A photograph of a riverbank with lush green grass and a body of water in the foreground. The grass is vibrant green and appears to be growing in a slightly elevated area. The water is clear and blue, reflecting the sky. The overall scene is bright and natural.

From Dry Beds to New Beginnings

***How Garhwa's Communities Are
Reviving Water and Work***

2026

Overview

Introduction

Government of India started Aspirational District Program started in 2018 with an objective of reaching out to the most backwards districts of India. As economy is largely agriculture based thus the critical component is availability of irrigation water for agriculture. Climate change escalated the situation by causing lower rainfall, frequent droughts and over exploitation of ground water. Water bodies are partially (or completely) filled with silt, limiting their water storage capacity and recharge. Aligning with the priority, Government of India started Rejuvenation of Water Bodies (RWB) initiative, an innovative, community-led, tech enabled water revival programs. Various schemes of central and state government have been implemented in Jharkhand like Jal Jeevan Mission, Pradhan Mantri Sinchayee Yojana, Mission Amrit Sarover, Jal Sanchay Abhiyan AMRUT 2.0, and NITI Aayog Rejuvenation Window-II.

OneStage implemented one such program in collaboration with NITI Ayog (funder), A.T.E. Chandra Foundation (Monitoring partner) and local communities, to reverse decades of land degradation and agricultural decline in Bokaro (Kathara, Pailadih, Amdiha, and Kasmar), Garhwa (Bhandariya, Kharaundi, Chiniya, and Garhwa), and Palamu (Pandu, Panki, and Tarhasi). The proposed impact study has been conducted in one such area Garhwa, one of Jharkhand's most impoverished districts, faces a complex web of challenges rooted in water scarcity, migration, and poverty.





With 35.84% of its population living in multidimensional poverty and a high climate vulnerability index of 62.5%, the district struggles to sustain its predominantly agrarian economy. Only 28.9% of the total land is net sown due to inadequate access to water, and over 92% of the farmers are classified as marginal, relying on small, rain-dependent plots for survival. Furthermore, 81.29% of rural households earn less than 5,000 per month, reflecting widespread income insecurity. In Garhwa, the lack of effective water harvesting infrastructure and the poor implementation of schemes like MGNREGA have left fields dry, poor agriculture productivity, and low cropping intensity forcing people to migrate in search of work and leaving women burdened with the daily struggle to secure water for their households.

Research Objectives – align them with SDGs goals

Denny El Jackson

2.1. To evaluate the impact of water body rejuvenation on net farm and livestock income among beneficiary farmers.

2.2. To examine changes in household-level water availability and its implications for domestic water security.

2.3. To assess improvements in community knowledge and practices related to sustainable water resource management following the intervention.

2.4. To estimate the social value created for donor institutions in terms of enhanced brand perception and institutional credibility through investment in sustainable water management.

2.5. To calculate the Social Return on Investment (SROI) of the water body rejuvenation intervention by monetising key outcomes and applying appropriate impact adjustment factors.

Associating SDGs

SDG 13	Climate Action	Adaptation, resilience, drought mitigation.
SDG 15	Life on Land	Ecosystem revival, biodiversity.
SDG 2	Zero Hunger	Irrigation & agriculture improvement.
SDG 1	No Poverty	Livelihood enhancement.
SDG 5	Gender Equality	Women's empowerment, leadership, financial inclusion, and decision-making.



The Area Profile: Garhwa

The secondary data reveals significant socio-economic and environmental development gaps in Jharkhand, with the situation appearing more pronounced in the aspirational district of Garhwa. The multidimensional poverty levels remain high in the state (28.81%) and increase further in Garhwa (35.84%), indicating deeper deprivation and limited access to essential services.

Health and Nutrition

The district faces persistent challenges in maternal and child health. Although the prevalence of anaemia among children under five is slightly lower in Garhwa (62.5%) compared to the state average (67.4%), levels remain critically high. Anaemia among adolescent pregnant women (15–19 years) also shows a similar pattern, with 61% affected in Garhwa versus 65.8% at the state level. Antenatal care coverage is strikingly low, with only 29.8% of mothers in Garhwa receiving at least four ANC visits compared to 38.7% at the state level. Malnutrition indicators reflect severe vulnerabilities: 47.7% of children under five in Garhwa are stunted and 40.6% are underweight—both higher than state averages—indicating chronic nutritional deficits.

Agriculture and Rural Infrastructure

Garhwa's economy remains predominantly agrarian, with limited industrial presence, leading to high dependence on natural resources. Groundwater extraction in Garhwa (24.6%) is lower than the state average (31.4%), indicating relatively better recharge conditions or lower irrigation intensity. However, adoption of improved irrigation systems such as drip and sprinkler remain minimal though comparatively higher in Garhwa (6.3%) than the state average (1.6%). Notably, the climate vulnerability index in Garhwa is extremely high (0.63), compared to a very low level for the state (0.07), indicating exposure to climatic risks, environmental degradation, and weak adaptation capacity. CSR investment shows a stark contrast, with Garhwa receiving only ₹0.35 crore, compared to ₹414.63 crore across Jharkhand—highlighting a major financing gap.

Education

Education outcomes reveal a mixed pattern. While upper primary dropout among girls is lower in Garhwa (1.9%) than in the state (4%), dropout at the secondary level rises sharply to 19.3%, more than double the state average (8.9%). Learning outcomes also remain weak.

The proportion of students in Class 8 performing at basic or below-basic levels in science (76.6%) is higher than the state figure (71%). Conversely, mathematics performance is slightly better in Garhwa (60.9%) compared to Jharkhand's 72%. Female educational attainment shows marginal improvement, with 31% of women in Garhwa having at least 10 years of schooling, similar to state levels (30.9%).

Groundwater Resources and Hydrology

Garhwa has a diverse hydrological profile, with significant areas classified as recharge-worthy. Key indicators include Total annual groundwater recharge: 0.3104 BCM, Extractable groundwater resource: 0.2855 BCM, Annual extraction: 679.9 ham, Groundwater extraction rate: 41.1%, and Net annual availability for future use: 972.35 ham. Long-term trends (2009–2022) show a stable groundwater extraction pattern, hovering around 34–35%, keeping the district within the “safe” category. Only 5.26% of water resources are semi-critical. The district has a large number of water bodies across blocks, especially in Bhandaria (3607), Chiniya (3754), and Garhwa block (1447). These water bodies are used for domestic consumption, religious activities, groundwater recharge, irrigation, pisciculture, industrial use, and recreation, and are managed by diverse entities including panchayats, cooperatives, state departments, and private groups.



Salient feature: Rejuvenation of Water Bodies (RWB), Government of India

Monetary contribution

Farmers contribute 75% of the cost- 25% is donor funded. The program operates on a costsharing model in which farmers contribute 75 percent of the total investment, while the remaining 25 percent is supported through donor funding. This ensures strong community ownership and financial responsibility.

Scheme convergence

Aligned with MGNREGA and other government schemes to leverage resources, avoid duplication, and enhance impact.

Demand driven

Rejuvenation initiated by communities backed by scientific data. All interventions are initiated based on community demand, supported by scientific assessments such as hydrogeological studies. This ensures that rejuvenation works address real needs and deliver meaningful outcomes.

Tech-Enabled Monitoring

GPS-based app track progress and impact in real time. A GPS-based mobile application is used to track the progress and performance of each water structure in real time. This improves transparency, accountability, and data-driven decision-making throughout implementation.

Collaborative governance

Local committees include officials, partners and villagers. Local governance structures—comprising government officials, implementing partners, and community representatives—jointly oversee planning, execution, and monitoring. This shared responsibility strengthens coordination and long-term stewardship.



Conclusions

The RWB model combines farmer contribution, convergence with MGNREGA, scientific planning, tech-enabled monitoring, and five-year maintenance to create a transparent, scalable, and sustainable water rejuvenation framework.



Methodology

Mixed-methods evaluation combining structured household surveys and Focus Group Discussions (FGDs) to triangulate quantitative outcomes and community perceptions.

200 beneficiary households sampled across 4 rejuvenated ponds using stratified random sampling (50 households per pond) to ensure balanced representation.

Uniform intervention design (desilting, embankment strengthening, groundwater recharge) enabled programme-level aggregation of outcomes with equal weighting across sites.

Outcome indicators aligned with the Theory of Change, covering farm and livestock income, irrigation and household water access, cost of cultivation, and knowledge/practice of sustainable water management.



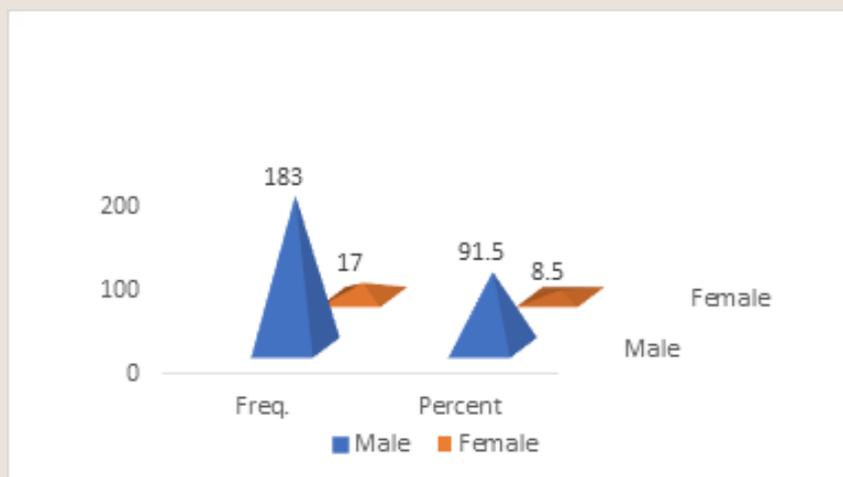


Data Analysis

Analysing Impact through Quantitative Data

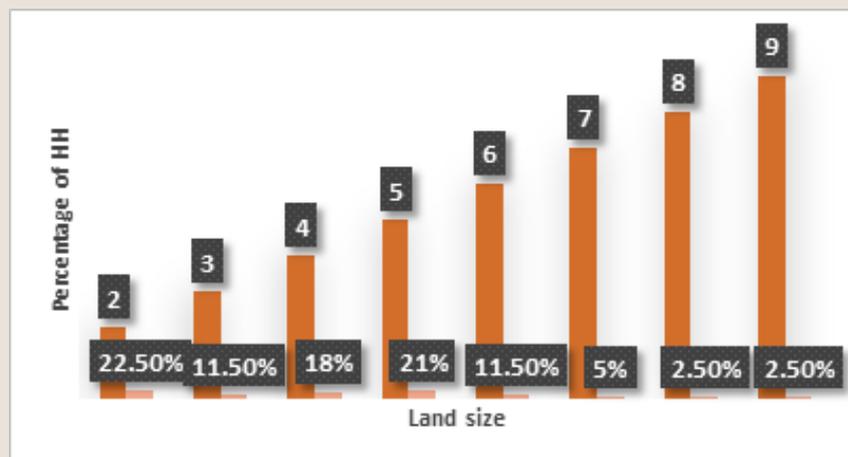
A.1. Gender Profile

Almost every HHs reported to have land and agriculture as their primary source of income. Every household keep livestock including cattle and goats. Women didn't take interest in the survey, mostly confined to livestock and agriculture work. Among the 200 farmers HHs, only 17 were women, rest were man.



A.2. Landholding size

The largest proportion of farmers (22.5%, n = 45) falls under Category 2, making it the most common landholding size among the respondents. This is followed by Category 5 (21%, n = 42) and Category 4 (18%, n = 36), suggesting that a substantial share of farmers own land in the lower-to-mid size categories.



Categories 3 and 6 each account for 11.5% (n = 23) of the respondents, reflecting moderate representation. Smaller shares are observed in Category 1 (5.5%, n = 11) and Category 7 (5%, n = 10). Very few respondents fall under Categories 8 and 9, together constituting only 5% (n = 10), indicating that large landholdings are rare in the study area.

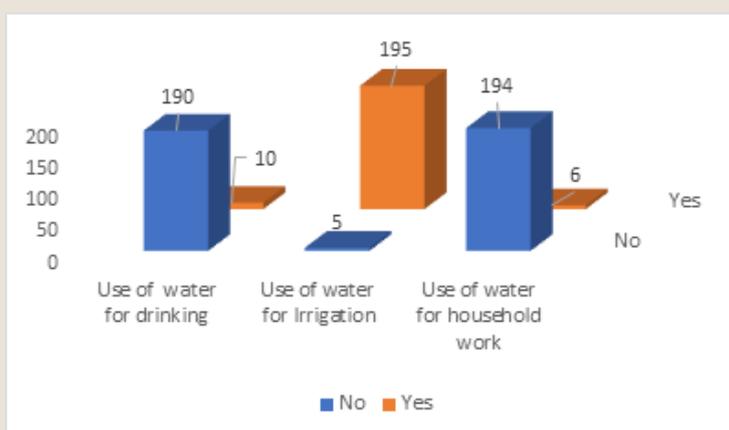
Nearly three-fourths of the respondents are concentrated in Categories 2 to 5, highlighting the dominance of small and semi-medium farmers. The negligible presence of large landholders suggests that agricultural interventions, productivity enhancement measures, and income-support programs in the study area should be tailored toward small and marginal farmers, who form the backbone of the local agrarian economy.



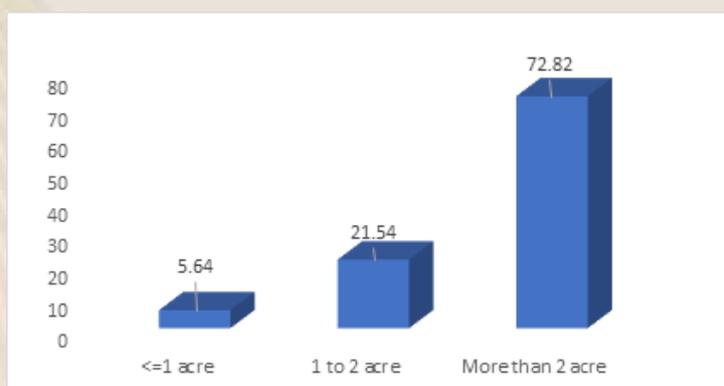
Perception & Utilization Analysis

B.1. Utility of Rejuvenated Pond

The table presents the usage pattern of pond water among farmers for different purposes, namely drinking, irrigation, and household activities. The findings show that pond water is predominantly used for irrigation purposes, with 195 farmers reporting its use and only 5 farmers indicating non-use for irrigation. This highlights the critical role of pond water in supporting agricultural activities. In contrast, pond water is rarely used for drinking, as 190 farmers reported not using it, while only 10 farmers indicated its use for drinking purposes.



The table clearly indicates that pond water is primarily utilized for agricultural irrigation, Strong positive relationship between land size and pond water use showed that nearly three-fourths of pond-water users (72.82%) are farmers with more than 2 acres of land. Use of pond water increases sharply with landholding size.

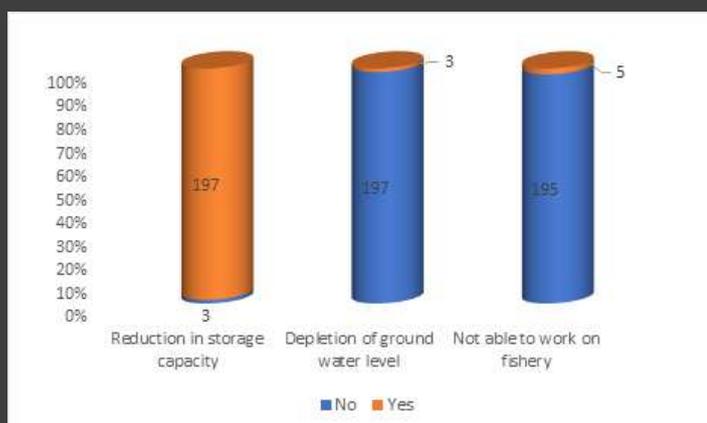


Farmers owning ≤ 1 acre account for only 5.64% of pond-water users, indicating constraints in access, infrastructure, or affordability. Even among 1–2 acre farmers, usage remains relatively low (21.54%). Larger farmers are better positioned to invest in pumps, pipes, and conveyance systems, bear recurring energy costs, and cultivate larger irrigated areas, making pond water economically viable. While pond rejuvenation has improved water availability, benefits are currently skewed toward larger landholders.

B.2. Result of Siltation (Awareness)

The table highlights farmers' perceptions regarding the impacts of siltation on water bodies. An overwhelming majority of farmers (197 out of 200) reported that siltation has led to a reduction in storage capacity of ponds, indicating that silt accumulation is a widespread and serious concern affecting water availability. In contrast, very few farmers (3) perceived depletion of groundwater levels as a direct result of siltation, while 197 farmers reported no such impact. This suggests that farmers largely associate siltation with surface water storage loss rather than with groundwater depletion. Similarly, siltation appears to have limited impact on fisheries-related activities, as 195 farmers stated that they were not affected, and only 5 farmers reported that siltation hindered their ability to engage in fishery activities.

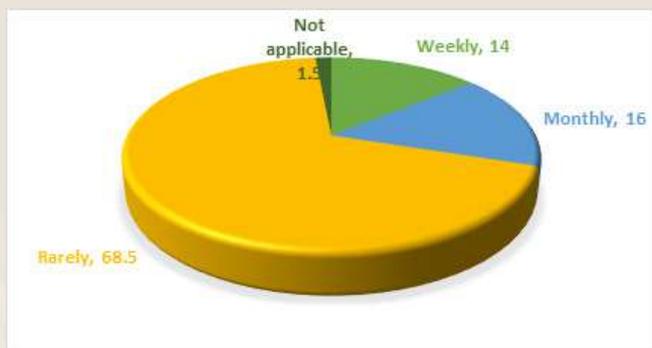
The findings indicate that siltation is perceived primarily as a problem of reduced water-holding capacity, rather than one affecting groundwater recharge or fisheries. This underscores the need for interventions such as desilting and pond rejuvenation, which can significantly enhance surface water storage and improve water availability for irrigation without major concerns related to fisheries disruption.



Participation & Governance Analysis

C.1. Contribution of community through participation in meetings

The table presents the frequency of farmer households' participation in meetings as a form of contribution to collective activities. The findings indicate low levels of regular engagement among the majority of farmers. The findings indicate low levels of regular engagement among the majority of farmers. A large proportion of farmer households (68.5%, n = 137) reported rare participation in meetings, highlighting limited consistent involvement in group-level processes. Only 16% (n = 32) of households participated in meetings on a monthly basis, while an even smaller share (14%, n = 28) reported weekly participation. A negligible proportion of respondents (1.5%, n = 3) indicated that participation was not applicable, suggesting that almost all households were at least nominally linked to the intervention or group.





The analysis suggests that while farmer households are broadly associated with collective structures, active and regular participation remains weak.

Strengthening farmer engagement may require more inclusive meeting schedules, clearer articulation of benefits, and participatory decision-making mechanisms to enhance ownership and sustained involvement.

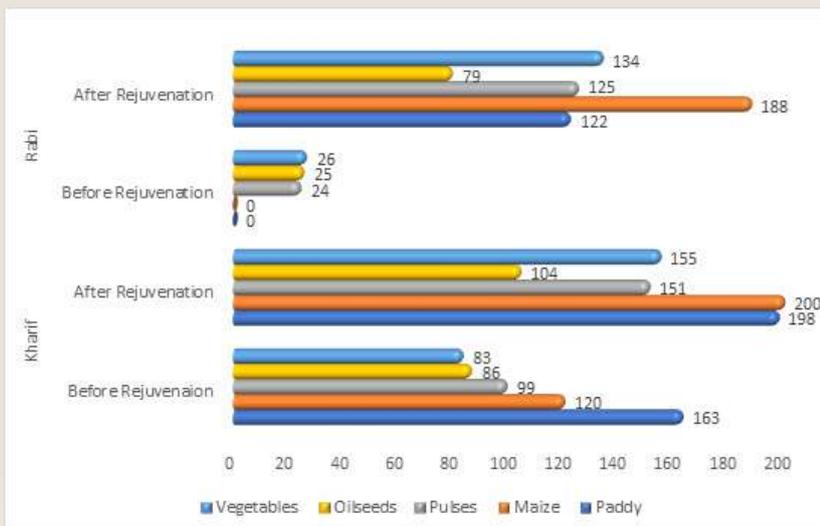
While current participation levels indicate scope for improvement, the near-universal linkage of households to the intervention reflects a strong foundation for deeper engagement. With targeted capacity building and structured engagement strategies, participation rates are expected to improve in subsequent phases.

The existing baseline of community association provides a promising platform for strategic interventions aimed at increasing regular participation, thereby reinforcing the project's sustainability and institutional strengthening objectives.

Agricultural Impact Analysis

D.1 Change in Cropping Pattern

Across all crops, farmer participation in Kharif cultivation increased markedly after rejuvenation. Paddy cultivation rose from 163 to 198 farmers, indicating improved water availability for water-intensive crops. Maize showed one of the most significant increases, from 120 to 200 farmers, suggesting strong farmer confidence in Kharif productivity. Pulses increased from 99 to 151 farmers, reflecting diversification beyond cereals. Oilseed's cultivation grew moderately from 86 to 104 farmers. Vegetable cultivation almost doubled, increasing from 83 to 155 farmers, indicating a shift toward higher-value crops. The impact of rejuvenation is even more pronounced in the Rabi season. Prior to rejuvenation, no farmers cultivated paddy or maize during Rabi, while after rejuvenation, 122 farmers cultivated paddy and 188 farmers cultivated maize, highlighting a major expansion of irrigated Rabi agriculture.



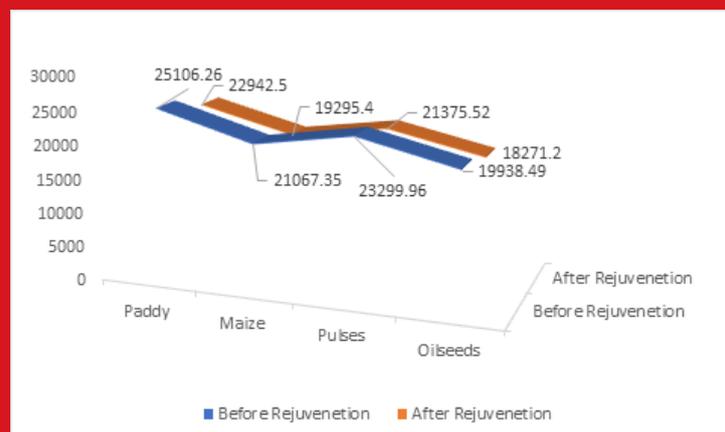


Pulses cultivation increased sharply from 24 to 125 farmers. Oilseeds cultivation rose from 25 to 79 farmers. Vegetables increased from 26 to 134 farmers, reflecting enhanced off-season production and income opportunities.

The results demonstrate that pond rejuvenation significantly enhanced water availability, enabling. Expansion of Rabi cultivation, which was previously very limited. After rejuvenation, increased cropping intensity, and Greater diversification toward pulses, oilseeds, and vegetables. These changes are likely to have contributed to higher farm incomes, improved food security, and reduced dependence on monsoon rainfall, underscoring the effectiveness of rejuvenation as a sustainable agricultural intervention.

D.2 Cost of Cultivation Analysis

Post-rejuvenation, production costs declined by 8–9% for every crop, indicating a broad-based impact rather than crop-specific effects. Highest absolute savings in Paddy: Paddy farmers saved the most per acre (₹2,164), significant given paddy's water-intensive nature. The reduction in cost of production is likely driven by improved availability of irrigation water, reducing dependence on diesel/electric pumps, lower expenditure on energy, water procurement, and crop stress management, better soil moisture retention, and possibly reducing input intensity.

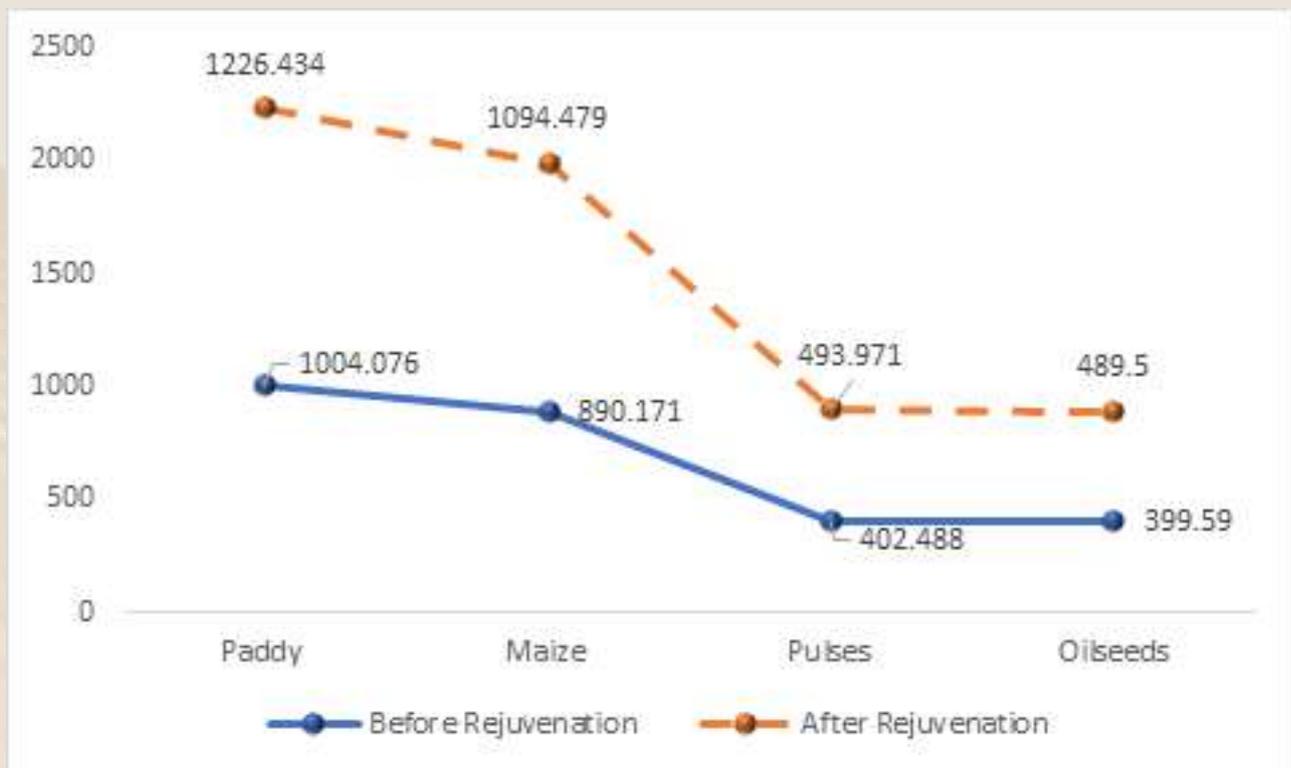


Agricultural Impact Analysis

D.3. Production

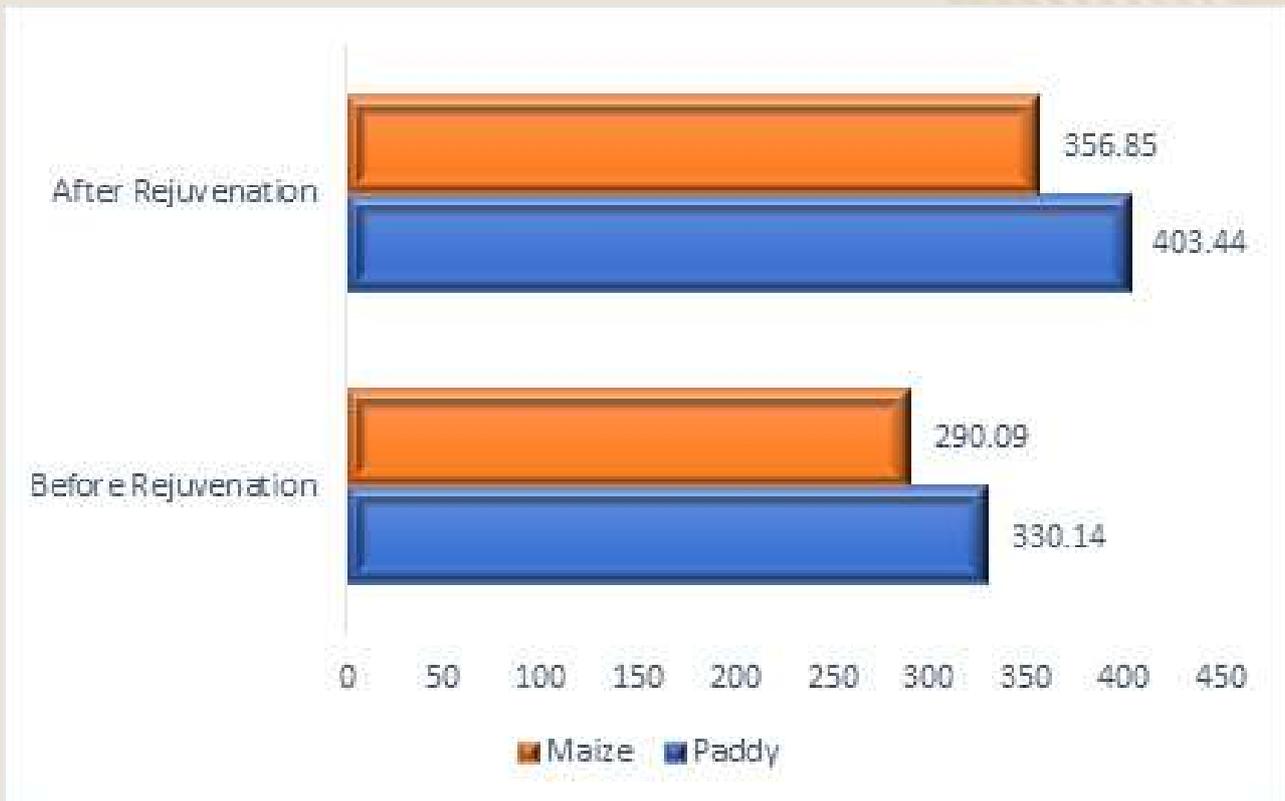
All crops show a 22–23% increase in per-acre production, indicating a strong and consistent impact of rejuvenation rather than random variation. Paddy recorded the largest absolute increase (+222 kg/acre),

The increase in production per acre can be attributed to improved irrigation reliability and reduced water stress during critical crop stages, better crop health and nutrient uptake due to enhanced soil moisture, and reduced crop loss from irrigation gaps and drought spells.



D.4. Productivity

Both paddy and maize recorded over 22% improvement in productivity per acre, indicating a substantial positive impact after rejuvenation. Paddy shows the larger absolute increase (+73.3 units/acre), consistent with its dependence on assured water supply and timely irrigation.



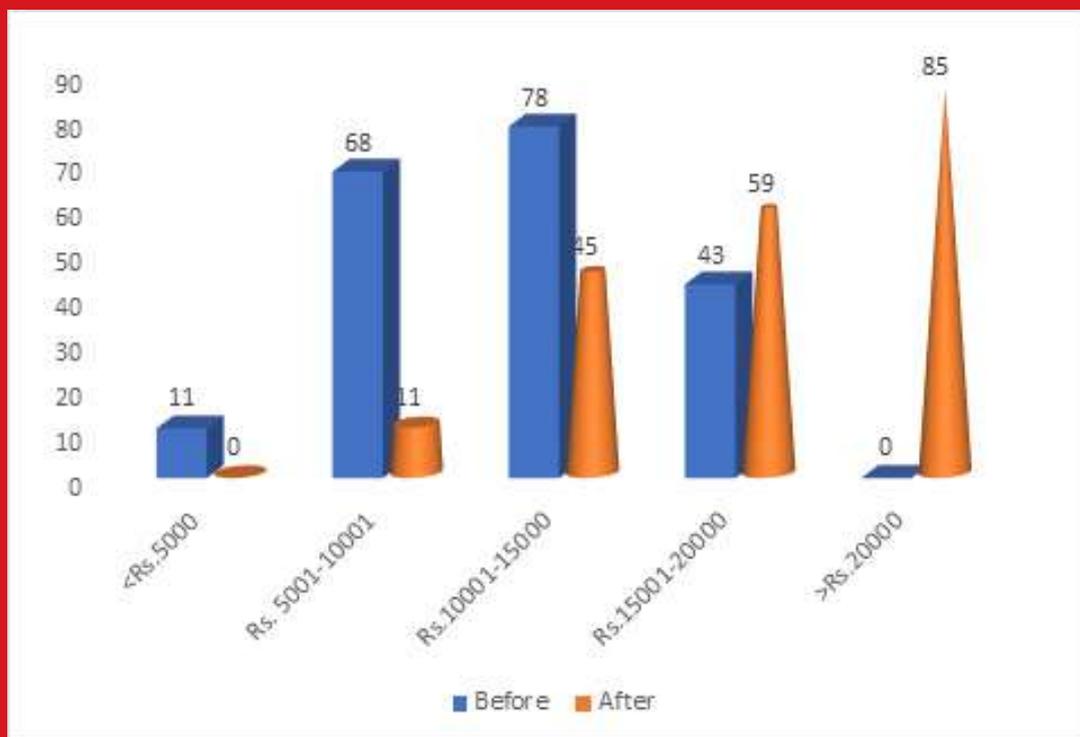
The near-identical percentage growth ($\approx 22\text{--}23\%$) across crops suggests that rejuvenation improved systemic water availability, rather than benefiting only one crop. The observed increase in productivity per acre can be attributed to improved irrigation reliability during critical crop growth stages, reduced crop stress and yield loss due to moisture availability, and enhanced input-use efficiency, especially seeds and fertilizers.

The consistent productivity gains across both crops demonstrate that investments in water infrastructure translate directly into measurable agricultural outcomes. This reinforces the intervention's effectiveness in enhancing farm-level income potential and strengthening livelihood resilience.

Income Impact Analysis

E.1 Agriculture Income

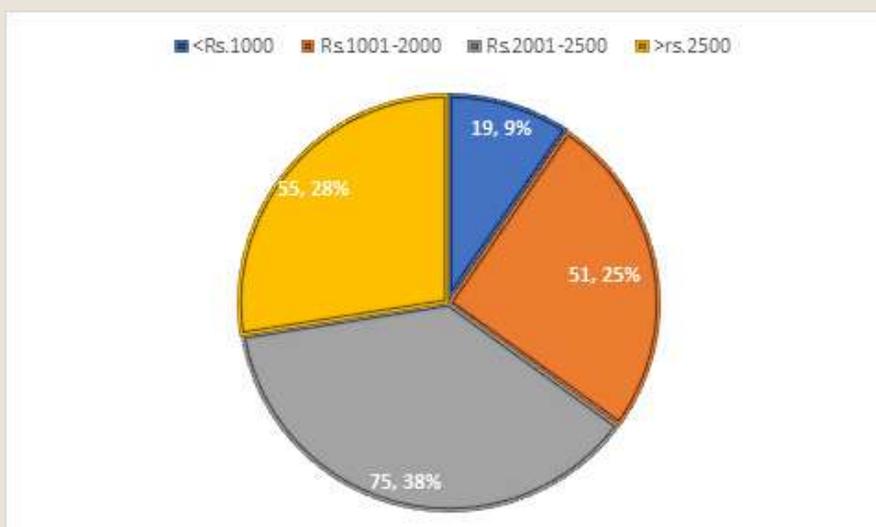
Households earning below ₹5,000/month reduced from 11 to zero, indicating improved income security post-rejuvenation. A clear shift from lower- and middle-income brackets to higher income brackets. The >₹20,000/month category increased from 0 to 85 households, highlighting substantial income gains driven by improved productivity and reduced costs. Before rejuvenation, income concentrated in ₹10,001–15,000 range. After the rejuvenation, income concentration shifts to ₹15,001–20,000 and above, indicating a structural improvement in farm livelihoods. This income transformation is likely due to higher crop productivity per acre, lower cost of cultivation, expansion of rabi cultivation, and crop diversification enabled by improved water availability. Together, these factors increased net monthly farm income, pushing households into higher income brackets.



E.2 Livestock Income

Majority around 65% (130 households) earn moderate to higher livestock income of (130 households) earn more than ₹2,000 per month from livestock. The largest group (37.5%) falls in the ₹2,001–2,500 category, indicating stable supplementary income. Only 9.5% of farmers earn less than ₹1,000 per month, suggesting that livestock contributes at least a minimum income buffer for most households.

Nearly one-third of farmers (27.5%) earn above ₹2,500 per month, reflecting better animal productivity, milk yield, or market access. The income distribution suggests that livestock functions as an important supplementary income source, especially for small and marginal farmers. It helps smooth household income, reducing vulnerability during agricultural lean seasons. Livestock has potential for scaling income through improved fodder availability, veterinary support, and market linkages.



F. Silt Utilization Impact

Regression analysis to understand the amount of silt use on agriculture income after pond rejuvenation shows that About 82.7% of the variation in post-rejuvenation agricultural income is explained by silt use and cultivable land size. Silt application—made possible through pond rejuvenation—has a statistically significant and positive effect on farm income. This supports the hypothesis that nutrient-rich silt improves soil fertility and productivity.

H. Institutional Sustainability Analysis

72% of respondents reported that the Water User Committee (WUC) is very effective in managing and maintaining water resources. The remaining 28% of respondents stated that the committee is effective. No respondents rated the committee as ineffective or poor. The Water User Committee has emerged as a robust community institution, critical for the sustainability of rejuvenated water bodies.

II. Transformational Impacts and SDG Contributions

Pond rejuvenation has delivered system-wide agricultural transformation—enhancing water security, enabling multi-season farming, reducing production costs, boosting productivity by over 22%, and driving households into higher income brackets.

This intervention stands out as a high-impact, sustainable rural development model with strong economic, ecological, and institutional returns.



1. Strengthened Livelihoods of Small and Semi-Medium Farmers

Nearly 75% of beneficiary households belong to small and semi-medium landholding categories, underscoring that the intervention primarily reached the agrarian backbone of the region. Despite limited land sizes, these farmers experienced significant gains in productivity, income, and resilience, validating the relevance of water-based interventions for marginal agrarian economies.

2. Rejuvenated Ponds as a Critical Irrigation Lifeline

Pond water is now overwhelmingly used for irrigation (97.5% of farmers), confirming rejuvenated ponds as a vital agricultural asset rather than a domestic water source. However, access remains uneven—nearly 73% of pond-water users own more than 2 acres, highlighting infrastructural and affordability constraints for marginal farmers. This indicates scope for inclusive irrigation solutions to democratize benefits.

3. Strong Community Awareness of Water Storage Challenges

An overwhelming 98.5% of farmers identified siltation as the primary cause of reduced pond storage capacity, reinforcing the relevance of desilting interventions. Farmers largely associate siltation with surface water loss rather than groundwater or fisheries impacts, strengthening the case for pond rejuvenation as a targeted and socially accepted solution.

4. Expansion and Diversification of Cropping Systems

Pond rejuvenation triggered a transformational shift in cropping intensity and diversity. Kharif cultivation expanded sharply, with paddy (+35 farmers), maize (+80), pulses (+52), and vegetables (+72). Rabi cultivation witnessed a structural breakthrough, moving from near-zero cultivation to large-scale adoption—paddy (122 farmers), maize (188), pulses (125), and vegetables (134). Farmers increasingly diversified into pulses, oilseeds, and vegetables, reducing mono-cropping risks and enhancing income potential.

5. Reduced Cost of Cultivation Across All Crops

Rejuvenation led to a uniform 8–9% decline in per-acre cultivation costs, with paddy farmers recording the highest absolute savings (₹2,164/acre). Reduced dependence on diesel and energy-intensive irrigation, improved soil moisture, and lower crop stress contributed directly to enhanced profitability and resilience.

6. Consistent Gains in Production and Productivity

All major crops registered a 22–23% increase in per-acre production and productivity, indicating systemic impact rather than crop-specific gains. Paddy showed the highest absolute production increase (+222 kg/acre), while pulses and oilseeds—traditionally moisture-sensitive—also recorded comparable gains, reflecting improved irrigation reliability and soil health.

7. Significant Upward Shift in Agricultural Incomes

The intervention delivered a clear income transformation:

- Households earning below ₹5,000/month declined from 11 to zero.
- The ₹20,000+ monthly income category increased from 0 to 85 households.
- Income concentration shifted from lower brackets to ₹15,001–20,000 and above, signaling structural livelihood improvement rather than marginal gains.

8. Livestock as a Stable Income Buffer

Livestock emerged as a strong supplementary income source:

- 65% of households earn more than ₹2,000/month from livestock.
- Nearly 28% earn above ₹2,500/month, supporting income smoothing during lean agricultural periods.
- Improved water availability and fodder conditions likely strengthened livestock productivity.

9. Nutrient-Rich Silt as a Driver of Farm Income

Regression analysis reveals that 82.7% of variation in post-rejuvenation farm income is explained by silt use and land size. Silt application has a statistically significant positive effect on income, confirming that pond rejuvenation delivers dual benefits—water security and soil fertility enhancement.

10. Strong Institutional Foundations for Sustainability

The Water User Committee (WUC) has emerged as a highly effective grassroots institution:

- 72% rated it as “very effective” and the remaining 28% as “effective”.
- Zero negative ratings reflect strong community trust and governance capacity, ensuring long-term sustainability of rejuvenated water bodies.

Qualitative analysis

Improvement in Groundwater Availability

Community interactions, field observations, and farmer testimonies indicate a measurable improvement in groundwater availability following the rejuvenation of local water bodies under the RWB intervention.

Pre-intervention scenario (August 2022 and earlier):

Households reported groundwater availability at depths of 3–7 metres below ground level, requiring deeper pumping, higher energy consumption, and greater effort for both irrigation and domestic use.

Post-intervention observations (August 2025):

Average water levels in open and bore wells have improved to 2–5 metres below ground level, reflecting a 1–2 metre rise in groundwater table. Respondents consistently attributed this change to:

- Increased rainwater retention in rejuvenated ponds
- Improved percolation due to desiltation and strengthening works
- Observed outcomes reported by farmers include:
- Faster well recharge after rainfall
- Reduced pumping time and energy use
- Greater reliability of water during critical cropping periods

This improvement has enhanced farmer confidence in irrigation planning and reduced vulnerability to seasonal water stress, particularly during dry spells. “Earlier, even after rainfall, our wells stayed dry. Now, water comes back quickly,” shared multiple farmers across intervention villages.

The Garhwa experience demonstrates that while the RWB model can catalyze tangible improvements in water availability, sustained livelihood transformation requires convergence—across water, land, livestock, and institutional systems. The intervention goes beyond reviving water bodies; it contributes to reviving ecosystems, local economies, and dignity in some of the most vulnerable communities.

Increase in Cropping Intensity and Agricultural Revival

In the remote villages of Karchali and Jamauti (Bhandariya block), agriculture had nearly collapsed due to erratic rainfall and lack of irrigation, leaving large tracts fallow for over a decade. The RWB intervention has triggered a significant turnaround.

- For the first time in 12 years, farmers reintroduced Rabi maize cultivation across 132 acres, marking a major revival of agricultural activity.
- Eighty-seven small and marginal farmers have begun cultivating vegetables using nutrient-rich silt excavated during pond rejuvenation.
- Crops now being cultivated include Rabi maize, Wheat, pulses, and oilseeds, and Seasonal green vegetables
- Improved irrigation access and enhanced soil fertility have enabled multiple cropping cycles, reversing years of decline.

“We never thought we would grow maize again in our lifetime. Now my children see hope in farming,” said Ramnath, a farmer from Jamauti.

“I never imagined growing two crops in a year. This season, I earned ₹60,000 from my small patch of land,” shared Mahavir Singh from Karchali.

Reduction in Cost of Cultivation

Prior to the intervention, farmers relied heavily on rain-fed agriculture and expensive irrigation options, including diesel- or electricity-based pumping from distant sources.

Pre-intervention irrigation costs:

- ₹2,000–₹3,000 per acre per year
- Post-rejuvenation, rejuvenated ponds have emerged as reliable community irrigation assets, supporting Local pumping systems and Gravity-based irrigation.

Post-intervention irrigation costs:

- ₹600–₹1,000 per acre per year
- This represents a 50–70% reduction in irrigation expenditure, enabling:
- Expansion of Rabi cultivation
- Reduced climate risk
- Improved net farm incomes

Overall, the RWB intervention has contributed to higher cropping intensity, lower production costs, and strengthened livelihood resilience, reinforcing the role of water-centric interventions in climate-vulnerable regions.

From Desiltation to Resource Circularity and Livelihood Gains

Desiltation was redesigned as a soil health and livelihood intervention, not just storage enhancement.

Reused silt improved soil fertility, reduced fertiliser costs, and increased productivity.

Pani Panchayats strengthened community governance, ensuring long-term water management and sustainability.

The project created a circular, climate-resilient natural resource management model.



9HJR+3M6, Arsali, Jharkhand 822112, India

Latitude

24.37927833333332°

Longitude

83.59074666666666°

Local 04:28:57 PM

GMT 10:58:57 AM

Altitude 237 m

Wednesday, 22.05.2024

Note : Captured by GPS Map Camera Lite

Advancing Gender-Responsive Water Governance and Livelihoods

- Women participated in Pani Panchayats and water governance decision-making.
- Improved water access reduced women's drudgery and time poverty.
- Silt reuse increased yields in women-managed crops and reduced input costs.
- Multi-season cropping improved food security and women's livelihoods.
- Women emerged as leaders and stewards of natural resources.



Social Return on Investment (SROI)

The Social Return on Investment (SROI) analysis was undertaken to assess the social, economic, and institutional value generated through the rejuvenation of community water bodies. The analysis follows the five-stage SROI framework, ensuring transparency, stakeholder relevance, and methodological rigor.

Stage 1: Stakeholder Identification and Mapping

Key stakeholders were identified based on their direct and indirect engagement with, and influence from, the intervention. Primary stakeholders included farmers, who are direct beneficiaries of improved irrigation and livestock water access; village households, who benefit from improved water availability for domestic use; community members and Panchayati Raj Institution (PRI) representatives, who play a role in local water governance; and the donor institutions, which derive institutional and reputational value from supporting sustainable development initiatives. Stakeholder inclusion was guided by the principle of materiality, ensuring that only those experiencing meaningful change were included in the valuation.

Stage 2: Mapping Outcomes and Indicators

Material outcomes were identified through primary household surveys, focus group discussions, and field observations. Key outcomes for farmers included increase in net farm income from crop cultivation and increase in income from livestock, driven by improved water availability and reduced irrigation costs. For village households, the principal outcome was improved availability of water at the household level. At the community level, the intervention contributed to increased knowledge of sustainable water resource management. For donor institutions, the outcome was enhanced brand perception as a responsible development partner. Each outcome was linked to measurable indicators, expressed as the percentage of stakeholders reporting positive change. To avoid double counting, income-related outcomes were monetised, while productivity improvements and cost reductions were treated as causal drivers rather than separate outcomes.

Stage 3: Valuing Outcomes Using Financial Proxies

Financial proxy values were assigned to each outcome using conservative and contextually appropriate benchmarks. Income-related outcomes were valued using self-reported increases in annual farm and livestock income. Improved household water availability was valued using cost avoidance proxies such as reduced expenditure on water procurement and pumping. Knowledge outcomes were valued using the cost of delivering equivalent community-level training on sustainable water management, reflecting the market cost of acquiring similar knowledge. Brand perception outcomes were valued using conservative proxy estimates based on communication and stakeholder engagement costs typically incurred to achieve comparable brand visibility.

Stage 4: Impact Adjustment Factors

To ensure that the estimated social value was not overstated, adjustment factors were applied to each outcome. Deadweight was calculated using beneficiary self-reporting on whether outcomes would have occurred without the intervention, applying weighted averages to reflect partial attribution. Attribution accounted for the influence of external factors such as rainfall variability and government schemes. Displacement was considered negligible, as the intervention did not shift negative impacts to other groups. Drop-off was applied annually to reflect the gradual reduction in outcome intensity over time, with shorter durations applied to knowledge and brand-related outcomes compared to infrastructure-linked benefits.

Stage 5: Calculating the SROI Ratio

The total present value of adjusted benefits was compared against the total investment cost of the intervention to calculate the SROI ratio. The analysis indicates an SROI of 2.15:1, meaning that every rupee invested generated ₹2.15 in social value. This ratio reflects a positive and credible return, achieved through conservative assumptions, avoidance of double counting, and stakeholder-informed valuation. The SROI demonstrates that investments in water body rejuvenation not only enhance livelihoods and water security but also generate sustained social and institutional value.

Beyond aggregate productivity gains, the intervention has resulted in a structural shift in agricultural incomes. The proportion of extremely low-income farming households has declined, while a growing segment of farmers has moved into higher income brackets. This transition highlights improved livelihood security, reduced vulnerability to climatic shocks, and enhanced capacity for reinvestment in agriculture. The Social Return on Investment (SROI) ratio is estimated at 2.35, indicating that for every ₹1 invested, ₹2.35 of social value has been generated. The monetised social value includes:

- Increased agricultural income due to higher crop productivity
- Reduced costs of irrigation and groundwater extraction
- Improved water security and resilience against dry spells
- Time savings and reduced physical effort in water access
- Enhanced livelihood stability and overall well-being

Overall, the SROI findings demonstrate that investments in water body rejuvenation are economically efficient, socially impactful, and contribute directly to poverty reduction and long-term rural resilience.



Impact Adjustment factors						
S. No.	Outcomes	Deadweight %	Displacement %	Attribution %	Drop Off %	Net impact
1	Increasing in net farm income from crop cultivation	15%	0%	0%	10%	2746350
2	Increase in income from livestock	20%	0%	5%	10%	268477.6
3	Improved availability of water at household level	10%	0%	5%	10%	1431270
4	Increased knowledge of sustainable water resource management	20%	0%	5%	100%	79800
5	Enhanced brand perception as a responsible development partner	0%	0%	10%	100%	76500

Calculating financial proxy values				
S. No.	Outcomes	Financial Proxy	Financial Proxy Value (Per stakeholder per year)	Gross Value (Financial Proxy Value X Quantity)
1	Increasing in net farm income from crop cultivation	Annual increase in income from crop (average of two crops per year)	17950	3231000
2	Increase in income from livestock	Annual increase in income from livestock	2078	353260
3	Improved availability of water at household level	Average time saved in fetching water from distance	9300	1674000
4	Increased knowledge of sustainable water resource management	Cost of providing community-level training on sustainable water resource management (Prevailing costs of NGO-led community training programmes and watershed management capacity-building initiatives)	750	105000
5	Enhanced brand perception as a responsible development partner	Average per capita cost of creating similar brand awareness	500	85000

(Calculating SROI)						
S. No.	Outcomes	Year 1	Year 2	Year 3	Year 4	Year 5
1	Increasing in net farm income from crop cultivation	2746350	2471715	2224543.5	2002089.15	1801880.235
2	Increase in income from livestock	268477.6	241629.84	217466.856	195720.1704	176148.1534
3	Improved availability of water at household level	1431270	1288143	1159328.7	1043395.83	939056.247
4	Increased knowledge of sustainable water resource management	79800	0	0	0	0
5	Enhanced brand perception as a responsible development partner	76500	0	0	0	0
	Total	4602397.6	4001487.84	3601339.056	3241205.15	2917084.635
	Grand Total	18363514.28				
	Total construction cost of ponds	7820000				
	SORI	2.35 (18363514.28/7820000)				

What Makes RWB a Game Changer

- Demand-driven, scientific planning: communities initiate projects supported by science data, enabling effective targeting of water bodies with maximum benefits.
- Real time monitoring ensures transparency, adaptive planning, and builds trust with donors and local stakeholders.
- Improved irrigation coverage: rejuvenated water bodies increase access to irrigation, enabling expansion into rabi cropping and year-round farming.
- Higher cropping intensity: reliable water availability allows farmers to cultivate multiple crops per year, improving land use and income.
- Soil fertility from silt: excavated nutrient-rich silt enhances soil quality, leading to better yields and reduced dependency on chemical fertilizers.
- Increased agricultural productivity, combined effect of irrigation and fertile silt boosts overall farm output and resilience.
- Women's engagement: ensure women benefit through improved water access, active participation, and awareness and rights.
- Reduced migration: Better local livelihood opportunities from vegetable and rabi crop cultivation help minimize seasonal distress migration.

Way Forward: Scaling Impact with Sustainability

- As the RWB program prepares for its next phase, focus areas include:
- Strengthening local institutions like Pani Panchayats,
- Building capacity for grassroots documentation and maintenance,
- Designing livelihood models that support long-term economic independence,
- Expanding to new villages, especially with high PVTG populations.

While desiltation activities had been undertaken earlier by the GPs and line departments, those interventions were largely limited to removal of silt for increasing storage capacity of waterbodies. The excavated silt was generally left unused or disposed of without any planned utilisation. Under the present initiative, the approach went beyond conventional desiltation.

The project systematically reused the nutrient-rich silt for application in nearby agricultural fields, thereby improving soil fertility, soil structure, and moisture-retention capacity. This integration of water resource management with soil health improvement added a strong livelihood and productivity dimension to the intervention. In addition, the formation and strengthening of Pani Panchayats across all targeted Gram Panchayats created a structured, community-led governance mechanism.

These institutions have enhanced local capacity for planning, operation, and maintenance of water resources, ensuring transparency, collective decision-making, and long-term sustainability of the rejuvenated water bodies. Overall, the project moved beyond infrastructure creation to establish a holistic and community-owned water resource management model, ensuring lasting environmental and livelihood benefits.



A STUDY BY



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