DECENTRALISING WASTE MANAGEMENT

An Assessment of Nagpur's DWCCs and their Contribution to Greenhouse Gas Emission Reduction

About

Asar Social Impact Advisors

Asar Social Impact Advisors is a startup in the environment and social justice impact space with a commitment to building climate resilience and ambitious climate action. We identify challenges and opportunities, research them, verify ground truths, and understand local contexts in order to build innovative strategies that are rooted in reality. Asar convenes multi-stakeholder conversations and helps build relationships between various key actors to be able to sustain collaborations essential to deliver real-world impact.

Centre for Sustainable Development

Centre for Sustainable Development (CFSD) works extensively in the field of environment and advocates for the right to clean air. CFSD works by coordinating with the Urban Local Body of Nagpur, creating awareness amongst the citizens through effective communication tools, conducting various research programmes to study the impact of air pollution. The organisation has also been instrumental in enumerating the waste pickers and other informal sector workers engaged in waste management, plus facilitated the provision of identity cards to them from the ULB. CFSD is a member of the “Nagpur City Hub,” a sentinel group that comprises various stakeholders concerned about air pollution. It is also an active member of the “Alliance of Indian Waste Pickers” that works on advocating waste pickers' rights and well-being, as they play a very important role in the circular and sustainable future.

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We would also like to acknowledge Green Partners Environmental Consulting, Women in Informal Employment: Globalizing and Organizing (WIEGO), and the Global Alliance of Waste Pickers (GlobalRec) for developing the WIEGO GHG Emission Calculator 2.0. This tool, specifically designed to estimate emission mitigation from DWCC operations, was instrumental in assessing the greenhouse gas emissions avoided through the work of waste picker organisations.

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We extend our deepest gratitude to Ms. Nalini Shekar, Co-Founder & Director of Hasiru Dala, for reviewing this report and ensuring its final form is robust.

Executive Summary

Dry Waste Collection Centres (DWCCs) are an essential component of decentralised waste management systems. This report documents the establishment and functioning of DWCCs in the city of Nagpur and assesses their contribution to dry waste management, livelihoods, and greenhouse gas (GHG) mitigation.

The study draws on qualitative insights from six DWCCs, gathered through discussions with the CFSD team, centre coordinators, and workers, and supported by field visits and secondary literature. Quantitative data from four DWCCs were analysed using the WIEGO GHG Emission Calculator 2.0, with monthly data extrapolated to annual estimates where at least three months of records were available.

The findings highlight the day-to-day functioning of the DWCCs, the composition of waste managed, and the livelihood support provided to workers, particularly women engaged in these operations. At their current scale, DWCCs contribute measurably to GHG mitigation through recycling, substitution of virgin materials, and the potential avoidance of open burning of waste.

Despite these benefits, DWCCs face challenges related to inconsistent waste supply, infrastructure constraints, transportation costs, and the need for formalised operational agreements. Strengthening municipal support through formal agreements, mandatory segregation at source, infrastructure investment, and expansion of DWCC coverage is essential to enhance their effectiveness, long-term sustainability, and overall improvement of waste management in the city.

सावित्रीबाई फुले स्वयंसहायता महिला बचत गट

नोंदनी क्र. SHG 27403200705

NMC अधिकृत

पेपर	10	जर्मन	100
किताब	40	पीतल	
खड्डा	8	ताम्बा	500
प्लास्टिक	10	तेल पिपा	18
टिन	15	स्टील	30
लोहा	25	काँच	3

List of Acronyms

AMC	Additional Municipal Commissioner
CFSD	Centre for Sustainable Development
CO_2	Carbon Dioxide
DWCC	Dry Waste Collection Centre
E Waste	Electronic Waste
EOI	Expression of Interest
GHG	Greenhouse Gas
Gg	Gigagram
IEC	Information, Education, and Communication
Kt	Kilotonne
LFG	Landfill Gas
MoHUA	Ministry of Housing and Urban Affairs
MoU	Memorandum of Understanding
MS	Manual Scavengers
MTD	Metric Tonnes per Day
NAMASTE	National Action for Mechanised Sanitation Ecosystem
NMC	Nagpur Municipal Corporation
NULM	National Urban Livelihoods Mission
PET	Polyethylene Terephthalate
RO	Resource Organisation
RWA	Resources & Waste Advisory Group
RWAs	Resident Welfare Associations
SBM	Swachh Bharat Mission
SHG	Self-Help Group
SSW	Septic-tank Workers
SWM	Solid Waste Management
ULB	Urban Local Body
WIEGO	Women in Informal Employment: Globalising and Organising

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RRR
CENTRE
REDUCE
REUSE

Context

Introduction

Nagpur is the third largest city in the state of Maharashtra after Mumbai and Pune, and is the largest city in central India. It has an area of 9,930.0 km.2 (3,834.0 sq. miles) and a population of 46,53,570[1]. It is expected to be the fifth fastest growing city in the world from 2019-2035 with an average growth of 8.41% and a population of 4.3 million by 2041[2]. Rapid urbanisation and economic growth are bound to increase the volume of waste generated and increase the woes of an already stressed waste management system of the city.

Nagpur city generates about 1200 MTD of waste, out of which dry waste is 393.5MTD and wet waste is 655MTD[3]. Nagpur has been a "Bin-Free" city since 2008, which resulted in a reduction of bins from 700 in 2008 to 170 in 2017 (approximately eightieth reduction)[4]. The responsibility of managing this waste falls under the ambit of Nagpur Municipal Corporation (NMC), which is working in partnership with multiple private agencies for the collection and treatment of this waste.

As per the recent Swachh Survekshan 2024-25, Nagpur was placed at 27th position among 40 cities in the million-plus category. This result highlights the scope of improvement in the city's overall waste management system. Mismanagement of municipal solid waste leads to an increase in vector-borne diseases, open dumping and burning, increase in number of dumpsites, and the burden on existing ones, release of methane (a highly potent GHG) from biodegradable waste decomposition, frequent fires, leaching, air pollution, etc. to name a few. A 2015 study suggests that depending on the city, 2% to 24% of the municipal solid waste generated in cities gets burned, adding to the local air pollution[5].

This study aims to quantify emission mitigation achieved by the Dry Waste Collection Centres (DWCCs) in Nagpur. It underscores the critical role these centres play in strengthening the city's overall waste management system. However, the sustainability of these DWCCs depends heavily on a consistent inflow of dry waste. Therefore, it is essential that these centres receive formal recognition and institutional support through the official diversion of dry waste from across the city. Such measures will enable the DWCCs to operate at their full potential, contributing to cleaner urban environments and a more circular waste economy.

The study aims to:

- Examine the process and evolution of establishing DWCCs in Nagpur.
- Assess the operational mechanisms and challenges encountered by six functional DWCCs in the city.
- Quantify the greenhouse gas (GHG) emission reductions achieved through the management of dry waste by four DWCCs, using the GHG Emission Calculator 2.0 tool.

[1] https://nagpur.gov.in/
[2] https://www.indiasanitationcoalition.org/viewpoints-on-wash/from-my-doorstep-to-the-mrf-nagpurs-management-of-its-solid-waste.html
[3] https://mpcb.gov.in/sites/default/files/environmentactionplan/Nagpur23062021.pdf
[4] https://www.ijraset.com/best-journal/case-study-on-municipal-solid-waste-management-of-nagpur
[5] https://pubs.acs.org/doi/full/10.1021/acs.est.5b03243

Why waste management is critical

Climate change is unfolding across the world, and India is among the most vulnerable regions to bear its impacts. To mitigate climate change, India has introduced various policies and programmes, yet the crucial role of waste management, both as a contributor to and a potential mitigator of climate change often goes unnoticed.

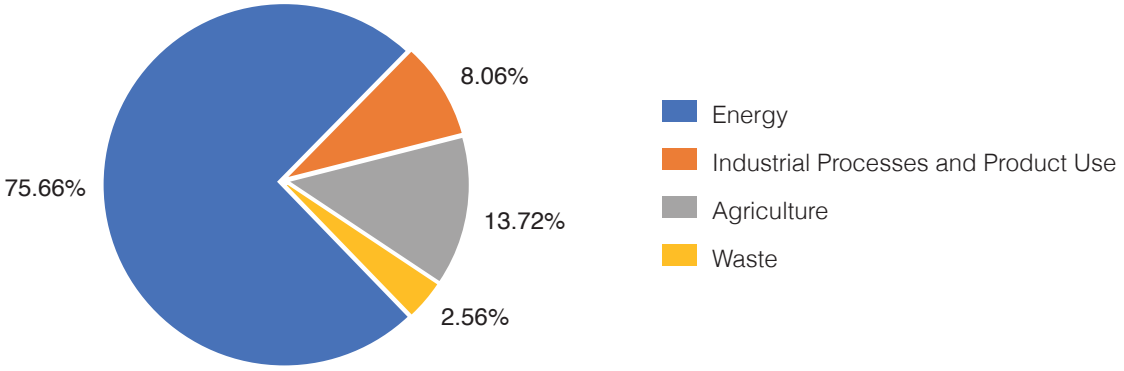


Figure 1: Major contributing sectors to India's GHG emissions, 2020 [6]

Waste is one of the major GHG-emitting sectors in our country[7]. It is estimated that 54% of the waste produced in India is disposed of without any treatment, leading to 8.5 million tonnes of methane emissions annually[8]. Methane is produced when organic waste dumped decays slowly over decades, releasing what is commonly known as landfill gas (LFG), a mixture of methane and carbon dioxide. The amount of methane produced by a dumpsite and/or landfill is primarily based on the proportion of organics in the waste stream. Methane is over 25 times more potent than carbon dioxide as a greenhouse gas, significantly accelerating environmental degradation.

Apart from emissions from waste dumpsites, a large volume of waste also ends up being burnt in the open. Open burning results in substantial emissions, particularly carbon dioxide. In India, according to a 2020 GHG inventory, it contributed to 178 Gg of CO_2 emissions from 310.97 Kt of waste incineration and burning[9]. Such burning can be prevented through robust segregation and collection of waste, followed by recycling and, ultimately, systematic disposal.

Lastly, there are indirect emissions that arise from the lack of recycling. Recycling more materials reduces the need for virgin resources in manufacturing processes. All the greenhouse gases that would have been released from extracting and refining new resources are avoided. Although some emissions occur during the transportation and processing of recycled materials, there is almost always a net reduction compared to using virgin resources[10].

Waste can be transformed into a valuable resource that contributes to both environmental sustainability and the economic well-being of people. For a country like India with its massive informal workforce, embracing this potential could generate multiple co-benefits.

[6] NIUA
[7] https://sensoneo.com/waste-library/climate-change-waste-management/
[8] https://www.scrapeco.in/why-waste-management-is-key-to-tackling-climate-change/
[9] https://niua.in/blogs/india-fourth-biennial-update-report-bur-4-focus-ghg-emissions-solid-waste-management
[10] https://openei.org/w/images/f/f7/Mitigating_the_Impact_of_Climate_Change_through_Waste_Recycling.pdf

Decentralisation and Role of DWCCs

India has traditionally followed a centralised waste management approach (Ganesan, 2017)[11]. In this system, all waste generated within a city is collected and transported to a single central location for treatment and final disposal. However, as waste volumes increase, it becomes challenging to manage diverse waste streams at 1 site. Poor segregation at source and the mixing of types of waste during transportation deteriorate the quality of waste, making treatment less effective. Consequently, large quantities of untreated waste are dumped at dumpsites, leading to their overburdening, a situation observed in most Indian cities. This accumulation poses significant environmental, social, and economic risks for communities living near dumpsites[12]. Additionally, the centralised model leads to higher transport-related emissions, as waste collection vehicles travel longer distances between collection points and disposal sites[13].

In contrast, a decentralised waste management system operates on a smaller and locally manageable scale (Iyer, 2016)[14]. Such systems allow processing and storage closer to the point of generation, thereby preserving the quality of waste and enhancing its value. As per the Decentralised SWM in Kerala report 2021, a decentralised system shifts the focus from disposal to source, making the maximum segregation and treatment possible[15]. For a country like India, with its extensive network of informal waste workers, decentralised systems provide an opportunity to integrate these workers into formal waste management practices. Evidence suggests that decentralisation improves resource recovery, reduces transportation costs, creates livelihood opportunities, and significantly decreases the volume of waste reaching landfills and/or waste dumpsites. It also fosters greater accountability among both citizens and waste workers, encouraging collective responsibility in keeping cities clean while contributing to the objectives of the circular economy[16].

Within this framework, DWCCs emerge as a practical and effective model. DWCC refers to a decentralised waste management facility to aggregate, store, sort and handle non-biodegradable waste. It is ideally operated by waste pickers/ informal waste collectors/ self-help groups related to waste picking[17]. After collection, these centres handle the segregation, storage, and processing of dry waste, functioning as key hubs where workers manually sort different categories of recyclables. By creating a structured value chain, DWCCs enable people to earn income through the sale of materials such as plastics, glass, paper, and metals. They also procure waste from informal waste pickers (a person or groups of persons informally engaged in collection and recovery of reusable and recyclable solid waste from the source of waste generation for sale to recyclers directly or through intermediaries to earn their livelihood)[18], thereby reducing environmental leakages, open burning, and the dumping of waste. Importantly, DWCCs facilitate localised resource recovery, reduce transport-related costs, and strengthen circular economy practices in urban waste management[19].

[11] https://doi.org/10.1080/00207233.2017.1374076
[12] https://eacpm.gov.in/wp-content/uploads/2024/05/Solid_Waste_management_Updated.pdf
[13] https://www.ijraset.com/research-paper/a-comparative-study-on-environmental-and-economic-benefits-of-centralized
[14] https://www.sciencedirect.com/science/article/pii/S1878029616301438
[15] https://www.kila.ac.in/wp-content/uploads/2022/04/Report.pdf
[16] https://globalrec.org/2021/04/02/seven-reasons-why-decentralized-waste-management-is-best-for-emerging-economies/
[17] https://upload.indiacode.nic.in/showfile?actid=AC_KA_71_402_00007_14_1552388734165&type=rule&filename=bbmp_swm.pdf
[18] https://investmeghalaya.gov.in/resources/homePage/17/megeodb/rules/Solid_Waste_Management_Rules.pdf
[19] https://www.thecirculateinitiative.org/wp-content/uploads/City-Waste-Management-Profile-Mumbai-India.pdf

Existing System of Waste Management in Nagpur

COLLECTION

Nagpur city has been divided into 10 zones for the purpose of waste management. The city generates around 1200 metric tonnes of MSW per day with an average daily MSW generation rate of 0.50 kg/capita. The composition of MSW generated in Nagpur is 60.10% organic, 15.50% plastic, 11.20% paper, 4.50% cardboard, 2.10% each of thermocol, inerts and textile, 1.80% wood, 0.40% glass, and 0.30% metals (Khandelwal et al. 2019)[20]. The scope of resource recovery and recycling of waste in the city is massive.

Door-to-door collection of waste is carried out across most parts of the city, excluding the peripheral areas. The Nagpur Municipal Corporation (NMC) has engaged 2 contractors since 2019 namely- AG Enviro and BVG India, each responsible for 5 wards. Currently, these 2 agencies collect and transfer waste daily to the Bhandewadi dumping yard[21].

For the purposes of transporting waste handcarts, tricycle rickshaws, motorised tippers, and light trucks are deployed. A significant portion of the waste collected is not adequately segregated at source.

Waste collected from households is transported to designated transfer stations, strategically located across different zones. These stations also serve as intermediate storage points. From here, the waste is transported to Bhandewadi, the city's sole dumpsite.

Figure 2: Vehicle carrying waste in Nagpur

[20] https://www.sciencedirect.com/science/article/abs/pii/S096085241930745X
[21] https://thelivenagpur.com/2025/01/21/nagpur-faces-surge-in-garbage-collection-nmc-intensifies-cleanliness-efforts/

TREATMENT

Nagpur city currently generates approximately 1,200 metric tonnes (MT) of municipal solid waste per day. Two waste treatment plants, with capacities of 800 MT and 500 MT respectively, are currently at the commissioning phase.

DISPOSAL

Final disposal of municipal solid waste takes place at the Bhandewadi dumpsite. The facility has been operational since 1968 and is estimated to have received around 1.8 million metric tonnes (MT) of waste since its inception.

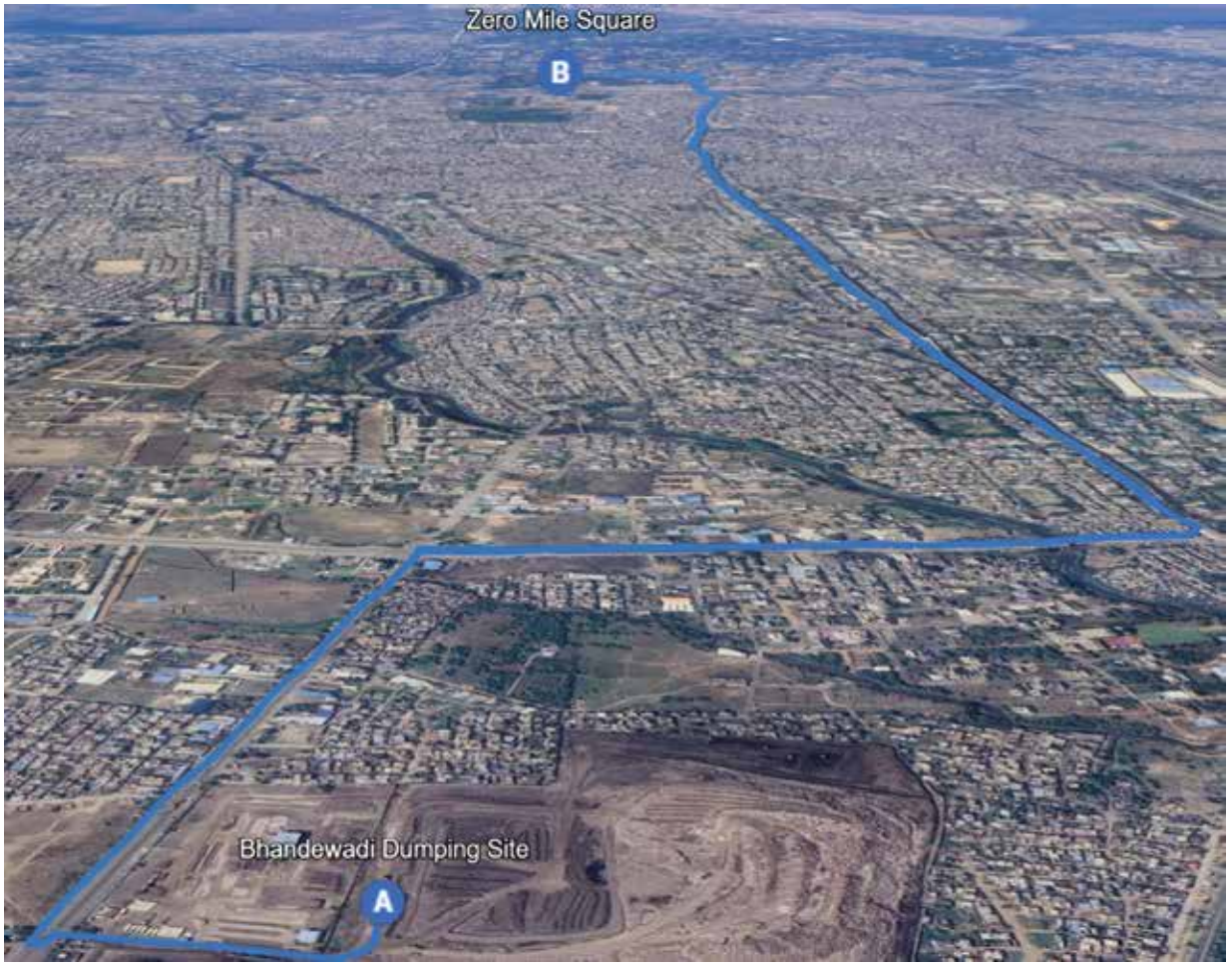


Figure 3: Location of Bhandewadi dumpsite

Setting Up DWCCs in Nagpur

The establishment of DWCCs in Nagpur has been a long process, marked by challenges, learnings, and eventual progress. It is the result of coordinated efforts among multiple stakeholders and the dedicated work of women's Self-Help Groups (SHGs), facilitated consistently by the ground-level NGO, Centre For Sustainable Development (CFSD). Broadly, this journey can be divided into 3 phases.

PHASE 1

The idea of establishing DWCCs in Nagpur first emerged in 2016-17, when the Swachh Bharat Mission (SBM) emphasised effective waste management. At that time, the benefits of decentralised waste management systems, as compared to centralised models, were actively discussed, leading to the conceptualisation of DWCCs.

Women-led SHGs were identified as the custodians and operators of these centres. To enable this, CFSD conducted extensive drives, supported by the Department of Women and Child Welfare, and NGO Swachh Association. Around 1000 SHG;'s were registered by the Social welfare department of NMC and from this pool, 10 SHGs were randomly selected to establish DWCCs across 10 zones. The Health and Sanitation Department also supported the initiative, linking it with Swachh Bharat Mission reporting.

In 5 zones- Ashi Nagar, Dharampet, Hanuman Nagar, Laxmi Nagar, and Mangalwari -the SHGs demonstrated particularly strong performances, successfully processing waste and generating profits. However, a critical shortcoming was the absence of any formal agreement or Memorandum of Understanding (MoU) between government departments and the SHGs. This lack of official recognition led to conflicts with local kabadiwalas (scrap collectors) and political figures, who questioned both the selection process of SHGs and the validity of the initiative.

Without formal institutional backing, all but a few DWCCs ceased operations by 2017-18, within a year of being established. A few centres continued limited operations in their individual capacities.

PHASE 2

Following the closure of the first set of DWCCs, progress on the initiative remained stagnant during the COVID-19 period. The revival efforts gained momentum with the government's directive to converge the National Urban Livelihoods Mission (NULM) with the Swachh Bharat Mission (SBM), which created renewed institutional support and opportunities for re-establishing DWCCs in the city.

Learning from Phase 1, emphasis was placed on formal recognition through official MoUs with the municipality. The then Additional Municipal Commissioner (AMC) took an interest in the initiative and played a pivotal role in advancing it. Under her leadership, an "Expression of Interest" (EOI) was floated for registered SHGs under NULM in the year 2024-25.

Selection criteria were introduced, including a minimum of 3 years of experience in waste-related work. However, this requirement was relaxed for SHGs comprising women from informal waste picker communities, allowing them to apply regardless of prior experience.

The Additional Municipal Commissioner also personally interviewed the SHGs, ultimately selecting 10 groups, with preference given to those having previously operated DWCCs during Phase 1. Bi-partite MoUs were signed with the selected SHGs for 2 years from 2024-2026, and workspaces were formally allotted to them. However, the MoUs do not include provisions for supplying incoming dry waste to the centres; they only guarantee the allocation of operational space. As of now, 6 out of the 10 DWCCs are active in Nagpur[22].

Figure 4: Operational DWCCs in Nagpur

[22] A seventh DWCC became operational at the Nehru Nagar Zone in Nagpur from January 2026; its details are not included in the current study.

PHASE 2.a

CFSD are a resource organisation (RO) for the NAMASTE Scheme, and under that they are building capacity for the DWCC workers. This integration ensures the DWCCs functionalities are strengthened.

CFSD is advocating for the official diversion of dry waste collected by contractors to the DWCCs to ensure more efficient functioning of the centres. Also along with the provision of basic amenities by the municipality for the municipality to provide basic amenities for the personnel running the centres. Efforts are also being directed towards building the capacities of those running the DWCCs, particularly in terms of technical knowledge and business management skills, to ensure the sustainability and scalability of the initiative. A key objective is to expand the initiative so that every ward in the city has at least 1 functioning DWCC, with employment opportunities for informal waste picker communities.

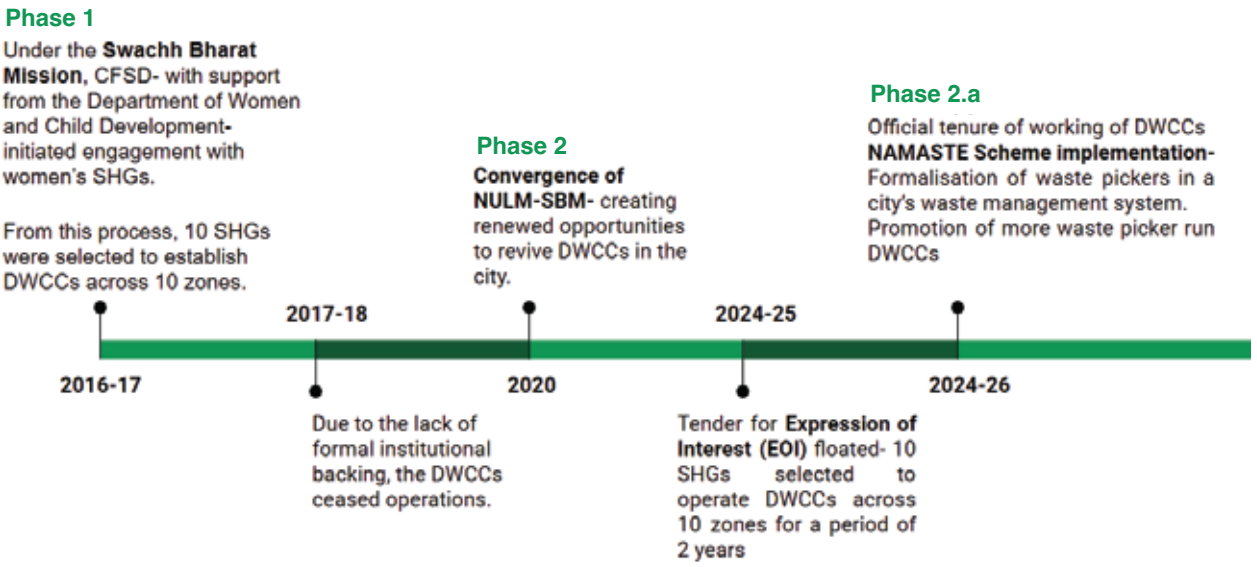


Figure 5: Journey of setting the DWCCs in Nagpur

Building Capacities

Different types of training and capacity-building programmes are essential components of operating DWCCs, and they are best implemented as a continuous process. The nature of such training sessions depends on factors such as the prior experience of the workforce, the specific skill requirements of their roles, and the need to adapt to evolving practices in the sector.

In Nagpur, several training programmes have already been conducted for the SHG women managing the existing DWCCs, while additional areas of training have been identified as future requirements. These needs were highlighted through consultations with the SHG members themselves as well as inputs from the knowledge partner, CFSD.

EXPOSURE VISITS

Exposure visits to operational DWCCs in Bengaluru were organised for some SHG women, accompanied by CFSD staff. Such visits are particularly valuable for women who are new to the work, as they provide an opportunity to observe day-to-day operations and understand the business in practice. Interactions with fellow workers at these centres also help address their queries on various aspects of the job. Seeing a successful, functioning example firsthand not only strengthens their understanding but also builds confidence and reinforces the value of their work.

LEADERSHIP TRAINING

This training was conducted by Hasiru Dala for 30 informal waste picker women. The 2-day workshop focused on raising awareness about their rights while also examining their existing informal business practices. Following the training, the process of forming a SHG with these women was initiated. The programme aimed to instill a sense of purpose and recognition of the significance of their work within the broader solid waste management system of the city.

TRAINING ON BOOK-KEEPING AND ACCOUNTING

This 1-day training was conducted by Hasiru Dala in collaboration with the Nagpur Municipal Corporation, with participation from all women currently managing the recognised DWCCs. The session focused on the importance of maintaining systematic inventories of incoming and outgoing waste, and provided practical guidance on how to implement this process. Inventory management not only enables accurate tracking of waste flows but also allows the women to monitor market rates and offer more competitive prices compared to local kabadiwalas. The training marked an important step towards strengthening their entrepreneurial capacities, reinforcing the understanding that operating a DWCC requires both efficiency and profitability.


MKS

Nagpur and its DWCCs

Study Area

The Nagpur city lies in coordinates between 78°30" to 79°30"E and 20°30" to 21°45"N. There are 10 zonal offices in Nagpur- Ashi Nagar, Dhantoli, Dharampet Zone, Gandhibagh Zone, Hanuman Nagar, Lakkadganj, Laxmi Nagar, Mangalwari, Nehru Nagar, and Satranjipura.

This study covers 6 of the operational DWCCs[23]. The 6 DWCCs exist in the following zones - Dhantoli, Dharampet, Gandhibagh, Hanuman Nagar, Mangalwari, and Satranjipura. Of these, quantitative data from 4 DWCCs has been analysed in detail, while qualitative data has been collated from all 6 DWCCs. The remaining 4 wards presently do not have an operational DWCC facility.

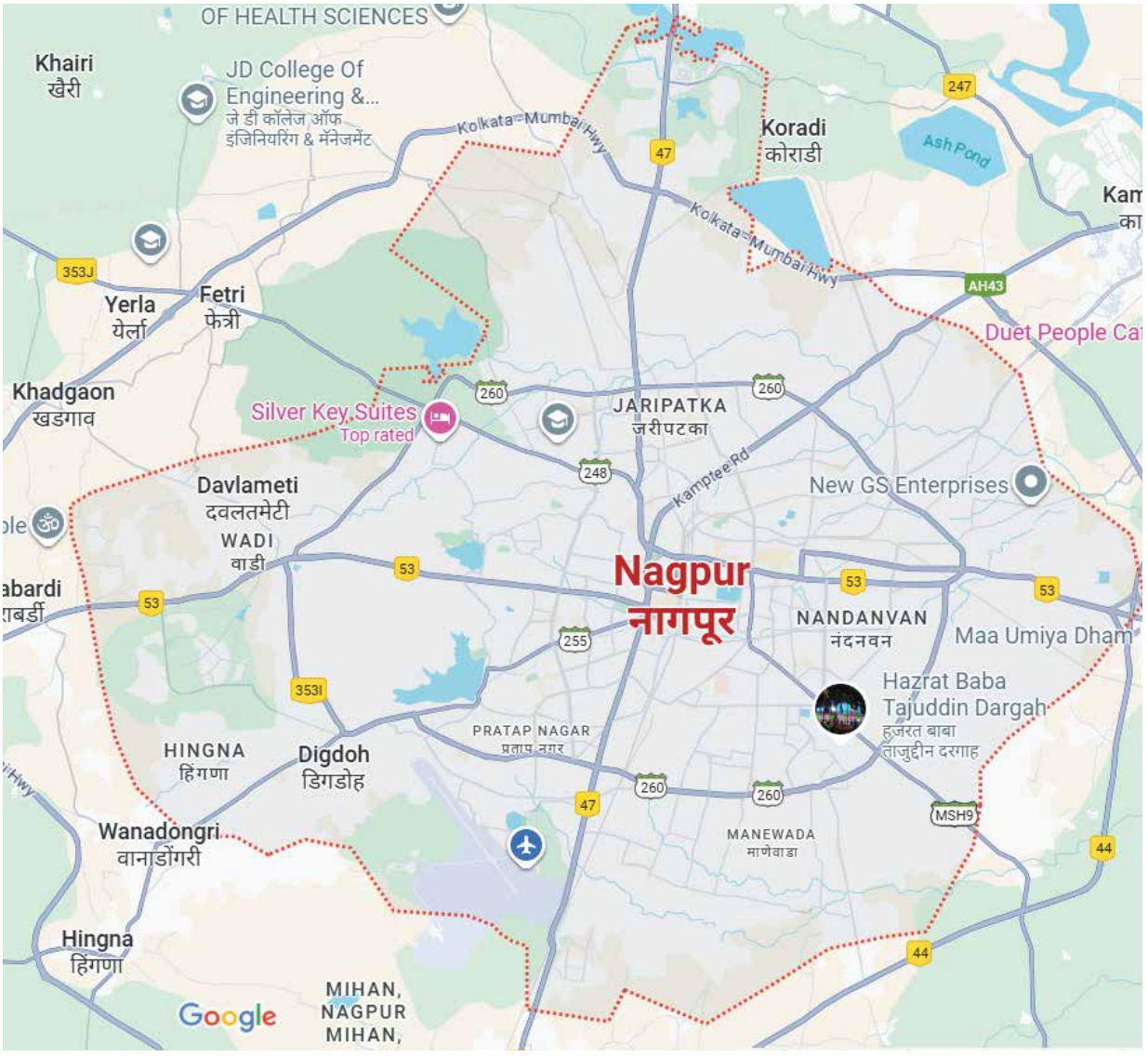


Figure 6: District map of Nagpur

[23] A seventh DWCC became operational in Nagpur in January 2026; its details are not included in the current study.

Current Status of Nagpur DWCCs

Currently, 6 DWCCs are operational in the city. The DWCCs are operated by women-led SHGs. The workforce at the centres comprises individuals with prior experience in waste management as well as those without such backgrounds. Daily sorting operations at the DWCCs are primarily carried out by waste pickers who apply their existing segregation skills. The DWCCs provide a more stable and sustained income. Some of the waste pickers are members of the SHGs, while others are engaged as per each centre's requirement on a need basis.

Figure 7: Sorting of waste in a DWCC

The day-to-day functioning follows a broadly similar process: incoming waste is received and segregated by workers into categories, after which it is stored within the centre until it is sold to designated vendors. While this describes the common process, individual operational nuances are provided in Annexure. Their efficiency, however, depends largely on the quality and quantity of incoming waste. At present, there is no formal arrangement between the Nagpur Municipal Corporation and the DWCCs for the supply of waste. As a result, the centres procure waste independently through networks established through individual contacts and local arrangements.

Common sources of incoming waste include informal waste pickers, NMC waste collectors, schools, offices, and construction sites. Once received, the waste is segregated into categories that vary across centres. The incoming waste is sorted daily, with no backlog reported. Segregated waste is stacked and stored in designated areas within the centres, and subsequently sold to vendors once sufficient quantities are accumulated.

Figure 8: Sorted waste stored in a DWCC

The frequency of sales is influenced by the volume collected, the storage capacity of the centre, prevailing market prices, and associated financial considerations. Vendors typically accept waste only after a minimum quantity has been aggregated, as they are required to send vehicles for collection. PET bottles are generally sold more frequently than other materials due to larger volumes of it collected. Conversely, materials such as tetra packs, clothing, thermocol, and single-use plastics are consistently regarded across centres as low-value or negligible-value items.

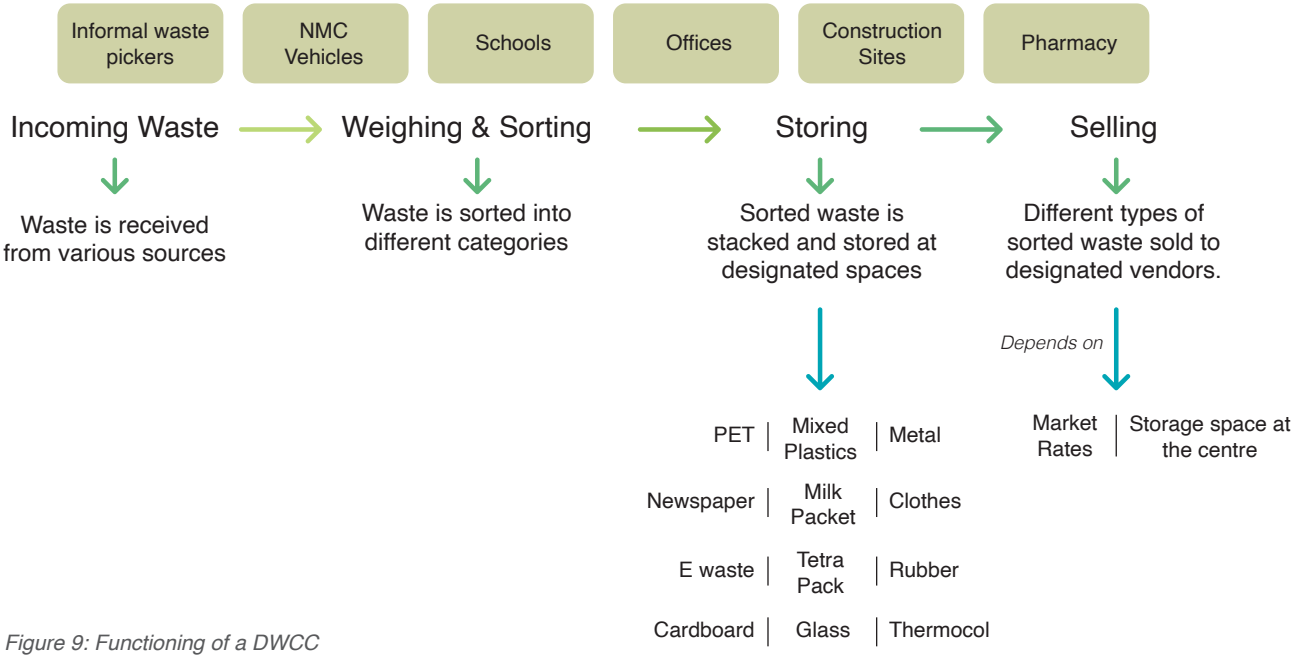


Figure 9: Functioning of a DWCC

Prior to the establishment of the DWCCs, a portion of this waste was managed through pre-existing informal recycling channels and may not have entirely ended up in landfills. However, DWCCs are formally authorised by the municipality and have been actively promoted to citizens as designated waste collection points. They are permitted to undertake outreach activities for household-level waste collection and processing, and they provide a sustained and formalised avenue for informal kabadiwalas to sell collected waste. Additionally, DWCCs have facilitated the participation of women in the sector by enabling livelihood opportunities in a domain that was previously male-dominated.

It is important to note that the DWCCs in the city are relatively new and are not generating substantial profits at present. However, after accounting for all operational expenses, the individuals employed at the centres are able to earn a modest income that supports their livelihoods.

Quantity of waste collected at the DWCCs

The quantity of recyclables collected by the 4 DWCCs in Nagpur for the year 2025 is presented in the table below. The figures have been extrapolated to represent tonnes per annum.

Centre	Months	Amount of waste received (kg)	Annual amount (tonnes/year)
Sataranjipura Zone	September, October, December	11548	45.82
Mangalwari Zone	June, July, September, October	23585	70.56
Gandhibagh Zone	May, June, July, Aug, Sept, October	57261	113.59
Hanuman Nagar Zone	March, June, July, August, September, October	48259	95.73
	Total Amount	**140653**	**325.70**

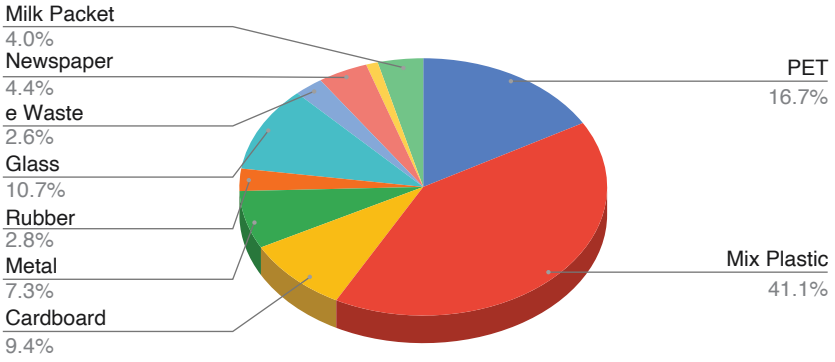
Amount of waste received by the respective DWCCs

Based on the data provided by the DWCCs for the stated months, a total of 140653 kg of dry waste was managed collectively by these centres. All the DWCCs reported handling more than 200 kg of dry waste per day on average. Assuming that the daily inflow of waste remains consistent throughout the year, it is estimated that these 4 DWCCs together would manage approximately 325.70 tonnes[24] of dry waste annually.

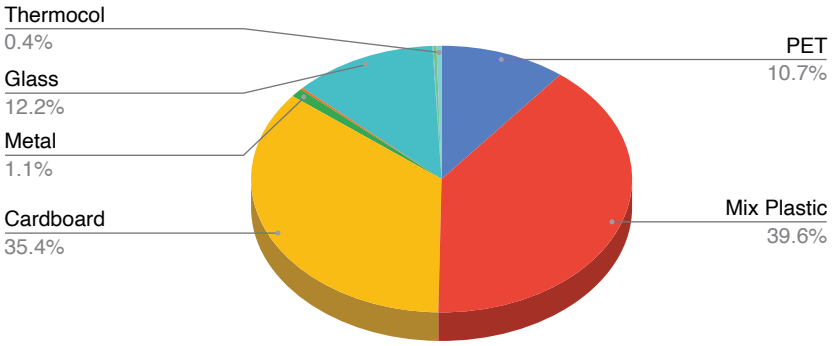
[24] This figure represents the extrapolated quantity of waste received by four DWCCs, converted from kilograms (kg) for respective months to tonnes per year.

Composition of waste collected at the DWCCs

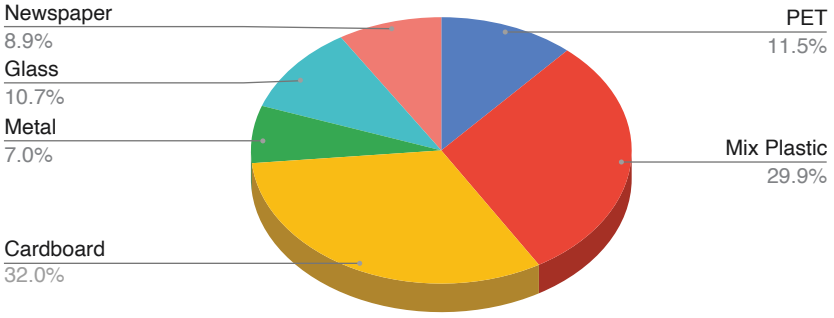
Gandhibagh Zone DWCC



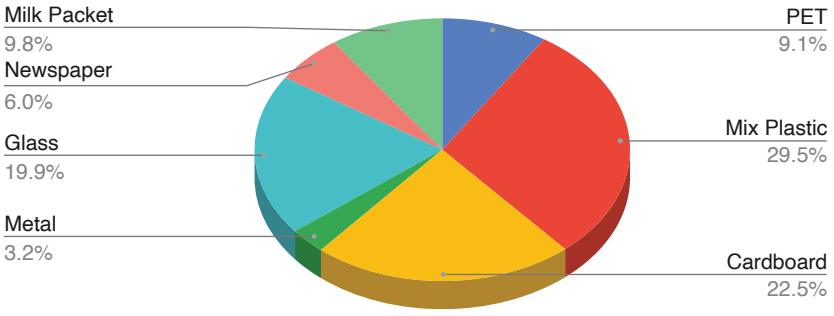
Hanuman Nagar Zone DWCC



Mangalwari Zone DWCC



Sataranjipura Zone DWCC



Composition of waste at 4 DWCCs

Data on the composition of dry waste was obtained from the 4 DWCCs for the following categories: PET, mixed plastic, cardboard, metal, rubber, glass, e-waste, newspaper, clothes, milk packets, tetra packs, and thermocol. The composition of waste varied slightly across locations, reflecting the surrounding land-use and source patterns.

Mixed plastic constituted the major fraction of waste (~30-40%) in 3 out of 4 DWCCs, and cardboard dominated the composition in the other 2 DWCCs (~30%). Several centres also reported receiving a significant proportion of PET bottles and glass rejects. Notably, only the Gandhibagh Zone DWCC recorded the collection of a nominal quantity of e-waste. In addition, the majority of the DWCCs also reported receiving some amount of scrap metal.

Methodology and Calculations

The Tool

The greenhouse gas (GHG) mitigation for this study was quantified using the GHG Emissions Calculator 2.0, developed by Green Partners Environmental Consulting, Resource and Waste Advisory Group (RWA), WIEGO, and Global Rec. This tool was selected as it is specifically designed for Dry Waste Collection Centres (DWCCs) and captures the activities of waste workers with accuracy, while also requiring input data that aligns well with the information available from our study. The calculator estimates avoided emissions across 5 major pathways that typically result from inclusive recycling, namely avoided emissions from biodegradation of waste at disposal sites, open burning of municipal solid waste, transportation, and substitution of raw materials through recycling and energy use in sorting and processing facilities[25]. For the purpose of this study, the focus was limited to 2 pathways- avoided emissions from substitution of raw materials through recycling, and avoided emissions from open burning- since reliable data was only available for these categories.

The tool is grounded in internationally recognised methodologies while also addressing the specificities of waste management systems, and it has been widely used in both national and international contexts. Previous applications include the 2023 Hasiru Dala study of seven DWCCs in Bangalore, the assessment of CO_2-equivalent reductions by the Association of Recyclers of Bogotá in Colombia through landfill diversion, the evaluation of avoided emissions by Argentina's Amanecer cooperative through the substitution of virgin raw materials, and the analysis of transportation-related emissions by the SWaCH cooperative in India[26].

The tool requires highly granular data and reliable baseline information, which is often unavailable or difficult to acquire, leading to necessary adjustments being made to suit the context of this study. In addition, the emission factors embedded in the tool may not reflect the most recent updates, but were used as provided to maintain consistency with the tool's framework.

[25] https://www.wiego.org/wp-content/uploads/2021/12/GHG-methodology-WIEGO.pdf
[26] https://www.wiego.org/advocacy-worker-education-resources/ghg/

The Data

The data used in this study is of 2 types- qualitative and quantitative, collected through a combination of primary and secondary methods.

Qualitative data on the process and evolution of establishing the DWCCs were obtained through discussions with CFSD personnel. Information on the day-to-day functioning of the centres and the challenges encountered was gathered through structured discussions with centre coordinators and workers, using a predefined questionnaire.

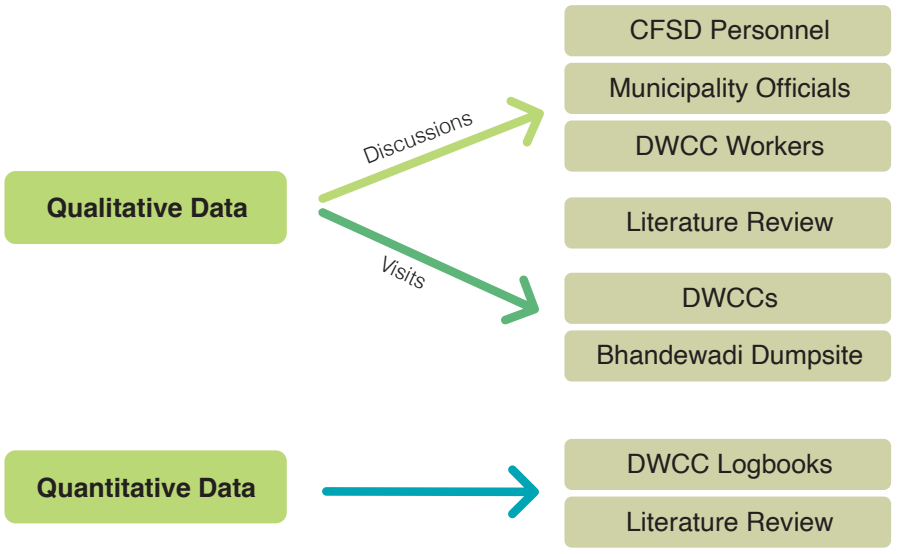


Figure 10: Data sources

The quantitative data for this study was obtained from 4 DWCCs in the Sataranjipura Zone, Gandhibagh Zone, Mangalwari Zone, and Hanuman Nagar Zone. The duration of available data varied across these centres; data from 2 DWCCs covered a period of 1 month, data from the remaining 2 centres spanned 3 and 4 months.

Centre	Months
Sataranjipura Zone	September, October, December
Mangalwari Zone	June, July, September, October
Gandhibagh Zone	May, June, July, August, September, October
Hanuman Nagar Zone	March, June, July, August, September, October

Quantitative data availability for respective DWCCs

Calculation

The waste quantities were originally reported in kilograms per day and subsequently converted into tonnes per year as required by the GHG Emissions Calculator 2.0. The conversion was carried out using the following formulae:

Conversion of 1 month data from kgs to tonnes/year:
(Total waste received for 1 month × 12) / 1000

Conversion of more than 1 month data from kgs to tonnes/year:
(Total waste received × No. of days in the year) / (No. of days of data availability × 1000)

Calculation of mitigated emissions from substitution of virgin materials

2 streams of quantitative data was fed into the tool -

- Quantity of recyclables diverted from the landfill by the DWCCs;
- Composition of different categories of dry waste in the DWCCs.

Calculation of mitigated emissions from avoided open burning

- Studies indicate that 2–24% of municipal solid waste (MSW) generated in Indian cities is openly burnt[27]. For this study, mitigated emissions were estimated by first calculating emissions if 100% of the dry waste received by each DWCC was openly burnt. This figure was then multiplied by 2%, representing the conservative estimate of the proportion of waste likely to be burnt in the absence of DWCCs.
- The quantity and composition of dry waste received by each DWCC was entered into the GHG Emissions Calculator 2.0.

Mitigated emissions = Emissions from 100% waste burned × 2%

[27] https://pubs.acs.org/doi/full/10.1021/acs.est.5b03243

Findings[28]

Calculation of mitigated emissions from the substitution of virgin materials

The dry waste sorted at the DWCCs is channelled to recyclers, where it is reprocessed into secondary materials. This recycling activity substitutes the need for virgin material extraction and production, thereby avoiding the associated GHG emissions.

To estimate the mitigation potential, data on the percentage composition of dry waste sent for recycling were obtained directly from the DWCCs. The mitigation results derived from the GHG Emissions Calculator 2.0 for each centre are presented below:

Centre	Mitigated Emissions
Sataranjipura Zone	39 tonnes CO2 eq/year
Mangalwari Zone	73 tonnes CO2 eq/year
Gandhibagh Zone	119 tonnes CO2 eq/year
Hanuman Nagar Zone	76 tonnes CO2 eq/year

Mitigated emissions by respective DWCCs

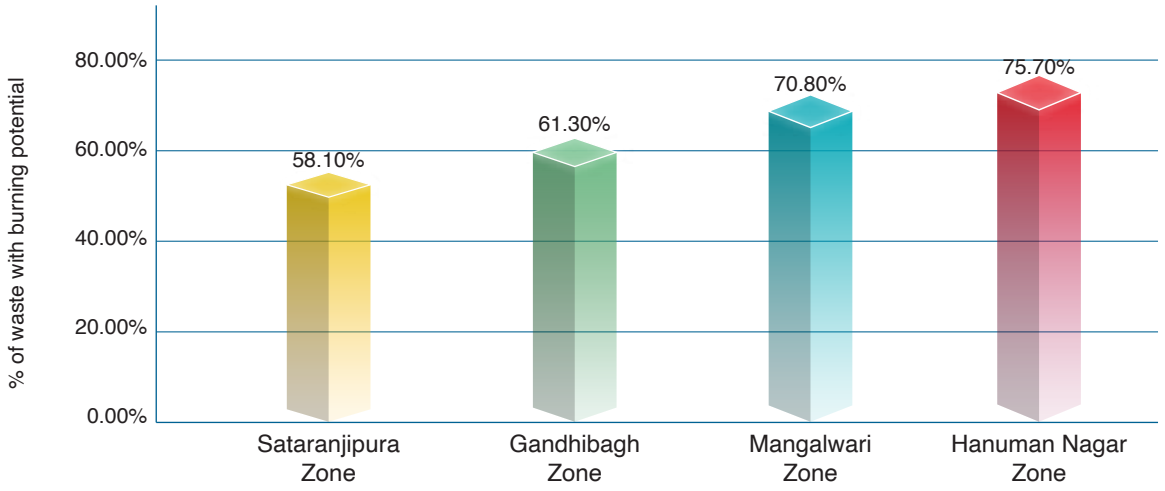
Collectively, the 4 DWCCs, at their current operational capacity, mitigate approximately 307 tonnes of CO_2 equivalent per year through the substitution of virgin raw materials via recycling. This equates to an average saving of around ~26 tonnes of CO_2 equivalent per month, achieved just by diverting the dry waste from the dumpsite to the DWCCs.

[28] Thematic findings were consolidated across stakeholders due to the similarity of insights; therefore, the report presents key cross-cutting themes rather than stakeholder-specific perspectives or direct quotes.

Calculation of mitigated emissions from avoided open burning

Open waste burning represents a significant and often underreported source of greenhouse gas emissions in national inventories. Due to the lack of reliable city-level data on open burning, this study assumes a hypothetical scenario where DWCCs do not operate, and 2% of the dry waste currently managed by these centres would otherwise be openly burnt.

The following graph illustrates the categories of waste presently handled by the DWCCs that could potentially be subject to open burning in their absence.



% of waste with burning potential

Based on this assumption, the 4 DWCCs collectively prevent approximately 383.31 tonnes of CO_2 equivalent emissions per year by diverting waste that would have otherwise been burnt in the open. Although this analysis applies a conservative estimate of 2% open burning, the actual proportion could be higher, suggesting an even greater potential for emission mitigation through decentralised waste management.

Challenges faced by the DWCCs

Lack of Incoming Waste

A major challenge reported across all DWCCs is the shortage of incoming waste. Centres procure waste independently from informal waste pickers and a limited number of collection vehicles that offload small quantities. The number of such vehicles varies significantly, from as few as 2-3 in some centres to 12-13 in others, depending on the personal dynamics between the DWCC coordinator and the vehicle operator. Some centres also source waste from nearby schools, offices, and construction sites. Despite these efforts, all DWCCs highlighted that their processing capacities remain underutilised due to insufficient supply.

Quality of Waste

The quality of incoming waste is a persistent concern. 5 out of 6 visited DWCCs reported receiving mixed waste to varying degrees, with the majority of collection vehicles delivering unsegregated material. Workers emphasised that mixed waste complicates sorting, lowers the quality of recoverable materials, and reduces market value. The presence of organic waste further creates unhygienic working conditions. All DWCCs expressed a preference for receiving source-segregated dry waste.

Figure 11: Collected waste

[27*] Thematic findings were consolidated across stakeholders due to the similarity of insights; therefore, the report presents key cross-cutting themes rather than stakeholder-specific perspectives or direct quotes.

Lack of Basic Amenities

Basic facilities are severely lacking across centres. None of the DWCCs had access to drinking water, and 5 out of 6 lacked toilet facilities. Workers reported significant difficulties managing long hours without adequate amenities. In particular, the absence of toilets raises safety concerns when workers are compelled to seek washrooms in nearby buildings.

Infrastructural Issues

Visits conducted during the monsoon season revealed several infrastructural challenges. All DWCCs reported seepage of rainwater through roofs and walls, leading to wetting of stored waste and a consequent reduction in its market value. In some centres, stagnant water accumulated in puddles, creating further unhygienic conditions. Additionally, the absence of internal compartmentalisation frequently resulted in mismanagement and hindered optimal use of available space.

Figure 12: Waterlogging inside a waste storage area

Space Constraints

Although the NMC has provided land for DWCC's operations, the adequacy of space varies. While some centres have sufficient room, others face severe limitations. Restricted space prevents proper allocation for different stages of sorting, forcing workers to use whatever area is available. As a result, smaller centres often have to sell segregated waste prematurely to free up space, sometimes at unfavourable market prices, which reduces profitability.

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Figure 13.1: DWCC with sufficient space

Figure 13.2: DWCC with space constraints

Lack of Skilled Labour

A few centres highlighted the shortage of skilled workers. Most DWCCs operates with 4-5 sorters for segregation, to handle daily inflows- a process that requires knowledge of categories. One centre reported a backlog of nearly 30 tonnes of unsorted waste due to insufficient skilled labour. This underscores the need for capacity-building and training to strengthen the workforce. Enabling more waste pickers to enter this work stream can fill this gap.

Figure 14: Pending piles of unsorted waste

Lack of Machines and Vehicles

Limited access to vehicles and machinery further restricts operations. At the time of the visit, only 1 DWCC owned a personal vehicle, while just 2 had baling machines. Without vehicles, centres are unable to independently procure waste from distant locations. The absence of balers and shredders exacerbates space constraints, as compacting waste would save storage space and allow greater flexibility in deciding the timing of sales to maximise profits.

Figure 14: Pending piles of unsorted waste

Electricity Bills

Out of the 6 DWCCs visited, 5 reported paying their own electricity bills, creating a significant financial burden. The problem is aggravated during the summer months when fans must run for extended hours as temperatures rise to 40-45°C. All the DWCC coordinators agreed that concessions in electricity charges would provide substantial relief.

Location of the Centres

DWCCs have been allotted space in areas where a significant number of kabadi shops already operate. Establishing centres in locations with a limited presence of waste management facilities, including informal systems, could enhance their contribution to the overall waste management process. Additionally, as the DWCCs are operated by women-led SHGs within a sector traditionally dominated by men, tensions and disputes over access to waste sources have occasionally been reported.

It was observed that even women newly engaged in this work are gradually developing entrepreneurial skills through their experience in managing the centres. Nevertheless, the role of a ground-level organisation such as CFSD remains essential in maintaining regular engagement, identifying operational challenges, and addressing gaps in knowledge and skills. The organisation also serves as a critical intermediary between the municipality and DWCC workers- articulating workers' issues and demands to the authorities, while simultaneously facilitating their understanding and compliance with administrative procedures to ensure efficient and sustained operations.

Further Training Requirements

Waste Sorting Training

There is a need to strengthen the capacity of DWCC workers in waste sorting and to train new entrants in this domain. A DWCC coordinator highlighted that expanding this skill base would make hiring easier, and ensure continuity of operations. At present, the number of workers engaged in sorting fluctuates due to various reasons, slowing down the process. Training more people in waste sorting will improve efficiency and overall system performance.

Expand Waste Handling Skills

It needs to be noted that to ensure the sustainability of the DWCCs, the municipality needs to officiate their presence by making them responsible for certain localities, which could include Resident Welfare Associations (RWAs) and bulk waste generator - ensuring waste supply to the DWCCs in an official manner. This would then need the workers to be trained in managing various kinds of waste including wet/ organic/ sanitary/ etc. Currently, most DWCC workers are trained primarily in handling dry waste. Equipping them with skills and knowledge to manage all waste streams would significantly enhance their role within the city's overall waste management framework. This training could also create opportunities for increased access to waste resources and livelihood enhancement.

Building Mobility and Access

Having vehicles for waste collection and transportation, and being able to drive the vehicles themselves, would significantly enhance the operational capacity of the DWCCs. This would not only increase their efficiency, and allow them to diversify the types of waste being collected, but also strengthen their decision-making power by enabling them to choose the categories of waste they wish to handle, rather than being limited to what is delivered to the centre. In the long term, this could also justify policy support or incentive schemes for providing vehicles to the DWCCs. Training at least a few workers from each centre in basic driving skills would be an important step toward building self-reliance and expanding access to recyclable materials.

Summary of Key Findings

- The 4 DWCCs included in this study collectively manage approximately 325.70 tonnes of dry waste annually.
- At their current operational capacity, the 4 DWCCs collectively mitigate about 307 tonnes of CO_2 equivalent emissions per year by substituting virgin raw materials through recycling[29]. This equates to approximately 26 tonnes of CO_2 equivalent saved per month.
- The DWCCs also prevent approximately 383.31 tonnes of CO_2 equivalent emissions per year by managing dry waste that might otherwise be openly burnt, based on a conservative estimate that 2% of unmanaged waste would end up being burnt.
- The major components of the waste stream include mixed plastics, PET bottles, cardboard, and glass rejects.
- The dry waste is procured through multiple sources such as informal waste pickers, schools, offices, and construction sites, rather than being officially supplied by the Nagpur Municipal Corporation (NMC).

[29] In other terms, this mitigation is equivalent to the carbon sequestered by around 4,605 tree seedlings grown for 10 years, or 279 acres of U.S. forest in 1 year, based on the U.S. Environmental Protection Agency's Carbon Calculator.

Conclusion and Recommendations

The following recommendations are based on the current study and the observed mitigation potential of the existing DWCCs:

- A formalised agreement between the municipality and the DWCCs should be established, clearly outlining mutually accepted responsibilities, operational procedures, and terms of engagement.
- Dry waste generated across the city should be officially channelled to the DWCCs to ensure a consistent and reliable supply of material and its appropriate management. The centres should retain full ownership of the waste handled and the proceeds from its sale.
- The NMC should mandate segregation of waste at source and ensure that segregated dry waste is regularly supplied to the DWCCs.
- Basic amenities including drinking water, sanitation facilities, and subsidised electricity should be provided at all DWCCs to ensure a safe and dignified working environment.
- In anticipation of increased quantities of incoming waste, the municipality should invest in strengthening the infrastructural capacity of the centres and in expanding opportunities for upskilling their staff.
- Regular coordination meetings between NMC officials and DWCC representatives should be institutionalised to facilitate smooth operations and timely resolution of operational challenges.
- Establishing at least one functional DWCC in each ward should be prioritised to advance decentralisation and improve overall dry waste management in the city.

DWCCs play a crucial role in strengthening the city's waste management system. They contribute significantly to resource recovery, reduce the burden on landfills, and generate important social benefits for the workers and communities involved. The findings of this study indicate that, even at their current scale of operation, the DWCCs contribute measurably to greenhouse gas mitigation through improved dry waste management practices. Recognising their contribution to both waste management and climate change mitigation, the Nagpur Municipal Corporation should address the key operational challenges faced by these centres. Strengthening their support will not only enhance the efficiency and impact of the DWCCs but also ensure their long-term sustainability within the city's waste management ecosystem.

Annexures

Profiles of the Individual DWCCs

Dhantoli Zone DWCC

The DWCC at Dhantoli is operated by the Self-Help Group (SHG) 'Angel Mahila Bachatgat'. The centre has been functional for the past year, and is housed in a repurposed old cinema hall provided by the Nagpur Municipal Corporation. It operates seven days a week from 8 a.m. to 8 p.m. and currently operates with 5 people who carry out the sorting of dry waste.

The centre receives waste primarily from 20-25 informal waste pickers who bring in around 100 kg (0.1 tonne) of mixed waste daily. The centre has the capacity to handle 5,000–10,000 kg (5-10 tonne) of waste per day. The sorted waste is stored on-site until adequate quantities are accumulated to fetch a better price from vendors. The centre currently sells materials to around 10 different buyers.

The monthly earning of the centre is ₹60,000–70,000. Regular expenses include vendor vehicle rentals, worker wages, payments to informal waste pickers, and electricity bills- all of which are borne entirely by the centre.

Despite its potential, the centre faces several operational challenges. The supply of incoming waste remains inconsistent and largely dependent on informal waste pickers, and there is no provision for drinking water at the premises. Nonetheless, the workers maintain a positive outlook and a strong sense of purpose. They view their work as a means of livelihood generation while contributing meaningfully to the city's solid waste management system.

Gandhibagh Zone 2 DWCC

The DWCC at Gandhibagh Zone 2 has been operational for the past eight months. The centre operates with the help of 6 women who carry out the sorting operations. The work shift spans across eight hours a day for seven days a week.

The DWCCs is located in a busy area of Gandhibagh but operates from a very small space that earlier used to be a school, which limits its functioning. The centre receives waste primarily from informal waste pickers who bring in about 5-10 kg (0.005- 0.01 tonne) each, along with Nagpur Municipal Corporation (NMC) vehicles that contribute around 50 kg (0.05 tonne) per trip. This amounts to a daily influx of approximately 450-500 kg (0.45-0.5 tonne) of mixed waste. The centre has an overall handling capacity of about 2 tonnes. The waste is collected from an area of nearly 10-15 kilometres, and sold to a network of 6-7 buyers.

The centre bears its own electricity costs and pays daily wages of around ₹300 to sorters and NMC workers. It is equipped with a weighing scale but lacks a baler, shredder, waste transportation vehicle, drinking water supply, and washroom facilities. Despite the operational challenges like the small space and lack of basic amenities, the women continue to work with commitment. They view their effort as both a form of social service and a means of sustained livelihood. However, they have expressed the need for improvements to be made to their centre.

Hanuman Nagar Zone DWCC

Hanuman Nagar Zone DWCC is located in a busy area facing the challenge of procurement of a consistent waste streams.

The centre is managed by the women from 'Savitri Bai Phule Mahila Bachatgat' SHG. The centre operates through the week from 11 am to 7 pm. There are 5 workers who are collectively responsible for sorting, storing and dispatching the collected material.

A weighing scale to monitor material inflow exists, but basic amenities do not, such as a washroom, drinking water, and a dedicated electricity connection. It also experiences issues like water leakage during rain, and the workers have reported facing health issues due to poor working conditions. It does not have its own vehicle for transportation, nor does it have equipment like a baler or shredder for processing material.

The DWCC currently receives around 400 kg (0.4 tonne) of mixed dry waste every day. The major sources include 1 informal waste picker and 4 NMC collection vehicles. The centre is reaching out to nearby schools to increase the inflow. The material is sold to 4 to 5 buyers on a weekly to fortnightly basis. The centre has a handling capacity of 500 to 1000 kg (0.5 to 1 tonne) at a time.

The major expenses of the DWCC include payments to an NMC worker, weekly wages for sorters, and occasional costs for vendor provided vehicles. Approximately ₹3,000 to ₹4,000 is spent daily on labour payments and buying drinking water. The centre earns around ₹60,000 to ₹70,000 per month from the sale of recyclables, generating a surplus of about ₹8,000 to ₹10,000. This centre as well expresses the need for support.

Satranjipura Zone DWCC

Satranjipura Zone DWCC has been operational for about 1-1.5 months. It is located in an area that is considered unsafe for women, which has posed challenges in staffing and daily functioning. Currently, 4 workers are employed to carry out the sorting and handling of waste.

The centre only has a weighing scale. It lacks all other essential amenities and pays its own electricity bills. The centre receives around 300-400 kg (0.3-0.4 tonne) of mixed dry waste per day, primarily from 8-10 NMC vehicles. The type of waste, frequency of incoming loads, information on expenditure and earnings, and selling schedules are still being established as the centre is at an early operational stage.

As of now, the unsafe location remains its biggest challenge, discouraging female workers from joining. A safer work site and provision of basic facilities would significantly improve the centre's functionality and appeal as a workplace.

Mangalwari Zone DWCC

The DWCC at Mangalwari Zone has been operational since 2019. It is located in an area where the purchase price of waste is comparatively higher than in other zones. The centre is operational 11 hours per day all through the week. It currently operates with the help of 5 workers.

In terms of infrastructure, the centre has a weighing scale and a baler machine, but does not have a washroom, drinking water facility, or in-house vehicles for material transport. There is also a shortage of adequately trained and skilled labour, which affects operational efficiency.

The DWCC receives waste primarily from 2-3 NMC vehicles, as well as from nearby under-construction buildings and local offices. This results in about 250-300 kg (0.25-0.3 tonne) of mixed dry waste collection per day. The centre has the capacity to handle 400-500 kg (0.4-0.5 tonne) of waste. The frequency of selling varies depending on accumulation and market demand. There is 1 fixed buyer while others are variable based on material type. The centre typically earns a surplus of about ₹2,000-₹5,000 per week. Expenditure includes payments to NMC workers, buyers, and sorters (at around ₹500 per day), as well as electricity charges. The staff have expressed the need for basic amenities and regular labour training to improve efficiency and productivity at the centre.

Dharampet Zone DWCC

Similar to the Mangalwari Zone DWCC, the Dharampet Zone DWCC has been operational since 2019. It is run by the SHG 'Savitri Mahila Bachatgat'. The centre operates daily from 10 a.m. to 6 p.m., with a team of 7 workers- 5 women and 2 men. The presence of an in-house vehicle has been hugely advantageous for the collection of waste, even from distant locations.

This centre collects around 700-800 kg (0.7-0.8 tonne) of dry waste daily, sourced from a variety of channels, though its daily processing capacity is 3,000-5,000 kg (3-5 tonne). It currently sources its waste from schools, medical stores, hospitals and apartments. Materials are sold to buyers at different frequencies depending on the type of waste and its market demand.

The centre is equipped with a weighing scale, a baler, and a shredder, which support its sorting and processing operations. Electricity bills and vehicle maintenance costs are borne by the centre, along with wages for workers. The centre earns about ₹90,000 per month through its activities.

Despite its functional efficiency and its crucial role in providing livelihood, earning respect, and contributing to city cleanliness, the centre has its challenges. It struggles with a lack of space and does not have facilities like a washroom and a drinking water facility. Addressing these gaps would greatly improve working conditions and enhance the overall effectiveness of the centre's operations.

Stakeholders Involved in the Process of Setting up the DWCCs

Social Welfare Department

The Social Welfare Department is responsible for the formation and registration of women's Self-Help Groups (SHGs) under the National Urban Livelihoods Mission (NULM). It maintains the official registry of SHGs and issues certification for their recognition. At the time of initiating the DWCC establishing process, more than 1,000 SHGs were registered with the department.

Health and Sanitation Department

The Health and Sanitation Department, being the nodal agency for waste management in the city, plays an important role in the process. The department views this initiative as an opportunity to strengthen Nagpur's performance in the Swachh Bharat Survekshan by showcasing the inclusion of DWCC as part of its waste management framework.

Nagpur Municipal Corporation

The Nagpur Municipal Corporation played a pivotal role in implementing the women-led SHGs managing the DWCCs. In the Phase 2, during the initial stages the municipality, through its senior officials, worked closely with CFSD and the SHGs to translate the concept into practical action. It issued an 'Expression of Interest', it facilitated the selection process of the SHGs. It entered a 2 year Memorandum of Understanding (MoU), with the established DWCCs. It ensured provision of operational spaces to the centres.

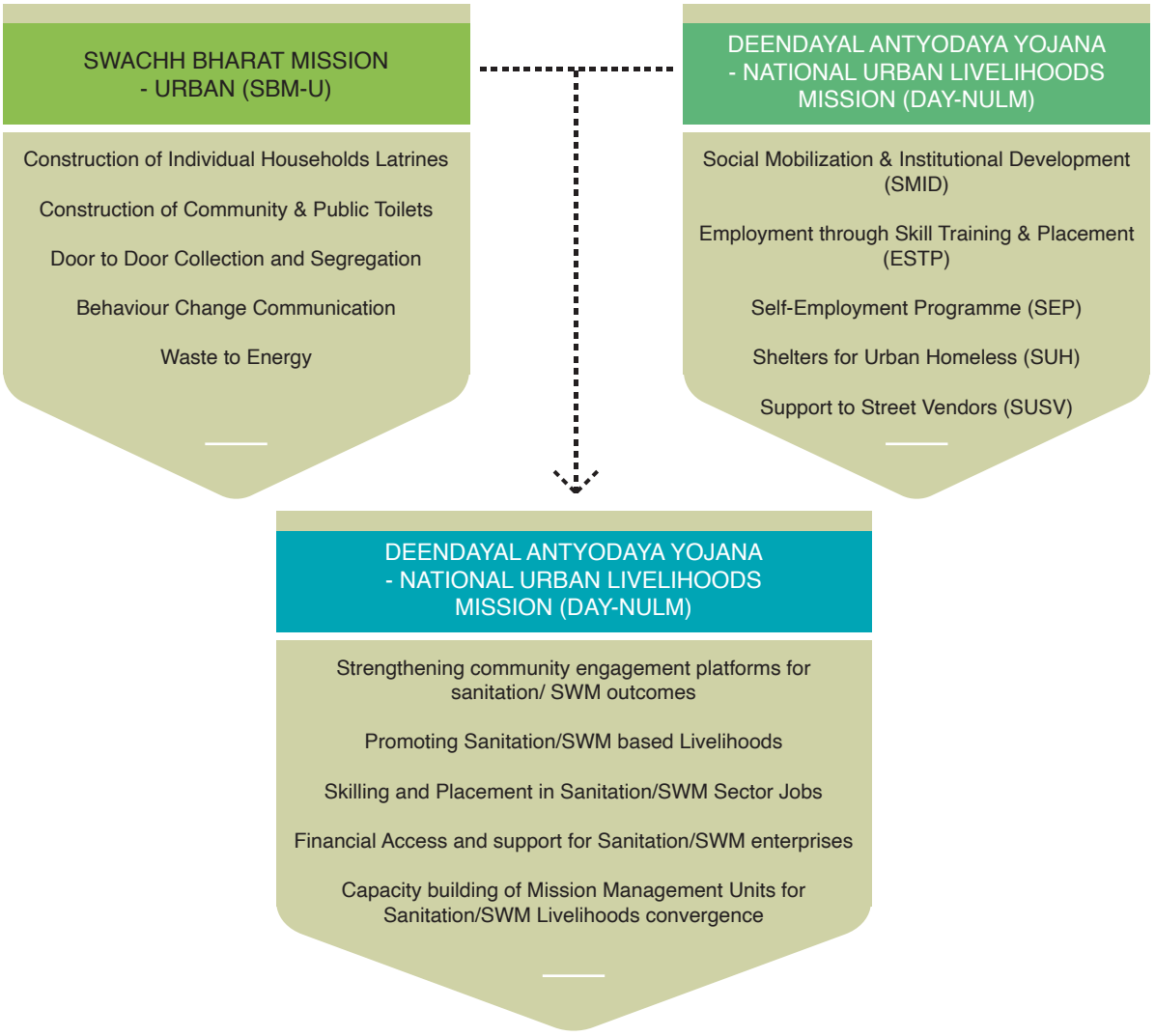
Women and Child Development Department

The elected representative serving as Chairperson of the Women and Child Development Department also played a key role, particularly from the perspective of women's livelihood generation. With her support, 10 SHGs were selected to run the first pilot DWCCs across 10 designated locations in the city. She also extended financial assistance for basic facilities and facilitated the distribution of weighing scales to the DWCCs, thereby strengthening their operational capacity.

Policies Leveraged for the Initiative

NULM-SBM Convergence

A guideline on convergence between Swachh Bharat Mission (SBM) and Deendayal Antyodaya Yojana -National Urban Livelihood Mission (DAY-NULM) was introduced in the year 2020 by the Ministry of Housing and Urban Affairs (MoHUA).



Framework of convergence between SBM and NULM [30]

The guidelines suggest the convergence through promoting livelihood options for women's Self-Help Groups (SHGs), informal workers, and other marginalised communities. These livelihood opportunities exist along the sanitation and waste management value chains, such as collection and transportation of waste, processing and converting municipal solid waste to wealth, operation & maintenance of sanitation facilities, as well as management of resource centres under the ambit of Swachh Bharat Mission-Urban[31].

[30] https://nulm.gov.in/PDF/NULM_Mission/SBM_NULM_Convergence_Guideline.pdf
[31] https://www.susana.org/knowledge-hub/resources?id=3220

Solid Waste Management (SWM) Rules 2016 and 2024

The SWM Rules 2016 defines the term 'Waste Picker'. Rule 15(c) of these guidelines requires Urban Local Bodies (ULBs) to establish systems for recognising organisations of waste pickers, facilitating their participation in waste collection, and providing them with a livelihood[32].

SWM 2024 rules retained the term "waste picker" and broadened the definition of "informal collector" to include a wider range of waste recovery activities. The rules mandate that waste must be handed over only to authorised waste pickers or collectors and require local bodies to formally integrate them, maintain records, and report progress. The Ministry of Housing and Urban Affairs (MoHUA) is tasked with supporting states in this integration process. A central online portal is proposed to facilitate reporting and traceability, and all stakeholders are required to work exclusively with authorised recyclers to ensure accountability and environmental compliance[33].

NAMASTE Scheme[34]

National Action for Mechanised Sanitation Ecosystem (NAMASTE) scheme, a central sector scheme introduced in the year 2023-24. Waste pickers, as the third component in the scheme were included from the F.Y. 2024-25 in addition to manual scavengers (MS) and sewerage and septic-tank workers (SSWs). The key objective of this component is to mainstream the informal waste pickers by formally recognising and providing them safe, dignified and sustainable livelihoods, through the following interventions -

- Identification and profiling of informal waste pickers, providing them ID cards and protection kits, also providing health insurance,
- Promoting waste picker collectives in the form of cooperatives and SHGs after their due identification is done,
- To allot RRR Centres (DWCCs) to waste picker collectives, with ULB collaboration, on a long-term basis to enable them to set up safe and sustainable workplace,
- Identified Resource Organisations (ROs) provide consistent support to waste pickers to enable them to manage their business,
- Providing capital subsidy for waste collection vehicles to waste picker SHGs.
- All of the above mentioned interventions are to be accompanied by worker and citizen centric IEC campaigns for awareness generation and behaviour change.

[32] https://cpcb.nic.in/uploads/MSW/SWM_2016.pdf
[33] https://cdn.cseindia.org/attachments/0.30708800_1737204243_swachpune.pdf
[34] https://www.nskfdc.nic.in/en/system/files/Scheme%20guidelines%20of%20Waste%20Scheme..._compressed.pdf


CFSD