



# Insights Report The role of the informal waste sector in the Indian waste plastics system

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**Authors:**

**Confederation of Indian Industry:** Dr Nandini Kumar

**Saahas Zero Waste:** Arun Murugesh and Sayujya Suresh Babu

**WWF-India:** Varun Aggarwal, Mahashweta Mukherjee and Yuvraj Singh Bankavat

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# List of abbreviations

AIWP	-	Alliance of Indian Waste Pickers
BBMP	-	Bruhat Bengaluru Mahanagara Palike
CSR	-	corporate social responsibility
DWCC	-	dry waste collection centre
EPR	-	extended producer responsibility
HDPE	-	high density polyethylene
IWS	-	informal waste sector
MLP	-	multi layered plastic
MRF	-	material recovery facility
NGO	-	non-governmental organization
PET	-	polyethylene terephthalate
PIBO	-	producers, importers, and brand owners
PPE	-	personal protective equipment
SMEs	-	small and medium enterprises
SMS	-	Stree Mukti Sanghatana
SZW	-	Saahas Zero Waste
ULBs	-	urban local bodies
WW	-	waste workers

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## Glossary

<i>dehadi</i>	Daily wage given to workers
<i>dhalao</i>	Community dump
Diwali	One of India's most important festivals
<i>kabariwala</i> (or) <i>raddiwala</i>	A person who collects dry waste from houses, usually on a bicycle or a mini truck, purchases high-value recyclable materials such as newspapers, plastic, glass, unsoiled mixed paper, cartons, and metals and sells at a higher price to a scrap shop
<i>parisar bhaginis</i>	Informal women waste workers
<i>pourakamikas</i>	Garbage cleaners

# Chapter 1:

## The informal waste sector: actors and material flows



### Introduction

Informal workers are the core of the waste management sector, the last link in the waste value chain, for many countries worldwide: despite the informal nature of their work, they are vital, indispensable parts of the reverse logistics value chain of most materials commonly used and disposed by households and commercial establishments. It is estimated that 1% of the urban population worldwide earns its livelihood by retrieving recyclables.<sup>1</sup> On average, the informal sector waste workers collect 20% to 30% of total plastic waste generated in India.<sup>2</sup>

The role of informal sector workers in resource recovery in developing and emerging economies is being increasingly recognized; however, the most effective approaches to improving waste management would leverage the structure and system that already exist, integrating informal workers into the solution.

'Informal' means that workers have no contract, no regular income; as such, their work in most places is little recognized or respected and they are likely to be highly vulnerable.<sup>3</sup> The level of

organization and formalization of waste pickers varies, and these two factors bear heavily on their ability to earn a livelihood. In general, waste pickers fall into three categories: unorganized (independent), organized (through a business collective or alliance, for instance), and contract laborers. In India, local authorities often maintain informal arrangements with waste pickers who fill gaps in formal waste management services in urban areas.

### Material flows and actors

Figure 1 is an overview of the flows of waste and its management in India. The activities of collecting from source, sorting/segregating, aggregating, and transporting between these and other stages, are distributed between the formal and informal sectors to varying degrees. Variations in practice are likely over different parts of India, but the figure correctly represents, (a) overall flows of material and finances, and (b) points at which informal sector workers play a significant role.

<sup>1</sup> Medina, Martin. 2008. The Informal recycling Sector in Developing Countries: Organizing Waste Pickers to Enhance their Impact. Gridlines; No. 44. © World Bank, Washington, DC. Accessed on 25 April 2023. Available at <https://openknowledge.worldbank.org/entities/publication/7e46b64d-3d04-500e-8375-bbc8562c39a5>

<sup>2</sup> Iyer M., Mahato P. 2012. Informal Sector Waste Recyclers in Municipal Waste: Prospects and Challenges – case of Ahmedabad, India, paper presented at ISWA World Congress 2012, Florence, Italy. Accessed on 25 April 2023. Available at [https://www.researchgate.net/publication/282651023\\_Informal\\_Sector\\_Waste\\_Recyclers\\_in\\_Municipal\\_Waste\\_Prospects\\_and\\_Challenges\\_-\\_Case\\_of\\_Ahmedabad\\_India](https://www.researchgate.net/publication/282651023_Informal_Sector_Waste_Recyclers_in_Municipal_Waste_Prospects_and_Challenges_-_Case_of_Ahmedabad_India)

<sup>3</sup> Richa Singh 2021. Integration of Informal Sector in Solid Waste Management: Strategies and Approaches, Centre for Science and Environment, New Delhi. Accessed on 25 April 2023. Available at <https://www.cseindia.org/content/downloadreports/10886>

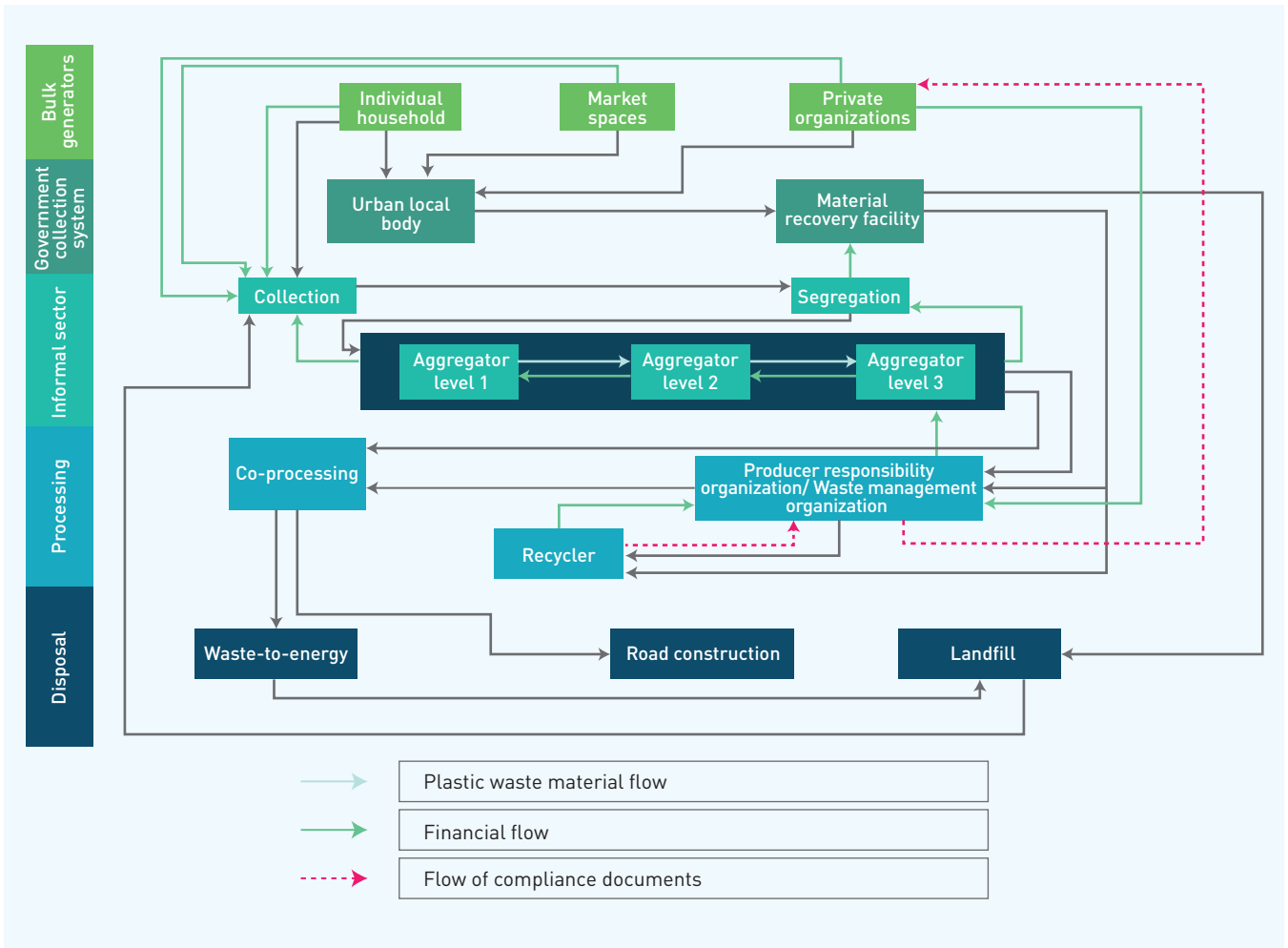


Figure 1: A schematic flow of plastic waste through the value chain involving the informal waste sector

In general, waste generated by individual households, commercial and industrial establishments is collected, sorted, and segregated into different streams of recyclable material. These are sold to aggregators who deal in specific materials and then channelised to recyclers or to co-processing destinations such as cement kilns, waste-to-energy plants and for road construction. Any remaining (residual) waste is sent to landfills.

The material flow and actors involved are described below.



Figure 2: Waste collector transport



Figure 3: Waste-pickers (picture courtesy: Hasiru Dala, left; Pinky Chandran, right)

- **Collectors:** waste generated by individual households, commercial and industrial establishments is collected at varying frequencies, ranging from once a day to a few times monthly. Waste collectors pick up waste, providing a door-to-door service for which they may or may not be paid by the householder, depending on demand for the waste and the prevailing collection system. Often, this is at no cost to the government.

Collectors are likely to own a bicycle or tricycle to transport waste, but typically, would not own space where they can store what they collect. They earn a little extra by sorting and segregating recyclables from the mixed waste collected, discarding the rest in community dumps (called *dhalao* in Delhi: these are three- or four-walled structures meant to receive garbage from a locality/market. Similar dumps are found in other parts of India but could be called by other names) or bins. They may also collect material from roadside waste bins or dumps, with segregation or sorting done on the road or in their homes.

- **Aggregators:** waste collected by door-to-door collectors is sold to aggregators called *raddiwalas* or *kabariwalas* who store high-value recyclables, materials such as newspaper, plastic, glass, unsoiled mixed paper, cartons, and metal, in small shops. *Raddiwalas* or *kabariwalas* may also ride bicycles around residential or commercial areas directly buying certain high-value materials. They usually rent space in commercial areas or residential areas of the city where a good supply of waste is available and sell the well-sorted clean material to aggregators or larger scrap dealers at a weekly or biweekly frequency.

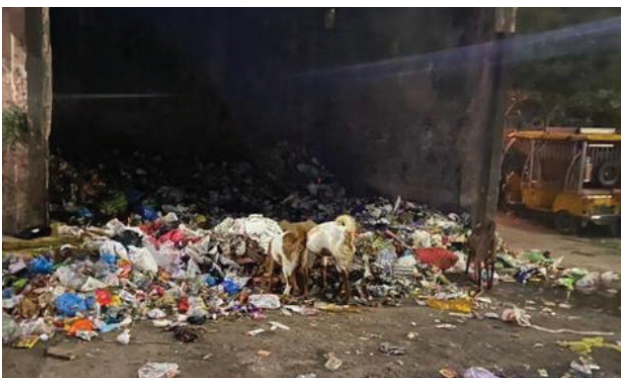


Figure 4: Collection centre (*dhalao*) run by the Municipality, Seemapuri, Delhi



Figure 5: Segregation of plastic waste into different sub-streams



Large aggregators typically establish themselves where land/space is somewhat cheaper, because they need a slightly larger area to store waste collected from the city. They are often located on the peripheries of an urban area and might deal in specific materials only. Aggregators, at different levels, together with authorised material recovery facilities (MRFs) work in tandem with the informal waste sector and feed recyclables to recyclers within the system.



Figure 6: Neighbourhood scrap shop (picture courtesy: Pinky Chandran)



Figure 7: Informal aggregation centre (picture courtesy: Pinky Chandran and Marwan Abubaker)



Figure 8: Upgraded Dry Waste Collection Centres (DWCC), Bengaluru (picture courtesy: Hasiru Dala archives)



Figure 9: DWCC operators and sorters (erstwhile waste-pickers), Bengaluru (picture courtesy: Hasiru Dala archives)

- **Itinerant street waste pickers:** apart from the actors described above, itinerant waste pickers roam the streets recovering recyclable materials from mixed waste discarded in community bins before it is removed by workers in the formal system. Most waste pickers collect either unsoiled or only moderately soiled material (such as paper and cartons), or materials that can be cleaned (such as plastic, metal, glass, and beverage cartons) always focusing on materials with high recycling value.



Figure 10: Itinerant buyer in Davangere (picture courtesy: Hasiru Dala archives)

- **Material recovery facilities (MRFs):** in many cities, MRFs<sup>4</sup> have been set up to store and process waste collected from households, commercial establishments. MRFs can be operated by municipal corporations or business, non-profit organization, or informal recyclers engaged by the municipal corporation for this purpose before the waste is taken for further processing or final disposal. Privately-operated MRFs supplement municipal collection centres whose capacity usually does not meet requirements. They collect waste from waste generators and the municipality, sort it and send it ahead for appropriate processing.



Figure 11: Material Recovery Facility in ELCITA (Electronics City Industrial Township Authority, Bengaluru) (picture courtesy: Hasiru Dala Innovations)

- **Recyclers:** Recyclers buy specific valuable materials (certain kinds of plastic, paper, rubber, for example) processing them into raw materials used to make new products.

Some kinds of waste are sent to cement kilns or co-processing units where energy is recovered from them. Finally, waste that, a) is not, or cannot be sorted, or, b) has no or hardly any value, or, c) does not have an end destination processor ready to buy it, ends up in landfills.



Figure 12: Sorted and baled material sent to recyclers/co-processors

The reverse supply chain essential for creating a circular economy has been created by informal workers and is efficiently operated by them. The collecting, sorting, and recovering of material from waste readies an input stream to recyclers and other end-destination processors who use the waste material thus preventing it from reaching landfills. Sorted recyclables are processed and eventually sent to recyclers or co-processors.

<sup>4</sup> In India, material recovery facilities are simple walled structures, with a roof, where post-consumer waste is segregated into different streams, mostly by hand. The level of automation is typically low but varies with location in the country. High-value materials, such as metals, paper and polyethylene terephthalate (PET), high density polyethylene (HDPE) are sold directly by generators to kabadiwalas so waste reaching the MRFs consists largely of relatively low-value material such as flexible packaging, medicine bottles, paperboard cartons and cardboard.

# Chapter 2: Challenges in existing waste management system



While the current system of waste collection has benefits and efficiently moves high-value waste through towns and cities, it can be further improved. For informal workers, waste collection is primarily a livelihood opportunity, and is therefore strongly linked to and motivated by the waste materials' demand and supply: it can safely be said that without a demand to incentivise it, there will be no collection by workers in the informal system.

Any measure that helps enhance demand will improve collection rates. The Extended Producer Responsibility Regulation<sup>5</sup> recently notified, is one such measure, mandating collection of packaging waste and incorporation of recycled content back into packaging, with targets and timelines. By mandating use of recycled content, the Regulation can improve collection rates by creating a higher demand for plastic packaging waste and encouraging the flow of larger volumes of waste through the collection system.

With the understanding that the collection depends heavily on volume, quality, and value of the material, it is helpful to get an idea of the general landscape in which informal workers and their enterprises operate and understand the challenges they face in the working and operation of the reverse supply chain.

Several studies and reports identify challenges, recommend strategies, solutions, and approaches for working with and integrating the informal waste sector into waste management. To gain

more information about the sector and link gaps to actions for stakeholders across the value chain, surveys were carried out in some parts of India, using a questionnaire and some face-to-face interviews.

## Survey methodology

Apart from stakeholder consultations, on-field surveys were also undertaken to gather information on various aspects from the stakeholders in the waste management ecosystem in India. The surveys conducted for this purpose were broadly under two categories - one directed towards the waste workers in the ecosystem and the other towards the enterprises that operated in it.

Both the surveys were kept to less than 30 questions, and the data collection was done using the Zoho Survey application. Wherever possible the survey enumerator visited the work premises and conducted the data collection. However, to be able to reach out to a larger cross-section of respondents, the other surveys were conducted through telephonic mode

Surveys were conducted in different parts of the country to get more information about these aspects. Owing to the diversity in culture, practice and compliance with the law, variations in the

<sup>5</sup> Ministry of Environment, Forest and Climate Change, Government of India (2022). Guidelines on Extended Producer Responsibility for Plastic Packaging. G.S.R. 133(E). Accessed on 25 April 2023. Available at [https://eprplastic.cpcb.gov.in/plastic/downloads/4th%20Amendment%20\(EPR%20guidelines\)%20Feb%202022.pdf](https://eprplastic.cpcb.gov.in/plastic/downloads/4th%20Amendment%20(EPR%20guidelines)%20Feb%202022.pdf)

results are expected: while challenges and observations may not represent all those faced by workers and enterprises, they are very likely to cover the most common ones.

The survey covering workers aimed to gain insights into areas such as socio-economic aspects, working conditions, access to finance, and identity (Annex 3: Workers survey questionnaire ). Workers surveyed were both those who collected waste informally and those who worked in enterprises (dry waste collection centres, materials recovery facilities or aggregation centres).

The survey covering enterprises dealing with plastic waste was designed to identify business

challenges faced by waste collection/aggregation centres and MRFs, and to understand the nature, source and destination of material handled (Annex 4: Enterprise survey questionnaire).

The surveys covered 123 respondents in plastic waste management across 13 states. Of these, 54 were enterprises and 69 were waste workers. Among the enterprises, 57% were MRFs operated and run privately, while 43% were MRFs operated by the government.

The number of surveys conducted in each state were: 55 in Karnataka<sup>6</sup>, 15 in Tamil Nadu, 11 in Madhya Pradesh, 8 in Maharashtra, 15 in Delhi, and 19 in other states (Goa, Telangana, Uttarakhand, Daman and Diu, Assam and West Bengal).

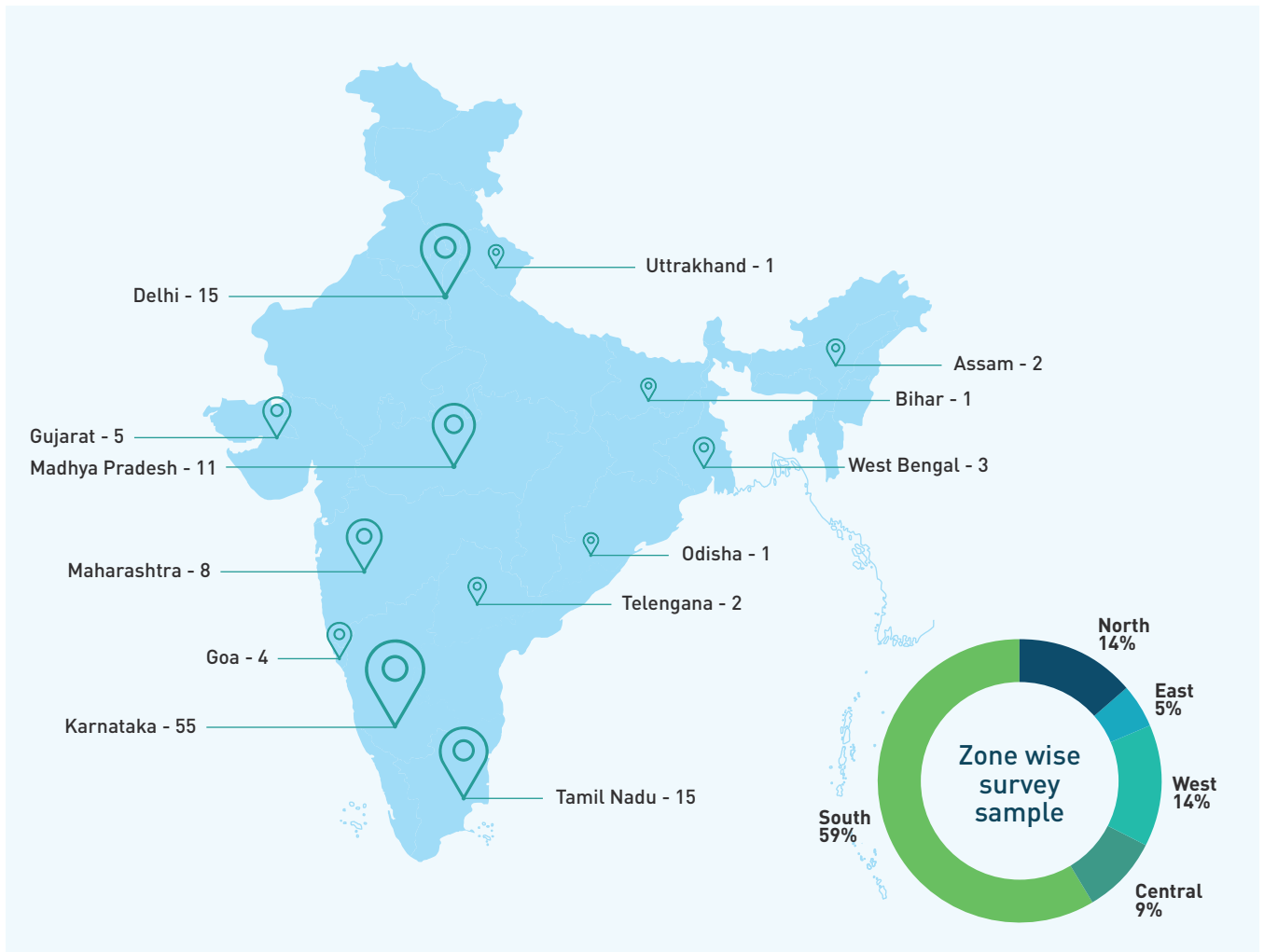


Figure 13: Number of surveys conducted and zone wise distribution of surveys across India for this study

<sup>6</sup> Snowball sampling was used, in which one respondent connects the surveyor to another respondent. Since waste workers in Bangalore were more willing to participate in the surveys than workers in other regions, there is a large number of responses from there. However, the main challenges are unlikely to be affected by this bias, even though regional variations exist.

# Worker survey results

More than half of workers at the facilities surveyed were males (63%), and overall, about 30% had migrated from other states. Migration was largely driven by unemployment and poverty but working in the waste sector is relatively easy because no skills, paperwork, investment, and references are required. Among those surveyed, about a quarter had not gone to school, about 40% had completed primary school; 10% had completed Class 12, and the rest were educated to different levels in between.

Of the different activities that waste workers typically engage in (collecting, sorting, baling, loading and transport), only men are involved in transport and baling operations. Women carry out 40% of sorting and about 10% of collection. Often, a family will work together to deliver the full range of activities and, therefore children may also be involved in waste-picking and sorting, working alongside their parents.

Health hazards that waste pickers are routinely exposed to arise from their inherent poverty and the occupation itself. Since they belong to the poorest and most deprived section of the urban population, undernutrition, growth retardation, anaemia, tuberculosis, and other bacterial and parasitic diseases are very common. Also common are health hazards arising from continued contact with wet and dry waste of all kinds which they sift through in search of valuable, recyclable material.

## Indicators of formalisation

An assessment of the degree to which informal waste workers are integrated into government welfare and benefit schemes was made in the survey via information about possession of identity documents, monthly income, working hours, access to PPE, provident fund facility, Employee State Insurance, and the nature of work contracts.

Out of the total number of respondents surveyed, 37% were permanent employees while the rest were temporary or contract workers. Waste workers may also be hired on a contractual basis or temporarily, on specific project; these workers are paid daily (*dehadi*) or at the end of the project. On average, workers worked for 27.9 days per month and 8.4 hours per day.

A variation in income earned by waste workers was noted by State, with the highest incomes in the Southern region, followed by the Western, Northern and Central regions.

On minimum wages for workers, waste worker groups said that many workers often earn more than the minimum wage while choosing their working hours, and therefore did not find minimum wages for structured working hours attractive.

Survey results revealed a significant difference in the work and pay structure between men and women. In some cities such as Pune, Maharashtra, waste pickers and traditional itinerant waste buyers are rather exclusively women, while in other regions men perform these first activities of the value chain, as women work at home sorting or pre-processing the collected wastes.

On average, men were found to earn INR 2,200 per month more than women (21%), even though the average number of working hours were almost the same. This could be explained by the fact that the highest paying activities, transport and loading vehicles, are done by men. Women work mostly as waste-pickers (collection and sorting), which is lower paid and so earn less.

In our survey, 53% of the workers said that they had access to Personal Protective Equipment (PPE) but very few workers observed during field visits in Karnataka used PPE (such as gloves). They cite loss of speed and efficiency of segregation/collection as the reason for not wearing shoes or gloves. Since wage calculation is based on the weight of waste collected, the motivation of informal workers to collect as much as possible during a day is clear.

# Enterprise survey results

Government collection centres run by the municipalities are the primary points of general waste collection in most Indian cities and towns, while private and informal collection centres tend to specialize in specific waste streams driven by market accessibility and processing.

Aspects of the working of enterprises surveyed were:

- source of input materials to the enterprise
- composition of materials received
- business operations
- destination of these materials

## Source

The source of waste to enterprises was found to be about equally divided between:

- **Indirectly:** via different intermediate points in the supply chain, such as scrap dealers and vendors who, in turn, source waste from generators and transport them to the enterprises. This may also be done by (a) informal waste pickers, *kabariwalas*,

and scrap dealers and, (b) Private aggregators may also purchase waste from the municipal collection centres because these centres do not have the capacity to process the waste that they have collected

- Directly from generators of waste (68% of this waste came from residential complexes and households, and 32% from commercial complexes and shops)

The cost of procuring waste is directly linked to the efficiency of the intermediaries to collect, sort and segregate waste, and the degree of formalization and professionalism in the system. As this is usually the primary cost of the enterprise, having an efficient supply chain of waste is a key driver for this segment.

## Composition

More than half of the dry waste collected, by weight, was paper (average, 53%), about 27% plastics (both rigid and flexibles combined), and the rest, materials such as metals, glass, and textiles. About 4% of the waste is rejected; either because it is too contaminated to process or there is no market: these usually end up in landfills. The typical composition of the plastic fraction is shown below.

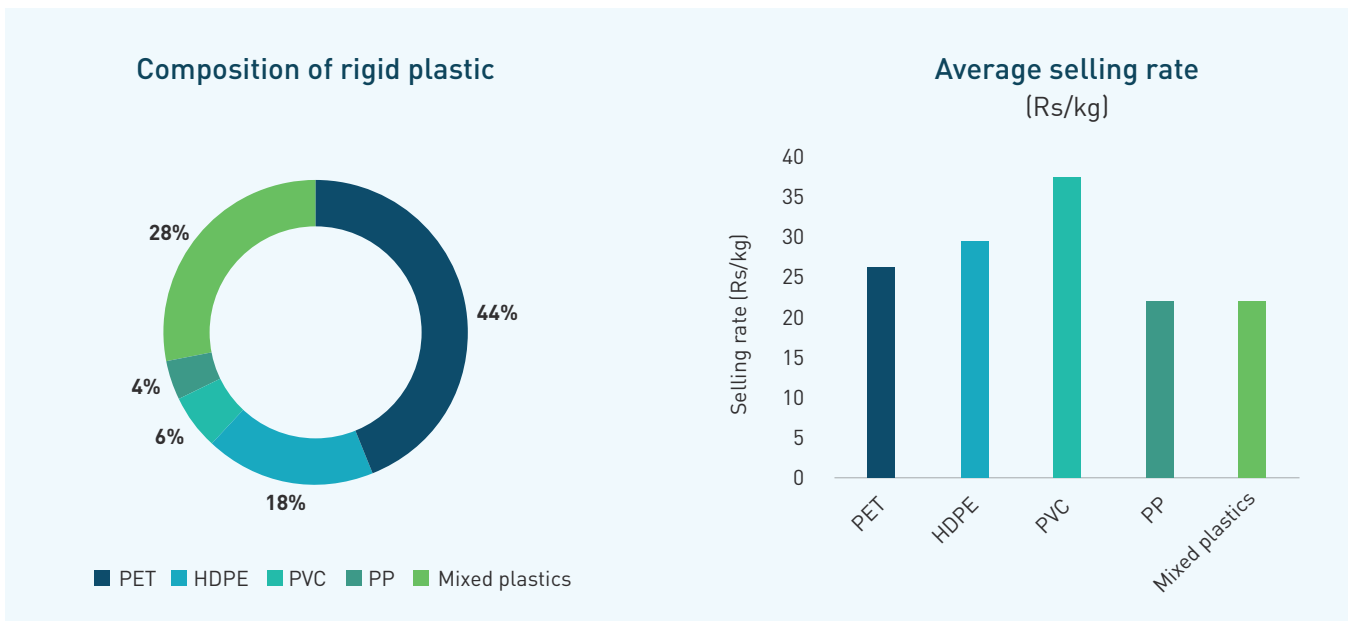


Figure 14: (left) Composition of rigid plastics collected; (right) Average selling rate for different plastics

## Business operations

The enterprises' revenue ranged between INR 5,000 to INR 5.5 lakhs per month, with an average of INR 1.05 lakhs per month; the number of employees ranged between two and thirty-six.

Basic equipment for handling material such as conveyors and balers were found at about half of surveyed enterprises, more than half reported (60 to 70%) having first aid kits and fire extinguishers on site.

Owners of small informal enterprises are ineligible for Government-run schemes promoting Small and Medium Enterprises (SMEs) and for formal credit from banks or financing institutions. Fluctuating and unstable prices of recyclable materials threatens a consistent income stream particularly when space for storage and sorting is limited.

## End destination analysis

Enterprises sell sorted materials to different end destinations with the market price determined by (a) demand for material and quality, and, (b) the availability of end destinations for, or recycling the material. These may be affected by seasonal variations, and activities such as real estate development. Materials that cannot be recycled are discarded into landfills (legal or illegal) or illegally burnt. As with the supply chain of input waste, flow to the end destination can take place directly or through intermediaries (traders).

About a quarter, 24%, of surveyed enterprises sold a specific waste material, mostly plastics, to recyclers. 31% sold their waste to intermediaries (some crossover between this and the former category is expected; another level of sorting may take place at this stage). 39% of surveyed enterprises sent their rejected waste to landfill, directly or by municipal vehicles; 22% of enterprises stated they also dump/burn rejected waste. The remainder, about 2%, of sorted material was transported on to co-processing units such as cement factories.

The data also indicated that a higher percentage (28%) of private enterprises were selling to recyclers than government-run enterprises were (20%). This difference was probably a result of the

fact that government facilities are mandated to collect all types of material (mixed waste) which tend to be highly contaminated and require a high level of manual segregation. Privately-owned enterprises collect specific high-quality material (PET, HDPE, for example) with well-established end markets.

## Indicators of formalization

The strongest motivation for small-scale entrepreneurs in the waste management sector to remain unregistered (and therefore being identified as informal) is being able to avoid taxes, registration costs, public service and/or insurance fees; however being unregistered means that they are not eligible for government funding schemes.

About 60% of enterprises surveyed had registered their operations with State Pollution Control Board (SPCB), with others operating without legal registration.

# Summary

Workers and enterprises in the informal sector are crucial components of the reverse plastics supply chain; however, the surveys indicate that there is scope for facilitating their work and for improving conditions in which these workers and enterprises operate.

A number of challenges emerged from the survey and via a few in-person interactions held in some Waste-Worker (WW) communities in different parts of the country. Emerged from discussions with WW during filming of video.

- **Lack of sorting/segregation at source:** having to spend time on sorting waste is a significant challenge for an informal worker. With most payments determined by the quantity of waste sorted and processed, the quality (how well it is sorted) of the incoming waste is very important.
- **Lack of identity documents:** many workers cited mistreatment and humiliation, police harassment, in part arising from a lack of acceptance in society. They are often evicted from their places of operation and accused of crimes.

The inability to obtain any national identity documents because they are often migrants to urban areas, leads to a high degree of suspicion surrounding them in society.

- **Lack of basic infrastructure:** the money to purchase and install basic machinery such as balers and conveyors to facilitate sorting/segregation is lacking. This slows down work.
- **Absence of transparency in pricing of material:** The market worth of material collected is much higher than the amount paid to informal workers for their highly labour-intensive task of door-to-door collection and segregation. This is because aggregators higher up in the value chain do not allow prices to become known transparently<sup>7,8,9</sup>. Informal workers are therefore paid only about one-third of what the same work would be worth, if formalised, while the material is sold at much higher prices along the value chain.
- **Threat from private sector operations:** Informal sector workers' livelihoods depend on volatile commodity markets, and they

constantly face the threat of losing access to waste streams as municipalities adopt 'cleaner' private sector solutions. The involvement of privately managed enterprises reduces their access to high-value waste, leaving informal sector workers unemployed.

- **Absence of amenities at site:** Exposure to health hazards in the form of chemicals and biological waste; threats to occupational safety; and lack of access to basic sanitation amenities when working in landfills, such as drinking water, toilets, and places to wash, are all challenges.
- **Access to waste:** this was cited as one of the main challenges of waste workers as they lacked the authorization or did not have partnerships with urban local bodies. The enterprise's main source of waste is then the *kabariwala* and scrap dealers.
- **Manpower:** Enterprises mentioned hiring and retaining manpower as a problem, with workers tending to get involved in waste management for short durations only.

<sup>7</sup> Richa Singh 2021. Integration of Informal Sector in Solid Waste Management: Strategies and Approaches, Centre for Science and Environment, New Delhi. Accessed on 25 April 2023. Available at <https://www.cseindia.org/content/downloadreports/10886>

<sup>8</sup> Kapur-Bakshi, S., Kaur, M., and Gautam, S., 2021. Circular Economy for Plastics in India: A Roadmap. New Delhi: The Energy and Resources Institute (p. 9). Accessed on 25 April 2023. Available at [Circular-Economy-Plastics-India-Roadmap-min.pdf](https://www.cseindia.org/content/downloadreports/10886) (itseducation.asia)

<sup>9</sup> The Circulate Initiative. 2023. Mapping local plastic recycling supply chains: insights from selected cities in India. Accessed on 25 April 2023. Available at <https://www.thecirculateinitiative.org/mapping-local-plastic-recycling-supply-chains-in-india-indonesia-thailand-vietnam>



# Chapter 3: Gaps



The survey results presented in the previous chapter identify challenges faced by workers and enterprises in the informal waste sector in the daily work of collecting and processing (plastic) waste. The larger ecosystem within which these two stakeholders operate was also studied via consultations with brands, recyclers, Non-Governmental Organizations (NGOs), and development organizations with a view to assessing the current situation of the informal sector plastics collection in India and understand the challenges faced by workers in it. Gaps emerging from an understanding of the challenges are presented below.

## Segregation at source

Ideally, waste should be segregated before it leaves the point of generation, either a household or institution/commercial establishment.

## Infrastructure

A focus on the following aspects will benefit the waste management system:

- **Transport:** efficiencies are low, with a need to increase the quantity of waste transported per trip, right from the source to the point where it is processed (such as a recycling unit).

- **Space and equipment for material storage and sorting:** limited availability of material recovery facilities equipped with simple machines such as balers and conveyors reduce the efficiency of overall operation. This in turn, compromises quality of material going to recyclers.
- **Forward linkages:** availability of up-to-date information about the recyclability of packaging formats/materials and in some cases, the absence of recycling facilities nearby for certain plastic resins can lead to technically recyclable material remaining behind in residual waste.
- **Means of tracking source of material:** at present, the absence of a way to trace the source of material leads to inefficiencies in closed-loop recycling, especially in the context of recycled content being used in contact with food. A mixing of contaminated and clean material can reduce quantities available for like-to-like recycling.

## Business models

Strengthening the following aspects of business models in waste management will help create a circular plastic waste management economy in India. A demand for recycled plastics can be expected to grow given ambitious targets in the current Extended Producer Responsibility (EPR) Guidelines. Different aspects which should be addressed are:

- **Quality of input feedstock:** although waste is generated in large quantities, the recyclable component is usually mixed with wet waste, reducing its intrinsic value. In the survey (Chapter 2), 31% of enterprises stated that access to usable or segregated waste is a major challenge.
- **Revenue to run MRFs:** The revenue from the sale of waste is currently not sufficient to manage and sustain material recovery facilities. This is because relatively small quantities of high-quality waste arrive there: another consequence is lower price realization for the effort put into collecting and sorting waste.
- **Registration of enterprises:** the large number of unregistered enterprises operating in waste management limits its development into a full-fledged industry. This also limits workers' access to identity documents, social benefits, better working conditions and fair wages.
- **Transparent pricing of different plastic grades:** transparent availability of pricing could help the informal sector worker realise a better value for waste collected. Given the penetration of smart phones and internet connectivity, this information could be facilitated by digital platforms.

## Human capital

The growing quantity of plastic waste needs management by skilled and trained manpower. Training and capacity-building for both business entrepreneurs and workers, will increase operating efficiency and the safety. Both these aspects contribute to enhancing the dignity of labour, and increasing the prospects of employment in the sector.

Other topics could include the setting up and operation of material recovery facilities and other kinds of waste management infrastructure.

# Chapter 4: Recommendations



Drawing from the gaps outlined in the previous chapter, a set of recommendations follows, which are divided into categories: a) activities needed, b) stakeholders involved, and, c) anticipated impact.

These derive from the gaps in earlier chapters and insights provided by experts from the Alliance of Indian Wastepickers (AIWP).

The recommendations are elaborated below:

- **Mainstreaming:** this signifies integration of entrepreneurs and workers into a well-developed waste management sector.
  - a. Activities needed**
    - enable local policy and legal environment, including the right to work in public spaces
    - register enterprises and workers by easing documentation, compliances, and capacity building
    - provide basic workspace, infrastructure, and protective equipment
    - recognizing informal livelihoods as legitimate employment/work
  - b. Stakeholders involved**
    - Institutional and civil society actors
    - Municipal corporations and Urban Local Bodies (ULBs)
    - NGOs
    - Waste management organizations
  - c. Anticipated impact**
    - better information about recycling markets and prices
    - better opportunities for resource recovery
    - more efficient door-to-door collection; better segregation at source, leading to enhanced collection
- **Capacity-building**
  - a. Activities needed**
    - capacity-building workshops and training for relevant stakeholders on topics such as material identification, health, and safety best practices in the waste management
    - upskilling opportunities through training and capacity-building on emerging technical interventions, entrepreneurship, etc.
  - b. Stakeholders involved**
    - NGOs
    - Social enterprises
    - Waste management organisation
    - Recyclers
  - c. Anticipated impact**
    - transition to a formalized waste collection system
    - improved collection rates, enabling more recycling

- **Social inclusion and protection**

- a. Activities needed**

- expanding and upgrading assistance programs for social protection including reforming contributory social protection schemes to include informal workers, and providing child-care services
    - enabling social inclusion and recognition by providing waste pickers with government identity cards and bank accounts, for example

- b. Stakeholders involved**

- Municipality and ULBs
    - NGOs
    - Social enterprises

- c. Anticipated impact**

- better living standards for the informal sector
    - transition to a formalized waste collection system
    - improved social recognition
    - access to healthcare

- **Financial inclusion**

- a. Activities needed**

- formalization of terms of employment and trade, including regular work orders, fair wages and price rates, and fair prices for goods and services
    - financial assistance to scale up operations, including short-term cash grants, and low-interest business loans
    - provide access to digital technologies, such as mobile apps, mobile payments, which help improve financial transparency

- b. Stakeholders involved**

- Private enterprises
    - Recyclers
    - Waste management organizations
    - NGOs

- c. Anticipated impact**

- transparency and traceability in the plastic waste management system
    - facilitation of formal recognition of informal waste workers
    - better access to financial or payment services

- **Safety equipment**

- a. Activities needed**

- provide waste pickers with gear such as gloves, protective and sorting tools to ensure primary safety
    - train informal stakeholders on aspects of their work related to health, environment, and handling machines/equipment

- b. Stakeholders involved**

- Municipality and ULBs
    - Private enterprises
    - Waste management organisations

- c. Anticipated impact: Better protected workers and safe working conditions.**

- **Creation of robust end-market**

- a. Activities needed**

- robust enforcement and monitoring of businesses meeting the recycled content target in the EPR
    - generate high-quality recycled plastic to be used as raw material by businesses, hence leading to better price realization of post-consumer waste
    - encourage investments into infrastructure for handling large quantities of sorted plastic waste

- b. Stakeholders involved**

- Private enterprises
    - Recyclers
    - Government

- c. Anticipated impact**

- lower dependency on virgin plastic
    - better quality of recyclate, which improves the selling rate and, in turn, raise incomes of informal waste sector workers

# Chapter 5: Conclusion



In the backdrop of increasing pollution by plastic, worldwide, working towards a circular economy for plastic packaging is vital for India and can be realised via collaborative efforts by stakeholders across the value chain. Enabling regulation is now present in the form of ambitious targets articulated in the EPR Guidelines which, when they come into full force, have the potential to mobilise the entire plastics value chain and develop robust end markets for recycled plastic.

Since robust end markets for recycled plastic rely on a consistent supply of high-quality recyclate, all post-consumer parts of the value chain (collection, segregation, aggregation) must also be strengthened so as to maximise the flow of good quality waste to recyclers.

In India, post-consumer waste is collected and segregated for the most part, by over a million or so informal workers who move plastic through a system which has evolved organically over decades.

While their role is crucial, informal workers remain unrecognized and unsupported with little or no income security, access to identity documents and government welfare schemes, or opportunities for entrepreneurship and livelihoods. These and other challenges identified in the insights report, if addressed will allow effective approaches to waste management leveraging the structure and system that already exist integrating informal workers and self-sustaining enterprises into the solution.

Inadequate space to operate and store waste, insufficient infrastructure, and funding for segregation/sorting, were also found to be challenges in the questionnaire and surveys conducted among informal waste workers and enterprises to gather information.

In terms of social challenges, a lack of formalization of the workers is partially responsible for the lack of recognition and dignity. Absence of amenities and toilets on site (especially affecting women workers), injuries during work, difficult-to-sort waste, the lack of transparent pricing, access to waste and competition from private players emerged as issues faced by workers and enterprises.

These challenges indicate gaps in the waste management ecosystem which broadly relate to (i) sustainable business models, (ii) infrastructure development (including segregation), and (iii) human capacity development to create and nurture entrepreneurial abilities. The absence of trained human resources compromises efficiencies at both, worker, and enterprise level.

The report draws on the above analysis of gaps and challenges to propose a set of recommendations relating to mainstreaming/ integrating of workers and entrepreneurs into a well-developed management sector; capacity-building so that waste management can be professionally handled, financial and social inclusion, creation of robust end-markets, and use of safety equipment to minimize injuries and occupational illnesses.

# Annex 1

## Introduction to informal waste sector document set

Understanding the role and workings of the informal waste sector is a complex task partly because there is no single model in practice, and it is hard to capture variations over different part of India. However, it is important and possible to gain insights into the challenges and workings of informal workers and enterprises involved in waste management; such insights can help address some of the challenges they face, identify workable solutions and record best practices to be followed via the experience of organizations active in this area.

A set of documents and video brought out by the India Plastics Pact aims to provide insights into different aspects of waste management and solutions via:

- A video capturing the voice of waste workers



- A toolkit which can be used by a wide range of organizations (Producers, Importers, and Brand-Owners (PIBOs), recyclers, consumers, voluntary organizations, government agencies, for example) to facilitate integration of informal sector workers and enterprises into the plastic recovery value chain. A stepwise description of activities leading to the design and implementation of an inclusion programme is presented in this toolkit.
- A compendium of case studies/best practices developed and adopted by waste management organizations operating at different locations in India. These organizations are well-known and have met with success in integrating the informal sector over several years of work.
- An insights report (this document), intended to identify some of the gaps in the existing waste management system and challenges faced by informal workers as an intrinsic part of this system in collection, segregation, and recycling. The inputs are based on questionnaires and surveys gathering information from stakeholders across the value chain. The report's recommendations identify the activities needed, stakeholders involved, and anticipated impact.

# Annex 2

## Case studies

### Sunita\* - earning her livelihood as a free roaming waste picker in Bhadarpur (Meethapur), Delhi, India

Sunita, 40, has been living in Delhi for the last 25 years. Her parents who worked as porters were too poor to send her to school, and so, she began working as a waste picker when she was 11 years old. She works between 6 am and 12.30 pm collecting waste from a radius of 2-3 km. She earns a meager sum of Rs. 40-60/- per day, simply not enough to sustain a family of eight.

**Earlier, there were more women in this profession. But now, many men are waste picking. They have more stamina to walk, they know where to go and therefore, collect more material than we do and earn more than we do. This is a threat to our work,**

Sunita

She works as a domestic help on some days making a little extra money whenever she can, but it still isn't enough and is often forced to borrow money from a local money lender. She pays interest of Rs. 100/- every month for every Rs. 1000/- that she borrows. Her family spends more than Rs. 50/- on food every day; Rs. 30/- just on an injection (vaccine) every five months. If she or her children fall ill, the costs are separate. There is no permanent toilet in sight, just a make-shift arrangement that she and her family use. Due to the unavailability of public taps, Sunita draws water from some nearby apartments.

Sunita is hoping that the housing scheme initiated will materialize soon, and she and her family can lead a normal life. She has an ambition

of operating in a more organized system and advocates women waste workers' upliftment in the waste management system. For this reason, she joined the local waste pickers association named "Shehri Mahila Kamgar Union". The association is a female-centric NGO that helps uplift the women in the informal sector through capacity building, advocating their rights, and helping overcome societal harassment.

#### Impact

According to Sunita, being a member of the waste picker association has helped and supported her with:

- Building capacity among girls and women involved in the manual sorting of municipal household waste
- Learning skills to empower future mothers
- Empowering adolescents and adults, especially girls, to participate in community and society

**We get up at 3-4 am to have a bath, as everyone else in the locality is sleeping during that time. There is no privacy and I get scared for my daughters, as drunken people come and harass us from time to time. There is no real support from the police. The police believe that we help thieves in this area and continuously question us on their whereabouts. How will we know anything about this?**

Sunita



Figure 15: Sunita at work

## Labour and Livelihood Impact: Dry Waste Collection Centres in Bengaluru, India

Bruhat Bengaluru Mahanagara Palike (BBMP) is a local administrative body responsible for civic amenities and some infrastructural assets of the Greater Bangalore metropolitan area. The organization extensively works towards ensuring door-to-door collection, segregation, and management of various municipality waste in **198 wards** of the city<sup>11</sup>. In 2011, the commissioner of the BBMP issued an official circular talking about the registration of individual waste pickers with the Palika. The initiative started with getting 200 waste pickers registered with the Palika and providing them with Identity cards has led to having 18,500 *pourakarmikas* (garbage cleaners) getting registered and working with the Palika as of 2021<sup>12</sup>.

The BBMP had set up Dry Waste Collection Centres (DWCC) which are responsible to facilitate the collection and buy-back of all dry waste from residents, contract and waste workers, and scrap dealers; integrating informal waste workers into the operations of these centres; and encouraging or implement extended producers' responsibility (EPR) of packaging materials that are not being recycled currently. The Palika with assistance from **Hasiru Dala** ensured that the informal waste workers that are registered with the Palika get to work and manage these DWCCs. Hasiru Dala currently supports **33 Dry Waste Collection Centres** being set up by BBMP as a third party that manages and empowers waste workers and leverages their innate entrepreneurial abilities to become service providers and create livelihood opportunities for waste-pickers. Through these initiatives, Hasiru Dala has been able to get more than 6000 waste workers an identity card from the BBMP.



Figure 16: Typical household dry waste collection in BBMP ward in Bengaluru

### Impact

The initiative led by Hasiru Dala has worked towards:

- Getting occupational ID cards for 8,598 waste workers in the city of Bangalore and 500 in the cities of Karnataka<sup>13</sup>
- 11,380 workers' occupational identity cards from Municipal bodies<sup>14</sup>
- 272 children of the waste workers are now enrolled in the schools<sup>15</sup>
- 16,169 workers have been able to avail Social Security Benefits by applying for basic identity documents such as the Aadhar Card, PAN card, through the social inclusion project<sup>16</sup>

### Key takeaway

Partnership with local administrative bodies (municipalities/ULBs), public and social enterprises, communities along with Corporate Social Responsibility (CSR) interventions of private enterprise can help integrate waste pickers in the waste management systems.

<sup>11</sup> Richa Singh 2021. Integration of Informal Sector in Solid Waste Management: Strategies and Approaches, Centre for Science and Environment, New Delhi. Accessed on 25-04-2023. Available at <https://www.cseindia.org/content/downloadreports/10886>

<sup>12</sup> Bruhat Bengaluru Mahanagara Palike (BBMP). City Statistics. Accessed on 25 April 2023. Available at [SWM \(bbmp.gov.in\)](https://www.bbmp.gov.in)

<sup>13</sup> Hasiru Dala. 2019 - 2020 Waste workers at the forefront: Annual Report. (p.2). Accessed on 25 April 2023. Available at [ANNUAL REPORT 2019 - 2020 \(hasirudala.in\)](https://www.hasirudala.in)

<sup>14</sup> Hasiru Dala. Our Impact: Occupational Identity Cards. Accessed on 25 April 2023. Available at [Our Impact - Hasiru Dala](https://www.hasirudala.in)

<sup>15</sup> Hasiru Dala. Our Impact: Admissions and Re-Enrollments. Accessed on 25 April 2023. Available at [Our Impact - Hasiru Dala](https://www.hasirudala.in)

<sup>16</sup> Hasiru Dala. Our Impact: Social Security Benefits Availed. Accessed on 25 April 2023. Available at [Our Impact - Hasiru Dala](https://www.hasirudala.in)



## Entrepreneur Development Programme: Saahas Zero Waste, Bengaluru, India

**Saahas Zero Waste (SZW)**, a social enterprise working towards developing integrated waste management services to bulk waste generators in Bengaluru, Chennai and Goa has a vision of creating a zero-waste world through circular economics and social inclusion. Through the organisations Entrepreneur Development Programme, they have worked towards leveraging the innate entrepreneurship of the stakeholders in the informal sector and integrate them into the formal waste management ecosystem. This includes holistic efforts in capacity building, introducing them to customers, hand holding through various compliance requirements, book-keeping, health and safety standards and assistance in interactions with the local governments among others.

**Hassan Khan**, an informal waste worker in the year 2010, is now on his way to become a formal entrepreneur. Back in the day, he managed 16 MT of dry waste per month on an illegally constructed facility in Begur, Karnataka. In August 2019, Hassan Khan partnered SZW for a four-month social inclusion project funded by Asian Paints Limited. The social inclusion model aimed at transitioning Hassan's informal activities to a fully formal and ethical business which would empower and elevate his existing working conditions.

The capacity building by SZW encouraged Hassan to operate the new facility according to identified social and environmental standards which has enhance his business. After four months of hand-holding Hassan Khan is now an authorised entrepreneur who runs a dry waste collection facility at Jigani, Karnataka.

### Impact

- Hassan currently handles a waste capacity of 30 MT per month and manages all types of dry waste
- He has employed ten field personnel to run his operations
- He also ensures that all employees have a regular salary which complies with minimum wage regulations and healthy working environment to all the field staff

### Key takeaway

The professionalization of informal entrepreneurs in business and financial management has involved systems that are small-scale and simple and should lead to the creation of longer-term partnerships with local entrepreneurs, NGOs in order to be sustainable.



Figure 17: Hassan's journey

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## Transforming the Lives of Informal Workers: Stree Mukti Sanghatana: Mumbai, India

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Established in 1975, Stree Mukti Sanghatana (SMS) has become the face of drastic transformation in the lives of informal women waste workers in the maximum city, Mumbai. SMS started organizing women workers, known as *parisar bhaginis*, at the Deonar landfill site, and today serves apartments, government institutes, educational campuses and more. Most importantly, SMS is no more just a waste collection initiative, but a holistic social protection-based institute. SMS has been working hard to provide microcredit, mental health, family counselling, education, and public health support services to *parisar bhaginis*. Improving the standard of living of women members, creating zero waste communities, improving recycling rates and developing new technologies to handle waste are some of the SMS core objectives. The organization believes strongly in decentralized waste management systems and advocates for the same.

Women members also have secured access to waste, sorting spaces, and recyclers. The federation collects waste from the women members directly at market rates, removing the role of the middleman in the process. Members

are also eligible for a 4 percent bonus (amounting to Rs. 10,000 to 12,000) depending on the value of the waste collected in a year, and this bonus is given out during festivals such as Diwali.

### Impact

- The formal training initiatives undertaken by SMS provide members with an opportunity to get new and improved jobs
- Due to source segregation and an efficient recycling system, waste reaching the dumpsites has also been reduced
- SMS remains one of the most inspiring and impactful examples of integrating the informal waste sector in the country.

### Key takeaway

The setup of sorting and recycling centres managed by female small enterprises is an important element and plays a key role in gender diversity. It is currently being replicated in several cities. This model has become a leading example of how gender equity and combating plastic waste can go hand-in-hand.

# Annex 3

## Workers survey questionnaire

Question	Answer Type	Options (if applicable)
Employer/Company Name	Text	
Name of worker	Text	
Upload photo of worker	Photo	
Age	Number	
Gender	Single choice	Male, Female, Other
Education	Single choice	Not gone to school, Stopped before 5th grade, Completed 5th grade, Completed 10th grade
Place of work (City/town and area name	Text	
Place of origin (State and town)	Text	
Type of work	Multiple option	Transportation, Waste picking, Sorting, Baling, Machine operator, Loading into vehicle
Type of waste working with	Multiple option	Mixed waste (wet and dry), Mixed dry waste, Plastic, Paper, Cloth, Metals, Other
Years of experience in the current work	Number	
Average no of working days in a month	Number	
Average no of working hours per day	Number	
Average monthly income	Number	

Question	Answer Type	Options (if applicable)
Wage calculation basis	Single choice	Fixed month salary, Based on rate per kg, Based on hours of work
Mode of wage payment	Single choice	Cash, Bank transfer/other electronic payment modes
Active bank account	Single choice	Yes/No
Provident Fund (PF)	Single choice	Yes/No
Any insurance policy	Single choice	Yes/No
If yes, what insurance	Multiple option	Health insurance, Life insurance, ESI, Other
Aadhar card	Single choice	Yes/No
PAN card	Single choice	Yes/No
Voter ID	Single choice	Yes/No
Mobile phone	Single choice	Yes/No
Challenges faced at work	Multiple option	Waste is mixed and difficult to separate, Payment is not made on time, Physical safety when working with waste, Workplace is not clean, Drinking water not available, No toilet, Discrimination at work
Describe the challenges selected in the above question	Text	

# Annex 4

## Enterprise survey questionnaire

Question	Answer Type	Options (if applicable)
Respondent name	Text	
Connection to organization	Single choice	Owner/Employee
Name of organization	Text	
Primary location address of the organization	Text	
Type of organization	Single choice	Private collection and processing centre, Government Collection and Processing Centre (DWCC), Recycling unit, Scrap dealer, Trader
Start year of operations	Number	
Operation locations	Text	
Is the company registered?	Single choice	Yes/No
If not registered, do you want to register?	Single choice	Yes/No
If yes, what are the challenges to registering?	Text	
Do you have a trade license?	Single choice	Yes/No
Current number of payroll employees	Number	
Current number of women payroll employees	Number	
Average number of contract workers in a month	Number	

Question	Answer Type	Options (if applicable)
Average number of women contract workers in a month	Number	
Average monthly revenue	Number	
Mode of wage payment	Multiple choice	Cash, Bank transfer/other electronic payment modes
Type of activities	Multiple choice	Waste picking, Sorting, Baling, Transportation
Source of waste	Multiple choice	Households/Residential complexes, Office complexes, Markets, Collection centres, Scrap dealers
Type and average amount of waste collected/processed	Multiple choice, Number	Yes/No
	Multiple choice, Number	Wet and dry mixed waste
	Multiple choice, Number	Mixed dry waste
	Multiple choice, Number	Mixed plastics
	Multiple choice, Number	PET
	Multiple choice, Number	HDPE
	Multiple choice, Number	MLP (Multi-Layered Plastics)
	Multiple choice, Number	Cloth
	Multiple choice, Number	Cardboard/Paper
	Multiple choice, Number	Metals
	Multiple choice, Number	E-waste
	Multiple choice, Number	Glass
	Multiple choice, Number	Biodegradables
If any other type, please specify	Text	

Question	Answer Type	Options (if applicable)
Percentage of total waste reject (cannot be sold)	Number	
Types of end destinations	Multiple choice	Recycling units, Scrap dealers, Cement factory, Other co-processing units, Landfills, Incinerator units/burning
Do you have the following	Multiple choice	Fire extinguisher, Baler, Conveyer, Toilet, Drinking water at site, First aid kit
Do you keep the following documentation	Multiple choice	Inward register, Outward register, Invoice for incoming waste
Challenges faced at work	Multiple choice	Better access to waste sources, Better segregation done at source, Payments made on time, Direct linkages to end destination, Better ways to dispose reject material, Better and more end destinations, Better infrastructure (machines, land), Difficulty to get license, Difficulty in meeting compliance conditions, Finding and retaining workers
Upload facility picture	Photo	



## About the India Plastics Pact

The India Plastics Pact is a collaboration between the Confederation of Indian Industry (CII) and WWF India that unites businesses, governments, NGOs and citizens to create a circular plastics economy in India. The CII-ITC Centre of Excellence for Sustainable Development (CESD) anchors the India Plastics Pact, within CII. The initiative is supported by WRAP, a global NGO based in the UK.

Launched in September 2021, the India Plastics Pact is the first Plastics Pact in Asia. As of July 2023, there are 14 Plastics Pacts spread across the globe. 50 organizations are currently part of the India Plastics Pact. The Pact works on all plastic resins at all stages of the plastics value chain.



Confederation of Indian Industry

## About Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes.

For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. With its extensive network across the country and the world, CII serves as a reference point for Indian industry and the international business community.

As India strategizes for the next 25 years to India@100, Indian industry must scale the competitiveness ladder to drive growth. CII, with the Theme for 2023-24 as 'Towards a Competitive and Sustainable India@100: Growth, Inclusiveness, Globalisation, Building Trust' has prioritized 6 action themes that will catalyze the journey of the country towards the vision of India@100.

With 65 offices, including 10 Centres of Excellence, in India, and 8 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with 350 counterpart organizations in 133 countries, CII serves as a reference point for Indian industry and the international business community.



## About WWF India

WWF India is committed to creating and demonstrating practical solutions that help conserve India's ecosystems and rich biodiversity. With more than 50 years of conservation journey in the country, WWF India works towards finding science-based and sustainable solutions to address challenges at the interface of development and conservation. WWF India is part of the WWF network, with offices in over 100 countries across the world. WWF India works in many states of India, through our state and field offices. The organisation works in different geographical regions and across thematic areas, including the conservation of key wildlife species and their habitats, management of rivers, wetlands and their ecosystems. On the sustainability side, the focus areas are climate change adaptation, driving sustainable solutions for business and agriculture and empowering local communities as stewards of conservation. WWF India also works in combatting illegal wildlife trade and in bringing environment education to students through outreach and awareness campaigns.





## About WRAP

WRAP is a climate action NGO working around the globe to tackle the causes of the climate crisis and give the planet a sustainable future. Our vision is a thriving world in which climate change is no longer a problem. We believe that our natural resources should not be wasted and that everything we use should be re-used and recycled. We bring together and work with governments, businesses and individuals to ensure that the world's natural resources are used more sustainably. Our core purpose is to help tackle climate change and protect our planet by changing the way things are produced, consumed and disposed of. We support partner NGOs around the world to deliver real change through collaboration and progress from over 300 of the world's largest businesses. Initiatives we support include: Plastics Pacts in Chile, South Africa, Kenya and India; food waste agreements in Mexico, South Africa and Indonesia; and food waste citizen campaigns through our Love Food Hate Waste brand in Canada, Australia and New Zealand.

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## UKRI India

UKRI India plays a key role in enhancing the research and innovation collaboration between the UK and India. Since 2008, the UK and Indian governments, and third parties, have together invested over £330 million in co-funded research and innovation programmes.

This investment has brought about more than 258 individual projects. The projects were funded by over 15 funding agencies, bringing together more than 220 lead institutions from the UK and India. These research projects have generated more than £450 million in further funding, mainly from public bodies but also from non-profit organisations and commercial entities, attesting the relevance of these project.



# INDIA PLASTICS PACT

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