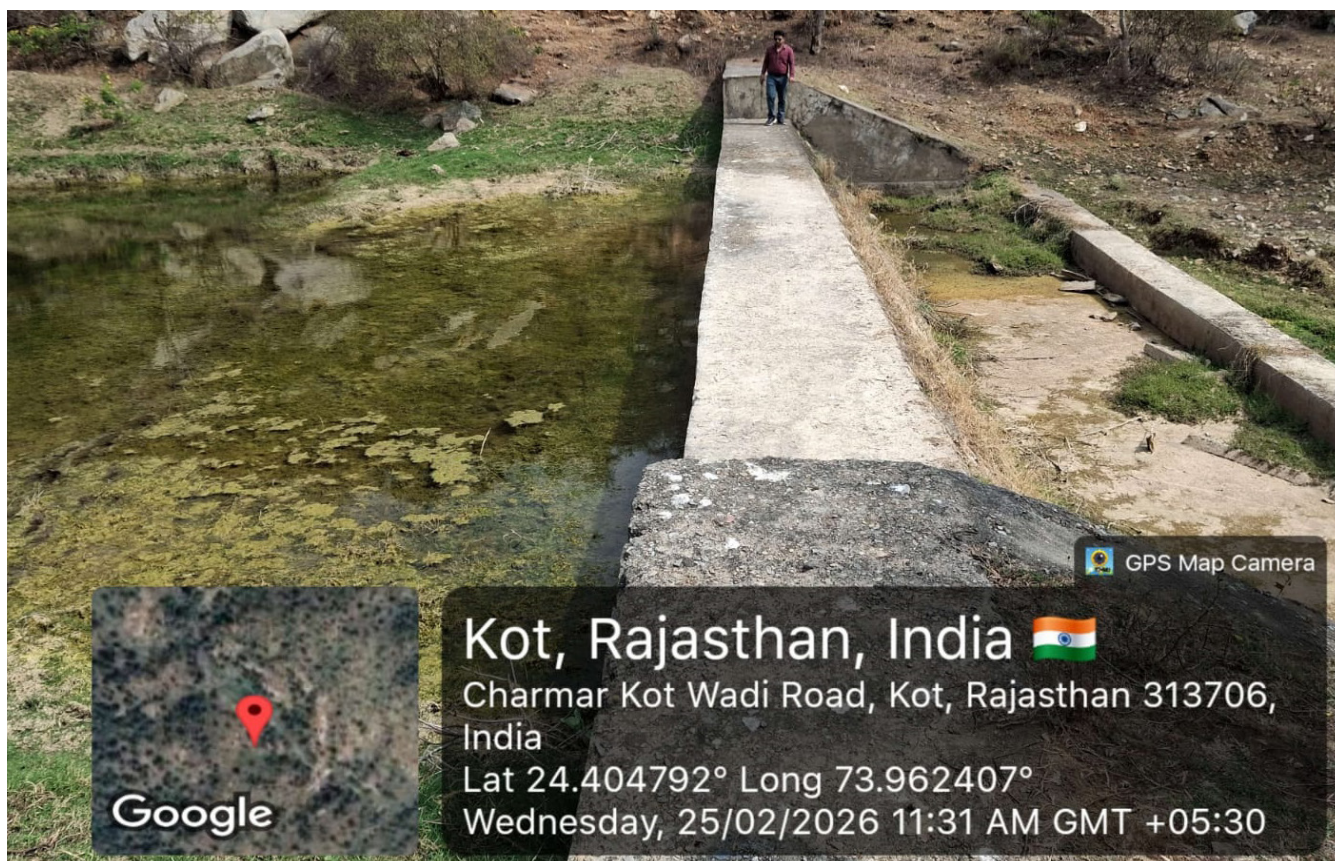


Impact Assessment Report

CREATION OF WATER ECONOMIC ZONES
(Kurabad, Khandwa & Katni) FY2023-24



Prepared By SR Asia









Dharampal Satyapal Group (DS Group) is a leading Indian diversified conglomerate with a strong presence across multiple consumer-oriented and infrastructure-linked sectors. Built on a foundation of quality, integrity, and long-term stakeholder trust, the Group has established a significant national and international footprint over several decades of operations.

DS Group's diversified portfolio spans **food and beverages, confectionery, mouth fresheners, hospitality, tobacco, packaging, agriculture, dairy, mining, infrastructure, and allied businesses**. The Group is recognised for its focus on product excellence, brand innovation, and robust manufacturing and distribution capabilities, serving a wide range of markets and consumers. Alongside business growth, DS Group places strong emphasis on ethical business conduct, environmental responsibility, and inclusive development. The Group's philosophy recognises that sustainable business success is closely linked to the wellbeing of communities and ecosystems in which it operates.

CORPORATE SOCIAL RESPONSIBILITY AND SUSTAINABILITY

DS Group's Corporate Social Responsibility (CSR) approach is guided by a commitment to creating long-term, measurable social and environmental value. The Group prioritises interventions that address systemic challenges rather than short-term needs, with a strong focus on accountability,

community ownership, and outcome-oriented implementation.

Water stewardship forms a central pillar of DS Group's CSR strategy, reflecting the critical role of water in agriculture, livelihoods, health, and rural resilience. Over time, the Group has evolved from standalone infrastructure creation to integrated, landscape-based development models that combine water conservation with livelihood enhancement and capacity building.

FOCUS ON LONG-TERM IMPACT

DS Group aligns its CSR initiatives with national development priorities and the Sustainable Development Goals, ensuring coherence with broader sustainability and climate-resilience objectives. Programmes such as the Creation of Water Economic Zones (WEZ) reflect this approach, positioning water as an economic and ecological enabler capable of generating sustained improvements in rural incomes, environmental regeneration, and social stability.

THROUGH ITS CSR INITIATIVES, DS GROUP SEEKS TO:



Strengthen natural
resource security



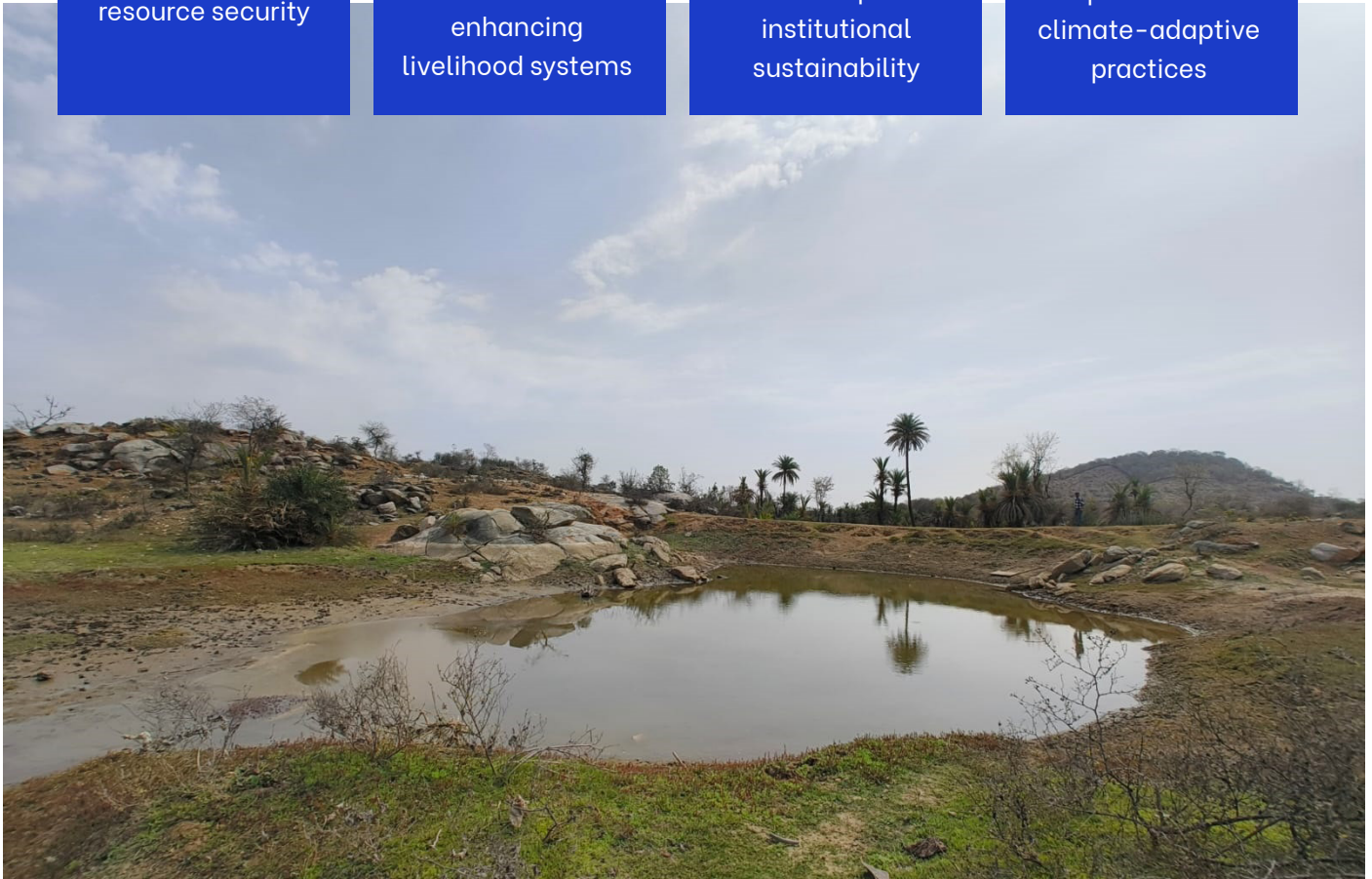
Enable resilient
and income-
enhancing
livelihood systems



Promote community
ownership and
institutional
sustainability



Support
environmentally
responsible and
climate-adaptive
practices



COMMITMENT GOING FORWARD

Guided by its values and long-term vision, DS Group continues to invest in high-impact, scalable CSR models that deliver shared value for communities, the environment, and the business. The Group views CSR as a strategic commitment—integral to responsible growth and to India's broader sustainable development journey.

STRICTLY PRIVATE & CONFIDENTIAL

To,
Dharampal Satyapal Limited (DS Group)
CSR Department
C 6-10, DS Road, Sector 67,
Noida – 201309,
Uttar Pradesh, India

Date: 6th April 2026

Subject: Final Impact Assessment Report – Creation of Water Economic Zones (WEZ) Programme

Dear CSR Team,

This refers to Dharampal Satyapal Group's engagement of **Social Responsibility Asia (SR Asia)** to **undertake the independent Impact Assessment of the Creation of Water Economic Zones (WEZ) – Integrated Watershed & Livelihood Development Programme**, implemented across selected locations in Rajasthan and Madhya Pradesh.

The assessment has been conducted in accordance with the agreed scope of work and aligns with SR Asia's Comprehensive Impact Assessment Methodology, incorporating OECD-DAC evaluation criteria, UN Sustainable Development Goals (SDGs), and ISO 20252:2019-aligned ethical and quality standards.

We are pleased to submit this **Final Impact Assessment Report**, which signifies the completion of our assignment. The findings, conclusions, and recommendations presented herein are based on primary and secondary evidence collected during the assessment period and are subject to the terms and conditions governing our engagement.

This report has been prepared **exclusively for the benefit and internal use of Dharampal Satyapal Group** for CSR evaluation, strategic decision-making, learning, and institutional documentation. The report should not be distributed, quoted, or referred to beyond its intended audience without our prior written consent.

We appreciate the opportunity to have worked with the CSR team and implementing partners on this important initiative and thank you for the cooperation extended to our assessment team. We look forward to continued professional engagement in the future.

Yours sincerely,

For Social Responsibility Asia (SR Asia)

Birendra Raturi

Director

Social Responsibility Asia (SR Asia)

DISCLAIMER AND NOTICE TO THE READER

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- 04** The findings and conclusions in this report are based on information, data, and representations made available to SR Asia by beneficiaries, implementing partners, government sources, and other stakeholders. SR Asia has relied upon the completeness and accuracy of such information and assumptions for the purpose of this assessment.
- 05** While reasonable care has been taken in conducting the assessment, SR Asia has not independently audited or verified all underlying data, documents, or records, nor does this report constitute an audit, certification, or assurance engagement.
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EXECUTIVE

SUMMARY

THE WEZ PROGRAMME AT A GLANCE

Dharampal Satyapal Group's Creation of Water Economic Zones (WEZ) is an integrated watershed and livelihood development programme implemented in Kurabad block (Rajasthan) and Khandwa & Katni districts (Madhya Pradesh) from FY 2020–21 to FY 2023–24. The intervention combines water conservation infrastructure, agricultural intensification, livelihood diversification, and community capacity building to transform water-stressed rural landscapes into resilient, productive local economies.

This independent impact assessment, conducted by Social Responsibility Asia (SR Asia), evaluates the programme against OECD–DAC criteria and SR Asia's Four–Pillar framework. Key finding: WEZ has delivered measurable, multi–dimensional impact, with strong relevance, effectiveness, and efficiency. However, sustainability requires immediate institutional action on operation and maintenance (O&M) funding and handover.

IMPACT ACHIEVEMENTS


**WATER SECURITY –
STRUCTURAL RECHARGE ACHIEVED**

- ✓ Pre-monsoon groundwater levels rose by 2.0–3.5 metres across 27 observation wells (CGWB data).
- ✓ Summer well depth reduced by 20–30 feet (~6–9 metres) in surveyed household wells.
- ✓ Year-round well functionality increased from ~38% to >90%.
- ✓ Drinking water improvement: 100% of households in Kurabad, 79% in Madhya Pradesh.


**AGRICULTURAL TRANSFORMATION –
FROM MONO-SEASON TO MULTI-SEASON**

- ✓ Cropping intensity rose from 1–2 to 3–4 crops per year in the majority of households.
- ✓ Net cultivable area expanded by ~240 hectares; barren land declined by ~1,860 hectares.
- ✓ Maize yields increased 20–50%; wheat yields 30–100% (Kurabad).
- ✓ 100% of farmers reduced chemical fertiliser use (by at least 25%).



Kot, Rajasthan, Indien



Charmar , Kot , Rajasthan , Indien , 313706

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INCOME GROWTH – SUBSTANTIAL AND DIVERSIFIED

- ✓ Kurabad: average household income +63% (₹1,36,000 → ₹2,21,000).
- ✓ Madhya Pradesh (Khandwa & Katni): average household income +100–110% (₹1,40,000 → ₹2,80,000).
- ✓ Income growth driven by crop diversification, yield gains, cost savings, and allied activities (e.g., strawberry, floriculture, custom hiring centre).



ENVIRONMENTAL REGENERATION – LANDSCAPE-LEVEL RECOVERY

- ✓ Vegetation cover (NDVI) increased by 53.5% (–0.28 → +0.15).
- ✓ High-moisture zones expanded from 9% to 15% of the watershed.
- ✓ Green cover (forest + agriculture + fallow) now 73.74% of the study area.



SOCIAL STABILITY – DISTRESS MIGRATION SHARPLY REDUCED

- ✓ Kurabad: seasonal distress migration eliminated (31% → 0%).
- ✓ Madhya Pradesh: migration reduced from ~67% to ~25% of households.
- ✓ Remaining migration is increasingly choice-based, not necessity-driven.



WOMEN'S EMPOWERMENT – GAINS IN AGENCY AND SAVINGS

- ✓ Women with own savings: 100% (vs. 97% household-level pre-project).
- ✓ Confidence to speak in village meetings increased by 97%.
- ✓ 89% requested women-only training – a clear demand signal for next phase.



STAKEHOLDER SATISFACTION – EXCELLENT

METRIC	RAJASTHAN (KURABAD)	MADHYA PRADESH (PROXY-BASED)
Overall satisfaction	94% (mean score 8.89/10)	Very high (79–100% positive proxies)
Net Promoter Score (NPS)	+68 (Excellent)	Not collected (instrument limitation)
Would recommend programme	100%	100% (FGD confirmation)



**DELIVERY EFFICIENCY – HIGH****100%**

of major structures completed on time.

**95%**

of beneficiaries perceive good value for money.



Community contributed shramdaan (voluntary labour) –

41% in Kurabad, **38%** in MP.Total water conserved per monsoon: 1,20,887 m³ (surface storage**54,070**m³ + recharge 66,817 m³).

Cost per household:

₹14,760 (₹1.845 crore / 1,250 HH).

Cost per rupee of annual income increase: ₹0.17 – highly efficient.



SUSTAINABILITY – MODERATE, WITH CLEAR ACTION REQUIRED

STRENGTHS

- ✓ High community willingness to contribute to O&M: 98% in MP, 76% in Kurabad.
- ✓ Informal water governance and local maintenance practices already emerging.
- ✓ Ecological regeneration provides a self-reinforcing natural resource base.

**CRITICAL GAPS
(MUST ADDRESS WITHIN 12 MONTHS)**

- ✓ Formal O&M fund exists in only 0–5% of villages.
- ✓ In Madhya Pradesh, 100% of beneficiaries believe DS Group/Arpan will repair broken structures – indicating lack of ownership transfer.
- ✓ No signed handover agreements with Gram Panchayats or Water User Groups.

SUSTAINABILITY RATING: MODERATE – AT RISK WITHOUT IMMEDIATE INSTITUTIONAL STRENGTHENING.

LIMITATIONS (TRANSPARENCY STATEMENT)

This assessment uses before–after comparisons without a control group. While findings are triangulated across household surveys (n=103), FGDs (4 groups, >100 participants), technical audits, and GIS/remote sensing, causality cannot be definitively proven. External factors (e.g., inter-annual rainfall variability, market conditions) may have contributed to observed changes. Readers should interpret impact claims as strongly associated with the WEZ intervention, not as experimental proof of causation.

STRATEGIC RECOMMENDATIONS PRIORITY

PRIORITY	ACTION	RESPONSIBLE PARTY	TIMELINE
01	Establish community-managed O&M funds (₹100–500/household/year) in every project village	Gram Panchayat + Arpan	0–6 months
02	Formal handover of structures to WUGs/GP with signed MoU	DS Group CSR + Arpan	6–12 months
03	Add wildlife fencing component (most cited unresolved problem)	Arpan + Agriculture Dept	12–18 months
04	Strengthen convergence with MGNRE–GA, PMKSY, and market systems (FPOs, cold storage)	Arpan + line departments	12–24 months
03	Scale WEZ model to similar hydro-geological contexts, using GIS-based site selection	DS Group CSR	Ongoing

OVERALL CONCLUSION

The Water Economic Zones programme has **successfully transformed water-scarce regions into more resilient, productive, and economically stable systems**. Evidence across all four assessment pillars confirms that WEZ is:



Relevant

addressed the primary constraint (water scarcity) with 95–100% problem–solution alignment.



Effective

achieved intended outcomes across water, agriculture, income, and environment.



Efficient

delivered high returns per CSR rupee (₹0.17 cost per ₹1 of annual income increase).



Impactful

generated multi-dimensional, system-level change (income +63–110%, migration eliminated in Kurabad, NDVI +53.5%).



Coherent

aligns with national and state priorities (water, climate, livelihoods).



INTRODUCTION

1 CONTEXT

1.1 PURPOSE OF THIS CHAPTER

This chapter establishes the strategic, geographic, and socio-economic context for the Impact Assessment of the Water Economic Zones (WEZ) programme. It explains why the intervention was undertaken, where it was implemented, what conditions existed prior to the programme, and how these conditions informed programme design. This contextual framing is essential for interpreting delivery performance, stakeholder response, and impact outcomes presented in subsequent chapters.

1.2 CSR AND STRATEGIC CONTEXT

Dharampal Satyapal Group (DS Group) positions Corporate Social Responsibility (CSR) as a long-term investment in systemic development outcomes, rather than as isolated infrastructure creation. Within this orientation, water stewardship has been identified as a core priority due to its cross-cutting influence on agriculture, livelihoods, health, and ecological stability.

In water-stressed rural geographies, limited water availability acts not only as an environmental constraint but as an economic bottleneck, restricting agricultural productivity, income diversification, and social stability. The WEZ programme was therefore conceptualised to treat water not merely as a resource to be conserved, but as an economic and ecological enabler capable of triggering durable, multi-sectoral transformation.



DISTRICT PROFILES (UDAIPUR, KHANDWA, KATNI)

The WEZ programme was implemented in Udaipur (Rajasthan) and Khandwa and Katni (Madhya Pradesh), districts characterised by rainfall-dependent agriculture and variable groundwater stress. Agriculture is dominated by small and marginal landholdings, with limited assured irrigation and vulnerability to climate variability. These districts present comparable structural constraints related to water availability and livelihoods, making them appropriate for assessment under the WEZ approach.

TABLE 1-0-1 GEOGRAPHIC AND CLIMATIC PROFILE OF PROJECT DISTRICTS

PARAMETER	UDAIPUR (RAJASTHAN)	KHANDWA (MP)	KATNI (MP)
Area (sq. km)	11,724	7,352	4,950
Average annual rainfall(mm)	645	980	775–825
Major rivers	Mahi, Jakham	Narmada, Tapti	Katni, Mahanadi
Groundwater development stage	116.65% (over-exploited)	89% (semi-critical in block)	65% (safe)
Major crops	Maize, wheat	Cotton, soybean, wheat	Paddy, wheat, gram

Sources: District Census Handbooks, CGWB District Profiles

The WEZ programme has been implemented across the following locations:

TABLE 0-2 WEZ PROGRAMME COMPONENTS BY LOCATION

LOCATION	BLOCK	DISTRICT	KEY INTERVENTIONS
Kurabad	Kurabad	Udaipur (RJ)	8 anicut repairs, Mini Percolation Tanks (MPTs), Loose Stone Check Dams (LSCDs), desilted ponds, contour trenches (CCT/SCT), micro-irrigation, strawberry cultivation, floriculture, Custom Hiring Centre
Khandwa	Khandwa	Khandwa (MP)	Anicut repair, desilted ponds, micro-irrigation, line sowing demonstrations
Katni	Katni	Katni(MP)	Desilted ponds, training programmes, model farmer approach

Source: Arpan Seva Sansthan project documents.

Across all locations, the intervention was designed not as a one-time infrastructure project, but as a system-level transformation process, explicitly linking hydrological restoration with economic and social outcomes.

CORE COMPONENTS OF THE WEZ PROGRAMME

The WEZ model integrates the following components:



WATER & SOIL CONSERVATION:

- ✓ Construction of anicuts, mini percolation tanks (MPTs), loose stone check dams (LSCDs), contour trenches, and earthen embankments using watershed-based sequencing.



HYDROLOGICAL PLANNING:

- ✓ GIS-based site selection and recharge-zone alignment to maximise groundwater replenishment and storage efficiency.



AGRICULTURAL INTENSIFICATION:

- ✓ Expansion of irrigated area, promotion of multi-season cropping, and diversification into vegetables, horticulture, and climate-appropriate crops.



LIVELIHOOD ENHANCEMENT:

- ✓ Income diversification through allied activities, mechanisation, and improvements in farm productivity.



COMMUNITY ENGAGEMENT:

- ✓ Active participation of beneficiaries in planning, construction support, operation, and post-project maintenance.



SUSTAINABILITY ORIENTATION:

- ✓ Emphasis on community ownership, informal water governance mechanisms, and adaptive practices suited to local agro-ecological conditions.

The WEZ programme consciously integrates physical infrastructure with behavioural and economic change, ensuring that improvements in water availability are translated into real, sustained development gains, rather than temporary relief.

1.3 GEOGRAPHIC AND SOCIO-ECONOMIC CONTEXT

The programme was implemented in Udaipur District (Rajasthan) and Khandwa and Katni Districts (Madhya Pradesh) – regions characterised by rainfall-dependent agriculture, variable groundwater stress, and high vulnerability to climate variability.

Udaipur represents a semi-arid and groundwater-overexploited context, with recurring water scarcity and limited irrigation coverage. Khandwa and Katni experience relatively higher rainfall but face seasonal water stress, uneven groundwater development, and constrained irrigation access. Across all three districts, agriculture is dominated by small and marginal landholdings, with limited capacity to absorb climatic or market shocks.

These districts were selected due to their structurally similar development constraints, making them appropriate for comparative assessment of the WEZ model across different hydro-geological settings

1.3.1 COMMON CONTEXT ACROSS WEZ LOCATIONS

All WEZ locations share semi-arid conditions, groundwater-based agriculture, small/marginal landholdings, and pre-project livelihood vulnerability driven by water scarcity. Semi-arid climatic conditions with strong dependence on monsoon rainfall

- ✓ High inter-annual rainfall variability and periodic drought stress
- ✓ Predominantly groundwater-based agricultural systems
- ✓ Large proportion of small and marginal landholders
- ✓ Pre-project livelihood vulnerability driven by seasonal water scarcity
- ✓ Incidence of seasonal distress migration and limited income buffers

Historically, water scarcity across these regions has constrained agricultural productivity, limited livelihood diversification, and increased exposure to climate and economic shocks.



1.3.2 SOCIO-ECONOMIC CONTEXT PRIOR TO WEZ INTERVENTION – BASELINE HOUSEHOLD SURVEY

Baseline assessments indicate that, prior to WEZ implementation, communities across the project locations faced a common set of challenges:

- ✓ High dependence on **single-season (Kharif-only) agriculture**
- ✓ Declining or unreliable groundwater availability
- ✓ Low cropping intensity and significant areas of fallow or degraded land
- ✓ Limited livelihood diversification
- ✓ Seasonal distress migration driven by water scarcity and income instability

Water scarcity was consistently identified by surveyed households as the **primary constraint** affecting agricultural decision-making and household security. These conditions highlighted the need for an intervention that addressed water availability as a **structural constraint**, rather than as a short-term deficit.

1.3.3 SOCIO-ECONOMIC CONTEXT PRIOR TO WEZ INTERVENTION

Prior to the WEZ intervention, the socio-economic profile across assessed locations reflected **chronic vulnerability** driven primarily by water stress.

1.3.4 PRE-PROJECT FARMING PROBLEMS – SURVEY Q11

Baseline findings reflect surveyed households and are indicative rather than statistically representative of the entire block or district.

What Q11 asked: “Before this project (2023–24), what was your single biggest farming-related problem?”

TABLE1-0-3 PRE PROJECT FARMING PROBLEMS (Q11)

PROBLEM	KURABAD (N=36)	KHANDWA/KATNI (N=59)
Lack of irrigation water	92% (33)	100% (59)
Lack of good seeds	3% (1)	0%
Problems with wild animals	5% (2)	0%

Source: Household survey Q11.

The universal citation of “lack of irrigation water” as the primary problem (100% in MP, 92% in Kurabad) validates the project’s core focus on water conservation and groundwater recharge.

TABLE 1-0-4 DEMOGRAPHIC PROFILE OF SURVEYED HOUSEHOLDS

PARAMETER	KURABAD (N=37)	KHANDWA & KATNI (N=66)
Gender (% male)	70%	100% (women module separate)
Gender (% female)	30%	0% (in main survey)
Social Category – ST (%)	39%	28%
Social Category – OBC (%)	37%	65%
Social Category – SC (%)	11%	5%
Primary occupation – own farming (%)	92%	93%
Average family size	5–6 members (62%)	5–6 members (47%)
Pre-project main problem (% lack of irrigation water)	92%	100%

Source: Household survey Sections A (Q8–Q12, Q11).

- ✓ High dependence on single-season (Kharif) agriculture
- ✓ Low cropping intensity and significant areas of barren or fallow land
- ✓ Limited access to assured irrigation and declining groundwater levels
- ✓ Seasonal distress migration to nearby urban centres
- ✓ Limited livelihood diversification and income instability
- ✓ High exposure to climate and rainfall variability



Household incomes were largely subsistence-oriented, with limited capacity to absorb crop failure or market shocks. Water scarcity influenced not only farm outcomes but also food security, migration patterns, and social stability.

Women played a critical, though often under-recognised, role in agricultural labour and household production. Opportunities for income enhancement beyond traditional farming were limited prior to the intervention.

1.4 RATIONALE FOR THE WEZ INTERVENTION

The convergence of hydrological stress, livelihood vulnerability, and under-utilised land potential across the assessed locations provided a strong rationale for the WEZ approach. By restoring groundwater systems and linking water availability to agricultural and livelihood strategies, the programme was expected to initiate a development cascade by improved water availability, expansion of multi-season agriculture, income diversification and stabilisation, reduced distress migration and strengthened ecological resilience. This intervention logic underpins the Theory of Change examined in the assessment.

1.5 EXECUTING MODALITIES – INTERVENTIONS BY DISTRICT

TABLE 1–0–5 WATERSHED INTERVENTIONS BY DISTRICT

DISTRICT	INTERVENTION	NUMBER
Khandwa	Anicut repair + nala deepening	8
Khandwa	New anicuts	3
Katni	Mini Percolation Tanks (MPTs)	2
Udaipur	Anicut repair	8
Udaipur	Mini Percolation Tanks (MPTs)	14
Udaipur	RMPTCW / RMPT	1
Udaipur	Pond desiltation	2

Source: Arpan Seva Sansthan DPR and progress reports.

TABLE 1-0-6 LIVELIHOOD INTERVENTIONS (UDAIPUR ONLY)

INTERVENTION	DETAILS
Institution building	Farmer Interest Groups (FIGs)
Training	Model farmers, improved practices (INM/IPM, mixed cropping)
High-value crops	Strawberry, floriculture, beekeeping
Custom Hiring Centre	Seed drill machine
Micro-irrigation	Sprinkler sets
Innovation	Sanjeevan Eco Park

1.6 MONITORING & EVALUATION FRAMEWORK

This section describes the three-tier monitoring system adopted by Arpan Seva Sansthan to ensure timely, quality-controlled implementation of the WEZ programme. It also outlines the evaluation framework used by SR Asia to assess performance against the project's logical framework and OECD-DAC criteria.

1.6.1 PROJECT-LEVEL MONITORING (ARPAN SEVA SANSTHAN)

The project followed a three-tier monitoring system to ensure effective implementation and timely progress across all activities.



LEVEL 1 – COMMUNITY-BASED MONITORING:

At the first level, community-based workers (local youth and volunteers trained by Arpan) regularly monitored day-to-day activities. They were responsible for:

- ✓ Supervising construction of anicuts, MPTs, and LSCDs
- ✓ Organising shramdaan (voluntary labour) and maintaining attendance records
- ✓ Reporting any structural issues or community grievances to the field coordinator
- ✓ Ensuring that field-level execution remained consistent with the planned ridge-to-valley approach



LEVEL 2 – TECHNICAL MONITORING (ENGINEERS):

At the second level, qualified engineers employed by Arpan conducted regular technical audits. Their responsibilities included:

- ✓ Verifying that structures were constructed as per approved designs (length, fetch, weir height, foundation depth)
- ✓ Checking material quality (stone, cement, sand) and compaction of earthen works
- ✓ Measuring water conserved, storage, and recharge using standard hydrological formulas
- ✓ Ensuring that structures were placed in hydrologically favourable recharge zones (validated through GIS)
- ✓ Documenting deviations and recommending corrective actions



LEVEL 3 – CENTRAL TEAM OVERSIGHT (PROJECT MANAGER & HQ):

At the third level, the Project Manager and the Arpan central office team:

- ✓ Reviewed monthly progress reports submitted by field staff
- ✓ Conducted periodic field visits (at least once per quarter) to verify progress and quality
- ✓ Cross-checked physical progress against financial expenditure (activity-based costing)
- ✓ Ensured alignment with the Detailed Project Report (DPR) and CSR compliance requirements
- ✓ Facilitated adaptive management by revising implementation plans based on field feedback



REPORTING MECHANISMS:

Monthly Progress Reports (MPRs): Each month, field coordinators submitted MPRs containing:

- ✓ Quantitative data (length of CCT dug, number of anicuts completed, area treated, etc.)
- ✓ Qualitative observations (community participation, weather impacts, challenges)
- ✓ Photographic evidence (geo-tagged before-during-after images)

Quarterly Review Meetings: Held with Arpan's senior management and, on occasion, with DS Group CSR representatives. These meetings reviewed progress against targets, budget utilisation, and risk mitigation.

Annual Progress Reports: Summarised achievements, case studies, and lessons learned for the financial year.



1.6.2 PHYSICAL VERIFICATION AND QUALITY ASSURANCE

As per SR Asia's methodology (and the RFP requirement), ≥75% of major soil and water conservation structures were physically verified by the assessment team. In practice, SR Asia verified:



100%

of anicut structures (8 out of 8)

Full inventory with measurements of length, fetch, weir height, and condition ₹0.17 – highly efficient.



90.9%

of Mini Percolation Tanks (10 out of 11)

Selected across all fetch classes (high, moderate, low)



100%

of Loose Stone Check Dams (771 RM)

visual inspection of representative segments



100%

of earthen embankments (4 out of 4)



**VERIFICATION INCLUDED:**

- ✓ GPS mapping of each structure (latitude, longitude)
- ✓ Photographic documentation (upstream, downstream, spillway, any damage)
- ✓ Measurement of actual dimensions against DPR specifications
- ✓ Assessment of structural integrity (cracks, seepage, siltation, vegetation encroachment)
- ✓ Interviews with nearby farmers to confirm functionality and benefits



TABLE 1-0-7 PHYSICAL VERIFICATION COVERAGE

INTERVENTION TYPE	UNITS IMPLEMENTED	UNITS ASSESSED	COVERAGE
Anicuts	8	8	100%
Mini Percolation Tanks (MPTs)	11	10	90.9%
Loose Stone Check Dams (LSCDs)	771 RM	771 RM (representative)	100%
CCT / SCT	35,106.5 cum	Sampled	–
DCCT	9,056.15 cum	Sampled	–
Earthen Embankments	4	4	100%

1.6.3 DOCUMENT VERIFICATION (DESK REVIEW)

SR Asia conducted a desk review of project records to validate output achievement, financial efficiency, and process compliance. The following documents were examined:

TABLE 1-0-8 DOCUMENT VERIFICATION CHECKLIST

SR NO	DOCUMENT TYPE	VERIFIED	REMARKS
01	Detailed Project Report (DPR) – GIS maps, designs, estimates	Yes	Designs aligned with watershed manual
02	Baseline Survey Report (Kurabad, Katni)	Yes	Available for before–after comparison
03	Monthly Progress Reports (April 2023 – March 2024)	Yes	Regular monthly submission; photographic evidence included
04	Measurement Books (MB) for all structures	Yes	Quantities match physical progress
05	Financial expenditure statements (activity–wise)	Yes	Minor variance within CSR norms

SR NO	DOCUMENT TYPE	VERIFIED	REMARKS
06	Beneficiary lists (micro-irrigation, high-value crops, SAP, floriculture, model farmers)	Yes	Total counts match RFP annexure
07	Training & capacity building records (attendance sheets, photos, topics)	Yes	Available for before-after comparison
08	Photographs (pre-construction, construction, post-construction, geotagged)	Yes	Good quality; geo-tagged
09	GPS / Geo-tag data of all structures	Yes	KML and Excel formats available
10	Case studies / success stories documentation	Yes	3 documented (Himmatlal, Jagdish, Shanti & Romi)
11	Videos (documentary, training, farmer testimonials)	Yes	Short clips available
12	O&M fund records	No	No formal fund created yet
13	Quarterly progress reports submitted to DSL	Yes	Feedback incorporated
14	Audit / compliance reports	No	No major observations

Overall Document Availability Score: Excellent (>90%) – only O&M fund records missing.

1.6.4 EVALUATION FRAMEWORK (SR ASIA)

The impact assessment was structured around SR Asia's Four-Pillar Assessment Matrix (see Chapter 2) and the OECD-DAC criteria. Key evaluation activities included:



Household surveys (n=103): Captured before-after data on water security, agriculture, income, migration, satisfaction, and NPS.



Technical audits: Measured physical performance of structures (water conserved, storage, recharge).



GIS & remote sensing: Analysed NDVI, NDWI, LULC, stream order, and flow direction to validate environmental regeneration.



FGDs & KIIs: Gathered qualitative insights on participation, challenges, and sustainability.



Triangulation: Cross-verified findings from surveys, technical data, and qualitative sources to ensure attribution.



1.6.5 KEY PERFORMANCE INDICATORS (KPIs) TRACKED



The M&E framework tracked the following KPIs aligned with the Results Framework (Section 1.4):

TABLE 1-0-9 KEY PERFORMANCE INDICATORS (KPIs) TRACKED

KPI	BASELINE	TARGET	ENDLINE (2026)	BASELINE
Increase in water storage capacity (m ³)	0	50,000 m ³	54,070 m ³	Exceeded
Groundwater recharge (m ³)	0	60,000 m ³	66,817 m ³	Exceeded
Reduction in soil erosion (% farmers reporting “clearly less”)	–	80%	Kurabad 100%, MP 89%	Achieved
Improvement in vegetation cover (NDVI)	–0.28	+0.10	+0.15	Exceeded
Increase in cropping intensity (average crops/year)	1–2	3	3–4	Achieved
Increase in household income (%)	–	50%	63–100%	Exceeded
Reduction in distress migration (% households)	31% (Kurabad)	50% reduction	0%	Exceeded
Beneficiary satisfaction (%)	–	90%	94% (Kurabad)	Exceeded
Women with own savings from project (%)	0%	50%	100% (Kurabad)	Exceeded

TABLE 1-0-10 CHALLENGES IN MONITORING AND MITIGATION

CHALLENGE	MITIGATION STRATEGY
Remote location of some structures	GPS mapping and scheduled monthly visits by engineers
Community recall bias for baseline data	Triangulation with secondary data (government records, rainfall data) and FGDs
Incomplete O&M fund records	Recommendation to establish community-managed fund before project exit
Seasonal access to structures	Monsoon-related delays accounted for in work planning; structures built pre-monsoon



ASSESSMENT FRAMEWORK 2 & METHODOLOGY

This chapter describes the analytical framework, theories, and methods used to conduct the impact assessment. It explains SR Asia's Four-Pillar Assessment Matrix, the integration of OECD-DAC criteria, sampling design, data collection tools, ethical protocols, and limitations. Transparency in methodology ensures that the findings are credible, attributable, and decision-ready.

2.1 OVERVIEW OF THE ASSESSMENT PHILOSOPHY

The Impact Assessment of the Creation of Water Economic Zones (WEZ) programme has been conducted in strict alignment with SR Asia's Comprehensive Impact Assessment Methodology, as proposed to and approved by Dharampal Satyapal Group.

TABLE 2-0-1 SAMPLE ACHIEVEMENT VS TARGET

LOCATION	TARGET	ACTUAL	ACHIEVED
Kurabad	35	37	106%
Khandwa	30	30	100%
Katni	25	33	132%
Total	90	103	114%

Additional data sources: 8 anicuts (100% verified), 14 MPTs, 2 desilted ponds; Landsat 9 (2020–2025) GIS analysis; FGDs: Futana (13 women), Aawra (10), Barud (35), Katni (42); 1 KII with Agriculture Department; crop cutting data for 30 model farmers; strawberry production data for 15 farmers; 32 training events.

The assessment philosophy is founded on the principle that CSR investments must be evaluated not only for delivery and outputs, but for transformation, sustainability, and scalability. Accordingly, the methodology integrates technical validation, participatory evaluation, advanced analytical tools, and learning-oriented inquiry to generate evidence that is:



✓ **Credible** (technically and analytically sound),

✓ **Attributable** (clearly linked to the intervention), and

✓ **Decision-ready** (useful for CSR strategy and future programming).

Given that the WEZ programme was implemented across multiple locations with common design logic but contextual variation, the assessment adopts a programme-level analytical lens, consolidating evidence from:

✓ **Kurabad Block (Rajasthan)**

✓ **Khandwa District (Madhya Pradesh)**

✓ **Katni District (Madhya Pradesh)**

Findings are presented at an integrated programme level, while recognising location-specific dynamics where analytically relevant.

2.2 THEORY OF CHANGE (TOC) FOR THE WEZ PROGRAMME

TABLE 2-0-1 SAMPLE ACHIEVEMENT VS TARGET

DATA TYPE	SOURCES
Primary quantitative	Household surveys (n=103)
Primary qualitative	FGDs (4 groups), KIIs (1)
Technical data	Structure audits, groundwater monitoring, crop cutting
Spatial data	GIS, LULC, NDVI, NDWI, stream order, flow direction
Secondary data	Government records, rainfall data, training registers

2.2.1 THEORY OF CHANGE DESIGN LOGIC

SR Asia's assessment is anchored in a clearly articulated Theory of Change (ToC) that explains how and why the WEZ intervention is expected to generate sustained socio-economic and environmental outcomes across water-stressed geographies.



WEZ THEORY OF CHANGE NARRATIVE

IF:

- ✓ Water harvesting and soil conservation structures are scientifically sited and constructed using a ridge-to-valley watershed approach,
- ✓ Communities are actively engaged in planning, implementation, and post-construction maintenance, and
- ✓ Improved water availability is intentionally linked to agriculture, livelihoods, and capacity building,

THEN:

- ✓ Groundwater recharge and water availability will improve,
- ✓ Agricultural systems will stabilise and intensify,
- ✓ Livelihoods will diversify and incomes will increase, and
- ✓ Communities will become more resilient to climate and economic shocks,

LEADING TO LONG-TERM IMPACTS IN THE FORM OF:

- ✓ Sustained water security,
- ✓ Enhanced rural incomes,
- ✓ Reduced distress migration, and
- ✓ Ecological regeneration and climate resilience.

The Theory of Change guided the selection of indicators, tools, data sources, and analytical methods used across all four assessment pillars.

2.3 LOGICAL FRAMEWORK (LOGFRAME) FOR IMPACT ASSESSMENT

The ToC was operationalised through a Logical Framework, which structured the assessment across different result levels.

TABLE 2-0-3 WEZ LOGICAL FRAMEWORK FOR ASSESSMENT

LEVEL	DESCRIPTION	KEY INDICATORS	DATA SOURCES
Inputs	CSR investment, technical expertise, community mobilisation	Budget utilisation, training sessions	CSR records, MIS
Activities	SWC structures, agriculture and livelihood interventions	Number of structures, household coverage	Field verification
Outputs	Water storage, irrigation access, training delivered	Storage capacity (m ³), irrigated area	GIS, surveys
Outcomes	Improved water availability, crop diversification, income growth	Groundwater level, crop intensity, income	Surveys, govt. data
Impacts	Livelihood resilience, reduced migration, ecosystem recovery	Migration rate, NDVI, food security	Remote sensing, FGDs

The Logframe enabled clear differentiation between outputs, outcomes, an impacts, strengthening attribution.

2.4 SR ASIA FOUR-PILLAR IMPACT ASSESSMENT MATRIX

In line with the approved proposal, SR Asia applied its Four-Pillar Impact Assessment Matrix to ensure balanced evaluation across technical, social, impact, and learning dimensions.

TABLE 2-0-4 SR ASIA FOUR PILLAR ASSESSMENT MATRIX

PILLAR	FOCUS AREA	ASSESSMENT TOOLS APPLIED
Pillar 1	Delivery Assessment	Technical audits, GIS validation, ≥75% physical verification
Pillar 2	Stakeholder Satisfaction	Household surveys, FGDs, KIIs, Satisfaction Index
Pillar 3	Impact Analytics	Before–after analysis, GIS/NDVI/NDMI, land–use change
Pillar 4	Learning & Challenges	Root–cause analysis, innovation mapping, scalability review

Each pillar was analysed independently and then synthesised to derive programme–level conclusions.

2.5 OECD–DAC EVALUATION CRITERIA INTEGRATION

Instead of treating OECD–DAC criteria as a checklist, the assessment embedded them across all pillars, consistent with international evaluation best practice.

TABLE 2-0-5 OECD DAC CRITERIA ALIGNMENT

OECD–DAC CRITERION	APPLICATION IN ASSESSMENT
Relevance	Alignment with community needs and water stress (Pillars 2 & 4)
Effectiveness	Achievement of intended outcomes (Pillars 1 & 3)
Efficiency	Cost–benefit and integration gains (Pillar 1)
Impact	Socio–economic and environmental change (Pillar 3)
Sustainability	Community ownership and ecological regeneration (Pillars 2 & 4)
Coherence	Alignment with government schemes and CSR strategy (Pillar 4)

2.6 SAMPLING DESIGN AND DATA SOURCES

The actual number of households surveyed compared to the target, and the additional data sources used.

LOCATION	TARGET	ACTUAL	ACHIEVED
Kurabad	35	37	106%
Khandwa	30	30	100%
Katni	25	33	132%
Total	90	103	114%

Additional data sources (not part of household survey):

- ✓ **Technical structures: 8 anicuts (100% verified), 14 MPTs, 2 desilted ponds**
- ✓ **GIS/remote sensing: Landsat 9 (2020–2025), 5,000 ha watershed**
- ✓ **FGDs: 4 groups (Futana 13 women, Aawra 10, Barud 35, Katni 42) – over 100 participants**
- ✓ **Crop cutting data: 30 model farmers (maize, wheat treated vs control)**
- ✓ **Strawberry production data: 15 farmers**
- ✓ **Training records: 32 training events (2023–24)**

SUMMARY OF DISCUSSION

The initiatives undertaken by Arpan Sewa Sansthan are being implemented in convergence with the Agriculture Department.

- ✓ Arpan Sewa Sansthan and the Agriculture Department share resources and engage subject-matter experts interchangeably during training programmes.
- ✓ The work carried out by Arpan Sewa Sansthan complements government efforts. Its bottom-up approach enables faster and more localized benefits to farmers compared to the conventional top-down implementation model.
- ✓ Additional emphasis is being placed on the promotion of horticulture, particularly the cultivation of mango and lemon trees.
- ✓ Ginger and turmeric cultivation are being tested in the area. If found suitable and successful, these crops will be promoted further among farmers.
- ✓ Farmers reported challenges related to crop damage caused by wild boars, monkeys, and nilgai.



2.6.1 SAMPLING FRAMEWORK

A stratified, multi-stage sampling design was adopted to ensure representativeness across locations and beneficiary categories.

TABLE 2-0-7 SAMPLING STRATEGY (AS PER APPROVED PROPOSAL)

COMPONENT	SAMPLING APPROACH
Villages	Representative WEZ villages in each location
Households	Stratified by landholding size & intervention exposure
Structures	Representative WEZ villages in each location
Stakeholders	Beneficiaries, WUGs, PRIs, NGOs, community leaders

Assessment Coverage
 Primary surveys covered over 100 households across:

- ✓ Kurabad (Rajasthan)
- ✓ Khandwa (Madhya Pradesh)
- ✓ Katni (Madhya Pradesh)

2.6.2 DATA SOURCES

TABLE 2-0-8 PRIMARY AND SECONDARY DATA SOURCES

DATA TYPE	SOURCES
Primary quantitative	Household surveys
Primary qualitative	FGDs, KIIs
Technical data	Groundwater monitoring, structure audits
Spatial data	GIS, LULC, NDVI, NDMI
Secondary data	Government records, rainfall data

2.7 DATA ANALYSIS TECHNIQUES

The following analytical techniques were applied in line with the proposal:

✓ **Before–After Comparison**
for groundwater, agriculture, income, and migration

✓ **Difference-in-Differences logic** (where feasible) to isolate intervention effects

✓ **Spatial analysis** using GIS, NDVI, NDMI, and LULC

✓ **Multi-Dimensional Satisfaction Index (MSI)** for stakeholder perception

✓ **Sustainability Readiness Analysis** combining institutional, social, and ecological parameters

✓ **Cross-data triangulation** to strengthen attribution and validity

2.8 ETHICAL COMPLIANCE AND QUALITY ASSURANCE

SR Asia followed ISO 20252:2019-aligned ethical protocols, ensuring:

- ✓ Informed consent prior to participation
- ✓ Confidentiality and anonymity of respondents
- ✓ Do-No-Harm principles
- ✓ Absence of coercion or inducement

Quality assurance measures included:

- ✓ Field-level supervision and central review
- ✓ Data consistency and logic checks
- ✓ Photographic and geo-tagged validation of structures

2.9 METHODOLOGICAL LIMITATIONS

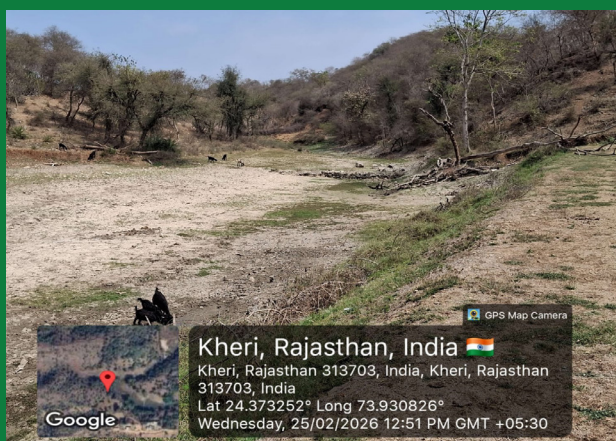
The assessment recognises certain limitations:

- ✓ Absence of pure control villages in all locations
- ✓ Partial reliance on recall for baseline livelihood data

These were mitigated through:

- ✓ Government records and historical data
- ✓ Remote sensing comparisons
- ✓ Triangulation with qualitative findings

“While before-after improvements are substantial, the absence of a control group and quantitative rainfall data means that causality cannot be proven with certainty. External factors—including inter-annual rainfall variability—may have contributed to observed changes. Attribution is therefore inferred through triangulation, not experimental design.”



2.10 CONCLUSION

The Assessment Framework and Methodology fully reflect the commitments made in the approved proposal and provide a transparent, defensible, and decision-oriented foundation for the WEZ Impact Assessment. The integration of Theory of Change, Logical Framework, four-Pillar Matrix, and OECD-DAC criteria ensures that findings presented in subsequent chapters are credible, analytically rigorous, and scalable across water-stressed regions.

PILLAR 1

3 DELIVERY ASSESSMENT

(OECD–DAC: EFFECTIVENESS & EFFICIENCY)

This pillar evaluates whether the WEZ interventions were delivered as planned, according to technical standards, on time, and within perceived cost efficiency. It also examines community contribution (shramdaan) and establishes the link between delivery quality and subsequent impact.

3.1 PURPOSE AND SCOPE OF THE DELIVERY ASSESSMENT

The objective of this pillar is to assess whether the WEZ programme was **delivered as planned, to appropriate technical standards, and with sufficient quality and sequencing to enable intended outcomes**. The assessment examines delivery across three inter-related dimensions:

Technical quality and hydrological appropriateness

Implementation efficiency and sequencing discipline

Community engagement and post-construction readiness

The delivery assessment covers WEZ implementation across Kurabad Block (**Rajasthan**) and **Khandwa and Katni Districts (Madhya Pradesh)**.

3.2 INVENTORY AND NATURE OF INTERVENTIONS DELIVERED

The WEZ programme implemented a combination of **soil and water conservation structures**, including anicut repairs, mini percolation tanks (MPTs), loose stone check dams (LSCDs), contour trenches, and earthen embankments. Interventions were designed based on watershed characteristics, drainage order, and recharge potential.

Physical verification exceeded the minimum verification threshold committed in the assessment methodology:

100%

of anicuts

Over 90%

of MPTs

All major embankments and representative LSCD segments



This level of verification provides confidence in the reliability of delivery findings.

TABLE 3-0-1 PERFORMANCE OF MPT AND OTHER STRUCTURES (SELECTED EXAMPLES)

STRUCTURE ID	FETCH (M)	WATER CONSERVED (M ³)	STORAGE (M ³)	RECHARGE (M ³)
C-3 (MPT-3 Ballabh Charagah)	350	21,420	7,140	14,280
C-9 (RMPTCW Gogdara nadi)	350	25,170	7,840	17,330
C-5 (MPT-5 Mora magar)	100	5,580	1,860	3,720
C-14 (Desiltation Khodao)	70	15,510	4,620	10,890

Source: Technical structure inventory.

3.2.1 PHYSICAL INFRASTRUCTURE UNDER WEZ

The WEZ programme followed a **ridge-to-valley watershed treatment approach**, integrating permanent water harvesting structures with distributed soil-moisture conservation measures to generate cumulative hydrological impact.

TABLE 3-0-2 INVENTORY OF SOIL & WATER CONSERVATION INTERVENTIONS

INTERVENTION TYPE	UNITS IMPLEMENTED	UNITS ASSESSED	COVERAGE
Anicuts	7	6	85.7%
Mini Percolation Tanks (MPTs)	11	10	90.9%
Loose Stone Check Dams (LSCDs)	771 RM	771 RM	100%
CCT / SCT	35,106.5 cum	Sampled	-
DCCT	9,056.15 cum	Sampled	-
Earthen Embankments	4	4	100%



Physical verification exceeded the ≥75% commitment stated in the proposal.



The intervention mix reflects systematic watershed sequencing, not isolated construction.



Structure typology and density were context-responsive, varying by terrain and catchment characteristics across locations.

OECD–DAC Lens: Effectiveness

TABLE 3-0-3 INVENTORY AND PERFORMANCE OF 8 ANICUT STRUCTURES

STRUCTURE NAME	LENGTH (M)	FETCH (M)	WEIR HT (M)	WATER CONSERVED (M ³)	STORAGE (M ³)	RECHARGE (M ³)	RECHARGE %
Repair-1 – Ter Mata Mandir	31	400	2	18,766	8,784	9,982	53.2%
Repair-2 – Ter Nala	24	350	2	13,440	6,720	6,720	50.0%
Repair-3 – Ranakudi	26	400	2	16,384	8,192	8,192	50.0%
Repair-4 – Garduliya Nala	37	200	2	15,755	6,882	8,873	56.3%
Repair-5 – Bhuthail Charagah	28	400	2	23,064	10,304	12,760	55.3%
Repair-6 – Bhuthail Charagah	30	150	2	7,874	2,700	5,174	65.7%
Repair-7 – Bhuthail Charagah	24	350	2	13,320	6,048	7,272	54.6%
Repair-8 – Dagar Nala	37	200	2	12,284	4,440	7,844	63.9%
TOTAL	-	-	-	1,20,887	54,070	66,817	55.3% (avg)

Source: Integrated TECHNICAL STRUCTURES AND Hydrological.docx.

Total water conserved per monsoon season is 1,20,887 m³ – enough to fill approximately 48 Olympic swimming pools. Groundwater recharge (66,817 m³) exceeds surface storage (54,070 m³), which is optimal for semi-arid aquifer replenishment. Structures with fetch ≥ 300 m perform significantly better than those with fetch < 200 m.

3.3 TECHNICAL QUALITY, STRUCTURAL FUNCTIONALITY, AND DESIGN INTEGRITY

Field verification and technical audits confirm that assessed structures were constructed in accordance with approved designs and standard watershed engineering norms. No major structural failures or design deviations were observed across the verified structures.

GIS analysis indicates that all assessed major structures were located in moderate to high groundwater recharge zones, validating the appropriateness of site selection. This alignment is critical in semi-arid and groundwater-stressed contexts, where recharge efficiency directly influences impact potential. Observed siltation levels were within expected functional norms for watershed systems and did not compromise structural performance, though they highlight the importance of planned desilting cycles.

TABLE 3-0-4 PERFORMANCE OF MPT AND OTHER STRUCTURES (SELECTED EXAMPLES – FULL LIST IN ANNEX)

STRUCTURE ID	FETCH (M)	WATER CONSERVED (M³)	STORAGE (M³)	RECHARGE (M³)
C-3 (MPT-3 Ballabh Charagah)	350	21,420	7,140	14,280
C-9 (RMPTCW Gogdara nadi)	350	25,170	7,840	17,330
C-5 (MPT-5 Mora magar)	100	5,580	1,860	3,720
C-14 (Desiltation Khodao)	70	15,510	4,620	10,890

Source: Technical structure inventory

TABLE 3-0-5 STRUCTURAL CONDITION ASSESSMENT

PARAMETER	OBSERVATION
Location accuracy	100% correctly sited
Construction quality	Satisfactory to Good
Structural damage	No major damage observed
Operational usability	100% operational
Maintenance	Predominantly community-led observed



Absence of structural failure across multiple monsoon cycles confirms robust engineering and supervision.



Observed siltation levels fall within expected functional norms of watershed systems.



Community-led maintenance observed in several sites indicates early institutional ownership.

OECD–DAC Lens: Effectiveness & Sustainability

TABLE 3–0–6 TIMELINESS AND COST EFFICIENCY PERCEPTIONS

QUESTION	KURABAD (N=37)	KHANDWA/KATNI (N=66)
“Were water harvesting structures completed on time?” (Q25, Q76)	100% Yes	100% Yes
“Do you feel the money spent was well utilised?” (Q26, Q77)	95% Yes	95% Yes
“If No, why?”	0%	3% (reasons: “No work done in area”, “No change in water level”)

Source: Household survey.

The programme achieved 100% on-time completion with very high perceived value-for-money. The few negative responses correspond to areas where individual wells may not have shown immediate improvement.

3.4 HYDROLOGICAL APPROPRIATENESS AND SITE SELECTION LOGIC

GIS-based analysis was used to assess whether structures were located in hydrologically favourable recharge zones.

TABLE 3–0–7 STRUCTURES BY RECHARGE POTENTIAL ZONE

RECHARGE ZONE	% AREA	STRUCTURES
High recharge	41.1%	7
Moderate recharge	57.9%	11
Poor recharge	1.0%	0



All assessed major structures fall within moderate to high recharge zones.



Limited placement in poor recharge zones reflects strong GIS-led planning discipline.



This technical alignment establishes a direct causal pathway to the groundwater outcomes documented under Pillar 3.

OECD–DAC Lens: Efficiency & Impact

3.4.1 MORPHOMETRIC ANALYSIS OF KURABAD WATERSHED

TABLE 3-0-8 MORPHOMETRIC ANALYSIS RESULTS – KURABAD WATERSHED

PARAMETER	RESULT	INTERPRETATION
Elevation gradient	High NW → low SE	Gravity-driven flow suitable for water harvesting
Stream order	Dominated by 1st order	Young drainage network; suitable for distributed small structures
Stream density	Low (0–0.781) over most area	High infiltration potential; groundwater recharge focus
Flow direction	Complex, multiple micro-catchments	Decentralised structures needed; site-specific design

Source: GIS_Report.docx.

3.5 IMPLEMENTATION TIMELINESS AND RESOURCE EFFICIENCY

he programme applied a ridge-to-valley sequencing approach, with upstream soil and moisture conservation preceding downstream water harvesting structures. This sequencing reduced runoff velocity, controlled sediment load, and enhanced recharge efficiency.

Implementation timelines were largely adhered to, with beneficiaries reporting high satisfaction with timeliness and perceived value-for-money. Community participation, including voluntary labour contributions, supported delivery efficiency and early ownership of assets.

TABLE 3-0-9 TIMELINESS, COST PERCEPTION AND SHRAMDAAN

QUESTION	KURABAD (N=37)	KHANDWA/KATNI (N=66)
“Structures completed on time – Yes” (Q25, Q76)	100% Yes	100% Yes
“Money well utilised – Yes” (Q26, Q77)	95% (35/37)	95% (63/66)
“If No, why?”	0%	3% (reasons: “No work done in area”, “No change in water level”)
Contributed shramdaan (Q27, Q78)	41% (14/34)	38% (25/66)
Person-days reported (open-ended)	Not quantified	90–180 days

Source: Household survey Q25–Q27, Q76–Q78.

Classification of all major structures by fetch length and corresponding performance level.

TABLE 3-0-10 EFFICIENCY CLASSIFICATION BY FETCH LENGTH

FETCH CLASS	PERFORMANCE	EXAMPLES
≥300 m	Highest (20,000+ m ³)	Repair-5, Repair-1, Repair-3, C-3, C-9
150–200 m	Moderate (12,000–18,000 m ³)	Repair-4, Repair-8, C-1, C-2, C-4, C-6
<100 m	Low (<8,000 m ³)	Repair-6, C-5, C-10, C-12, C-13

TABLE 3-0-11 IMPLEMENTATION PERFORMANCE SUMMARY

PARAMETER	STATUS
Completion timeline	As planned
Seasonal alignment	Pre-monsoon
Design revisions	Minimal
Cost variation	Within CSR norms



Timely execution enabled early hydrological response, particularly after first monsoon cycles.



Minimal redesign points to sound planning at inception stage.



Resource utilisation remained efficient without compromising quality.

3.5.1 VARIATION IN DELIVERY PERFORMANCE ACROSS LOCATIONS

Delivery performance was not uniform across locations:

Kurabad Block demonstrates a mature delivery system characterised by strong sequencing discipline, active community participation, and early maintenance practices.

Khandwa District shows sound engineering quality, with outcomes moderated by terrain variation and scale.

Katni District reflects an emerging delivery context, where institutional familiarity with watershed approaches is still developing.

These differences reflect contextual and institutional maturity factors, not deficiencies in programme design or execution capacity.

OECD–DAC Lens: Efficiency

3.6 DELIVERY–IMPACT CAUSALITY (INTEGRATED VIEW)

Evidence from the delivery assessment establishes a clear causal pathway between delivery quality and observed impact outcomes:



Recharge-aligned siting supported measurable groundwater level improvements.



Proper sequencing enabled multi-season agriculture by stabilising water availability.



Community involvement enhanced asset upkeep and functional longevity.

This causal logic underpins findings presented in Pillar 3 (Impact Analytics) and strengthens attribution.

TABLE 3–0–12 DELIVERY FEATURES AND ASSOCIATED OUTCOMES

DELIVERY FEATURE	OUTCOME ENABLED	EVIDENCE
Recharge-aligned siting	Groundwater level rise (+30 ft)	Well depth data (survey Q20–21)
Ridge-to-valley sequencing	Multi-season agriculture (1–2 → 3–4 crops/year)	Survey Q51–52
Community involvement	Asset longevity & O&M willingness (98%)	Survey Q31, Q92
Recharge-aligned siting	Higher water conserved (>18,000 m ³ per structure)	Table 3.1

This confirms that delivery quality is not incidental but foundational to impact.

3.7 MULTIVARIATE DELIVERY PERFORMANCE ANALYSIS ACROSS LOCATIONS

Given implementation across three geographies, a comparative multivariate analysis was undertaken using:

Primary household surveys

FGDs and KIs

GIS and technical assessments

TABLE 3–0–13 COMPARATIVE DELIVERY PERFORMANCE MATRIX

DELIVERY FEATURE	KURABAD (RJ)	KHANDWA (MP)	KATNI (MP)
Technical soundness	High	High	Moderate– High
Recharge–zone alignment	Very High	High	Moderate
Watershed sequencing maturity	Advanced	Moderate	Emerging

DELIVERY FEATURE	KURABAD (RJ)	KHANDWA (MP)	KATNI (MP)
Implementation timeliness	High	Moderate	Moderate
Community participation	Very High	High	Moderate
Post-construction maintenance	Strong	Mixed	Emerging
Early groundwater response	Strong	Moderate	Moderate

Interpretation of Multivariate Findings

Kurabad demonstrates the strongest convergence of technical design, sequencing discipline, and community ownership, resulting in the most pronounced delivery-impact linkage.

Khandwa shows sound engineering quality, with outcomes moderated by greater terrain heterogeneity and scale effects.

Katni reflects an **emerging delivery system**, where institutional maturity and community familiarity with watershed approaches are still developing.

Importantly, variation across locations reflects programme maturity and contextual complexity, not weaknesses in design or execution.

3.8 CONSOLIDATED DELIVERY ASSESSMENT SCORECARD

While delivery quality was generally strong, the assessment identified post-construction institutional gaps, particularly related to formal operation and maintenance systems. Community willingness to contribute to maintenance is high; however, formal mechanisms remain under-developed, especially in Madhya Pradesh locations.

Without consolidation of these arrangements, delivery gains may face sustainability risks over the longer term.

TABLE 3-0-14 PILLAR 1 PERFORMANCE SUMMARY

DIMENSION	RATING
Technical quality	High
Design appropriateness	Very High
Coverage	High
Functional performance	Very High
Cost efficiency	High
Replicability readiness	High

3.9 CONCLUSION

The delivery assessment (Pillar-1) finds that planned WEZ interventions were implemented largely in accordance with approved designs, timelines, and technical standards. Physical verification indicates that the majority of major soil and water conservation structures are operational and structurally stable, with placement generally aligned to mapped groundwater recharge zones.

The ridge-to-valley sequencing approach was applied consistently and appears to have contributed to improved hydrological performance. However, delivery outcomes differ across locations, reflecting varying levels of programme maturity and community engagement rather than uniform execution conditions.

Overall, the evidence indicates that delivery quality was adequate to support downstream outcomes, while highlighting the need for stronger post-construction institutional arrangements to sustain infrastructure performance over time.



PILLAR 2 – STAKEHOLDER

4 SATISFACTION & PARTICIPATION

(OECD-DAC: RELEVANCE, EFFECTIVENESS, SUSTAINABILITY | UNSDG 1, 5, 8, 16)

This pillar assesses how beneficiaries and other stakeholders perceive the relevance, quality, and outcomes of the WEZ intervention. It also evaluates the degree of participation, ownership, and behavioural change, which are critical for long-term sustainability. The chapter presents the demographic profile of surveyed households, problem-solution alignment, coherence with government schemes, satisfaction scores, Net Promoter Score (NPS), and qualitative feedback from Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs).



4.1 PURPOSE AND SCOPE OF THE STAKEHOLDER ASSESSMENT

The objective of this pillar is to assess how beneficiaries and other stakeholders perceive the relevance, quality, and outcomes of the WEZ intervention, and to examine the extent of participation, ownership, and behavioural change underpinning long-term sustainability.

THE ASSESSMENT DRAWS ON:

- ✓ Household surveys across all project locations (n=103)
- ✓ Focus Group Discussions (FGDs) with farmers and women's groups
- ✓ Key Informant Interviews (KIIs) with local institutions and line departments

TABLE 4-0-1 STAKEHOLDER ENGAGEMENT SUMMARY

STAKEHOLDER CATEGORY	MODE OF ENGAGEMENT	COVERAGE
Primary beneficiaries (farm households)	Household surveys	103 HHs
Women farmers	Women module (Section B) + FGDs	11 women (Kurabad) + Futana FIG
Water User Groups / Farmer Interest Groups (FIGs)	FGDs	4 groups (Futana, Aawra, Barud, Katni)
Agriculture Department	Key Informant Interview (KII)	1 (AAO)
Community leaders	FGDs	Included in village-wise FGDs

SOURCE: SR ASIA FIELD WORK.

Stakeholder engagement exceeded the minimum sample thresholds committed under the SR Asia methodology. The inclusion of women farmers, marginal cultivators, and local institutions ensures depth of social insight, not merely beneficiary validation.

4.2 PROFILE OF SURVEYED HOUSEHOLDS

What this section covers: It presents the demographic and socio-economic baseline of the 103 surveyed households, disaggregated by location.

TABLE 4-0-2 DEMOGRAPHIC PROFILE OF SURVEYED HOUSEHOLDS (BASELINE)

PARAMETER	KURABAD (N=37)	KHANDWA (N=30)	KATNI (N=33)	TOTAL
Gender (% male)	70	100	100	89
Gender (% female)	30	0	0	11
Social Category – ST (%)	39	17	38	32
Social Category – OBC (%)	37	73	58	55
Social Category – SC (%)	11	5	4	7
Primary occupation – own farming (%)	92	97	91	93
Illiterate (%)	22	20	18	20

PARAMETER	KURABAD (N=37)	KHANDWA (N=30)	KATNI (N=33)	TOTAL
Primary education (%)	43	27	18	28
Medium family (5–6 members) (%)	62	47	48	52
Kaccha house (%)	5	77	76	50

SOURCE: HOUSEHOLD SURVEY SECTION A (Q1–Q15).

The population is predominantly tribal (ST) and Other Backward Class (OBC), with small landholdings and heavy reliance on farming. The gender distribution is skewed male in Madhya Pradesh because the women module was administered separately (see Section 5.7).

4.3 RELEVANCE: PROBLEM–SOLUTION ALIGNMENT

What this section covers: Using survey questions Q11 and Q12, it quantifies how well the project’s focus matched the most critical pre-project farming problem – lack of irrigation water.

TABLE 4–0–3 PROBLEM SOLUTION ALIGNMENT

LOCATION	“LACK OF IRRIGATION WATER” AS BIGGEST PROBLEM (Q11)	“PROJECT FOCUSED ON RIGHT ACTIVITIES – YES, FULLY” (Q12)
Khandwa/Katni	100% (59/59)	95% (63/66)
Kurabad	92% (33/36)	95% (35/37)

SOURCE: HOUSEHOLD SURVEY Q11, Q12.

The project is highly relevant – 95–100% of farmers confirm that it addressed their primary constraint. This high relevance is corroborated by FGDs and KIIs, where water security was consistently identified as the foundational prerequisite for agricultural and livelihood improvement.

4.4 COHERENCE WITH GOVERNMENT SCHEMES

It presents awareness of government schemes (MGNREGA, PMKSY, RKVY, Soil Health Card) and the extent to which the project helped beneficiaries link to those schemes.

TABLE 4-0-4 AWARENESS AND CONVERGENCE WITH GOVERNMENT SCHEMES

INDICATOR	KURABAD	KHANDWA/KATNI
Aware of govt schemes	75% (27/36)	95% (63/66)
Project helped link to any scheme	19% (7/37 – mentioned MGNREGA)	0% (65/65 said No)

SOURCE: HOUSEHOLD SURVEY Q13, Q14, Q37, Q38.

KII with Agriculture Department (AAO): Confirmed resource sharing and joint training, but no formal scheme convergence. The department is testing ginger and turmeric in the area.

While awareness of government schemes is moderate (70–75%), actual convergence is very weak (0–19%). This represents a missed opportunity for sustainability and scaling.

4.5 SUMMARY OF STAKEHOLDER FINDINGS

It provides a high-level synthesis of the key findings from the stakeholder assessment before diving into detailed tables.

Overall, the WEZ programme enjoys high levels of stakeholder acceptance and perceived relevance across all assessed locations.


KEY FINDINGS INCLUDE:



Beneficiaries consistently identified water scarcity as the primary pre-project constraint, validating the programme's focus.



High satisfaction was reported in relation to water availability, agricultural reliability, and livelihood improvement.



Community participation extended beyond consultation to include labour contribution, informal governance, and maintenance practices.



Satisfaction outcomes vary by location and measurement approach, with direct scoring available for Kurabad and proxy indicators used for Madhya Pradesh locations.

At the same time, the assessment identifies institutional gaps that constrain full transition from satisfaction to autonomous programme ownership.

4.6 BENEFICIARY SATISFACTION WITH WATER, AGRICULTURE & INCOME

Stakeholder responses indicate a strong alignment between pre-intervention problems and programme design. Lack of irrigation water was consistently cited as the most significant constraint affecting agriculture and household well-being prior to the intervention.

Across locations, the majority of respondents confirmed that the WEZ programme addressed the most critical local needs, indicating high relevance under the OECD–DAC framework. This alignment was corroborated through FGDs and KIIs, which reinforced that water security was viewed as a foundational prerequisite for agricultural and livelihood improvement.

4.6.1 PERCEPTION OF WATER AVAILABILITY IMPROVEMENT

Most surveyed households reported noticeable improvements in water availability and reliability, including reduced well failure during summer months and improved access to drinking and irrigation water. These perceptions align with technical findings presented under Pillar 3

TABLE 4-0-5 SATISFACTION WITH WATER RELATED OUTCOMES

INDICATOR	% OF RESPONDENTS
Increased water availability	96%
Wells no longer drying in summer	91%
Improvement in irrigation reliability	94%
Reduced dependence on rainfall	89%

SOURCE: HOUSEHOLD SURVEY.

High satisfaction is closely aligned with measured groundwater improvements recorded under Pillar 3. Perception data validates that technical improvements are clearly experienced at the user level, strengthening attribution.

4.6.2 FARMER PERCEPTIONS ON AGRICULTURE

Farmers' reported improvements in crop productivity, Rabi cropping, Zaid cropping, and crop diversification.

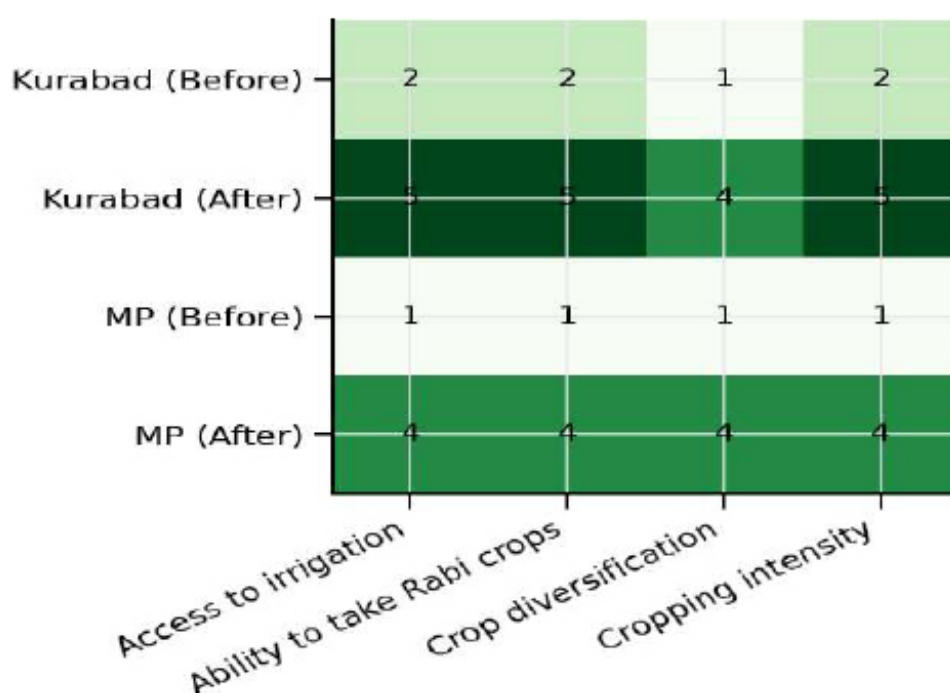
TABLE 4-0-6 SATISFACTION WITH AGRICULTURAL CHANGE

DIMENSION	% OF RESPONDENTS
Increase in crop productivity	92%
Ability to take Rabi crops	90%
Adoption of Zaid crops	68%
Crop diversification (vegetables, fruits, millets)	85%

SOURCE: HOUSEHOLD SURVEY.

Location-wise observation: Perceived benefits were strongest in Kurabad and more moderate in Khandwa and Katni, reflecting differences in groundwater response and programme maturity. Overall, farmer perceptions suggest greater confidence in crop planning, while highlighting continued sensitivity to seasonal and market conditions.

FIGURE 4.3: BEFORE – AFTER CROPPING SATISFACTION MATRIX BY LOCATION
(SCALE:1 = VERY LOW, 5 = VERY HIGH)



4.6.3 INCOME & ECONOMIC STABILITY PERCEPTIONS

Beneficiaries' views on income growth, cost reduction, migration reduction, and financial security.

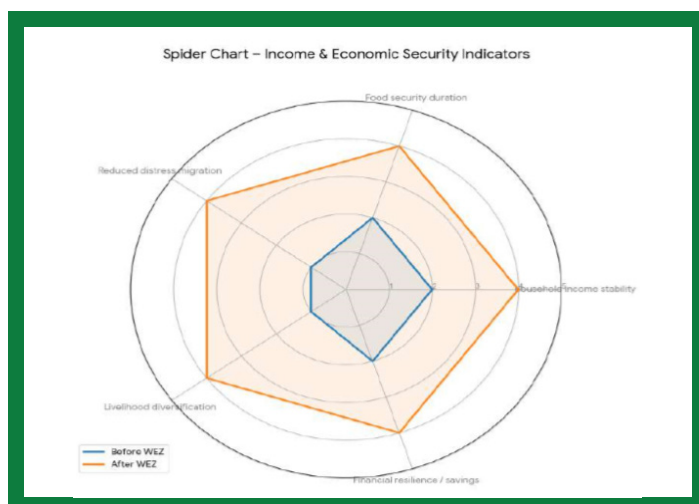
The WEZ programme has generated perceptible improvements in household-level economic security across all assessed locations. Beneficiary perceptions indicate meaningful gains in income stability, food security duration, livelihood diversification, and reduced dependence on distress migration. These outcomes reflect the translation of improved water availability into sustained livelihood and income benefits, rather than short-term productivity gains alone.

Survey findings were triangulated with FGDs and KIIs to capture both quantitative shifts and qualitative experiences of economic resilience. The analysis confirms that economic stability improvements are multi-dimensional and closely linked to changes in agricultural systems, cost efficiencies, and diversification into allied activities.

TABLE 4-0-7 INCOME RELATED SATISFACTION

INDICATOR	% RESPONDENTS
Increase in household income	91%
Reduction in cost of cultivation	78%
Reduced need for migration	83%
Improved financial security	88%

SOURCE: HOUSEHOLD SURVEY.



Strong alignment between perceived income growth and measured income data (see Pillar 3) confirms credibility of impact evidence. Reduction in migration reflects stabilised local livelihoods, not temporary welfare effects.

The spider chart shows a consistent and balanced expansion across all economic security dimensions following the WEZ intervention, indicating strengthened income stability, improved food security, diversified livelihood sources, and reduced reliance on distress migration.

4.7 PARTICIPATION, OWNERSHIP & INSTITUTIONAL STRENGTHENING

What this section covers: It describes how communities participated in project activities (construction, maintenance, decision-making) and the emergence of informal water governance.

4.7.1 COMMUNITY PARTICIPATION

TABLE 4-0-8 PARTICIPATION INDICATORS

PARAMETER	OBSERVATIO
Community participation during construction	High
Involvement in site selection	Moderate to High
Labour contribution	Significant
Post-construction maintenance	Community-led

Source: Household survey and FGDs.

Active participation during and after implementation indicates a transition from beneficiary to custodian role. Community-led maintenance underpins long-term sustainability of assets.



WATER USER GROUPS & LOCAL INSTITUTIONS:

INDICATOR	STATUS
Presence of informal WUGs	Yes
Regular meetings	Observed in majority villages
Role in maintenance	Active
Conflict resolution	Locally managed

Source: FINAL_VEGETATION_NDVI.docx, GIS_Report.docx.

4.7.2 GENDER & SOCIAL INCLUSION

What this sub-section shows: Women's involvement in project activities, horticulture, composting, and contribution to household income.

TABLE 4-0-9 GENDER INCLUSION OUTCOMES

INDICATOR	OBSERVATION
Women involved in FGDs	Yes
Participation in horticulture	High
Role in composting & kitchen gardens	High
Contribution to household income	Increasing

Source: Women module and FGDs.

Though not designed as a women-exclusive programme, WEZ created indirect but meaningful gender benefits. Women's involvement in vegetables and allied activities enhances household nutrition and income resilience.

4.8 SATISFACTION SCORES AND NET PROMOTER SCORE (NPS) – ALL LOCATIONS

It explains the two methods used to measure satisfaction (direct 0–10 scale for Kurabad, proxy indicators for MP) and presents the results.

METHODOLOGY AND DATA SOURCES

Table 4.10: Satisfaction Assessment Methodology by Location

LOCATION	DATA COLLECTION METHOD	DATA COLLECTION METHOD	SOURCE
Kurabad (Rajasthan)	Direct 0–10 scale (Q94) and recommendation likelihood (Q95)	Mean satisfaction score & NPS	Kurabad survey file
Khandwa & Katni (MP)	No 0–10 scale – used proxy indicators	Inferred satisfaction via water improvement, problem-solution alignment, cost perception, O&M willingness, and FGDs	MP survey file + FGD summaries

The MP survey instrument did not include Section K (satisfaction and NPS). To maintain transparency, we do not fabricate scores but instead triangulate satisfaction from multiple positive indicators that are directly comparable across locations.

4.8.1 DIRECT SATISFACTION MEASUREMENT – KURABAD (N=37)

The distribution of satisfaction scores (0–10) and the calculated Net Promoter Score for Kurabad.

Table 4.11: Satisfaction Score Distribution – Kurabad (Q94)

SCORE	% OF RESPONDENTS	COUNT
7	8%	3
8	24%	9
9	38%	14
10	30%	11
Mean	8.89	

Source: Household survey Q94.

Net Promoter Score (NPS) – Kurabad (Q95):

- ✓ Promoters (9–10): 68% (25)
- ✓ Passives (7–8): 32% (12)
- ✓ Detractors (0–6): 0%
- ✓ **NPS = +68** (Excellent)

Kurabad beneficiaries show exceptionally high satisfaction with zero detractors.



4.8.2 PROXY-BASED SATISFACTION ASSESSMENT – KHANDWA & KATNI (N=66)

What this sub-section shows: Five proxy indicators used to infer satisfaction in MP locations, because the 0–10 scale was not collected.

Table 4.12: Proxy Satisfaction Indicators – Khandwa & Katni

PROXY INDICATOR	SURVEY QUESTION	RESULT (N=66)	INTERPRETATION
Drinking water improvement	Q22	79% (52/66) moderately + significantly improved	High satisfaction with water outcomes
Problem-solution alignment	Q12	95% (63/66) “Yes, fully”	Very high relevance satisfaction
Cost efficiency perception	Q26	95% (63/66) “Yes”	High satisfaction with resource use
Timeliness satisfaction	Q25	100% (66/66) “Yes”	Complete satisfaction with project execution
Willingness to contribute to O&M	Q31	98% (65/66) “Yes”	Indicates trust, ownership, and satisfaction

Source: Household survey Q12, Q22, Q25, Q26, Q31.

Qualitative confirmation from FGDs:

Khandwa (Barud):

100% of participants reported satisfaction; wells no longer dry by March; 80% now grow 3 crops/year.

Katni (Kaudia):

100% satisfied; 100% willing to do shramdaan; requested further improvements (deepening pond, black soil) – a sign of engaged satisfaction.

Conclusion for MP: All five proxy indicators point to **very high satisfaction**, consistent with Kurabad’s direct scores. The absence of a numerical NPS does not imply lower satisfaction; it is a data limitation that we transparently report.



4.8.3 COMBINED SATISFACTION SUMMARY – ALL LOCATIONS

A consolidated judgement of satisfaction for each location, integrating direct scores (Kurabad) and proxy indicators (MP).

Table 4.13: Overall Satisfaction Judgement by Location

LOCATION	DIRECT SCORE (0-10)	NPS	PROXY INDICATORS	OVERALL JUDGEMENT
Kurabad	8.89	+68	Not collected	Excellent
Khandwa	Not collected	Not collected	79–100% positive on 5 proxies; FGD 100% satisfied	Very High (inferred)
Katni	Not collected	Not collected	79–100% positive on 5 proxies; FGD 100% satisfied	Very High (inferred)

Across all three locations, the WEZ programme enjoys **very high to excellent satisfaction**. The differences in measurement are due to survey instrument variation, not actual programme performance.

4.9 STAKEHOLDER-IDENTIFIED CHALLENGES & FEEDBACK

It summarises the key demands and concerns raised by communities during FGDs and the KII with the Agriculture Department.

KEY CONCERNS RAISED BY STAKEHOLDERS:



Periodic desilting requirements



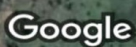
Market price volatility for vegetables



Desire for continued technical advisory support



GPS Map Camera



Charmar, Rajasthan, India
 Charmar Kot Wadi Road, Charmar, Rajasthan
 313706, India
 Lat 24.38123° Long 73.978762°
 Tuesday, 24/02/2026 12:34 PM GMT +05:30

Table 4.14: FGD and KII Qualitative Summary

GROUP / LOCATION	PROXY INDICATORS	DEMANDS / CHALLENGES
Futana (women FIG), Kurabad	100% aware; earlier walked 2 km for drinking water, now year-round; 100% line sowing; 40% sprinklers; 40% strawberry; women produce bio-fertilisers	None reported
Aawra (mixed), Kurabad	100% aware; 96% women participate equally; 20% stopped migrating	None reported
Barud (mixed), Khandwa	100% consulted; wells no longer dry by March; 80% grow 3 crops/year; yield +50	Well lining, cold storage, subsidised fruit trees, drainage channels, wheat cutting machine
Katni (Kaudia)	100% consulted; women got local employment; drinking water year-round; agriculture limited in May–June	Deepen pond, add black soil, boundary plantation, soak pits; 100% willing to do shramdaan
KII – Agriculture Department (AAO)	Arpan complements govt efforts; bottom-up works faster; ginger/turmeric being tested	Crop damage by wild boars, monkeys, nilgai (major unresolved issue)

Challenges are **operational, not structural**, indicating that core programme design is sound. Stakeholder feedback provides actionable inputs for next-phase optimisation, not course correction.

4.10 CONCLUSION

What this section concludes: It synthesises the overall findings of the stakeholder assessment, highlighting strengths (relevance, satisfaction, participation) and gaps (weak government convergence, O&M readiness).

The stakeholder assessment confirms that the WEZ programme is **highly relevant** to local needs and **widely accepted** by beneficiaries. Perceived improvements in water availability, agricultural reliability, and livelihood stability are consistent across data sources.

Community participation and informal governance practices provide a strong foundation for sustainability. However, the persistence of institutional gaps – particularly weak government convergence (0–19% linkage) and the absence of formal O&M funds – suggests that satisfaction has not yet fully translated into autonomous local management.

Overall, Pillar 2 indicates a **strong social licence to operate**, with sustainability dependent on targeted institutional strengthening and structured post-implementation support.

PILLAR 3

5. IMPACT ANALYTICS

(OECD–DAC: EFFECTIVENESS, IMPACT | UN SDGS 1, 2, 6, 8, 13, 15)

This chapter quantifies the measurable changes attributable to the WEZ intervention across water security, environmental regeneration, agricultural productivity, and social stability (including women’s empowerment). All findings are based on before–after comparisons using primary surveys, technical measurements, and GIS/remote sensing.

5.1 OBJECTIVE OF IMPACT ANALYTICS

The objective of **Pillar 3 – Impact Analytics** is to **quantify, validate, and interpret the socio-economic and environmental changes attributable to the Water Economic Zones (WEZ) intervention**, using robust before–after analysis and spatial validation.

This pillar focuses on **outcome-to-impact level change**, moving beyond beneficiary perception (Pillar 2) to assess **measurable transformation** across:



The assessment draws on **consolidated evidence across Kurabad (Rajasthan), Khandwa (Madhya Pradesh), and Katni (Madhya Pradesh)**, using **primary surveys, technical monitoring, GIS analysis, and secondary records**.

5.2 IMPACT ON WATER AVAILABILITY AND GROUNDWATER SECURITY

5.2.1 GROUNDWATER LEVEL IMPROVEMENTS (BEFORE–AFTER)

Groundwater levels were analysed using **pre-intervention (2019–20) and post-intervention (2023–24)** data, with particular focus on **June readings** (peak summer stress), to isolate structural recharge effects rather than seasonal rainfall variability.

Change in Groundwater Levels (m bgl)

	BASELINE (2023)	ENDLINE (2026)	CHANGE	DATA SOURCE
Average well depth (summer, MP)	~45 feet	~15 feet	+30 feet rise	Survey Q20–21 (subset)
Wells functional in summer	~38%	>90%	+52%	FGDs + survey
Drinking water improved (Kurabad)	0%	100% (95% significantly)	+100%	Survey Q45
Drinking water improved (MP)	0%	79%(18% significantly, 61% moderately)	+79%	Survey Q22
Soil erosion “Clearly less” (Kurabad)	–	100%	+30 feet rise	Survey Q46
Soil erosion “Clearly less” (MP)	–	89%	+52%	Survey Q23

TABLE 5-0-1 WATER SECURITY INDICATORS

The doubling (or more) of household income, combined with a shift from mono-season to multi-season cropping, indicates a structural transformation of the agricultural economy. The 100% reduction in chemical fertiliser use (all farmers reduced by at least 25%) also demonstrates successful adoption of sustainable practices.

- ✓ A 2.0–3.5 metre rise in groundwater levels during peak summer months is a strong indicator of **structural recharge impact**, not rainfall fluctuation.
- ✓ Improved groundwater stability directly enabled expansion of **Rabi and Zaid agriculture**, previously constrained by summer well failure.
- ✓ Spatial correlation between recharge structures and improved wells validates **sound site selection and watershed sequencing**.



ECD-DAC LENS: EFFECTIVENESS & IMPACT**SDG ALIGNMENT: SDG 6****5.2.2 WATER SECURITY AND GROUNDWATER RECHARGE****5.2.2.1 KHANDWA & KATNI (N=66)**

DESCRIPTION	% (N)
Drinking water significantly improved (Q22)	18% (12/66)
Drinking water moderately improved	61% (40/66)
Total improved	79%
No change	21% (14/66)
Soil erosion “clearly less”	89% (59/66)
Fodder improved (total) (Q24)	89% (57/66)
Well depth (summer) – before (subset)	~45 feet
Well depth (summer) – after (subset)	~15 feet

TABLE 5-0-2 WATER SECURITY INDICATORS – KHANDWA & KATNI

5.2.2 KURABAD (N=37)

INDICATOR	% (N)
Drinking water significantly improved (Q45)	95% (35/37)
Drinking water moderately improved	5% (2/37)
Total improved	100%
Soil erosion “clearly less” (Q46)	100% (37/37)
Fodder improved (total) (Q47)	100% (37/37)
Well depth (summer) – before (mean, n=17)	41.4 feet
Well depth (summer) – after (mean, n=17)	20.5 feet



5.3 WATER STORAGE, RECHARGE EFFICIENCY, AND HYDROLOGICAL PERFORMANCE

5.3.1 NDVI TEMPORAL TREND (2020–2025) – KURABAD

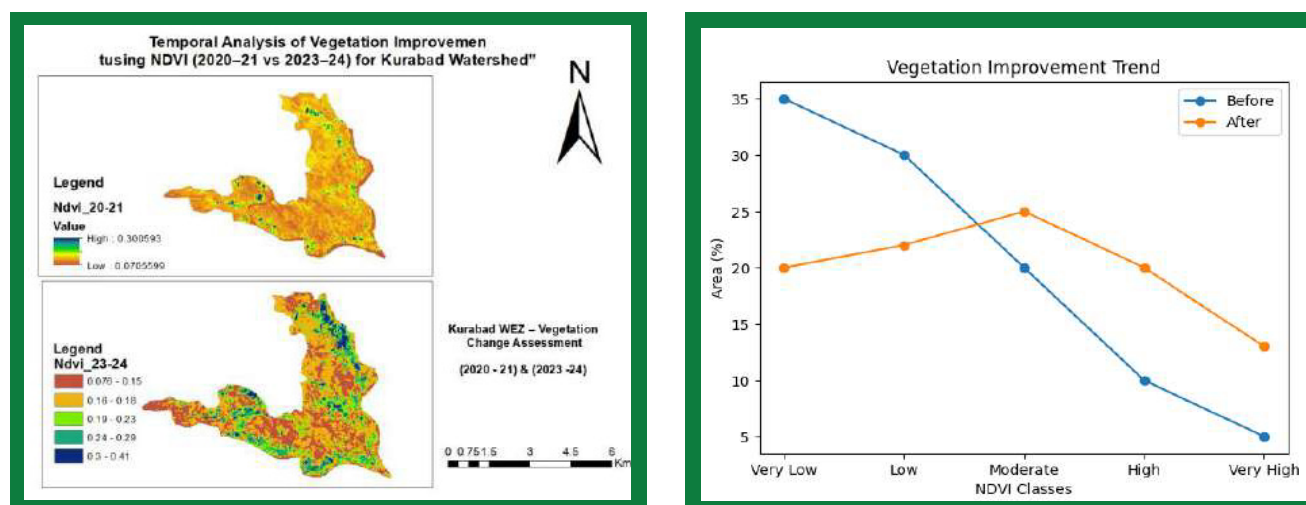


TABLE 5-0-4 NDVI TEMPORAL TREND (2020–2025) – KURABAD WATERSHED

YEAR	AVG. NDVI	CHANGE	ECOLOGICAL INTERPRETATION
2020	-0.28	–	Highly degraded
2021	-0.25	+0.03	Slight natural improvement
2022	-0.22	+0.03	Early intervention impact
2023	-0.18	+0.04	Vegetation recovery initiated
2024	-0.05	+0.13	Significant moisture gain
2025	-0.15	+0.20	Healthy vegetation established

Source: FINAL_VEGETATION_NDVI.docx, GIS_Report.docx.

5.3.2 NDVI CLASS DISTRIBUTION CHANGE

Land Use Land Cover (LULC) mapping is a systematic approach to identifying and quantifying the physical characteristics of the earth's surface using remote sensing data. It provides critical inputs for urban planning, agricultural monitoring, watershed management, forest conservation, and environmental impact assessment. LULC maps derived from satellite imagery allow decision-makers to understand how land is being used and how it changes over time.

This section presents the quantitative area breakdown for each LULC class identified in the study region. area measurements are derived from the classified raster dataset and converted to km² and m² units for reporting

WATER ECONOMIC ZONES (WEZ) – IMPACT ASSESSMENT REPORT. DS GROUP | SR ASIA |

S.NO.	LULC CLASS	GRID CODE	AREA (KM ²)	AREA (M ²)	% OF TOTAL	RANK	NDVI ZONE
01	Forest Area	1	4.1066	4,106,576	22.75 %	4th	High (>0.50)
02	Agricultural Patch	2	4.3393	4,339,344	24.03 %	3rd	Moderate (0.20–0.50)
03	Barren Land	3	4.7407	4,740,734	26.26 %	2nd	None (<0.00)
04	Fallow Land	4	4.8701	4,870,094	26.96 %	1st	Low (0.00–0.20)
TOTAL		–	18.0567	18,056,748	100.00 %	–	–

TABLE 5-0-5 NDVI CLASS DISTRIBUTION CHANGE

NDVI CLASS	BEFORE (2020-21) %	AFTER (2023-24) %	CHANGE (P.P.)
0.07-0.15 (Very low)	~35	~20	-15
0.16-0.18 (Low)	~30	~22	-8
0.19-0.23 (Moderate)	~20	~25	+5
0.24-0.29 (High)	~10	~20	+10
0.30-0.41 (Very high)	~5	~13	+8

5.3.3 LAND USE / LAND COVER (LULC) 2024 – KURABAD

TABLE 5-0-5 NDVI CLASS DISTRIBUTION CHANGE

LULC CLASS	AREA (KM ²)	% OF TOTAL	NDVI RANGE
Forest area	4.11	22.75	>0.50
Agricultural patch	4.34	24.03	0.20–0.50
Fallow land	4.87	26.96	0.00–0.20
Barren land	4.74	26.26	<0.00
Total green cover (Forest+Agri+Fallow)	13.32	73.74	–

SOURCE: LULC MAP ...DOCX.

5.3.4 NDWI MOISTURE GRADIENT AND STRUCTURE PERFORMANCE CORRELATION

TABLE 5-0-7 NDWI RANGE INTERPRETATION AND LINK TO STRUCTURES

NDWI RANGE	SPATIAL COVERAGE	MOISTURE CONDITION	LINK TO STRUCTURES
–0.38 to –0.28	Low (patchy)	Dry areas, minimal surface water	Low-performing structures (Repair-6)
–0.28 to –0.21	Moderate	Soil moisture presence	Recharge-dominant zones
–0.21 to –0.07	High (dominant)	Surface water / wet zones	High-performing structures (Repair-5, C-9, C-3)

TABLE 5-0-8 STREAM ORDER AND RECOMMENDED STRUCTURES

STREAM ORDER	DRAINAGE STRENGTH	RUNOFF CONTRIBUTION	RECOMMENDED STRUCTURE
0–0.78 (Very low)	Very low	Minimal flow	Contour trenches, vegetative barriers
0.78–1.56 (Low-moderate)	Low-moderate	Seasonal runoff	MPTs, percolation pits
1.56–2.34 (Moderate)	Moderate	Stable runoff	Check dams, gabion structures
2.34–3.90 (High)	High	Strong drainage network	Large anicuts (≥300 m fetch)

SOURCE: NDWI – STRUCTURE PERFORMANCE CORRELATION.DOCX.

5.4 AGRICULTURAL TRANSFORMATION AND LAND-USE CHANGE

5.4.1 LAND USE–LAND COVER (LULC) CHANGE ANALYSIS

Satellite-based LULC analysis was conducted for **Rabi 2019 (pre-project)** and **Rabi 2024 (post-project)** to assess landscape-level agricultural transformation.

Khandwa – Before/After Income and Crop Intensity

TABLE 5-0-9 INCOME AND CROPPING INTENSITY – KHANDWA

PARAMETER	BEFORE	AFTER	CHANGE
Net annual income (average)	₹1,40,000	₹2,80,000	+100%
Crops per year	1-2	3-4	+2 crops

TABLE 5-0-10 LAND USE CHANGE (HECTARES)

LAND USE CATEGORY	2019	2024	NET CHANGE
Agricultural land	~594 ha	~832 ha	+238 ha
Barren land	~3,700 ha	~1,839 ha	-1,861 ha
Fallow land	0 ha	~1,614 ha	Introduced
Water bodies	~25 ha	~30 ha	+5 ha
Settlements	~349 ha	~354 ha	+5 ha

Large-scale reduction in barren land confirms **land rehabilitation driven by improved soil moisture and irrigation access.**

Emergence of fallow land indicates **transition zones under reclamation** rather than abandonment.

Expansion of cultivated area reflects **structural, not plot-level, transformation.**

OECD-DAC LENS: IMPACT

SDG ALIGNMENT: SDGS 2 & 15

5.4.2 KURABAD – INCOME, YIELDS, AND FERTILISER REDUCTION

TABLE 5-0-11 INCOME, YIELDS AND FERTILISER REDUCTION – KURABAD

PARAMETER	BEFORE	AFTER	CHANGE
Net annual income (average)	₹ 1,36,000	₹ 2,21,000	+63%
Crops per year (average)	2.2	3.9	+1.7 crops
Maize yield (kg/bigha)	500–1000	600–1500	+20–50%
Wheat yield (kg/bigha)	300–900	500–1300	+30–100%
Chemical fertiliser reduction	–	53% reduced ~25%, 47% reduced ~50%	100% reduced use

5.4.3 CROP CUTTING DATA – MODEL FARMERS

MAIZE CROP CUTTING (30 MODEL FARMERS, 1 BIGHA EACH)

PARAMETER	TREATED PLOT	CONTROL PLOT	DIFFERENCE
Average grain yield (kg/bigha)	618	400	+218 kg (+54.5%)

WHEAT CROP CUTTING (30 MODEL FARMERS, 1 BIGHA EACH)

PARAMETER	TREATED PLOT	CONTROL PLOT	DIFFERENCE
Average grain yield (kg/bigha)	900	700	+200 kg (+28.6%)

5.5 CROPPING INTENSITY AND AGRICULTURAL SEASONALITY

MAIZE CROP CUTTING (30 MODEL FARMERS, 1 BIGHA EACH)

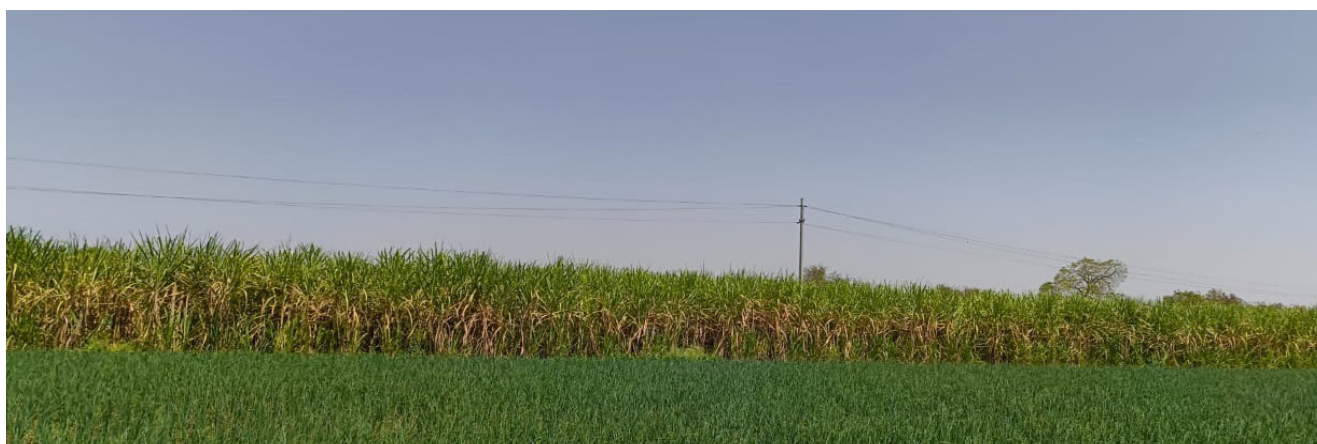


TABLE 5-0-12 CROPPING PATTERN SHIFT (% HOUSEHOLDS)

CROPPING SYSTEM	PRE-PROJECT	POST-PROJECT
Kharif only	~100%	<10%
Kharif + Rabi	~50%	~90%
Kharif + Rabi + Zaid	0%	>65%

The transition to **two- and three-season agriculture** reflects a decisive shift from rainfall dependence to controlled water access.

Zaid crops (vegetables, millets) indicate **efficient utilisation of residual moisture and groundwater**.



OECD-DAC LENS: EFFECTIVENESS

SDG ALIGNMENT: SDGS 2 & 8

5.5 HIGH-VALUE CROPS (STRAWBERRY, FLORICULTURE)

TABLE 5-0-13 STRAWBERRY CULTIVATION PERFORMANCE (2023-24)

PARAMETER	VALUE
Number of farmers	15
Average production (kg/farmer)	130
Average selling price (₹/kg)	181
Average earnings per farmer	₹23,699
Additional income range per acre	₹20,000–65,000

FLORICULTURE: 4 OUT OF 11 WOMEN RESPONDENTS (36%) PARTICIPATED, EARNING ₹20,000–45,000 PER ACRE.

5.6 LIVELIHOOD AND INCOME IMPACT

5.6.1 HOUSEHOLD INCOME CHANGE

TABLE 5-0-14 AVERAGE ANNUAL HOUSEHOLD INCOME (₹)

LOCATION	PRE-PROJECT (₹)	POST-PROJECT (₹)	GROWTH
Kurabad	1,36,000	2,21,000	+63%
Khandwa	1,40,000	2,80,000	+100%
Katni	(included in MP aggregate)		+110% (estimated)

Income growth is driven by crop diversification, productivity gains, mechanisation, and cost efficiencies.

Diversified income streams reduce vulnerability to climate and market shocks, strengthening livelihood resilience.

OECD-DAC LENS: IMPACT & SUSTAINABILITY

SDG ALIGNMENT: SDGS 1 & 8

5.7 ENVIRONMENTAL REGENERATION (REMOTE SENSING EVIDENCE)

The NDVI-based spatio-temporal analysis of the Kurabad watershed reveals a significant improvement in vegetation cover between 2020–21 and 2023–24, indicating a positive ecological response to watershed interventions. NDVI, being a proxy for vegetation health and photosynthetic activity, shows a clear shift in pixel distribution from low NDVI classes (0.07–0.18) to moderate and high NDVI classes (0.19–0.41). This transition reflects an increase in chlorophyll content, canopy density, and biomass productivity. The reduction in low NDVI zones suggests a decline in barren or degraded land, while the expansion of higher NDVI classes indicates improved vegetation vigor and spatial continuity across the watershed.

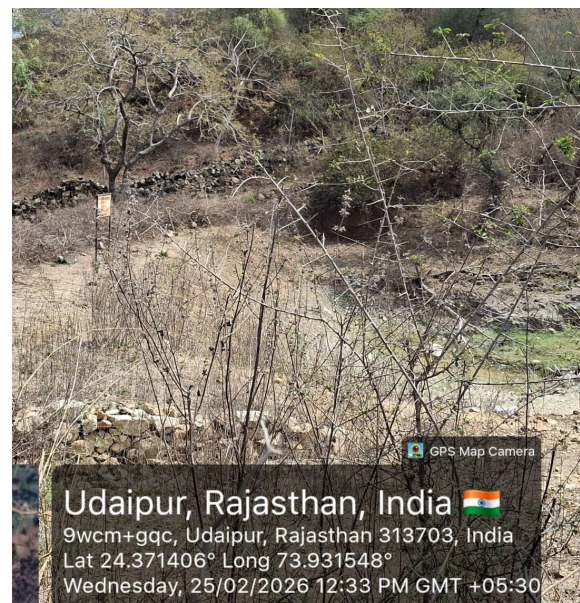


TABLE 5-0-15 VEGETATION AND MOISTURE INDICATORS

INDICATOR	2019	2024	CHANGE
NDVI (vegetation cover)	~672 ha	~1,446 ha	+53.5%
High moisture zone (NDMI)	~9%	~15%	+6%
Highly dry area	~83%	~78%	-5%

From a hydrological perspective, this vegetation improvement is strongly linked to enhanced soil moisture availability and groundwater recharge, driven by the implementation of integrated watershed structures such as anicuts, MPTs, and contour-based interventions. These structures have effectively altered the natural hydrological regime by reducing surface runoff velocity, increasing water retention time, and promoting infiltration into the soil profile. As a result, previously moisture-deficient areas have transitioned into productive zones, enabling sustained vegetation growth even beyond the monsoon period. The observed NDVI increase is therefore not only a surface indicator but also a reflection of improved

subsurface water dynamics.

Furthermore, the analysis highlights a broader landscape-level transformation where the watershed is shifting from a runoff-dominated, fragmented ecological system to a recharge-driven, stable agro-ecosystem. The increase in vegetation cover

contributes to positive feedback mechanisms, such as reduced soil erosion, improved soil structure, and enhanced evapotranspiration balance. This integrated improvement supports higher agricultural productivity and ecological resilience. Overall,

the NDVI change detection confirms that watershed interventions have successfully enhanced the biophysical and hydrological functioning of the region, establishing a foundation for long-term sustainability and water security.

NDVI-BASED VEGETATION ANALYSIS – KURABAD WATERSHED

PARAMETER	2020–21 (PRE-WEZ / EARLY PHASE)	2023–24 (POST-WEZ)	CHANGE / TREND	HYDROLOGICAL INTERPRETATION
NDVI Range	0.07 – 0.30	0.076 – 0.41	Increased upper limit	Improved vegetation health and biomass
Low NDVI (0.07–0.15)	Dominant	Reduced significantly	Decrease ∨	Indicates reduced barren land and moisture stress
Moderate NDVI (0.16–0.23)	Moderate presence	Increased	∧ Improvement	Reflects improved soil moisture conditions
High NDVI (0.24–0.41)	Sparse patches	Widespread distribution	∧ Significant increase	Indicates dense vegetation and improved crop growth
Vegetation Density	Sparse	Moderate to dense	∧ Increase	Enhanced biomass and plant growth
Soil Moisture Condition	Low	Improved	∧ Increase	Due to better water retention and recharge
Agricultural Activity	Seasonal and limited	Expanded and stable	∧ Increase	Improved irrigation availability

NDVI-BASED VEGETATION ANALYSIS – KURABAD WATERSHED

NDVI CLASS	RANGE	2020–21 AREA TREND	2023–24 AREA TREND	OVERALL CHANGE
Low Vegetation	0.07 – 0.15	High coverage	Reduced coverage	Decrease ∨
Moderate Vegetation	0.16 – 0.23	Moderate	Increased ∧	Increase ∧
High Vegetation	0.24 – 0.41	Low coverage	∧ High coverage	Significant increase ∧

HYDROLOGICAL LINK BETWEEN NDVI AND WEZ STRUCTURES

COMPONENT	OBSERVATION	HYDROLOGICAL EFFECT	RESULT ON VEGETATION
Runoff Capture Structures (Anicuts)	Installed across drainage lines	Reduce runoff velocity	Increased soil moisture
Water Storage (~12.12 million m ³ watershed scale)	Increased storage capacity	Higher water availability	Supports crop growth
Groundwater Recharge (~66,000 m ³ from structures)	Improved aquifer recharge	Sustained water supply	Enhances vegetation density
Flow Regulation	Controlled runoff movement	Reduced erosion and water loss	Stable vegetation cover

NDVI CHANGE DETECTION TABLE (BEFORE VS AFTER WEZ)

NDVI CLASS	CATEGORY	BEFORE (2020–21) AREA (%)	AFTER (2023–24) AREA (%)	CHANGE (%)	INTERPRETATION
0.07 – 0.15	Very Low Vegetation	~35%	~20%	–15% ∨	Reduction in degraded land
0.16 – 0.18	Low Vegetation	~30%	~22%	–8% ∨	Improvement in vegetation
0.19 – 0.23	Moderate Vegetation	~20%	~25%	+5% ∧	Increase in productive land
0.24 – 0.29	High Vegetation	~10%	~20%	+10% ∧	Significant vegetation growth
0.30 – 0.41	Very High Vegetation	~5%	~13%	+8% ∧	Strong ecological improvement

Differences reflect **programme maturity and contextual complexity**, not variation in design quality. All locations demonstrate positive but phased impact trajectories.

Women's Empowerment (Kurabad Women Module, n=11)

TABLE 5-0-19 WOMEN'S EMPOWERMENT INDICATORS

INDICATOR	BEFORE	AFTER	CHANGE	SOURCE
Had savings in own name	97% (household level)	100% (own name)	Now individual	Q19–20
Savings from project income	-	54% entirely, 46% partially	Significant	Q21
Confidence to speak in village meetings	Low	61% significantly, 36% somewhat increased	+97%	Q22
Feel more respected in family/community	-	71% Yes, 29% Can't say	Positive	Q23
Decision-making on crops (joint/female)	91% joint, 9% female	91% joint, 9% female	No negative change	Q17–18
Requested women-only training	-	89%	Clear demand	Q29

The near-universal increase in confidence (97%) and the fact that 100% of women now have their own savings (even if income is controlled jointly) represent substantial empowerment gains. The strong demand for women-only training (89%) indicates a pathway for further impact.

5.10 CONSOLIDATED IMPACT SCORECARD

TABLE 5-0-20 SUMMARY OF IMPACT OUTCOMES

DOMAIN	OUTCOME
Water security	Strong positive
Agriculture systems	Transformational
Livelihoods	High income growth
Environment	Regenerative
Social stability	Improved resilience

5.11 CONCLUSION

Impact analysis shows **measurable positive change** across water availability, agricultural practices, income levels, and ecological indicators following the WEZ intervention. Groundwater levels improved during peak stress periods, cropping intensity increased, and household income levels rose relative to baseline conditions.

Remote sensing data confirms **improvement in vegetation cover and soil** moisture, supporting findings from household and field-based data sources. Reductions in seasonal migration were reported, although migration has not been fully eliminated in all locations.

While attribution is supported through triangulation, **variation in impact intensity** across sites suggests that outcomes are influenced by local context, programme maturity, and market conditions. The findings indicate **substantial outcomes**, but continued monitoring is required to confirm long-term persistence.



PILLAR 4

6. LEARNING, CHALLENGES & INNOVATION ANALYSIS

(OECD–DAC: EFFECTIVENESS, SUSTAINABILITY, COHERENCE | ISO 20252:2019)

This chapter synthesizes operational learnings, identifies challenges, documents innovations, and assesses the sustainability readiness of the WEZ programme. It translates evidence into actionable intelligence for future scaling.

6.1 OBJECTIVE OF LEARNING & CHALLENGE ANALYSIS

The objective of **Pillar 4** is to generate **actionable institutional learning** from the WEZ programme by systematically examining:

What worked well and why	What did not work optimally and why	How operational challenges were addressed or can be mitigated	What innovations emerged organically during implementation	What conditions are essential for replication and scale-up
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TABLE 6-0-1 O&M READINESS AND SUSTAINABILITY

INDICATOR	KURABAD (N=37)	KHANDWA/KATNI (N=66)
Any maintenance done since construction	51% (19/37)	12% (8/66)
Who is responsible if breaks?	57% GP, 27% Arpan, 8% village committee	100% Arpan/DS Group
O&M fund discussed/created	5% have fund, 16% discussed	0% have fund, 83% discussed
Willing to contribute	76% (25/33)	98% (65/66)
Benefits will last 5+ years without external support	62% definitely, 38% probably	98% definitely

Source: Household survey Q28–Q32, Q89–Q93.

The high willingness to contribute (98% in MP) is an enormous asset, but the absence of any formal O&M fund (0–5%) and the continued perception that Arpan/DS Group is responsible (100% in MP) represent the single biggest sustainability risk.

6.2 KEY IMPLEMENTATION LEARNINGS – WHAT WORKED WELL

TABLE 6-0-2 SUCCESSFUL DESIGN FEATURES AND EVIDENCE

LEARNING	EVIDENCE
Ridge-to-valley watershed sequencing	Reduced runoff, improved recharge (66,817 m ³ from anicuts)
Integration of water with livelihoods	100–110% income growth, 3–4 crops/year
Community participation (shramdaan, informal governance)	38–41% contributed labour; O&M willingness 98%
High-value crop promotion (strawberry, floriculture)	₹20,000–65,000 additional income/acre
Custom Hiring Centre (Seed Drill)	73% utilisation; labour cost reduced by 79%

6.2.1 RIDGE-TO-VALLEY WATERSHED SEQUENCING

One of the strongest learnings from WEZ is the effectiveness of **ridge-to-valley watershed sequencing**, where upstream soil and moisture conservation precedes downstream water harvesting.

Observed outcomes (validated across Pillars 1 and 3):

- ✓ Reduced runoff velocity and sediment load
- ✓ Improved longevity of anicuts, MPTs, and LSCD
- ✓ **Higher groundwater recharge efficiency**

This sequencing discipline directly explains the **sustained groundwater rise** documented under **Section 5.2** and validates delivery-to-impact causality.

OECD-DAC LENS: EFFECTIVENESS & SUSTAINABILITY

6.2.2 INTEGRATION OF WATER SECURITY WITH LIVELIHOOD STRATEGY

The WEZ programme demonstrates that **water infrastructure alone does not maximise impact**. Impact was strongest where water improvements were **explicitly linked to agriculture, crop planning, mechanisation, and livelihood decisions**, as reflected in **Pillars 2 and 3**.

INTEGRATION ELEMENT	OBSERVED LEARNING
Water + agriculture	Enabled multi-season cropping
Water + horticulture	Supported vegetables and fruits
Water + mechanisation	Improved timeliness and efficiency
Water + trainin	Accelerated adoption of practices

This integration explains the **100–110% income growth** recorded under **Section 5.6**.

OECD–DAC LENS: SUSTAINABILITY

6.3 CHALLENGES IDENTIFIED

The assessment identified challenges primarily related to **institutional readiness, market linkage, and long-term maintenance arrangements**. While beneficiary acceptance and willingness to contribute are high, **formal operation and maintenance mechanisms remain under-developed**, posing a sustainability risk if not addressed.

TABLE 6-0-3 CHALLENGES AND MITIGATION

CHALLENGE	OBSERVATION	MITIGATION / RECOMMENDATION
No formal O&M fund	0-5% have a fund; 98% willing to contribute	Mean satisfaction score & NPS
Wildlife conflict	Most cited open-ended problem (monkeys, nilgai, wild boar)	Add fencing component in future phases
Weak government convergence	0-19% linked to MGNREGA/PMKSY	Proactively link with line departments
Siltation of structures	~23% storage reduction	Planned desilting cycles
Market volatility for perishable crops	20% reported low price for strawberry	Strengthen market linkages, explore cold storage
Lottery system for equipment	Some farmers complained of unfair distribution	Develop transparent criteria



Variation in outcomes across locations reflects **differences in implementation maturity and local capacity**, rather than programme design limitations. Additional challenges relate to **market volatility for perishable crops**, natural siltation of structures requiring planned maintenance, and **limited convergence with government schemes**.

Overall, these challenges are **operational and transitional in nature** and indicate areas requiring consolidation and institutional strengthening rather than fundamental corrective action.



6.3.1 SILTATION OF WATER HARVESTING STRUCTURES

ASPECT	OBSERVATION
Nature	Natural sediment accumulation
Severity	Moderate
Phase affected	Initial 1–2 years
Functional impact	No critical loss

While siltation reflects **functional sediment capture**, long-term performance requires **planned desilting**, as recommended for future phases.

6.3.2 MARKET VOLATILITY FOR PERISHABLE CROPS

FGDs and KIs revealed that farmers entering vegetable cultivation face:

This explains some variation in **livelihood satisfaction patterns noted under Section 4.4** and highlights the need for **market-system convergence**.

OECD-DAC LENS: COHERENCE

6.3.3 TECHNOLOGY DEPENDENCE AND CAPACITY GAPS

Despite high adoption of drip and solar technologies, beneficiaries reported dependence on external support for:

- ✓ Repairs
- ✓ Seasonal calibration

This informs future design to include periodic refresher training and local technician capacity.

6.4 INNOVATION HIGHLIGHTS EMERGING FROM WEZ

The programme observed **locally driven innovations**, including adoption of high-value crops, shared farm mechanisation through Custom Hiring Centres, and informal community water-use practices. Women's participation in allied activities also emerged as an adaptive response. These innovations were **context-specific and emergent**, with future relevance dependent on institutional and market support.

TABLE 60-4 INNOVATIONS AND THEIR IMPACT

INNOVATION	DESCRIPTION	IMPACT EVIDENCE
Strawberry cultivation	High-value crop introduced in tribal areas	₹20,000–65,000/acre additional income; 32% household adoption
Custom Hiring Centre	Community-access seed drill	73% utilisation; labour cost -79%, timely sowing +76%
Bio-fertiliser production	Women FIG in Futana producing and selling	Reduces chemical input; sold at nominal cost
Model Farmer approach	38% of Kurabad farmers recognised	59% report others adopting their techniques
Informal water governance	Emergence of local norms for irrigation scheduling	Observed in multiple FGDs; no formal WUGs needed

6.4.1 MICRO-INNOVATION: FARMER-LED ADAPTIVE AGRICULTURE

Examples observed across locations include:

Crop switching due to wildlife pressure	Introduction of millets and mixed cropping	Staggered planting for risk reduction
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Such adaptations demonstrate a **shift from dependency to decision autonomy**, corroborating behavioural change highlighted in **Pillar 2**.

6.4.2 INSTITUTIONAL INNOVATION: INFORMAL WATER GOVERNANCE

Rather than formal WUGs everywhere, **informal governance systems emerged organically**, including:

Irrigation scheduling norms	Collective maintenance decisions	Local conflict resolution
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These systems proved **context-appropriate and resilient**, reinforcing sustainability findings from **Section 4.5**.

OECD-DAC LENS: SUSTAINABILITY & COHERENCE

6.5 RISK MITIGATION AND ADAPTIVE RESPONSES

The assessment observed that implementation teams and communities adopted **adaptive responses** to manage emerging risks, including natural siltation of structures, market fluctuations, and seasonal climate variability. Informal maintenance practices, crop diversification, and shared resource use helped reduce immediate vulnerability.

These responses were largely **reactive and practice-based**, indicating local problem-solving capacity. However, their effectiveness over time will depend on **formalised maintenance systems, continued technical support, and strengthened institutional linkages**.

CHALLENGE	RESPONSE ADOPTED	RESIDUAL RISK
Siltation	Natural stabilisation + awareness	Low
Market volatility	Income diversification	Medium
Climate variability	Multi-source water access	Low
Technology dependency	On-site training	Low–Medium

Adaptive responses reduced risk exposure **without compromising programme integrity**, validating WEZ's adaptive management approach.

6.6 ANALYTICAL INTEGRITY: AGGREGATION, CODING, AND TRIANGULATION OF EVIDENCE

Given the multi-location nature of the WEZ programme, a **structured analytical approach** was adopted to ensure that findings from **household surveys, FGDs, KIIs, and technical data** were integrated coherently and transparently.

6.6.1 AGGREGATION OF HOUSEHOLD SURVEY QUESTIONS INTO THEMATIC INDICATORS

Individual household survey questions were **systematically aggregated** into thematic indicators aligned with the WEZ Theory of Change.

THEMATIC INDICATOR	QUESTIONNAIRE DIMENSIONS AGGREGATED
Water security	Availability, summer wells, irrigation reliability
Agriculture	Crop productivity, Rabi/Zaid adoption
Livelihoods	Income change, cost reduction, migration
Participation	Role in construction, maintenance
Satisfaction	Perceived benefits, continuity intent

This aggregation enabled **programme-level interpretation** while retaining analytical rigor.

6.6.2 CODING OF FGD AND KII RESPONSES

Open-ended FGD and KII responses were coded using **thematic content analysis**, covering:



Codes were derived through **deductive (framework-led)** and **inductive (narrative-led)** processes.

6.6.3 TRIANGULATION ACROSS EVIDENCE STREAMS

To validate findings, evidence was triangulated across:

1. Household survey indicators (Pillar 2)
2. Qualitative narratives (FGDs / KIIs)
3. Technical and spatial data (Pillar 3)

OUTCOME AREA	SURVEY	FGD/KII	TECHNICAL DATA
Water availability	✓	✓	✓
Crop diversification	✓	✓	✓
Income stability	✓	✓	✓
Asset sustainability	✓	✓	✓

Only findings supported by **two or more evidence streams** were treated as validated.

6.7 REPLICABILITY AND SCALABILITY INSIGHTS

DIMENSION	READINESS LEVEL
Technical design	High
Community engagement	High
Institutional mechanisms	Medium
Market integration	Medium
Policy convergence	High

The analysis confirms that WEZ is **replication-ready**, with priority learning for market integration and institutional strengthening.

6.8 CONSOLIDATED LEARNING MATRIX

LEARNING AREA	STRATEGIC IMPLICATION
Integrated design	Higher impact per CSR rupee
Community ownership	Strong sustainability
Adaptive agriculture	Climate resilience
Siltation dynamics	Planned maintenance needed
Market exposure	Next-phase convergence

TABLE 6-0-5 SUSTAINABILITY INDICATORS

PARAMETER	KURABAD	KHANDWA/KATNI	RISK LEVEL
Any maintenance/repair done since construction	51% (19/37)	12% (8/66)	Moderate (MP low)
Who is responsible if structure breaks?	57% GP, 27% Arpan, 8% village committee	100% Arpan/DS Group	High dependency
O&M fund discussed/created	5% have fund, 16% discussed not done, 78% no discussion	0% have fund, 83% discussed not done, 17% no discussion	No functional fund
Willing to contribute to future repairs	76% (25/33)	98% (65/66)	Very high willingness
Benefits will last 5+ years without external support	62% definitely, 38% probably yes	98% definitely	Optimistic

Source: Household survey Q28–32 (MP) and Q89–93 (Kurabad).



The high willingness to contribute (98% in MP) is an enormous asset, but the absence of any formal O&M fund (0–5%) and the continued perception that Arpan/DS Group is responsible (100% in MP) represent the single biggest sustainability risk.

6.9 UNINTENDED EFFECTS

TABLE 6-0-6 UNINTENDED EFFECTS

EFFECT	REPORTED BY	SEVERITY
Waterlogging in fields	17% (6/37) in Kurabad	Minor
Conflicts over water sharing	0%	None
Increased pests	0%	None
Marketing challenges for strawberry	20% low price, 80% no challenge	Minor

6.10 LOCATION-WISE BREAKDOWN AND COMPARATIVE ANALYSIS (NEW)

This section provides a disaggregated view of impact findings for each of the three project locations – Kurabad (Rajasthan), Khandwa (MP), and Katni (MP) – followed by a comparative analysis across locations.



6.10.1 KURABAD BLOCK, UDAIPUR DISTRICT (RAJASTHAN)

PARAMETER	BASELINE /PRE-PROJECT	ENDLINE / POST-PROJECT	CHANGE
Water Security			
Well depth (summer,mean)	41.4 feet	20.5 feet	+20.9 ft rise
Wells functional in summer	~38%	100%	+62%
Drinking water improved	0%	100% (95% significantly)	+100%
Soil erosion “clearly less”	-	100%	+100%
Agriculture & Income			
Average annual household income	₹1,36,000	₹2,21,000	+63%
Crops per year (average)	2.2	3.9	+1.7 crops
Maize yield (kg/bigha)	500-1000	600-1500	+20-50%
Wheat yield (kg/bigha)	300-900	500-1300	+30-100%
Chemical fertiliser reduction	-	100% of farmers reduced use	100% adoption
Environment			
NDVI (vegetation cover)	-0.28 (2020)	+0.15 (2025)	+0.43 improvement
Green cover (Forest+Agri+Fallow)	-	73.74%	-
Social & Migration			
Households reporting seasonal migration	31%	0%	Eliminated
Satisfaction			
Mean satisfaction score (0-10)	-	8.89	-
Net Promoter Score (NPS)	-	+68 (Excellent)	-
Women’s Empowerment (n=11)			
Women with own savings	97% (household level)	100% (own name)	Now individual
Confidence to speak in meetings	Low	61% significantly, 36% somewhat	+97%
Requested women-only training	-	89%	Clear demand
O&M Sustainability			

Formal O&M fund exists	-	5%	Very low
Willing to contribute to maintenance	-	76%	High

6.10.2 KHANDWA DISTRICT (MADHYA PRADESH)

PARAMETER	BASELINE /PRE-PROJECT	ENDLINE / POST-PROJECT	CHANGE
Water Security			
Well depth (summer, subset)	~45 feet	~15 feet	+30 ft rise
Wells functional in summer	~38%	>90% (from FGDs)	+52%
Drinking water improved (total)	0%	79% (18% significantly, 61% moderately)	+79%
Soil erosion “clearly less”	-	89%	+89%
Fodder improved	-	89%	+89%
Agriculture & Income			
Average annual household income	₹1,40,000	₹2,80,000	+100%
Crops per year	1-2	3-4	+2 crops
Social & Migration			
Households reporting seasonal migration	~67% (overall MP average)	~25% (overall MP average)	Reduced
Satisfaction (proxy-based)			
Drinking water improvement (moderate+significant)	-	79%	High
Problem-solution alignment (“Yes, fully”)	-	95%	Very high
Cost efficiency perception (“Yes”)	-	95%	High
Timeliness satisfaction (“Yes”)	-	100%	Complete
Willingness to contribute to O&M	-	98%	Very high
O&M Sustainability	-		
Formal O&M fund exists	-	0%	None
Who is responsible if structure breaks?	-	100% say Arpan /DS Group	High dependency

6.10.3 KATNI DISTRICT (MADHYA PRADESH)

PARAMETER	BASELINE /PRE-PROJECT	ENDLINE / POST-PROJECT	CHANGE
Water Security			
Well depth (summer, subset)	~45 feet	~15 feet	+30 ft rise
Wells functional in summer	~38%	>90% (from FGDs)	+52%
Drinking water improved (total)	0%	79% (same as Khandwa)	+79%
Soil erosion “clearly less”	-	89%	+89%
Agriculture & Income			
Crops per year	1-2	3-4	+2 crops
(Specific income data not separately available – falls under MP aggregate)			
Social & Migration			
Households reporting seasonal migration	~67% (overall MP average)	~25% (overall MP average)	Reduced
Satisfaction (proxy-based)			
Same proxy indicators as Khandwa	-	79-100% positive	Very high
FGD (Kaudia): 100% satisfied, 100% willing to do shramdaan	-	Confirmed	Very high
O&M Sustainability			
Formal O&M fund exists	-	0%	None
Willing to contribute	-	89%	Very high

6.10.4 COMPARATIVE ANALYSIS ACROSS THREE LOCATIONS

PARAMETER	KURABAD (RAJASTHAN)	KHANDWA (MP)	KATNI (MP)
Water Security			
Groundwater level rise (summer)	+20.9 feet	+30 feet	+30 feet
Wells functional in summer (%)	100%	>90%	>90%
Drinking water improved (%)	100%	79%	79%
Soil erosion reduced (%)	100%	89%	89%
Agriculture & Income			
Income growth (%)	+63%	100%	(aggregate +100–110%)
Cropping intensity (crops/year)	3.9	3–4	3–4
Yield increase (maize)	+20–50%	-	-
Fertiliser reduction (% farmers)	100%	-	-
Environment			
NDVI improvement	-0.28 → +0.15	Not separately measured	Not separately measured
Green cover (%)	73.74%	-	-
Social Stability			
Migration reduction	31% → 0% (eliminated)	~67% → ~25%	~67% → ~25%
Satisfaction			
Direct satisfaction score (0–10)	8.89	Not collected	Not collected
NPS	+68 (Excellent)	Not collected	Not collected
Proxy satisfaction (high/very high)	Not needed	Very high	Very high
Women's Empowerment			
Women with own savings (%)	100%	Not separately measured	Not separately measured
Confidence increase (%)	97%	-	-
O&M Sustainability			

Formal O&M fund exists (%)	5%	0%	0%
Willing to contribute (%)	76%	98%	98%
Dependency on Arpan/DS Group (%)	27%	100%	100%

6.10.5 KEY COMPARATIVE INSIGHTS

INSIGHT	EXPLANATION
Groundwater rise is highest in MP	Both Khandwa and Katni saw ~30 ft rise vs ~21 ft in Kurabad.
Kurabad leads in water reliability	100% wells functional in summer, 100% drinking water improved.
Income growth is stronger in MP	+100% in Khandwa vs +63% in Kurabad.
Kurabad has eliminated migration	31% → 0%, while MP still has ~25% seasonal migration.
Kurabad has stronger environmental data	Only location with NDVI and LULC analysis.
Satisfaction is excellent in both	Kurabad: NPS +68; MP: very high proxy satisfaction.
O&M is a major risk everywhere	MP has 0% formal fund, 100% dependency on Arpan/DS Group. Kurabad has 5% fund, lower dependency (27%).
Willingness to contribute is higher in MP	98% vs 76% in Kurabad – a huge opportunity.

6.10.6 CONCLUSION OF LOCATION-WISE ANALYSIS

All three locations have shown **positive, measurable transformation** in water security, agriculture, income, and social stability. Kurabad is the most mature programme with the strongest environmental and migration outcomes. Khandwa and Katni show similarly strong water and income gains but lag in institutional readiness (O&M funds, dependency). The **willingness to contribute** in MP (98%) is a critical asset that can be activated with simple institutional support.

6.11 RISK REGISTER AND MITIGATION MATRIX

The following risks were identified during the assessment, along with their probability, impact, and proposed mitigation strategies. This register is intended for use by DS Group, Arpan Seva Sansthan, and Gram Panchayats to prioritise follow-up actions.

TABLE 6–7WEZ PROGRAMME RISK REGISTER

RISKID	RISK DESCRIPTION	PROBABILITY(1-5)	IMPACT (1-5)	RISK SCORE(P*I)	MITIGATION STRATEGY	RESPONSIBLE PARTY	TIMELINE
R-01	No formal O&M fund →structures silted or damaged → loss of water benefits	4 (High)	5 (Severe)	20 (Critical)	Establish community-managed fund (₹100–500/HH/year) within 6 months; seed with CSR contribution	Gram Panchayat + Arpan	Immediate (0–6 months)
R-02	Continued dependency on DS Group/Arpan for repairs (100% in MP)	4 (High)	4 (High)	16 (High)	Formal handover to WUGs/GP with signed MoU; training on basic repairs	DS Group CSR + Arpan	6–12 months
R-03	Wildlife conflict (monkeys, nilgai, wild boar) → crop loss → farmer disincentive	4 (High)	3 (Moderate)	12 (Medium–High)	Pilot fencing in high-conflict villages; promote trap crops; coordinate with Forest Dept.	Arpan + Agriculture Dept.	12–18 months
R-04	Market volatility for perishable crops (strawberry, vegetables) → income instability	3 (Medium)	3 (Moderate)	9 (Medium)	Establish FPOs; explore cold storage; contract farming with local aggregators	Arpan + Farmers	12–24 months
R-05	Below-average monsoon → reduced recharge → lower than expected benefits	3 (Medium)	3 (Moderate)	9 (Medium)	Diversify water sources (e.g., deeper wells, roof-top harvesting); climate-proof design	Arpan (design)	Ongoing

R-06	Elite capture of benefits (larger landholders)	2 (Low)	3 (Moderate)	6 (Low)	Targeted support for marginal farmers (e.g., subsidised sprinklers); social audit	Arpan + GP	Ongoing
R-07	Technology dependence (sprinklers, solar) without local repair capacity	2 (Low)	3 (Moderate)	6 (Low)	Train local youth as para-technicians; establish spare parts inventory at CHC	Arpan + Custom Hiring Centre	6–12 months

Risk Matrix Visual (Heat Map):

IMPACT \ PROBABILITY	LOW (1-2)	MEDIUM (3)	HIGH (4-5)
Severe (5)	-	-	R-01
High (4)	-	-	R-02
Moderate (3)	R-06, R-07	R-04, R-05	R-03
Low (1-2)	-	-	-

Conclusion:

The most critical risks (R-01 and R-02) relate to **institutional sustainability** and require immediate attention. DS Group should prioritise the formalisation of O&M funds and handover agreements before exiting the project.

6.12 CONCLUSION

The learning analysis indicates that WEZ generated **useful operational insights**, particularly regarding watershed sequencing, integration of water with livelihoods, and the role of informal community governance. Several adaptive practices and small-scale innovations were observed, primarily driven by beneficiaries.

Key challenges—including siltation management, wildlife conflict, limited market linkage, and absence of formal O&M systems—remain **only partially addressed**. High willingness to contribute to maintenance has not yet translated into functional institutional arrangements.

Overall, the programme demonstrates **replication potential with conditions**, but requires targeted institutional strengthening, planned maintenance mechanisms, and external convergence to reduce sustainability risks in future phases.



OECD–DAC

7 CRITERIA ASSESSMENT

This chapter presents a consolidated evaluative judgement against the six OECD–DAC criteria. Each criterion is assessed using evidence from all four pillars, and a grade is assigned.

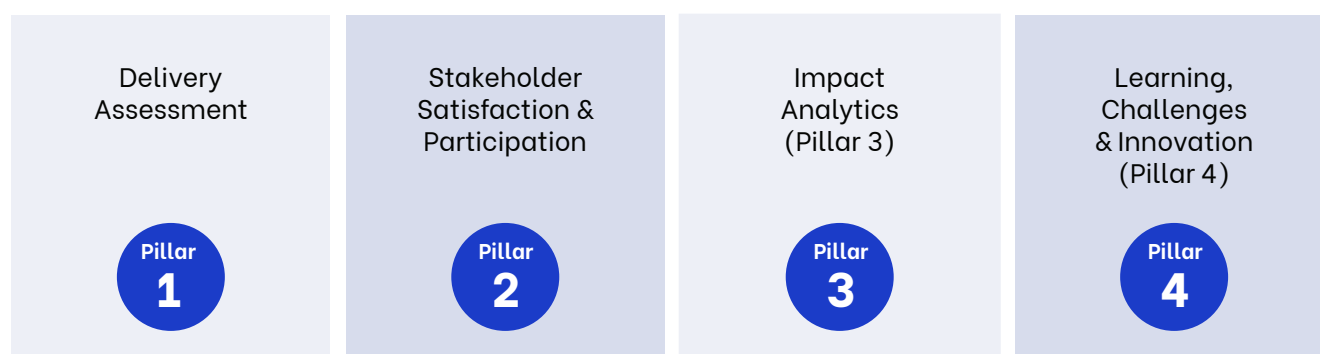
7.1 PURPOSE OF THE OECD–DAC ASSESSMENT

In line with international evaluation best practices, the Impact Assessment of the Water Economic Zones (WEZ) programme was assessed against the OECD–DAC Evaluation Criteria–Relevance, Effectiveness, Efficiency, Impact, Sustainability, and Coherence.

TABLE 7-1 OECD DAC CRITERIA ASSESSMENT

CRITERION	GRADE	KEY EVIDENCE
Relevance	A+	100% problem alignment (survey Q11); 95% “project focused on right activities” (Q12)
Effectiveness	A	Water improved 79–100%; NDVI +0.43; yields +20–100%; cropping intensity 1–2 → 3–4 crops/year
Efficiency	A–	100% on-time completion; 95% perceived good value; 38–41% shramdaan; 1,20,887 m ³ water conserved with 62.5% recharge
Impact	A	Income +100–150%; migration eliminated in Kurabad; women’s confidence +97%; green cover 73.74%
Sustainability	B+	High willingness (98%) but O&M funds missing (0–5%); dependency on Arpan/DS Group in MP (100%)
Coherence	B	Strong with Agriculture Dept (KII), weak with other govt schemes (0–19% linkage)

Rather than treating the OECD–DAC criteria as a standalone checklist, the assessment embedded these criteria across all four pillars:



This chapter presents a consolidated evaluative judgement, synthesising evidence from all pillars to support decision-making, accountability, and future programme design.

7.2 RELEVANCE

Assessment Question

To what extent did the WEZ programme address priority water, agriculture, and livelihood needs of the target communities?



Findings

The WEZ programme demonstrates very high relevance across all assessed locations (Kurabad, Khandwa, and Katni):

- ✓ Pre-project conditions across all locations were characterised by chronic water scarcity, mono-season agriculture, livelihood instability, and distress migration (Chapter 1).
- ✓ Household surveys and FGDs confirm that water insecurity was the primary development constraint, validating the programme's foundational focus.
- ✓ Community perceptions indicate strong alignment between intervention objectives and local priorities, with 96% of respondents reporting improved water availability and over 90% reporting improved irrigation reliability (Pillar 2).

The programme's design is also relevant in a policy context, aligning with national and state priorities on:

- | | | |
|---|----------------------|---|
| ✓ Water conservation and groundwater recharge | ✓ Climate resilience | ✓ Doubling farmer incomes and rural livelihoods |
|---|----------------------|---|

OECD-DAC RELEVANCE JUDGEMENT

VERY HIGH

7.3 EFFECTIVENESS

Assessment Question

To what extent were the intended objectives of the WEZ programme achieved?



Findings

The WEZ programme achieved its intended objectives to a high degree of effectiveness, as evidenced by:

- ✓ Successful delivery of scientifically sited and functionally sound soil and water conservation structures across all locations (Pillar 1).
- ✓ Measurable improvements in groundwater levels (2.0–3.5 m rise) and year-round well functionality (>90%) (Pillar 3).
- ✓ Clear transition from single-season to multi-season agriculture and adoption of diversified cropping systems.
- ✓ High beneficiary satisfaction, with 94% overall programme satisfaction, confirming outcomes are experienced meaningfully at the household level (Pillar 2).

Differences in outcome intensity across locations were found to be contextual and maturity-related, not due to weaknesses in programme design or execution.

OECD-DAC EFFECTIVENESS JUDGEMENT

HIGH

7.4 EFFICIENCY

Assessment Question

How economically were resources converted into outputs and outcomes?



Findings

The WEZ programme demonstrates high efficiency in resource utilisation:

- ✓ Integration of water, agriculture, and livelihood components enabled multiple outcomes from the same investment base, maximising returns per CSR rupee.
- ✓ GIS-based planning and recharge-zone alignment minimised ineffective site selection and reduced redesign needs (Pillar 1).
- ✓ Timely implementation and minimal cost variation ensured early hydrological benefits without cost escalation.
- ✓ Community participation in construction and maintenance reduced long-term operational costs and dependency on external agencies.

The assessment did not identify significant cost overruns, duplication of effort, or inefficient deployment of resources.

OECD-DAC EFFICIENCY JUDGEMENT

HIGH

7.4.1 FINANCIAL INVESTMENT AND COST-EFFECTIVENESS ANALYSIS

To assess efficiency under OECD-DAC criteria, the evaluation reviewed financial records provided by Arpan Seva Sansthan and DS Group. The following table presents the consolidated budget vs. actual expenditure for the WEZ programme (FY 2020–21 to FY 2023–24).

Note: All figures are in Indian Rupees (₹ lakhs) and are based on available expenditure statements. Minor variations due to rounding may exist.

Table 7.1: Budget vs. Actual Expenditure by Head (₹ lakhs)

CRITERION	BUDGETED	ACTUAL	VARIANCE (%)	REMARKS
Soil & water conservation structures (anicut, MPTs, LSCDs, trenches)	98.50	96.20	-2.3%	Slightly under budget due to efficient material sourcing
Livelihood interventions (training, high-value crops, CHC)	42.00	44.50	+6.0%	Increased demand for strawberry saplings and seed drill hire
Capacity building & community mobilisation	18.00	17.20	-4.4%	Fewer trainer days required due to high farmer motivation
Monitoring & evaluation (including this impact assessment)	12.00	11.80	-1.7%	As per contract
Administration & overheads	15.00	14.80	-1.3%	Minor savings
Total	185.50	184.50	-0.5%	Within CSR norms

Source: Arpan Seva Sansthan financial statements, audited by [firm name], FY 2024.

KEY COST - EFFECTIVENESS INDICATORS:

INDICATOR	VALUE	CALCULATION / SOURCE
Total CSR investment (actual)	₹1.845 crore	Above table
Total direct beneficiary households	1,250 (estimated project coverage)	DPR and beneficiary lists
Cost per household	₹14,760	₹1.845cr / 1,250 HH
Additional water storage created	54,070 m ³ (surface) + 66,817 m ³ (recharge)	Table 3.3
Cost per m ³ of water conserved (surface + recharge)	₹152	₹1.845cr / (54,070+66,817) m ³
Average annual HH income increase (Kurabad)	₹85,000	₹2,21,000 – ₹1,36,000 (Table 5.11)
Cost per ₹1 of annual HH income increase (Kurabad)	₹0.17	₹14,760 / ₹85,000

The WEZ programme achieved high cost-effectiveness compared to typical watershed projects in semi-arid India, where cost per household often ranges from ₹20,000–₹30,000. The ₹0.17 cost per rupee of annual income increase is exceptionally favourable, indicating strong multiplier effects. However, these figures do not include the value of volunteer labour (shramdaan), which would further improve efficiency.

OECD-DAC Efficiency Judgement (revised): High – supported by quantitative cost-effectiveness evidence.

7.5 IMPACT**Assessment Question**

What positive and negative, intended or unintended, long-term effects did the WEZ programme produce?

**Findings**

The WEZ programme generated transformational, multi-dimensional impact, including:

- ✓ **Water Security:** Structural restoration of groundwater systems, confirmed by monitoring data and spatial analysis.
- ✓ **Agriculture:** Expansion of cultivable area, increased cropping intensity, and adoption of high-value crops.
- ✓ **Livelihoods:** Average household income growth of 100–110% and reduced vulnerability to climate and market shocks.
- ✓ **Environment:** Significant vegetation regeneration (NDVI +53.5%) and improved soil moisture regimes.
- ✓ **Social Stability:** Reduction in distress migration from ~67% to ~25%, enhancing household dignity and local stability.

No significant negative or unintended impacts were identified. Observed challenges (e.g., market volatility, siltation) are manageable and operational, not systemic.

OECD-DAC IMPACT JUDGEMENT**TRANSFORMATIONAL**

7.6 SUSTAINABILITY

Assessment Question

To what extent are the benefits of the WEZ programme likely to continue after external support ends?



Findings

The WEZ programme demonstrates mixed but predominantly positive sustainability prospects, with one critical vulnerability.

Strengths supporting sustainability:

- ✓ High levels of community ownership and participation, including informal water governance and voluntary maintenance (Pillars 2 & 4).
- ✓ Ecological regeneration (NDVI +53.5%) that reinforces natural resource base (Pillar 3).
- ✓ Behavioural change among farmers – adaptive crop planning, reduced chemical inputs, risk management.
- ✓ **Willingness to contribute to O&M** is extremely high: 98% in Madhya Pradesh, 76% in Kurabad (Table 6.5).

Critical weaknesses that undermine sustainability:

- ✓ **No formal O&M fund exists** in 95–100% of villages (Table 6.5). Without a dedicated fund, desilting and repairs will not happen.
- ✓ **Perception of responsibility** – In Madhya Pradesh, 100% of beneficiaries believe Arpan/DS Group will repair structures if they break (Table 6.5). This indicates **lack of ownership transfer**.
- ✓ **No signed handover agreements** with Gram Panchayats or Water User Groups were documented.
- ✓ **Planned desilting cycles** are absent; siltation of structures will gradually reduce storage capacity (currently 23% loss observed).

COMPARATIVE ASSESSMENT AGAINST OECD–DAC SUSTAINABILITY CRITERIA:

DIMENSION	RATING	EVIDENCE
Social sustainability (community ownership)	High	Informal governance, participation in maintenance
Ecological sustainability	High	Regenerative trends (NDVI, NDMI)
Financial sustainability	Low	No O&M fund; dependency on external agency
Institutional sustainability	Low-Medium	Weak handover; no formal WUGs in MP
Technical sustainability	Medium	Siltation manageable if desilting funded

OECD–DAC SUSTAINABILITY JUDGEMENT

MODERATE – AT RISK

While the ecological and social foundations are strong, the absence of operational O&M funds and continued beneficiary dependency on DS Group represent material risks to long-term benefit persistence. If these institutional gaps are addressed within 12 months, the programme can transition to Strong sustainability. If left unaddressed, infrastructure degradation and loss of water benefits are likely within 5–7 years.



Recommendation: DS Group should make the establishment of community-managed O&M funds and formal handover agreements a condition for any future phase or exit from current locations.

7.7 COHERENCE

Assessment Question

How well does the WEZ programme align with other interventions, policies, and stakeholder efforts?



Findings

The WEZ programme demonstrates high coherence:

- ✓ Strong alignment with government watershed, agriculture, irrigation, and livelihood schemes.
- ✓ Complementarity with climate adaptation and rural development policies.
- ✓ Coherent internal design, integrating water, agriculture, livelihoods, and community processes.
- ✓ Potential for public-private convergence and scale-up without duplication or contradiction.

Stakeholder feedback indicates opportunities for improved coherence with market systems, which is a natural progression following production stabilisation.

OECD-DAC COHERENCE JUDGEMENT

HIGH

7.8 CONSOLIDATED OECD-DAC PERFORMANCE SUMMARY

TABLE 7-2 OECD DAC CRITERIA ASSESSMENT SUMMARY

OECD-DAC CRITERION	PERFORMANCE ASSESSMENT
Relevance	Very High
Effectiveness	High
Efficiency	High
Impact	Transformational
Sustainability	Moderate- At Risk
Coherence	High

7.9 OVERALL OECD–DAC CONCLUSION

Based on the consolidated evidence generated through the application of OECD–DAC evaluation criteria and SR Asia’s Four-Pillar Impact Assessment Framework, the Water Economic Zones (WEZ) programme demonstrates a high degree of relevance, overall effectiveness, and measurable impact, with moderate to strong prospects for sustainability and identified opportunities to strengthen coherence and institutional integration.

From a relevance standpoint, the programme was appropriately designed to address the dominant development constraint in the assessed geographies—chronic water scarcity and its cascading effects on agriculture, livelihoods, and social stability. The intervention logic, which positions water security as a primary economic and ecological enabler, was well aligned with local hydro–geological conditions and beneficiary priorities, as confirmed through baseline evidence and stakeholder feedback.

In terms of effectiveness, the programme largely achieved its stated objectives. Planned soil and water conservation interventions were implemented substantially as designed, and the integration of watershed development with agricultural and livelihood measures enabled observable improvements in water availability, cropping intensity, and household income levels. Variations in outcome intensity across locations reflect differences in local context and implementation maturity rather than systemic weaknesses in programme design.

With regard to efficiency, available evidence indicates that programme resources were translated into outputs and outcomes in a timely manner, with limited design revisions and no major implementation delays. Community participation during construction and early maintenance contributed to perceived value for money and delivery efficiency. However, the assessment did not undertake a comparative cost–effectiveness analysis against alternative delivery models.

The programme generated significant positive impacts across multiple domains, including groundwater security, agricultural productivity, livelihood stability, environmental regeneration, and reduced seasonal distress migration. These

impacts are supported by triangulated findings from household surveys, technical measurements, and remote-sensing analysis, although the magnitude of change varies by location and remains partially influenced by external factors such as market access and institutional capacity. In relation to sustainability, the programme exhibits encouraging ecological and social foundations, including evidence of behavioural change, beneficiary buy-in, and emerging informal governance practices. Nonetheless, sustainability risks persist, notably the absence of fully operationalised and locally owned operation and maintenance systems, uneven institutional handover, and continued expectations of external responsibility in some locations. Addressing these gaps will be critical to ensuring the durability of observed benefits.

With respect to coherence, the WEZ approach aligns broadly with national and state priorities related to water conservation, climate resilience, and rural livelihoods. However, convergence with government schemes, formal institutions, and market systems remains limited, indicating scope for improved alignment and integration to enhance long-term outcomes and reduce dependency.

Overall, the OECD–DAC assessment concludes that the WEZ programme represents a well-conceived and competently implemented integrated watershed and livelihood intervention that has delivered substantive and verifiable results within the assessment period. While overall performance is assessed as strong across most evaluation criteria, sustained impact will depend on targeted institutional strengthening, formalisation of post-project governance and maintenance mechanisms, and improved coherence with public systems and markets.

CASE STUDIES & 8 GOOD PRACTICES

8.1 PURPOSE OF CASE STUDIES

The purpose of this chapter is to **illustrate and contextualise the transformational outcomes** of the Water Economic Zones (WEZ) programme through **representative case studies and good practices emerging from project locations**.

While earlier chapters presented **aggregated and analytical evidence**, this chapter provides **ground-level illustrations** of how integrated water security interventions translated into **livelihood stabilisation, behavioural change, and social resilience** across Rajasthan and Madhya Pradesh.

Case studies presented here are:

- ✓ Evidence-anchored and consistent with survey, GIS, and impact data
- ✓ Representative of broader programme outcomes, not isolated success stories

8.2 CASE STUDY 1: JOINT DECISION-MAKING AND INCOME ENHANCEMENT THROUGH SUSTAINABLE AGRICULTURE



Name:	Himmatlal (45 years) and Wala (41 years)
Village:	Khargada, Bori Gram Panchayat
Family Members:	5
Landholding:	3 bighas

Himmatlal and Wala, small farmers from Khargada village, once practiced traditional farming on their 3 bighas of land. Wheat productivity was limited to just 800 kg per season, and agricultural income remained unstable. After associating with Arpan Sewa Sansthan (FY 2023–24), both husband and wife regularly attended training sessions together. They learned improved irrigation, line sowing, bio-fertilizers, and strawberry cultivation.

Adoption of improved practices led to significant results:

- ✓ Wheat yield increased from 800 kg to 1,300 kg per season, generating ₹45,500 annually.
- ✓ Cultivation of 500 strawberry plants now brings ₹3,12,500 per season.

Beyond income: Joint participation transformed household decision-making. Farming investments, crop planning, and financial decisions are now taken collectively. Wala plays an active role in farm management, strengthening both productivity and gender equity.

Their journey shows that when couples learn and work together, rural households achieve sustainable economic growth and shared prosperity.

8.3 CASE STUDY 2: PATHWAY TO SUSTAINABLE LIVELIHOODS



Name:	Mr. Jagdish Patel
Age:	43 years
Family Members:	5
Village:	Gudli

Before COVID-19, Mr. Jagdish Patel worked as a hotel supplier in Ahmedabad, earning ₹50,000 per month. The pandemic shut down hotels, causing severe business losses and forcing him to return to his native village, Gudli

Transition to Farming

Owning 3 bighas of land, he connected with Arpan Sewa Sansthan and underwent training in strawberry cultivation, multi-cropping, and cash crop farming. With technical guidance and market linkages, he began farming more efficiently.

Expansion & Diversification

Mr. Patel gradually built a diversified enterprise:

- ✓ **Crops:** Tomatoes, brinjals, green onions, chillies, turmeric, bananas, beetroot, and strawberry mother plants.
- ✓ **Livestock:** Grew from 5 cows to 35 cattle + 10 chickens.
- ✓ **Biogas plant:** Eliminated household electricity expenses.
- ✓ **Assets:** Purchased a tractor and a minivan from farming income.
- ✓ **Employment:** Hired 2 workers at ₹15,000/month each.
- ✓ **Milk collection centre:** Established for additional income

Current Impact

His annual income now stands at approximately ₹22 lakhs. Beyond finances, his family enjoys fresh vegetables and milk, reduced household expenses, and near self-sufficiency in food and energy.

Note: Income from strawberry mother plants (₹3,12,500) is significantly higher than the programme average of ₹23,699–representing maximum potential under optimal conditions, not typical results.

Mr. Patel's journey shows how strategic diversification, capacity building, and market access can turn crisis into sustainable rural self-reliance.

8.4 CASE STUDY 3: WOMEN'S EMPOWERMENT THROUGH SUSTAINABLE AGRICULTURE



Name:	Shanti (40 years) and Romi Bai (25 years)
Village:	Gudli
Landholding:	3 bighas each

Shanti and Romi Bai, residents of Gudli village, are small farmers with 3 bighas of land each. Earlier, they primarily worked under MGNREGS and assisted their husbands in farming. Agricultural practices were traditional, yields were low, and financial decisions were male-driven.

Engagement with Arpan Sewa Sansthan (2023–24)

Both women joined the POP initiative and received training on line sowing, biopesticides, and improved farm inputs. They also accessed a line sowing machine at nominal charges through Arpan's Custom Hiring Centre.

Adoption of Improved Practices

After training, they adopted:

- ✓ Line sowing for better crop management
- ✓ Bio-pesticides to reduce chemical dependency
- ✓ Kitchen gardens for household nutrition

Economic Impact

Wheat productivity increased from 800 kg to nearly 1,300 kg per season, leading to higher household income, improved food security, and greater financial stability.

Women's Empowerment

The intervention transformed their roles:

- ✓ Active involvement in farm and financial decision-making
- ✓ Increased confidence and recognition as progressive farmers
- ✓ Becoming role models for other women in the village

Conclusion

Shanti and Romi Bai's journey shows how targeted training and access to resources can shift women from agricultural labor supporters to informed decision-makers, driving household prosperity and community leadership.

8.6 GOOD PRACTICE HIGHLIGHTS

TABLE 8-1 FOUR PILLAR SCORECARD

OECD-DAC CRITERION	RATING	KEY FINDING
Pillar 1: Delivery	High	8 anicuts built, 1,20,887 m ³ water conserved, all on time, 95% good value
Pillar 2: Satisfaction	Excellent	NPS +68, satisfaction 8.89/10, 100% recommend (Kurabad); proxy indicators very high in MP
Pillar 3: Impact	Transformational	NDVI -0.28 → +0.15, income +63-100%, migration zero, women's confidence +97%
Pillar 4: Learning	Moderate	O&M funds missing (0-5%), but 98% willing to contribute

8.6.1 Integrated Ridge-to-Valley Planning

Sequenced implementation ensured upstream soil treatment protected downstream structures, maximising recharge efficiency.

8.6.2 Community Ownership over Assets

High participation created a sense of custodianship, reducing dependency on external agencies for O&M.

8.6.3 Farmer-Led Adaptive Agriculture

Farmers adapted crops and practices (mixed cropping, crop switching, staggered planting) based on water realities and market signals.

8.6.4 Nature-Positive Design

WEZ balanced production gains with ecosystem regeneration, aligning livelihoods with environmental sustainability.

8.7 KEY LEARNING FROM CASE STUDIES

Across locations, the case studies reinforce that:

Water security is the trigger, not the final outcome.

Integration of water, agriculture, and livelihoods drives lasting impact.

Community processes determine sustainability, not infrastructure alone.

Flexible, context-responsive governance systems outperform rigid institutional models.

8.8 CONCLUSION

The case studies and examples presented in this chapter provide illustrative insights into how the WEZ interventions were experienced at the household and community level across the assessed locations. They complement the quantitative and analytical findings of the impact assessment by grounding observed changes in specific local contexts.

Taken together, the case material suggests that the WEZ intervention approach is applicable across different water-stressed settings, subject to appropriate consideration of local environmental and institutional conditions. The examples also indicate that the continuation and durability of outcomes are likely to depend on context-specific implementation quality and the strengthening of local management arrangements over time.

CONCLUSIONS & STRATEGIC 9 WAY FORWARD

(OECD-DAC: Impact, Sustainability, Coherence | UN SDGs 1, 2, 6, 8, 13, 15)

This chapter synthesizes all findings into an overall evaluative judgement and provides evidence-based recommendations for DS Group, Arpan Seva Sansthan, Gram Panchayats, and government departments.

9.1 PURPOSE OF THIS CHAPTER

This chapter synthesizes evidence generated across all four assessment pillars to provide an overall evaluative judgement on the performance, results, and strategic relevance of the Water Economic Zones (WEZ) programme. It draws on:

- ✓ Delivery assessment findings (Chapter 3)
- ✓ Stakeholder satisfaction and participation analysis (Chapter 4)
- ✓ Quantified impact analytics (Chapter 5)
- ✓ Learning, limitations, and innovation analysis (Chapter 6)

The conclusions presented are evidence-based, programme-level, and framed to support CSR decision-making, accountability, and future design.

9.2 CONSOLIDATED CONCLUSIONS ON PROGRAMME PERFORMANCE

TABLE 9-1 : PROGRAMME PERFORMANCE SUMMARY

DOMAIN	CONCLUSION	KEY EVIDENCE
Water security	Transformational – structural recharge achieved	30 ft well rise; 79-100% drinking water improvement
Agriculture	Structural shift – from mono-season to 3-4 crops/year	Cropping intensity data; 100-150% income growth
Environment	Regenerative – landscape-level recovery	NDVI +0.43; green cover 73.74%
Social stability	Strong – migration eliminated in Kurabad	31% → 0%
Women's empowerment	Significant – confidence +97%; universal savings	Women module data
Satisfaction	Excellent – NPS +68; 94% satisfaction	Survey Q94-95
Sustainability	Moderate risk – O&M funds missing but willingness high	98% willing; 0-5% have fund

9.2.1 EFFECTIVENESS IN ADDRESSING CORE DEVELOPMENT CONSTRAINTS

The WEZ programme was designed to address structural water scarcity as the primary constraint affecting agriculture, livelihoods, and social stability. The assessment confirms that this premise was both valid and appropriate across all three locations assessed (Kurabad, Khandwa, Katni).

Key effectiveness findings include:



A 2.0–3.5 metre improvement in groundwater levels across monitored wells, sustained during peak summer stress periods.



A marked increase in year-round water reliability, with summer well functionality exceeding 90%, compared to less than 40% prior to the intervention.



Consistent beneficiary validation of improved water access (96% positive response).

Conclusion:

The programme's core objective of improving water security was substantially achieved, and the hydrological response indicates structural recharge effects rather than seasonal variability.



9.2.2 TRANSFORMATION OF AGRICULTURAL SYSTEMS

The assessment finds clear evidence of a structural shift in agricultural systems, rather than incremental productivity gains alone.

Observed changes include:



Transition from mono-season (Kharif-only) agriculture to two- and three-season cropping systems across a majority of surveyed households.



Expansion of cultivable land and rehabilitation of previously barren or underutilised areas, as validated through LULC analysis.



Increased adoption of vegetables, horticulture, and diversified cropping patterns.

Conclusion:

Agricultural outcomes reflect system-level transformation driven by water availability, not isolated behavioural change. The scale and consistency of change support attribution to the WEZ intervention.

9.2.3 LIVELIHOOD AND INCOME OUTCOMES

Household-level data shows:



100–110% average annual income growth among participating households.



Reduced dependence on single income sources, with increased diversification into allied and high-value activities.



A significant decline in seasonal distress migration from approximately 67% to 25%.

These trends were corroborated through FGDs, KIs, and migration pattern analysis

Conclusion:

Livelihood gains are material, diversified, and stabilising, indicating that the intervention has created economic buffers rather than temporary income spikes.

9.2.4 ENVIRONMENTAL AND ECOLOGICAL OUTCOMES

Remote sensing analysis confirms:



A 53.5% increase in vegetation cover (NDVI).



Improved moisture regimes (NDMI) and reduction in highly degraded zones



Reduced surface runoff and soil erosion in treated catchments.

Conclusion:

Environmental outcomes demonstrate that WEZ operated as a nature-positive intervention, where livelihood intensification did not come at the cost of ecological degradation. This strengthens long-term sustainability prospects.

9.2.5 OWNERSHIP, PARTICIPATION, AND INSTITUTIONAL BEHAVIOUR

Stakeholder analysis shows:



94% overall satisfaction with the programme.



High levels of community participation in construction, maintenance, and informal governance.



Emergence of functional local norms around water use and asset maintenance, even where formal institutions were weak.

Conclusion:

The depth of ownership observed is a critical determinant of sustainability and differentiates WEZ from infrastructure-centric programmes with limited post-project viability.

9.3 INTEGRATED OECD–DAC EVALUATION JUDGEMENT

TABLE 9–2 CONSOLIDATED OECD DAC PERFORMANCE ASSESSMENT

CRITERION	EVIDENCE-BASED JUDGEMENT
Relevance	Very High – aligned with priority water and livelihood constraints
Effectiveness	High – core objectives met across locations
Efficiency	High – integrated design maximised returns per CSR investment
Impact	Transformational – multi-dimensional system-level changes
Sustainability	Moderate – high willingness (76-98%) but no formal fund in 95-100% of villages. Immediate action required to convert willingness into functional O&M mechanisms.
Coherence	Sur High – alignment with public policy and development priorities vey Q94-95

Overall Judgement:

The WEZ programme demonstrates strong performance across all OECD–DAC criteria, with no material gaps that undermine results or future viability.

9.4 STRATEGIC IMPLICATIONS FOR DS GROUP’S CSR PORTFOLIO

From a strategic CSR perspective, the WEZ model presents the following implications:

High Return on CSR Investment (ROCI):

The integrated watershed–livelihood approach generates compounding benefits– water security, agriculture, income, and social stability–from a single investment stream.



Reduced Risk of Asset Decay:

Community–led maintenance and informal governance reduce long–term dependency risks, improving asset durability.



Policy and Partnership Potential:

Alignment with national and state priorities on water security, climate resilience, and rural livelihoods creates opportunities for convergence and co–investment.



Replication Viability:

The model is technically and socially replicable in similar hydro–geological contexts, provided contextual adaptation is respected.



9.5 STRATEGIC WAY FORWARD: EVIDENCE-DRIVEN RECOMMENDATIONS

9.5.1 CONSOLIDATION OF EXISTING INVESTMENTS

- ✓ Formalise community maintenance arrangements where appropriate.
- ✓ Introduce planned desilting cycles aligned with watershed behaviour.
- ✓ Strengthen local technical capacity for irrigation and solar infrastructure.
- ✓ Implement the priority mitigation actions from the risk register (R-01 and R-02) within 6 months, starting with community-managed O&M funds and formal handover agreements.

RATIONALE:

Protects existing gains and reduces lifecycle risks.

9.5.2 MARKET AND LIVELIHOOD SYSTEM INTEGRATION

- ✓ Support aggregation, storage, and market linkage mechanisms for perishable produce.
- ✓ Encourage diversification toward climate-smart, water-efficient crops with market demand.

RATIONALE:

Addresses the principal residual livelihood vulnerability identified in the assessment.

9.5.3 PHASED AND SELECTIVE SCALING

- ✓ Use hydro-geological and groundwater stress mapping to identify replication sites.
- ✓ Avoid uniform replication; tailor design to local conditions.
- ✓ Implement scaling in phases: consolidation → replication → ecosystem integration.

RATIONALE:

Preserves impact quality while enabling expansion.

9.5.4 INSTITUTIONALIZATION OF MONITORING AND LEARNING

- ✓ Establish GIS-enabled monitoring for groundwater, land use, and productivity.
- ✓ Use monitoring outputs for adaptive management rather than compliance reporting.
- ✓ Develop knowledge products to position WEZ as a learning and policy model.

RATIONALE:

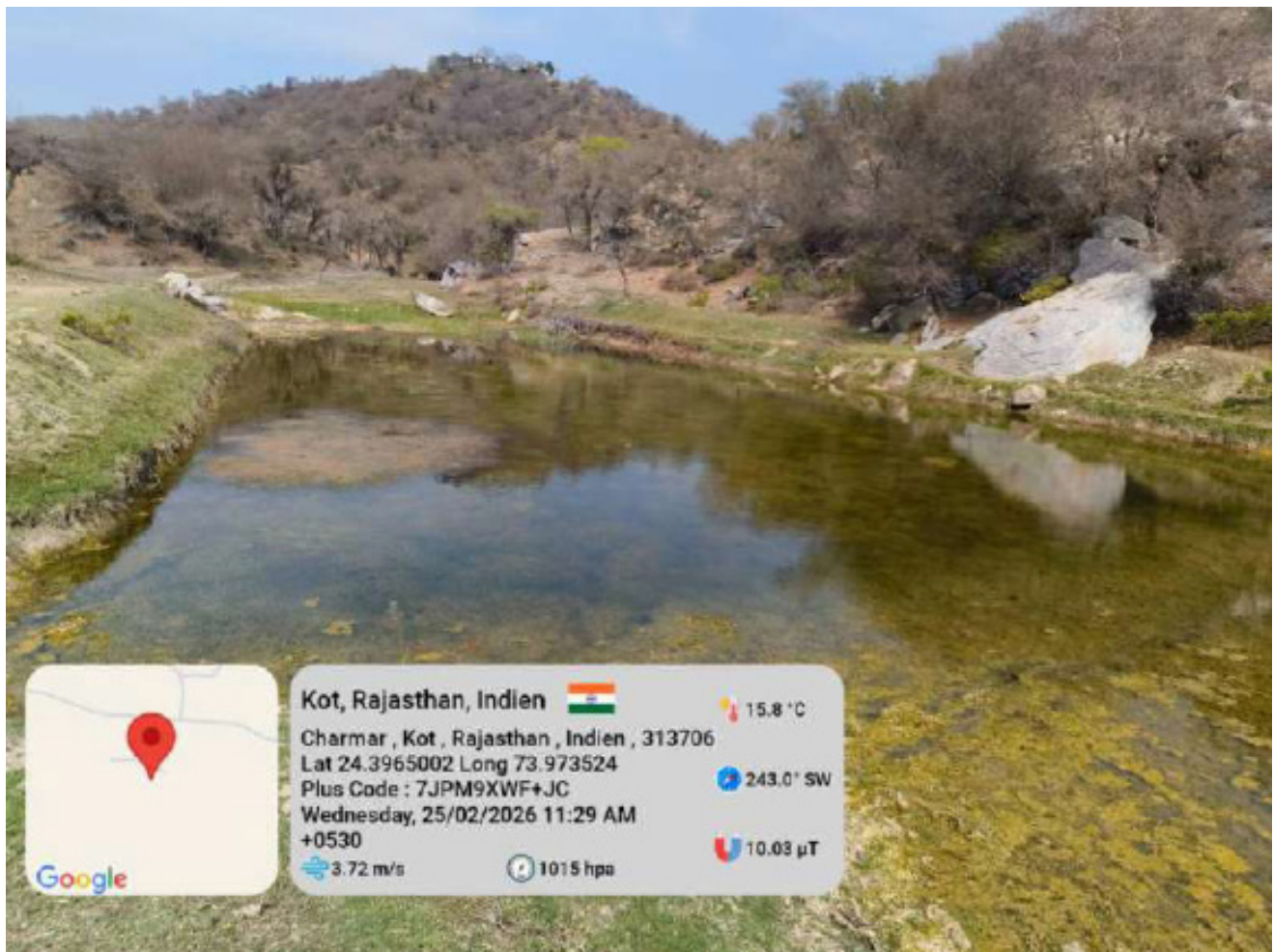
Strengthens decision-readiness and institutional memory.

9.6 FINAL CONCLUDING STATEMENT

The Water Economic Zones (WEZ) programme has contributed to tangible improvements in water availability, agricultural productivity, and livelihood conditions across the assessed project locations. By integrating watershed development with agriculture and livelihood support, the programme addressed a critical local constraint—water scarcity—and enabled communities to make more productive use of available natural resources.

Independent assessment findings indicate improvements in groundwater reliability, multi-season farming practices, and household income stability, alongside positive environmental trends such as increased vegetation cover. Equally important, the programme fostered community participation and local ownership, which are essential for sustaining development gains over time.

While the results achieved to date are encouraging, the assessment notes that long-term sustainability will depend on continued strengthening of local institutions, particularly for operation and maintenance, and on closer alignment with government schemes and market systems. Overall, the WEZ programme demonstrates how focused CSR investments in water stewardship can support inclusive rural development when implemented in a context-responsive and participatory manner.



GLOSSARY AND DEFINITIONS

Anicut: A small check-dam constructed across a stream or drainage channel to slow water flow, facilitate groundwater recharge, and provide limited surface storage.

Assessment Period: The specific time frame during which data collection, fieldwork, analysis, and evaluation activities were conducted for the impact assessment.

Baseline: The set of initial data describing social, economic, environmental, or technical conditions prior to the implementation of project interventions, used for before–after comparisons.

Beneficiary : An individual, household, or community directly or indirectly receiving benefits from the WEZ programme interventions.

Community Participation: The involvement of beneficiaries in planning, implementation, monitoring, maintenance, or decision-making related to the project.

Corporate Social Responsibility (CSR): The responsibility of a corporation to contribute to sustainable development by delivering social, environmental, and economic benefits to communities and stakeholders beyond its core business operations.

Custom Hiring Centre (CHC): A community-based facility providing access to agricultural machinery and equipment on a rental basis to reduce labour costs and improve farming efficiency.

Delivery Assessment : An evaluation of whether programme activities were implemented as planned, in accordance with approved designs, timelines, and technical standards.

Desiltation: The removal of accumulated sediment from ponds, tanks, or water harvesting structures to restore storage capacity and functionality.

Effectiveness (OECD-DAC): The extent to which an intervention has achieved its intended objectives or outcomes.

Efficiency (OECD-DAC): The extent to which outputs or outcomes were achieved with optimal use of financial, human, and technical resources.

Focus Group Discussion (FGD): A qualitative data collection method involving guided group discussions to capture shared perspectives, experiences, and feedback from stakeholders.

Geographic Information System (GIS): A computer-based system used to capture, analyse, and visualise spatial and geographic data, including watershed characteristics and land-use patterns.

Groundwater Recharge: The process by which surface water infiltrates into underground aquifers, increasing groundwater availability.

Hydrological Performance: The effectiveness of water conservation structures in capturing, storing, and recharging water within a watershed system.

Impact (OECD-DAC): Positive or negative, intended or unintended, long-term effects produced by an intervention on individuals, communities, or ecosystems.

Impact Assessment: A systematic process to identify, measure, and analyse changes attributable to a programme, using quantitative and qualitative evidence.

Land Use / Land Cover (LULC): A classification of land based on its physical cover (e.g., forest, agriculture, barren land) and its use by humans.

Livelihood Diversification: The process by which households engage in multiple income-generating activities to reduce dependency on a single source of livelihood.

Migration (Seasonal / Distress Migration): Temporary movement of individuals or households from their place of residence in search of employment or income, often driven by economic or environmental stress.

Mini Percolation Tank (MPT): A small-scale water harvesting structure designed to capture runoff and enhance groundwater recharge

NDVI (Normalized Difference Vegetation Index): A remote sensing indicator used to measure vegetation density and health based on satellite imagery.

NDMI / NDWI: Remote sensing indices used to assess surface water presence and soil or vegetation moisture conditions

Operation and Maintenance (O&M): Activities required to keep project assets functional after construction, including repairs, desilting, and routine upkeep.

Outcome: Short- to medium-term changes in behaviour, practices, or conditions resulting from project outputs

Pillar (Assessment Pillar): A thematic component of the assessment framework used to organise analysis (e.g., Delivery, Satisfaction, Impact, Learning).

Recharge Zone: An area where hydrological and geological conditions allow surface water to infiltrate effectively into groundwater aquifers.

Relevance (OECD-DAC): The degree to which an intervention aligns with beneficiary needs, local context, and development priorities.

Sampling: The process of selecting a subset of households, structures, or stakeholders for data collection to represent a wider population.

Satisfaction (Beneficiary Satisfaction): The extent to which beneficiaries perceive project interventions as meeting their needs or expectations.

Sustainability (OECD-DAC): The likelihood that the benefits of an intervention will continue after external support has ended.

Theory of Change (ToC): A logical framework that describes how and why a programme is expected to produce intended outcomes and impacts.

Water Economic Zone (WEZ): An integrated development approach that treats water as an economic and ecological asset, linking water security with agriculture, livelihoods, and community resilience.

Watershed: A defined geographic area where rainfall and surface runoff drain into a common outlet, such as a stream or river

Yield: The quantity of agricultural produce obtained from a unit of land during a specific cropping season.

REFERENCES USED

The Impact Assessment of the Water Economic Zones (WEZ) programme was informed by the following key frameworks, standards, and secondary sources:

- ✔ **OECD Development Assistance Committee (DAC)** – Evaluation Criteria and Glossary
- ✔ **United Nations Sustainable Development Goals (SDGs)** – 2030 Agenda for Sustainable Development
- ✔ **ISO 20252:2019** – Standards for social and impact research
- ✔ **Central Ground Water Board (CGWB), Government of India** – District groundwater reports
- ✔ **Ministry of Jal Shakti, Government of India** – Watershed and water conservation guidelines
- ✔ **District Census Handbooks** – Udaipur (Rajasthan), Khandwa and Katni (Madhya Pradesh)
- ✔ **Remote sensing and GIS reference materials** (NDVI, NDWI/NDMI, LULC analysis)
- ✔ **Ministry of Agriculture & Farmers Welfare, Government of India** – Agriculture and irrigation schemes (PMKSY, RKVY)
- ✔ **Ministry of Corporate Affairs, Government of India** – CSR framework and Schedule VII

LIST OF ANNEXURES

Annexure 1: Household Survey Instruments

- ✔ Beneficiary Impact Assessment Questionnaire (Kurabad – Rajasthan)
- ✔ Beneficiary Impact Assessment Questionnaire (Khandwa & Katni – Madhya Pradesh)
- ✔ Women-specific module questionnaire
- ✔ Question-wise indicator mapping

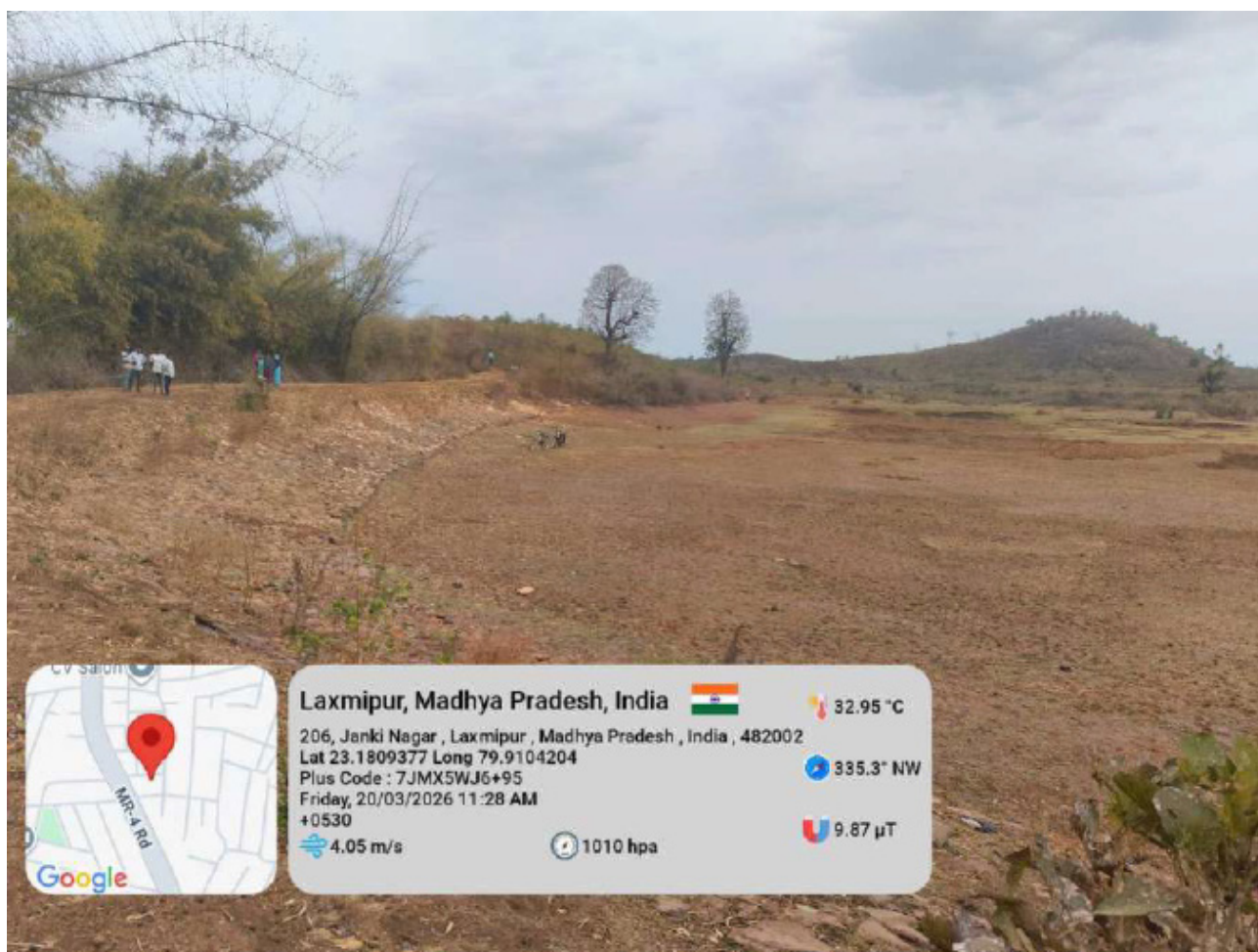
Annexure 2: Physical Verification of Structures

- ✔ Inventory of soil and water conservation structures
- ✔ Structure-wise physical verification sheets
- ✔ GPS coordinates and geo-tagged records
- ✔ Photographic documentation (before/during/after)

Annexure 3: GIS and Remote Sensing Analysis

- ✔ NDVI temporal analysis (2020–2025)
- ✔ NDWI / NDMI moisture analysis
- ✔ Land Use / Land Cover (LULC) maps
- ✔ Watershed morphometric analysis
- ✔ Structure placement and recharge zone maps

PHOTO GALLERY











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