# Impact Assessment Report

## Clean Village Program under Samuday Hardoi

FY 2020 to 2024

protiviti®

## Contents

## 1. Introduction

Rural development in India has increasingly focused on cleanliness, sanitation, and water security as critical pillars of community well-being. In 2019, HCL Foundation launched the Clean Village Project in Hardoi district, Uttar Pradesh, under its flagship Samuday CSR program. The initiative was in alignment with the Swachh Bharat Mission-Gramin Phase-II which emphasizes sustaining Open Defecation Free, status and establishing solid and liquid waste management systems and the Jal Jeevan Mission (JJM) which aims to provide safe tap water to all rural households. By focusing on comprehensive WASH (Water, Sanitation and Hygiene) improvements, the Clean Village program sought to create model visibly clean & green villages that could inspire replication across the region.


The program was implemented in selected Gram Panchayats (GPs) of Hardoi. Phase 1 (2019–2021) targeted 64 GPs in three blocks Kachhauna, Kothawan, and Behendar in partnership with local NGOs. Phase 2 (2022–2024) expanded to 70 GPs across all 11 blocks of Hardoi where HCL Samuday operates. In total, the project covered over 140 GPs in Hardoi by 2024, reaching hundreds of villages and an estimated population of ~200,000.

| | |
|---|---|
| **Program name** | **Clean Village - SAMUDAY** |
| **Unit of intervention** | Residents of Grampanchayat |
| **Program objective** | To enhance rural waste managament through integrated capacity-building and resource support such as infrastructure development and maintaince. Provide safe drinking water to every households via OHT. |
| **Program location** | Hardoi, Uttarpradesh |
| **SDG alignment** |   |

The Clean Village program encompassed three thematic components:

- **Solid Waste Management (SWM):** Establishing systems for household waste segregation, door-to-door collection, composting of biodegradable waste, recycling of plastic and other recyclables, and elimination of open dumping points. Community beautification (cleanliness drives, tree plantation, mural painting) was included to enhance visual cleanliness. School sanitation and menstrual waste management were also addressed under SWM in institutions.

- **Pond Rejuvenation & Liquid Waste Management**: Cleaning and rehabilitating village ponds and drainage channels to manage grey water, thereby preventing waterlogging and improving the local environment. Simple wastewater treatment units (such as soak pits or sedimentation chambers) were introduced to treat kitchen and bath water before discharging into ponds. These efforts aimed to recharge groundwater and restore aquatic ecosystems in the villages.

- **Water Supply (Overhead Tank Systems):** Supporting the installation of overhead storage tanks and piped distribution networks to provide reliable drinking water access to households. The program worked alongside the Jal Jeevan Mission by mobilizing community contributions and bridging gaps in last-mile infrastructure. Operationalizing village water supply schemes, including formation of Village Water & Sanitation Committees (VWSCs) for oversight.

By integrating these components, the program tackled rural sanitation holistically, from toilets (sustaining ODF status) to waste (solid and liquid) to safe water supply, thus contributing to multiple Sustainable Development Goals (SDGs), chiefly SDG 6 (Clean Water and Sanitation) and SDG 11 (Sustainable Communities).

### 1.1 Background of the project

Hardoi is a predominantly agrarian district in central Uttar Pradesh, comprising numerous small villages with modest physical and service infrastructure. When HCL Samuday initiated its development interventions in 2015, rural Hardoi faced significant sanitation and hygiene challenges. Sanitation coverage was low, open defecation was widely practiced, waste management systems were absent, and drinking water access largely depended on hand pumps.

By 2019, under the Swachh Bharat Mission–Gramin (SBM-G), most households had constructed toilets, and the district was declared Open Defecation Free (ODF). However, field observations revealed that the achievement of ODF status did not automatically translate into sustained sanitation outcomes. Issues such as inconsistent toilet usage, lack of solid and liquid waste management, plastic littering, and wastewater stagnation emerged as critical second-generation sanitation challenges.

Villages lacked formal systems for waste collection and disposal. Household garbage was commonly dumped on streets, road edges, vacant plots, or village ponds. Wastewater from

kitchens and bathing areas flowed into open lanes or low-lying areas, leading to stagnant pools and unhygienic surroundings. These conditions increased the prevalence of water-borne and vector-borne diseases, undermining public health gains achieved through toilet construction. There was a clear need for an integrated, village-level approach that could institutionalize clean habits, build local systems, and sustain sanitation outcomes beyond ODF status.

HCL Foundation, through Project Samuday, has been working in Hardoi since 2015 across six developments: Education, Water, Sanitation and Hygiene (WASH), Livelihoods, Agriculture, and Infrastructure. The Clean Village Initiative was conceptualized under the WASH vertical as a pilot intervention to develop scalable and sustainable models of rural sanitation.

During Phase 1 (2019–2021), HCL Foundation partnered with local NGOs to implement the Clean Village model in selected Gram Panchayats (GPs). NGOs such as ADARSH, Samvedna Development Society (SDS), and SANKALP undertook baseline assessments, community mobilization, and establishment of basic solid waste management (SWM) and liquid waste management (LWM) infrastructure across different blocks. Following the successful completion of Phase 1, Phase 2 (2022–2024) focused on scaling the model across all 11 blocks of Hardoi using HCL Foundation's in-house implementation team. This phase placed strong emphasis on strengthening village-level institutions, ensuring convergence with government schemes, and embedding sustainability mechanisms.

The overarching vision of the initiative was to create visibly clean, healthy, and self-reliant villages by transitioning from a toilet-centric approach to a comprehensive rural cleanliness and environmental management framework.

The Clean Village Initiative was designed with the following objectives:

a) **Strengthen Cleanliness and Water Infrastructure**: To enhance village-level sanitation and water security by creating and upgrading essential infrastructure such as solid and liquid waste management systems (waste bins, collection carts, compost pits, soak pits), safe water storage facilities, and household tap connections, in alignment with Swachh Bharat Mission (SBM-G) and Jal Jeevan Mission (JJM) guidelines.

b) **Enable Sustained Hygiene and Sanitation Behaviour Change:** To promote safe sanitation and hygiene practices, including regular toilet use, handwashing with soap, waste segregation, and responsible waste disposal—through targeted Information, Education and Communication (IEC) activities and Behaviour Change Communication (BCC) events that are locally relevant and inclusive.

c) **Foster Community Ownership and Local Capacity**: To institutionalise community ownership by activating and strengthening village-level institutions such as Village Water and Sanitation Committees (VWSCs), Swachhta Samitis, and Panchayati Raj Institutions (PRIs). To build the capacities of safai karamcharis, schoolteachers, frontline

volunteers, and community leaders to operate, maintain, and monitor cleanliness and water systems sustainably.

d) **Enhance Environmental Quality and Resource Circularity**: To eliminate illegal dumping sites and garbage vulnerable points (GVPs), restore village environments, and reduce pollution by promoting organic waste, recycling plastics through plastic banks or scrap collectors, and discouraging open waste burning. To support ecological restoration through pond rejuvenation and increased green cover via tree plantations, contributing to improved local climate resilience.

### 1.2 Key Activities

Based on the programme context and objectives, the Clean Village Initiative implemented a set of integrated activities across four thematic areas:

**Setting up Solid Waste Management (SWM) System**

The programme focused on creating Clean and Green Villages by achieving visible cleanliness through the removal of garbage dumps, elimination of garbage vulnerable points (GVPs), and regular cleaning of public spaces.

To institutionalise cleanliness, sustainable, community-owned SWM systems were established, including door-to-door waste collection, household-level waste segregation, composting of organic waste, and safe disposal or recycling of non-biodegradable waste. Strong emphasis was placed on community participation and behaviour change so that, post-project, Gram Panchayats can independently operate and manage the SWM systems.

**Rejuvenation of Ponds and Construction / Maintenance of Drains**

To address liquid waste and wastewater management, the programme supported the construction and improvement of village drainage systems to prevent waterlogging and contamination of soil and water bodies.

Existing ponds and tanks were rejuvenated and repurposed as decentralised wastewater treatment and recharge systems, while also being restored as valuable community assets. Awareness activities were conducted to build understanding of greywater management, its health implications, and its role in protecting local water resources.

**Maintenance and Use of Overhead Tank**

The programme supported access to safe and adequate drinking water by facilitating household tap connections for all families in the target Gram Panchayats, in alignment with Jal Jeevan Mission (JJM) coverage goals.

Community-managed water supply schemes were demonstrated; wherein overhead tanks and pipeline networks were operated with local governance and partial community contributions. These efforts aimed to improve health outcomes by reducing reliance on

contaminated groundwater, commonly affected by fluoride and nitrate in Hardoi and to significantly reduce the burden on women and girls of fetching water from distant sources.

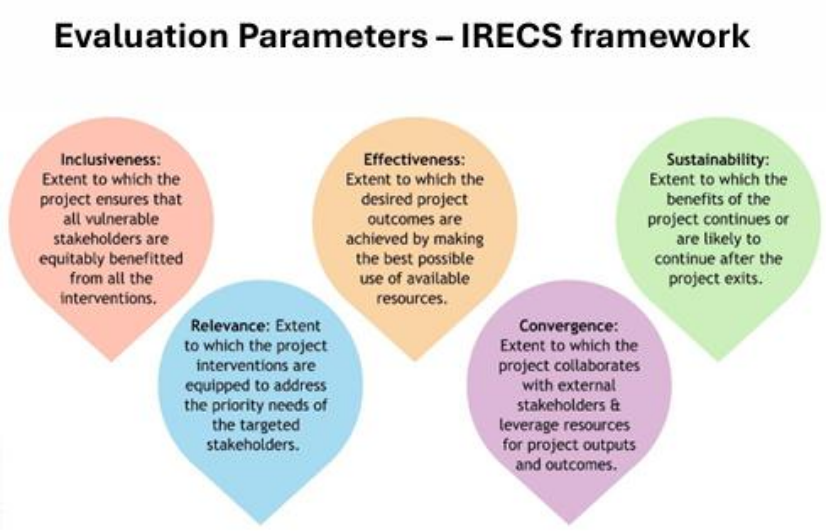
**Capacity Building of the Stakeholders**

Capacity-building initiatives were undertaken for key stakeholders, including Safai Karamcharis, Panchayat members, women's Self-Help Groups (SHGs), schoolteachers, and students, to strengthen local leadership and ownership of WASH systems.

Trainings and engagement activities focused on creating long-term behaviour change, such as consistent toilet use, household-level waste segregation, timely payment of user fees for services, and volunteerism for village cleanliness. These stakeholders were nurtured as local change agents to ensure the sustainability of outcomes beyond the project period.

## 2. Approach and Methodology

**Evaluation framework:** Protiviti uses the IRECS framework for evaluation. The proposed evaluation framework has 5 broad dimensions, as presented below.




**Approach:** Protiviti used a mix of qualitative and quantitative approaches to analyse the impact of the program on the target population.

The program's impact was assessed and justified using a combination of two approaches:

- Intervention control comparison between groups with and without the program to isolate project effects while accounting for external influences.
- Reviewing annual progress reports and Management Information System data from the evaluation period to assess program performance.

Protiviti has analysed quantitative information using descriptive and inferential statistical methods. The quantitative information was triangulated using the program level MIS and qualitative information collected using FDGs and In-depth Interviews of key stakeholders.

The findings from the quantitative and qualitative study were then grouped into the dimensions mentioned in the evaluation framework, i.e., inclusiveness, relevance, effectiveness, convergence, sustainability.

**Knowledge-Attitude-Practice (KAP) Survey**

A detailed KAP survey was administered to assess outcomes and behavior change. A structured questionnaire using Kobo Toolbox was deployed, covering 287 randomly selected respondents across selected intervention and control villages.

**Respondent Profile:**

| Intervention/Control | Village | Social Category | Male (No.) | Female (No.) | Total |
|---|---|---|---|---|---|
| Intervention | Akbarpur | General | 1 | 1 | 2 |
| | | OBC | 19 | 6 | 25 |
| | | SC | 3 | 1 | 4 |
| | Hathoda | General | 3 | 3 | 6 |
| | | OBC | 28 | 13 | 41 |
| | | SC | 4 | 0 | 4 |
| | Hemant Kheda | OBC | 9 | 3 | 12 |
| | Katiyamau | General | 5 | 0 | 5 |
| | | OBC | 17 | 6 | 23 |
| | | SC | 8 | 7 | 15 |
| | Purwa | General | 13 | 1 | 14 |
| | | OBC | 15 | 2 | 17 |
| | | SC | 21 | 8 | 29 |
| **Intervention total** | | | **146** | **51** | **197** |
| Control | Gauri Khalsa | General | 7 | 7 | 14 |
| | | OBC | 7 | 4 | 11 |
| | | SC | 2 | 3 | 5 |
| | Makdoompur | General | 14 | 5 | 19 |
| | | OBC | 4 | 2 | 6 |
| | | SC | 1 | 4 | 5 |
| | Padri | General | 5 | 3 | 8 |
| | | OBC | 14 | 2 | 16 |
| | | SC | 2 | 4 | 6 |
| **Control Total** | | | **56** | **34** | **90** |

| Grand Total | 202 | 85 | 287 |
|---|---|---|---|

The survey covered practice, attitude, and knowledge questions on solid waste management (SWM), sanitation, and water. Key indicators included toilet ownership and usage; household water connections and supply duration; exposure to training/IEC; knowledge of waste segregation and recycling; attitudes toward cleanliness; and self-reported practices such as waste segregation, paying user fees, and participation in cleanliness drives.

Protiviti also administered the following tools during the assessment.

*Table: Data collection tools*

| Stakeholder | Tool employed |
|---|---|
| Community Leaders | Key informant interview |
| Community Members | FGDs |
| Ponds & Overhead Tanks | Observation Checklist |

## 3. Findings

### 3.1 Solid Waste Management (SWM)

#### Impact 1: Improved Knowledge & Awareness

**Key Activities:**

- Conducted extensive IEC/BCC campaigns in each village, door-to-door awareness drives, street plays (nukkad nataks), wall paintings with cleanliness messages, and nightly community meetings (chaupals) focused on sanitation and waste management.
- Organized regular training and awareness sessions on solid waste management (SWM) and recycling for villagers. Many community members attended multiple sessions delivered by the project team (HCL Samuday), improving their understanding of waste segregation and environmental hygiene.

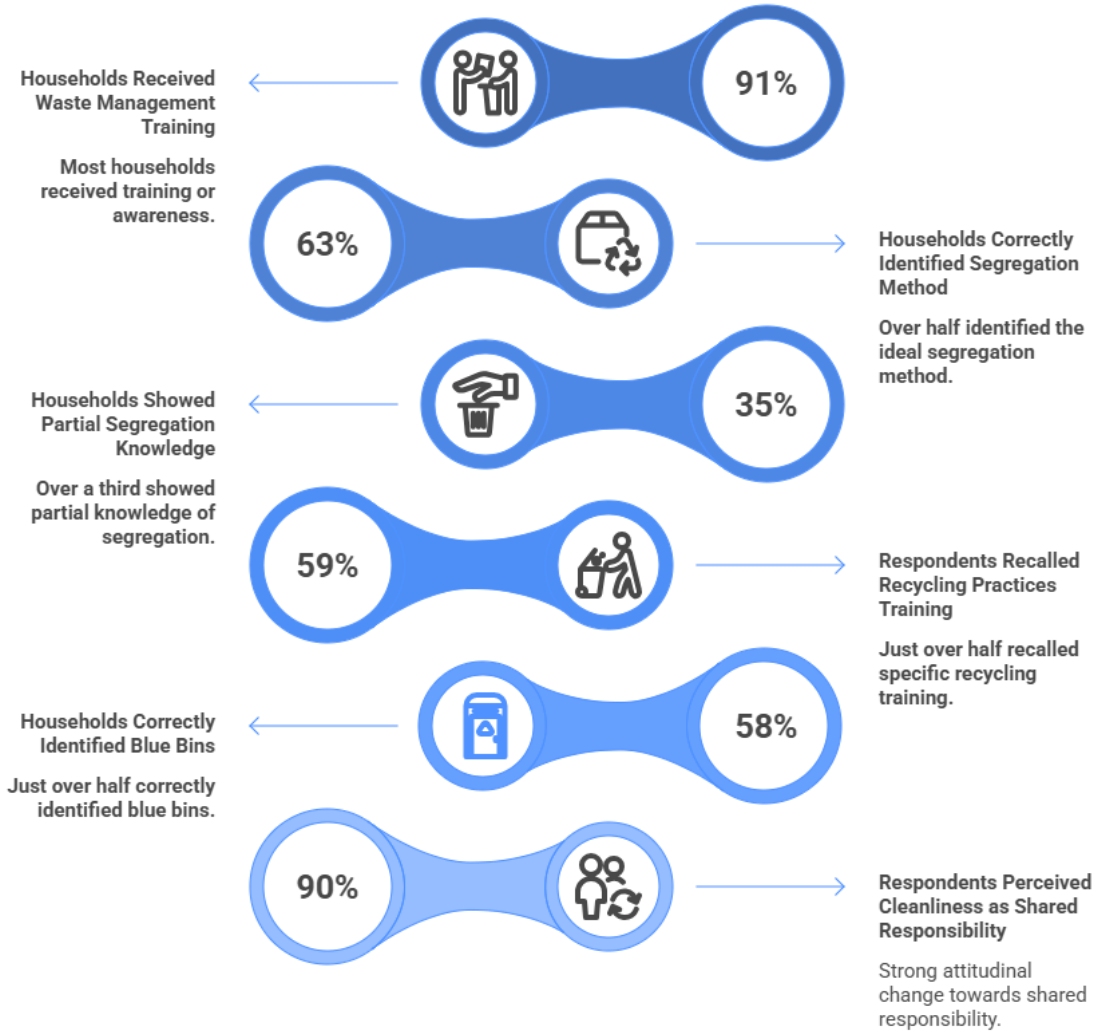

*Image 1: Example of the Posters used to spread awareness on Waste Management*

- Held practical demonstrations (e.g., composting workshops in every village) to educate households on managing organic waste. These hands-on sessions showed

families how to compost kitchen scraps and farm residue, building knowledge on converting waste to useful compost.

- Involved local institutions in awareness efforts, for instance, school campaigns and special events like the “Swachhta Hi Sewa” plastic drive on Gandhi Jayanti, which mobilized communities and reinforced messages about reducing single-use plastic and keeping the environment clean.

**Visible Impact:**




- **High community awareness:** Nearly all households were reached by the project’s awareness efforts, **91% (N=197)** of intervention families reported receiving training or awareness sessions on waste management from the project. Villagers are now familiar with concepts that were previously new, such as separating waste into categories and

the importance of recycling. At the control locations, **92% of households (N = 90)** reported that they had **not received any training or awareness sessions** from any organization or public authority.

- **Improved knowledge of waste segregation:** Most residents now understand how to sort their waste correctly. For example, **58% (N=197)** of respondents know that the blue-colored bin is for dry waste (recyclables), reflecting grasp of the color-coding system. When tested on the proper method of household segregation, **63% (N=197)** could correctly identify that waste should be separated into wet, dry, and hazardous categories (with another 35% giving a partially correct "wet & dry" answer). This is a remarkable leap from the beginning, where almost no one was aware of these practices. At the control locations, **68% of households (N = 90)** reported **having no knowledge of waste segregation**.

- **Specific knowledge gains in recycling:** Due to targeted awareness campaigns, residents are much more informed about recycling than before. **59% (N=197)** of households said they received training in recycling (e.g. how to repurpose or safely dispose of plastics) from the project team. Community members now routinely talk about and participate in recycling efforts, a clear sign that awareness has translated into understanding and interest in better waste management. At the control locations, **none of the households reported attending any training on waste recycling**.

### Impact 2: Improved Behavior and Practices

**Key Activities:**

- The program sets up a regular garbage collection system in every target Gram Panchayat (GP). This included providing households with dustbins (often color-coded) for separating wet and dry waste and appointing or reorganizing Safai Karamcharis (sanitation workers) to visit homes and collect waste on a routine schedule at least 2–3 times a week per household. By creating an accessible disposal service, the project made it convenient for villagers to change their waste-handling behavior.

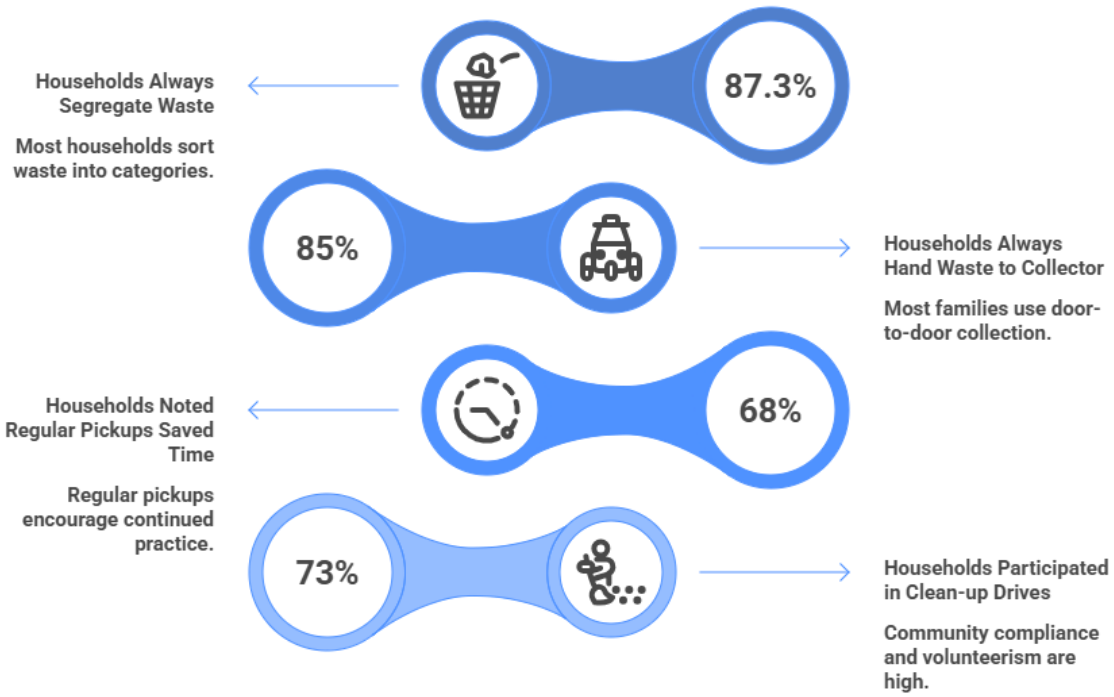
- Along with distribution of bins, the project continually encouraged families to segregate waste at source. Training sessions and daily interactions by the waste collectors reinforced the habit of sorting trash into different categories (wet, dry, hazardous). The provision of separate bins and the visible system of collectors taking sorted waste helped ingrain this new practice in daily life.

- The program strongly pushed for composting of organic waste as a household habit. It constructed community compost pits for collected biodegradable waste and conducted village-level demonstrations so that many households started their own compost pits in backyards. This not only gave families a method of handling kitchen waste responsibly but also motivated them by showing the useful output (compost) for farming or gardening.

- To foster active participation, the project facilitated mass clean-up drives and events. All villages undertook one-time mass garbage clean-ups where residents and volunteers cleared roadside dumps and litter, eliminating dozens of longstanding dump sites. The initiative also set up “Plastic Banks” and held periodic plastic collection drives. Such activities not only removed waste but also normalized the practice of community-led cleanliness and recycling.

- The program helped form and activate local bodies like Swachhta Samitis village cleanliness committees, Self-Motivated Groups (SMGs), and youth clubs. These groups took ownership of maintaining sanitation norms, spreading messages, monitoring littering, and organizing volunteer efforts. By involving villagers directly in rule-setting and clean-up efforts, the project reinforced consistent behaviors (like using the waste service, not littering, and keeping public areas clean) as part of the community culture. It also introduced the concept of a user fee for waste collection services to encourage a sense of responsibility (though this is still being integrated, as noted below).

**Visible Impact:**




- **Adoption of waste segregation practice at home:** Most households have adopted the practice of sorting their waste. Currently, **87.3% (N=197)** of surveyed households “always” segregate their garbage into different categories (typically separating wet, dry, and hazardous waste) before disposal, and another ~11% do so “sometimes.” This is a dramatic change from before the project, when source segregation was virtually nonexistent in these villages. Now, nearly **99%** (**N=197)** of families attempt to sort their

waste at least, indicating a fundamental shift in daily behavior toward proper waste management. At the control locations, **nearly 54% of households (N = 90)** reported that they **do not segregate waste prior to disposal**.

- **Routine use of waste collection services:** Most families are consistently using the new door-to-door collection system instead of dumping or burning their trash. Around **85%** of households **(N=197)** reported that they always hand over their waste to the garbage collector during the collection rounds, and an additional ~12% do so whenever the service is available, storing waste temporarily if a pickup is missed. This reliable participation means far less garbage ending up in streets or yards, a clear behavioral improvement was disposing of trash through the correct channel has become the norm. Importantly, **68%** of households **(N=197)** noted that having their waste picked up regularly saved them time and effort in managing garbage, which likely helps encourage them to stick with this new practice. At the control locations, **72% of households (N = 90)** responded **"Not sure" or "Never"** when asked whether they hand over waste to collectors daily.

*Images 2 & 3: Cart (left) & Three-wheeler vehicle (right) with separate 2 -stream waste storage used for effective waste collection of segregated waste*

- **Adoption of composting and recycling habits:** A significant number of families have embraced composting and recycling as new habits. For instance, in just two GPs (Purwa and Akbarpur), **147 households** began composting their organic waste at home due to the project's demonstrations. Across the intervention area, roughly **712,300 kg** of biodegradable waste has been processed into about **240,278 kg** of compost through household and community level efforts, waste that would otherwise have been dumped or burned is now converted into useful fertilizer. On the recycling front, villagers actively participate in plastic waste collection; the fact that over a ton of single-use plastic was voluntarily collected by communities in one day for recycling shows a strong uptake of recycling behavior. At the control locations, **only 24% of households (N = 90)** reported **practicing composting at home**.

*Images 4 & 5: Collection of non- biodegradable waste for Recycling (left) & Compost Pit for the biodegradable waste (right)*

- **Community compliance and volunteerism:** The presence of local cleanliness committees and volunteer groups has translated into high compliance with sanitation rules and communal effort to keep villages clean. About **73%** of households **(N=197)** said that they or a family member has participated in community clean-up drives or at least actively follow the Panchayat's guidelines on waste disposal and village cleanliness. This indicates that a culture of cooperation and peer accountability has formed many villagers now willingly contribute their time and labor to collective sanitation activities, something rarely seen before. The community-driven approach (via Swachhta Samitis, SMGs, youth clubs) is fostering a sense of pride and shared duty in maintaining clean surroundings, reinforcing individual behavior changes through group action. At the control locations, **50% of respondents (N = 90)** reported that they **participate in some cleanliness drives**.

### Impact 3: Improved Environmental Sanitation

**Key Activities:**

- Each target village (GP) was equipped with the basic infrastructure needed for solid waste management. This included distributing household garbage bins to promote at-source segregation, supplying collection tools and equipment like handcarts or tricycles, gloves, etc. for sanitation workers, and constructing common compost pits or vermicomposting units to process organic waste locally. These infrastructural setups created a foundation for maintaining cleaner surroundings by ensuring waste had designated places to go.

- A structured door-to-door waste collection service was rolled out, as mentioned, with dedicated sanitation workers collecting garbage several times a week.

Collected waste was then managed properly, organic waste went to compost pits, recyclables were stored for recycling pickup, and minimal residual waste was disposed of safely. By institutionalizing regular waste removal from homes and streets, the project effectively prevented garbage from accumulating in the environment.

- Garbage Vulnerable Points (GVPs), essentially open dump sites at street corners, public spaces, or outskirts where trash had piled up over years. The program organized one-time mass clean-up campaigns in every GP to clear these dumps completely. Community members, local youth, and sanitation workers all participated in physically removing the garbage. After clearing, those sites were rehabilitated, many were leveled and then planted with grass or trees or even turned into small parks or open spaces with painted walls carrying cleanliness slogans, to discourage people from dumping there again.

- Beyond the initial drives, the Swachhta Samitis and volunteer groups established under the project took on the role of regular monitoring of cleanliness in the community. They help organize follow-up cleanliness drives, spread the message to refrain from littering or dumping, and enforce rules (like fines or warnings for dumping, in some cases). This community-led monitoring, combined with ongoing IEC efforts (e.g., reminder wall paintings and messages), helped sustain the improved sanitary conditions achieved by the project's interventions.

**Visible Impact:**

- **Improved cleanliness of the villages:** The most striking change has been the transformation of the village environment from dirty to clean. Where there were once piles of garbage and litter along roads and in common areas, there are now clean streets and public spaces. All the open garbage dumps have been eliminated in the project GPs, approximately **270** dump sites were identified and removed. Many Residents commented that heaps of trash that existed for years have vanished, improving the look and hygiene of the villages.

- **No more routine littering or dumping:** With the new systems in place, indiscriminate dumping of waste has largely stopped. Because most households now give their waste to a collector, garbage is no longer ending up tossed in the open. The regular collection servicing **~70–80%** of households **(N=197)** multiple times per week, means that even those who might have dumped waste earlier have an easy alternative. Importantly, the common practice of burning trash (especially dry waste) has been curtailed, as villagers now have options to compost or hand over waste; this has likely improved the air quality and reduced respiratory irritants from smoke. At the control locations, **50% of households (N = 90)** reported that **waste collection takes place daily**.

- **Improved public health and hygiene conditions:** The cleaning up of waste and the end of open dumping are contributing to a healthier environment. Stagnant garbage piles can harbor flies, mosquitoes, and rodents, and contaminate soil and water, their removal

has reduced these health risks. Villagers enjoy better sanitation with far fewer foul odors and disease vectors in their neighborhoods. Although a detailed health impact study was not conducted, it's reasonable to expect fewer instances of illness related to poor sanitation like diarrheal diseases, which are often linked to dirty surroundings now that the environment is cleaner.

- **Sustainable local environment:** The project's emphasis on composting and tree planting has had ecological benefits. By converting organic waste into over 240 tons of compost, the community created a natural fertilizer that was returned to fields and kitchen gardens, improving soil health and crop yields in a small but meaningful way.

### 3.2 Liquid Waste Management & Pond Rejuvenation

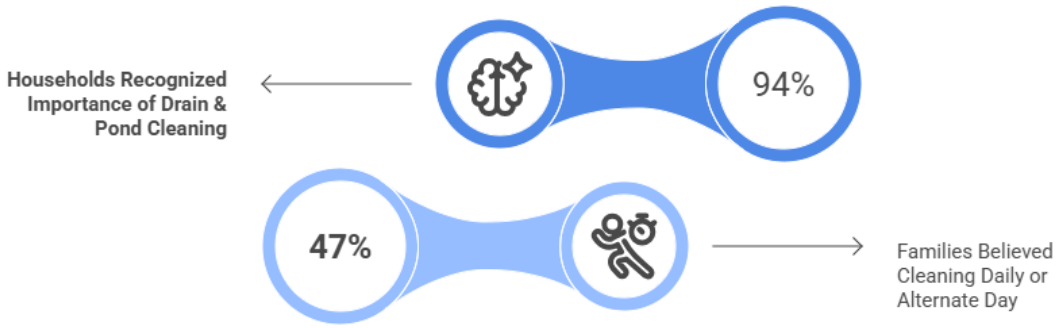
#### Impact 1: Improved Infrastructure for Liquid Waste Management

**Key Activities:**

- Infrastructure set up and rejuvenating the ponds as part of a liquid waste management system. Small-bore or concrete drains were constructed along several lanes with high wastewater flow to channel greywater away from homes. A common model used was a three-chamber soak pit system:
    - **Sedimentation Chamber:** Incoming kitchen and bath water first enters a pit where solids and sediments settle at the bottom.
    - **Filtration Chamber:** The partially clarified water then overflows into a second pit filled with gravel and sand, which filters out soap scum, grease, and remaining particles.
    - **Dispersion/Recharge Chamber:** Finally, the cleaned water either percolates into the soil or is safely released into the village pond.

  By introducing this tiered filtration system, the project ensured that most food particles, soap residues, and other contaminants were removed before greywater reached the ponds. This significantly reduced the direct pollution load entering the ponds.

**Visible Impact:**




- **Improved Knowledge & Awareness:** According to the KAP survey, about 94% of households recognized the importance of regular drain cleaning. Roughly **47% (N=197)** of surveyed families felt that drains should be cleaned at least once a week, while another **47% (N=197)** believed cleaning daily or every alternate day is necessary. This shows a high level of awareness about maintaining drainage to prevent clogs and overflow. Such attitude extends to keeping drains and ponds clean as well, indicating a strong sense of collective responsibility for shared spaces. In practical terms, villagers have developed pride in their cleaner environment. For example, the Gram Pradhan (village head) of one GP noted that after the pond was rejuvenated, community members themselves stopped outsiders and neighbors from throwing garbage into or near the pond. In the control group, **50% of respondents (N = 90)** believed that **drains need to be cleaned only once a week or once a month**.

Image 6: Drain cleaning activity

- **Improved Health:** The liquid waste management interventions have visibly transformed the village environment. Lanes and streets that were once perpetually muddy with wastewater are now dry and clean, as the greywater is captured by drains instead of stagnating in the open. There are far fewer stagnant water puddles, which has likely led to a notable reduction in mosquito breeding. Residents indeed reported a drop in the swarms of mosquitoes after the project, attributing this to the elimination of stagnant

greywater around homes. In turn, this likely lowered the incidence of mosquito-borne illnesses like malaria and dengue and helped reduce water-borne diseases such as diarrhea that can spread when dirty water contaminates surfaces. While no formal health survey was conducted as part of the project, community feedback strongly suggests fewer illness cases compared to earlier, aligning with the cleaner conditions.

### Impact 2: Improved Water Conservation and Resource Recharge

**Key Activity:**

- Pond Rejuvenation work included de-silting and deepening the ponds by excavating years of accumulated silt, thus increasing their water storage capacity. Workers and community members removed trash and weeds from the pond beds, restoring a cleaner aquatic environment. To prevent future contamination and enhance usability, many ponds were fenced and equipped with *ghats* (steps) to allow people and cattle to access water without eroding the banks or wading directly into the mud. Tree plantation around the pond peripheries was also done to stabilize the soil, prevent erosion, and improve the aesthetics of the area.

**Visible Impact:**

In Hardoi, **12 ponds across various GPs were rejuvenated** and transformed into cleaner, functional water bodies.

The table below lists some of the notable ponds revived under the project:

| Sr. No. | Pond Name (Village) | Gram Panchayat | Block |
|---|---|---|---|
| 1. | Tal (Lundariya) – Kureri | Kansuwa | Kothawan |
| 2. | Lebara – Gesinghpur | Uttarghaiya | Kachhauna |
| 3. | Dakhniya Tailya – Basantpur | Deen Nagar | Kachhauna |
| 4. | Semari Pond – Hewali | Hewali | Bahendar |
| 5. | Kumar Gadha – Nirmalpur | Nirmalpur | Kachhauna |
| 6. | Gadiyan Taliya – Hemantkheda | Hathoda | Kachhauna |
| 7. | Katiyamau Pond – Katiyamau | Katiyamau | Kachhauna |
| 8. | Barauli Pond – Barauli | Barauli | Kachhauna |
| 9. | Suthena Pond – Suthena | Suthena | Kachhauna |
| 10. | Akbarpur Pond (Near School) | Akbarpur | Bahendar |
| 11. | Purwa Pond – Purwa | Purwa | Kachhauna |
| 12. | Gogawajot Pond – Gogawajot | Gogawajot | Bahendar |

To sustain the improvements in drainage and pond cleanliness, the project actively engaged the community and local governance institutions in maintenance. Existing village committees, such as *Village Nigrani Samitis* (village monitoring committees), were

encouraged and guided to include drain and pond upkeep in their regular agenda. The project facilitated community-led shramdaan (voluntary labor) drives where villagers would periodically come together to clear trash from drains and remove debris or weeds from ponds.

*Image 7: Before & After Image of the Pond Kumar Gadha in Nirmalpur GP*

An Important impact of the pond rejuvenation efforts has been improved water conservation and groundwater recharge. By de-silting the ponds and increasing their depth and capacity, the project enabled these ponds to capture and hold more rainwater and treated greywater. Instead of wastewater being lost to evaporation in street puddles, it is now filtered and added to the ponds. Community members observed that after the monsoons following the intervention, the water levels in wells and handpumps were higher than in previous years. This indicates that more rain and wastewater is percolating into the ground, recharging the aquifers. The rejuvenated ponds act as infiltration basins, allowing water to seep slowly into the soil. As a result, villages now experience more reliable water supply during the crucial summer months. These conservation benefits complement state government initiatives like Uttar Pradesh's *"Mission Jal Thal,"* which encourages water body restoration

### 3.3 Water Supply

#### Impact 1: Improved Knowledge & Awareness

**Key Activities:**

- Conducted community education and training for village water committees (VWSCs) and local leaders on safe drinking water management, system maintenance, and water quality (e.g. recognizing and addressing issues like fluoride contamination). This built local knowledge and ownership of the new OHT water systems.
- Coordinated awareness campaigns (community meetings, IEC materials, World Water Day events) to highlight the health benefits of using safe piped water and practicing hygiene. Gram Panchayat members were engaged and oriented on the importance of WASH, fostering their support and leadership in the project.

**Visible Impact:**

- **Greater awareness of safe water & health:** Communities now recognize the link between clean water and health. For example, a VWSC leader in Purwa noted that ensuring access to safe water minimizes health hazards and helps reduce the ill effects of COVID-19. Such testimonies show a shift in mindset towards valuing safe drinking water.
- **Community ownership and confidence:** Villagers have developed a sense of ownership for the water supply. Most households are satisfied with the OHT service (over 76% reported being satisfied) and confident it will sustain about 58% "definitely" expect the benefits to continue for 2–3 years. This positive attitude shift, including willingness to pay user contributions for maintenance, reflects greater awareness of the system's value and alignment with the SDG 6.1 goal of sustained safe water access.

#### Impact 2: Improved Behavior and Practices

**Key Activities:**

- Mobilized households to connect to the new piped water network. The project rehabilitated and built OHTs, then facilitated household pipe connections in collaboration with the community. Local campaigns and door-to-door outreach convinced families to switch from traditional water sources to tapes at home.
- Established community-led operations and maintenance practices. Village Water & Sanitation Committees were formed/trained to manage daily water supply (e.g. opening valves on schedule) and collect a nominal user fee from each household for repairs and electricity, instilling the habit of regular payment and system upkeep. Gram Panchayats coordinated in these efforts, reinforcing the practice of shared responsibility.

**Visible Impact:**

- **Adoption of piped water use:** There has been a dramatic behavioral shift from almost no one using piped water to a majority now using it daily. Household tap coverage rose from nearly 0% before to about **73% of homes (N=197) now have a drinking water connection.** At the control locations, **95% of households (N = 90)** reported that they do not have a household drinking water connection.

- **Regular water consumption & hygiene practices:** With reliable in-home water, families have improved their hygiene behaviors. Water is available daily (many villages supply water **3** times a day via the OHT), so people can wash hands, bathe, and clean homes more frequently. Notably, during the COVID-19 lockdown, continuous water enabled villagers to maintain sanitation and hand-washing, aiding the pandemic response.

- **Time savings, especially for women:** Most households about **58% (N=197)** reported that the overhead tank has reduced the time they spend fetching or managing water. Instead of walking to distant wells or hand-pumps, women and girls now have water on tap, saving on average 10 to 40 minutes per day for 62% of those who saw time benefits. This saved time is being redirected to livelihoods, childcare, and other productive activities – a significant improvement in daily routines and quality of life.

### 3.4 Intervention Location V/s Control Location

#### Knowledge & Awareness

The Clean Village intervention markedly improved households' waste-management knowledge. Nearly all intervention households **~90%** reported receiving SWM training or awareness visits, compared to only ~2% in control villages. This translated into much higher factual knowledge: about **63% (N=197)** of intervention respondents correctly named the three-bin segregation system (wet/dry/hazardous) vs only ~3% of control households. Similarly, roughly **78% (N=197)** of intervention vs **15%** of control households knew that the blue bin is for dry waste. Awareness of single-use plastic bans was also far higher (≈76% vs 15% correct). In contrast, baseline studies had found only general cleanliness awareness ("lack of cleanliness is unhygienic") but low understanding of specific SWM rules. The project's training and IEC campaigns thus produced dramatic knowledge gaps: intervention villages now clearly outperform controls in waste/composting awareness.

| Indicator | Intervention | Control |
|---|---|---|
| Received SWM training/awareness (%) | 92% | 2% |
| Correctly identify 3-bin segregation (%) | 63% | 3% |
| Knows dry-waste bin is blue (%) | 78% | 15% |
| Knows banned plastic items (%) | 76% | 15% |

### Behavior and Practices

Behavioral uptake of proper waste practices is much higher in intervention villages. At baseline, most waste was simply dumped or burned, but now **88%** of intervention households **(N=197)** *always* segregate waste into wet/dry/hazardous streams, versus only **3%** in control. Likewise, **64%** of intervention households **(N=197)** *always* deposit dry waste in the blue bin, compared to ~3% in controls. Daily handover of waste to the local collector is similarly higher (85% vs 4% *always*). Composting behaviors also differ about **61%** of intervention households *always* use their compost in fields, versus only **12%** of controls. In short, intervention families routinely follow the practices taught (segregation, composting, timely disposal), whereas most control households still rely on open dumping or irregular routines. These results reflect the program's emphasis on practical SWM behaviors.

| Indicator | Intervention | Control |
|---|---|---|
| Always segregate waste at source (%) | 88% | 3% |
| Always hand over waste daily to collector (%) | 85% | 4% |
| Always use compost in fields (%) | 61% | 12% |

### Environmental Sanitation

Sanitation infrastructure and practices also improved under the intervention. Today about **84%** of households **(N=197)** in intervention villages have a toilet (almost all in use), versus **61% (N=90)** in control areas. Reported use of both toilets and proper waste segregation (a proxy for comprehensive sanitation behavior) is correspondingly higher in intervention sites. Crucially, intervention villages have eliminated many garbage dumps: **72%** of households report that at least one local open dumping site (GVP) was removed during the program, whereas only **13%** of control households recall such removal. By contrast, the baseline survey noted *no* community waste-disposal infrastructure in any GP[4] and largely unsanitary conditions. The project's mass-clean drives and waste bins helped shift the environment from "visually not appealing" and unhygienic to cleaner villages (consistent with the baseline finding that lack of cleanliness was seen as a health risk[1]). Overall, intervention areas now enjoy far cleaner surroundings and higher sanitation coverage than controls.

| Indicator | Intervention | Control |
|---|---|---|
| Households with home toilet (%) | 84% | 61% |
| Usage of those with toilet (%) | 98% | 91% |
| Households reporting local open-dump removal (%) | 72% | 13% |

### Liquid Waste Management & Pond Rejuvenation

Liquid-waste and waterbody management metrics likewise favor the intervention areas. At baseline 46% of GPs lacked any formal drain-cleaning system, but post-intervention many families report active management. Notably, **37% (N=197)** of intervention households now use water from rejuvenated village ponds for irrigation (vs 0% in control areas where no such work was done). Similarly, **8%** vs **3%** of households use pond water for livestock. After desilting, about **26%** of intervention households use pond silt as fertilizer on fields, compared to 0% in controls. These figures indicate that pond-rejuvenation efforts (dredging, cleaning, banks) are yielding tangible benefits. (Detailed drain maintenance was not directly measured in this survey.) Overall, intervention villages report improved water availability from local ponds a service largely absent in control villages.

| Indicator | Intervention | Control |
|---|---|---|
| Households using pond water for irrigation (%) | 37% | 0% |
| Households using pond water for livestock (%) | 8% | 3% |

### Water Supply Improvements

Access to safe drinking water is dramatically better in intervention areas. About **73% (N=197)** of intervention households have an in-home piped drinking-water connection, versus only **6% (N=90)** in control villages (Table). This reflects the project's extension of water lines under programs like Jal Jeevan Mission. With a piped tap in the yard, intervention families report greatly reduced time and effort fetching water. Although baseline data for water supply was limited, intervention villages now enjoy far higher coverage of household taps, which should help sustain sanitation gains by providing ready access to water.

| Indicator | Intervention | Control |
|---|---|---|
| Households with piped drinking-water connection (%) | 73% | 6% |

## 4. Mapping with IRECS Framework

| Evaluation Parameter | How the Program Aligns |
|---|---|
| **Inclusiveness** | • The Clean Village program in Hardoi adopted a highly inclusive implementation approach, ensuring participation from almost every household in the target villages. Through sustained awareness campaigns and structured training sessions on waste management and hygiene, the program reached **91% of households**, indicating wide social penetration across gender, age, and socio-economic groups.<br><br>• Women, men, and children were engaged through different entry points: school children participated in plastic waste collection drives and cleanliness campaigns, while women benefited directly from improved access to piped water, significantly reducing the physical and time burden associated with water collection.<br><br>• The program actively empowered local sanitation workers (Safai Karamcharis) by formalizing and reorganizing their roles, particularly for daily door-to-door waste collection, thereby improving dignity of work and service reliability.<br><br>• Community-led institutions such as Swachhta Samitis, youth clubs, and Self-Motivated Groups were activated in each village, ensuring representation of diverse voices, including marginalized households, in planning, monitoring, and maintenance of sanitation systems.<br><br>• This inclusive strategy translated into strong community participation, with **73% of households** reporting involvement in cleanliness drives or compliance with Panchayat sanitation rules, and **90% of respondents** affirming that cleanliness is a shared community responsibility. |

| Evaluation Parameter | How the Program Aligns |
|---|---|
| **Relevance** | • The interventions were highly relevant to local needs, directly addressing long-standing challenges such as open dumping of waste, stagnant greywater on village streets, polluted ponds, and unreliable or unsafe drinking water sources.<br><br>• Prior to the project, most villages relied on open dumping and burning of waste, while household greywater collected in open cesspools. The introduction of structured solid and liquid waste management systems therefore responded to immediate environmental and public health risks faced by the community.<br><br>• Pond rejuvenation and drainage construction were especially pertinent in Hardoi's agrarian context, where traditional ponds had become polluted and ineffective, contributing to water scarcity and groundwater depletion.<br><br>• The expansion of piped drinking water supply addressed a critical need, as most households previously depended on handpumps, some of which had quality issues such as fluoride and nitrate contamination. Improved water access particularly benefited women and girls by reducing daily drudgery.<br><br>• The program was strongly aligned with national and state priorities, including the Swachh Bharat Mission, Jal Jeevan Mission, Swachhta Hi Sewa campaign, and Uttar Pradesh's Mission Jal Thal, ensuring that local solutions also contributed to broader development goals. |

| Evaluation Parameter | How the Program Aligns |
|---|---|
| **Effectiveness** | • The program achieved visible and measurable improvements in village cleanliness and environmental conditions. All identified garbage vulnerable points across target Gram Panchayats were eliminated, with approximately **270 dumpsites cleared** and many converted into green spaces, paved areas, or clean public zones.<br><br>• A functional door-to-door waste collection system was established, covering **70–80% of households** with services provided multiple times per week. This significantly reduced household-level waste management burdens, with **68% of families** reporting time savings.<br><br>• The program was highly effective in changing waste management behavior. While waste segregation was virtually absent before the intervention, endline data shows **87.3% of households consistently segregating waste at source**, supported by the distribution of color-coded bins and repeated demonstrations.<br><br>• Organic waste management yielded strong results, with over **712,300 kg of biodegradable waste composted**, producing approximately **240,278 kg of compost** used for agriculture and household gardening. Model villages also saw adoption of backyard composting at the household level.<br><br>• Liquid waste interventions, including drains and soak pits, connected over **406 households** to safe greywater disposal systems, leading to visibly cleaner streets and reduced mosquito breeding. Pond rejuvenation in **12 villages** improved water storage, reduced pollution, and contributed to groundwater recharge.<br><br>• Water supply interventions were particularly impactful, with more than **1,100 households** gaining piped water access. Over **92% of connected households** reported reliable daily water supply, even during periods such as the COVID-19 lockdown, and improved water quality reduced exposure to contamination risks. |

| Evaluation Parameter | How the Program Aligns |
|---|---|
| **Convergence** | • A major strength of the Clean Village program was its effective convergence with government schemes and local institutions. Water supply interventions were implemented in close coordination with the Jal Jeevan Mission, with the program often filling critical infrastructure gaps such as internal pipelines, soak pits, or last-mile connectivity.<br><br>• The pond rejuvenation component complemented the Uttar Pradesh government's Mission Jal Thal by restoring traditional water bodies and supporting state-level water conservation objectives.<br><br>• National cleanliness campaigns such as Swachhta Hi Sewa were integrated into program activities, including large-scale plastic waste collection drives conducted on occasions like Gandhi Jayanti, amplifying both local and national messaging.<br><br>• At the village level, Gram Panchayats, Swachhta Samitis, and Village Water & Sanitation Committees worked closely with the project team, ensuring local ownership and contextual customization of interventions.<br><br>• The program also leveraged community contributions and volunteerism, including shramdaan and even land donations for water infrastructure, demonstrating strong public–private–community collaboration. |
| **Sustainability** | • The program invested heavily in institutional sustainability by establishing or strengthening village-level bodies such as Swachhta Samitis and Village Water & Sanitation Committees, which are now responsible for routine operations, maintenance, and oversight of sanitation and water systems.<br><br>• These committees were trained in both technical maintenance (minor repairs, water chlorination, compost pit upkeep) and financial management, helping build a local culture of system ownership and accountability.<br><br>• Community attitudes strongly support sustainability, with **98% of households** agreeing that maintenance culture is essential, and many villagers actively discouraging a return to open dumping or pond pollution. |

| Evaluation Parameter | How the Program Aligns |
|---|---|
| | • Durable infrastructure such as bins, carts, drains, compost pits, and overhead tanks provides long-term functionality, while environmental benefits like improved groundwater recharge reinforce incentives for continued upkeep.<br><br>• Behavioral change outcomes appear robust, with high levels of waste segregation, regular waste handover, and awareness around plastic reduction becoming normalized practices.<br><br>• A key sustainability challenge remains financial viability of waste collection services, as user-fee payment is still inconsistent. However, several Gram Panchayats have begun introducing nominal monthly charges, and community acceptance for contributing towards maintenance is gradually increasing, indicating a positive trajectory. |

## 5. Conclusion and Recommendations

### 5.1 Conclusion

The Clean Village program in Hardoi (2019–2024) has demonstrated a successful model of integrated rural sanitation and water supply improvement. The program's multi-thematic approach tackling solid waste, liquid waste, and potable water access in tandem – has yielded comprehensive benefits for target communities. Villages that were once marred by garbage, polluted ponds, and water scarcity have been transformed into cleaner, healthier, and more livable environments. Key outcomes such as ~77% toilet usage, ~61% waste segregation compliance, elimination of all major garbage dumps, rejuvenation of water bodies, and provision of tap water to over half the households signify significant progress toward ODF Plus sustainable villages.

The alignment with national missions (SBM-G Phase II and Jal Jeevan Mission) and the contribution to multiple Sustainable Development Goals (SDGs) stand out. By ensuring sanitation infrastructure is used and maintained, the program furthers SDG 6.2 (safely managed sanitation). By providing safe water, it addresses SDG 6.1, and by establishing community-led systems, it touches on SDG 11 (sustainable communities) and SDG 3 (health and well-being).

One of the most encouraging aspects is the behavioral and institutional change engendered. Infrastructure alone cannot sustain outcomes; it is the changed mindsets – people valuing cleanliness and demanding services that will carry forward the impact. The project fostered a culture where cleanliness is a community norm and water is seen as a communal asset,

not just an individual utility. The emergence of local champions and committees provides a self-replenishing mechanism for oversight and innovation.

The program's impact, while significant, needs to be consolidated and scaled. In Hardoi, there are hundreds of other Gram Panchayats that could benefit from the lessons of this initiative. HCL Foundation and partners can serve as knowledge resources to replicate this model across Uttar Pradesh and similar contexts. Conversely, sustaining the gains in the project GPs over the long run will require continued commitment from communities and linkage with government support systems. Challenges like ensuring 100% user fee collection, expanding coverage to the remaining households, and adapting to future needs (population growth, climate variability affecting water, etc.) must be proactively managed.

### 5.2 Recommendations

Building on the findings and analysis, the following recommendations are offered to HCL Foundation, local stakeholders, and government partners for sustaining and scaling the Clean Village achievements:

**1. Strengthening Institutional Mechanisms**

Formalize the roles of VWSCs and Swachhta Samitis through Panchayat resolutions and regular meetings. Provide for annual refresher training and cross-learning visits. Encourage GPs to include WASH committees in their official structure (many states have mandated Village Water & Sanitation Committees under JJM ensure these are active). At the block level, constitute a forum of Clean Village GP Pradhans to share experiences and collectively interface with block officials for any support needed.

**2. Financial Sustainability Plan**

Introduce or enhance user fee systems for waste collection and water supply gradually. For waste, even a nominal ₹20 per household per month can generate funds for equipment repair and worker salary. For water, ensure tariffs cover electricity and minor maintenance; consider a graded tariff (e.g. ₹50 for first 1,000 liters, more for high use) to promote water conservation. Training Panchayat secretaries in accounting for these funds will help. Explore revenue generation through resource recovery: e.g., sell surplus compost to nearby farms (some villages have started packaging compost for sale), aggregate recyclable plastic and connect with recyclers for bulk sale.

**3. Continuous IEC & Behavior Change**

Continue periodic IEC campaigns at village level, Observe key days like World Environment Day, World Toilet Day, etc., with activities to reinforce messages. Empower school WASH clubs to conduct quarterly cleanliness drives or exhibitions children will keep reminding their families. Use local media (if available, like community radio or WhatsApp groups) to send out seasonal messages (e.g. pre-monsoon drains cleaning alert, or festival-time anti-littering messages). Recognize and reward positive deviance: e.g., institute a "Cleanest

Ward/Street" award within the village to incentivize neighbors to maintain their area, or "Best Segregating Household" award.

**4. Policy Integration and Scale-Up**

Advocate for a District Swachhata Plan that allocates government resources to replicate this model in remaining GPs, using the lessons and perhaps with HCLF as a knowledge partner. Share success metrics and approaches with the National Jal Jeevan Mission and SBM-G officials. This could influence state policy, for example, promoting community composting units as a mandatory element of ODF Plus verification or encouraging CSR-government collaboration for waste management in other districts.

In summary, these recommendations focus on consolidating the gains, addressing remaining gaps and scaling the impact. The success of the Clean Village program in Hardoi is a testament to effective collaboration and community-driven development. By implementing the above recommendations, HCL Foundation and stakeholders can ensure that these villages not only remain clean and healthy but continue progressing towards higher development outcomes.

**Annexure:**

## Phase -wise Details:

1. **Clean Village Project – Phase I**
   - **Implementing Partner: Samvedna Development Society (SDS)**
   - **Project Period:** February 2021 – August 2021
     **Geographic Coverage:** 10 Gram Panchayats across Ahirori and Tadiyawan Blocks, Hardoi District

The Clean Village Project – Phase I was conceptualized as a structured response to the growing environmental and sanitation challenges observed across rural Gram Panchayats in Hardoi. A comprehensive baseline profiling exercise conducted at the outset of the project revealed systemic gaps in waste management practices and institutional mechanisms.

### 1.1 The key issues identified included:

1. Prevalence of open dumping and burning of solid waste particularly household organic waste and dry plastics, contributing to environmental pollution and health hazards.
2. Multiple Garbage Vulnerable Points (GVPs) across village lanes, community spaces, and pond peripheries, which had become chronic dumping hotspots.
3. Low awareness and adoption of waste segregation practices at the household level, with waste typically disposed of as mixed refuse.
4. Absence of structured systems for plastic storage and diversion, leading to plastic leakage into open drains, fields, and water bodies.
5. Weak Panchayat-level Solid Waste Management (SWM) governance mechanisms, including lack of defined roles, rosters, monitoring protocols, and technical knowledge among sanitation workers.

These findings highlighted that the problem was not merely infrastructural but systemic, requiring behavioural change, community mobilization, and institutional strengthening alongside operational waste management solutions.

Accordingly, the project aimed to establish a community-owned, decentralized solid waste management model, wherein households, Panchayats, sanitation workers, and village institutions collaboratively participated in segregation, collection, processing, and disposal

systems. The intervention sought to move beyond episodic cleanliness drives toward building a structured and sustainable rural waste governance ecosystem.

### 1.2 Intervention Components

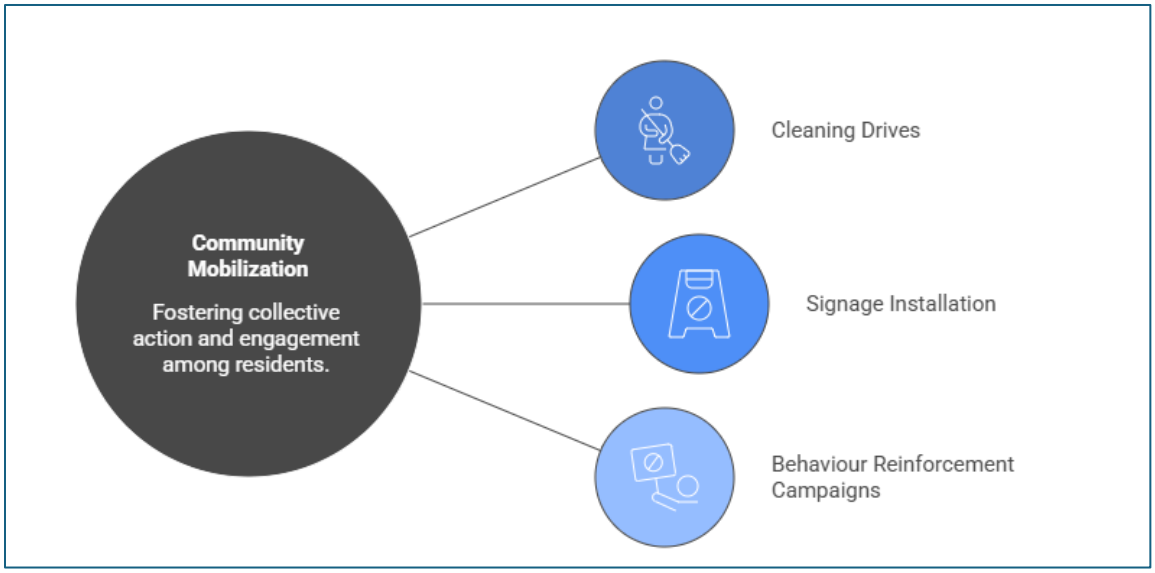
The project adopted a comprehensive value-chain strengthening approach, addressing each stage of waste management from generation to processing and disposal. The intervention was implemented through the following components:

**1. Baseline Survey and Participatory Rural Appraisal (PRA)**

A comprehensive baseline survey combined with Participatory Rural Appraisal (PRA) tools was conducted across all 10 Gram Panchayats at the outset of the intervention. This structured assessment enabled the project team to systematically map waste generation patterns, identify the locations of Garbage Vulnerable Points (GVPs), assess prevailing sanitation and disposal practices, and understand institutional roles and capacity gaps within Panchayats and community structures. The participatory approach ensured that community members were actively involved in diagnosing existing challenges and co-creating solutions. By engaging stakeholders from the planning stage, the intervention fostered early ownership and alignment, laying a strong foundation for subsequent implementation.


**2. Identification and Elimination of Garbage Vulnerable Points (GVPs)**

Based on baseline findings, detailed mapping and prioritization of Garbage Vulnerable Points were undertaken. These sites, often chronic dumping hotspots, posed environmental and public health risks. A structured elimination process was implemented, combining community mobilization, organized cleaning drives, installation of cautionary and awareness signage, and sustained behaviour reinforcement campaigns. The objective extended beyond waste removal; it aimed to convert these vulnerable sites into clean, socially monitored spaces, thereby preventing recurrence. This systematic transformation helped shift community norms around waste disposal and strengthened collective accountability.




### 3. Mass Cleanliness Drives

Village-wide cleanliness drives were organized across intervention Gram Panchayats to address accumulated waste in critical areas, including internal lanes, open drains, public spaces, pond peripheries, and school surroundings. These drives delivered immediate environmental improvements while also serving as powerful symbolic demonstrations of collective action. By visibly showcasing the results of coordinated community participation, the drives reinforced the importance of shared responsibility in maintaining sanitation standards and strengthened local commitment to sustained cleanliness.


These drives served both operational and symbolic purposes, reinforcing the importance of collective action.

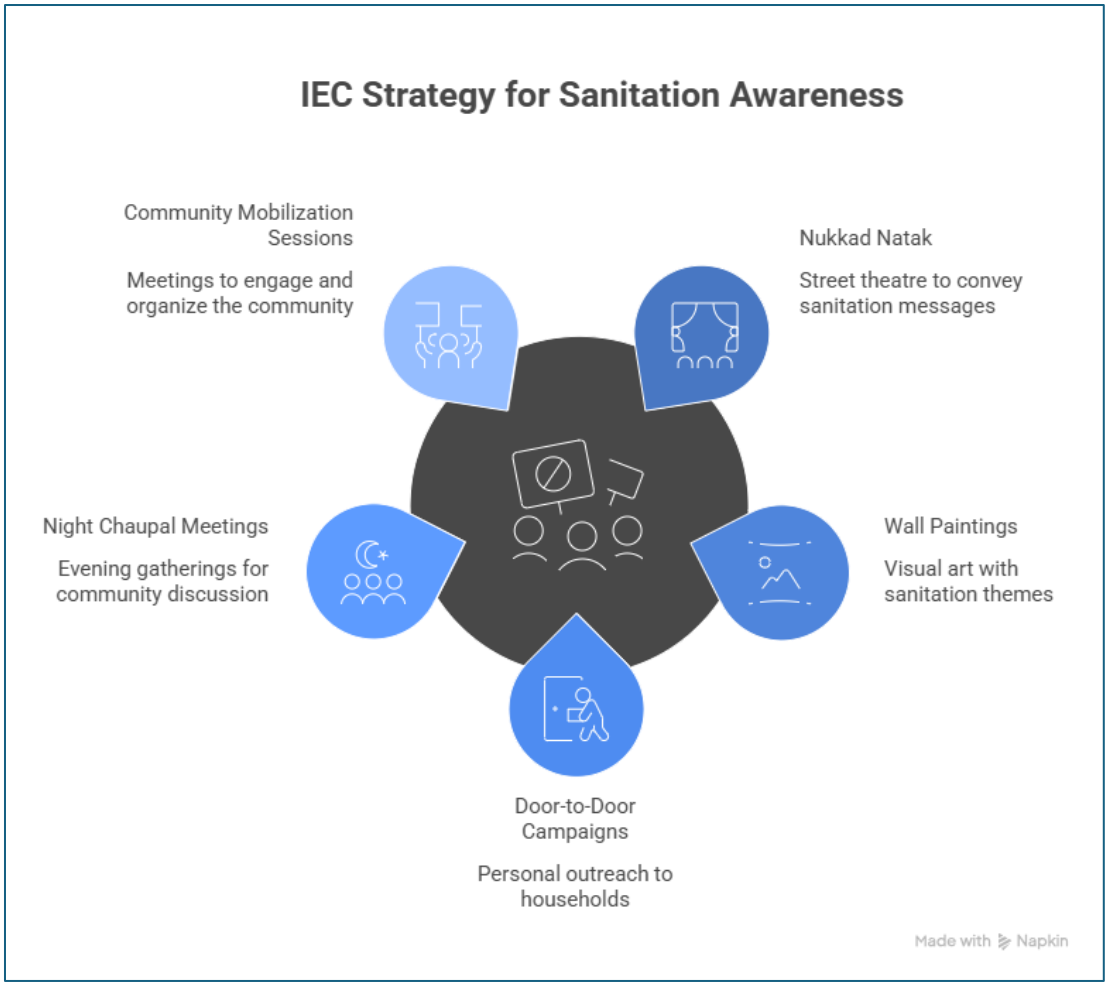
**4. Training of Safai Karmacharis**

Recognizing the central role of frontline sanitation workers in ensuring operational continuity, structured training sessions were conducted for Safai Karmacharis. These sessions covered waste segregation principles, safe collection and handling protocols, composting techniques, and effective community engagement practices. Strengthening technical competencies and clarifying operational procedures enhanced service delivery efficiency and improved worker confidence. This capacity-building component was critical in ensuring that waste management systems could function sustainably beyond the project implementation period.


Capacity building ensured that operational systems could be maintained beyond the project period.

**5. IEC & Behaviour Change Communication (BCC)**

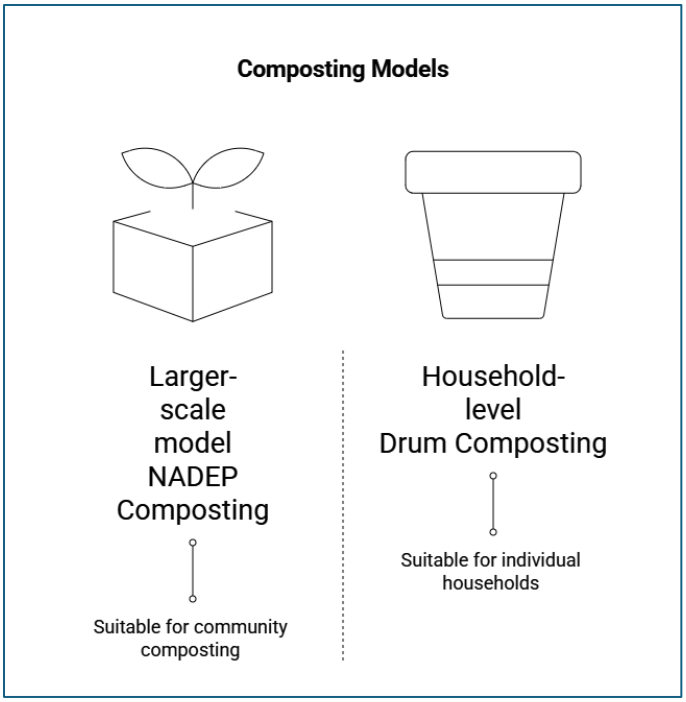
A comprehensive Information, Education, and Communication (IEC) and Behaviour Change Communication (BCC) strategy was implemented to reinforce sustainable waste management practices. The strategy included street theatre (Nukkad Natak), wall paintings with sanitation messaging, door-to-door awareness outreach, night Chaupal meetings, and structured community mobilization sessions. These interventions were designed to promote segregation at source, encourage composting adoption, and discourage environmentally harmful practices such as open dumping and burning. By combining mass communication with interpersonal engagement, the initiative ensured repeated reinforcement and deeper behavioural internalization.




These efforts focused on promoting segregation at source, composting adoption, and discouraging open dumping and burning.

**6. Demonstration and Scaling of Composting Models**

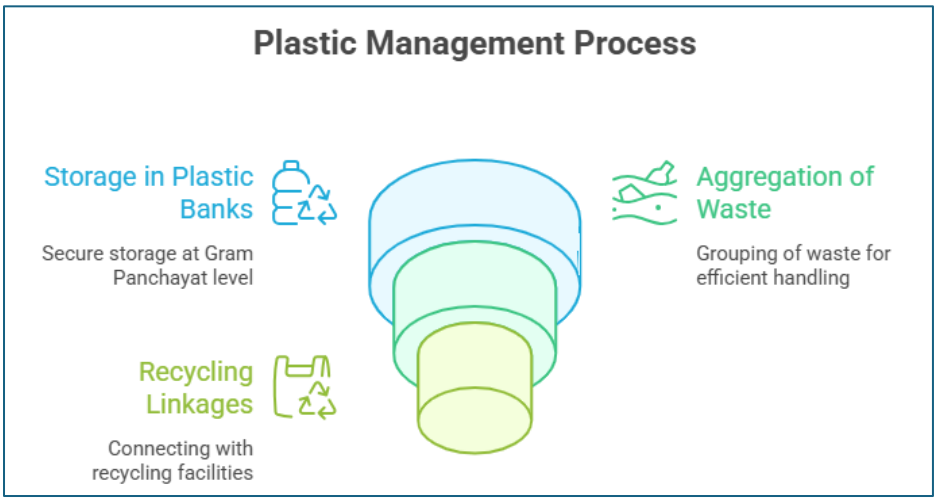
To promote decentralized organic waste management, two composting models were introduced, household-level drum composting and the larger NADEP composting model. Practical demonstrations were organized to showcase the process of converting organic waste into nutrient-rich compost. Following demonstrations, households received technical handholding and troubleshooting support to scale adoption. This approach enabled composting to transition from isolated pilot units to widespread household-level practice, facilitating organic waste diversion and enhancing soil health through locally generated compost.




Demonstrations were conducted, followed by handholding support to scale adoption across households.

**7. Installation of Plastic Banks**

Structured plastic storage units, referred to as “Plastic Banks,” were installed at the Gram Panchayat level to formalize plastic waste aggregation. These units provided designated collection points, preventing plastic leakage into open drains, agricultural lands, and water bodies. By facilitating aggregation and enabling periodic recycling linkages, the initiative introduced an organized framework for rural plastic waste management. This component significantly reduced environmental contamination and strengthened structured waste diversion systems.



This introduced formalization into rural plastic waste management.

**8. Formation of Self-Motivated Village Groups**

Community volunteers and local leaders were identified and organized into self-motivated groups to sustain behavioural reinforcement and peer monitoring.

**9. Panchayat-Level Cleaning Roster Development**

A formal cleaning schedule was developed in consultation with Panchayat representatives, clearly defining:

- Collection routes
- Frequency
- Roles and responsibilities
- Monitoring mechanisms

This institutionalized waste management beyond project-driven operations.

**1.3 Key Achievements**

The intervention delivered measurable outputs across the 10 Gram Panchayats, reflecting both operational effectiveness and behavioural uptake.

| Output Indicator | Achievement |
|---|---|
| Garbage Vulnerable Points Eliminated | 571 |
| Households Adopting Composting | 3,436 |
| Plastic Collected & Diverted | 15,105.94 kg |
| Waste Processed via Composting | 14.67 million kg |
| Compost Produced | 3.23 million kg |
| Samiti-Level Trainings Conducted | 40 |

The scale of compost adoption significantly exceeded initial targets, demonstrating strong behavioural acceptance and community participation. The volume of waste processed, and compost generated reflects a substantial diversion of organic waste from open dumping and burning practices.

### 1.4 Observed Outcomes

Beyond the quantitative outputs, Phase I generated visible and structural outcomes across intervention villages.

**1. Environmental Improvement**

- Noticeable reduction in open dumping across public spaces.
- Elimination and beautification of former GVP sites.
- Reduced open burning of organic waste.

**2. Resource Recovery & Circularity**

- Organic waste is diverted into productive compost.
- Compost reuse in agriculture improved soil quality and reduced chemical fertilizer dependency.

**3. Economic Benefits at Household Level**

- Reduced fertilizer expenditure for compost-adopting households.
- Potential savings on waste clearing costs were previously incurred informally.

**4. Behavioral Transformation**

- Increased awareness of segregation practices.
- Shift from passive disposal to participatory waste management.
- Improved collective accountability within communities.

**5. Strengthened Local Governance**

- Defined sanitation roles at Panchayat level.
- Enhanced coordination between sanitation workers and Gram Panchayats.
- Integration of waste management discussions in Gram Sabha meetings.

2. **Clean Village Project – Phase II (Scale Expansion & Institutional Consolidation)**
    - **Implementing Partner: Umang Sunehra Kal Sewa Samiti (USKSS)**
    - **Project Period:** November 2022 – February 2024
      **Geographic Coverage:** 40 Gram Panchayats across 7 Blocks (Ahirori, Bilgram, Kachhauna, Madhoganj, Mallawan, Sursa, and Tadiyawan)

### 2.1 Strategic Rationale for Phase II

Following the successful demonstration and behavioural traction achieved under Phase I, the Clean Village initiative transitioned into a structured scale-up and consolidation phase. While Phase I validated the decentralized SWM model across 10 Gram Panchayats, Phase II sought to:

- Expand geographic coverage to 40 Gram Panchayats.
- Institutionalize systems within Panchayati Raj structures.
- Strengthen operational continuity and governance mechanisms.
- Embed sustainability through convergence with government schemes.
- Transition from project-driven implementation to Panchayat-led ownership.

The expansion phase recognized that scaling environmental interventions requires not only replication of infrastructure but also strengthening of institutional capacity, financing pathways, and accountability mechanisms at the Gram Panchayat level.

Thus, Phase II was designed as a **systems consolidation phase**, moving the programme from behavioural adoption toward long-term institutional embedding.

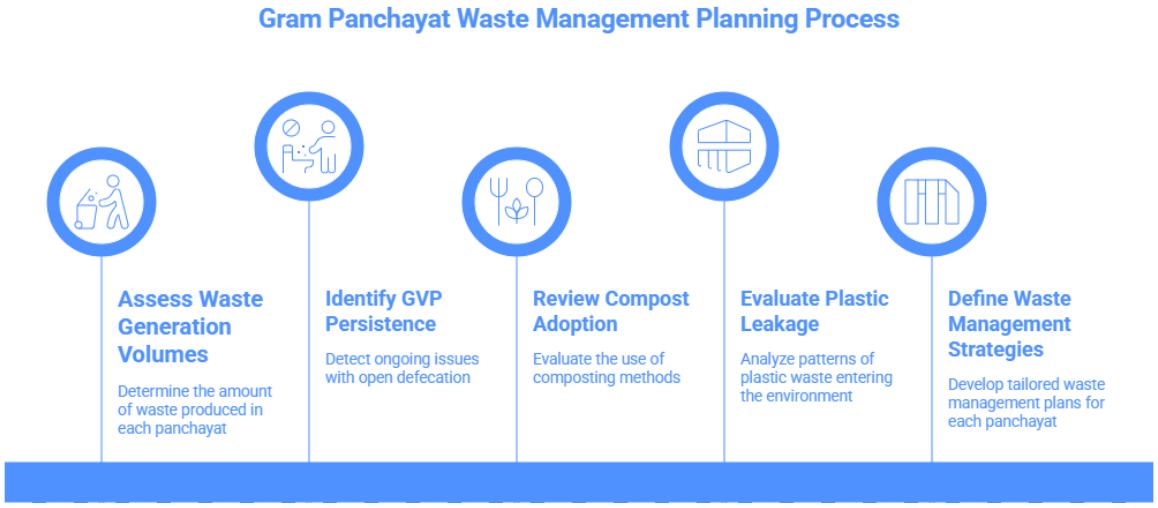
### 2.2 Intervention Framework

Phase II retained the core decentralized Solid Waste Management (SWM) value-chain model developed during Phase I; however, it introduced a stronger emphasis on institutional strengthening, monitoring systems, and governance convergence. While Phase I focused primarily on behaviour change and operational demonstration, Phase II was designed to embed systems within Panchayat structures and ensure long-term sustainability. The intervention framework combined operational refinement with governance integration, enabling the transition from project-driven implementation to locally owned waste management systems.

The intervention components included:

### 2.2.1 Gram Panchayat-Level Baseline & Planning Refinement

At the outset of Phase II, each of the 40 Gram Panchayats underwent a structured planning and refinement exercise. Rather than replicating Phase I uniformly, the project adopted a contextual approach to assess block-specific and Panchayat-specific dynamics. This exercise included evaluation of waste generation volumes, identification of persistent or re-emerging Garbage Vulnerable Points (GVPs), review of compost adoption levels, and assessment of plastic leakage patterns within each jurisdiction. Based on these findings, Panchayat-specific waste management strategies were defined, ensuring that interventions were tailored to local needs and existing institutional capacity. This approach strengthened contextual relevance and prevented a one-size-fits-all replication model.

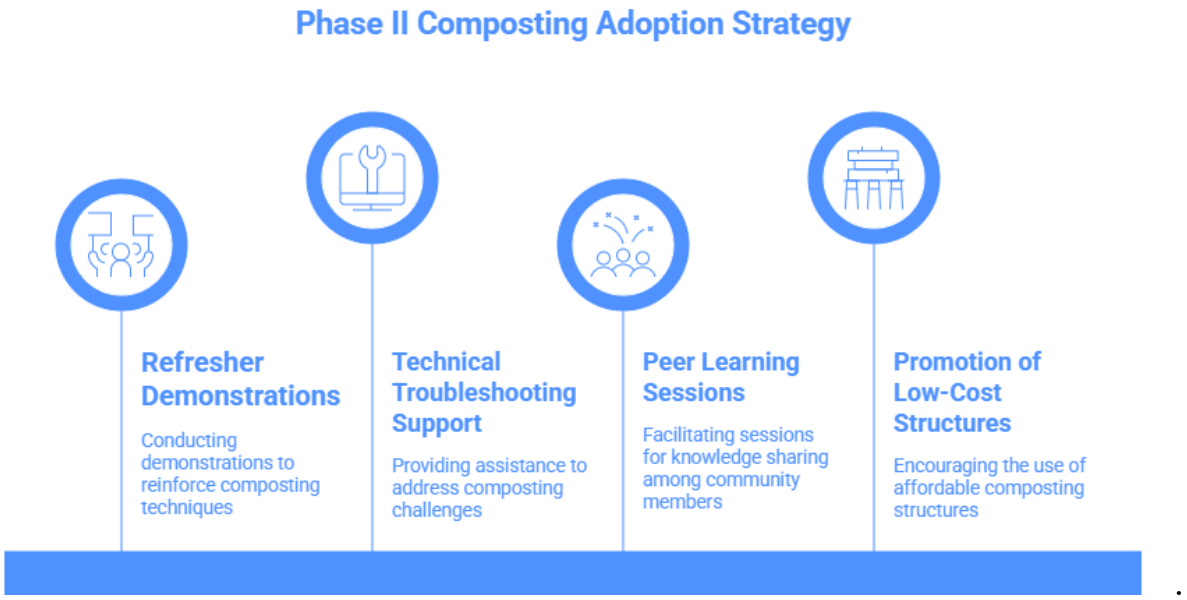



This ensured contextual customization rather than uniform replication.

### 2.2.2 Expansion of Household Composting

Building on the composting demonstrations introduced in Phase I, Phase II focused on scaling and normalizing composting as a routine household practice. Refresher demonstrations were organized to reinforce techniques and address knowledge gaps, while technical troubleshooting support was provided to households facing operational challenges. Peer learning platforms enabled experienced adopters to share practical insights with new participants, fostering horizontal knowledge transfer within communities. Additionally, promotion of low-cost composting structures made the practice accessible to economically vulnerable households. The objective was to shift composting from isolated

demonstration units to a normalized, widely adopted behavioural practice embedded in everyday rural life.

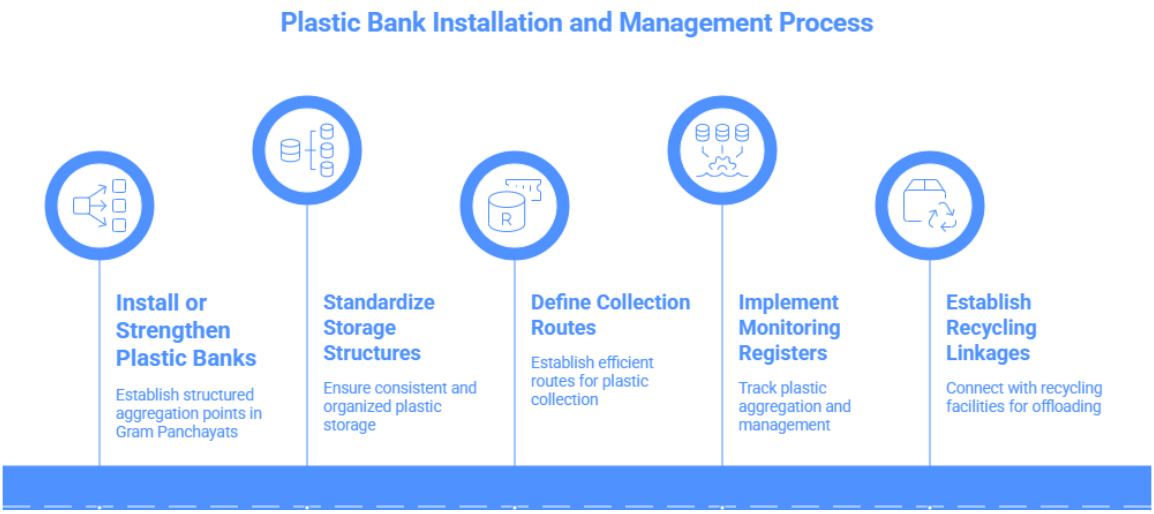



.

The objective was to move composting from “demonstration units” to a normalized household practice.

### 2.2.3 Plastic Waste Management Consolidation

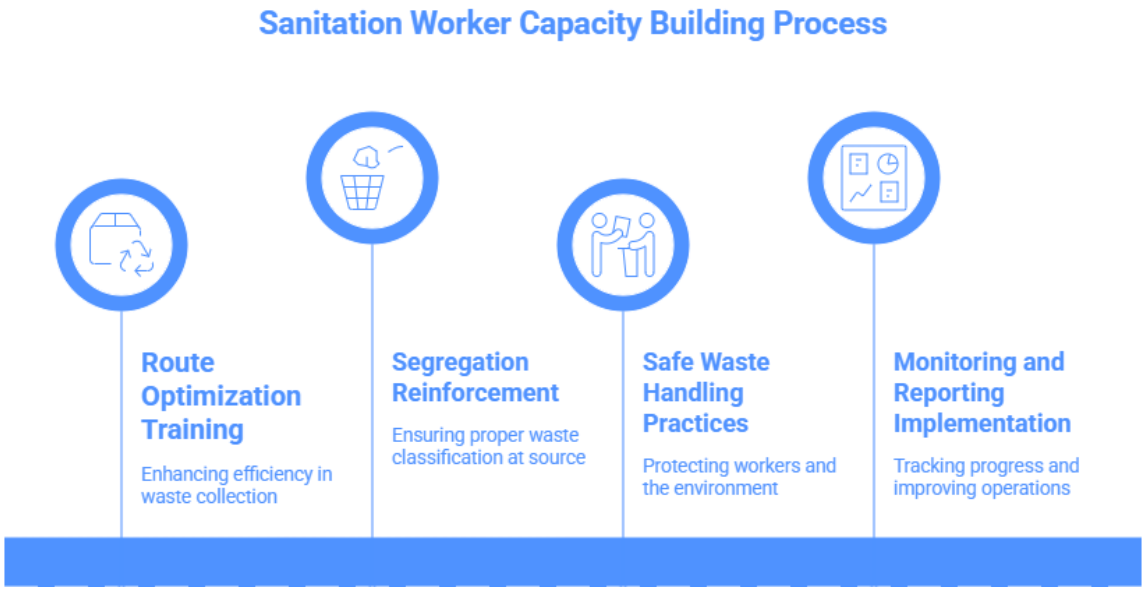
Phase II strengthened plastic waste management through installation and reinforcement of Plastic Banks across all 40 Gram Panchayats. Standardized plastic storage structures were established to create clearly designated aggregation points. Defined collection routes and operational schedules were institutionalized to streamline aggregation processes. Monitoring registers were introduced to track plastic volumes collected and stored, and linkages were facilitated for periodic offloading and recycling. This structured consolidation significantly reduced plastic leakage into open drains, agricultural fields, and water bodies, contributing to environmental cleanliness and reducing ecosystem contamination.




This reduced plastic leakage into drains, agricultural fields, and water bodies.

### 2.2.4 Strengthening of Safai Karmachari Systems

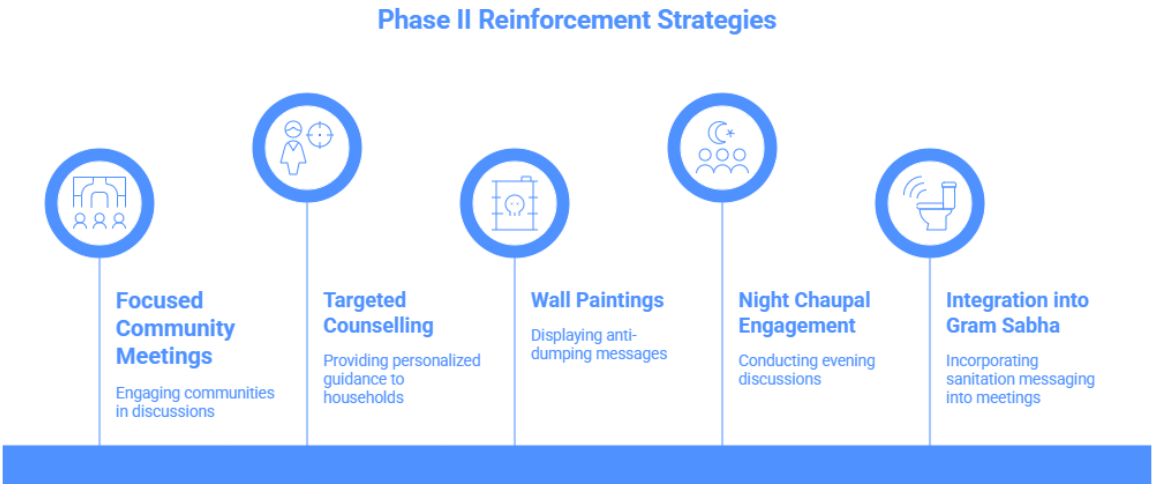
Recognizing that operational sustainability depends on frontline workers, Phase II invested in strengthening Safai Karmachari systems. Sanitation workers received capacity-building support on route optimization to improve collection efficiency, reinforcement of segregation practices at source, safe waste handling protocols, and standardized monitoring and reporting formats. Clear operational rosters were institutionalized at the Panchayat level, ensuring predictable service delivery and accountability. By professionalizing sanitation service delivery, the programme reduced dependence on ad hoc arrangements and enhanced system reliability.



Clear operational rosters were institutionalized at Panchayat level to ensure predictable service delivery.

### 2.2.5 Behaviour Change Reinforcement (Second-Generation IEC)

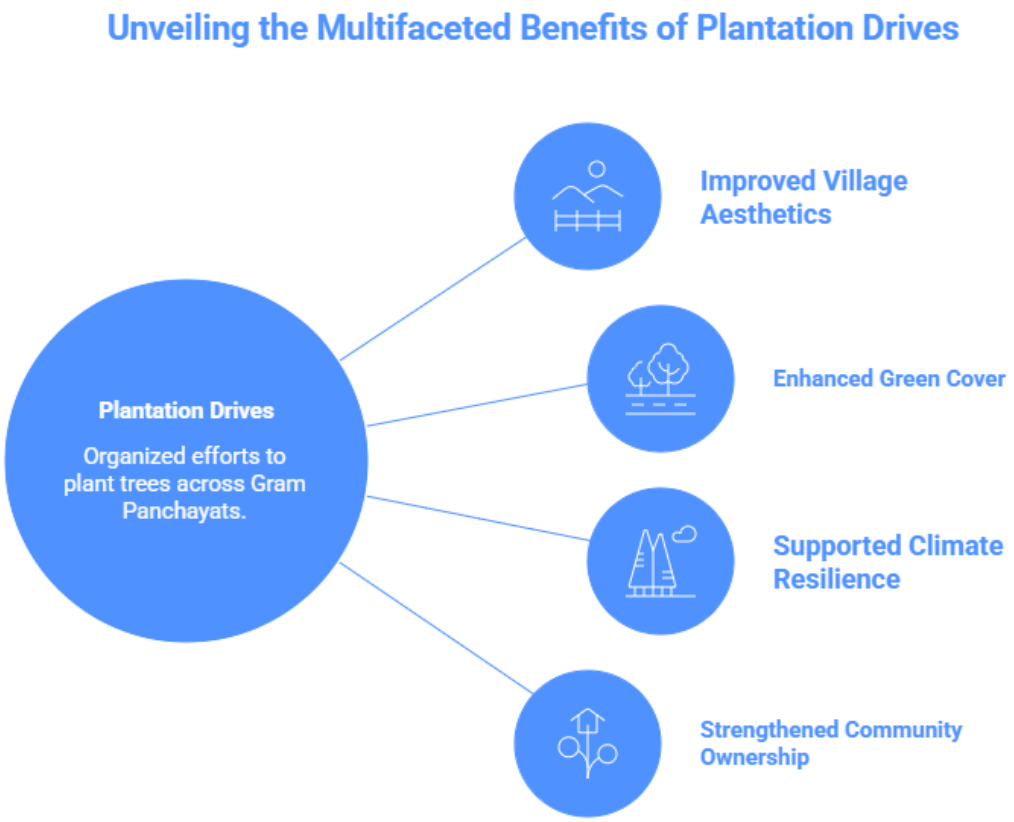
Phase II moved beyond introductory awareness campaigns to what may be termed "second-generation IEC," focused on reinforcing and sustaining behavioural gains achieved earlier. Targeted community meetings were conducted to address emerging challenges and clarify misconceptions. Households with low adoption levels received focused counselling to encourage compliance with segregation and composting practices. Wall paintings with anti-dumping messaging were refreshed or newly installed in strategic locations to discourage relapse into old practices. Night Chaupal sessions continued to serve as forums for dialogue and reinforcement, and sanitation messaging was increasingly integrated into Gram Sabha discussions. These reinforcement strategies minimized behavioural relapse and stabilized community-level adoption.




This minimized behavioural relapse and sustained earlier gains.

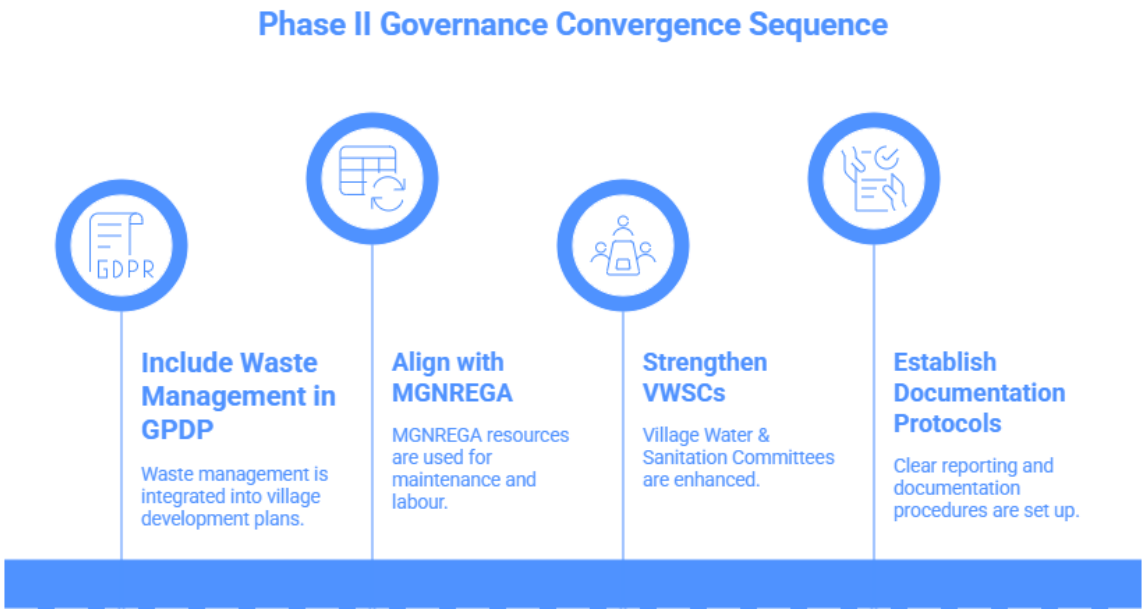
### 2.2.6 Plantation & Environmental Enhancement

Phase II integrated environmental co-benefits through structured plantation drives across intervention Gram Panchayats. These efforts aimed not only to improve village aesthetics but also to enhance green cover and contribute to climate resilience. Plantation activities strengthened ecological restoration efforts while also fostering community stewardship of public spaces. By linking environmental enhancement with sanitation improvements, the programme broadened its sustainability narrative beyond waste management alone.




### 2.2.7 Governance Convergence & Sustainability Integration

A defining feature of Phase II was its structured convergence with formal governance mechanisms. Waste management priorities were integrated into Gram Panchayat Development Plans (GPDP), ensuring budgetary and planning recognition. Convergence with MGNREGA facilitated labour alignment for maintenance and environmental works, strengthening financial sustainability. Village Water & Sanitation Committees (VWSCs) were further strengthened to oversee operational compliance and community monitoring. Clear documentation and reporting protocols were institutionalized to improve transparency and accountability. Collectively, these measures shifted the accountability framework from NGO-driven oversight to Panchayat-led governance, embedding sustainability within local administrative systems.




This shifted the accountability framework from NGO-driven monitoring to Panchayat-led oversight.

### 2.3 Key Performance Achievements

Phase II delivered significant operational and environmental outputs across the expanded footprint.

| Deliverable | Target | Achievement |
|---|---|---|
| Gram Panchayats Covered | 40 | 40 |
| Plastic Banks Installed | 40 | 40 |
| Households Adopting Composting | 2,000 | 3,436 |
| Plastic Collected | 10,000 kg | 15,105.94 kg |
| Plantation | 8,000 trees | 8,000 trees |
| GVP Elimination | Sustained | 571 maintained |

Notably, compost adoption continued to exceed planned targets, reflecting sustained behavioural retention rather than short-term adoption spikes.

The volume of plastic aggregated surpassed targets, demonstrating improved collection efficiency and increased community compliance.

### 2.4 Institutional Outcomes

Phase II generated deeper institutional transformation beyond operational metrics.

#### 1. Panchayat Ownership

Waste management responsibilities were clearly defined within Panchayat structures, including:

- Allocation of roles to sanitation workers.
- Development of collection schedules.
- Monitoring through VWSCs.
- Review during Gram Sabha meetings.

#### 2. Systems Maturity

The programme progressed to what may be described as **Stage 4 Institutional Maturity**, characterized by:

- Operational regularity.
- Defined governance structures.
- Convergence with local development planning.
- Reduced dependency on external facilitation.

#### 3. Reduced GVP Recurrence

Regular monitoring mechanisms and community accountability significantly reduced the recurrence of Garbage Vulnerable Points, indicating structural rather than episodic change.

### 4.5 Environmental and Economic Implications

#### Environmental Impact

- Sustained diversion of organic waste from open burning.
- Structured plastic aggregation reduced environmental contamination.
- Enhanced green cover through plantation.
- Reduced burden on open drains and village commons.

**Economic Implications**

- Continued reduction in fertilizer expenditure among compost-adopting households.
- Reduced informal expenditure on clearing waste accumulation.
- Potential agricultural productivity gains due to soil enrichment.

The economic implications form the basis for SROI analysis in subsequent sections of the report.

**4. Behavioral Sustainability**

Unlike Phase I, where awareness generation was primary, Phase II focused on retention and normalization of behaviors.

Indicators of behavioral sustainability include:

- High compost adoption retention.
- Regular plastic bank utilization.
- Continued participation in cleanliness drives.
- Community-led monitoring of dumping practices.

The intervention demonstrated that when governance structures are aligned with behavioral reinforcement, rural sanitation systems can achieve durable adoption.

**2.5 Comparative Phase Assessment**

| Dimension | Phase I | Phase II |
|---|---|---|
| **Scale** | 10 GPs | 40 GPs |
| **Focus** | Demonstration & Behavior Change | Institutional Consolidation |
| **Compost Adoption** | Initiation | Scale & Retention |
| **Governance** | Emerging Structures | Embedded in Panchayat System |
| **Sustainability** | Project-supported | Convergence-driven |

Phase II thus represents a structural evolution from pilot experimentation to decentralized governance institutionalization.

**3. Pond Rejuvenation– Phase I**

- **Implementing Partner: SANKALP**
- **Project Duration:** March 2022 – August 2022
  **Geographic Coverage:** 6 Ponds across Kachhauna and Bahendar Blocks, Hardoi District

**3.1 Key Challenges**

Traditional village ponds in Hardoi historically served as critical ecological and socio-economic assets, supporting groundwater recharge, irrigation, livestock needs, and micro-climatic regulation. However, prior to intervention, the six selected ponds exhibited significant environmental degradation due to years of neglect, anthropogenic pressure, and inadequate institutional oversight.

A structured pre-intervention assessment identified the following key challenges:

**1. Severe Siltation and Reduced Depth**

Most ponds had become shallow due to accumulated silt and indiscriminate soil deposition over time. The reduced depth significantly diminished their water-holding capacity, particularly during monsoon months, and limited their recharge potential during dry seasons.

**2. Encroachments and Shrinking Water Spread Area**

Unregulated encroachment along pond peripheries had narrowed the effective water spread area. Temporary and semi-permanent land use alterations around pond boundaries further disrupted natural inflow patterns and ecological balance.

**3. Direct Discharge of Wastewater**

In several locations, domestic wastewater and greywater were directly discharged into ponds, resulting in stagnation, odor issues, and contamination. The absence of filtration or diversion systems exacerbated water quality deterioration.

**4. Reduced Groundwater Recharge Potential**

Due to siltation and disrupted hydrological pathways, the ponds were no longer functioning effectively as groundwater recharge structures. This had implications for declining water tables and seasonal water scarcity in surrounding areas.

**5. Ecological Degradation**

The ponds exhibited declining biodiversity, minimal green cover around embankments, and increased vulnerability to solid waste dumping. The ecological integrity of these water bodies had been significantly compromised.

Collectively, these issues underscored the need for a scientifically designed, community-supported rejuvenation model that addressed both structural and governance deficiencies.

### 3.2 Intervention

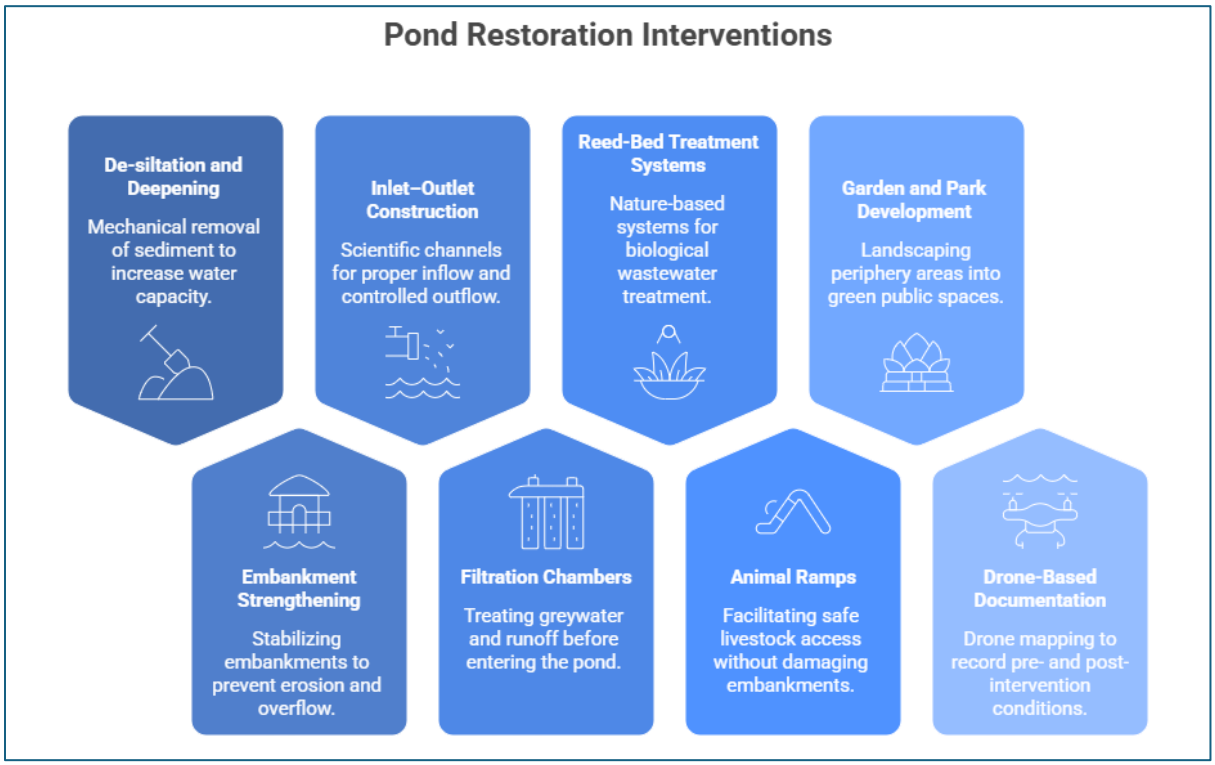
The pond rejuvenation model adopted under Phase I combined technical restoration measures with structured community and governance engagement. This integrated approach ensured that physical restoration was accompanied by institutional sustainability.

#### 3.2.1 Technical Restoration Measures

The engineering component of the intervention was designed to restore hydrological functionality, improve water quality, and enhance ecological resilience.

- **De-siltation and Deepening**
  Mechanical de-siltation was undertaken to remove accumulated sediment and restore original depth contours. The process increased the water-holding capacity and improved the pond's ability to retain monsoon inflows.
- **Embankment Strengthening**
  Embankments were stabilized and strengthened to prevent erosion and overflow during heavy rainfall. Reinforced boundaries enhanced structural integrity and reduced the risk of future encroachment.
- **Inlet–Outlet Construction and Correction**
  Scientific inlet and outlet channels were constructed or rehabilitated to ensure proper inflow and controlled outflow. This intervention restored natural hydrological pathways and minimized stagnation.
- **Filtration Chambers**
  Filtration chambers were introduced to treat greywater and runoff before entering the pond. These chambers reduced the entry of suspended solids and organic pollutants.
- **Reed-Bed Treatment Systems**
  Nature-based reed-bed systems were installed in selected ponds to biologically treat wastewater inflow. These systems enhanced natural filtration and contributed to improved water quality through phytoremediation.

- **Animal Ramps**
  Dedicated animal ramps were constructed to facilitate safe livestock access without damaging embankments or contaminating large sections of the pond.
- **Garden and Park Development**
  Periphery areas were landscaped and converted into green public spaces, enhancing aesthetic value and encouraging community stewardship.
- **Drone-Based Documentation**
  Drone mapping and visual documentation were undertaken to record pre- and post-intervention conditions, providing visual evidence of transformation and supporting monitoring and reporting processes.



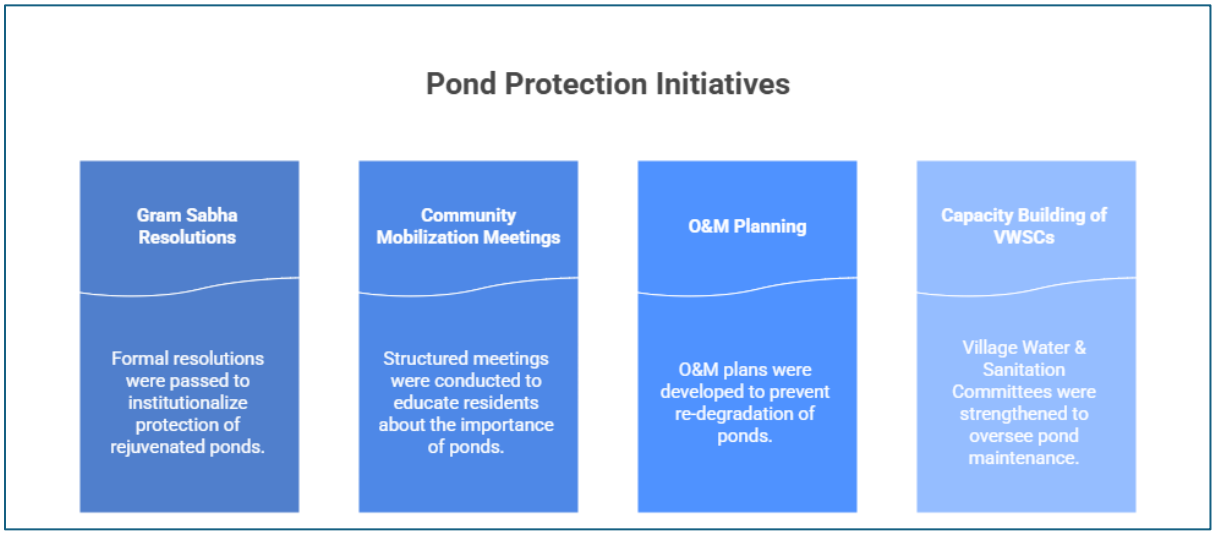

### 3.2.2 Social and Institutional Measures

Recognizing that infrastructure alone does not ensure sustainability, Phase I integrated structured social engagement and governance strengthening components.

- **Gram Sabha Resolutions**
  Formal resolutions were passed in Gram Sabha meetings to institutionalize protection of rejuvenated ponds and prevent future encroachments or dumping.
- **Community Mobilization Meetings**
  Structured mobilization meetings were conducted to educate residents about the ecological and hydrological importance of ponds, fostering collective ownership.

- **Operation & Maintenance (O&M) Planning**
  O&M plans were developed in consultation with Panchayat representatives, outlining roles, monitoring mechanisms, and maintenance schedules to prevent re-degradation.
- **Capacity Building of VWSCs**
  Village Water & Sanitation Committees (VWSCs) were strengthened to oversee monitoring, ensure compliance with usage norms, and integrate pond maintenance into broader village sanitation systems.

This dual approach ensured that restoration efforts were technically sound and socially embedded.




### 3.3 Ecological and Environmental Outcomes

Phase I generated measurable environmental improvements across the six rejuvenated ponds.

**1. Increased Carrying Capacity**

De-siltation and deepening significantly enhanced the water-holding capacity of ponds, improving their resilience during both monsoon and dry seasons.

**2. Improved Water Inflow and Hydrological Functionality**

Reconstructed inlet-outlet systems restored natural inflow patterns and reduced stagnation. Improved water circulation reduced contamination risks.

**3. Enhanced Groundwater Recharge Potential**

With restored depth and hydrological alignment, the ponds regained their recharge functionality, contributing to local aquifer replenishment.

**4. Increased Green Cover and Biodiversity**

Plantation and landscape development around pond peripheries improved micro-ecological conditions, enhanced biodiversity potential, and reduced soil erosion.

**5. Improved Water Quality Parameters**

Post-intervention water testing indicated improvement in key parameters including:

- Reduced Biological Oxygen Demand (BOD)
- Reduced Chemical Oxygen Demand (COD)
- Lower Total Suspended Solids (TSS)
- Stabilized pH levels

These improvements reflect enhanced ecological health and reduced pollutant load.

**4. Pond Rejuvenation & Beautification – Phase II**

- **Implementing Partner: SANKALP**
- **Project Duration:** February 2023 – October 2023
  **Geographic Coverage:** 6 Ponds across Kothawan, Kachhauna, and Bahendar Blocks, Hardoi District

Following the successful execution of Phase I, which demonstrated the technical feasibility and community acceptance of pond rejuvenation, Phase II was conceptualized as a consolidation and sustainability-focused expansion. While Phase I primarily emphasized structural restoration and ecological revival, Phase II deepened institutional ownership, strengthened long-term operation and maintenance systems, and expanded restoration across additional water bodies.

The strategic focus of Phase II included:

- Consolidating ecological gains achieved in earlier ponds.
- Extending rejuvenation to additional degraded ponds.
- Embedding Operation & Maintenance (O&M) within Panchayat governance.
- Strengthening convergence with government schemes.
- Institutionalizing monitoring and accountability mechanisms.

Phase II marked a transition from infrastructure-led rejuvenation to governance-embedded sustainability.

**4.1 Pre-Implementation Planning**

Before commencing physical restoration, detailed site assessments and planning exercises were conducted for each selected pond. These included:

- Topography surveys and mapping of catchment areas.
- Measurement of existing water spread and depth.
- Identification of inflow and outflow disruptions.
- Assessment of silt levels and embankment stability.
- Documentation of encroachments or informal usage patterns.
- Water quality sampling for baseline parameters (BOD, COD, TSS, pH).

Community consultations were held to understand local usage patterns, historical significance of the ponds, and existing challenges. Gram Panchayat No Objection

Certificates (NOCs) were obtained prior to implementation, ensuring legal and administrative alignment.

This planning phase ensured technical precision and minimized implementation risks.

### 4.2 Technical Restoration and Infrastructure Strengthening

Phase II of the Pond Rejuvenation Program retained the core engineering principles established during Phase I; however, it introduced additional refinements aimed at enhancing structural durability, hydrological performance, and long-term sustainability. The restoration approach was guided by site-specific hydrological assessments, catchment mapping, and environmental risk analysis. Rather than undertaking cosmetic improvements, the intervention focused on restoring ecological functionality, strengthening structural resilience, and reducing future vulnerability to degradation.

#### 4.2.1 Advanced De-Siltation and Depth Optimization

Mechanical de-siltation was carried out following detailed hydrological assessments to determine optimal depth contours and slope gradients. Over time, excessive silt deposition had significantly reduced the water-holding capacity of the ponds, leading to shallow water spread and seasonal drying. The accumulated sediment was carefully removed to restore original depth profiles while maintaining structural stability of the pond bed.

The desilting process was not uniform; rather, it was contour-based to ensure appropriate depth gradients that support both water storage and safe embankment stability. By increasing the effective storage volume, the intervention enhanced the ponds' capacity to retain monsoon inflows, reduce overflow risk, and extend water availability into dry months. Improved depth optimization also strengthened the ponds' groundwater recharge potential by increasing infiltration time and surface-water retention.

#### 4.2.2 Reinforced Embankment Stabilization

Embankments were strengthened using erosion-resistant techniques tailored to local soil conditions. Prior to intervention, weakened bunds were vulnerable to collapse, seepage, and scouring during heavy rainfall events. In Phase II, embankment stabilization involved slope correction, soil compaction, and in certain cases reinforcement using turfing, plantation, or protective layering to minimize erosion.

Stabilization measures reduced structural vulnerability during peak inflow periods and prevented lateral soil displacement. Stronger embankments also served as a deterrent to informal encroachments and dumping activities. By reinforcing structural integrity, the intervention reduced future maintenance costs and improved the long-term resilience of restored ponds.

### 4.2.3 Inlet and Outlet Rehabilitation

One of the critical hydrological challenges identified during baseline assessments was the disruption or absence of scientifically aligned inlet and outlet systems. In Phase II, existing inflow channels were corrected, reconstructed, or re-aligned to ensure smooth entry of rainwater and runoff into the pond basin. Where necessary, sediment traps and filtration measures were incorporated to reduce solid load during inflow.

Outlet systems were also strengthened or redesigned to prevent uncontrolled overflow during heavy rainfall. Controlled outflow mechanisms reduced the risk of embankment breaches and downstream erosion. By restoring balanced inflow–outflow dynamics, the intervention improved hydraulic efficiency, minimized stagnation, and enhanced seasonal water retention.

### 4.2.4 Greywater Diversion and Filtration Enhancements

In several intervention sites, untreated domestic greywater had historically entered ponds directly, contributing to organic pollution and eutrophication. Phase II introduced or upgraded greywater diversion channels to redirect wastewater away from direct entry points. In addition, filtration chambers were constructed to treat runoff before it entered the pond.

These filtration units reduced the entry of suspended solids, organic matter, and contaminants. By minimizing untreated wastewater inflow, the intervention significantly improved water quality parameters and reduced odor, stagnation, and vector breeding risks. This structural correction was essential in restoring ecological balance and preventing re-contamination of rejuvenated water bodies.

### 4.2.5 Reed-Bed and Nature-Based Treatment Systems

To complement mechanical filtration systems, Phase II expanded the use of reed-bed treatment systems as a nature-based solution for wastewater purification. Reed-bed systems leverage phytoremediation processes, where plant roots and associated microbial communities naturally absorb and break down pollutants.

These systems were strategically positioned to treat inflowing wastewater before it entered the main pond body. Reed-bed installations enhanced biological filtration capacity, reduced nutrient load (particularly nitrogen and phosphorus), and contributed to improved Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) levels. By integrating ecological engineering with conventional infrastructure, the intervention strengthened the sustainability and cost-effectiveness of water treatment mechanisms.

### 4.2.6 Animal Access Infrastructure

Livestock use of ponds is a common rural necessity; however, uncontrolled access often damages embankments and accelerates sedimentation. To address this, dedicated livestock ramps were constructed to provide controlled entry points for animals. These ramps were designed with slope stabilization and protective surfacing to prevent erosion.

By channeling livestock movement through designated access points, the intervention minimized structural damage to embankments and reduced contamination across the broader water spread. This measure balanced livelihood needs with ecological protection.

#### 4.2.7 Landscape Development and Protective Fencing

Selective fencing was installed around vulnerable pond peripheries to prevent encroachment, uncontrolled dumping, and vehicular intrusion. Landscaping efforts, including plantation and green belt development, were undertaken to strengthen ecological buffering around the pond boundary.

Peripheral vegetation reduced soil erosion, enhanced biodiversity, and improved aesthetic value. Green cover also contributed to micro-climatic regulation and stabilized embankments. Together, fencing and landscaping reinforced both environmental integrity and community perception of ponds as protected public assets rather than informal dumping zones.

#### 4.2.8 Drone-Based Monitoring and Documentation

To enhance monitoring transparency and spatial analysis, drone-based mapping and aerial photography were conducted before and after restoration activities. Drone imagery enabled accurate documentation of:

- Water spread area changes
- Depth and contour restoration
- Embankment stabilization
- Landscape transformation
- Inlet-outlet alignment

The use of drone technology improved evidence-based reporting, facilitated technical verification, and strengthened impact documentation. It also provided visual validation for stakeholders and funders, demonstrating the scale and quality of transformation.

### 4.3 Institutional Strengthening and Governance Integration

A defining characteristic of Phase II of the Pond Rejuvenation Program was its deliberate shift from infrastructure-led restoration to governance-embedded sustainability. While technical restoration addressed structural and ecological deficiencies, long-term impact required institutional ownership, accountability mechanisms, and financial convergence within decentralized governance structures. Accordingly, Phase II placed strong emphasis on institutional convergence, operational formalization, and sustainability integration.

This approach ensured that rejuvenated ponds were not treated as project assets but as protected and managed public resources under Panchayat oversight.

### 4.3.1 Gram Sabha Institutionalization and Community Mandate

To formalize community ownership and establish legal-social protection mechanisms, structured discussions were conducted during Gram Sabha meetings in each intervention village. Formal resolutions were passed recognizing rejuvenated ponds as protected public assets of the Gram Panchayat.

These resolutions served multiple governance functions:

- Officially prohibiting dumping of solid waste and greywater discharge into restored ponds.
- Preventing new encroachments or informal land-use conversion along pond peripheries.
- Clearly defining community responsibilities in safeguarding and maintaining water bodies.
- Mandating monitoring and periodic review of pond conditions within Gram Sabha forums.

By institutionalizing these commitments within Gram Sabha proceedings, the intervention ensured that pond protection norms were democratically endorsed and recorded within local governance registers. This formalization significantly strengthened accountability and reduced the risk of post-project neglect.

### 4.3.2 Development and Handover of Operation & Maintenance (O&M) Framework

Recognizing that restoration without maintenance leads to re-degradation, a comprehensive Operation & Maintenance (O&M) framework was developed for each

rejuvenated pond. The O&M plans were designed to be practical, locally implementable, and aligned with Panchayat administrative processes.

The framework included:

- Defined schedules for periodic de-weeding to prevent excessive aquatic vegetation growth.
- Recommended desilting frequency based on catchment sediment load.
- Embankment protocols to detect erosion, cracks, or seepage early.
- Assigned responsibilities for maintaining inlet and outlet channels.
- Clear drain maintenance roles to prevent greywater inflow.
- Monitoring and reporting templates to document maintenance activities.

These O&M plans were formally handed over to Gram Panchayats and Village Water & Sanitation Committees (VWSCs), ensuring that operational continuity did not depend on external facilitation. By embedding maintenance planning within local governance structures, the program strengthened sustainability and reduced long-term vulnerability.

### 4.3.3 Strengthening of Village Water & Sanitation Committees (VWSCs)

Village Water & Sanitation Committees (VWSCs) were identified as key institutional actors responsible for localized oversight of water and sanitation assets. Phase II invested in strengthening VWSC capacity through structured orientation sessions and practical guidance.

VWSC members were trained to:

- Monitor usage patterns of rejuvenated ponds and ensure compliance with protection norms.
- Identify and prevent greywater discharge violations.
- Facilitate periodic cleaning drives and maintenance reviews.
- Coordinate with Panchayat representatives on funding and labour allocation.
- Maintain basic documentation of maintenance activities and grievances.

Strengthened VWSCs acted as a bridge between community members and Panchayat leadership, ensuring that pond management remained participatory and accountable. Their involvement enhanced social monitoring and reduced dependency on external oversight mechanisms.

### 4.4 Ecological and Hydrological Outcomes

Phase II of the Pond Rejuvenation Program generated measurable ecological and hydrological improvements across the restored water bodies. The combination of structural restoration, hydrological correction, and nature-based treatment systems resulted in enhanced storage capacity, improved water quality, and strengthened environmental resilience. These outcomes demonstrate that the intervention not only rehabilitated degraded assets but also restored their functional role within the local ecosystem.

#### 4.4.1 Increased Water Holding Capacity

One of the most immediate and quantifiable outcomes of the intervention was the significant increase in water-holding capacity of the rejuvenated ponds. Through contour-based de-siltation and depth optimization, accumulated sediment layers were removed, restoring original basin profiles and expanding effective storage volume.

By increasing the vertical and horizontal storage dimensions, the ponds were able to retain substantially larger volumes of monsoon runoff. This enhanced retention capacity reduced seasonal overflow losses and extended water availability during dry periods. In practical terms, restored ponds now function more effectively as seasonal reservoirs, supporting irrigation needs, livestock usage, and ecological stability. The improved storage capacity also contributes to climate resilience by buffering against rainfall variability and extreme weather events.

#### 4.4.2 Improved Hydrological Flow and Reduced Stagnation

Correction and reconstruction of inlet and outlet systems improved the hydrodynamic balance of the ponds. Prior to intervention, disrupted inflow channels and blocked outlets had led to stagnation, uneven water spread, and localized contamination. Phase II restored natural water circulation patterns by ensuring smooth entry of rainwater and controlled exit of excess flow during peak rainfall events.

Improved circulation reduced stagnant zones, thereby minimizing mosquito breeding grounds and reducing risks of water-borne contamination. Enhanced hydrological flow also facilitated natural aeration, contributing to improved dissolved oxygen levels. Collectively, these improvements strengthened the functional efficiency of the ponds and reduced public health risks associated with stagnant water bodies.

#### 4.4.3 Strengthened Groundwater Recharge Potential

With restored depth, corrected hydrological pathways, and improved basin permeability, the rejuvenated ponds regained their groundwater recharge functionality. By retaining water

for longer durations and increasing infiltration time, the ponds now contribute more effectively to local aquifer replenishment.

Improved recharge potential has significant implications for rural water security, particularly in regions dependent on shallow aquifers for domestic and agricultural use. Although recharge is influenced by seasonal rainfall variability, the structural enhancements under Phase II improved the ponds' capacity to act as recharge structures during monsoon periods. This contributes to stabilizing groundwater tables and strengthening long-term water sustainability at the village level.

### 4.4.4 Enhanced Green Cover and Biodiversity

Peripheral plantation, green belt development, and landscaping initiatives contributed to increased green cover around rejuvenated ponds. Vegetative stabilization reduced soil erosion along embankments and improved sediment control during runoff events. The introduction of native plant species enhanced ecological diversity and created micro-habitats that support avian and aquatic biodiversity.

Improved vegetation density also contributes to micro-climatic regulation by reducing surface temperature fluctuations and providing shaded zones. Enhanced green cover strengthens the ecological integrity of water bodies and reduces the likelihood of soil degradation along pond peripheries.

### 4.4.5 Improved Water Quality Indicators

Post-restoration water quality assessments indicated measurable improvements in key environmental parameters. These included:

- Reduction in Biological Oxygen Demand (BOD), reflecting decreased organic pollution load.
- Reduction in Chemical Oxygen Demand (COD), indicating lower levels of oxidizable pollutants.
- Decrease in Total Suspended Solids (TSS), demonstrating improved sediment control and filtration.
- Stabilization of pH levels within acceptable ecological ranges.

These improvements are attributable to a combination of greywater diversion, filtration chambers, reed-bed treatment systems, and improved water circulation. Lower pollutant load enhances aquatic health, reduces odor and contamination risks, and improves the suitability of pond water for secondary usage.

# Social Return on Investment (SROI): My Clean City - Noida

## 1. Scope and Key Stakeholders

### 1.1 Purpose of the SROI Analysis

The purpose of this Social Return on Investment (SROI) analysis is to assess, measure, and articulate the social, economic, and environmental value created by the *Clean Village Project* implemented in selected Gram Panchayats of Hardoi district. The analysis is intended to support internal decision-making and external reporting to CSR leadership by demonstrating how project investments translate into measurable social outcomes.

### 1.2 Scope and Timeframe

- **Geographical scope:** Selected intervention Gram Panchayats under the Clean Village Project in Hardoi district, Uttar Pradesh
- **Comparison group:** Control villages captured under the KAP survey
- **Total Benefitted Population:** Approximately 2 Lacs beneficiaries i.e. ~40,000 households (Considering 5 members per HH)
- **Timeframe of analysis:**
    - Benefits estimated for 2 years post-intervention
    - Drop-off assumed at 10% per year to account for gradual reduction in behavior persistence and benefit intensity
- **Type of SROI:** Evaluative SROI based on primary KAP survey data and project monitoring reports

### 1.3 Key Stakeholders Included

Stakeholders were selected based on the principle of materiality, those who experienced significant change due to the intervention.

| Stakeholder Group | Role in the Project | Nature of Change |
|---|---|---|
| **Rural households (intervention villages)** | Primary beneficiaries | Time savings, reduced expenditure, improved health and hygiene |
| **Women (household managers of waste & water)** | Key change agents | Reduced drudgery, time savings |
| **Small & marginal farmers** | Users of compost | Reduced chemical fertilizer use |
| **Gram Panchayats** | Local governance | Improved village cleanliness and service delivery |

| | | |
|---|---|---|
| **HCL Foundation / CSR funder** | Investor | Social value creation |

Stakeholders such as government health systems and the environment are acknowledged but not monetized due to attribution and data limitations.

## 2. Mapping Outcomes and Identifying Material Outcomes for Monetization

### 2.1 Theory of Change

Project activities such as door-to-door waste collection, composting promotion, behavior change communication, and infrastructure support led to improved waste management practices. These changes resulted in time savings, cost reductions, and improved hygiene-related outcomes for households.

From the full outcome map, five outcomes were identified as material and suitable for monetization based on stakeholder significance, evidence availability, and avoidance of double counting.

### 2.2 Material Outcomes Selected for Monetization

**a. Time Saved – Due to Improved Waste Disposal**

Households experienced a reduction in time spent on waste handling and disposal due to the introduction of door-to-door collection and elimination of informal dumping practices.

- **Who benefits:** Households (especially women)
- **Type of value:** Economic (time saved converted to productive or leisure use)

**b. Reduction in Chemical Fertilizer Use**

Adoption of composting practices reduced household expenditure on chemical fertilizers among farming households.

- **Who benefits:** Small and marginal farmers
- **Type of value:** Direct cost savings

**c. Time Saved – Reduced Water Collection Effort**

Improved water and sanitation infrastructure reduced the time households spent collecting water.

- **Who benefits:** Women and adolescent girls
- **Type of value:** Economic and social (reduced drudgery)

**d. Reduction in Household Health Expenditure**

Improved sanitation, waste management, and hygiene behaviors reduced the incidence of sanitation-related illnesses, leading to lower out-of-pocket medical expenses.

- **Who benefits:** Households
- **Type of value:** Cost avoidance

**e. Productivity Gains from Reduced Sick Days**

Fewer illness episodes resulted in fewer workdays lost, improving household productivity.

- **Who benefits:** Working-age adults
- **Type of value:** Income-equivalent productivity gain

## 3. Assigning Financial Value to Project Outcomes

Financial proxies were selected using conservative, locally relevant benchmarks and aligned with SROI best practices.

a. **Time Saved – Due to Improved Waste Disposal:**
   - Weighted Average time saved: 19.9 minutes per household per day (Source – KAP Survey)
   - Monetized value: ₹0.53 per minute (₹10.47 saved per HH per day)
   - Annual saving per HH: ₹3,820 per year
   - Beneficiary households: 39,188 HHs
   - Total economic value generated (2 years): **₹29.09 crore**

b. **Reduction in Chemical Fertilizer Use**
   - Average annual saving per household (fertilizer use): ₹822.9
   - Fertilizer usage instances considered: 6 times per year*
   - Beneficiary households (calculated): 21,312 HHs
   - Total economic value generated (2 years): **₹3.64 crore**

**Based on the dominant paddy - wheat cropping system in Hardoi district and standard fertilizer application practices (2–3 applications per crop cycle), an average of 6 fertilizer applications per annum has been considered for estimation. This represents a realistic and agronomically aligned assumption for irrigated, double-cropped farms in the region.*

c. **Time Saved – Reduced Water Collection Effort**
   - Average time saved: 23.26 minutes per household per day
   - Monetized value: ₹0.53 per minute (approx. ₹12.21 saved per HH per day)
   - Annual saving per HH: ₹4,457.36 per year
   - Beneficiary households: 32,690 HHs
   - Total economic value generated (2 years): **₹29.14 crore**

d. **Reduction in Household Health Expenditure**

- Average annual money saved per household: ₹562.25
- Average reduction instances considered: ~1.88 times per year
- Beneficiary households (calculated): 31,066 HHs
- Total economic value generated (2 years): **₹3.49 crore**

e. **Productivity Gains from Reduced Sick Days**
   - Average days saved per household: 2.50 days per year
   - Daily wage considered: ₹252 (minimum wage benchmark)
   - Annual income loss avoided per HH: ₹630.86
   - Beneficiary households (calculated): 29,645 HHs
   - Total economic value generated (2 years): **₹3.74 crore**

Note – The effective beneficiary households for each outcome were derived by multiplying the total beneficiary households by the percentage of respondents reporting positive change in the KAP survey, ensuring outcome-specific attribution.

Summary Table:

| Outcomes | Financial Proxy | Intervention - Total Value |
|---|---|---|
| **Time Saved in waste disposal** | Minimum Wages (₹0.53/min) | ₹ 29,09,87,912.4 |
| **Reduction in cost of cultivation - due to reduction in use of chemical fertilizers** | Reduction in Cost or Savings (Average saving- ₹822/year) | ₹ 3,64,26,395.9 |
| **Time saved due to reduced drudgery - due to water collection** | Minimum Wages – Female (₹0.53/min) | ₹ 29,14,25,634.5 |
| **Reduced OPE on health** | No. of Instances of reduced illness * Minimum Wages per day (Average saving – ₹562/year) | ₹ 3,49,33,424.4 |
| **Reduced productivity loses due to illness** | No. of Workdays saved * Minimum Wages per day. (Average Saving – ₹630/year) | ₹ 3,74,03,451.8 |
| **Grand Total** | | ₹ 69,11,76,819.0 |

**Annual value per outcome** was calculated as:

*Number of beneficiary households × Average benefit per household × Financial proxy*

All values were aggregated at the project level and projected for two years, before applying adjustments.

# 4. Calculating Percentage Monetary Value Attributed to the Project

To avoid over-claiming impact, three standard SROI adjustments were applied.

## 4.1 Deadweight

Deadweight refers to the proportion of outcomes that would have occurred even in the absence of the project intervention. It helps ensure that the SROI analysis does not overstate impact by isolating the net change directly attributable to the program.

**Deadweight Assumption: 3%**

A deadweight value of **3%** has been applied uniformly across outcomes.

**Rationale for 3% Deadweight**

- A control group comparison (non-intervention villages) was conducted through the KAP survey.
- Findings indicate minimal spontaneous behavioural improvement in control villages during the same time period.
- There was no comparable structured intervention related to:
    - Solid and liquid waste management (SLWM)
    - Composting adoption
    - Behaviour change communication on sanitation
    - Water access facilitation or system strengthening
- Any minor positive changes observed in control areas were largely attributable to:
    - Gradual awareness diffusion
    - Routine government messaging
    - Natural seasonal variation

Given the limited organic change observed without intervention, a conservative but realistic deadweight factor of 3% has been applied.

### 4.2 Attribution

Attribution accounts for the contribution of other actors or external factors (e.g., government schemes, personal motivation).

a. **Time Saved – Due to Improved Waste Disposal:**

Out of 100%, how much of the change would you credit to this project alone?

| Contributor | % |
|---|---|
| Clean Village Program (training, bins, compost pits) | 85% |
| Municipal waste collection | 5% |
| Community self-initiative | 10% |

**b. Reduction in Chemical Fertilizer Use**

Out of 100%, how much of the change would you credit to this project alone?

| Contributor | % |
|---|---|
| Clean Village Program (compost pits/drums, demonstrations, sustained handholding) | 70% |
| Government agriculture ecosystem (fertilizer availability/prices, extension messages, soil health card awareness, etc.) | 20% |
| Farmer self-initiative / peer learning | 10% |

**c. Time Saved – Reduced Water Collection Effort**

Out of 100%, how much of the change would you credit to this project alone?

| Contributor | % |
|---|---|
| Clean Village/Water intervention support (overhead tank repair/support, community systems strengthening, local facilitation) | 35% |
| Government water schemes (e.g., Jal Jeevan Mission / panchayat system operations) | 60% |
| Community self-initiative (collective maintenance, user discipline, minor repairs) | 5% |

**d. Reduction in Household Health Expenditure (OPE)**

Out of 100%, how much of the change would you credit to this project alone?

| Contributor | % |
|---|---|
| Clean Village Program (clean environment, reduced open dumping, behaviour change, cleaner water practices) | 50% |
| Government health system & vaccination/PHC access | 30% |

| | |
|---|---|
| Household behaviour / personal preventive practices beyond project | 20% |

**e. Productivity Gains from Reduced Sick Days**

Out of 100%, how much of the change would you credit to this project alone?

| Contributor | % |
|---|---|
| Clean Village Program (cleaner surroundings, reduced illness triggers) | 55% |
| Government health interventions (seasonal disease control, PHC response, awareness drives) | 25% |
| Household self-care & hygiene/behaviour improvements | 20% |

## 4.3 Drop-off

Drop-off represents the reduction in outcome benefits over time due to behavioural fatigue, reduced monitoring intensity, infrastructure wear and tear, or gradual decline in community engagement after active project support tapers.

In community-led sanitation and behaviour change programs, benefits often persist, but the intensity of impact may slightly reduce once structured handholding and field-level reinforcement decrease.

**Drop-off Assumption: 10% per year**

A **10% annual drop-off rate** has been applied to Year 2 benefits onward.

**Rationale for 10% Drop-off**

The assumption is based on the following considerations:

- Behaviour change outcomes (waste segregation, composting, hygiene practices) may slightly weaken without continuous reinforcement.
- Community infrastructure (compost pits, waste systems, minor repairs) may experience reduced efficiency over time.
- Volunteer or committee engagement may decline after intensive facilitation phases.
- Agricultural substitution practices may partially revert if market prices fluctuate.

However:

- The program activated local committees and strengthened systems, which supports sustainability.
- Government schemes (water supply, sanitation frameworks) continue to operate.

- Community ownership mechanisms were built into the intervention design.

Therefore, a moderate and conservative 10% drop-off has been considered appropriate, reflecting partial decline, but not full erosion of benefits.

## 4.4 Adjusted Social Value

| Outcome | 2-year Gross Value | Attribution to Project | Year 1 Adjusted | Year 2 Adjusted (10% drop-off) | Total Adjusted (2 years) |
|---|---|---|---|---|---|
| Time saved - waste disposal | 29,09,87,912.40 | 85% | 11,99,59,766.89 | 10,79,63,790.20 | 22,79,23,557.09 |
| Fertilizer cost reduction | 3,64,26,395.90 | 70% | 1,23,66,761.41 | 1,11,30,085.27 | 2,34,96,846.68 |
| Time saved – water collection | 29,14,25,634.50 | 35% | 4,94,69,501.46 | 4,45,22,551.31 | 9,39,92,052.77 |
| Reduced OPE on health | 3,49,33,424.40 | 50% | 84,71,355.42 | 76,24,219.88 | 1,60,95,575.29 |
| Reduced productivity loss | 3,74,03,451.80 | 55% | 99,77,370.77 | 89,79,633.69 | 1,89,57,004.46 |

**Total Adjusted Social Value: ₹38,04,65,036.28 = ~₹38.05 crore**

## 5. SROI Calculation:

To calculate the SROI ratio, you need the total project investment (cost):

$$\text{SROI} = \frac{\text{Total Adjusted Social Value}}{\text{Total Project Investment}}$$

- Total Adjusted Social Value = **₹38.05 crore**
- Total Project Expenditure = **₹16.17 crore**
- SROI = **2.35** *(*₹2.35 of social value generated for every ₹1 invested)

The Clean Village Program in Hardoi generated ₹2.35 in measurable social and economic value for every ₹1 invested over a two-year period, after applying conservative adjustments for deadweight (3%), attribution, and 10% drop-off in Year 2.