Enduring Value

Impact Assessment Report

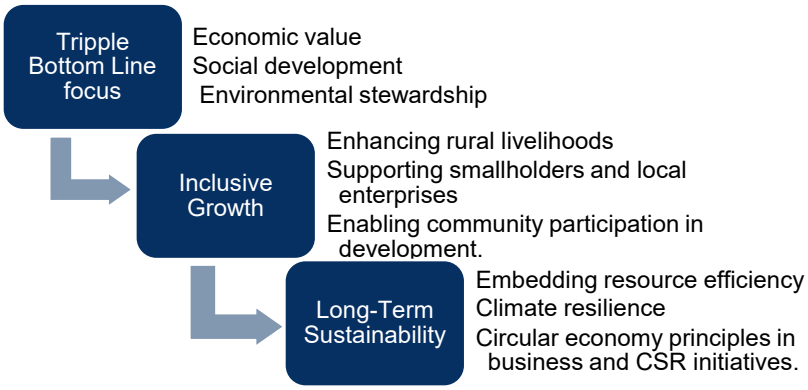
Mission Sunhera Kal Decentralised Solid Waste Management Programme

FY 2025-2026

Impact Practice
by CSRBOX

Table of Contents

1. Programme Background and Overview



ITC Limited is one of India's leading private sector companies with diversified businesses across FMCGs (Fast Moving Consumer Goods), hotels, paperboards and speciality papers, packaging, agri business and information technology. It is a major FMCG marketer and a key player in India's paperboard, packaging, agri and hospitality sectors[1].

ITC's sustainability vision[2], anchored in the triple bottom line, creates enduring economic, social, and environmental value through inclusive growth—strengthening livelihoods, community resilience, and business integration—positioning it as a long-term partner in India's sustainable development. Its flagship CSR platform, Mission Sunehra Kal (MSK)[3], fosters this by improving livelihoods, social infrastructure, and environmental stewardship in rural/urban communities via structured, long-term programmes.

ITC Mission Sunehra Kal

- **Horizon I**
  Sustainable Livelihoods Today
- Water stewardship
- Climate-smart agriculture
- Biodiversity conservation
- Social forestry
- Animal husbandry
- **Horizon II**
  Social Infrastructure for Tomorrow
- Education
- Skilling for youth
- Public health (MCH, nutrition, sanitation, waste management)
- Women's empowerment

A key component of MSK is ITC's Decentralised Solid Waste Management (SWM) Programme, which plays a pivotal role in environmental stewardship while creating economic opportunities for local communities. This initiative aligns with national priorities, such as the Swachh Bharat Mission. It is integrated into ITC's broader commitment to sustainability, reducing landfill waste, encouraging circular-economy practices, and improving waste segregation at the source. The current report captures the highlights of the impact assessment done in the districts of Bhadradri Kothagudem and Medak (Telangana), Coimbatore (Tamil Nadu), East Godavari and Guntur (Andhra Pradesh) and Mysuru and Bengaluru (Karnataka).

2. Programme Components

Key Programme Components	Decentralised Waste Management Initiative
	Liquid Waste Management Initiative
	Well-being of Waste Collectors
	Green temple
	Rural and Urban Waste Management Models

The Decentralised Waste Management initiative strengthened rural/semi-urban solid waste management through key components designed for sustainability, scalability, and effectiveness—a multi-pronged approach empowering

[1] https://itcportal.com/about-itc.html
[2] https://itcportal.com/content/dam/itc-corporate/open-pdfs/sustainability-reports/itc-sustainability-report-2025.pdf
[3] https://itcportal.com/content/dam/itc-corporate/pdfs/report-and-accounts/ITC-Report-and-Accounts-2025.pdf

households, schools, collectors, SHGs, temples, and civic bodies with decentralised practices for better hygiene/sanitation via hands-on training, PRI/VWMC collaborations, and community ownership.

Key strategic focus:

- Community empowerment via awareness, training, capacity building, and behaviour change campaigns.
- Comprehensive waste solutions (solid, liquid, faecal waste + Green Temple recycling) and livelihood enhancement for collectors/SHG members.

3. Assessment Objectives and Scope of Work

The primary objective of the assessment undertaken by CSRBOX was to evaluate the success of the programmes in terms of implementation, coverage, and achievement of intended outcomes and impacts. The findings below will also support informed decision-making for effective programme implementation.

1. Assess programme outcomes using OECD-DAC and KAB frameworks, and evaluate the Social Return on Investment (SROI)
2. Gather quantitative and qualitative feedback from stakeholders, including partner NGOs, on programme performance, experiences, and implementation challenges.
3. Document impactful human-interest stories from end beneficiaries and provide evidence-based suggestions and recommendations drawn from the study findings.

4. Research Methodology

This research study employs a mixed-methods approach that combines quantitative and qualitative data collection tools to provide robust statistical evidence and a rich, nuanced understanding of programme outcomes and community perspectives.

- Quantitative tools: Structured questionnaires administered to Treatment and Control groups to measure programme impact.
- Qualitative tools: In-Depth Interviews (IDIs), Key Informant Interviews (KIIs), and Focus Group Discussions (FGDs) to capture contextual insights and lived experiences.

The beneficiary questionnaire measures programme impact on key objectives among treatment group participants, while the control questionnaire captures baseline data from demographically similar individuals who received no programme intervention. **Key Impact Indicators** are assessed via dual comparisons:

- **Pre- vs Post-intervention** (within treatment group)
- **Treatment vs Control groups** (cross-group benchmarking)

4.1 Assessment Framework

The evaluation applied the **OECD-DAC** criteria to assess the effectiveness, efficiency, impact, and sustainability of ITC's waste management programme. These six universal standards: relevance, coherence, effectiveness, efficiency, impact and sustainability—provide a globally recognised framework for measuring intervention merit.

Assessment approach:

This structured methodology evaluated the programme's contribution to outcomes, accounted for external factors influencing results, and applied normative benchmarks for development interventions, ensuring a comprehensive, credible analysis of performance across all key dimensions.

Complementing the OECD-DAC criteria, the evaluation applied the Knowledge, Attitude, and Behaviour (KAB) framework to assess how the waste management programme influenced community behaviour change. Knowledge alone is insufficient—positive attitude shifts drive meaningful, lasting behavioural transformation in waste segregation, hygiene practices, and sanitation habits.

KAB Model Core Logic:

- **Knowledge** provides an awareness foundation.
- **Attitudes** shape willingness to act.
- **Behaviour** delivers sustained practice change.

5. Programme Sampling

Simple random sampling ensured representative coverage across all socio-economic strata among beneficiaries.

5.1 Quantitative Sampling

- **Bhadradri Kothagudem, Medak (Telangana)**
- **Coimbatore (Tamil Nadu)**
- **East Godavari, Guntur (Andhra Pradesh)**
- **Mysuru, Bengaluru (Karnataka)**

Study Coverage: 9 districts across 4 states. Structured treatment-control design with 95% CL and 5.05% MOE. Primary field surveys captured authentic responses across socio-economic strata, enabling a credible programme impact evaluation.

Location	Total Households	Treatment Group	Control Group
Bhadradri Kothagudem	1,40,642	310	42
Medak		38	
Coimbatore	16,000	328	39
East Godavari	4,155	325	48
Guntur	10,845	330	43
Mysuru (Outreach)	1,04,170	356	40
Mysuru (MYKAPS)	95,964	351	40
Mysuru (Sneha)	1,48,563	359	40
Bengaluru	**Qualitative Study**		
Total	5,20,339	2,397	292

5.2 Qualitative Sampling

In-Depth Interviews (IDIs), Key Informant Interviews (KIIs), and Focus Group Discussions (FGDs) targeted key stakeholders actively involved in programme implementation.

Stakeholder	Total Interaction	Type of Interaction	Stakeholder	Total Interaction	Type of Interaction
Waste Workers / SHG / Green workers / Waste Collectors	**27**	IDI / FGD	*MRF/ Segregation Yard's Head / Staff*	**7**	IDI
GP Heads / PRI Representative	**17**	IDI	*School HM/Teachers*	**6**	IDI
Panchayat Development Officers	**4**	IDI	*School Students*	**4**	IDI / FGD
Nagar Nigam / Swachh Bharat Mission Representative	**6**	IDI	*SCRAP Dealers / Waste Aggregators*	**6**	IDI
Mohalla committees / Village Waste management committees	**5**	IDI / FGD	*Bulk Waste Generators*	**8**	IDI
Lighthouse intervention - staff/representative	**1**	IDI	*Informal Waste Community*	**5**	IDI / FGD

LHI - community	**1**	IDI / FGD	*Green Temple Priests / Representatives*	**15**	IDI
Youth / Village Leaders	**1**	IDI / FGD	*Implementation Team*	**10**	KII
Community members - Bangalore	**4**	IDI / FGD	*ITC Team*	**1**	IDI
Total	**128**				

6. Key Findings of the Impact Assessment

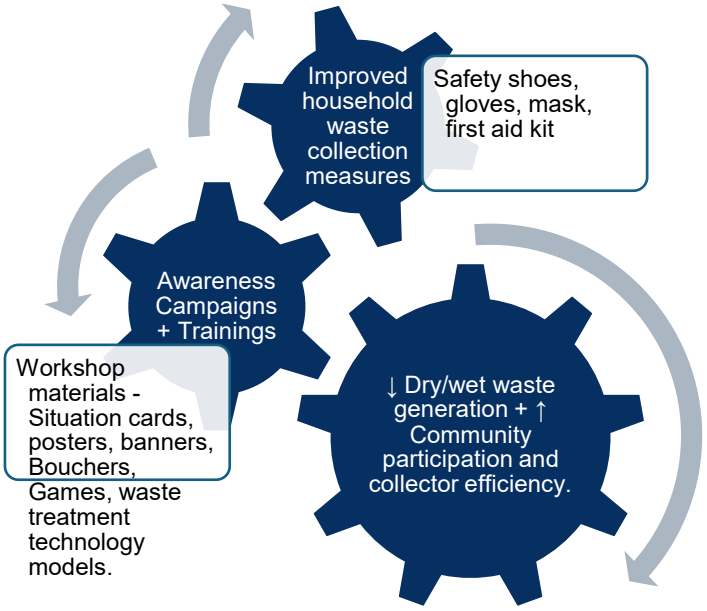
This section evaluates intervention outcomes across **environmental, social, and economic** dimensions. Together, these provide a holistic view of programme effectiveness, community resonance, and long-term sustainability potential.

6.1 Environmental Impact

The Solid Waste Management (SWM) programme transforms waste practices across rural and semi-urban communities by replacing harmful open dumping and burning with systematic household-level solutions. These interventions create cleaner rural ecosystems while addressing both immediate pollution challenges and long-term climate resilience. By fostering circular waste management principles, the programme establishes a foundation for sustained environmental health and agricultural productivity across the intervention districts.

- ↓ Methane / GHG emissions
- ↓ Landfills/Open dumping
- ↑ Segregation / Composting
- ↑ Organic soil fertility
- ↓ Plastic pollution
- ↓ Water Body, Soil and air contamination

6.1.1 Reduction in waste generation



Reducing household waste generation contributes significantly to environmental sustainability by lowering the volume of waste requiring collection and disposal, conserving landfill space, and encouraging responsible consumption practices. Interventions that promote source segregation, home composting, user fee collection, which helps in meeting the O&M requirements and community awareness play an important role in shifting waste management practices toward more sustainable, circular systems. The programme implemented across treatment villages combined awareness campaigns, composting training, and improved waste-handling infrastructure, which together encouraged households to manage waste more efficiently at the source. Educational materials, such as pamphlets and wall paintings, reinforced behavioural change, while providing protective gear, such as gloves and masks, improved the safety and operational efficiency of waste collectors. These measures collectively strengthened community participation and supported the reduction of both dry and wet waste generation at the household level.

Dry waste reduction in treatment villages				
Location	Pre-intervention			
	Less than 1 kg	1 Kg - 3 Kg	3 Kg - 5 Kg	More than 5 kg

Guntur	56%	44%	0%	0%
East Godavari	74%	21%	4%	0%
Coimbatore	82%	18%	0%	0%
Mysore (MYKAPS)	65%	28%	5%	1%
Mysore (OUTREACH)	88%	10%	2%	0%
Mysore (SNEHA)	77%	13%	10%	0%
Bhadradri - Medak	53%	42%	5%	0%
AVERAGE	**71%**	**25%**	**4%**	**0%**
Location	**Post-intervention**			
	Less than 1 kg	**1 Kg - 3 Kg**	**3 Kg - 5 Kg**	**More than 5 kg**
Guntur	55%	45%	0%	0%
East Godavari	80%	17%	2%	0%
Coimbatore	98%	2%	0%	0%
Mysore (MYKAPS)	73%	21%	4%	1%
Mysore (OUTREACH)	92%	6%	2%	0%
Mysore (SNEHA)	84%	12%	3%	1%
Bhadradri - Medak	58%	38%	4%	0%
AVERAGE	**77%**	**20%**	**2%**	**0%**

Treatment villages, indicate a shift towards lower waste generation, as households in the lowest category increased from 71% to 77%, while those producing More than 1 kg declined from 29% to 22%, showing an overall reduction in dry waste generation. Coimbatore, East Godavari, Mysore Outreach and Mysore SNEHA recorded strong shifts into the “less than 1 kg” band, while Bhadradri–Medak showed gradual improvement despite higher initial waste volumes.

In Guntur, the lowest waste band remained almost stable, but households moved from higher categories into the 1–2 kg range, indicating more efficient waste management even where reductions were modest. In Bengaluru, qualitative findings show that households practice source segregation, compost wet waste at the household or community level, and send dry waste to Material Recovery Facilities for further processing.

- The programme has led to a measurable shift towards lower daily dry waste quantities in most treatment locations.
- Bengaluru demonstrates an operational model where segregation, composting and MRF-linked dry waste management function together as an integrated system.
- Although the specific composition of dry waste varies across locations, the project mainly collected and facilitated the segregation and channelisation of key dry waste categories, including paper, cardboard, plastics, glass, and multilayered packaging.

Wet waste reduction in treatment villages				
Location	**Pre-intervention**			
	Less than 1 kg	**1.1 Kg - 3 Kg**	**3.1 Kg - 5 Kg**	**More than 5 kg**
Guntur	55%	45%	0%	0%
East Godavari	71%	21%	7%	0%
Coimbatore	82%	18%	0%	0%
Mysore (MYKAPS)	64%	25%	10%	0%
Mysore (OUTREACH)	91%	8%	1%	0%
Mysore (SNEHA)	76%	17%	7%	0%
Bhadradri - Medak	59%	37%	4%	0%
AVERAGE	**71%**	**24%**	**4%**	**0%**
Location	**Post-intervention**			
	Less than 1 kg	**1.1 Kg - 3 Kg**	**3.1 Kg - 5 Kg**	**More than 5 kg**
Guntur	57%	44%	0%	0%
East Godavari	78%	18%	4%	0%
Coimbatore	95%	6%	0%	0%
Mysore (MYKAPS)	74%	21%	5%	1%
Mysore (OUTREACH)	91%	7%	2%	0%

Mysore (SNEHA)	84%	11%	3%	2%
Bhadradri - Medak	68%	29%	3%	0%
AVERAGE	**78%**	**19%**	**2%**	**0%**

Across treatment villages, wet waste generation followed a similar reduction trend, closely linked to home composting and better organic waste management practices. The proportion of households generating less than 1 kg of wet waste rose from 71% to 78%, while those producing 1–3 kg fell from 24% to 19%, and those in the 3.1–5 kg band decreased from 4% to 2%.

Coimbatore showed the strongest shift, with households in the "less than 1 kg" category increasing from 82% to 95%, followed by East Godavari (71% to 78%) and Bhadradri–Medak (59% to 68%), indicating a growing uptake of household-level practices. The Mysore clusters also improved, with Mysore SNEHA rising from 76% to 84% and Mysore MYKAPS from 64% to 74%, while in Guntur, the lowest band moved only slightly (55% to 57%) and some households shifted into the 2.1–3 kg range, pointing to mixed but evolving patterns of wet waste generation.

- The intervention has driven a visible shift towards lower daily wet waste quantities, primarily through increased adoption of composting and organic waste management.
- Location-specific trends highlight particularly strong progress in Coimbatore, East Godavari, Bhadradri–Medak and the Mysore clusters, with Guntur showing partial but uneven improvements.

6.1.2 Waste diversion rate

Waste diversion from landfills via home composting cuts methane emissions and leachate risks while transforming organic waste into soil-enriching compost. The programme empowered treatment villages through awareness, hands-on demonstrations, and community engagement to identify and process compostable waste at source.

Key Programme Actions:

- Awareness campaigns on compostable waste identification
- Practical composting demonstrations and training
- Community mobilisation for household-level adoption

Dual Impact: ↓ Landfill pressure + ↑ Soil regeneration through circular organic waste management.

Location	Percentage of wet waste used in composting	Quantity of wet waste produced in households (Treatment group)					
		Less than 1 kg	1 Kg - 2 Kg	2.1 Kg - 3 Kg	3.1 Kg - 4 Kg	4.1 Kg - 5 Kg	More than 5 Kg
Guntur	**Less than 10%**	1%	0%	0%	0%	0%	0%
	10-50%	42%	18%	14%	0%	0%	0%
	50-100%	14%	6%	5%	0%	0%	0%
East Godavari	**Less than 10%**	0%	0%	0%	0%	0%	0%
	10-50%	39%	7%	3%	2%	0%	0%
	50-100%	38%	7%	3%	1%	0%	0%
Coimbatore	**Less than 10%**	2%	0%	0%	0%	0%	0%
	10-50%	6%	0%	0%	0%	0%	0%
	50-100%	85%	3%	0%	0%	0%	0%
Mysore (MYKAPS)	**Less than 10%**	17%	2%	3%	1%	0%	0%
	10-50%	27%	3%	5%	1%	0%	0%
	50-100%	30%	3%	5%	2%	0%	0%
Mysore (OUTREACH)	**Less than 10%**	6%	0%	0%	0%	0%	0%
	10-50%	15%	1%	0%	0%	0%	0%
	50-100%	72%	5%	0%	1%	0%	0%
Mysore (SNEHA)	**Less than 10%**	0%	0%	0%	0%	0%	0%
	10-50%	28%	1%	3%	1%	0%	1%

	50-100%	55%	2%	5%	2%	0%	2%
Bhadradri - Medak	**Less than 10%**	1%	0%	0%	0%	0%	0%
	10-50%	33%	11%	3%	1%	0%	0%
	50-100%	35%	11%	3%	0%	0%	0%

This table shows how households in the treatment villages linked wet waste composting practice with the amount of wet waste they generated. It helps indicate whether higher composting use was associated with lower wet waste remaining for disposal, which implies greater diversion of organic waste away from landfills.

Most households produce <1 kg wet waste daily yet show strong composting diversion. Coimbatore excels with 85% of <1 kg households composting 50-100%; Mysore Outreach (72%) and SNEHA (55%) follow closely. Mysore MYKAPS shows gradual uptake (30% 50-100%, 27% 10-50%); Guntur indicates partial diversion (42% <1 kg, 14% 2.1-3 kg at 10-50%).

Higher producers (1-2 kg, 2.1-3 kg) compost at lower rates, extending diversion beyond low generators. Dry waste goes to MRFs for segregation into plastics, glass, metals and multi-layered plastics, replacing open dumping and enabling recycler sales for resource recovery.

- Composting patterns reflect effective behaviour change from awareness and guidance, with substantial diversion even at small household volumes.
- MRF segregation creates circular economy opportunities by transforming dry waste into marketable recyclables.

In Guntur, interactions with MRF staff and **waste workers** noted that segregated dry waste from households reaches sorting points for plastics, paper and metals separation. Recovered materials flow to local scrap dealers handling iron, plastic, paper and cardboard, then to Hyderabad and Vijayawada recycling markets.

In **Bhadradri-Medak**, interactions with the **Gram Panchayat officials** reported operational compost yards diverting wet waste, with dry recyclables sold for modest revenue. School students demonstrated practical wet/dry segregation and composting for kitchen gardens, showing applied knowledge.

Gram Panchayat officials in **East Godavari** confirmed that segregation points and composting units enable local organic processing. Green workers noted fluctuating diversion due to mixed household waste requiring extra sorting, emphasising source segregation's key role in efficiency.

Promotion Strategy:

- Awareness sessions on composting benefits
- Hands-on demonstrations for practical learning
- Continuous community engagement for sustained adoption

% of households practising home composting						
Location	**Treatment group**				**Control group**	
	Pre-intervention		**Post-intervention**			
	No	**Yes**	**No**	**Yes**	**No**	**Yes**
Guntur	84%	16%	48%	52%	95%	5%
East Godavari	90%	10%	74%	26%	87%	13%
Coimbatore	86%	14%	50%	50%	97%	3%
Mysore (MYKAPS)	77%	23%	23%	77%	90%	10%
Mysore (OUTREACH)	79%	21%	17%	83%	68%	32%
Mysore (SNEHA)	82%	18%	32%	68%	95%	5%
Bhadradri - Medak	41%	59%	45%	55%	100%	0%
AVERAGE	**77%**	**23%**	**41%**	**59%**	**90%**	**10%**

The findings indicate a clear improvement in composting adoption across treatment villages. On average, households practising home composting increased from **23% pre-intervention to 59% post-intervention**, while the proportion not practising composting declined from **77% to 41%**. In comparison, **control villages reported only 10% of households practising composting**, indicating that the observed improvements are largely associated with the programme's awareness and behavioural change efforts.

Location-wise trends show notable increases in several areas. **Mysore (under OUTREACH)** recorded one of the greatest improvements, with composting adoption rising from **21% to 83%**, followed by **Mysore (under MYKAPS)** increasing from **23% to 77%** and **Mysore (under SNEHA)** from **18% to 68%**. **Guntur** and **Coimbatore** also showed significant shifts, where the proportion of households practising composting increased from **16% to 52%** and **14% to 50%**, respectively.

Organised door-to-door collection prevents open dumping/burning, boosts segregation at source, enables recycling, and cuts landfill waste volumes. The intervention built sustainable systems through structured stakeholder engagement. Consistent service transforms waste handling practices across treatment villages.

Implementation Model:

- Engaged: Waste workers + SHG members + Panchayat/municipal systems
- Process: Regular household collection → Transportation to segregation centres
- Outcome: Responsible waste management replacing haphazard disposal

Entities responsible for door-to-door waste collection (Treatment group)							Entities responsible for door-to-door waste collection (Control group)		
	Pre-intervention			Post-intervention					
	Waste worker	SHG worker	Municipal / Panchayat worker	Waste worker	SHG worker	Municipal / Panchayat worker	Waste worker	SHG worker	Municipal / Panchayat worker
Guntur	33%	0%	0%	66%	35%	75%	81%	23%	93%
East Godavari	34%	0%	0%	16%	1%	88%	21%	4%	68%
Coimbatore	8%	0%	0%	38%	13%	12%	0%	0%	41%
Mysore (MYKAPS)	2%	0%	0%	25%	0%	16%	0%	0%	40%
Mysore (OUTREACH)	8%	0%	0%	23%	2%	50%	0%	0%	0%
Mysore (SNEHA)	0%	0%	0%	30%	0%	33%	5%	0%	0%
Bhadradri - Medak	54%	0%	0%	28%	27%	70%	42%	20%	55%
AVERAGE	**20%**	**0%**	**0%**	**32%**	**11%**	**49%**	**21%**	**7%**	**42%**

Pre-intervention, only 20% of treatment village households reported waste workers for collection, indicating the absence of organised systems. Post-intervention, this rose to 32% waste workers, 11% SHG-led and 49% municipal/panchayat collection, establishing formalised mechanisms.

Mysore locations reported higher waste collection through municipal or panchayat workers after the intervention, whereas there was no such involvement before. **These workers were mostly SHG members who were employed either full-time or part-time by the panchayat and paid monthly by the government.**

In Bhadradri–Medak, Panchayats enable mobilisation, supervision and inclusive collection across all households. Officials are confident that the systems will sustain without external support, showing institutional strength. Control villages show weaker involvement (21% waste workers, 7% SHG, 42% municipal), confirming intervention-driven improvements.

Beneficiary perception on open dumping scenario (Treatment group)							Beneficiary perception on open dumping scenario (Control group)		
Location	Pre-intervention			Post-intervention					
	Always	Never	Sometimes	Always	Never	Sometimes	Always	Never	Sometimes
Guntur	26%	9%	65%	14%	66%	20%	7%	84%	9%
East Godavari	8%	4%	89%	7%	7%	85%	13%	2%	85%
Coimbatore	49%	23%	28%	12%	68%	19%	31%	3%	67%
Mysore (MYKAPS)	23%	38%	38%	17%	37%	46%	58%	17%	25%
Mysore (OUTREACH)	22%	46%	31%	7%	49%	44%	55%	26%	19%
Mysore (SNEHA)	27%	31%	42%	9%	29%	62%	49%	28%	23%
Bhadradri - Medak	17%	27%	56%	20%	28%	52%	29%	21%	50%
AVERAGE	**25%**	**25%**	**50%**	**12%**	**41%**	**47%**	**35%**	**26%**	**40%**

A reduction in open dumping is an important indicator of improved waste management practices, as it prevents environmental pollution, reduces health risks, and limits the amount of waste reaching landfills. Through improved segregation, home composting, and organised waste collection systems, the intervention enabled households to manage waste more responsibly.

The findings indicate a noticeable improvement in the open dumping scenario across treatment villages after the intervention. On average, households reporting **very frequent open dumping declined from 25% pre-intervention to 12% post-intervention**, while the share of households reporting **absence of open dumping increased from 25% to 41%**. This shift suggests that improved collection systems and waste diversion practices have contributed to reducing unmanaged waste disposal.

6.1.3 Greenhouse Gas (GHG) Emissions Avoided

Location	Total quantity of wet waste used in composting (kg)	GHG emissions avoided annually (kgCO2e)	Cost of GHG emissions avoided annually (INR)
Guntur	939845.87	963717.95	7537912.72
East Godavari	561792.07	576061.59	4505780.91
Coimbatore	2275295.08	2333087.57	18248711.07
Mysore (MYKAPS)	13616445.84	13962303.56	109208949.79
Mysore (OUTREACH)	14017429.13	14373471.83	112424984.61
Mysore (SNEHA)	21538825.01	22085911.17	172749371.36
Bhadradri - Medak	5158021.00	5289034.73	41369242.97
TOTAL	**58107653.99**	**59583588.40**	**466044953.43**

Home composting diverts biodegradable waste from landfills, cutting methane emissions while producing soil amendments for sustainable agriculture. Treatment villages compost 58107653.99 kg wet waste annually, avoiding 59583588.40 $kgCO_2e$ emissions (INR 466044953.43 carbon cost). Among the locations, Mysore (SNEHA) contributed the highest composting volume at 21,538,825.01 kg, followed by Mysore (OUTREACH) at 14,017,429.13 kg and Mysore (MYKAPS) at 13,616,445.84 kg. These three locations also recorded the highest emissions avoided and the largest monetary climate benefits, showing that the Mysore sites accounted for most of the overall impact.

In Coimbatore, intervention drove 36% more households to home composting, diverting organic waste from open dumping/burning and cutting carbon emissions. Community members now sensitise roadside dumpers, reducing open burning. These shifts reinforce quantitative evidence of substantial emission reductions through improved composting.

In comparison, **control villages generated approximately 1234332.59 kg of mixed waste**, which is likely to be disposed of through landfilling or open burning due to the absence of systematic composting practices. Such disposal methods contribute directly to greenhouse gas emissions and environmental pollution. The adoption of home composting in treatment villages, therefore, demonstrates a clear environmental benefit by diverting organic waste from conventional disposal pathways.

6.1.4 Resource Recovery Rate

Compost production due to home composting (Treatment group) (kg)						
Location	**1 Kg - 2 Kg**	**2.1 Kg - 3 Kg**	**3.1 Kg - 4 Kg**	**4.1 Kg - 5 Kg**	**Less than 1 kg**	**More than 5 Kg**
Guntur	25%	8%	10%	1%	50%	6%
East Godavari	27%	26%	6%	2%	38%	1%
Coimbatore	25%	10%	4%	3%	37%	21%
Mysore (MYKAPS)	19%	34%	17%	0%	27%	2%
Mysore (OUTREACH)	9%	11%	0%	3%	41%	35%
Mysore (SNEHA)	17%	10%	17%	0%	37%	19%
Bhadradri - Medak	37%	9%	8%	5%	36%	5%
AVERAGE	**23%**	**15%**	**9%**	**2%**	**38%**	**13%**

Home composting enables the recovery of organic waste as nutrient-rich compost, reducing dependence on chemical fertilisers while improving soil health and generating potential economic value through savings or small-

scale sales. By converting household kitchen waste into compost, communities are able to utilise organic resources locally, supporting circular resource flows and strengthening sustainable waste management practices.

Treatment villages show steady compost production: 38% of households yield <1 kg per cycle, 23% produce 1-2 kg, and 13% generate >5 kg, reflecting varying household waste volumes and composting capacity.

- Bhadradri–Medak schools implement compost pits and kitchen gardens, creating closed-loop waste models that embed circular economy practices. The programme drives behavioural change, institutional integration and environmental stewardship in schools.
- Green Temples manage flower waste through composting, external processing and incense conversion, demonstrating diverse resource recovery approaches.

The produced compost is largely utilised locally and households use compost for multiple purposes.

- **65% of households apply compost in home gardens**, supporting small-scale horticulture and kitchen gardening practices.
- **Agricultural fields account for 40% of compost use**, particularly in locations such as **Mysore MYKAPS (92%)** and **Mysore Sneha (91%)**, where compost is integrated into farming activities.
- A smaller proportion of households **share compost with neighbours (4%)**, **use it in community gardens (2%)**, or **sell it (4%)**, indicating emerging but limited economic utilisation.

In contrast, composting activity remains limited in control villages, where adoption levels are lower, and compost use is primarily restricted to **home gardens (62%)** and **agricultural fields (38%)**, with virtually **no reported sale of compost**. This comparison highlights the role of the intervention in promoting household composting practices that enable organic waste recovery and productive use.

Scrap dealers and Panchayat officials in **East Godavari** scrap dealers and Panchayat officials report improved recovery of plastics, cardboard and metals for sale, though limited to high-value items, while low-value plastics accumulate in yards, showing uneven market linkages.

Qualitative interactions in Guntur further highlighted that composting practices are gradually being integrated into local waste management routines. Waste workers and bulk waste generators noted that households use compost for kitchen gardens/greenery, converting 10–50% daily organic waste and integrating practices into routines on a modest scale.

Overall, the programme boosts segregation, composting (23% to 59% adoption) and collection, reducing dry/wet waste, diverting 581.08 lakh kg wet waste annually (avoiding 595.84 lakh kgCO_2e), with treatment villages outperforming controls.

6.2 Social Impact

The social dimension of the Decentralised Solid Waste Management (DSWM) programme spans community awareness and participation, community ownership, health outcomes, improvements in living conditions, and equity and dignity in service provision. These aspects are central to ensuring that behaviour change around waste management is sustained beyond the programme period and that benefits are distributed fairly across different social groups.

6.2.1 Awareness and Community Participation

Home composting awareness rose sharply in treatment villages from 27% full awareness pre-intervention to 56% post-intervention, with non-awareness dropping from 54% to 18%. Guntur (15% to 90%), Coimbatore (16% to 85%) and East Godavari (13% to 63%) showed the largest gains; Mysuru sites progressed moderately. Control villages lag at 16% full awareness and 65% non-awareness, confirming intervention impact.

- Treatment villages achieved 2x full awareness of composting processes vs. controls.
- Strongest gains in Guntur, Coimbatore and East Godavari; Mysuru shows steady progress.
- Intervention drives community understanding of composting's waste management role.

Awareness of Home composting & its processes									
Location	Pre-intervention			Post-intervention			Control		
	Yes	No	Partially	Yes	No	Partially	Yes	No	Partially
Guntur	15%	75%	10%	90%	2%	9%	0%	47%	53%

East Godavari	13%	77%	10%	63%	17%	10%	6%	89%	4%
Coimbatore	16%	78%	6%	85%	6%	9%	13%	85%	3%
Mysore (MYKAPS)	34%	50%	16%	30%	40%	30%	40%	25%	35%
Mysore (OUTREACH)	39%	53%	8%	46%	34%	21%	25%	68%	7%
Mysore (SNEHA)	35%	40%	25%	46%	24%	30%	23%	58%	19%
Bhadradri - Medak	34%	7%	59%	35%	6%	59%	2%	81%	17%
AVERAGE	**27%**	**54%**	**19%**	**56%**	**18%**	**24%**	**16%**	**65%**	**20%**

Awareness of mixed waste disposal's health and environmental risks improved markedly in treatment villages, rising from 32% full awareness to 59% post-intervention, with non-awareness dropping from 45% to 13%. Guntur (22% to 88%) and Coimbatore (28% to 90%) showed the largest gains, East Godavari rose from 14% to 57%, while Mysore sites progressed moderately; Bhadradri–Medak remained stable from a high baseline. Controls lag at 24% full awareness and 45% non-awareness.

Coimbatore Green Temples shifted from burning dry waste and dumping wet waste—causing odours, mosquitoes and health risks—to source segregation and on-site composting of all biodegradables using provided composters, eliminating burning and improving cleanliness.

- Treatment villages doubled the awareness of mixed waste risks vs. controls.
- Green Temples demonstrate practical segregation-composting transformation.
- The programme drives understanding of improper disposal's health/environmental impacts.

Awareness of health/environmental effects of mixed waste disposal									
Location	**Pre-intervention**			**Post-intervention**			**Control**		
	Yes	**No**	**Somewhat**	**Yes**	**No**	**Somewhat**	**Yes**	**No**	**Somewhat**
Guntur	22%	71%	8%	88%	3%	9%	0%	35%	65%
East Godavari	14%	67%	19%	57%	16%	26%	6%	89%	4%
Coimbatore	28%	65%	7%	90%	5%	4%	26%	56%	18%
Mysore (MYKAPS)	37%	39%	24%	37%	27%	36%	33%	10%	57%
Mysore (OUTREACH)	43%	37%	21%	52%	17%	31%	41%	34%	25%
Mysore (SNEHA)	42%	32%	26%	50%	12%	38%	58%	33%	9%
Bhadradri - Medak	39%	7%	55%	39%	8%	55%	2%	55%	43%
AVERAGE	**32%**	**45%**	**23%**	**59%**	**13%**	**28%**	**24%**	**45%**	**32%**

54% of treatment village respondents reported clear perception changes about waste management post-intervention, 31% partial change, and 15% no change, indicating broad awareness impact.

On average, the proportion of households reporting at-source segregation **increased from 33% before the intervention to 62% after the intervention**, while those reporting **no segregation declined significantly (40% to 15%**). Strong improvements are particularly visible in **Guntur, waste segregation practice at household level increased from 30% to 90%, Coimbatore (15% to 89%),** followed by **East Godavari (11% to 59%),** while other locations reported more partial changes.

- Awareness activities reshaped waste perceptions across most beneficiaries.
- Guntur and Coimbatore demonstrate the deepest perception transformation.

Households practicing source segregation of waste									
Location	**Pre-intervention**			**Post-intervention**			**Control**		
	Yes	**No**	**Partially / Sometimes**	**Yes**	**No**	**Partially / Sometimes**	**Yes**	**No**	**Partially / Sometimes**
Guntur	30%	50%	20%	90%	0%	10%	2%	67%	30%
East Godavari	11%	54%	34%	59%	8%	33%	11%	66%	23%
Coimbatore	15%	72%	13%	89%	3%	8%	23%	72%	5%
Mysore (MYKAPS)	28%	44%	28%	52%	28%	20%	58%	20%	22%
Mysore (OUTREACH)	70%	14%	17%	34%	44%	23%	25%	64%	11%
Mysore (SNEHA)	36%	40%	24%	62%	18%	20%	49%	42%	9%
Bhadradri - Medak	38%	4%	58%	50%	1%	49%	10%	50%	40%

AVERAGE	33%	40%	28%	62%	15%	23%	25%	54%	20%

Treatment villages show higher awareness of solid/liquid waste disposal risks (57% clear, 33% partial, 10% none) vs. controls (42% clear, 31% none). Guntur (91%) and Coimbatore (94%) show highest awareness; East Godavari/Mysore show moderate levels with ongoing dumping/burning near water sources despite reductions.

- Treatment villages significantly outperform controls in risk awareness.
- Guntur and Coimbatore achieved near-universal understanding of disposal risks.

Field observations confirm awareness gaps where behaviour lags: East Godavari dumping/burning persists near irrigation water sources, indicating that while programme messaging reaches communities, translating understanding into sustained practice remains a challenge in select locations.

Awareness of risks associated with improper disposal of solid & liquid waste						
Location	Treatment group			Control group		
	No	Yes	Somewhat	No	Yes	Somewhat
Guntur	1%	91%	9%	0%	88%	12%
East Godavari	11%	51%	38%	62%	11%	28%
Coimbatore	2%	94%	5%	21%	31%	49%
Mysore (MYKAPS)	19%	36%	45%	25%	43%	33%
Mysore (OUTREACH)	16%	46%	38%	27%	48%	25%
Mysore (SNEHA)	9%	44%	47%	21%	74%	5%
Bhadradri - Medak	15%	35%	50%	60%	0%	40%
AVERAGE	**10%**	**57%**	**33%**	**31%**	**42%**	**27%**

6.2.2 Community Ownership

Community ownership (responsibility of the entire community – the beneficiaries and the government authorities) is vital for the sustainability of waste management programmes**, as it helps sustain practices such as composting and resource reuse beyond external support.** When communities feel responsible, waste management becomes a **shared social practice rather than an imposed activity.** This collective involvement strengthens environmental awareness and mutual accountability. It also helps embed **sustainable behaviours into daily household routines**.

Community willingness for long-term continuance of home-composting			
Location	No	Yes	Maybe
Guntur	48%	38%	14%
East Godavari	16%	52%	32%
Coimbatore	1%	94%	5%
Mysore (MYKAPS)	57%	19%	24%
Mysore (OUTREACH)	17%	83%	0%
Mysore (SNEHA)	65%	15%	20%
Bhadradri - Medak	3%	31%	66%
AVERAGE	**30%**	**47%**	**23%**

Willingness to continue home composting in the long-term varies across locations but is relatively favourable overall, with **47% of respondents indicating willingness**. **Coimbatore (94%)** and **Mysore (under OUTREACH) (83%)** show the strongest positive responses, suggesting stronger behavioural adoption and programme influence in these treatment contexts. In contrast, **Mysore (SNEHA) (65% No)** and **Mysore (MYKAPS) (57% No)** report higher resistance, indicating limited readiness for sustained continuation. **East Godavari (32% Maybe)** and **Bhadradri–Medak (66% Maybe)** show higher uncertainty, suggesting that while awareness exists, long-term adoption may depend on continued guidance, effective management and support by the panchayat or visible benefits.

Community willingness for long-term continuance of nutritional gardening			
Location	No	Yes	Maybe
Guntur	55%	35%	10%
East Godavari	12%	38%	50%
Coimbatore	41%	42%	17%
Mysore (MYKAPS)	69%	15%	16%

Mysore (OUTREACH)	71%	15%	14%
Mysore (SNEHA)	75%	9%	16%
Bhadradri - Medak	9%	16%	75%
AVERAGE	**47%**	**24%**	**28%**

Only 24% of respondents are willing to continue nutritional gardening, with 47% unwilling and 28% uncertain; Mysore clusters show high resistance (69–75% "No"). Coimbatore (42% Yes) and Guntur (35% Yes) fare better, while East Godavari (50% Maybe) and Bhadradri–Medak (75% Maybe) reflect uncertainty due to practical constraints.

Home composting willingness (47% Yes) far exceeds gardening (24% Yes), as composting seems more feasible with less effort/resources, directly boosting community ownership and long-term sustainability.

- Gardening faces high resistance, especially in Mysore (69–75% unwilling).
- Composting shows stronger ownership potential (47% vs. 24% willingness).
- Feasibility gaps limit gardening commitment despite recognised benefits.

6.2.3 Health Impacts

Health impacts are captured through self-reported incidence of waste-related illnesses and the perceived occurrence of flies, mosquitoes, rodents, and foul odour before and after the intervention.

Incidence of waste-related illnesses							
Location	**Pre-intervention**		**Post-intervention**		**Control**		
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Sometimes**
Guntur	28%	72%	0%	100%	70%	23%	7%
East Godavari	20%	80%	4%	96%	6%	47%	47%
Coimbatore	8%	92%	6%	94%	3%	92%	5%
Mysore (MYKAPS)	11%	89%	2%	98%	20%	7%	73%
Mysore (OUTREACH)	19%	81%	8%	92%	55%	29%	16%
Mysore (SNEHA)	14%	86%	1%	99%	16%	79%	5%
Bhadradri - Medak	19%	81%	13%	87%	12%	45%	43%
AVERAGE	**17%**	**83%**	**5%**	**95%**	**26%**	**46%**	**28%**

Treatment villages saw waste-related illness drop from 17% pre-intervention to 5% post-intervention. Largest reductions occurred in Guntur (28% to 0%), East Godavari (20% to 4%), Mysore SNEHA (14% to 1%) and MYKAPS (11% to 2%); Coimbatore fell marginally (8% to 6%); Bhadradri–Medak (19% to 13%) and Mysore Outreach (19% to 8%) improved gradually.

Controls report higher persistent illness (26% regular, 28% occasional), especially in Guntur (70%) and Mysore Outreach (55%). Treatment villages' sharp declines vs. controls confirm intervention's role in reducing exposure through better segregation, collection and disposal.

- Illness incidence fell 3x in treatment villages vs. controls.
- Guntur and East Godavari show near-elimination of waste-related health issues.
- Improved practices directly lower community health risks from waste exposure.

Occurrence of flies, mosquitoes, rodents, or foul smell pre- and post-project interventions									
Location	**Pre-intervention**			**Post-intervention**			**Control**		
	No	**Sometimes**	**Yes**	**No**	**Sometimes**	**Yes**	**No**	**Sometimes**	**Yes**
Guntur	5%	18%	77%	65%	13%	21%	81%	9%	9%
East Godavari	18%	59%	24%	31%	52%	18%	23%	49%	28%
Coimbatore	65%	12%	23%	81%	6%	14%	59%	15%	26%
Mysore (MYKAPS)	42%	38%	20%	47%	41%	12%	5%	38%	57%
Mysore (OUTREACH)	40%	33%	27%	47%	39%	14%	16%	32%	52%
Mysore (SNEHA)	30%	43%	27%	30%	57%	13%	53%	12%	35%
Bhadradri - Medak	30%	54%	16%	28%	55%	17%	33%	48%	19%
AVERAGE	**33%**	**37%**	**31%**	**47%**	**38%**	**16%**	**39%**	**29%**	**32%**

Treatment villages saw environmental nuisances (flies, mosquitoes, rodents, foul smell) improve, with "no occurrence" rising from 33% to 47% and frequent cases falling from 31% to 16%. Guntur improved most dramatically ("Yes" 77% to 21%, "No" 5% to 65%), Coimbatore strengthened favourable conditions ("No" 65% to 81%), and Mysore MYKAPS/Outreach reduced frequent nuisance (20-27% to 12-14%).

East Godavari showed incremental gains ("No" 18% to 31%, "Yes" 24% to 18%), while Mysore SNEHA and Bhadradri–Medak had modest reductions in frequent cases but more "Sometimes" reports, indicating ongoing partial improvement.

- Guntur and Coimbatore demonstrate the sharpest nuisance reductions.
- All treatment sites show net environmental gains post-intervention.
- "Sometimes" persistence signals areas for further behavioural focus.

Control villages report twice the frequency of nuisance (32% pests/foul smell) vs. treatment villages (16%), with 39% nuisance-free. Mysore MYKAPS (57%) and Outreach (52%) controls far exceed treatment counterparts (12%, 14%); East Godavari controls (28%) exceed post-intervention (18%). Treatment sites show lower persistent nuisance and greater "no occurrence" shifts due to segregation, composting and decentralised management.

- Control villages have 2x the frequency of environmental nuisance vs. treatment sites.
- Mysore control clusters show particularly high pest/foul smell persistence.
- Intervention practices drive measurable local environmental improvements.

6.2.4 Improvement in Living Conditions

Beneficiary perception of household cleanliness									
Location	Pre-intervention			Post-intervention			Control		
	Somewhat	No	Yes	Somewhat	No	Yes	Somewhat	No	Yes
Guntur	15%	7%	78%	9%	4%	87%	9%	77%	14%
East Godavari	54%	19%	27%	35%	19%	27%	47%	36%	17%
Coimbatore	7%	72%	22%	7%	14%	79%	5%	67%	28%
Mysore (MYKAPS)	29%	48%	23%	35%	55%	10%	73%	7%	20%
Mysore (OUTREACH)	33%	42%	25%	39%	29%	31%	26%	13%	61%
Mysore (SNEHA)	33%	29%	38%	46%	39%	15%	9%	51%	40%
Bhadradri - Medak	62%	26%	12%	51%	14%	34%	45%	38%	17%
AVERAGE	**33%**	**35%**	**32%**	**32%**	**25%**	**40%**	**31%**	**41%**	**28%**

Treatment villages report improved household cleanliness post-intervention, with "Yes" responses rising from 32% to 40% and "No" falling from 35% to 25%. Coimbatore showed sharp gains (22% to 79% "Yes"); Guntur improved (78% to 87%); Bhadradri–Medak rose (12% to 34%). East Godavari reduced uncertainty ("Maybe" 54% to 35%); Mysore Outreach gained modestly, while MYKAPS/SNEHA declined slightly.

Coimbatore plains use cow dung for pest control; intervention improved shared spaces via regular collection. Hilly areas maintained pre-existing cleanliness despite infrequent collection due to terrain/low density.

- Coimbatore and Guntur lead in perceived cleanliness gains.
- Intervention reduces dissatisfaction across treatment sites.
- Local practices like cow dung complement programme effects.

Control villages report higher dissatisfaction with household cleanliness (41% "No") vs. treatment villages (25% "No"), with only 28% "Yes" vs. 40%. Guntur (77% "No") and Coimbatore (67% "No") controls lag sharply; Mysore Outreach (61% "Yes") and SNEHA (40% "Yes") perform relatively better but less consistently than treatment counterparts. The pattern highlights structured waste management systems' role in driving cleanliness improvements.

- Control villages show 1.6x higher dissatisfaction rates than treatment sites.
- Guntur/Coimbatore controls have particularly poor cleanliness perceptions.
- Treatment interventions enable consistent gains in household hygiene.

6.2.5 Equity and Dignity in Service Provision

Location	Group	Male	Female	General	OBC	SC	ST	Others (Caste)

Guntur	Treatment	37%	63%	24%	47%	9%	19%	0%
	Control	42%	58%	33%	49%	14%	5%	0%
East Godavari	Treatment	33%	67%	6%	56%	31%	5%	1%
	Control	34%	66%	0%	81%	15%	4%	0%
Coimbatore	Treatment	10%	90%	2%	2%	35%	43%	18%
	Control	28%	72%	0%	0%	0%	0%	100%
Mysore (MYKAPS)	Treatment	22%	78%	6%	57%	18%	19%	0%
	Control	25%	75%	12%	60%	3%	20%	5%
Mysore (Outreach)	Treatment	23%	77%	19%	30%	23%	25%	0%
	Control	30%	70%	11%	87%	2%	0%	0%
Mysore (SNEHA)	Treatment	16%	84%	7%	58%	11%	19%	5%
	Control	40%	60%	0%	72%	14%	14%	0%
Bhadradri–Medak	Treatment	38%	61%	4%	50%	6%	38%	3%
	Control	43%	57%	4%	50%	6%	38%	–
Average	**Treatment**	**26%**	**74%**	**10%**	**43%**	**19%**	**24%**	**4%**
	Control	**35%**	**65%**	**9%**	**57%**	**8%**	**12%**	**18%**

Equity and dignity in service provision are reflected in the gender and caste composition of beneficiaries across treatment locations. Women comprise 74% of treatment village beneficiaries vs. 26% men, with the highest participation in Coimbatore (90%), Mysore SNEHA (84%) and MYKAPS (78%); Guntur (63%), East Godavari (67%) and Bhadradri–Medak (61%) also show female majority. Controls have a lower female share (65%).

Caste inclusion is broad: OBC 43%, ST 24%, SC 19%, General 10%. Coimbatore/Bhadradri–Medak emphasises ST/SC; other sites favour OBC. Controls skew more OBC (57%) with lower ST/SC, confirming inclusive reach to marginalised groups.

- The programme achieves strong female engagement (74% average).
- Marginalised castes (ST/SC/OBC) form 86% of beneficiaries.
- Treatment areas exceed controls in women/marginalised inclusion.

6.3 Economic Impact

6.3.1 Job Creation

The SWM programme generated significant economic benefits through employment formalisation and supplementary livelihood opportunities for marginalised community members. While most waste collectors were long-term panchayat employees—serving for years with government stipends of ₹5,000-6,000 monthly in rural areas (₹15,000-18,000 in larger Nagar Panchayats)—the intervention professionalised their roles. Working 7 AM-2 PM daily, these experienced workers gained structured employment contracts, protective gear, and operational efficiency improvements that enhanced both dignity and income reliability. Additionally, waste collectors had limited time and bandwidth to pursue secondary livelihood opportunities, as a significant portion of their time was dedicated to waste collection and related activities. This constrained their ability to diversify income sources and supplement their earnings through alternative economic activities.

New Employment Avenues Created:

- **SHG Women:** Door-to-door awareness campaigns provided supplementary income and skill-building opportunities
- **Waste Segregation Facilities:** Part-time jobs (3 days/week, 10 AM-2 PM) established for waste sorting operations
- **Supervisor Roles:** Oversight positions emerged to coordinate collection and segregation logistics

In Mysore, PRI representatives candidly explained workforce realities: "No one would hire us... Young adults and middle-aged people refuse waste-related work." The programme thus served as an employer of last resort for aged workers facing acute discrimination, while creating supplementary opportunities for SHG women. This dual approach delivered immediate economic relief alongside sustainable community infrastructure development.

6.3.2 Cost Recovery Model

Overall, the findings illustrate that inadequate waste management practices not only affect environmental conditions but also translate into recurring healthcare expenditures for rural households. Strengthening community-level waste

management systems, promoting segregation practices, and improving awareness around sanitation can therefore play a critical role in reducing both health risks and the associated economic burden on communities.

Beneficiary cost savings in household vegetable expenses from nutritional gardening								
Treatment Villages								
Perceived cost saving	**Guntur**	**East Godavari**	**Coimbatore**	**Mysore (MYKAPS)**	**Mysore (OUTREACH)**	**Mysore (SNEHA)**	**Bhadradri - Medak**	**AVERAGE**
No	36%	22%	61%	80%	86%	82%	11%	**54%**
Somewhat	23%	63%	7%	17%	12%	18%	81%	**32%**
Yes	41%	15%	32%	3%	2%	0%	8%	**14%**
Control Villages								
No	100%	29%	0%	60%	40%	14%	0%	**35%**
Somewhat	0%	71%	60%	40%	20%	86%	0%	**40%**
Yes	0%	0%	40%	0%	40%	0%	0%	**11%**

Across treatment villages, nutritional gardening yields limited but measurable cost savings on vegetable purchases: 54% of households report no reduction, 32% note some savings, and 14% achieve clear expenditure cuts. This pattern indicates gardens primarily supplement rather than replace market purchases, constrained by small scale, seasonal cycles, and limited crop diversity.

Guntur leads with 41% of households reporting clear savings, followed by Coimbatore at 32%, reflecting stronger integration of home-grown produce into daily consumption. Mysore clusters (MYKAPS 80%, Outreach 86%, SNEHA 82%) show minimal financial impact, suggesting early-stage establishment or low yields focused on nutritional diversity rather than expenditure reduction.

East Godavari (63%) and Bhadradri–Medak (81%) households report partial substitution of purchased vegetables, gradually strengthening household food security without yet delivering substantial cost reductions.

- Guntur and Coimbatore demonstrate the highest garden utilisation for daily consumption.
- Mysore clusters need scale-up for meaningful financial returns.
- East Godavari/Bhadradri–Medak show promising partial substitution patterns.

Comparison with control villages further highlights the intervention's emerging impact. While 35% households in control villages reported no savings and 11% reported clear savings, a substantial share only experienced marginal benefits, indicating that without structured programme support, nutritional gardening may remain inconsistent or dependent on individual household initiative.

Overall, the results suggest that nutritional gardening is beginning to generate economic benefits for households, particularly through a partial reduction in vegetable purchases. However, the relatively high proportion of households reporting limited or no savings indicates the need for continued technical support, crop diversification, and guidance on garden management to help households maximise production and translate nutritional gardens into more tangible economic and dietary benefits.

Cost recovery from compost sale (treatment group)					
Location	**Less than Rs. 10**	**Rs. 11 - Rs. 50**	**Rs. 51 - Rs. 100**	**Rs. 101 - Rs. 200**	**More than 500**
Guntur	67%	0%	33%	0%	0%
East Godavari	0%	0%	83%	17%	0%
Coimbatore	0%	27%	27%	9%	27%
Mysore (MYKAPS)	0%	0%	0%	0%	0%
Mysore (OUTREACH)	89%	11%	0%	0%	0%
Mysore (SNEHA)	0%	0%	91%	0%	9%
Bhadradri - Medak	75%	25%	0%	0%	0%
AVERAGE	**33%**	**9%**	**33%**	**4%**	**5%**

Compost sales generate limited financial returns for most households, with 33% recovering <Rs. 10 and 33% Rs. 51–100, indicating small-scale self-use rather than income generation. East Godavari shows the strongest earnings (83% Rs. 51–100, 17% Rs. 101–200) due to local manure demand; Coimbatore diversifies (27% >Rs. 500). Guntur (67% <Rs. 10) and Bhadradri–Medak (75% <Rs. 10) reflect minimal commercial activity.

- East Godavari leads in compost revenue from organic manure markets.
- Coimbatore shows diverse, higher-value sales potential.
- Guntur/Bhadradri–Medak remains household-focused with low returns.

Mysore Outreach shows 89% households earning <Rs. 10 from compost (internal use); SNEHA has 91% in Rs. 51–100 (emerging sales); MYKAPS reports no recovery (low adoption/production or missing markets). Overall, composting primarily delivers environmental/household benefits over income; quality awareness, aggregation and farmer linkages could boost future economic value.

- Outreach prioritises self-use; SNEHA shows sales potential.
- MYKAPS is limited by production/market access
- Market strengthening needed for income viability

Beneficiary willingness to pay for waste collection service (treatment group)			
Location	Perceived beneficiary willingness		
	May be	No	Yes
Guntur	34%	64%	2%
East Godavari	55%	41%	4%
Coimbatore	8%	71%	21%
Mysore (MYKAPS)	24%	75%	1%
Mysore (OUTREACH)	19%	74%	7%
Mysore (SNEHA)	44%	52%	4%
Bhadradri – Medak	45%	54%	2%
AVERAGE	**33%**	**62%**	**6%**

Treatment villages show low willingness to pay for waste collection: 62% unwilling, 33% uncertain ("may be"), 6% willing, viewing it as a public duty. Coimbatore leads (21% willing); Mysore MYKAPS/Outreach resist strongly (75%/74%); East Godavari/Bhadradri–Medak show openness (55%/45% "may be") if reliable. Building service reliability and visible cleanliness could foster acceptance of user fees.

- 62% unwilling reflects evolving payment norms in rural areas
- Coimbatore shows the highest readiness (21%)
- Conditional openness (33%) is tied to proven service quality.

While households expressed willingness to pay for waste collection services, they remained hesitant about the proposed fees. In Mysore locations, panchayats already levy a waste-related tax as part of the overall household tax paid by beneficiaries, complicating additional charges. Panchayat officials noted widespread non-payment of household taxes, questioning compliance with a separate waste fee.

6.3.3 Revenue generation from waste

The SWM programme established revenue streams through systematic segregation and sale of dry recyclables, creating supplementary income for panchayats and waste workers across treatment locations. Mysuru panchayats generate ₹3,000–4,000 per transaction from selling segregated dry recyclables 1–2 times yearly to scrap dealers, retaining proceeds as performance incentives for waste workers supplementing their government stipends.

There was no user fee collection at any location other than Mysore. Although the Panchayat attempted to collect user fees from households, it did not receive any contributions from the beneficiaries. The Panchayat also explored the collection of household taxes; however, households were largely unwilling to make payments. As a result, the model was found to be impractical and financially unsustainable in these locations.

Location-Specific Revenue Models: (Per GP)

- **Mysuru** - Recyclable sales fund 6 months of salaries; ₹3-4 thousand per sale retained by panchayat
- **Guntur**: Waste workers directly earn ~₹1,000/month from recyclables
- **East Godavari**: GPs generate avg. ₹2,617.5/month (annual sales), retained by panchayat
- **Coimbatore**: GPs generate avg. ₹2,714/month (annual sales), panchayat-managed
- **Bhadradri-Medak**: Dry recyclables sold at ₹5-15/kg through GP interactions; panchayat workers handle collection, while panchayat heads handle the sale of the recyclables.
- **Bengaluru** - Segregated waste is systematically sold to the Material Recovery Facility (MRF), generating consistent revenue of ₹2,000-3,000 per month for panchayats

This revenue mechanism transforms waste from a liability into an asset, incentivising sustained segregation practices while providing supplementary household income in resource-constrained rural economies. The panchayat-managed model ensures community-level reinvestment potential alongside direct worker benefits. **Coimbatore GP officials** note minimal recyclable revenue (plastic/paper/metals) insufficient for sustainability, with waste workers' ₹5,000/month honorarium unsupplemented due to low waste volumes; NGO highlights limited MRF feasibility but plans to channel waste from 2 neighbouring panchayats to Thekkampatty's Micro Compost Centre with plastic shredders for better utilisation. **Mysore PRI representatives** note self-funding limitations—"We do not generate so much waste that can be sold or suffice for waste workers' salary"—as recyclable sales often fail to cover the second 6 months' wages, causing delays and underscoring the need for supplementary funding to sustain worker pay and programme continuity.

7. Social Return on Investments (SROI)

Social Return on Investment (SROI) is a comprehensive framework for **measuring and accounting for social, environmental, and economic value beyond traditional financial metrics**[4]. It assesses how activities create positive change by assigning monetary values to social and environmental outcomes. SROI helps in reducing inequality, minimising environmental degradation, and improving well-being by incorporating broader costs and benefits into decision-making. For example, an SROI ratio of 3:1 signifies that an investment of ₹1 generates ₹3 of social value. More than just a financial measure, SROI provides a narrative of change through qualitative, quantitative, and financial insights.

Indicators	Location applied to	Rationale	Proxy Estimation	Source
Percentage difference in HHs reporting waste-related illnesses pre- and post-intervention	Coimbatore, Guntur, East Godavari, Mysuru	Improved waste management practices contribute to reduced exposure to pathogens and vectors, leading to lower incidence of waste-related illnesses	Average annual out-of-pocket healthcare expenditure per household on treatment of common waste-related illnesses (₹/HH/year)	Secondary research
Percentage difference in HHs segregating waste pre- and post-intervention	All	Segregation at source enables efficient waste processing, reduces landfill burden, and improves overall system effectiveness	Estimated cost savings to Gram Panchayat/ULB on collection, transportation, and processing of mixed waste due to improved source segregation (₹/tonne of solid waste)	Secondary research
Percentage difference in HHs practising composting pre & post intervention (utilised in home gardens/agricultural fields)	All	Increased adoption of composting reduces dependence on chemical fertilisers and promotes sustainable waste utilisation	Market value of compost produced or equivalent expenditure avoided on chemical fertilisers (₹/HH/year)	Secondary research
Avoided carbon emissions due to a reduction in wet waste that ends up in landfills	All	Composting and decentralised processing reduce methane emissions from landfills, thereby lowering the carbon footprint	Social Cost of Carbon (SCC) applied to estimated tonnes of CO_2 equivalent emissions avoided through diversion of wet waste from landfills (₹/tonne CO_2e)	Secondary research
Volume of biogas generated (m^3/day)	Bhadradri-Medak	Biogas systems convert organic waste into energy, providing an alternative renewable fuel source and reducing reliance on conventional fuels	Monetary value of LPG expenditure avoided through substitution with biogas generated (₹ per m^3 of biogas converted to LPG equivalent)	Secondary research
Avoided Carbon Emissions due to reduced LPG usage from the GT initiative	Bhadradri-Medak	Substitution of LPG with biogas reduces fossil fuel consumption and associated emissions	Monetised value of avoided greenhouse gas emissions using the Social Cost of Carbon (₹ per tonne of CO_2 equivalent reduced)	Secondary research

[4] A Guide to SROI by The SROI Network

The percentage of workers who are regularly utilising PPEs	Coimbatore	Increased utilisation of PPE reduces workers' exposure to waste-related health risks, leading to a lower incidence of occupational illnesses and associated out-of-pocket healthcare expenditure.	Avoided annual out-of-pocket healthcare expenditure on treatment of occupational health issues among green workers due to the use of PPE (₹/worker/year)	Secondary research
Percentage of households reporting improved knowledge of waste management	Bengaluru	Increased awareness enhances adoption of sustainable waste practices, reflecting outcomes typically achieved through structured Information, Education, and Communication (IEC) interventions and behaviour change campaigns.	Equivalent cost of delivering IEC campaigns per household required to achieve similar improvements in awareness and behaviour (₹/HH/year)	Secondary research
Percentage of households reporting no current open dumping	Bengaluru	Reduction in open dumping decreases environmental contamination and public health risks, while reducing the need for municipal intervention in clearing and remediating informal dump sites	Avoided public expenditure on collection, transportation, and scientific disposal of waste from open dumping sites (₹/tonne of waste)	Secondary research
Deadweight 1 A portion of households would have experienced reduced healthcare expenditure, irrespective of the intervention	Coimbatore, Guntur, East Godavari, Mysuru	Low-income households rely on public healthcare, resulting in inherently low out-of-pocket expenditure irrespective of intervention impact. Deadweight reflects pre-existing reliance on public healthcare systems rather than changes in disease incidence.	Average annual household expenditure on treatment of waste-related illnesses	Secondary research
Deadweight 2 A portion of emissions reduction would have occurred without the intervention due to existing composting practices	All locations	Some households were already practising composting prior to the intervention, contributing to baseline emissions reduction	Social cost of carbon per tonne of emissions avoided	Secondary research
Deadweight 3 Some adoption of biogas systems would have occurred without the intervention due to existing government support	Bhadradri-Medak	Schemes such as SBM-G Phase II and GOBARdhan promote biogas adoption through subsidies and infrastructure support	Market value of equivalent LPG replaced or cost savings from biogas generation	Secondary research
Deadweight 4 A share of emissions reduction would have occurred due to pre-existing waste management practices among temples	Bhadradri-Medak	A proportion of the temples were already practising composting or waste diversion prior to the intervention	Social cost of carbon per tonne of emissions avoided	Secondary research
Deadweight 5 A portion of households would have improved knowledge independent of the intervention	Bengaluru	Some households already had awareness due to prior campaigns and information exposure	Equivalent cost of IEC campaigns per household	Secondary research

Deadweight 6 A portion of households would have avoided open dumping independent of the intervention	Bengaluru	Some households already used alternative disposal methods due to existing practices	Avoided cost of clearing and managing open dumps	Secondary research

7.1 SROI Calculation for all locations

Year	FY 2023-2024	FY 2024-2025	FY 2025-2026
Inflation rate[5]	5.70%	4.60%	2.70%
Discounted Rate	**4.23%**		

Locations	Total Input Cost	Total Net Impact	Net Present Value (NPV)	SROI
Coimbatore	₹12,50,019.00	₹1,22,70,941.91	₹1,17,72,569.79	9.42
Bhadradri-Medak	₹30,26,895.00	₹1,99,76,487.55	₹1,91,65,162.35	6.33
Guntur	₹4,19,725.00	₹32,35,165.15	₹31,03,772.13	7.39
East Godavari	₹90,573.00	₹15,95,962.34	₹1,531,143.91	16.91
Mysuru - MYKAPS	₹6,85,693.00	₹1,42,32,983.02	₹13,654,924.54	19.91
Mysuru - OUTREACH	₹8,81,986	₹1,58,06,299.533	₹15,164,342.37	17.19
Mysuru - SNEHA	₹3,93,122.00	₹79,95,331.88	₹7,670,609.41	19.51
Bengaluru	₹2,47,225.00	₹20,82,972.59	₹1,998,374.72	8.08

8. Recommendations

Sl. No.	Current Scenario	Recommendations
1	High project awareness exists, but remains partial across key areas such as composting, waste types, and environmental impact	• **Strengthen IEC tools to move beyond basic awareness towards applied understanding** by introducing visual, easy-to-retain materials such as pictorial waste classification charts, composting step guides, and household cue cards placed near waste storage areas. These should be designed in the local language and tailored for low-literacy contexts. • Complement awareness sessions with **live demonstrations and role-based engagement** (e.g. separate modules for women managing household waste, and children as behaviour change ambassadors) to ensure practical comprehension rather than theoretical awareness. • Institutionalise **periodic refresher engagements** through door-to-door visits or community meetings to reinforce concepts and address gaps over time.
2	IEC outreach is strong but gaps remain in consistent dissemination, usage, and retention of materials	• Ensure universal and standardised IEC dissemination across all households, with durable materials such as laminated posters or wall charts that can be retained and referred to regularly. • Integrate IEC usage into daily household routines by encouraging placement in high-visibility areas (e.g. kitchens or near waste bins) so that messaging acts as a constant behavioural nudge. • Reinforce IEC messaging during door-to-door waste collection interactions, where waste collectors briefly validate practices and remind households using the same visual tools.
3	Behaviour change is visible but remains inconsistent, with many households	• Introduce structured behavioural nudges such as a colour-coded recognition system (e.g. green stickers for households consistently segregating waste correctly), which can act as both motivation and social signalling within the community.

[5] Source considered for inflation rate

	demonstrating only partial adoption	• Facilitate peer learning and community benchmarking, where high-performing households are showcased during Gram Panchayat meetings or local events to influence others through social proof. • Engage Panchayat members and SHGs in community-level monitoring and reinforcement, ensuring that behaviour change is locally driven rather than externally imposed.
4	Waste segregation practices have improved but confusion and inconsistency persist at the household level	• Simplify segregation through clear, standardised and visual waste categorisation systems, for instance using colour-coded bins (green for wet, blue for dry) with pictorial labels indicating acceptable waste types. • Provide households with segregation aids such as labelled bins or bags, reducing dependency on memory and minimising errors. • Equip waste collectors with simple verification checklists to provide on-the-spot feedback to households and discourage mixing at the collection stage.
5	Waste collection systems have improved but challenges remain in consistency, timing, and handling of segregated waste	• Optimise collection systems by introducing fixed, well-communicated schedules aligned with community routines, ensuring predictability and reliability. • Strengthen accountability by ensuring strict adherence to segregated waste collection, preventing mixing at later stages which discourages household efforts. • Introduce basic feedback mechanisms (e.g. community registers or WhatsApp groups) for reporting missed collection or service gaps.
6	Limited willingness to pay for waste management services and resistance to penalties	• Shift from penalty-driven approaches to incentive-based models, such as recognising compliant households publicly or providing small service benefits (e.g. priority collection). • Pilot nominal user contribution models linked directly to visible service improvements (e.g. cleaner surroundings, improved infrastructure), helping households' associate value with payment. • Conduct targeted awareness on the health and environmental costs of poor waste management, using relatable local examples to improve willingness to contribute.
7	Home composting adoption is present but not universal and varies in consistency	• Promote context-specific composting solutions, such as pit composting for households with space and drum/bucket composting for those with constraints. • Establish demonstration units in common community spaces (e.g. schools, anganwadis) to serve as live learning models. • Provide continuous handholding support, including troubleshooting for issues like odour or pest management, to ensure sustained adoption.
8	Barriers to composting include time, space, and operational challenges	• Introduce compact, low-maintenance composting models such as stackable bins or covered drums that require minimal daily effort. • Develop cluster-level composting systems where groups of households can collectively manage organic waste, especially in space-constrained settings. • Provide structured maintenance protocols and periodic follow-ups to address operational challenges and build confidence.
9	Nutritional gardening adoption is moderate and not consistently practiced	• Provide seasonal crop planning guidance and technical support to ensure year-round engagement in gardening activities. • Distribute starter kits (seeds, basic tools) to reduce entry barriers and encourage adoption. • Promote integration of compost usage in kitchen gardens, demonstrating visible improvements in yield and soil quality.
10	Waste generation during festivals and peak periods strains the system	• Develop event-specific waste management plans, including temporary segregation points and additional bins. • Increase collection frequency and manpower during peak periods to prevent overflow and dumping. • Engage local volunteers or youth groups for on-ground waste management during events.
11	Limited awareness of downstream waste	• Conduct sessions explaining the journey of waste from household to recycling, building trust in the system.

	processing and recycling value chain	• Organise exposure visits to material recovery facilities or recycling units to enhance understanding. • Promote transparency by sharing periodic updates on waste processing outcomes with the community.
12	While awareness has increased, limitations have been observed in resource availability.	• Although awareness levels have improved, the programme should now prioritise resource strengthening, including adequate collection infrastructure, staff support, and composting materials, so that informed households can consistently adopt the desired waste management practices.

CSRBOX®

Doing Good in a **Better** Way

CSRBOX & NGOBOX

A-404-405, SWATI TRINITY

Applewood Township, SP Ring Road,

Shela Ahmedabad, Gujarat 380058