

Sustainable Water Resource Development & Management (SWRDM) Initiatives

Case Study of ADI-PepsiCo Initiative, Kosi Kalan (Mathura, Uttar Pradesh)

1) ADI–PepsiCo partnership scope and history

PepsiCo and ADI have jointly pursued a Positive Water Balance journey through community-based SWRDM initiatives, with the objective of replenishing **more than 100%** (and at places **more than 200%,** as per **Government of India CGWB guidelines**) of the water used in manufacturing back into the same **block/district/micro-watershed.**

Year/Phase	Milestone
2004–05	Macro-level planning of **36 PepsiCo plants** (inside and outside plants)
2005	Positive water balance concept evolved with PepsiCo
2008–09	Resource mapping of **9 PepsiCo plants**
2009–10 onwards	Phase-wise micro-level planning and implementation outside manufacturing facilities
PAN India	Outside-the-plant initiatives facilitated for **11 PepsiCo plants**

Scale: ~70,000 people benefitted. Across all implemented SWRDM initiatives around PepsiCo plants, recharge potential of **> 6,000 million litres per annum** was created.

2) Background and baseline situation (Kosi Kalan, Mathura)

Scenario during initiation of study (pre-implementation):

- Study coverage: **119 villages** and **218 waterbodies** visited.
- Groundwater depletion: in **9 out of 11** selected villages (groundwater is the traditional irrigation source).
- Groundwater quality: major concern in **2 out of 11** villages.
- Wastewater disposal: major concern in **Chhata tehsil.**
- Secondary data baseline: average **TDS = 3,242 mg/L; TH = 670 mg/L.**
- Spatial quality note (secondary data): only locality around **Dangheta (SE part)** had water suitable for drinking and irrigation; **north-western, western, and south-western regions** were unsuitable for drinking due to higher TDS.

The project was developed under participatory water resource management to integrate water solutions with institutions and capacity building enhancing water availability, regenerating aquifers, and strengthening livelihoods (including women's groups).



3) Project objectives

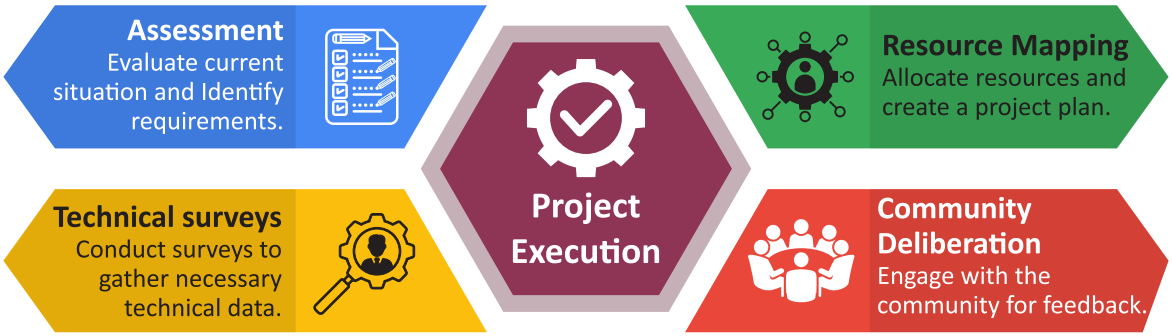
- Enhance livelihoods through agricultural intensification/extension via improved water availability while regenerating aquifers.
- Facilitate planning, implementation, and monitoring of SWRDM to replenish groundwater within villages/watershed of the PepsiCo manufacturing facility.
- Enable poor households to enhance livelihoods through better land and water use in a comprehensive watershed framework, and build local organisational structures for sustained adoption.
- Long-term sustainability strategy: form/strengthen User Groups and women SHGs for stewardship, asset maintenance, and value-added livelihood support (**twin planks: groundwater replenishment + SHG-led sustainability**).

4) Work approach and implementation process

Programme intent:

1. Enable groundwater recharge using geo-hydrological considerations at watershed level; 2) Boost local economy via agricultural intensification and allied income activities.

Process flow :



Assessment & planning → Resource mapping & need assessment → Technical surveys, designs & cost estimates → Community deliberation + Panchayat resolution → Implementation → O&M from Year 2 + capacity building → Evidence-based monitoring and course-correction

Core implementation elements:

- Detailed socio-economic, topographical, and hydro-geological assessment of the plant watershed.
- Identification/prioritization of interventions (creation/rejuvenation of structures, wastewater management, other structures as per topography and community needs).
- Technical roadmap: milestones, financial/technical/operational plan, costs, designs/drawings; recharge potential estimation as per Government of India guidelines.
- Community-first planning: deliberation with communities, PepsiCo HO and plant team; **Panchayat resolution for each village/Panchayat.**
- Implementation with active community involvement (**11 water conservation structures**).
- Regular maintenance from **2nd year onwards** (to maintain recharge potential and as per Government norms) with village community, User Groups and SHGs.

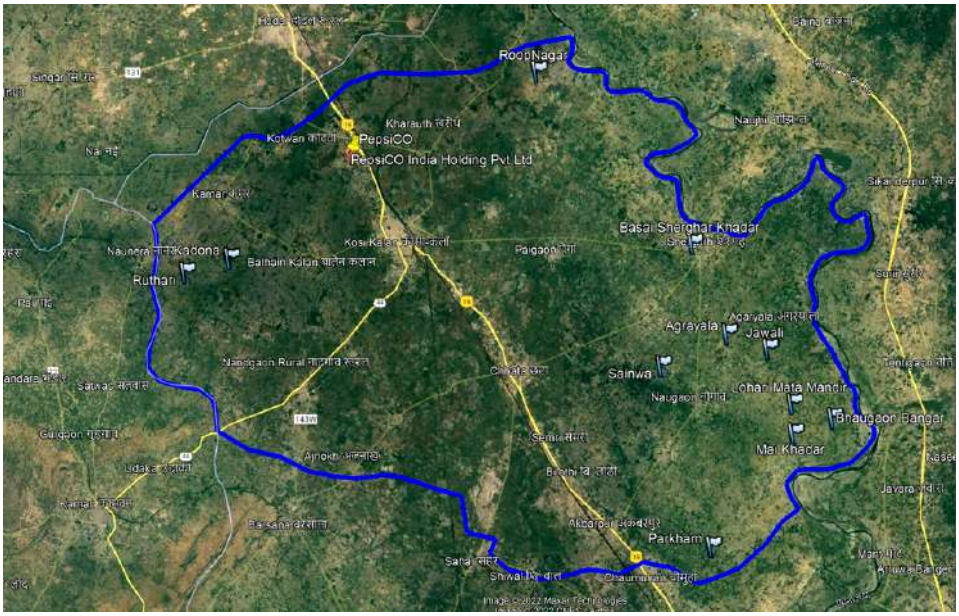
- Formation/strengthening of User Groups and SHGs; promotion of agronomic practices, water management practices, micro-irrigation where relevant.
- Capacity building for farmers, women, local resource persons, WUGs and Panchayat through trainings and exposure visits.

Guiding principles: "Active Participation" and **"Collective Action"**; ADI acts as a catalyst technical inputs + local capability building + convergence with government/training institutions/banks.

5) Study snapshot (project footprint)

Component	Details
Geography	Chhata tehsil, Mathura district, Uttar Pradesh
Coverage	11 villages
Water assets	11 WHSs: 10 rejuvenated, 1 newly created
Evidence system	32 groundwater observation wells + 12 rain gauges; water-quality testing across WHS & bore sources
Community institutions	11 WUGs (66 members)
Women's institutions	22 SHGs (220 members)
SHGs cumulative Savings, internal loan disbursement and Government schemes leveraged	₹3.37 lakh savings; ₹23,169 interest; ~₹16.5 lakh internal loans; ₹17.75 lakh schemes leveraged (total ₹21.12 lakh).
2025 livelihood activities (names)	Tailoring/stitching; beautician services; surf–soap–detergent making; dairy processing & value addition; candle making; embroidery; vermicompost production; kitchen gardening.
2025 engagement reach	1,385 participants across 35 events

Plant and Selected Villages in Chhata Tehsil for SWRDM Initiatives



6) Water stewardship approach and implementation

- 11 WHSs treated as core village assets for monsoon holding and recharge support.
- Evidence system established: rainfall via **12 rain gauges**; groundwater via **32 observation wells** (readings typically every two weeks); water quality testing for WHS (pond) and bore sources in **2024 and 2025** to guide safe-use messaging.
- Institutions: WUGs for oversight and maintenance orientation; SHGs for savings, internal lending, and livelihood activity creating the integrated structure: **infrastructure + evidence + institutions.**

7) Water outcomes (rainfall, groundwater response, recharge)

Rainfall context: Cluster-average annual rainfall increased from **~489.0 mm (2024)** to **~775.15 mm (2025)**, contributing to stronger post-monsoon recovery.

Indicator	2024	2025
Cluster-average annual rainfall	~489.0 mm	~775.15 mm
Mean groundwater depth (June → Sept)	17.84 m bgl → 16.39 m bgl (**~1.45 m** improvement)	16.74 m bgl → 12.13 m bgl (**~4.61 m** improvement)
Annual mean depth-to-water (trend)	2023: 18.78 m bgl; 2024: 16.71 m bgl	2025: 15.45 m bgl
Estimated recharge volume (VWBA)	**342.53 TCM**	**545.07 TCM**

Note: VWBA recharge estimates are sensitive to rainfall, catchment behaviour, and the coefficients used in the assessment.

Pictures depicting the Before, During and After Condition - Kadauna kosi kalan



Pictures depicting the Before, During and After Condition - Puthari, Kosikalan

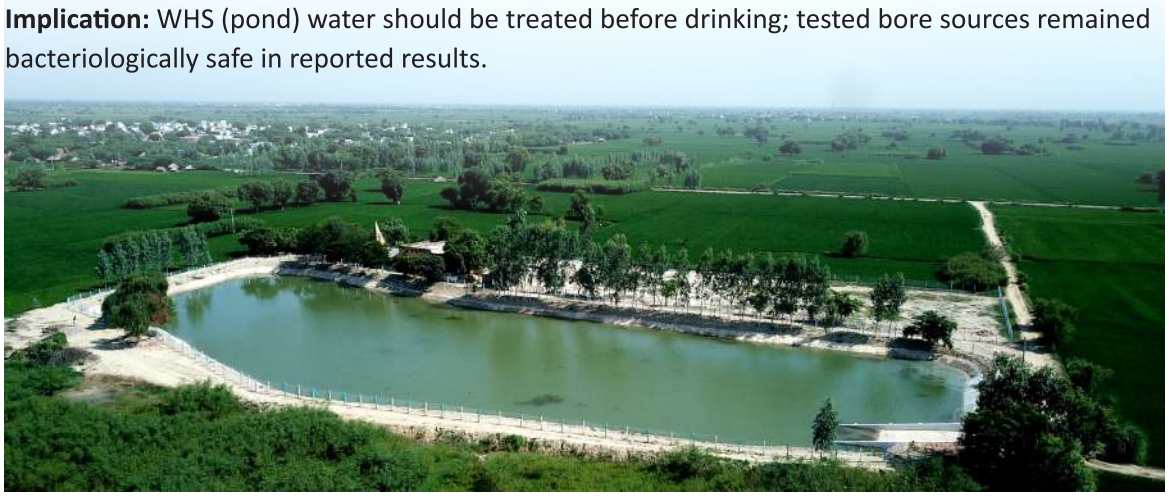


8) Water quality monitoring and safe-use implications

Sampling coverage: **2024 and 2025** across 11 villages; **22 sources/year** (WHS + bore) = **44 samples** across two years.

Parameter	Observed (2024–2025)
pH	6.89–8.40
EC	< 1 mmhos/cm
TDS	~120.8–890 mg/L
Total hardness	~110–579 mg/L
Microbiology	2024: 0 coliform & 0 E. coli; 2025: low detectable counts in some WHS samples, 0 in bore sources

Implication: WHS (pond) water should be treated before drinking; tested bore sources remained bacteriologically safe in reported results.



9) Community participation and stewardship institutions

- **11 WUGs (66 members)** support oversight and basic maintenance orientation for WHSs.
- **2025 engagement: ~35 events** reaching **~1,385 participants** (women, farmers, children/youth).
- Also emphasized: monitoring systems (rain gauges; groundwater readings every fortnight), local carriers of the program, post-project institutional capacity, and convergence with government for larger impact.



10) Women's SHGs and livelihoods

Across 11 villages: **22 SHGs (220 members)** formed progressively from **2022–2025.**

2025 SHG records (combined):

- Combined monthly savings: **~₹17,000**
- Cumulative savings: **~₹3.37 lakh**
- Interest earned: **~₹23,169**
- Internal loan disbursement: **~₹16.5 lakh**
- Government schemes leveraged: **~₹17.75 lakh**

Livelihood domains (11): stitching/tailoring, beauty services, detergent/soap/surf preparation, embroidery, dairy, food processing, kitchen gardening, and other SHG-led micro-enterprises.

This livelihood platform strengthens household stability and supports continued participation in water stewardship during stress periods.






प्रदर्शनी


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OMEN BEAUTY PARLO
तहसील:
Tehsil:-

11) Community Voices



Devki Nandan, Senwa Village:

"Our village earlier had a lot of difficulty in getting water for irrigation and drinking. After the pond was constructed in 2023 under the ADI–PepsiCo program, within one year we have seen an improvement in water availability in the village and surrounding area and better crop yields, and the quality of drinking water is also slowly improving. This work is commendable and should be expanded to other villages facing similar problems."



Rajesh, Mai Village (SHG member):

"My name is Rajesh and I live in Gram Panchayat Mai, District Mathura. Earlier, the quality of drinking water in our area was very poor. In 2023, ADI and PepsiCo constructed a pond here, which has helped improve water quality. Along with this, ADI and PepsiCo have worked on women's capacity-building by forming Self-Help Groups and giving us different types of trainings. Through our SHG we received training for running a stitching centre and also got the complete setup and materials. Earlier, after finishing household work I would sit at home without any income, but now each woman in our SHG is earning about ₹2,000, and many women in the village have got employment."

