) roads improved connectivity for 96% of respondents, reduced travel time, and boosted access to services. Regular usage patterns and enhanced trade were reported. However, 92% flagged the lack of streetlights as a concern. Additionally, 21% of respondents suggested installing proper signage to improve navigation.

Impact of primary school repair: The need for school infrastructure repairs was primarily driven by the community's desire to improve the quality of education (83%), accommodate the increasing number of students (82%), and create a safer, more hygienic environment for students and staff (61%). Post-repair, 81% of respondents acknowledged that the improvements have created a safer environment, while 76% noted enhanced hygiene conditions. The repair work undertaken was diverse—83% of respondents reported the addition of new classrooms, 52% cited floor and wall repairs, 46% mentioned roof repairs, and 42% highlighted improvements in sanitation facilities.

Impact of District Divyang Centre: The centre has significantly improved healthcare access for people with disabilities through local physiotherapy, speech therapy, and education services. Vocational training has boosted skills and confidence, though structured employment support remains a need. Community perceptions have improved, but awareness gaps and accessibility barriers persist. Sustainability will require enhanced transportation, inclusive training programs, and inter-agency collaboration.

Conclusion and Way Forward

Ambuja Foundation's WRM and rural infrastructure initiatives have transformed communities by addressing water scarcity and poor infrastructure. The key achievements of the program include improved water availability, enhanced agricultural productivity, infrastructure development and livelihood/social benefits.

Way Forward:

1) **Strengthen community ownership of water infrastructure** through local user committees and training**.**

2) **Expand infrastructure** like rainwater systems and irrigation alternatives.

3) **Integrate WRM with livelihoods** by promoting less water-intensive crops and sustainable agriculture practices.

1. Background

Baloda Bazaar, often referred to as the "Cement Hub of Chhattisgarh," is home to major cement plants, such as Ambuja Cement. While industrial activities have bolstered the local economy, they have also presented challenges related to water scarcity and sustainable community development. The Ambuja Foundation has undertaken initiatives aimed at water conservation and enhancing community livelihoods to address these challenges.

1.1. Regional Context: Baloda Bazaar at glance

With 86% of its population living in rural areas, the economy of Baloda Bazaar region heavily depends on agriculture along with cement manufacturing. Both activities require groundwater for sustenance. The semi-arid climate brings an average annual rainfall of 1,200 mm, but seasonal variability often leads to water scarcity, affecting both farming and drinking water supply.

Critical water challenges in the region:

Though the industrial activities have played a significant role in employment and economic development, the region faces several water related challenges:

1) **Groundwater Development:** As per the groundwater resource report, the stage of groundwater development in the district is at 41.45%[1], indicating that less than half of the available groundwater resources are currently utilized. This suggests potential for sustainable groundwater conservation and extraction. It will require adoption of efficient water management practices.

2) **Seasonal Water Scarcity:** The region's reliance on monsoon rains leads to water availability fluctuations, causing scarcity during dry seasons. This affects both agricultural productivity and the daily water needs of the communities.

3) **Water Quality Concerns:** Industrial activities have raised concerns about water pollution, necessitating regular monitoring and mitigation efforts to ensure safe water for all uses.

4) **Agriculture Impact:** As per Niti Aayog, farmers often experience 30 to 40% yield reduction in drought years due to irregular irrigation access.[2] This leads to decline in their profitability.

Overview on Baloda Bazar

Geographical Area: 3,733.8 sq.km (86% rural)

Elevation: ~270 m above sea level

Climate: Semi-arid with 1200 mm/ year average rainfall

Main Industries: Cement and Agriculture

Main Water Bodies: Mahanadi river tributaries

Agriculture Dependence: Water intensive crops, seasonal irrigation

Water Challenges: Seasonal scarcity, ground water depletion and pollution

[1] Central Ground Water Board (CGWB). (2020). District Groundwater Resource Report – Baloda Bazar. Ministry of Jal Shakti, Government of India.

[2] NITI Aayog. (2019). Composite Water Management Index Report. Government of India.

5) **Industrial Impact:** Critical water shortages also impact manufacturing of cement, leading to increase in operational costs by 15% to 20% in water stressed months. This will lead to decline in employment and growth opportunities in the region.[3]

1.2. Overview on Initiatives by Ambuja Foundation in Baloda Bazaar, Chhattisgarh

Ambuja Foundation has implemented a range of Water Resource Management (WRM) and Rural Infrastructure Development (RID) initiatives in Baloda Bazar, Chhattisgarh, to address water security, livelihood enhancement, and community well-being in 2022-23 and 2023-24. These efforts have the potential to significantly improve water availability, infrastructure, and quality of life for local communities.

Water Resource Management Initiatives

Recognizing the challenges of water scarcity and dependency on groundwater, Ambuja Foundation has undertaken several WRM interventions to improve water storage, irrigation, and recharge capacity:

#	WRM structures	No. of structures	Households benefited	Population benefited
1	Check Dams	7	4,411	18,427
2	Pond Development	30	16,837	75,192
3	Irrigation Canals	1	-	150 farmers
4	Borewell Construction & Repair	4	1,297	6,485

Borewell constructed in Baloda Bazar by Ambuja Foundation

Rural Infrastructure Development Initiatives

Ambuja Foundation has also focused on enhancing community infrastructure, addressing key issues in education, healthcare, and public amenities by developing community halls, constructing concrete roads, repairing primary schools, supporting district hospitals and providing other essential infrastructure support.

[3] State Water Resources Department, Chhattisgarh. (2021). Water Resources Annual Report.

#	RID structures	No. of structures	Households benefited	Population benefited
1	Community halls and Rangmanch constructions	11	4,485	22,867
2	Concrete roads construction	13	5,421	24,867
3	Primary school repairs and roof strengthening	8	-	4,763 students
4	Establishment of district Divyang Centre	1	-	200
5	Establishing District Covid Hospital	1	1000	5000
6	Garden related works	1	-	-
7	Gaowthan levelling	1	-	400 livestock
8	Public utility infrastructure	1	1000	5000
9	Ventilators for covid hospital	1	1000	5000

Through these interventions, Ambuja Foundation can expect the following:

- ✓ Increased water storage capacity in the region, reducing water stress among farmers and community members.
- ✓ Enhancement in agricultural productivity by improving irrigation facilities for farmers.
- ✓ Improvement in rural infrastructure, boosting livelihoods and the overall standard of living of households by better roads, hospitals, schools, gardens etc.

CC road constructed by Ambuja Foundation

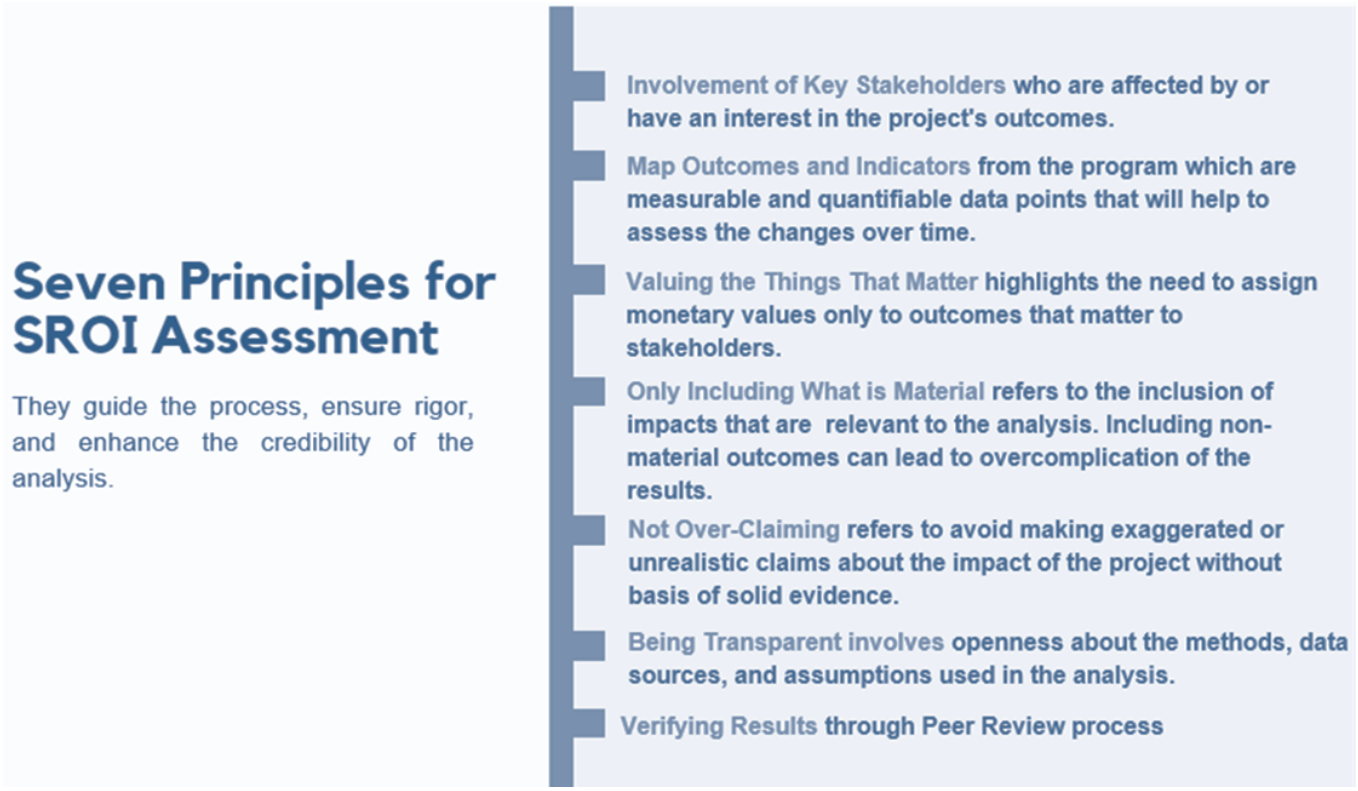
Divyang centre constructed by Ambuja Foundation

2. Study Methodology

The current report provides a comprehensive Impact Assessment of the Water Resource Management and Rural Infrastructure Development program by the Ambuja Foundation in Baloda Bazaar, Chhattisgarh in 2022-23 and 2023-24. Additionally, the report also provides Social Returns on Investment of the Water Resource Management initiatives.

To conduct the Impact Assessment of the program, CRISIL adopted a mixed methods approach which consists of quantitative and qualitative assessments to effectively map the changes and the key explanations for the same.

To conduct Social Returns on Investment of the program, CRISIL evaluated and quantified the broader impact of the program. It measured the overall value of the program. The SROI assessment will be based on the seven principles to ensure rigor and enhance credibility of the analysis.



2.1. Program stakeholders, data collection tools and sampling methodology

The study adopted a **mixed-methods approach** using both quantitative and qualitative data collection techniques to ensure comprehensive insights. A **randomized stratified sampling** approach was followed for the structured surveys, accounting for key variables such as location, age, gender, and activity types to ensure representative coverage of the target population.

A total of 250 structured survey interviews were conducted across key stakeholder groups (community members and farmers). This sample size was chosen to strike a balance between statistical representation and feasibility while ensuring adequate coverage of various beneficiary categories. Given the relatively homogeneous nature of the community, this number is considered sufficient to capture measurable impact trends across domains.

In addition to the surveys, Focused Group Discussions (FGDs) were conducted with stakeholder groups such as community members, water groups, and people with disabilities to gain a deeper and more nuanced understanding of lived experiences, behavioural changes, and community dynamics that structured surveys may not fully capture. These qualitative insights helped contextualize the survey findings and validate emerging themes.

Key Informant Interviews (KIIs) were also conducted with school teachers, community leaders, and the implementation team of Ambuja Foundation to gather strategic perspectives and implementation insights. The combination of these tools strengthens the reliability and richness of the assessment findings.

Key Stakeholders	Data Collection Tool	Sample
Farmers	Structured survey questionnaires	50
Community Members	Structured survey questionnaires	200
Community Members	Focused Group Discussions	27
Water groups	Focused Group Discussions	5
People with disability	Focused Group Discussions	5
Community Leaders	Key Informant Interviews	25
School teachers	Key Informant Interviews	5

3. Study Findings: Water Resource Management Initiatives

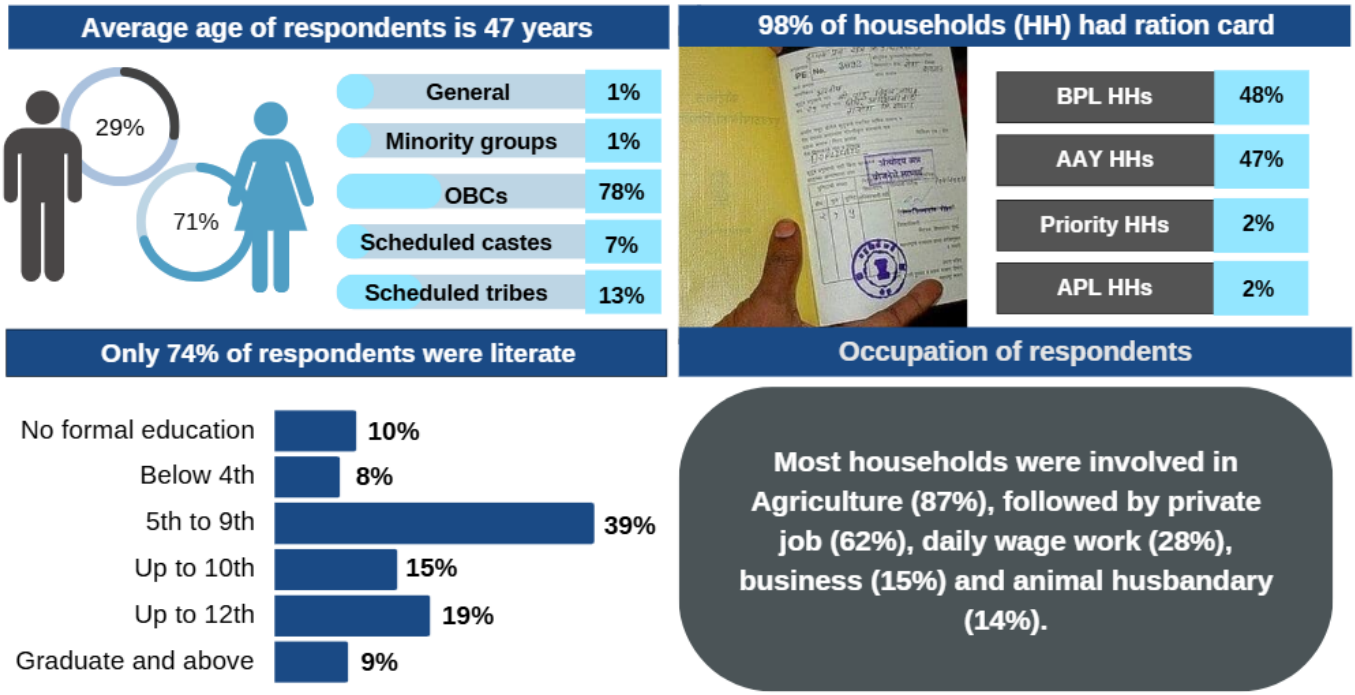
In this section, the study will focus on the Impact of Water Resource Management Initiatives. The focus will be on assessing the impact of program on community members in terms of water resource development process, impact on water availability and water sufficiency levels. Additionally, the study will also intend to assess the impact of the program on farmers—through improvements in cropping patterns, yields, cost of cultivation and income.

A. Key Demography

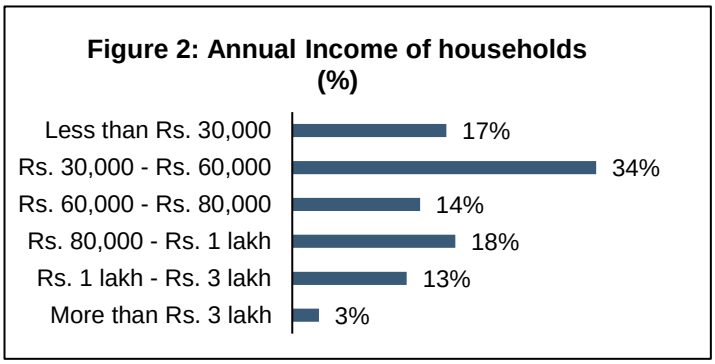
CRISIL surveyed 252 respondents— community members (202) and farmers (50) across 10 villages of Baloda Bazar region— Arjuni, Rawan, Khairtal, Maldi, Devrani, Mpar, Kukurdih, Bharseli, Bhadrapali and Pousari.

The average age of the respondents was 47 years. Around 71% were women and 29% were men. Most of them (78%) belonged to other backward caste (OBC) category, while 13% belonged to the scheduled tribe's category. In terms of education, around 26% had no formal education and the rest had limited levels of education, with only 43% having completed 10th standard and above. The marginalization of respondents was also reflected in their ration card ownership, with 48% having Below Poverty line card and 47% having Antyodaya Anna Yojana card, meant for the poorest of poor.

Figure 1: Key Demographic Indicators



The primary source of livelihood within the households was agriculture (87%), followed by private job (62%), daily wage work (28%), business (15%) and animal husbandry (14%). On an average, 2 to 3 people were working in each household. The family size was large consisting of 7 members on an average.



The average annual income of most households was between Rs. 30,000 to Rs. 60,000 (34%), followed by 18% who earn between Rs.80,000 to Rs. 1 lakh, 17% who earned less than Rs. 30,000, 14% who earned between Rs. 60,000 to Rs. 80,000 and 13% who earned between Rs. 1 lakh to Rs. 3 lakhs. Only 3% earned more than Rs. 3 lakhs. Almost all respondents owned their homes, of which 52% had Pucca houses, 33% had semi pucca houses and 14% had kutcha houses. Most households (96%) had toilet facilities.

The demographic findings show that the respondents surveyed in the region belonged to marginalized backgrounds with low incomes. However, they had ownership of their homes, and some assets in the form of agriculture land, alleviating the challenges of marginalization to some extent.

B. Water Resource Development Process

In this section, we aim to assess the awareness of community members and farmers regarding the water resource structures developed by the Ambuja Foundation, as well as their engagement in related community-driven efforts. This is important given the critical role of local participation in ensuring the sustainability and effectiveness of these interventions.

As per most respondents—ponds (88%) were constructed or deepened in their villages by Ambuja Foundation, followed by borewells (76%), check dams (14%) and irrigation canals (13%). The awareness of check dams and irrigation canals were high in villages where the work had been undertaken such as Mopar (88%) and Ravan (65%). **Additional potential water storage capacity created through water harvesting and recharge structures was 220033 cubic metres (cum) in the year 2022-23 and 2023-24**.

Figure 3: Water resource management structures constructed in villages as per respondents (%)

Community awareness and engagement in the construction and renovation of water conservation structures were limited prior to the construction, with only 56% of respondents being aware of the process (44% of community members and 48% of farmers). However, among those who were aware, 97% received some form of knowledge before construction began.

The shared information covered the importance of water conservation structures, the type of work being undertaken, their societal benefits, and their impact on farming. Among respondents aware of the construction process, 59% to 84% reported receiving in-depth information from the Ambuja Foundation team.

This indicates that while overall community engagement reached only half of the surveyed respondents, those who were engaged received substantial and detailed information about the initiative.

Knowledge provided on Water Conservation Structures	In great depth	To some extent	To little extent	Not provided
Importance of water conservation structure	84%	7%	5%	0%
Type of work being conducted	80%	12%	5%	0%
Structures benefits to society	82%	11%	3%	0%
Structures impact on farming	71%	13%	11%	1%
Need for efficient water usage and conservation	67%	18%	12%	0%
Community responsibility for maintenance	59%	29%	5%	3%

In terms of maintenance of water structures, most respondents stated that Panchayats (96%) are responsible for maintaining it. The rest didn't know about it. **Almost all respondents stated that there are currently no maintenance issues with the structures such as siltation or sedimentation, structural damage, leakage issues, vegetation overgrowth etc. All respondents also stated that the water is accessible to all community members, highlighting the inclusive nature of the interventions.**

Overview on Ponds – Before and After renovation

Figure 4: General condition of ponds before and after renovation (%)

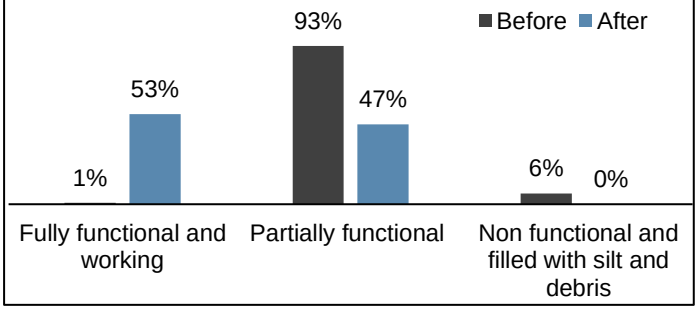
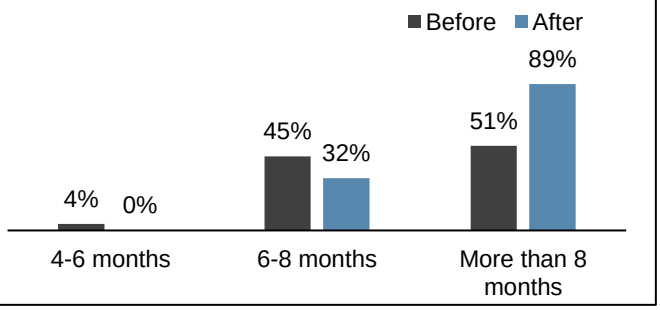


Figure 5: No. of months water is retained in ponds post monsoon before and after renovation (%)



The main source of water for the ponds is rainfall (100%) and nearby river (31%). The depth of pond has increased from 6.25 metres to 12 metres.

Before Renovation

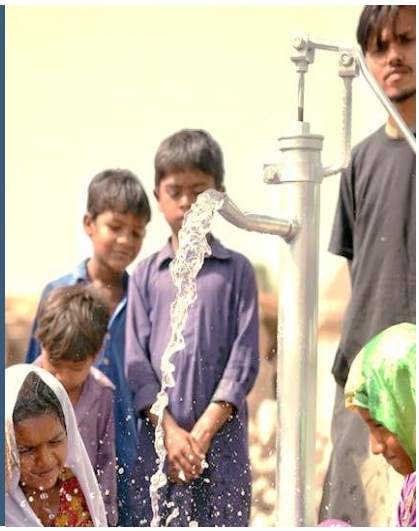
- ✓ **The ponds were partially filled with water as per 93% of respondents, making it only partially functional for usage.**
- ✓ **The pond's boundary was an issue for 48% of respondent—weak and partially damaged (26%).**
- ✓ **Major reason for poor condition—accumulation of garbage and debris (91%) and lack of cleaning/maintenance (74%).**
- ✓ **51% stated that farm pond retains water for more than 8 months.**

After Renovation

- ✓ **The ponds are fully functional (53%) or partially filled with water (46%).**
- ✓ **The pond's boundary is made of soil/clay (98%) and is stronger (67%) than before.**
- ✓ **100% believe ponds water retention capacity has increased.**
- ✓ **As per 92% of respondents, there have been no major issues with ponds since the renovation.**
- ✓ **89% stated that farm pond retains water for more than 8 months (June to March).**

Overview on Borewells

- ✓ Among all those who had borewells in their villages supported by Ambuja Foundation — 100% respondents stated that borewells were constructed or repaired.
- ✓ The new borewells were constructed primarily to meet increasing demand of water (99%), followed by lack of other water sources (36%).
- ✓ All community members access the borewells, highlighting the inclusiveness of the intervention.
- ✓ 100% stated that the quality of water from the new borewell is clean and potable.



Overview on Irrigation Canals

- ✓ The primary source of irrigation before the canal was rainfall (63%), borewell (56%), open well (31%) and river/stream (13%).
- ✓ The water was transported to fields through natural channels (59%) or using pumps (41%).
- ✓ Prior to the renovation work by Ambuja Foundation, the irrigation canals were either nonfunctional (41%) or required frequent repairs (50%). For around 9%, no irrigation channels existed.
- ✓ Around 98% stated that water availability for irrigation has increased due to the irrigation canal.

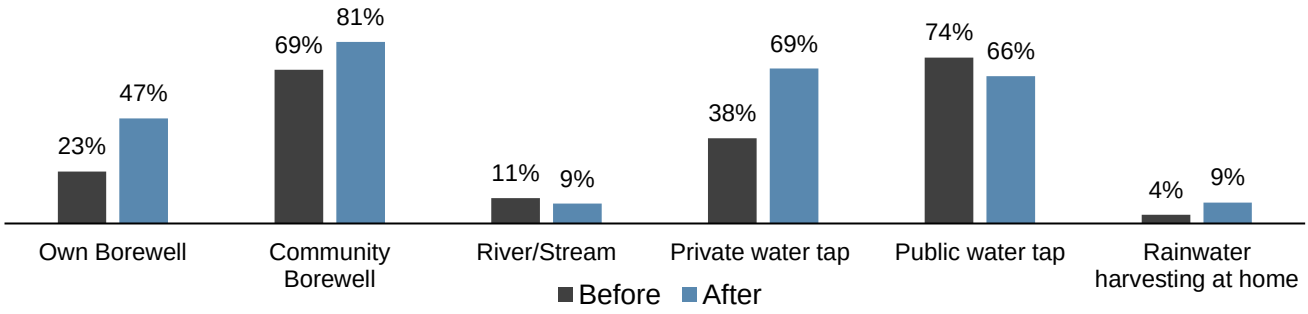
C. Impact on Water Availability

Primary sources of water and distance to the source

The primary source of water for households saw a significant shift towards groundwater sources, with the use of own borewells increasing from 23% to 47% and community borewells rising from 69% to 81%. There is also a notable increase in private water taps, from 38% to 69%, suggesting improved household-level water access. Meanwhile, reliance on public water taps has slightly declined from 74% to 66%, possibly indicating greater self-sufficiency. The percentage of households depending on rivers or streams for water has marginally reduced from 11% to 9%, reflecting improved access to other sources. Additionally, rainwater harvesting at home has increased from 4% to 9%, indicating growing awareness of water conservation.

Key Highlights: Increased dependence on borewells (both private and community), rise in private water tap connections, improving direct household access; slight decline in public water tap usage, indicating improved self-sufficiency; reduced reliance on rivers/streams, suggests better water security and growth in rainwater harvesting, reflecting awareness of sustainable water use.

Figure 6: Primary source of water for household before and after WRM initiatives



Nearest water source from home	Before	After	Difference
Within home	38%	69%	**31%**
Within 200m	52%	23%	**-29%**
200m to 500m	10%	8%	**-2%**

The average time to fetch water has declined from 55 minutes to 12 minutes in a day.

When the respondents were asked about the nearest water source from their homes before and after WRM initiatives—it was found that the percentage of households with a water source within their home increased from 38% to 69% after the program, reducing the need for long-distance water collection. Meanwhile, the proportion of households with water sources within 200 meters declined from 52% to 23%, and those relying on sources 200–500 meters away reduced from 10% to 8%. Mostly (82%) the women and girls were responsible for water collection.

As a result, the average time spent fetching water decreased from 55 minutes to just 12 minutes per day, leading to significant time savings, especially for women (52%) and children (30%) who were responsible for water collection in most household. Discussion with teachers revealed that taps in homes has improved water access, resulting in an average increase of at least 2 days of student attendance per month.

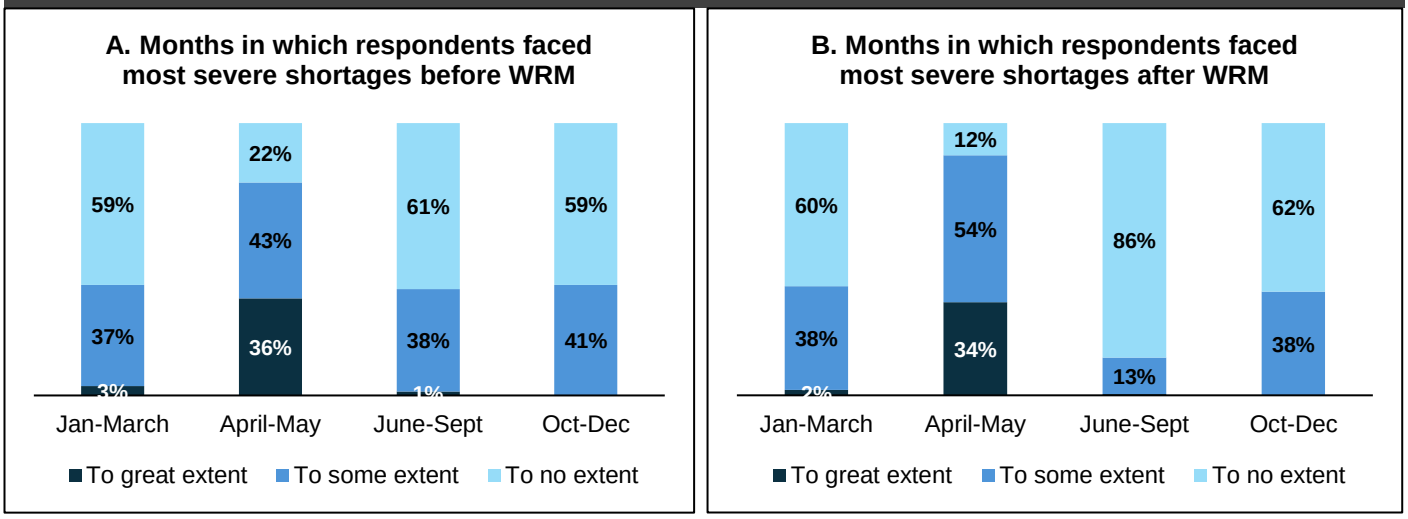
"Sometimes due to water collection in the morning, the students ended up missing school." – Purnima Kure, Asst Teacher, Bhadrapali Government Primary School

When respondents were asked if they faced seasonal water shortages, the percentage reporting shortages declined from 46% before the intervention to 38% after, indicating an improvement in water availability. The severity of water shortage across different months also showed a positive shift.

- **In April-May**, the most critical period for water scarcity, the proportion of respondents experiencing shortages to a great extent remained high at 34%, but those facing shortages to some extent increased to 54%, suggesting an overall increase in water stress.
- During **June-September**, households experiencing no shortages rose from 61% to 86%, highlighting significant improvement.
- Similarly, in **January-March** and **October-December**, a significant percentage of households reported no shortages (60% and 62%, respectively, after the intervention).

These findings suggest that water resource management efforts have reduced water shortages between June to January, though April-May remains a critical period requiring further intervention.

Figure 7: Months in which respondents faced most severe shortages (before and after WRM)



Water sufficiency levels

The implementation of water conservation initiatives has significantly improved water sufficiency for households. Before the intervention, only 36% of respondents reported having a very sufficient water supply (enough for drinking, cooking, cleaning, and farming). This percentage increased to 49% after the intervention, reflecting a 12% improvement.

Most notable change was in the sufficient category, where households with enough water for daily needs increased from 18% to 48%, marking a 30% improvement. Conversely, the proportion of households experiencing insufficient water availability dropped significantly from 41% to just 4%, a 37% reduction. Additionally, households facing very insufficient water availability, characterized by frequent shortages, were eliminated, decreasing from 5% to 0%. The daily water consumption of households (average family size of 7) increased from 193 litres to 258 litres. Average increase of 9.32 litres per members in the family.

These findings highlight the positive impact of water conservation efforts in enhancing water security for households, reducing water shortages, and improving overall water availability.

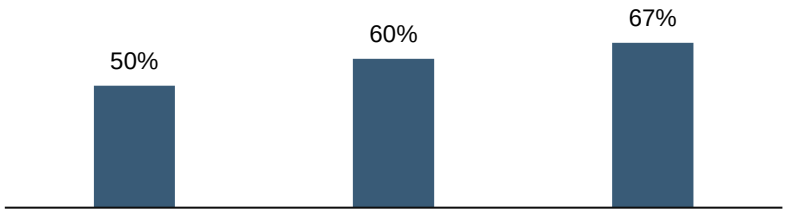
Extent of water sufficiency for household use	Before	After	Difference
Very sufficient (water was enough for day to day needs)	36%	49%	**13%**
Sufficient (I had enough water for most daily needs)	18%	48%	**30%**
Insufficient (I had to adjust or limit my usage)	41%	4%	**-37%**
Very insufficient (I had frequent water shortages for basic needs)	5%	0%	**-5%**

D. Sustainability of Water Structures

When asked about the sustainability of their current water structures, 40% of respondents believed the sources were somewhat sustainable, meaning they were expected to last for the foreseeable future. However, the majority (58%) expressed concerns about sustainability, fearing that the structures might not endure in the long run due to a lack of maintenance.

The main challenges with the water structures are as follows: overuse of borewells leading to depletion (67%), lack of water in dry seasons (60%) and lack of maintenance (50%).

Figure 8: Main challenges with water structures impacting sustainability (%)



Suggestions by community members to ensure sustainability:

- Develop proper maintenance structure at community level
- Plant trees near ponds
- Deepen the ponds further
- Provide a structure to deal with borewell repairs.

Proposed maintenance strategies to improve sustainability of the water structures

1) **Formation of Water User Groups (WUGs):** Establish village-level WUGs to oversee the management and upkeep of water structures. It can include farmers, women, and community leaders to ensure inclusive decision-making. The WUGs can conduct monthly meetings to review water usage, maintenance needs, and fund collection.
2) **Develop WUG fund:** Introduce nominal water usage fees to create maintenance funds. The fees can be differentiated for domestic and agriculture usage. Ensure regular reporting of fund management to the community.
3) **Schedule maintenance and repair systems:** Implement routine inspections for borewells, ponds and canals. Additionally, provide a structure for maintenance procedures. Local youths can be trained to handle minor repairs.
4) **Water conservation initiatives:** As a complementary program, plant trees near water bodies to reduce evaporation and improve soil moisture. Also promote rainwater harvesting to replenish groundwater.

E. Impact on Agriculture

Agriculture is the core livelihood of households in program villages. As a result, it is essential to evaluate the impact of the water conservation program on agriculture. Within our sample, around 87% of households are engaged in agriculture. The assessment focuses on changes in irrigation patterns, farming challenges, crop diversification, yield improvements, cost of cultivation, and overall profitability. By analysing these factors, the study aims to understand how improved water availability has influenced agricultural productivity and economic outcomes for farmers in the region.

Impact on irrigation patterns:

The intervention led to noticeable improvements in irrigation patterns and water availability for farming. The average irrigated land area increased from 2.7 acres to 3.34 acres, with an average landholding of 3.5 acres among surveyed farmers.

Irrigated land before and after intervention	
Average Land Size: 3.5 acres	
Avg Irrigated land- Before	**2.70**
Avg Irrigated land- After	**3.34**

The source of irrigation water also experienced some shifts. The reliance on borewells remained high at 72%, showing a marginal increase from 70%. However, **the use of canal irrigation saw a significant rise from 16% to 64%, indicating improved water distribution.** On the other hand, dependence on farm ponds declined from 6% to 2%, while 2% of respondents used dams as an irrigation source.

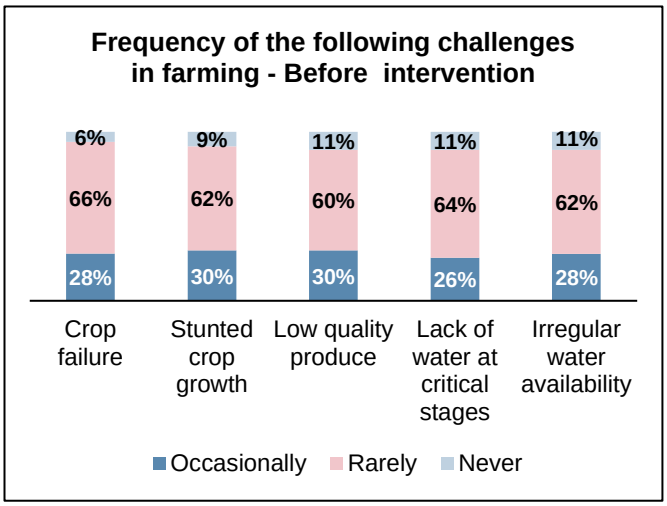
Regarding irrigation methods, the facilities used in the fields remained largely unchanged before and after the intervention. However, **there was a 16% increase in the adoption of sprinkler irrigation from 6% to 22%, reflecting a shift toward efficient water-use practices.** This trend suggests that some farmers are beginning to adopt modern irrigation techniques, and further promotion of these methods could enhance water conservation and agricultural productivity.

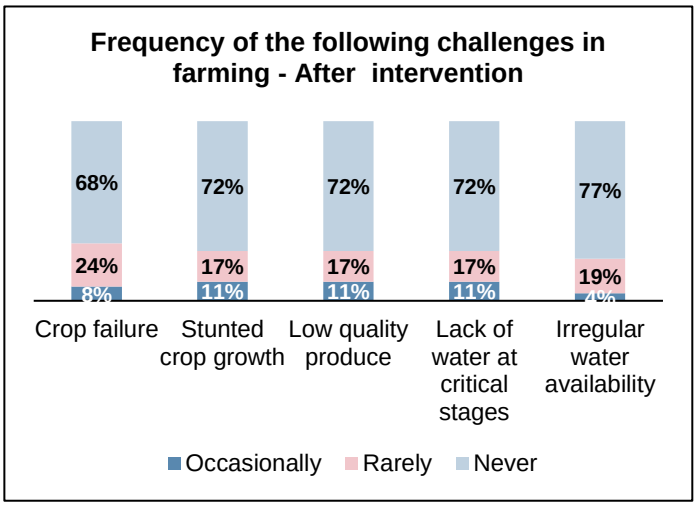
Irrigation facility used in field	Before	After	Difference
Drip irrigation	8%	8%	**0%**
Sprinkler irrigation	6%	22%	**16%**
Furrow irrigation	10%	10%	**0%**
Surface or sub surface irrigation	66%	66%	**0%**
No irrigation facility	10%	10%	**0%**

Critical farming challenges:

Despite improvements in water availability, several farmers reported that challenges in farming persist. However, the frequency of these issues has significantly declined after the intervention. Previously common problems such as crop failure, stunted growth, low-quality produce, lack of water at critical stages, and irregular water availability have reduced, with most respondents now experiencing them rarely or never.

Notably, the percentage of farmers who never faced these issues increased to around 68-72%, indicating improved water access and irrigation practices.

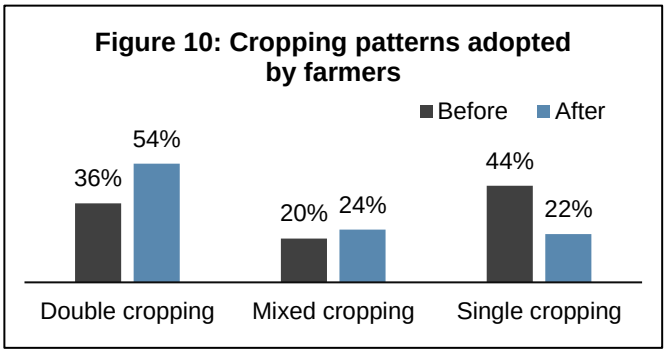




Impact on crops grown:

Cropping patterns have changed among the respondents in our sample. The adoption of,

- Double cropping practice increased by 18%-- from 36% to 54%.
- Mixed cropping practice increased by 4%-- from 20% to 24%.
- Single cropping practice decreased by 22%-- from 44% to 22%.



This indicates that with improved water availability, several farmers have started cultivating crops in a second season. However, around 22% still opt for single cropping. This could be due to persisting water management challenges and dry seasons in later months of the year in some villages**.**

Additionally, 10% of farmers have expanded their cultivation area and 22% have introduced new crops. The primary crops grown remain paddy (100%), wheat (56%), mustard (12%), and gram/chana (8%), with no significant shift in crop diversification before and after the intervention. This suggests that while water availability has improved, further efforts are required to encourage crop diversification and optimize agricultural productivity.

The major crops grown were as follows— Paddy (100%), Wheat (56%), Mustard (12%) and Gram/Chana (8%).

The assessment focuses on the impact of water conservation initiatives on two major crops. The findings highlight improvements in overall indicators of yield, production, and profitability post-intervention.

Paddy

The farmers cultivated paddy in 3.2 acres of land. The average yield per acre increased from 13.01 to 14.48 quintals per acre, leading to a rise in total production from 41.63 to 46.34 quintals. **This increase in productivity contributed to an 11.3% improvement in total revenue.**

The cost of cultivation per acre also saw a minor rise of 3.1%, leading to an increase in total cultivation costs by ₹1,495. Despite this, total profit increased by ₹10,736, and profit per acre rose by ₹2,279. While the intervention improved productivity and profitability, it did not significantly impact input costs for paddy cultivation. There are also effects of inflation on cost of cultivation.

Paddy Statistics on Average			
Parameters	**Before**	**After**	**Difference**
Area under cultivation	3.20	3.20	**0.00**
Yield (Q/acre)	13.01	14.48	**1.47**
Total production (Q)	41.63	46.34	**4.71**
Total Revenue (Rs.)	1,08,243	1,20,474	**12,231**
Cost of cultivation per acre (Rs. /acre)	15,002	15,469	**467**
Total cost of cultivation (Rs.)	48,007	49,501	**1,494**
Total profit per acre (Rs. /acre)	12,789	15,068	**2,279**
Total profit (Rs.)	60,236	70,972	**10,736**

Wheat

The farmers cultivated wheat in 3.15 acres of land. The average yield per acre increased from 9.86 to 10.38 quintals per acre, leading to a rise in total production from 31.1 to 35 quintals. **This improvement in productivity contributed to a total revenue increase of ₹9029.**

The cost of cultivation per acre also saw a slight increase from ₹10,900 to ₹11,200, leading to a marginal rise in total cultivation costs. T**he total profit increased from ₹36,324 to ₹44,409, and profit per acre improved from ₹7,712 to ₹9,429.** While the intervention contributed to a modest increase in yield, revenue, and profitability, there has been marginal increase in input costs most probably due to inflation.

Wheat Statistics on Average			
Parameters	**Before**	**After**	**Difference**
Area under cultivation	3.15	3.15	**0**
Yield (Q/acre)	9.86	11.12	**1.26**
Total production (Q)	31.1	35.0	**3.969**
Total Revenue (Rs.)	70,659	79,689	**9,030**
Cost of cultivation per acre (Rs. /acre)	10,900	11,200	**300**
Total cost of cultivation (Rs.)	34,335	35,280	**945**
Total profit per acre (Rs. /acre)	7,712	9,429	**1,717**
Total profit (Rs.)	36,324	44,409	**8,085**

Annual Water Costs

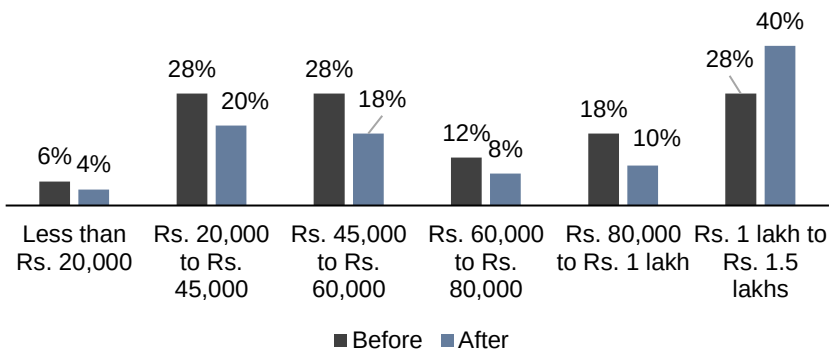
When respondents were asked about their annual water expenses, the average cost was ₹6,596 before the Water Resource Management (WRM) program. Following the intervention, this declined to ₹5,748, primarily due to a reduction in hiring of water tankers. The introduction and increased use of irrigation canals helped decrease dependence on borewells to some extent, contributing to cost savings of Rs. 848 per year. However, maintenance expenses for irrigation infrastructure remained unchanged at ₹1,800.

Farmers Income

The analysis of farmers' annual income before and after the intervention shows a significant shift towards higher income brackets. Before the intervention, 6% of farmers earned less than ₹20,000, which declined to 4% after the program. The percentage of farmers earning between ₹20,000 and ₹45,000, ₹45,000 to ₹60,000, ₹60,000 to ₹80,000 and ₹80,000 and ₹1 lakh, also declined by 8%, 10%, 4% and 8% respectively.

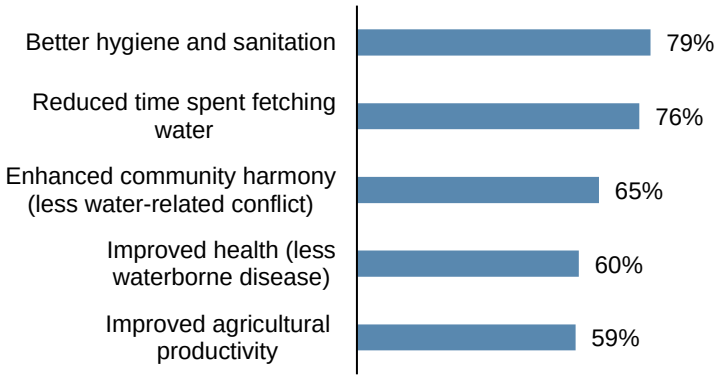
Meanwhile, the proportion of farmers earning between ₹1 lakh to ₹1.5 lakh significantly increased from 28% to 40%. These findings suggest that there has been an increase in earnings for a significant number of farmers, reducing the proportion of those in lower-income groups and improving overall financial stability.

Figure 11: Annual income of farmers before and after intervention (%)



F. Overall Impact of Water Resource Structures

Figure 12: Impact of water availability on lives



Enhanced water availability has led to significant improvements in multiple aspects of daily life. The most notable impact has been better hygiene and sanitation (79%), followed closely by a 76% reduction in time spent fetching water, easing the burden on households. Improved access to water has also strengthened community harmony (65%), reducing conflicts over water resources. Additionally, 60% of respondents reported improved health due to fewer waterborne diseases, which has directly contributed to a decline in household medical expenses by ₹1,180. These findings underscore the impact of water resource interventions on household well-being and economic stability.

4. Study Findings: Rural Infrastructure Development Initiatives

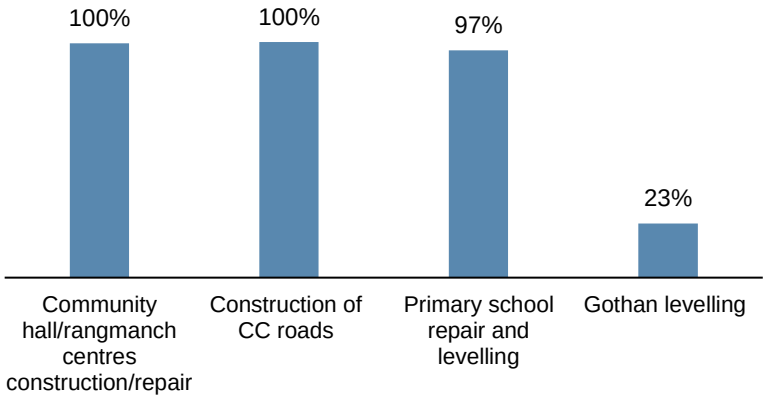
In this section, the study evaluates the impact of rural infrastructure development (RID) initiatives undertaken by the Ambuja Foundation. Various structures were created to enhance public facilities, healthcare, education, and agriculture. Community halls and Rangmanch constructions to foster social and cultural engagement, while the construction of concrete roads to improve accessibility. Educational infrastructure was strengthened through primary school repairs and roof reinforcements, ensuring better learning environments. Healthcare facilities were enhanced with the establishment of a District Divyang Centre, a District COVID Hospital, and the provision of ventilators, improving medical support. Additionally, Gaothan levelling has supported livestock, and garden-related works, along with paver block installations in police colonies, have contributed to better public spaces.

A. About Rural Infrastructure Development Initiatives

When respondents were asked about rural infrastructure development initiatives in their villages, 100% were aware of the construction of community halls, Rangmanch centers, and concrete roads. Around 97% acknowledged the repair of primary schools and land levelling efforts, while only 23% were aware of Gaothan levelling.

The study captured the impact of establishment of Divyang centres, district COVID hospitals, ventilator provisions and garden related works through focused group discussions with relevant stakeholders, including people with disabilities for Divyang centres, teachers for schools, and healthcare professionals for hospital-related infrastructure.

Figure 13: Community awareness on Rural Infrastructure Development Initiatives by Ambuja Foundation



The need of village level infrastructures such as community halls, CC roads and primary school repair was identified by Panchayats (93%) and Ambuja Foundation team (85%). All respondents affirmed community involvement in planning and decision making fully (41%) and partially (59%).

A majority of respondents (79%) stated that these developments were part of an overall development plan, while 15% believed they were initiated to address specific community needs. The primary beneficiaries of these infrastructure projects were the entire community, with women (84%) and youth/children (82%) benefiting the most.

In terms of utilization, 65% of respondents reported using these spaces occasionally, while 24% used them daily. Community satisfaction with the quality of infrastructure was remarkably high, with 90% expressing approval.

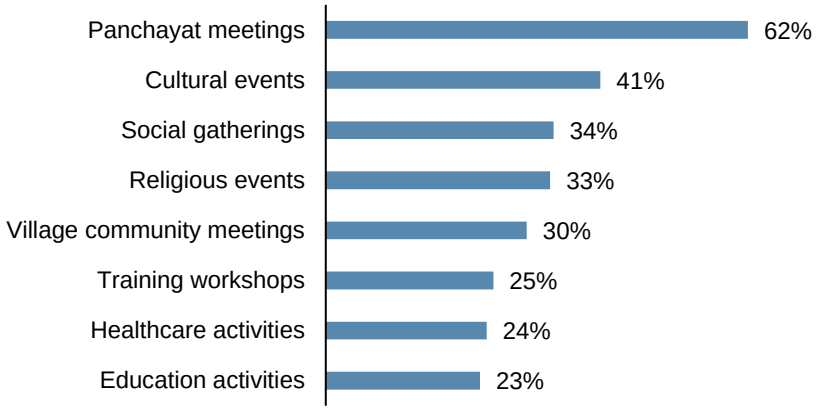
Impact of Community Halls and Rangmanch Centres

The construction of community halls and Rangmanch centres has played a significant role in fostering social, cultural, and administrative activities within villages.

The primary purposes for constructing these centres were to facilitate social gatherings (93%), cultural activities (97%), and health and awareness programs (87%). The location of these centres was determined based on discussions with local authorities (45%) or community consultations (44%) or at existing rangmanch/community centre locations.

The spaces were used for various activities, including panchayat meetings (62%), cultural events such as festivals and traditional celebrations (41%), social gatherings like weddings and birthdays (34%), religious gatherings (33%), and village-level meetings (30%). Notably, the frequency of community gatherings and overall engagement increased significantly after the construction of these centres as highlighted in the table below. About 97% of respondents highlighted that the new facilities reduced the need for external venues. However, the centres currently do not generate any revenue through rents.

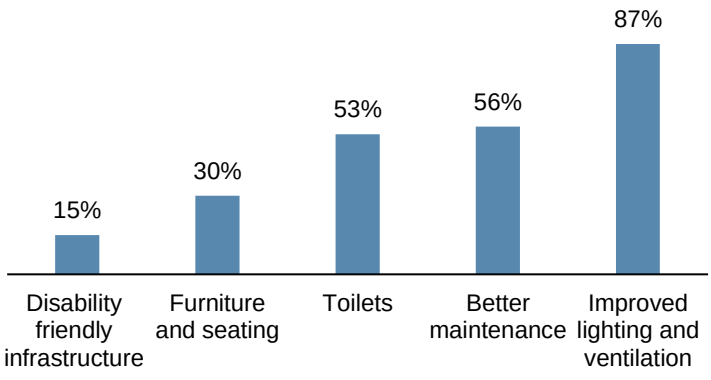
Figure 14: Events undertaken at community halls



Impact of space on the following community engagement parameters	Increased significantly	Increased moderately	No change
Frequency of community gatherings	19%	**81%**	0%
Participation of different groups (women, elderly etc.)	35%	**65%**	0%
Diversity of activities conducted (cultural, educational, health)	28%	**72%**	0%
Strengthening of social ties among community members	10%	**90%**	0%
Opportunities for marginalized groups to participate in activities	7%	**93%**	0%
Utilization of space for conflict resolution or decision-making meetings	9%	**91%**	0%
Sense of ownership and pride within the community	9%	**91%**	0%
Ability to organize larger events (weddings, training, health camps etc.)	23%	**77%**	0%

Prior to the development of these spaces, 8 6% of respondents stated they were unable to organize local events, and 71% felt that community interaction was limited. With the establishment of these centres, 95% of respondents expressed satisfaction with their functionality. However, when asked about potential improvements, 87% suggested better lighting and ventilation, 56% recommended enhanced maintenance, 53% requested toilet facilities, and 30% advocated for better furniture and seating. Additionally, 15% of respondents emphasized the need for disability-friendly infrastructure, such as ramps, to ensure accessibility for all community members.

Figure 15: Additional features needed in community halls



Impact of CC Roads on Community Development

The construction of CC roads has significantly addressed several challenges previously faced by community members. Before the intervention, residents encountered delays in reaching schools, traffic congestion, lack of transportation options, isolation during the rainy season, increased transportation costs, and limited accessibility. The extent to which these issues affected daily life and economic activities in the villages is highlighted in the table below,

Transportation challenges prior to CC road construction	To great extent	To some extent	To no extent
Poor road condition	9%	**85%**	6%
Limited accessibility	1%	**91%**	8%
Lack of transportation option	1%	**88%**	11%
Traffic congestion	0%	**85%**	15%
Safety issue	0%	**94%**	6%
Difficulty in transporting goods	0%	**96%**	4%
Isolation during rainy or stormy weather	0%	**88%**	12%
Difficulty in accessing medical care	1%	**93%**	6%
Increased transport cost	0%	**89%**	11%
Delay in reaching school	0%	**82%**	18%
Reduced trade opportunities due to poor connectivity	3%	**89%**	8%

Following the construction of CC roads, most respondents (98%) reported improvements in village connectivity. Around 69% of respondents used the roads several times a week, followed by 13% who used them daily and 18% who used them occasionally.

The roads have contributed to the well-being and economic growth of the community in multiple ways. They have enhanced trade and business by improving connectivity, facilitated access to essential services such as markets, hospitals, and schools, ensured better road safety, and reduced travel time as highlighted in the table below:

Primary benefits of CC road construction	To great extent	To some extent	To no extent
Improved accessibility to essential areas (markets, hospitals, schools etc.)	7%	**91%**	2%
Better connectivity to nearby towns	2%	**91%**	7%
Reduced travel time	4%	**93%**	3%
Better road safety	5%	**93%**	2%
Enhanced trade and business due to better transport	12%	**83%**	5%
Improved mobility of emergency vehicles such as ambulances	3%	**97%**	0%
Improved quality of life	1%	**96%**	3%
Enhanced social interactions due to increase in mobility	7%	**91%**	2%

Qualitative discussions with respondents revealed an overall sense of ease during travel. Many mentioned that roads, which previously deteriorated during monsoons, are now in good condition and easier to navigate. Improved road conditions have also led to better access to hospitals and increased vehicular movement, with more cars now visible on village roads.

Despite these improvements, certain challenges persist. The absence of streetlights was cited as a major concern by 92% of respondents, highlighting the need for inclusion under future programs. Additionally, 21% of respondents suggested installing proper signage to improve navigation.

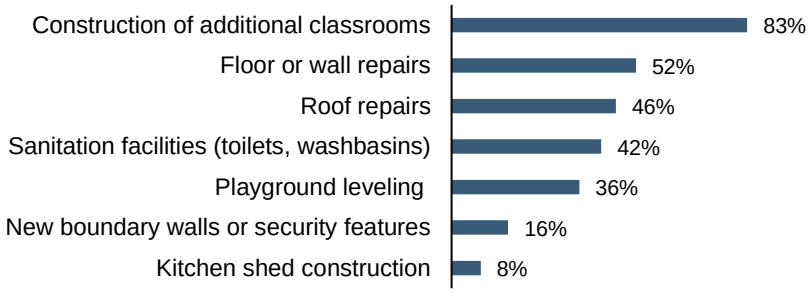
In terms of recommendations, community members emphasized the need for streetlights, direction maps, roadside plantations, and ongoing maintenance support to sustain the roads in the long run. While 96% of respondents expressed satisfaction with the maintenance of the roads, 4% voiced concerns, stressing the need for regular upkeep to ensure durability over the next decade.

Impact of Primary School Repair

The need for school infrastructure repairs was primarily driven by the community's desire to improve the quality of education (83%), accommodate the increasing number of students (82%), and create a safer, more hygienic environment for students and staff (61%).

Post-repair, 81% of respondents acknowledged that the improvements have created a safer environment, while 76% noted enhanced hygiene conditions. The repair work undertaken was diverse—83% of respondents reported the addition of new classrooms, 52% cited floor and wall repairs, 46% mentioned roof repairs, and 42% highlighted improvements in sanitation facilities.

Figure 16: Work undertaken in primary schools by AF as per community members



Before these repairs, schools faced several infrastructure challenges. The most significant issues included a lack of sufficient classrooms (81%), poor lighting and ventilation (76%), inadequate sanitation facilities (64%), and damaged roofs, walls, and floors (62%).

Following the renovations, 61% of community members reported noticeable improvements in the school environment, while 25% did not observe significant changes. Overall, 93% of respondents expressed satisfaction with the repair work.

Moving forward, community members have recommended additional enhancements, including smart classrooms, school playgrounds, improved sports facilities, and a library to further enrich the learning experience.

7. Program through the lens of stakeholders

Program Impact from the perspective of Panchayat sarpanch and community members

The Key Informant Interviews (KIIs) with the Sarpanches and focused group discussions with community members provided critical insights into the infrastructure and water conservation initiatives implemented in their villages. While the interventions have led to notable improvements in water availability, agriculture, and community infrastructure, there are ongoing challenges related to sustainability, maintenance, and further infrastructure development.

Below is a thematic analysis of the key findings:

Thematic Areas	Key Findings
Impact on Water Availability and Agricultural Development	**For Ravan Village, Sarpanch and Community Members** ✓ Construction of check dams and canals has improved water retention and groundwater recharge. ✓ Farmers now have better access to irrigation water, leading to increased agricultural productivity. ✓ Introduction of new crops by some farmers like mustard and wheat, diversifying agricultural production. However, some areas still experience water shortage, particularly during droughts. ***"Fetching water used to take hours. Now, borewells and pumps have made life easier, but some areas still struggle during summer." – Community member*** **For Mopar Village, Sarpanch and Community Members** ✓ The construction of a check dam and rainwater harvesting initiatives has improved water availability for both drinking and agriculture. However, siltation in structures remains a concern. ✓ Farmers can now cultivate two crops per year, compared to one earlier. ✓ Despite improvements, groundwater levels are still declining, making long-term water conservation a priority. ✓ Women no longer need to travel long distances to fetch water, saving time and reducing conflicts. ***"Water scarcity remains a challenge despite the check dam. We need more efforts in rainwater harvesting and deepening existing water bodies."- Community member*** ***"With better irrigation, we have increased our yields, but in summers, the fields still go dry. More long-term solutions are needed."- Community member*** **For Khairtal Village, Sarpanch and Community Members** ✓ New water supply systems have increased access to clean drinking water for 100-150 families. ✓ Improved irrigation through check dams, borewells, canals, and sprinklers has enhanced farming conditions. ✓ Water-related conflicts have reduced, as multiple water sources have eased the pressure on resources.

	✓ Water purity has significantly improved, leading to a lower incidence of waterborne diseases. ✓ Women and children no longer have to spend long hours fetching water, allowing them to focus on education and other productive activities. ***"Before, we struggled with water shortages and impure drinking water. Now, with better infrastructure, our people are healthier, and farming has become more reliable." – Community Member*** **For Bhadrapali Village, Sarpanch and Community Members** ✓ Pond construction and school water tanks have improved water availability for irrigation and drinking. ✓ Farmers have benefited from sprinklers and improved irrigation, increasing crop yields. ✓ The increasing population has put pressure on existing water resources, requiring further water management solutions. ✓ The Panchayat is responsible for water structure maintenance, but aging infrastructure like the 20-year-old water tank needs urgent replacement.***"*** **For Arjuni Village, Sarpanch and Community Members** ✓ Construction of a pond and installation of hand pumps has significantly improved water availability for both irrigation and drinking. However, water quality from ponds is sometimes unsuitable for farming, requiring better filtration and irrigation solutions. ✓ Groundwater levels have increased, reducing dependence on external water sources leading to economic benefits to farmers. ✓ Installation of wire fencing has helped protect crops from stray animals, reducing losses. ✓ Improved water quality from hand pumps has led to better health outcomes. ✓ The Sarpanch highlighted the need for a small dam and rainwater harvesting systems to further enhance water security. **For Kukurdi Village, Sarpanch and Community Members** ✓ Borewells and pipelines have improved drinking water availability, thereby reducing contamination-related health issues. However, some borewells have broken and require support for repair. ✓ Limited irrigation facilities mean that farming still depends heavily on seasonal rainfall. ✓ Quality seeds were provided to farmers, improving yield, but lack of irrigation limits agricultural expansion. However, kitchen gardens have flourished, allowing households to grow their own vegetables. ✓ Pond deepening projects have helped with water conservation, but further desilting and boundary construction are needed. ✓ Water-related conflicts have decreased, as better distribution has reduced tensions. ***"We have started kitchen gardens and skill training, but for real farming growth, irrigation must improve."- Community Member*** **For Pousari Village, Sarpanch and Community Members** ✓ Before the projects, Pousari faced severe water shortages, particularly in summer**.** ✓ The construction of ponds, check dams, and borewells has improved water availability for drinking, bathing, and livestock.

	✓ Groundwater levels have declined over time, and some areas still struggle with water contamination and siltation in ponds. ✓ Some farmers have access to borewells, but many still rely on the village lake for irrigation. ✓ While improved water infrastructure has helped, agricultural productivity has not significantly increased. ✓ Farmers reported monkey infestations damaging crops. ***"Even with better water, our crops suffer because of monkeys. We need solutions for that too." – Community Member*** **For Deorani Village, Sarpanch and Community Members** ✓ Before the projects, villagers relied on wells and hand pumps, facing severe water scarcity in summers. ✓ Post-project improvements included pipelines, borewells, and ponds, significantly enhancing water access. However, siltation in ponds can be a concern. ✓ Improved water access has helped farmers, leading to better crop yields. ***"With more water, farming has improved, but we still need better irrigation systems." – Farmer*** **For Barseli Village, Sarpanch and Community Members** ✓ Before the projects, villagers had to fetch water from distant sources, leading to health and hygiene challenges. The construction of ponds, check dams, and borewells has significantly improved water availability. However, drinking water shortages persist in summers. ✓ Water levels in ponds have increased, improving access to drinking water, irrigation, and livestock care. ✓ Use of sprinklers and irrigation systems has enhanced farming efficiency with better yields. It has also supported double cropping in some cases. ***"Now we can grow more crops, but maintaining irrigation systems is costly." – Farmer*** **For Maldi Village, Sarpanch and Community Members** ✓ Before the projects, villagers relied on distant and inconsistent water sources, facing severe water scarcity. ✓ Construction of ponds, borewells, and irrigation systems has improved water access, though seasonal drying of lakes remains a challenge. The impact on irrigation has been limited. ✓ Hand pumps were far away, requiring long travel times, especially in summer.
Community Infrastructure and Social Impact	**For all villages, Sarpanch and Community Members** ✓ Construction of community centers, better roads, and school infrastructure has improved the quality of life. - Road development has enhanced connectivity and transportation.

	- Education quality and attendance have improved with school upgrades, although additional investments in smart classes and computers are suggested. - Community centers provide inclusive spaces for social and cultural activities. **For Arjuni Village, Sarpanch and Community Members** ✓ Drainage improvements have reduced waterlogging, enhancing road durability and hygiene. ✓ Provision of bus facilities for schoolchildren has increased attendance and accessibility to education. ✓ Installation of gym equipment in playgrounds has encouraged physical activity among young people.
Maintenance and Sustainability of Infrastructure	**For all villages, Sarpanch and Community Members** ✓ Community participation in maintaining water structures is needed to ensure long term sustainability. ✓ Awareness programs on water conservation should be initiated. ✓ Additional water conservation measures, such as deepening water bodies and increasing rainwater harvesting, were suggested. ✓ Challenges include occasional financial constraints and the need for ongoing technical support. ***"Water structures are helping, but we must continue efforts to maintain them and expand rainwater harvesting."***
Future Sustainability Plans	**For Ravan Village, Sarpanch and Community Members** ✓ Need for additional rainwater harvesting structures. ✓ Introduction of smart classes and computers in schools. ✓ Maintenance of borewells and irrigation canals remains a challenge, with occasional siltation and contamination. ✓ The community has formed water user groups, but additional technical and financial support is needed for long-term sustainability. **For Mopar village, Sarpanch and Community Members** ✓ Deepen existing water bodies and enhance rainwater harvesting. ✓ Address declining groundwater levels through sustainable water management. ✓ Continue investment in schools, roads, and community halls. ✓ Ensure inclusivity, particularly for women and children. ✓ Strengthening Panchayat and community roles in maintenance. ✓ Increase community engagement in planning and decision-making. ✓ Conduct regular feedback meetings to address ongoing challenges. **For Khairtal village, Sarpanch and Community Members** ✓ Expand water supply initiatives to tackle seasonal shortages. ✓ Additional road construction projects to improve connectivity. ✓ Provide technical training for maintenance teams. ✓ Enhance community engagement in infrastructure upkeep.

	For Bhadrapali village, Sarpanch and Community Members ✓ Construct a new water tank to replace the old, damaged one. ✓ Implement rainwater harvesting and advanced irrigation systems. ✓ Improve road connectivity and drainage systems to prevent waterlogging. ✓ Increase community education on water conservation **For Arjuni village, Sarpanch and Community Members** ✓ Construct a small dam to improve long-term water availability. ✓ Expand rainwater harvesting and advanced irrigation systems. ✓ Maintain and upgrade the community hall (Rangamanch) with better lighting and seating. ✓ Increase cultural and educational programs for youth and women. ✓ Increase community awareness programs on water conservation and sustainable farming. **For Kukurdi Village, Sarpanch and Community Members** ✓ Expand irrigation projects to support sustainable farming. ✓ Implement rainwater harvesting and pond maintenance. ✓ Construct a bypass road to ease congestion. ✓ Strengthen community participation in infrastructure upkeep. ✓ Develop structured maintenance plans **For Pousari Village, Sarpanch and Community Members** ✓ Groundwater depletion remains a concern. The community suggested building soak pits in every household to recharge groundwater. ✓ Need to deepen existing water bodies and improve irrigation access for farmers. ✓ Address water contamination and siltation issues in community water sources. ✓ Provide solutions for monkey infestations affecting crop yields. ✓ Strengthen community participation in planning and maintenance. **For Deorani Village, Sarpanch and Community Members** ✓ Establish community-led maintenance committees. ✓ Improve lighting, security, and accessibility for all residents. ✓ Implement rainwater harvesting and groundwater recharge initiatives. ✓ Regular cleaning and deepening of ponds and check dams. **For Barseli Village, Sarpanch and Community Members** ✓ Implement rainwater harvesting and filtration systems. ✓ Construct additional borewells to ensure year-round availability. ✓ Expand training for farmers on sustainable water use. **For Maldi Village, Sarpanch and Community Members** ✓ Implement rainwater harvesting and regular siltation removal in water bodies. ✓ Form community-led water user groups for better management. ✓ Conduct awareness programs on infrastructure usage and upkeep.

Program Impact from the perspective of Divyang's who access the District Divyang Centre

The Focus Group Discussion (FGD) with individuals associated with the Divyang Centre highlighted significant improvements in accessibility, healthcare, and social inclusion for people with disabilities. However, challenges remain in employment support, transportation, and long-term sustainability. Below is a thematic analysis based on key findings from the discussion.

1) Challenges Before the Establishment of the Divyang Centre

- **Limited Accessibility:** Participants struggled with mobility due to the lack of accessible transport, infrastructure, and medical facilities in their villages.
- **Healthcare Barriers:** Access to therapy, rehabilitation, and specialized medical care was extremely limited. Many relied on informal community networks for support.
- **Educational Gaps:** Parents of children with disabilities noted that formal education and skill-building opportunities were unavailable before the centre's establishment.
- **Social Exclusion:** Individuals with disabilities faced stigma and isolation, with minimal participation in community activities.

"Before, we had to travel long distances for therapy, which was both expensive and exhausting." — Parent from Bhatapara

"There was no dedicated space for our children to learn or receive treatment." — Parent from Pausari

2) Awareness and Expectations from the Divyang Centre

- Most participants learned about the centre through the Ambuja Foundation and local authorities.
- Expectations included healthcare access, skill development programs, and greater social inclusion.
- Some participants felt their voices were not fully considered in the planning phase, leading to gaps in services.

"We were excited when we heard about the centre, but we hoped for more employment programs." — Participant from Baloda Bazar

3) Impact of the Divyang Centre

- **Healthcare Improvements**: The centre now offers occupational therapy, physiotherapy, speech therapy, and basic education, significantly improving the well-being of individuals with disabilities.
- **Accessibility to Services**: Medical and rehabilitation support is now locally available, reducing the financial and physical burden of traveling long distances.
- **Increased Social Inclusion:** The centre has created a safe space for interaction, reducing social stigma and fostering peer relationships.

"My child is now able to receive therapy close to home, and I have seen great improvements." — Mother from Pausari

"For the first time, we feel like we are part of the community because we have a space of our own." — Participant from Bhatapara

4) Employment and Skills Development

- The centre introduced vocational training programs, helping some participants acquire new skills.
- A few individuals have found work, but many believe more structured employment support is needed.
- Skills learned at the centre have led to greater self-sufficiency and confidence among individuals with disabilities.

"Learning a skill has made me feel independent, but I still struggle to find job opportunities." — Participant from Baloda Bazar

5) Community Perception and Social Inclusion

- Attitudes toward people with disabilities have shifted positively since the centre's establishment.
- Some barriers remain, especially in terms of public accessibility and awareness of available services.

"Earlier, people in the village didn't think we could do anything. Now, they see us learning and growing." — Participant from Bhatapara

6) Sustainability and Future Needs

- Need for transportation support to help individuals reach the centre.
- Expansion of vocational training programs to include diverse skill sets and job placement assistance.
- Increased collaboration between the centre, NGOs, and government agencies for long-term sustainability.
- Broader age inclusion, ensuring continued support for older individuals with disabilities.

"If we had better transport, more people would be able to use the centre's services." — Parent from Pausari

The Divyang Centre has had a positive impact, enhancing accessibility, healthcare, and social inclusion for people with disabilities. However, to maximize its effectiveness, greater focus on employment opportunities, transportation, and long-term sustainability is essential.

Program Impact from the perspective of Teachers

Key Informant Interviews (KIIs) with teachers from various villages highlighted significant improvements in school infrastructure, student engagement, and learning environments. However, persistent challenges remain in areas such as water supply, smart classrooms, and support for students with disabilities. Below is a thematic analysis of the key findings, incorporating insights from schools in Khairtal, Barseli, Arjuni, Bhadrapali, and Devrani.

Thematic Areas	Key Findings
Challenges Before Infrastructure Improvements	**Poor Infrastructure and Safety Concerns** ✓ **Khairtal & Barseli**: The absence of boundary walls led to unauthorized entries and safety risks for students. ✓ **Arjuni**: Frequent thefts and trespassing due to inadequate fencing discouraged school attendance. ✓ **Devrani**: Damaged classroom roofs and broken lintels in bathrooms created safety hazards. ***"People used to enter the school on bikes, and there was no security for students." — Teacher from Khairtal*** **Water Scarcity and Poor Sanitation** ✓ **Bhadrapali:** Schools were dependent on distant hand pumps, with muddy and contaminated water. ✓ **Barseli:** No toilets within the school, forcing students to go home, disrupting learning. ✓ **Devrani:** Water shortages after February affected daily school operations. **Lack of Basic Learning Facilities** ✓ **Devrani:** No library—books were stored in bags, limiting access. ✓ **Khairtal & Arjuni**: Poorly maintained classrooms and lack of teaching aids. ✓ **Bhadrapali:** Broken furniture, cracked walls, and lack of play areas hindered student engagement.
Impact of Infrastructure Development	**Improved Safety and Student Attendance** ✓ **Khairtal, Barseli, Arjuni**: The construction of boundary walls significantly improved school security, leading to higher student enrollment. ✓ **Arjuni**: Student enrollment increased from 85 to nearly 200 after school renovations. **Better Water and Sanitation Facilities** ✓ **Bhadrapali**: A borewell was installed, reducing reliance on distant water sources, though supply remains inconsistent. ✓ **Khairtal & Barseli**: Schools received separate toilets for girls, addressing a major attendance barrier. ✓ **Devrani**: Bathroom lintels were repaired, improving sanitation. ***"Now, girls don't have to leave school to use the toilet, which has boosted attendance." — Teacher from Barseli*** **Enhanced Learning Spaces and Materials** ✓ **Devrani**: A new library was set up, making books accessible for students.

	✓ **Khairtal**: Schools received toys, wall paintings, and hygiene kits, creating a more engaging learning environment. ✓ **Bhadrapali**: Some classroom repairs were done, but further improvements are needed.
Gaps and Areas for Improvement	**Need for Smart Classrooms and Digital Learning** ✓ **Arjuni, Khairtal:** Teachers emphasized the need for projectors and smart classrooms to modernize education. ***"A smart classroom setup would significantly enhance student engagement." — Teacher from Arjuni*** **Persistent Water Supply Issues** Awareness programs on water conservation should be initiated. ✓ **Bhadrapali**: The borewell dries up in summer, affecting hygiene and kitchen activities. ✓ **Devrani**: A deeper hand pump or additional water sources are required. ***"Without a consistent water supply, the midday meal program and hygiene suffer." — Teacher from Bhadrapali*** **Limited Support for Divyang (Special Needs) Students** ✓ **Bhadrapali & Arjuni**: Schools lack ramps, specialized seating, and inclusive teaching materials.
Recommendations for Future Improvements	✓ **Introduce Smart Classrooms:** Install projectors and digital boards in Arjuni, Khairtal, and Barseli. ✓ **Ensure Sustainable Water Supply:** Implement rainwater harvesting in Bhadrapali and Devrani and explore deeper borewells. ✓ **Enhance Support for Divyang Students**: Build ramps, provide mobility aids, and offer specialized teaching tools in Arjuni and Bhadrapali. ✓ **Improve Community Engagement**: Involve teachers, parents, and local leaders in school infrastructure planning. ✓ **Expand Playground and Sports Facilities**: Provide sports equipment and safe play areas in Barseli and Khairtal.

8. Social Returns on Investment of WRM Initiative

Social Return on Investment (SROI) is a valuable framework for assessing and quantifying the broader impact of Corporate Social Responsibility (CSR) programs. It is used to measure and communicate the social, environmental, and economic value created by an organization's activities, projects, or initiatives.

Social Returns on Investment (SROI) ratio is the heart of the analysis. It quantifies the relationship between the social value created and the investment cost. The ratio essentially compares the social value generated by the CSR program to the resources (financial investment) put into it.

It helps to identify the per value rupee benefit generated for every rupee invested in the program.

SROI Ratio= (Social Value Created / Investment Cost)

Wherein,

Social value created= Sum of all assigned values to materialized impacts

Investment cost= Total cost of program

WHAT DOES THE RATIO TELL US?

A ratio greater than 1 indicates a positive social return on investment. This means that for every unit of currency invested, the program generates more than one unit of social value.

SROI Approach

The SROI measurement for the WRM Project will follow the principles for SROI Assessment. The process will involve the following steps,

Step 1: Identification of program stakeholders

Step 2: Selection of stakeholders who are material to the study

Step 3: Mapping outcomes that can be valued

Step 4: Assigning values to outcomes

Step 5: Establishing Impacts

Step 6: Summing all impact values to find total social value created

Step 7: Program Cost

Step 8: Calculation Social Returns on Investment

SROI Calculations

Step 1 and 2: Identification and selection of key stakeholders

The stakeholders impacted by the program and considered into the SROI calculations are divided into 2 categories:

- **Implementation stakeholders: Ambuja Foundation**
- **Directly impacted stakeholders: Community members (households) and farmers**

Step 3: Mapping of Outcomes that can be valued

#	Outcome Indicators	Justifications for inclusion in SROI
1	**Awareness Generation on Water-Efficient Practices**	Knowledge leads to behavior change, reducing water wastage and improving long-term conservation efforts. Awareness programs influence sustainable water use, making it a key non-material benefit.
2	**Improvement in Water Availability at Household Level**	Increased access to water improves quality of life, reduces reliance on tanker water, and enhances household hygiene and sanitation, leading to broader well-being impacts.
3	**Reduction in Water-Borne Diseases**	Clean and sufficient water supply decreases disease prevalence, lowering medical expenses and productivity losses due to illness, making it a critical health and economic outcome.
4	**Improvement in Productivity of Women**	Reduced water-fetching time allows women to engage more in income-generating activities, particularly in agriculture, improving overall household earnings and gender-equitable economic growth.
5	**Improvement in School Attendance of Children**	With reduced time spent fetching water, children (especially girls) miss fewer school days, enhancing education outcomes and future livelihood opportunities.
6	**Impact on Profitability of Cultivation and Diversification (Paddy, Wheat and Mustard)**	Increased irrigation access improves crop yields, crop diversity and profitability, directly enhancing farmers' income and agricultural sustainability.
7	**Decline in Annual Water Cost**	Reduced dependence on expensive water sources (e.g., tankers) directly benefits household and farm budgets, leading to economic savings.

Step 3: Assigning Values to Outcomes

#	Outcome indicators	Logic of beneficiary selection	Beneficiary considered	Unit value (Rs.)	Total value (Rs.)	Justification for Values
1	**Awareness generation on water efficient practices**	59% of respondents were provided with information	13390.05	500	66,95,025	The value of awareness training is estimated at ₹500 per participant, based on research on water conservation training programs in India. Comparable government and NGO-led training programs cost between ₹350–₹500 per participant, and formal certification courses can cost even more. This valuation aligns with community training costs in similar interventions.[4]
2	**Improvement in water availability at household level**	97% stated that water availability has improved by 16,607 litres in a year	22014.15	0.2	7,31,17,798	Households reported an increase of 16,607 liters per year in water availability. We have assigned a value of ₹0.2 per liter based on the cost of purchasing or transporting water, especially in water-scarce regions where tankers are used. This figure reflects water tanker costs, bottled water prices, and estimated opportunity cost of fetching water.[5]
3	**Reduction in water borne diseases**	67% experienced improved health	15205.65	1180	1,79,42,667	Households reported an average reduction of ₹1,180 per year in healthcare expenses due to reduced waterborne diseases. This was calculated based on survey responses, which captured savings in medical costs, doctor visits, and medication expenses for illnesses such as diarrhea, skin infections, and other water-related diseases.
4	**Improvement in productivity of women**	52% of women fetch water from our sample of which around 78% work in farms and have less time to work	4602.78	3600	1,65,70,008	Female agricultural workers in Chhattisgarh earn significantly below the mandated minimum wage. Survey data shows wages were ₹153/day in 2018–19, rising to ₹170–₹200/day by 2021–22, still below the official minimum of ₹403/day. An employment study reported an

[4] Centre for Science and Environment. (n.d.). Training Programme on Advanced Rainwater Harvesting and Bhowmick, G. D. (n.d.). Water Quality Management Practices. NPTEL, IIT Kharagpur

[5] World Bank (2017). The Cost of Water Scarcity: Water Demand and Supply Imbalances. (Water tankers charge around ₹800 for 6,000 litres (₹0.133/litre) and ₹2,200–₹2,500 for 12,000 litres (₹0.183–₹0.208/litre).

		by 46 minutes				actual average wage of ₹225/day, indicating that many laborers earn below the legal rate. Based on trends, a benchmark of ₹200/day (₹25/hour) is reasonable for SROI calculations. We consider this for 180 hours of work loss. Time lost fetching water (46 min/day or 0.77 hours) equates to ₹19–₹20 per day in lost earnings.[6]
5	**Improvement in school attendance of children**	51% of households had children in the age group of 10 to 17, 30% of which go to fetch water.	3472.20	400	13,88,880	The average school fee in the sample was ₹400 per month. On an average, children lost two school days per month due to water collection. Since there are 20 school days per month, the per-day cost is ₹400 ÷ 20 = ₹20 per day. Over 10 months (excluding summer vacations), students take 2 leaves per month due to water collection. As a result, ₹400 per child is the estimated annual education cost loss per household due to water-related absenteeism.
6	**Impact on profitability of Paddy**	87% of respondents are farmers, of which 100% of respondents were farmers cultivating paddy	19744.65	10736	21,19,78,562	Total profit improvements were directly provided by respondents
7	**Impact on profitability of Wheat**	87% of respondents are farmers, of which 56% of respondents were farmers cultivating wheat	11057.20	8084	8,93,86,405	Total profit improvements were directly provided by respondents

[6] NABARD. (2023). All India Rural Financial Inclusion Survey (NAFIS) 2022–23 and Ministry of Statistics and Programme Implementation. (2023). Periodic Labour Force Survey (PLFS) Annual Report 2022–23.

8	**Impact on earnings from Mustard**	87% of respondents are farmers, of which 12% of respondents were farmers cultivating mustard. They started growing mustard after the program due to availability of water.	2369.40	10478	2,48,26,573	Total profit improvements were directly provided by respondents
9	**Decline in Annual Water Cost**	87% of respondents were farmers	19744.65	845	1,66,84,229	Households reported a reduction of ₹848 per year in water costs due to a decline in dependency on water tankers. Electricity for pumping groundwater is free in Chhattisgarh, so no electricity costs were included in this calculation.

The summation of total value outcomes provides the total summarized monetized outcomes for the WRM program:

Total Valued Outcome: Rs. 45,85,90,147.5

Step 5: Establishing Impact

To ensure that the Social Return on Investment (SROI) calculations accurately reflect the program's unique contributions, adjustments were made for deadweight, attribution, and displacement across various outcome indicators. These adjustments help avoid overestimating the program's impact by accounting for what would have occurred naturally or through other stakeholders' efforts.

#	Outcome Indicator	Deadweight (%)	Attribution (%)	Displacement (%)
1	Awareness generation of water-efficient practices	20%	15%	0%
2	Improvement in water availability at household level	15%	20%	0%
3	Reduction in waterborne diseases	10%	20%	0%

4	Improvement in productivity of women	5%	15%	0%
5	Improvement in school attendance of children	5%	25%	0%
6	Impact on profitability of Paddy	15%	25%	5%
7	Impact on profitability of Wheat	15%	25%	5%
8	Impact on earnings from Mustard	15%	25%	5%
9	Decline in Annual Water Cost	5%	15%	0%

Justification for Deadweight, Attribution, and Displacement (DAD)

The assignment of DAD values in this SROI was grounded in triangulated evidence from multiple data sources including beneficiary interviews and focus group discussions. External secular factors such as sectoral government schemes, and market dynamics were transparently acknowledged through moderate attribution assumptions. Where uncertainty existed, the evaluation approach was deliberately conservative to avoid over-claiming outcomes. Displacement filters were applied judiciously only to indicators where crop substitution or opportunity costs were plausible. Furthermore, scale limitations, particularly in irrigation coverage, were carefully factored into the SROI computations.

1) **Awareness Generation on Water-Efficient Practices:** Under the Ambuja program, structured awareness campaigns were conducted on water conservation structures, efficient water use, and community maintenance responsibilities. Field data shows that 80% to 85% percentage of respondents received substantial information on importance of water conservation structures in great depth.

   - Deadweight is applied at 20% because, while Ambuja was a primary catalyst, awareness may have been influenced by other government agricultural extension services (e.g., Krishi Vigyan Kendras, ATMA programs) or organic farmer-to-farmer knowledge spread.
   - Attribution of 15% is justified as approximately 15% to 20% of respondents indicated that they were not provided information on water conservation structures by Ambuja, based on survey findings.
   - No displacement is considered, as awareness does not reduce existing benefits; rather, it creates additional value by empowering farmers with knowledge and improving efficiency across the ecosystem.

2) **Improvement in Water Availability at Household Level:**
   - Deadweight is applied at 15% acknowledging that, while Ambuja's interventions were crucial, in certain villages, natural factors like seasonal rainfall and existing borewell infrastructure might have partially contributed to water availability improvements independently.
   - Attribution is applied at 20%, reflecting qualitative feedback indicating the presence of other NGOs and government efforts (e.g., MGNREGS works, minor drinking water programs) complementing Ambuja's interventions, though not at the same intensity.
   - No displacement was considered as increased household water access is a net gain for the community without substituting prior benefits.

3) Reduction in Waterborne Diseases:

- Deadweight at 10% is justified because improved water quality alone may not account for the full health improvements; behavioral factors (like hygiene practices) and other awareness programs could also influence health.
- Attribution at 20% reflects a cautious recognition that other health campaigns (government, NGO-led or Ambuja's community development work especially in school) might have overlapped partially with WRMs impact.
- No displacement was assigned, as reduction in disease represents pure community benefit.

4) Improvement in Productivity of Women:

- While women's productivity in farm operations likely improved through better water access, it's important to recognize that many women worked informally on household farms without receiving formal wages. Hence, Deadweight is kept low at 5% to acknowledge that without the intervention, marginal productivity changes might still have occurred through general community development.
- Attribution at 15% accounts for broader influences on women's work productivity (such as general economic requirements, support by government etc.).
- No displacement since improvements in women's productivity add to household well-being and do not displace others' benefits

5) Impact on Profitability of Paddy, Wheat and Mustard

- Deadweight at 15% accounts for general sectoral improvements (e.g., better seed varieties, good monsoon).
- Attribution at 25% acknowledges partial contributions from external market factors, government agriculture schemes, and organic shifts in farming practices. Additionally, since canal irrigation infrastructure directly benefited only 150 farmers, a higher attribution has been applied to exercise caution and avoid over estimation of the program's impact across the broader farming community.
- 5% Displacement is applied because while growing paddy, wheat and mustard, the farmers are losing out on growing other crops, which can be more valuable.

6) Decline in Annual Water Cost

- Deadweight is very low at 5% because most cost reductions are directly linked to project-supported access to water sources.
- Attribution at 15% accounts for factors such as rainfall variability or small community-driven water sharing initiatives that may have contributed.
- No displacement since lower water cost is a pure economic benefit to households.

Step 6 and 7: Calculating Social Value Created and Program Cost

#	Outcome indicators	Total benefits (Rs.)	Total DAD	Social Value Created (Rs.)
1	Awareness generation on water efficient practices	66,95,025	35%	43,51,766.25
2	Improvement in water availability at household level	7,31,17,797	35%	4,75,26,568.58
3	Reduction in waterborne diseases	1,79,42,667	30%	1,25,59,866.9
4	Improvement in productivity of women	1,65,70,008	20%	1,32,56,006.4
5	Improvement in school attendance of children	13,88,880	30%	9,72,216
6	Impact on profitability of Paddy	21,19,78,562	45%	11,65,88,209.3
7	Impact on profitability of Wheat	8,93,86,405	45%	4,91,62,522.64
8	Impact on earnings from Mustard	2,48,26,573	40%	1,48,95,943.92
9	Decline in Annual Water Cost	1,66,84,229	20%	1,33,47,383.4
Total Social Value Created				**27,26,60,483.4**

The total program cost for Water Resource Management Initiatives in 2022-23 by Ambuja Foundation was:

Total Program Cost: Rs. 2,69,19,549

Step 8: Calculating Social Returns on Investment

In this section, we calculate the SROI ratio by quantifying the relationship between the social value created and the investment cost. The ratio essentially compares the social value generated by the program to the resources (financial investment) put into it. It helps to identify the per value rupee benefit generated for every rupee invested in the program.

SROI Ratio= (Social Value Created / Investment Cost)

SROI Ratio= 10.12

The SROI Ratio of the WRM program of Ambuja Foundation implies that for every rupee invested in the program, it generated Rs. 10.12 worth of returns

Outcome Contribution Analysis

Outcome Contribution Analysis is a valuable technique in SROI assessments, as it helps identify the relative impact of individual outcomes on the overall value created by a project. This analysis involves calculating the net present value (NPV) of each outcome by adjusting its financial value for factors like deadweight, attribution, and drop-off. By comparing each outcome's NPV to the total value created, we can determine the percentage contribution of each outcome to the SROI. This percentage reveals which outcomes are the main drivers of social impact, highlighting high-impact areas where the project is delivering the most value.

The outcome contribution reveals that in WRM—Impact on profitability on paddy, Improvement in water availability at household level and Impact on profitability of wheat contributed to almost 78% of the total social value created.

#	Outcome indicators	Social Value Created	Outcome Contribution
1	Awareness generation on water efficient practices	43,51,766.25	1.6%
2	Improvement in water availability at household level	4,75,26,568.58	17.4%
3	Reduction in waterborne diseases	1,25,59,866.9	4.6%
4	Improvement in productivity of women	1,32,56,006.4	4.9%
5	Improvement in school attendance of children	9,72,216	0.4%
6	Impact on profitability of Paddy	11,65,88,209.3	42.8%
7	Impact on profitability of Wheat	4,91,62,522.64	18.0%
8	Impact on earnings from Mustard	1,48,95,943.92	5.5%
9	Decline in Annual Water Cost	1,33,47,383.4	4.9%

SROI Limitations

This SROI analysis provides valuable insights into the social impact generated by the WRM project; however, several limitations affect the precision and reliability of the findings:

- **Attribution and Deadweight Challenges:** Determining the extent to which outcomes are directly attributable to the project is complex, especially when multiple stakeholders or external factors influence outcomes. Accurately estimating deadweight—the degree to which outcomes would have occurred without the project—can be challenging, potentially leading to over- or underestimations of impact.
- **Assigning Financial Proxies:** Converting social outcomes, into monetary terms is essential for SROI, yet it requires subjective judgment. Identifying suitable financial proxies that capture the real value of these outcomes is difficult and may not fully reflect the project's qualitative impacts.
- **Data Collection Constraints:** Comprehensive data collection for all outcomes is challenging. Self-reported information from beneficiaries may introduce biases.
- **Time Lag in Realizing Outcomes:** Many of the project's outcomes may only be fully realized over a longer period. Since SROI studies often capture a shorter timeframe, some long-term impacts may be undervalued, potentially providing a conservative estimate of the project's full value.

9. Conclusion and Way Forward

The Water Resource Management (WRM) and Rural Infrastructure Development (RID) initiatives undertaken by the Ambuja Foundation have had a transformative impact on the community. The program has addressed critical challenges related to water scarcity, poor infrastructure, and limited agricultural productivity, thereby improving the overall quality of life. The key achievements of the program include:

- **Improved Water Availability:** The construction of check dams and canal repairs has enhanced groundwater recharge, ensuring year-round water availability.
- **Enhanced Agricultural Productivity**: Increased access to irrigation water has enabled farmers to cultivate multiple crops, improving their income and food security.
- **Infrastructure Development**: Upgraded roads, schools, and community halls have enhanced connectivity, education quality, and social cohesion.
- **Livelihood and Social Benefits**: Reduced water-fetching burden on women, improved health due to cleaner drinking water, and lower conflicts over water usage have contributed to social harmony.

Despite these achievements, there remain areas for further improvement, including the need for additional rainwater harvesting structures, enhanced maintenance mechanisms, and further investments in education and digital infrastructure.

Way Forward

To build upon the progress made and ensure the long-term success of the WRM and rural infrastructure development initiatives, the following strategic actions are recommended:

1) Enhancing Sustainability through Community Ownership:

- Establish village-level water user committees responsible for the maintenance and management of water conservation structures.
- Develop a structured fund allocation for long-term maintenance of water infrastructure.
- Train local youth for minor repairs.
- Develop systematic structures for other repair issues.
- Train farmers in water management techniques to optimize irrigation practices and prevent over-extraction.
- Promote participatory decision-making to ensure that interventions align with farmers' specific needs.

2) Scaling Up and Expanding Infrastructure Development

- Construct additional check dams, percolation ponds, and borewells in water-scarce regions to improve groundwater recharge.
- Strengthen rainwater harvesting systems in households and community farms to reduce dependency on erratic rainfall.
- Expand alternative irrigation solutions to more farmers. Also provide capacity building sessions to increase adoption.

3) Integrating Water Resource Management with Livelihood Development

- Encourage farmers to diversify into high-value, less water-intensive crops such as pulses, vegetables, and horticulture.
- Provide training in sustainable agricultural practices to maximize water productivity.


ND PUMP