



**C40
CITIES**

Inclusive waste management in cities

**Analysis and recommendations
for city-led actions to making waste
management value chains more
inclusive, green, and socially just**



This project is led by C40's Inclusive Climate Action (ICA) programme with contributions from C40's Sustainable Waste Systems team. C40's ICA programme is delivering technical assistance to the City of Accra through the Global Green New Deal (GGND) pilot implementation program. This technical assistance focuses on supporting the city to strengthen its collaboration with informal waste workers. Through C40's Inclusive Climate Action (ICA) Forum, the lessons and knowledge being generated from the Accra pilot have been regularly shared with two other cities that are also developing policy action in this area, the cities of Rio de Janeiro (Brazil) and Lagos (Nigeria).

Key knowledge gaps raised by the three cities have included how to use city powers to leverage stakeholders, small, medium, and large, along the waste management value chain to integrate more inclusive and fair labour practices in their relationships with workers – particularly informal workers out of which women, migrants and youth are disproportionately represented. To help address these knowledge gaps, C40 delivered a four-day in person workshop and study visit known as an Inclusive Climate Action (ICA) Academy. The cities of Rio de Janeiro and Lagos were hosted by the city of Accra from the 28th of November and the 1st of December 2022. During this visit, knowledge, best practices, and lessons were shared between the cities to collectively identify innovative approaches to improving and strengthening collaboration with informal workers. The three cities continue to provide each other mutual support in the longer term and Accra has become a leading example to replicate, for other cities in the region.

The following analysis was developed to help inform and enrich the content delivered during the Academy, particularly with regards to better understanding the intersectionality of informal workers and the implications of for designing and delivering inclusive and fair waste management systems. This analysis, after validation from cities, can be used as a responsive tool designed to answer key questions identified by cities, for cities.

Cover photo: An informal waste worker sorting and processing plastic waste bottles; Accra

Source: NKACC commissioned by C40



About C40

C40 is a network of nearly 100 mayors of the world's leading cities, who are working to deliver the urgent action required immediately to confront the climate crisis, and create a future where everyone, everywhere can thrive. Mayors of C40 cities are committed to using a science-based and people-focused approach to help the world limit global heating to 1.5°C and build healthy, equitable and resilient communities. Through a Global Green New Deal, mayors are working alongside a broad coalition of representatives from labour, business, the youth climate movement and civil society to achieve more in a shorter timeline than ever before.

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Founded in 2011, Archipel&Co is a research and consulting firm specialising in social innovation. Archipel&Co assists its clients (companies, foundations, associations, and international organisations) in the development, implementation and evaluation of strategies and programs with high social impact.

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Partners

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Fondation L'Oréal supports and empowers women to shape their future and make a difference in society, focusing on three major areas: scientific research, inclusive beauty, and climate action. The Fondation supports multiple programs allowing women to develop climate action projects addressing the urgent climate crisis and raising awareness of the importance of gender-sensitive climate solutions.

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- the Global Green New Deal (GGND) Pilot initiative in the city of Accra funded by Open Society Foundations (OSF);
- the Inclusive Climate Action (ICA) Forum's city peer-to-peer exchange and engagement activities with the cities of Accra, Rio de Janeiro and Lagos funded by the Porticus foundation.
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An informal waste worker processing plastic waste for recycling, Accra

Source: NKACC commissioned by C40

Executive Summary

Informal waste workers: key players in solid waste management within cities, and yet still under recognized.

Informal waste pickers collect between 50 and 100% of cities' waste in the Global South¹, generating numerous economic, environmental, health and social contributions. From an economic perspective, they divert a significant portion of waste flows, allowing municipalities to save 15-20% of their annual budget dedicated to solid waste management². Considering that cities often spend 20 to 50% of their municipal budget on waste management³, this represents major savings in terms of public finance. Informal waste workers also contribute to energy savings and cost reductions for private companies and industries as recycled materials reduce the need for mining, extraction, and processing of raw materials. They boost business opportunities by trading materials and initiating new transactions. From an environmental and health perspective, informal waste workers contribute to the circular economy, help preserve the environment and reduce greenhouse gas emissions. They mitigate some of the negative effects of waste on public health by reducing the accumulation of waste in public spaces and illegal dumpsites. Finally, from a social perspective, waste is a source of income for 1% of the urban working population in developing countries⁴. Low entrance barriers make informal waste recovery a way to earn a livelihood when there are no other income opportunities for non or low-skilled workers or those facing barriers hindering their access to the labour market.

Despite these significant contributions, informal waste workers often live and work on the fringes of society, suffering from harsh and precarious conditions, exposure to occupational and health hazards and deeply rooted social stigma, and in some cases, exploitative situations. The informal sector is also composed of various actors. While some informal waste workers may be able to cope with harsh conditions and may wish to remain informal, others simply have no alternative. Among the most disadvantaged groups in the waste management value chain, women, migrants and youths often suffer many constraints preventing them from making a decent living from their activities and lack the means and capacities to change their situation.

Analysing the challenges and risks faced by informal worker women, migrants and youth in the value chain

In the waste management value chain, the most disadvantaged groups like women, migrants and youths are overrepresented in activities that bring the lowest rate of return. They suffer multiple obstacles as well as structural and systemic inequalities. Disadvantages can overlap and exacerbate vulnerabilities experienced by individuals.

It is essential for cities and other stakeholders in the solid waste management value chain to better understand how individual experiences differ depending on informal waste workers' identities. This report takes a closer look at how women, migrants and youths are affected by different constraints using an intersectional perspective. This report distinguishes:

- **Practical constraints:** the lack of assets, resources and services that limits their capacity to undertake economic and social activities and access opportunities. For instance, female informal waste workers are more likely to work from home or inside waste centres performing low-income generating tasks. They often do not own any assets in their name and lack sufficient equipment to collect more waste, ease segregation or even protect themselves.
- **Strategic constraints:** the lack of recognition, rights, voice, and bargaining power which limits their ability to transform the existing imbalances of power. Migrants are often affected by unequal access to rights as well as ethnicity-based discrimination. They often need to hide from public authorities. As a result, they tend to be poorly considered in policy design.
- **Structural constraints:** restrictive social and cultural norms as well as unequal market relationships and transaction processes that are the underlying and root causes of practical and strategic constraints. Gender roles and the gender division of labour often constrain women's working capacity and force them to concentrate on household and domestic work. Social norms sometimes limit their capacity to walk alone in public spaces or seek work opportunities farther from home. Migrant workers frequently suffer social stigma and stereotypes because they are often seen as competitors in the informal waste market.



How cities and stakeholders in the value chain can take action going forward

Cities can play a key role in helping to build more inclusive and efficient waste management value chains. The inclusion of these workers, particularly the most disadvantaged groups, represents a chance to seize the economic opportunities of recycling by improving the collection and processing of waste, and thus to participate in preserving the climate and the environment. It also provides opportunities to create decent and dignified jobs.

It is therefore about recognising the positive contributions and the know-how of informal players while mitigating the potential negative aspects of the current systems. Cities can leverage both their formal power (rules, regulations, authorities, institutions, and procedures) and informal power (their capacity to influence and their political leadership) to influence stakeholders along waste management value chains and incentivise equitable and gender-transformative employment practices⁵. They have four levers at their disposal:

- As policy makers and regulators, they can set policy visions and rules, define and implement regulations at the local level and influence the national debate.
- As urban planners and market trend-setters, cities manage infrastructure and resources, planning urbanisation and development with strong decision-making power on finance and procurement.
- As capacity builders and facilitators, they can stimulate engagement and socio-economic opportunities by investing in training and building new partnerships.
- As awareness-raisers, cities can engage stakeholders and provoke durable changes through communication and awareness campaigns.

This report identifies **18 city-led actions** that can strengthen the recognition of the contribution of informal waste workers all along the value chain and in doing so harness this contribution and support the improvement of waste management services, thus addressing environmental challenges. Building a fairer and inclusive waste management system requires acting simultaneously at all levels, from the bottom to the top of the value chain and adopting a systemic approach to tackle practical, strategic, and structural constraints that prevent disadvantaged informal workers from taking advantage of the numerous opportunities in the waste sector. Some of the key actions cities can implement are the following (refer to Part III of this report to access the complete list of suggested city-led actions):

- **At the bottom of the value chain:** cities can be the ambassadors for the official recognition and integration of informal waste workers into public policies, including at the national level (Action #1). They have an opportunity to design local policies based on the active and meaningful participation of informal waste workers, notably the most disadvantaged groups within the chain (Actions #2 and #6).
- **In the middle of the value chain:** decentralisation of solid waste management systems (decentralised waste transfer stations or collection and sorting centres for instance) can be an opportunity to include informal waste workers into the system and provide opportunities to climb up the value chain for downstream stakeholders (action #8). Cities can also grant access to public infrastructure and storage spaces to improve informal waste workers' environment and working conditions, which in turn could boost informal worker entrepreneurship, their businesses and their livelihoods.
- **At the top of the value chain:** cities can facilitate cooperation between formal and informal players through extended-polluter responsibility (EPR)⁶, reverse logistics and sustainable procurement (Action #3). They can design incentives to encourage the formalisation of upstream actors (registration simplification, startup grants, etc.; Action #4) and raise awareness or train aggregators and processors on inclusive waste management, safety and environmentally friendly practices (Action #11).

Finally, all along the value chain, cities have room to promote gender-transformative practices and intersectional approaches, which requires awareness-raising and training of staff members and policy makers at different levels (Action #17).



Woman informal worker sorting and processing plastic waste, Accra

Source: NKACC commissioned by C40

Glossary



Circular economy

An alternative model of production and consumption (as opposed to the linear economic model or “take-make-waste”) that seeks to extend the lifecycle of products as much as possible. Circular economy encourages reuse, repair, recycling, leasing, etc.



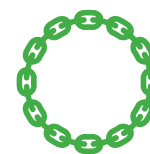
E-waste

Abbreviation of “electronic waste”. E-waste refers to all the electrical and electronic equipment (EEE) that have been discarded and thrown away.



Gender equality

Gender is a spectrum that includes women, men, and non-binary, transgender, gender fluid and gender diverse people. C40 recognizes that gender equality refers to the equal rights, responsibilities and opportunities of all members of the gender group and that gender interacts with, but is different from, the binary categories of biological sex. This analysis predominantly uses the UN definition of gender equality referring to the equal rights, responsibilities and opportunities of women and men and girls and boys⁷. UN Women also stipulates that “equality does not mean that women and men will become the same but that women’s and men’s rights, responsibilities and opportunities will not depend on whether they are born male or female. Gender equality implies that the interests, needs and priorities of both women and men are taken into consideration, recognizing the diversity of different groups of women and men.



Inclusive value chain development

Any positive or desirable change in a value chain to extend or improve productive operations and generate social benefits – poverty reduction, income and employment generation, economic growth, environmental performance, gender equality and other development goals.⁸



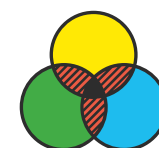
Informal economy

The diversified set of economic activities, enterprises, jobs, and workers that are not regulated or protected by the state.⁹



Informal waste sector workers

Individuals or small and micro-enterprises that intervene in waste management without being registered and without being formally charged with providing waste management services.¹⁰



Intersectionality

A framework of understanding developed by Kimberlé Crenshaw in 1989 that describes the way different systems of inequality, like racism, sexism, ableism, and classism intersect to create unique experiences of discrimination and oppression. Hence, adopting an intersectional approach acknowledges the fact that everyone has a different experience based on aspects of their identity including race, social class, ethnicity, sexual orientation, religion, age, physical appearance, etc.



Low, low-to-middle, high-income countries

Based on the World Bank’s classification of countries, which uses gross national income (GNI) per capita data in US dollars (USD), converted from local currency using the World Bank Atlas method, which is applied to smooth exchange rate fluctuations.



Migrant

This report refers both to internal migration and external migration (from one country to another) as per the statement by UN Migration which defines a migrant as “any person who leaves his or her usual place of residence to settle temporarily or permanently and for various reasons, either in another region within the same country or in another country, thus crossing an international border”.



Social inclusion

The process by which efforts are made to ensure equal opportunities – so that everyone, regardless of their background, can achieve their full potential in life.¹¹



Solid Waste Management

Supervised handling of waste material from generation at the source through the recovery processes to disposal.¹²



Take-make-waste model

Refers to a linear economic model based on the extraction of raw materials to produce products that are used for a limited period of time and then disposed of.



Youth

This report considers youth as people aged 15 to 24, in alignment with the World Bank’s most commonly used definition. This analysis acknowledges that countries in Africa, for instance Ghana and Nigeria, define youth as people between the ages of 15-35 years. This definition was developed after research was conducted on the state of the African Youth, commissioned by the African Union Commission in 2006. While the report uses the most common definition for comparison between African and Brazilian cities in particular, it is key to bear in mind that for the African cities alone, the range is greater.



Workers in Star Plastics, an informal recycling facility, Accra

Source: NKACC commissioned by C40

Acronyms

AMA	Accra Metropolitan Assembly
ASWOL	Association of Scrap and Waste picker of Lagos
CEMPRE	Compromisso Empresarial para el Reciclagem (Corporate Commitment for Recycling)
COMLURB	Companhia Municipal de Limpeza Urbana (Municipal Urban Cleaning Company)
DWCC	Dry Waste Collection Centres
EPR	Extended Producer Responsibility
ETR	Estações de Transferência de Resíduos (Waste Transfer Stations)
FIWON	Federation of Informal Workers' Organizations of Nigeria
GAMA	Greater Accra Metropolitan Area
GARID	Greater Accra Resilient and Integrated Development Program
GHG	Greenhouse Gases
GNI	Gross National Income
HIC	High Income Countries
ILO	International Labour Organisation
LAGRA	Lagos Recyclers Association
LAWMA	Lagos State Waste Management Authority
LCDA	Local Council Development Areas
LGA	Local Government Areas
LMIC	Low-to-Middle Income Countries
LIC	Low-Income Countries
MLGRD	Ministry of Local Government, Rural Development and Decentralisation
NASWON	National Association of Scrap and Waste Workers of Nigeria
NGO	Non-Governmental Organisation
PET	PolyEthylene Terephthalate
PEV	Voluntary Delivery Points
PNRS	National Policy on Solid Waste
PPE	Personal Protective Equipment
PSPs	Private Sector Participators
SMS	Stree Mukti Sanghatana (Women's Liberation Organization)
SWM	Solid Waste Management
TPD	Tonne Per Day
UN	United Nations
WIEGO	Women in Informal Employment Globalizing and Organizing



Recicla Comunidade transfer station, Rio de Janeiro

Source: City of Rio de Janeiro.

Introduction and methodology

Solid waste management is a major challenge but comes with opportunities for cities.

Economic development, rapid urbanisation, migration flows and demographic pressure have led to a large increase in the volumes of waste worldwide, which is likely to continue in the next decades.

In 2020, 2.24 billion tonnes of solid waste were generated worldwide. Global annual waste generation is expected to increase by 73% by 2050, up to 3.4 billion tonnes¹³. This boom will be primarily driven by demographic growth as the world's population is expected to increase by 2 billion people in the next 30 years, reaching 9.7 billion in 2050. More than half of this growth will occur in Africa, where the population will double by 2050¹⁴. Waste volume will also

Cities often dedicate 20 to 50% of their municipal budget to waste management.

be increased by rapid urbanisation and migration flows toward big cities: by 2050, 7 billion, more than two-thirds of the world's population, is projected to live in urban places (versus 4 billion today)¹⁵. This is an even greater challenge for cities in developing countries, where waste volume will increase the most. Most waste is produced by developed countries, but waste volume is expected to increase substantially in low-income countries (LIC). It is projected that LIC will see their waste volume multiplied by 3, from 93 million to 283 tonnes per year, with the largest increase in Sub-Saharan Africa and South Asia.¹⁶

In this context, prevention, reuse, recycling, and recovery of waste can bring numerous economic and environmental opportunities.

Waste management, from collection to processing and recycling, represents a huge market, estimated at \$890 billion USD in 2021 with a projected annual growth of 5.4% until 2030¹⁷. Plenty of jobs could be created along the waste value chain: 45 million waste management jobs could be created worldwide by 2030 in a circular economy scenario according to the International Labour Organisation's (ILO) estimates¹⁸. Effective waste management also comes with environmental opportunities: 15 to 20% reductions in greenhouse gas (GHG) emissions could be achieved globally through a zero-waste strategy¹⁹.

If things remain unchanged however, cities in developing countries will be more severely impacted by the consequences of rising waste volumes on the environment and public health.

Cities in developing countries often lack financial resources and infrastructure to keep up with rapid urbanisation and demographic growth and to properly manage booming waste flows. Cities often dedicate 20 to 50% of their municipal budget to waste management²⁰. Yet, they still achieve lower collection ratios, higher rates of waste discarded by dumping and lower rates of reuse and recycling. Only 39% of waste is collected in LIC, compared to 51% in low-to-middle-income countries (LMIC) and 96% in high-income countries (HIC). 93% of waste is dumped in open dumping in LIC compared to 2% in HIC. Finally, less than 4% of waste is recycled in LIC, compared to 6% in LMIC and 29% in HIC²¹. This has serious implications in terms of public health, safety, and the environment as solid waste downgrades the quality of air, water and land, and is a source of GHG emissions. Waste generation and the prevailing "take-make-waste model" greatly contribute to climate change. Waste accounts for about 5 to 12% of global GHG²² and this sector is one of the key methane emitting sectors²³. This in turn affects public health and developing countries are disproportionately affected: it is estimated that between 400,000 and 1 million people die

each year in developing countries because of diseases caused by mismanaged waste²⁴.

The most disadvantaged groups are the urban poor, among which women, migrants, and young people are disproportionately represented.

They face higher risks in terms of poverty, social exclusion, climate change and poor service provision, including waste management. Women are overrepresented in urban informal settlements among those aged 15 to 49²⁵. They face numerous barriers to benefiting from cities' economic opportunities due to gender-based inequities that limit their access to education, employment, housing, mobility, and asset ownership. As a result, 75% of women in developing regions depend on the informal economy²⁶, where they are less likely to have employment contracts, legal rights, and social protection. Migrants also form a large proportion of the urban poor. They tend to work long hours in low-paid, insecure, and unsafe jobs. They are exposed to a wide range of occupational and environmental hazards notably because they live in precarious informal settlements. Internal migrants from rural areas, as well as migrants from foreign countries, face specific barriers: they have fewer assets, harsh housing conditions, language barriers, fewer social connections. People living in urban areas also tend to be younger. It is estimated that 60% of the urban populations will be under the age of 18 by 2030²⁷. Young people are overrepresented among the urban poor²⁸ notably because they struggle more to find a job: youth are approximately three times more likely to be unemployed than adults²⁹.

Informal actors divert a significant portion of waste flows to the top of the chain.

The informal economy plays a vital role in solid waste management (SWM) systems in most cities in developing countries

Informal waste sector constitutes a major part of city waste management in developing countries due to municipal waste service delivery deficits, limited capacity by formally-contracted waste companies, and the infrastructural challenges of waste collection in cities. It is estimated that informal waste pickers collect between 50 to 100% of city waste in developing countries³⁰. 15 to 20 million people globally earn a living in the waste sector³¹. The informal sector generates essential economic, environmental and social contributions to the waste value chain in contexts where municipalities do not have the capacity and the financial means to effectively manage waste at the city scale.

- From an economic perspective, informal actors divert a significant portion of waste flows, allowing municipalities to save 15-20% of their annual budget dedicated to SWM. Informal workers also contribute to energy savings and cost reductions for private companies and industries as recycled materials reduce the need for mining, extraction, and processing of raw materials. For instance, one tonne of recycled aluminium saves 14,000 kWh of energy, 40 barrels of oil, 10 cubic yards of landfill space. One tonne of plastic saves 5,774 kWh of energy, 16 barrels of oil and 30 cubic yards of landfill space³².

Informal players also boost business opportunities by trading materials and initiating new transactions. Besides their tremendous contribution to the waste management system, these workers have developed skills and expertise that could be leveraged to improve the current waste management outcomes.

- From an environmental and health perspective, informal waste workers contribute to the circular economy, help preserve the environment and reduce GHG emissions. A study by WIEGO assessed that in Dakar, Mbeubeuss dumpsite waste pickers reduced emissions by almost 32,000 tonnes of CO2 equivalent/year by preventing materials from decomposing in the dumpsite.³³ Informal workers mitigate the negative effects of waste on public health by reducing the accumulation of waste in public spaces or illegal dumpsites.
- From a social perspective, waste is a source of income for 1% of the urban working population in developing countries³⁴.

Despite their significant contributions, informal workers suffer from very precarious situations and are highly exposed to occupational and health hazards.

For example, more than half of the waste pickers in Lagos have suffered health problems affecting their work capacity³⁵. They often suffer from harassment by citizens, the police or other workers and

upstream waste stakeholders. Exploitative situations, corruption and child labour are unfortunately no exception. There is also a high stigmatisation of the job as being "dirty".

In this informal waste economy, women, migrants and youth are often over-represented at the lower-ends of the waste value chain where activities bring the lowest rate of return.

They suffer from multiple obstacles as well as structural and systemic inequalities. For instance, the traditional division of labour between men and women in the waste sector limits women's capacity to progress within the value chain³⁶. The status of migrants (non-domestic migrants), their lack of network or knowledge of the local language deeply limits their ability to find better opportunities inside the waste sector. These sources of disadvantage can overlap, which exacerbates vulnerabilities and inequalities experienced by individuals in cities in developing countries as well as the consequences of climate change.

Identifying and implementing the right policies for the inclusion of informal waste workers is a great opportunity for cities to improve the whole solid waste management (SWM) system. It is about recognising their positive contributions while mitigating the potential negative aspects of the system's current functioning. On this latter, the role played by local mafias and the blurred frontiers between legal and illegal activities in the waste sector cannot be denied and makes it challenging for cities to find the right

modalities to engage with informal waste workers. Still, building new types of collaborations between cities, formal and informal waste stakeholders, including the most precarious ones, is necessary to better understand who the informal players along the value chain are, their characteristics, barriers, vulnerabilities, and also the interactions with formal stakeholders. This should be the breeding ground upon which to build adequate and effective policies. The aim of this report is to analyse the role of informal stakeholders in the waste value chains using three cities as case studies (Accra, Lagos and Rio de Janeiro), and make recommendations on how cities can harness the capacities of these actors, protect and support them and in turn scale up and improve their own services to meet their climate goals.

Structural changes are necessary to tackle injustices and inequalities from the bottom to the top.

This analysis is conducted through a value chain perspective to highlight connections and interdependencies between all waste stakeholders.

If waste pickers are usually the focus of interest in the existing literature, opportunities for inclusion and equity changes are not limited to the bottom of the value chain. Structural changes are necessary to tackle injustices and inequalities from the bottom to the top. Most disadvantaged groups at the bottom will not be able to climb up the ladder if systemic barriers, discrimination, and unfair practices from upstream stakeholders persist.

After specifying the economic, labour and environmental opportunities in the waste sector (Part I), this report identifies the main informal waste stakeholders along the value chain of these three cities as well as their specific challenges and vulnerabilities, with a focus on the most disadvantaged ones, namely women, migrants and youths (Part II). The last part of this report (Part III) identifies ways to build more inclusive and sustainable waste management systems by seeking collaborations with the informal waste sector.

Methodology of the research

This report is based on the collection and analysis of information and data from four main sources:

- **24 interviews with city representatives, researchers, industry experts and non-governmental organisations (NGOs) working in the waste sector and the informal economy.**

- India: Akshata Venkatesha, Inclusive Climate Action City Advisor, Bengaluru; Divya Tiwari and Shrotik Bose, Sahaas; Nalini Shekar and Pinky Chandran, Hasiru Dala; Siddharth Hande, Kabadwalla Connect.
- Brazil: Sonia Dias, WIEGO Waste Specialist; Jutta Gutberlet, PhD in Geography, University of Victoria, Canada; Pedro Rodrigo Rolim, Manager for Sustainability and Resilience at the City Planning Office of Rio de Janeiro; Moises Leão Gil, Rio de Janeiro Waste Management Expert.
- Ghana: John Edem Akubia, Environmental and Geo-information Specialist, Project Manager, Land Resources Management and Climate Change; Victor Kotey, Deputy Head of the Waste Management Department, Accra Metropolitan Assembly; Josephine Agbeko, Inclusive Climate Action City Advisor, Accra; Owusu Boampong, Research Fellow Development Studies University of Cape Coast.
- Nigeria Laura Kim Yeat, Expert in International Environmental Management at MINES ParisTech; Adeline Pierrat, Head of the Waste and Circular Economy Masters at Le Mans Université; Chidi Nzeadibe, Professor of Environmental Management & Sustainability, University of Nigeria; Michael Bankole, Deputy Director of Climate Change and Environmental Planning, Lagos Municipality; Jirinsola Olaleye, Head of Recycling, Lagos State Waste Management Authority; Yewande Seriki, Senior Scientific Officer Climate Change and Environmental Planning, Lagos Municipality; Maximus Ugwuoke, City Advisor, Lagos; Temilade Salami, Founder of Ecochampions.
- Other C40 waste experts: Gisela Provasi, Senior Manager, Sustainable Waste Systems; Ricardo Cepeda-Márquez, C40 Technical Lead, Food & Waste Programme.

- **A workshop session held as part of an *Inclusive Climate Action Academy***, a 4-day in person study visit in Accra with city representatives from Accra, Lagos and Rio de Janeiro, held in November 2022. The workshop discussed the preliminary findings, value chain challenges and recommendations, and validated these with the cities through focus group discussions.
- **Qualitative interviews** with some informal waste workers in Bengaluru, Rio de Janeiro, Accra and Lagos.
- **Literature review and desk research.**

The **Inclusive Climate Action (ICA) Academy** builds on the commitment and engagement between the cities of **Accra, Rio de Janeiro** and **Lagos** that had for the 18 months prior to the Academy become engaged in monthly knowledge and best practice sharing and mutual support.

The Academy was attended by up to three delegates from each of these cities, pertaining to different departments, including environment and economic development to encourage silo-breaking knowledge exchange.

The Academy was held in the city of Accra, Ghana between the **28th of November** and the **1st of December 2022**.

ICA Academies are a tool used by C40 to encourage city-to-city practice focused knowledge sharing and learning from real-time delivery by cities of inclusive climate action on the ground. They are also an opportunity to see first-hand the projects and programmes that the city of Accra and its Waste Management Department have implemented at a local level through C40's Global Green New Deal (GGND) initiative.

Academies provide city delegates with practical tools and methodologies, playing a critical role in showcasing how local action can drive a green recovery and a just transition, leaving no one behind.

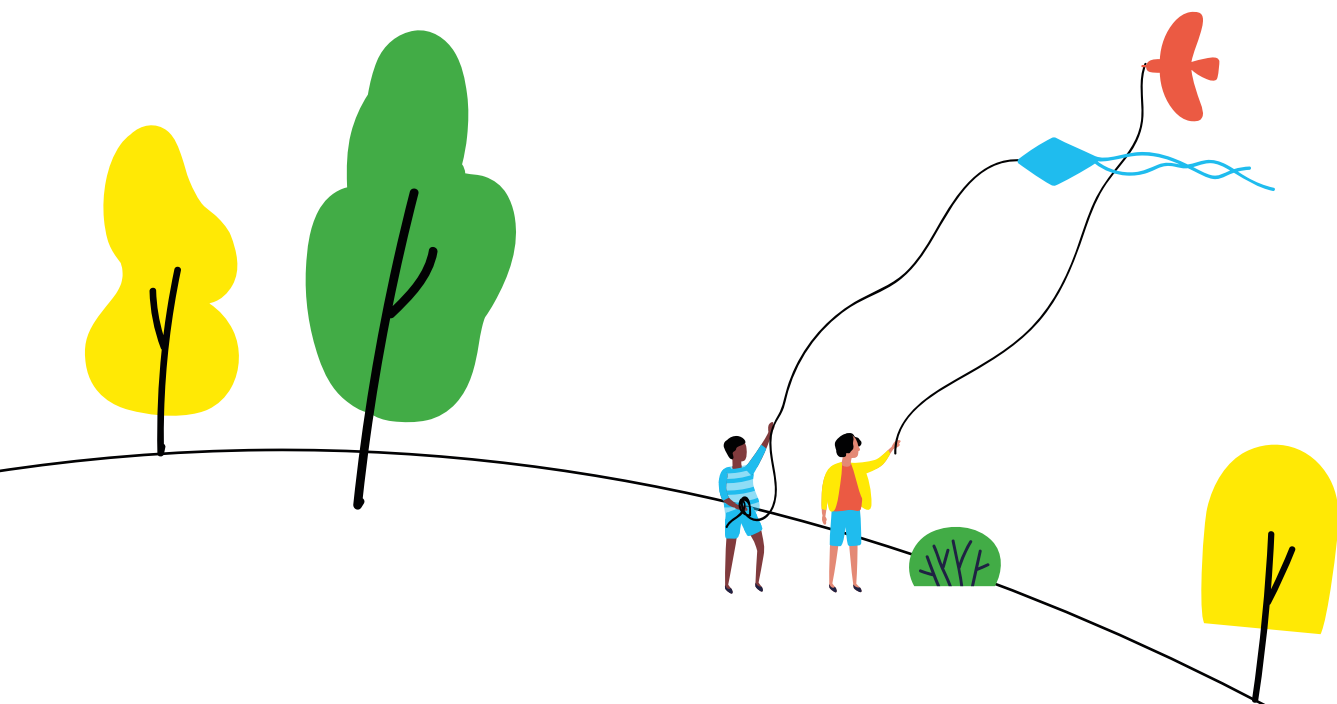
Through the Academy, city representatives not only strengthen their technical skills but are also inspired with new ideas on driving policy changes and joint advocacy to promote stronger collaboration with informal workers, and in doing so, delivering more effective, inclusive, and sustainable local transitions.



Woman selling refreshments at informal waste deposit site set-up by informal workers, Accra
Source: C40 Cities.

Part I.

Assessing economic, environmental and labour opportunities and challenges of the waste sector



This section aims at better analysing the economic, environmental and labour opportunities as well as the challenges of the waste sector in cities in developing countries.

Figures and trends demonstrate that better waste segregation and waste management systems are crucial climate actions for cities which, if well designed and managed, could lead to many economic and green job opportunities. In terms of the labour market, one of the key challenges for cities in developing countries is to better assess the contribution of informal waste sector workers throughout the value chain.

With such an assessment, cities are better equipped to meet inclusion and equity challenges, improve working conditions and provide decent jobs while improving their management of the increasing volumes of waste.

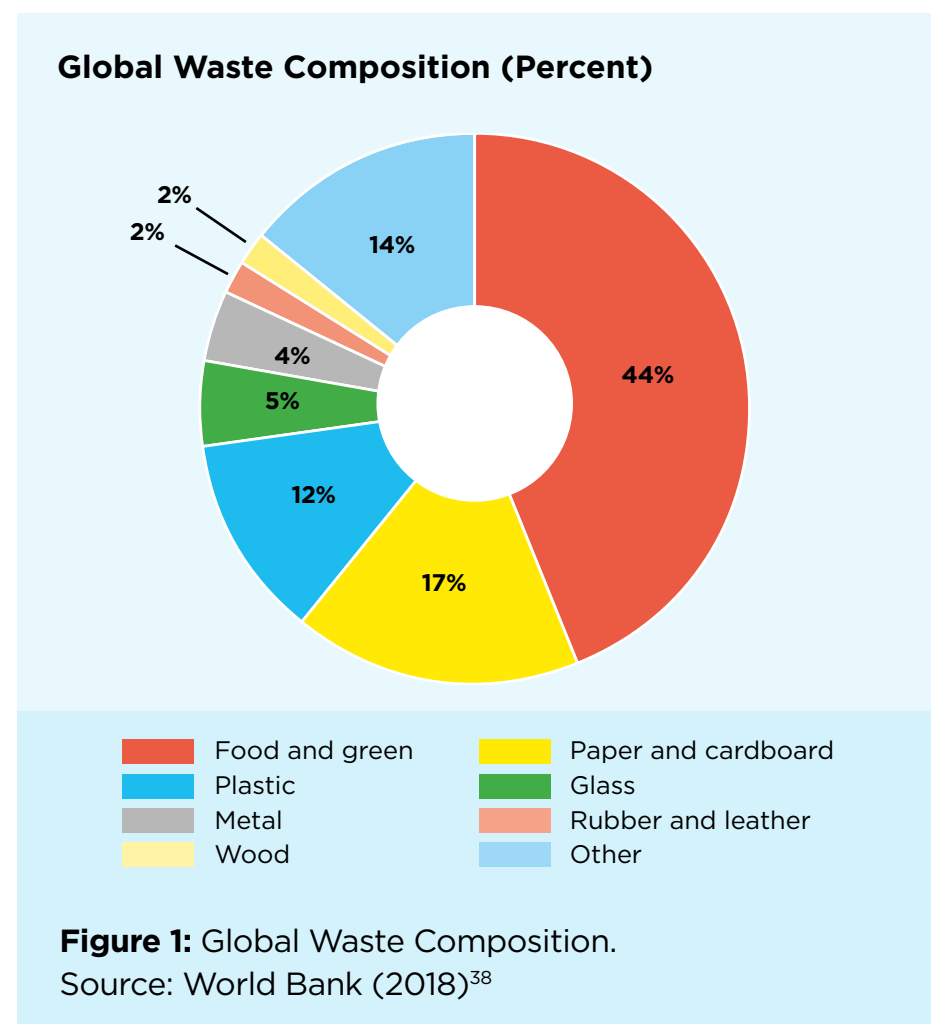
1.1. Economic and environmental opportunities of waste: segregated collection could boost waste markets while better preserving the environment

Waste management, from collection to processing and recycling, represents a huge market worldwide, estimated at \$890 billion USD in 2021 with a projected annual growth of 5.4% until 2030.

Waste markets are growing, with many opportunities in the circular economy and climate actions for cities in developing countries.

As waste volume is growing worldwide, waste market size is expanding with potential

economic and employment opportunities. Waste management, from collection to processing and recycling, represents a huge market worldwide, estimated at \$890 billion USD in 2021 with a projected annual growth of 5.4% until 2030³⁷.



Opportunities related to recyclables will grow in the upcoming years, particularly for cities in developing countries.

Today, global municipal solid waste is largely composed of food and green (organic) waste (44%) and dry recyclables (38%) but this composition varies considerably by income level. In LIC, organics represent 56% of their waste compared to only 32% in HIC. As countries develop, the relative share of organic waste decreases and dry waste's share increases, although in absolute terms all shares of waste generation increase. Still, the opportunity to meet zero-emissions lies in both organic and dry waste. With economic development and urbanisation, the share of recyclables among cities' waste will grow, resulting in increased collection and treatment requirements and further job opportunities in the circular economy.

These growth trends are reflected in all kinds of materials (from plastic to organics) with large impacts on the environment.

The waste sector accounts for about 5 to 12% of global GHG³⁹ today and is one of the key methane emitting sectors, being responsible for 20% of the human-driven global methane emissions. There is an urgent need to develop and improve segregated collection systems to increase waste recovery, create economic opportunities and green jobs in the circular economy and reduce emissions.

The table below summarises the climate impacts of different types of recyclable materials and their potential if better segregated. Note that this report does not focus on the global waste shipped to countries from the US, Canada, European Union, Australia and Japan – the plastic trade and e-waste having the most impact.

Table 1: Current production, climate impacts and future market trends of some recyclable materials

	Current production and recycling practices, including from the informal waste workers	Climate impacts	Market trends
Plastics	<p>Plastic waste more than doubled worldwide since 2000, from 156 million tonnes to 353 million in 2019 and is projected to triple by 2060. In 2019, only 15% of plastic waste was collected for recycling and only 9% recycled worldwide⁴⁰.</p> <p>The plastic economy has been structured in recent years with an important participation of the informal sector even, according to WIEGO the informal sector is responsible for an estimated 58% of the collected and recycled plastic waste⁴¹.</p>	<p>Production and incineration of plastics generated 850 million metric tonnes of GHGs in 2019, and this could reach 1.3 gigatons per year by 2030⁴². Every year, about 8 million tonnes of plastic waste ends up in ocean and aquatic environments⁴³, which alter habitats and natural processes, reducing ecosystems' ability to adapt to climate change.</p>	<p>The global plastic waste management market is expected to grow from \$37 billion USD in 2021 to \$59 billion USD by 2030 (+60%)⁴⁴.</p>
E-waste	<p>The fastest-growing waste stream in the world. About 50 million tonnes of e-waste is produced per year, mostly composed of personal devices⁴⁵. It is estimated that only 17% of this electronic waste is properly collected, treated, and recycled today⁴⁶. The e-waste volume is expected to increase by 140%, reaching 120 million tonnes annually by 2050.</p> <p>The potential high profits in reusing and recycling e-waste materials drive informal waste workers' participation in this market.</p>	<p>E-waste's impact on the environment is massive since it is non-biodegradable mixed-materials. Open-air burning as well as acid baths that are used to recover valuable materials from electronic components release toxic gas into the environment. This also exposes workers to hazardous materials such as lead, arsenic, mercury, etc.</p>	<p>E-waste is worth at least \$62.5 billion USD annually. A circular-economy vision based on repair, second-life, durability, and recycling is the most promising approach to tackle the challenge of e-waste⁴⁷.</p>

Textile waste	<p>Globally, an estimated 92 million tonnes of textile waste is created each year. This figure is expected to reach 160 million tonnes (+74%) by 2050.</p> <p>Recycling practices from informal waste workers in the textile industry are mostly about reuse.</p>	<p>Textiles accounts for 10% of the global GHGs emissions emitting 1.7 million tonnes of CO₂ annually. Textiles account for 35% of the microplastics released into the environment⁴⁸. The decomposition of textiles in landfills or during incineration releases hazardous chemicals and GHG.</p>	<p>The most promising and immediate actions to address the textile waste challenge is through reverse logistics and a circular economy approach, notably via reuse, repurposing, or recycling. Such an approach could reduce 33% of the CO₂ from textiles products⁴⁹. Technologies are still in underdevelopment, but about 70% of textile waste could be fibre-to-fibre recycled⁵⁰.</p>
Organic waste	<p>The largest part of municipal solid waste in cities in developing countries remains unrecovered, representing a missed opportunity of nutrient recovery, green job generation and emissions reduction. Organic waste is rarely properly segregated, ending in landfills and dumpsites and contaminating dry recyclable waste materials.</p> <p>Most informal waste workers do not have an interest nor the incentive to take care of organic waste in the absence of existing markets. In some cases, they collect mixed waste from households and businesses to sort recovered materials but dump the rest of the organic materials.</p>	<p>Organic waste is the main generator of methane, which also comes from the breakdown of paper, cardboard, and wood in an anaerobic (oxygen free) environment such as landfills and dumpsites. Landfills and dumpsites represent the most methane emissions of the waste sector. Globally, a third of the food produced is lost or wasted, and food waste accounts for around 20% of global methane emissions⁵¹. There is a great potential for GHG reductions through food loss reduction, segregation, and treatment of organic waste by composting or dumpsite and landfill rehabilitation with gas capture systems.</p>	<p>The global food waste management market was estimated at \$70 billion USD in 2023 and is projected to reach around \$121.8 billion USD in 2033 (+74%)⁵². Investing in the implementation of existing technologies and treatment facilities could turn wet waste into valuable resources such as biogas, through anaerobic digestion technology, and soil fertiliser, through aerobic digestion or composting processes.</p>

Paper and cardboard

The most recycled materials, but with high growth potential. More than 50 million tonnes of paper were recovered for recycling in 2021, achieving a 68% recycling rate.⁵³

Paper and cardboard, alongside glass, are materials traded by informal waste workers in almost all markets despite their usually lower value on the market (often lower than PET or Aluminium for instance).

A generator of methane, especially in landfills and dumpsites.

The global waste paper management market was estimated at \$42.2 billion USD in 2021 and is expected to reach \$96 billion USD by 2030 (+128%)⁵⁴.

Glass

Globally over 130 million tonnes of glass are produced every year. Today only 22% of glass is recycled, often being dumped improperly in landfills and dumpsites, making it a hazardous material for waste workers.

Glass manufacturing causes 95 million tonnes of CO2 worldwide each year. This comes mainly from its production and inappropriate disposal (dumpsites, landfills, etc). However, glass has the advantage of being fully recyclable without quality loss. Glass produced from recycled glass reduces related air pollution by 20% and related water pollution by 50%.

Global recycled market size of waste glass is estimated at \$3.3 billion USD and will reach \$5 billion USD by 2030 (+50%).⁵⁵

Better SWM systems represent a major climate action opportunity. With the current market heavily relying on free to low cost labour from the informal sector, inclusive systems that aim to compensate for this work through recycling credits, direct contracts, purchase agreements or other forms of support are expected to grow. In addition, recycling and reusing materials reduces the mining and processing of new raw materials, saving tremendous levels of energy use, including fossil fuel extraction, especially for industries.

Extended-producer responsibility, defined as an “environmental policy approach in which a producer’s responsibility for a product is extended to the waste stage of that product’s life-cycle”⁵⁶ is essential for building greener cities. This approach is interesting from a municipality’s budget perspective as it shifts the financial burden for waste management from the public sector to the manufacturers. It also gives an incentive for producers to design products fit for reuse and recycling and to adopt a reverse logistics approach.

1.2. Labour opportunities in the waste sector: significant green jobs potential will remain unmet unless informal worker conditions improve

Plenty of jobs could be created along the waste value chain in the near future: up to 45 million waste management jobs by 2030 in a circular economy scenario according to the ILO⁵⁷. This includes activities like recycling, repair, rent and remanufacture, production of renewable-based electricity, water-saving activities, conservation, and preservation of the environment, etc. The question is what types of jobs would be created not only in terms of quantity but also quality of employment and who will be able to seize these job opportunities.

Today, the large majority of waste-related jobs in developing countries are still in the informal economy, marked by no or poor recognition of the services provided and indecent working conditions, especially for most disadvantaged workers such as women and migrants.

Informal waste workers are defined by the ILO as individuals or small and micro-enterprises that intervene in waste management without being registered and without being formally charged with providing waste management

The question is what types of jobs would be created not only in terms of quantity but also quality of employment and who will be able to seize these job opportunities.

services⁵⁸. Low entrance barriers at the bottom of the value chain make informal waste recovery a way to earn a livelihood, particularly for people who have few other income opportunities, such as non or low-skilled workers or minorities who face barriers to access the labour market. Waste jobs are sometimes more lucrative than other activities, notably rural activities where the workforce is abundant, and wages are low. For instance, in India, many workers come from West Bengal, a region characterised by the importance of agricultural related jobs. Many decide to go to big cities to make a better living. Informal waste activities also offer high flexibility and provide earnings on a daily basis. But informal workers have no contract, no regular income, and little social or political recognition. Informal actors are often seen as hindrances

to efficient waste management processes, they contribute significantly to resource recovery and recycling of waste materials, having a positive impact on SWM systems, the environment and public health. Informal players' main income comes from the revenues of selling the materials (some receive payment at the collection stage, such as with door-to-door collection). Their net costs are significantly lower than the costs of the formal sector, which perform the collection, transportation and disposal and which finance its activities through fees and municipality's subventions. The informal sector unpaid work saves formal authorities a great deal of money, mostly due to avoided collection and disposal costs (according to various estimates up to €14 million per year in Lima, €12 million in Cairo)⁵⁹.

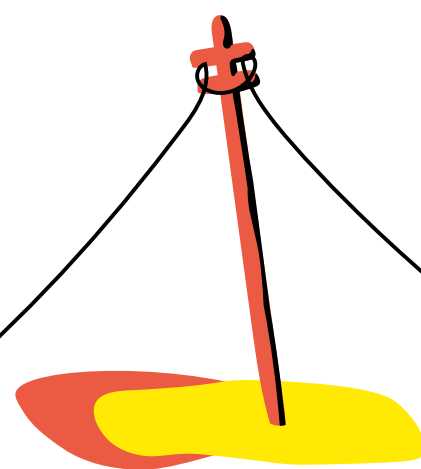
1.3. A clearer picture of who informal waste workers are is important to better inform SWM strategies and seize the economic, environmental and labour opportunities of the waste sector

One of the prerequisites for any city or private waste stakeholder to be able to engage with informal waste workers is to understand who the informal players are, the variety of their profiles, positions in the value chain, and related vulnerabilities. Stakeholders engaging with informal waste workers should bear in mind these four realities when it comes to the informal waste sector:

locally. Most statistics from this report rely on academic research and projects by local associations in an attempt to size the population of informal waste workers in the 4 cities this report focuses on (with the exception of Brazil where data are available through the last register). They provide interesting orders of magnitude and knowledge of these populations. Still, there is a pressing need for better data and knowledge of informal waste workers, not only those at the bottom but also in the middle and top of the value chain.

1. **Data on informal waste workers is scarce:** Very few cities have set up census and or registration of these informal workforce⁶⁰, making it almost impossible to find reliable data. Some of the waste activities are hidden, especially when illegal or concerning expensive or dangerous products. The large share of migrants among the population of waste workers makes the exercise even more complicated as most of the time, they fear any involvement in exercises, even academic research, that pertain to data collection to estimate the number (and types) of informal waste workers

2. **Informality is a heterogeneous condition:** Informal waste activities can be schematized into 4 steps and the workforce as a pyramidal structure (see Figure 2), with at its bottom the collectors where landfills, dumpsites and street waste pickers are the most numerous but also the most marginalised. Small-to-medium scale aggregators often buy waste from these informal



collectors, waste is sorted by categories and aggregated into larger quantities to be sold either to larger scale aggregators, processors, recyclers, or the industry. Yet, waste workers can work in the waste economy full or part-time with great variations in earnings and working conditions. Some may have chosen this activity, others may not have any other options. The worst conditions are often for landfill and dumpsite pickers due to the unsanitary conditions in those places. Informal workers involved in the segregation, recovery, aggregation, and processing are able to add value and increase their earnings. Even the willingness to formalise varies greatly from one worker to another. It is often a trade-off between security (accessing a proper contract with fixed salary, potential social security and other advantages) and flexibility (remaining independent and able to diversify activities) as well as expected costs and benefits. This means local authorities or waste players seeking collaboration with the informal economy, should strive to understand and find the right incentives for the engagement and formalisation of relationships. Finally, some specific groups of waste workers are more likely to encounter challenges, including structural barriers, and accumulate vulnerabilities, especially women and migrants.

- While both men and women are involved in informal waste activities, women tend to be overrepresented in less-

profitable activities. They often conduct sorting and cleaning tasks from home or small waste hubs while men are more represented in upstream roles or activities, which are more profitable. The gender division of labour and traditional roles explain this split of tasks between men and women. Men are more likely to sell higher-value recyclables and own processing units. Women are stuck in less visible positions (e.g. sorting waste at home) resulting in low valuation of the work done. Women also have limited time availability, due to the traditional share of household responsibilities. Time poverty prevents them from boosting their professional activities as well as being part of associations or other representative movements that could help them gain more visibility and voice. Other barriers, including lower capacity to circulate within the city, prevent them from finding opportunities elsewhere, even within the waste economy (many different factors contribute: cultural and gender norms that compel them not to travel too far from home, limited access to transportation, safety issues, etc.)⁶¹.

- A large share is composed of recent migrants, including internal migrants from rural areas, but also from neighbouring countries. Migrants suffer from isolation, and it is very difficult for them to climb up the value chain due to a lack of social connections in the city, insufficient financial resources, and language barriers.

Willingness to formalise is often a trade-off between security (accessing a proper contract with fixed salary, potential social security and other advantages) and flexibility (remaining independent and able to diversify activities) as well as expected costs and benefits.

- The age of waste workers varies from one country to another and local contexts. Still, younger waste workers often have difficulties climbing the waste value chain due to limited capacity to bargain. Child labour is also common, especially at the lower-ends of the value chain, among waste pickers.
- The informal waste workforce composition in any given region or country will generally reflect the groups most affected by unemployment in that area, due to being a low to no-barrier to entry activity as seen above.
- This context incites cities and formal waste stakeholders engaging with informal stakeholders to adopt a gender mainstreaming approach and an intersectional lens, considering gender, race, class and migration status, while engaging with these stakeholders facing different situations and barriers. This type of inclusive and intersectional approach is a great opportunity for cities to foster positive social and economic impacts while achieving improved environmental outcomes.

Box 1: Gender mainstreaming and intersectionality

Gender mainstreaming of policies is not about counting the number of women and men involved, rather the gender mainstreaming approach addresses the existing gender inequalities. It requires a contextual analysis of the needs, priorities, roles, norms and experiences of each individual and the integration of this information in the design and implementation of the intervention. Being gender inclusive means actively and meaningfully including the voices of women, men and gender-diverse people in planning and decision-making to ensure they have equal access to the opportunities

and benefits arising from actions taken. This approach requires awareness-raising and training of staff responsible for the design and implementation of policies and programmes.

A **gender-blind** intervention has no proactive consideration of the pre-existing gender norms, roles and power structures that can affect the programme or policy and the achievement of its objectives, nor the consequences of the actions taken on gender structures.

A **gender-sensitive or aware** intervention considers these norms, roles, and power structures in order not to worsen the

situation, but it does not address these inequalities and their rooting causes. It is a “do no harm” approach, this should be the minimum approach.

A **gender-responsive or transformative** intervention considers gender norms, roles, relations and how these affect access to opportunities, risks, and outcomes. It also addresses the causes of gender-based inequities. It is the approach to embrace wherever possible in order to better address gender in policies and programmes.

Intersectionality is a framework of understanding developed by Kimberlé Crenshaw in 1989 that

describes the way different systems of inequality, like racism, sexism, ableism, and classism, intersect to create unique experiences of discrimination and oppression. Hence, adopting an intersectional approach acknowledges the fact that everyone has a different experience based on aspects of their identity including race, social class, ethnicity, sexual orientation, religion, age, etc.

This report provides some insights about intersectionality in the context of waste. It aims at better understanding the individual experiences of waste workers depending on their identities with specific focus on intersecting barriers and challenges for women, migrants and youth. For instance, stories from waste pickers in cities in India, Lagos and Accra explore the different journeys and barriers faced by women migrant waste workers. They encounter precarious

working conditions, cumulating paid jobs outside the waste sector and unpaid waste jobs in support of their husbands, as well as isolation from the rest of the city due to the language barrier as migrants but also gender and cultural norms limiting women in their capacity to explore the outside world.

3. **Lines between formal and informal waste systems cross each other in many ways:**

SWM is a highly dynamic system with deep connections between stakeholders. In fact, informal and formal actors are highly intertwined and the frontier between formality and informality is often blurred. For instance, formal aggregators sometimes buy from informal collectors, often called scavengers or waste pickers, informal scrap shop dealers can sell to formal processors. Sometimes companies and industries pay the services of waste workers' cooperatives or informal waste workers to collect their waste. There are also different levels of informality, some actors combining formal and informal activities. For instance, waste collectors employed by the municipality often take valuable materials out of their collection to sell informally to scrap shop dealers. There is a *gradient of*

*informality*⁶² that varies based on the links with the formal sector and the visibility of the activity.

4. **Informal does not mean irrational:** Informal waste workers are rational economic actors involved in a business activity. They know about their jobs and have acquired skills. But informality often means asymmetry of information and loopholes in terms of organisational models that can be improved. Informal waste pickers for instance, often criss-cross the districts of a city without any certainty of finding waste for hours, sell it to the closest intermediary without information on prices or other types of stakeholders that they could resell their waste to. There is a large space for cities and waste organisations to optimise the SWM system by leveraging and improving the existing activities of these stakeholders.

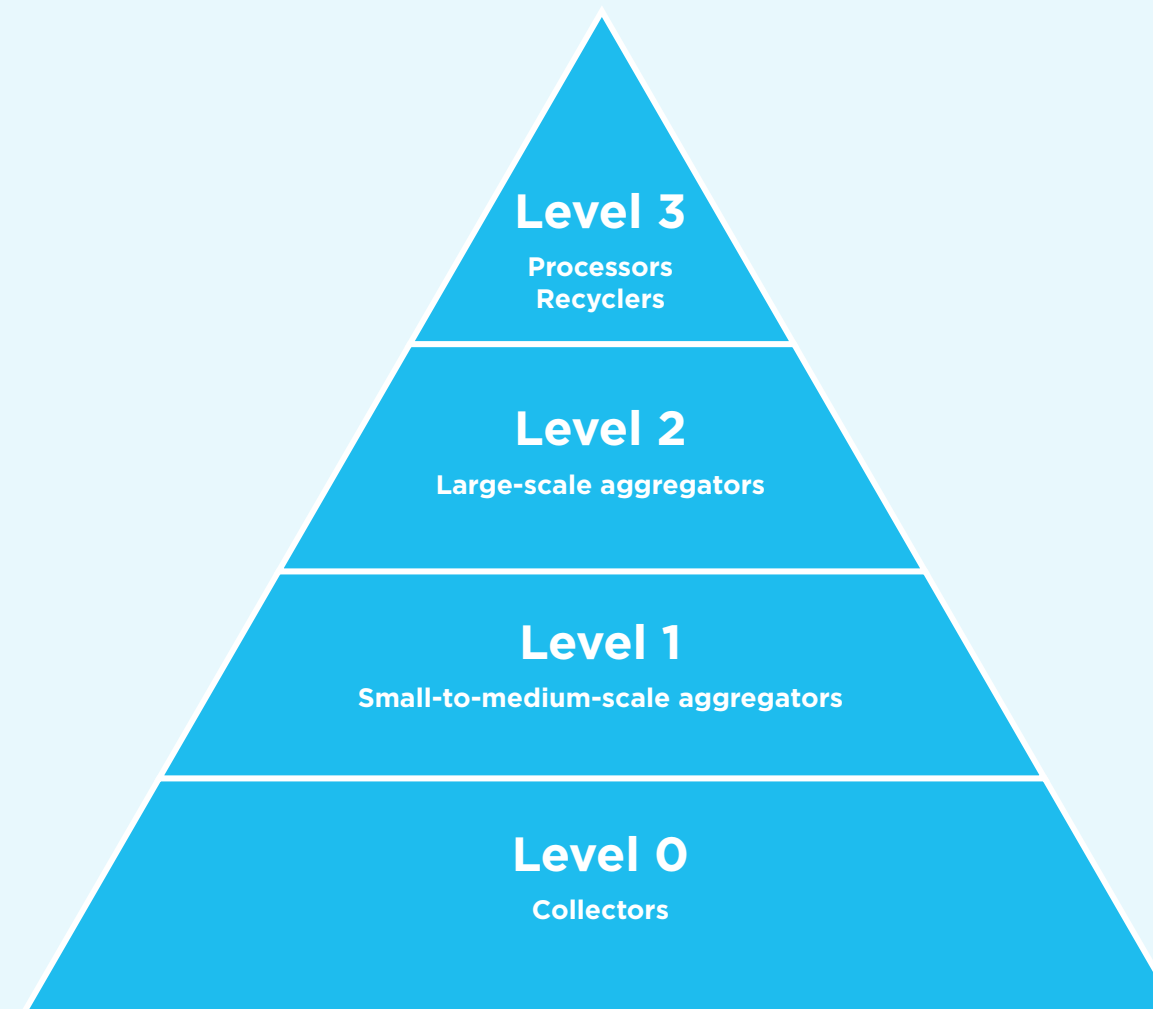


Figure 2: The informal waste worker pyramid

Municipal authorities are the first in line that can lead actions to build a more inclusive and efficient value chain.

Understanding the organisation of the value chain, the distribution of the economic value between each segment and the diversity of situations is the key to identifying

levers for improvement and inclusion. Municipal authorities are the first in line that can lead actions to build a more inclusive and efficient value chain.

1.4. Cities have multiple levers at their disposal to leverage waste economy opportunities and build more inclusive solid waste management systems

Cities have four main levers to activate: policy makers and regulators, urban planners and market trend-setters, capacity builders and facilitators, and awareness raisers.



Figure 3: Four main levers

- As policy makers and regulators, cities set the policy visions and rules. They can define and implement legislations and regulations at the local level, influencing small and large waste generators' behaviour, assigning responsibilities and financial burden across waste operations, advocate for ambitious national policies, conduct

monitoring and evaluation. These competencies and responsibilities make municipalities the first in line to encourage, mandate or incentivise gender inclusive and transformative labour practices, segregation at source, recognise and empower informal waste workers and provide legal protection, advocate for their integration into national

policies and into private and formal actors' activities, in urban policies and decisions.

- As urban planners, and market trend-setters, cities manage infrastructures and resources. They are the ones planning urbanisation and development. Cities are in charge of public procurement, they raise finance infrastructure and manage the city's assets. They can play a leading role in organising informal waste workers' activities, provide, or reserve appropriately equipped spaces for waste storage (with bathrooms, first aid and care centres), sorting and processing, include social requirements into public procurement processes, build market demand, and organise safe access to the waste collected. Cities are also among the players that can provide gender responsive financial support or implement local fiscal incentives whenever possible.

These levers call for cities to use a variety of powers, formal (hard) as well as informal (soft) powers, depending on the local context and their own capacity and resources.

- As capacity builders and facilitators, cities can stimulate engagement and socio-economic and gender transformative economies. Cities invest in education and training –enhancing human capital – so they can facilitate the creation of new partnerships, knowledge transfers and innovations

and new opportunities, including through targeted education and training for underrepresented groups. Cities can build on these capacities to support waste workers organisations along the value chain, notably cooperatives, self-help groups, unions, or NGOs. They can stimulate business partnerships between formal and informal actors. They can promote equitable participation of women, migrants and youth in consultations and partnerships.

- As an awareness-raiser, cities can engage stakeholders and provoke durable changes. Municipalities implement communication and awareness campaigns and facilitate behavioural and social norm changes. Cities through these actions have the opportunity to shift the mentalities, decisions, and behaviour of citizens, reduce harassment particularly of women, migrants and children, and improve formal players' perception of informal waste workers.

These levers call for cities to use a variety of powers, formal (hard) as well as informal (soft) powers, depending on the local context and their own capacity and resources.

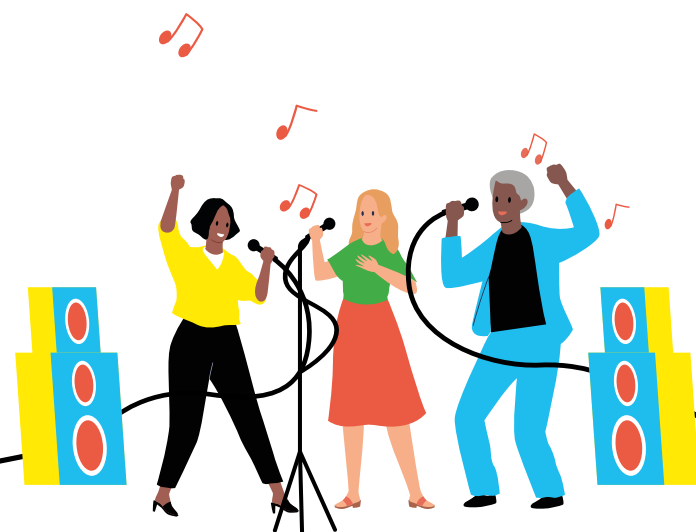
Box 2: Leveraging cities' formal and soft powers to build more inclusive waste management value chains

Cities employ different types of powers to implement their political agenda and push for ambitious public policies. While formal power depicts visible power such as formal rules, structures, authorities, institutions and procedures of decisions-making, soft powers refer to cities' and mayors' capacity to influence and use their political leadership. Depending on local contexts, capacity and resources, cities can leverage these different forms of powers, to

influence stakeholders along waste management value chains and incentivise more inclusive, equitable and gender transformative employment practices. The four levers presented in this report as well as main recommendations (see Part III) could be implemented in different ways with cities mobilising formal and soft powers depending on their own starting points and capacity. As an example, the awareness-raising lever could be envisioned either through the use of leadership, symbolic and

convening power (soft power) or through transferring awareness into concrete laws and policies (formal power).

In 2022, C40 investigated further on the different forms of powers cities have to deliver inclusive, just and equitable climate outcomes for all. Results from this study could provide cities with concrete actionable actions and strategies to devolve power and deliver transformative inclusive climate action⁶³.



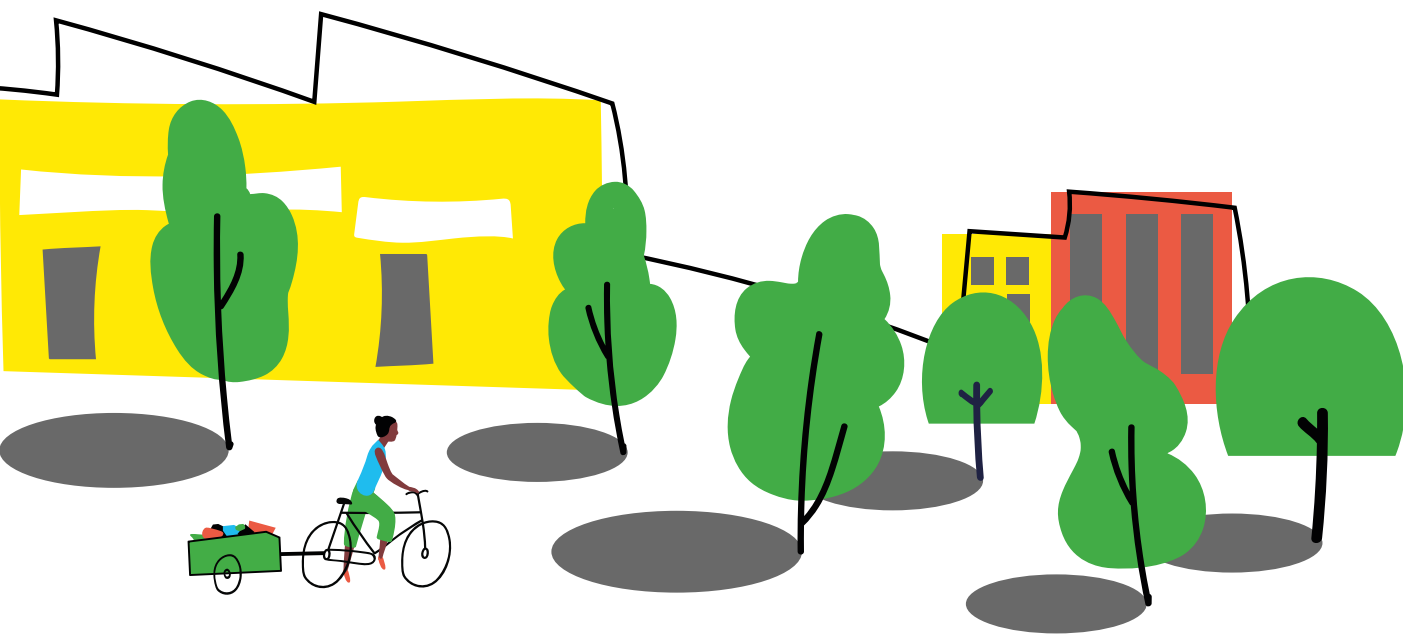
'Borla' tricycle operators at a transfer station; Accra

Source: NKACC commissioned by C40

Part II.

Understanding who the waste workers are.

Human-centric value chains in the cities of Rio de Janeiro, Accra and Lagos.



Three detailed case studies from Rio de Janeiro, Accra and Lagos presented in Annex 1 provide an in depth analysis of each city's waste management value chain. The case studies also elevate how the cities are already using their powers and capacities through the four different levers to build more inclusive solid waste management.

Over the next few pages, Table 2 summarises the main relationships these cities maintain with waste stakeholders, especially informal ones, throughout the value chain following the levels of the pyramid (see Figure 2). The table includes key actions, per city, set up to foster inclusion. Following the city overview, Table 4 then provides conclusions from an intersectional analysis of the three case studies drawing out the practical, strategic and structural barriers faced by informal workers, especially women, migrant and youth, throughout the chain.

Part III then provides concrete recommendations on how cities can act through these different levers and foster inclusive waste value chains in the future, including specific measures to foster gender mainstreaming interventions and an intersectional lens considering gender, race, class and migration status in their decision-making process and policy design.

Table 2: Synthesis of interactions between cities and waste sector workers throughout the value chain and examples of key actions set up by cities

	At the top of the value chain (level 3 – processors)	In the middle of the value chain (level 1 & 2: small-to-large scale aggregators)	At the bottom of the value chain (level 0 – collectors)
Rio de Janeiro	<p>The Municipal Company for Urban Cleaning (COMLURB), one of the largest public cleaning organisations in Latin America, is responsible for waste management in the City.</p> <p>The processing of recyclable waste is done by formal private industries.</p>	<p>The city enables collaboration with informal waste workers organised into cooperatives (up to 10-year contract at Irajá and Bangu Sorting Centres) to collect and proceed to sorting.</p> <p>More recently, the State government is seeking to regulate scrap dealers by making it mandatory to register and regulate junkyards with the Civil Police and better formalise their activities (establishments will be able to issue invoices and keep record books).</p>	<p>The Municipal Company for Urban Cleaning (COMLURB) employs and organises waste collection services through its own formal employees.</p> <p>Since 2002, Brazil started to better recognise informal waste workers by acknowledging them into the Brazilian Classification of Occupation (CBO) and official data base.</p> <p>The City is promoting the organisation of waste-pickers and workers into cooperatives while providing capacity-building programmes.</p>

Accra	<p>The local authorities have delegated waste management to private actors through concessions paid on a polluter pays basis.</p> <p>Large-scale recyclers are mostly formal and buy waste from pickers, crushers or aggregators and transform the materials into new products.</p>	<p>The city of Accra has implemented transfer stations with registration and access for informal waste collectors and supports them in primary sorting.</p>	<p>The city is still increasingly considering the role of informal waste workers.</p> <p>Accra Metropolitan Assembly has launched different programmes seeking to integrate informal waste collectors (training courses, raising awareness, driving licence, etc.).</p> <p>The 2019 Accra Resilience Strategy went further officially recognising the contribution of the informal sector in waste management.</p>
<p>Needs assessment in collaboration with the C40 has recently built trust and fostered cooperation through participatory stakeholder workshops.</p>			
Lagos	<p>The Lagos State Waste Management Authority (LAWMA) has delegated the waste management service to private actors referred to as Private Sector Participators (PSPs)</p> <p>Small and medium scale industries and larger recycling companies process and recycle materials collected from the streets or landfills. They deal directly with large buyers and brokers and have huge capital requirements and supply needs.</p>	<p>Local authorities have been investing in collection hubs where formal recyclers (who often work with informal workers as well) collect and segregate waste.</p>	<p>The City and LAWMA with support from the association of scrap and waste pickers of Lagos (ASWOL) started a census of existing informal waste workers starting with waste pickers in order to help the semi-formalisation of their activities</p>
<p>Dialog and discussions with associations representing informal waste workers are maintained by the city and LAWMA.</p> <p>The city launched the Pakam App to allow households to declare a certain amount of recyclable waste to order collection and is progressively opening it to informal waste workers, beyond PSPs.</p>			

Conclusions from the case studies: an intersectional perspective on challenges and vulnerabilities of informal workers in the waste value chain


Understanding the individual experiences of these groups and taking an intersectional perspective is the key to developing policies that will build a more inclusive and fair waste management value chain.

These three cities' case studies (see Annex 1) highlight the challenges and vulnerabilities that are common to all waste workers and are linked to the fact that they are informal workers operating in the waste sector, in general coming from poor households and disadvantaged communities. Common challenges and vulnerabilities include high exposure to pollution, health hazards and injuries, poor working environment, social stigma around waste jobs, poverty, etc. However, individual experiences differ depending on the informal waste workers' identities and there are some intersecting constraints and barriers that are specific to women, migrants and youths.

Understanding the individual experiences of these groups and taking an intersectional perspective is the key to developing policies

that will build a more inclusive and fair waste management value chain. The table below summarises the practical, strategic and structural constraints faced by women, migrants and youths in the informal waste sector⁶⁴. The assumption of this analytical framework is that each individual has multiple identities: as women, as migrants, as young people, as informal workers, as waste workers, as members of poor households and disadvantaged communities. Each identity has its own constraints. They can interact and reinforce each other and create an exacerbated burden. *Practical constraints* limit the resources available to undertake economic and social activities. *Strategic constraints* limit their ability to transform the balance of power. Finally, the *structural constraints* are the underlying and root causes of such constraints⁶⁵.

Table 3: An intersectional perspective on the challenges and vulnerabilities of informal waste workers in the value chain: practical, strategic and structural constraints faced by women, migrants and youths.

	 WOMEN	 MIGRANTS	15 to 24 YOUTH
Practical constraints → limit the resources available to undertake economic and social activities.	Lack of assets and resources <ul style="list-style-type: none"> • Little or no land and housing ownership and property rights • Little or no equipment • Lower education, skills and know-how • Low or no financial capital • Lower income <p>Female informal waste workers tend to work from home or inside waste centres, performing low-income tasks like sorting and washing. They are less “visible” than men. When they pick up waste in the streets or landfills, they have no or little equipment, and they tend to collect lighter and lower-valued recyclables. Most frequently, they have lower education, skills and know-how. Most frequently, they do not own any asset in their name either because of economic/ income inequalities (they tend to earn less than men and have more difficulty accumulating wealth), social norms and practices (for instance regarding inheritance and dowry) or unequal property rights. As a result, they earn less money than men in general.</p>	Lack of assets and resources <ul style="list-style-type: none"> • Little or no land and housing ownership and property rights • Little or no equipment • Lower education, skills and know-how • Low or no financial capital • Low social capital • Lower income <p>Migrant informal waste workers tend to live in informal settlements with no property rights. They often work at night to avoid harassment or being seen. They have little or no equipment. They often come from rural areas and have lower educational backgrounds. Language is a key barrier, they are often excluded from local communities. They have little or no financial capital and very few social links in the city where they settle. They are particularly at risk of exploitation and earn lower income than local informal waste workers in general.</p>	Lack of assets and resources <ul style="list-style-type: none"> • Little or no land and housing ownership • Little or no equipment • Lower experience, education, skills and know-how • Little or no financial capital • Poor social and professional networks • Lower income <p>Young informal waste workers do not own any asset in general. They typically have less experience and low education background. They usually don't have financial capital and their earnings are lower than more experienced workers. They also have poorer social and professional networks.</p>

WOMEN	MIGRANTS	YOUTH
<p>Lack of access to services</p> <ul style="list-style-type: none"> Poor access to basic infrastructure Poor geographic mobility / transport Poor access to health services Poor or no childcare services Poor access to financial and business development services <p>Female informal waste workers often live and work in places where basic infrastructure, notably sanitation, is rare. They struggle to access health services. They often have to take care of their children, which limits their working capacity. Financial inclusion is also lower for women, and they have less access to business development services compared to their male counterparts. This includes financial development like microcredits, starting grants and saving schemes, legal advice and support, technical and entrepreneurial training, etc.</p>	<p>Lack of access to services</p> <ul style="list-style-type: none"> Poor access to basic infrastructure Poor access to health services Poor access to financial and business development services <p>Migrant informal waste workers often live in informal settlements where basic infrastructure is rare. In general, they don't have insurance and have poor access to health services. Financial inclusion is also low, and they have poor access to business development services.</p>	<p>Lack of access to services</p> <ul style="list-style-type: none"> Poor access to basic infrastructure Poor access to health services Poor access to financial and business development services <p>Young informal waste workers live in poor conditions and have poor access to basic infrastructure. They struggle to access and use health services. They are less aware of waste jobs' health risks. Financial inclusion is low.</p>

	WOMEN	MIGRANTS	YOUTH
<p>Strategic constraints</p> <p>→ limit their ability to transform the balance of power</p>	<p>Lack of recognition and rights</p> <ul style="list-style-type: none"> Unequal rights between women and men Poor gender mainstreaming of public policies and interventions <p>Unequal rights and gender-based discrimination affect female informal waste workers and can add to their burden. Lack of gender-responsive and transformative measures prevent changes in the balance of power along the waste value chain.</p> <p>Lack of voice and bargaining power</p> <ul style="list-style-type: none"> Poor representation in high-level positions Poor participation in policy design and discussions <p>Female informal waste workers are underrepresented among informal waste workers organisations (with differences between countries). They are overrepresented at the bottom of the pyramid and men mostly hold management, decision-making and ownership positions among aggregators, buyers, processors, etc.</p>	<p>Lack of legal identity and rights</p> <ul style="list-style-type: none"> Poor and no recognition as well as legal rights (unauthorised non-domestic workers) Poorly considered in local policies <p>Unequal rights between locals and migrants, as well as ethnic-based discrimination affect migrant informal waste workers and can add to their burden. They tend to avoid public authorities, and little is known about their conditions. Hence, they are poorly considered in policy design.</p> <p>Lack of voice and bargaining power</p> <ul style="list-style-type: none"> Poor representation in high-level positions Poor participation in policy design and discussions <p>Migrant informal waste workers are underrepresented among informal waste workers' organisations. They are overrepresented at the bottom of the pyramid and rarely hold management, decision-making and ownership positions among aggregators, buyers, processors etc. They are often either not considered or not willing to take part in policy design and discussions due to their status.</p>	<p>Lack of voice and bargaining power</p> <ul style="list-style-type: none"> Poor representation in high-level positions Poor participation in policy design and discussions <p>Young informal waste workers are underrepresented among informal waste workers organisations. They are overrepresented at the bottom of the pyramid and rarely hold management, decision-making and ownership positions among aggregators, buyers, processors, etc.</p>

	WOMEN	MIGRANTS	YOUTH
<p>Structural constraints</p> <p>→ the underlying and root causes of practical and strategic constraints</p>	<p>Restrictive social and cultural norm</p> <ul style="list-style-type: none"> Gender norms and stereotypes Roles, attitudes and behaviours expected from women <p>Due to gender roles female informal waste workers often have the majority of their domestic and household work to do, which constrains their working capacity. Women walking alone in public spaces, driving or bike-riding are regarded negatively in some countries. They are often associated with the private sphere and underrepresented in public places.</p> <p>Unequal market relationships and transactions</p> <p>Female informal waste workers are more at risk of sexual harassment, exploitative situations and have low bargaining power in transactions with upstream waste workers.</p>	<p>Restrictive social and cultural norms</p> <ul style="list-style-type: none"> Stereotypes around migrants Racism <p>Migrants are often seen as competitors in the informal waste market, they suffer from this stigma and are often excluded.</p> <p>Unequal market relationships and transactions</p> <p>Migrant informal waste workers are more at risk of persecution and exploitative situations and have poor bargaining power in transactions with upstream waste workers.</p>	



Recyclers in an informal recycling facility; Accra

Source: NKACC commissioned by C40

City-led actions and recommendations.

To build sustainable, fairer and more inclusive waste management value chains.



Cities can take actions to build sustainable, fairer and inclusive SMW systems. They have multiple levers such as local policy and regulation, urban planning and market trend-setting tools, power to build capacity, facilitate, and raise awareness. These formal and informal powers are at their disposal to take adequate actions.

Cities have the opportunity to support the meaningful participation of diverse individuals and communities when planning, implementing, monitoring, and evaluating an action. Given the specific vulnerabilities and challenges faced by women, migrants and youth in waste value chains, it is more than necessary to adopt gender-responsive (at least) and transformative approaches as well as an intersectional perspective to engagement and policy making.

Several measures can be taken to lift the practical, strategic and structural barriers faced by informal workers.



Policy Maker and Regulator

Action #1: Recognizing informal waste workers in local policies or advocating for their recognition in national framework to grant them better access to rights and protection

- Recognize specific situations/experiences of women, migrants and young people
- Include undocumented migrants in the registration process

Action #2: Facilitating the inclusion and participation of informal waste workers and in particular disadvantaged groups such as women, migrants and youths in policy design, implementation and evaluation

- Ensure participation of disadvantaged groups in the design and writing of policies and plans

Action #3: Facilitating cooperation and projects between formal and informal players, especially through Extended Producer Responsibility (EPR) systems and sustainable procurement, to boost recovery and recycling

- Gender and intersectional mainstreaming of reverse logistics and EPR systems

Action #4: Designing the right incentives, including for upstream actors, to encourage formalisation and the adoption of better practices by the informal sector

- Ensure special support for disadvantaged groups, providing higher incentives for the inclusion of women and migrants

Action #5: Supporting access to new livelihoods and opportunities for informal workers whenever local waste policies result in a net loss of informal work



Urban Planner and Market Trend Setter

Action #6: Mapping informal waste workers in the city's value chain and setting up diagnosis to assess their concrete contribution to the SWM system

- Give voice to disadvantaged groups and disaggregate data and information by sex, age and origin to design gender-sensitive, inclusive and transformative policies

Action #7: Granting access to public infrastructures to improve informal waste workers' environments and working conditions and provide storage spaces

- Include access to public toilets and water, especially for female workers
- Facilitate access for women, migrants and youth to safe storage spaces

Action #8: Decentralizing the solid waste management system to facilitate collection and primary sorting and better integrate informal waste workers

- Represent and include disadvantaged groups among operators of transfer stations and collection centres
- Facilitate access for women, migrants

Action #9: Influencing private formal waste stakeholders to better consider informal waste workers in their value chains and provide better livelihoods



Capacity Builder

Action #10: Providing adapted equipment to help waste workers work in safer conditions

- Engage with workers to discuss the most urgent needs
- Facilitate access to vehicles and carts for women and migrant workers who have lower equipment rate

Action #11: Providing training on waste-related skills, safety and environmentally-friendly practices to boost the competencies of all waste workers

- Provide specific training for female workers to empower them (pricing information, entrepreneurial skills)
- Raise awareness on gender-bias among actors notably upstream in the value chain
- Provide information in local/ foreign languages for migrants
- Fight discrimination and stereotypes based on gender, ethnic origins, religion, etc.

Action #12: Supporting the creation of intermediary structures or reinforcing existing ones to facilitate collaboration with informal waste workers

- Ensure representation and participation of disadvantaged groups in organisations' leadership and staff

Action #13: Encouraging financial inclusion of informal waste workers to increase their earnings and support formalisation

- Facilitate in particular information on financial services for women, migrants and youths

Action #14: Advocating for additional investment in schools and supporting existing local initiatives to limit child labour in waste-related activities



Awareness Raiser

Action #15: Providing information on and access to available social security and insurance schemes to mitigate occupational hazards and health issues

- Ensure special focus on female waste workers, their children, migrants and young people who are particularly exposed to health risks

Action #16: Support the implementation of segregation at source through behavioural changes to improve informal waste workers' situations and ease waste management

- Empower women as awareness raisers or environmental promoters

Action #17: Raising awareness and training policy makers, city officials and staff members about gender and identity sensitive approaches

Action #18: Fighting social stigma around waste-related jobs among citizens to value the essential service provided by these workers



3.1. Taking action as policy makers and regulators

Action #1

Recognizing informal waste workers in local policies or advocating for their recognition in national framework to grant them with better access to rights and protection

Cities can advocate for the recognition of informal waste workers in national public policies and include formal and official recognition in local SWM plans or by-laws to lift strategic barriers faced by informal waste workers.

The lack of legal identity and recognition (and sometimes the fact that their activities are unauthorised) is a main constraint for informal waste workers, particularly for women and migrants, as it prevents them from accessing their rights. Official and legal recognition of their work and contribution is a prerequisite to their inclusion in cities' waste management systems. Brazil and India are two good examples of official recognition in the national and local SWM framework. Brazil's National Waste Policy (2010) is considered one of the most forward-thinking waste laws in the world. It defines how informal waste pickers should be integrated into municipal waste recycling programs. By organising workers into cooperatives, supporting their training and access to formal contracts, this

policy has helped improve the solid waste management system while providing safer working conditions and better livelihoods for informal waste workers. India's General Framework Legislation for Solid Waste Management (2016) acknowledges the informal sector and formulates guidelines towards the inclusion of informal workers in waste management.

Registration and provision of ID cards to informal waste pickers at the city level is an important step in informal waste workers' recognition, notably waste pickers. It can have a positive impact on their working conditions. Occupational ID cards recognise waste picking as a legitimate occupation and often guarantee certain rights to the card holder like legal ownership of waste. The registration and provision of ID cards should also consider undocumented migrants, who are often reluctant to deal with public institutions or formal organisations as they fear expulsion. Regularisation of migrants working in the informal waste sector is a necessary counterpart of their inclusion.

Action #2

Facilitating the inclusion and participation of informal waste workers and in particular disadvantaged groups such as women, migrants and youths in policy design, implementation and evaluation

Participation of informal waste workers, and in particular of women, migrants and youths, is an opportunity to improve policies and programmes.

Cities have the opportunity to promote and support the active and meaningful participation of a diverse range of individuals and communities when planning, implementing, monitoring and evaluating their policies. This can be done through informing people, gathering feedback, organising focus groups, setting committees and advisory boards, partnering with communities, grassroots organisations, etc. Meaningful participation requires a regular platform with clear rules of engagement. A participatory approach is also an opportunity for disadvantaged groups to voice their experiences and regain power.

Meaningful participation requires a regular platform with clear rules of engagement.

Designing community engagement requires a thorough understanding of the barriers that disadvantaged groups may face presenting them from engaging with public organisations and policy decision-makers.

Underrepresented groups may encounter practical barriers hindering participation in this process: women may have limited access to transport, migrants may have limited social networks and lack information about such initiatives, they may face language barriers, etc. Structural constraints might impede effective participation as well: gender norms may prevent women from participating in public events, sexism and racism can reduce the consideration of women and migrants' voice as legitimate, young people can be poorly connected to public institutions, etc. Participative policy design and community engagement can be a powerful tool to lift strategic barriers but it requires additional analysis and effort to take into account the practical and structural constraints that could defeat the process. Some measures can be taken: going directly to women, migrants and youths in the places they live or gather (door-to-door visits, going to informal settlements, communities' social meeting points, etc), providing translation, identifying community leaders, etc.

Action #3

Facilitating cooperation and projects between formal and informal players, especially through Extended Producer Responsibility (EPR) systems and sustainable procurement, to boost recovery and recycling

Cities have the opportunity to facilitate cooperation between processors, recyclers, industries with informal workers and cooperatives as part of a reverse logistics, extended producer responsibility system as well as sustainable procurement practices.

This represents a major opportunity to lift strategic and structural barriers, in particular to build equal market relations and establish fairer transactions and transform the balance of power, particularly with most disadvantaged groups. Reverse logistics and EPR are powerful tools to make companies accountable for their actions and ensure they contribute to the environmental and social costs of waste production. This is particularly interesting from a municipality's budget perspective as it shifts part of the financial burden for waste management from the public sector to the manufacturers, thus contributing to sustainable and fairer waste value chains. Sustainable procurement standards such as reduction and ban of single-use and non-recyclable plastics are also effective ways through which cities can better hold companies accountable for their end life cycle. Cities from C40, through the Zero Waste Accelerator, have already engaged in such a path towards zero waste cities by implementing, among other actions, local and regional EPR and sustainable procurement policies⁶⁶.

Producer responsibility and sustainable procurement standards such as those elevated through C40's Zero Waste Accelerator focused on the reduction and ban of single-use and non-recyclable plastics are also effective ways through which cities can hold companies accountable.

In Latin America, some cities work closely with the membership organisation Compromiso Empresarial para el Reciclaje (CEMPRE), which gathers 20 private sector members to promote a shared responsibility approach strengthening existing value chains and supporting organised informal recyclers. Informal recyclers have an incentive to join official associations; if not, they remain outside the inclusive recycling system and don't have access to opportunities and benefits. It works mainly through price support and the authorization of junk shops and informal recyclers cooperatives. For instance, the ECORED network for PET collection is a collaboration of two CEMPRE members, Coca Cola and ENKA, a PET recycler. ECORED operates a small number of authorised, subsidised junk shops specialised in the purchase and processing of PET beverage packages. Operations include buy-back with price support to associated waste pickers, collection, processing, and marketing to the value chains⁶⁷.

In Rio de Janeiro, Ambev, the leading South American beer brewer, has set up a system of buying back glass directly from waste workers, at a higher price than the market, using short circuit and leveraging on informal waste pickers' competencies in the collection and sorting of products has achieved higher levels of collection and recycling.

EPR and reverse logistics measures can interfere with the livelihoods of informal waste pickers who rely on waste streams that are extracted from the informal flows into a reverse logistics approach. Hence it is primordial to include them in the policy design. Furthermore, EPR and reverse logistics measures should consider the practical, strategic and structural barriers that might prevent equal relations between all stakeholders involved. Informal waste workers may not have the resources and power to engage in this process fairly, and this is particularly true for

most disadvantaged groups. For instance, they may not have the literacy skills or negotiation competencies, migrants may have language barriers, women and migrants might face discrimination when negotiating their working conditions with private formal actors. Supporting informal waste workers to engage in equitable relations with the formal sectors is essential. This can be done by strengthening their representation and organisations like cooperatives, organising training, establishing trusted third parties, providing legal advice and support, etc.

Action #4

Designing the right incentives, including for upstream actors, to encourage formalisation and the adoption of better practices by the informal sector

Higher up in the value chain, cities can incentivise informal aggregators and processors to register as official companies through registration simplification, temporary local tax exemption or grants to start their activities.

The administrative burden to start a business and register a company is often a barrier for informal players, and particularly women and migrants who struggle to navigate such processes due to a lack of financial and social capital, on top of language barriers for migrants, and low educational background in general among informal workers. Considering the practical, strategic and structural barriers that informal workers and more specifically minorities face

to formalise is essential. Special support for most disadvantaged populations might be useful to lift practical constraints, including measures such as additional training, individual advisors or mentors to help women and migrants register, grants or other financial support, etc. In addition, incentives such as temporary local tax exemptions or grants could be based on inclusion requirements such as the inclusion of women or migrant workers among the owners, directors or managers, which constitute a strong lever to tackle strategic and structural barriers.

Previous studies and work also demonstrated that different types of incentives could be leveraged to foster cooperation and adoption of better practices

(e.g. prevent harmful behaviours for the environment such as illegal dumpsites, etc.) with informal waste workers, including social incentives that can take the form of access to insurance, training or microcredit. In Kenya, the social enterprise specialised in plastic waste collection and recycling Mr. Green Africa launched a loyalty programme to encourage waste pickers to sell their waste to the start-up by

providing them better working conditions. The programme is a sustainable model as the cost of the social incentives is financed by the improved performance of waste pickers. Promising results a couple of months after the launch were registered with a more than 113% increase in the average monthly income of waste pickers and a more than 122% increase in the volume collected by workers per month.

Action #5

Supporting access to new livelihoods and opportunities for informal workers whenever local waste policies result in a net loss of informal work

On their journeys towards more efficient solid waste management, cities are likely to make decisions that could lead to a net loss of informal work (e.g. shutting down a landfill that was providing livelihoods to informal workers or being able to hire only a portion of the informal workers to formalise their activities).

Cities should anticipate such situations by planning retraining or re-employment plans for this workforce to avoid the impoverishment of these workers.

The Greater Lomé Autonomous District in Togo was supported by the French Development Agency with the closure of the Agoè-Nyivé landfill that provided livelihoods to at least 60 waste pickers. The retraining assistance plan was divided into three possibilities: financial

compensation, rehiring of some of them by the municipality, assistance provided by the NGO Entrepreneurs du Monde to support workers for four years (entrepreneurship, apprenticeship, vocational training⁶⁸).

Particular attention on how disadvantaged groups are affected by such decisions is essential. For instance, when a city decides to close a landfill, gathering information on the share of men, women, migrants, minority ethnic groups working there is the first step towards understanding individual situations.

Cities can also organise interviews with these actors to understand how they will be affected, what they plan to do afterwards and how their transition can be supported.

When a city closes a landfill, interviewing and gathering information on the men, women, and migrants working there to understand how they will be affected, what they plan to do afterwards and how their transition can be supported is a first step.



3.2. Taking action as urban planners and market trend-setters

Action #6

Mapping informal waste workers in city's value chain and setting up diagnosis to assess their concrete contribution to the SWM system

Establishing a clear picture and objective measure of informal waste workers' economic and environmental contributions is an important step for cities to better understand the opportunities of collaboration with the informal economy. Having a realistic idea of who the actors are (profiles, location, etc.), depends on how much the city saves from informal waste workers' services, how much income is generated out of recyclables in the informal sector, and the environmental, economic and social benefits generated would give additional incentives to considering them as partners in SWM system.

This requires collecting data on informal waste workers' activities and drawing a clear picture of the informal waste value chain. This process should mobilise both quantitative and qualitative approaches in order to: (i) have the clearest picture of the informal waste value chains and its stakeholders; and (ii) give voice to the informal workers involved, notably women, migrants and youths, along the value chain. Stakeholder mapping is also an opportunity to shed light on the practical,

strategic and structural barriers they encounter. Disaggregating data and information by sex, age and migration status is the key to designing gender-sensitive and transformative policies and regulations and building inclusive waste value chains.

However, this data can be challenging to collect (getting in touch with targeted respondents, trust issues, reluctance or refusal to answer, bias in response, etc.). Throughout data collection it is important to ensure data protection and potential harm and risks that informal workers – especially migrants, women and youths – take and therefore their potential wish to remain anonymous.

The ownership of the information itself can be a contentious issue which is why organisations like Slum Dwellers International⁶⁹ advocate for the ownership of data to remain in the hands of the communities. Leveraging on this information, cities have the opportunity to help informal workers, and particularly the most disadvantaged groups, to move up the value chain and make a greater economic and environmental contribution.

Action #7

Granting access to public infrastructures to improve informal waste workers' environments and working conditions and provide storage spaces

Access to storage and sorting facilities with flexible schedules represents a strong lever to lift practical constraints that informal waste workers and in particular most disadvantaged groups encounter.

At the bottom of the pyramid, working conditions are particularly harsh and informal workers often have no access to toilets, water, and sanitation facilities. **Cities can ease access to public toilets and water, building and opening infrastructure close to collection spots**, like landfills, dumpsites and waste collection or aggregation hubs. In addition, cities can take action to improve the safety of informal waste workers, notably for women, by investing in public lighting and road safety. This is a key measure to address some of the practical constraints that informal waste workers face and it can particularly benefit the most disadvantaged groups who lack access to basic infrastructure, goods and services (for instance migrants living in informal settlements often live in harsh conditions and are particularly isolated).

Most informal waste workers sell recyclables daily to survive, which limits the quantity and the rates at which they can sell and hence their income. Being able to store the waste they collect, but also to sort it properly (better sorted waste has higher value on the market) highly impacts their earnings. **Access to storage and sorting facilities with flexible schedules** can greatly improve informal waste workers' situations. Flexible schedules can be particularly convenient for women who often have to juggle with household responsibilities and take care of their children. Access to storage spaces would help them accumulate larger

quantities of waste so that they can bargain higher rates on the market and increase their revenues. This action represents a strong lever to lift practical constraints that informal waste workers and in particular most disadvantaged groups encounter. For instance, the Temesi Recycling project, undertaken by NGOs in Indonesia, is based on a treatment plant where salaried employees process organics and run more technical tasks in the compost plant but also freelance sorters, often informal waste pickers sort the waste. The latter are paid based on the weight of separated waste and they can keep the recyclables they find; they have the flexibility to work when they want, and they can accept or reject a truckload of waste based on cleanliness. Cities can initiate such projects with the support of local NGOs and help find sites and facilities to run these operations.

Storage is also an issue for aggregators higher up in the value chain, especially small-scale aggregators who often have very small facilities that they rent, sometimes they even do it at home. Hence, supporting **small aggregators to invest in larger facilities and equipment and ensuring they have official property rights** will help them increase their revenue and provide incentives to progressively formalise. A particular focus on disadvantaged groups such as women, migrants and youths is essential since they face more barriers in a climb up the value chain.

Action #8

Decentralising the solid waste management system to facilitate collection and primary sorting and better integrate informal waste workers

Providing or facilitating access to storage and sorting facilities calls for a decentralisation of solid waste management systems. Installing transfer stations or district-based collection and sorting centres can greatly help informal workers to store, sort and sell their waste. For example, transfer stations in the city of Accra, Ghana, provide infrastructure for informal waste workers to store and primarily sort the waste they collect.

Decentralisation through the opening of transfer stations, local collection centres or hubs not only address practical constraints

faced by informal waste workers but can also be an opportunity to address some of the strategic and structural constraints that disadvantaged groups encounter. This action provides rooms to include women, migrants and young people and help them climb the value chain if they are supported and included as owners, operators and workers in these local facilities. Cities have the opportunity to push for equal representation of minorities among operators and managers and provide additional training and support to develop their management skills and entrepreneurial competencies.

Action #9

Influencing private formal waste stakeholders to better consider informal waste workers in their value chains and provide better livelihoods

There is some room for cities to influence bigger waste players to guarantee better living conditions and livelihood stability.

Cities have the opportunity to raise awareness among aggregators and processors, especially formal ones, on working conditions, harassment, environment preservation practices and engage them to build clean and green channels. There is some room for cities to influence bigger waste players to guarantee better living conditions and livelihood stability for waste workers among the value

chain. These types of actions could range from awareness raising and the use of cities' soft powers to more coercive and formal measures from cities as contractors through their procurement policies. Such efforts can help tackle some of the structural constraints faced particularly by women, migrants and youths, such as unequal market relationships and transactions.



3.3. Taking action as capacity builders and facilitators

Action #10

Providing adapted equipment to help waste workers work in safer conditions

Personal protective equipment (PPE) is the key for protecting frontline waste workers against injuries and infections. However, there is very little use of PPE among informal waste workers, as it is often expensive and seen as uncomfortable and a hindrance to work efficiency. Proper PPE usage is necessary, and cities can take action to **provide PPE, such as masks, gloves, shoes, caps, etc., that are designed to be suitable for waste related activities, and train informal waste workers to properly use it.** For instance, SWaCH, a waste workers' cooperative based in Pune in India, has worked with Tata Motors and students from MIT to redesign some of the equipment used by waste collectors like push carts, sticks used to poke and pick up waste and sacks. Each item was designed in a collaborative process with waste pickers, aiming for ease of manipulation and multipurpose use. The sacks and sticks were redesigned to put less stress on pickers' backs. They also find out that pickers prefer to use scarves, rather than masks, which they find uncomfortable and embarrassing. Raincoats have also been issued by the municipality after data revealing illness related to getting drenched in the rain.

There is also room to specifically address practical constraints encountered by disadvantaged groups. Women often have less access to equipment constraining their collection capacity and hence their revenues. **Providing access to vehicles and carts to female waste workers** so that they can collect larger volumes of recyclables, cover additional areas, improves their efficiency and incomes substantially. This calls for structural barriers to be addressed concomitantly to change social norms about women using vehicles, driving and their mobility. **Facilitating access to such durable goods to migrants through innovative financial schemes** can also help them raise their revenue and climb the value chain. Indeed, most migrants come with little or no financial capital to the city where they settle, and struggle to acquire equipment like vehicles and carts or they have to rely on other providers or money lenders, potentially ending-up in exploitative relationships. Some of them are also seasonal workers who go back and forth between the city and rural areas, preventing them from keeping assets. Improving access could be done through leasing or renting with registered and authorised providers, with financial support.

Action #11

Providing training on waste-related skills, safety and environmentally friendly practices to boost the competencies of all waste workers in the value chain

Cities have the opportunity to organise professional training and capacity building on entrepreneurial skills, waste-related competencies and opportunities, safety and environment-friendly practices among waste workers. Such educational programs and professional training represent an opportunity for gender-transformative policies and intersectional approaches. Curriculum can include information and awareness-raising content on gender equitable relationships, prevention of sexual harassment and gender-based violence, stereotypes and discrimination based on gender, ethnic origins, religion etc. This is also an opportunity to empower women with additional skills such as pricing information, entrepreneurship, negotiation competencies, etc. This would be particularly useful to help them climb the value chain and gain bargaining power. Supporting migrants to learn the local language or provide information and training in various languages can help include migrants in such activities. Investing in skills development, professional training and education of informal waste workers is also essential if more landfills and dumpsites are to be closed.

Therefore, this action represents a tremendous opportunity to simultaneously tackle practical, strategic and structural

constraints by: (i) giving informal waste workers – and particularly the most disadvantaged groups – the necessary resources to undertake economic and social activities (investment in human capital through capacity building and training); (ii) improving their ability to transform the balance of power, notably with upstream stakeholders (having more skills and competencies, gaining self-confidence can boost their willingness to express their voice and regain power); and (iii) questioning the underlying causes notably social norms and unequal relationships (raising awareness about the restrictive social and cultural norms that govern the organisation of waste value chains and the relationships between stakeholders).

In Mumbai, the NGO Stree Mukti Sanghatana (SMS) offers training to female waste pickers organised in self-help groups in leadership, health and vocational training⁷⁰. In particular, SMS implemented the Parisar Vitas programme to train female waste pickers to manage compost and biogas small-scale units. They resell dry waste to recycling industries and organic waste to biogas producers. This gives women an opportunity to earn additional income, groups often contract with housing complexes and businesses to perform waste collection and composting. In Chile, TriCiclos⁷¹ has established Clean Points, which are centralised facilities

Cities have the opportunity to empower women with additional skills such as pricing information and negotiation competencies that are particularly useful to help them gain bargaining power and climb up the value chain ladder.

where households and businesses can deliver sorted waste materials for recycling. Each Clean Point is funded by the private sector or municipalities. Selected waste pickers join TriCiclos for two years, learning every aspect of the Clean Point business - from recycling and administration to running a business. While in training, waste pickers earn a salary of roughly \$485

USD a month, plus the sale of recyclables. This is considerably more than average waste picker earnings. There is an expectation that money is saved in order to maintain the business once they become independent. After two years, once the Clean Point is firmly established in the community, it is handed over and no further financial support is provided.

Action #12

Supporting the creation of intermediary structures or reinforcing existing ones to facilitate collaboration with informal waste workers

It is almost impossible for cities to deal with thousands of individual waste workers in the value chain. Intermediary organisations are important for organising relationships. Cities can **promote integration and organisation of waste collectors through cooperatives, NGOs or self-help groups with representative leadership notably in terms of their gender, age and migration profile**. Representative leadership could be achieved through quotas or requirements among board members, committees and/or staff.

Integration into cooperatives is probably the most advanced form to enable close collaboration and economic relationships with the formal waste ecosystem and is an efficient tool to lift the strategic constraints faced by most disadvantaged groups. Integration and organisation of informal waste workers can reinforce their bargaining power, give them better representation

and more voice. In this regard, Brazil is a good example of the successful integration of waste pickers into municipal waste management through cooperatives. Today, in the Brazilian city of Diadema, waste pickers' organisations are paid the same amount per tonne of recyclables collected as a private company would be. This was made possible by Law 2336/04, which entitles organisations to be paid by service rendered⁷². Colombia is also one of the countries with the most dynamic recycler cooperative movements in the world.

The Fundacion Social has been assisting waste pickers in the formation of cooperatives since the 1980s. Planeta Verde, ARB, ANR, Recuperar are some of the numerous cooperatives advocating for waste pickers' rights in the country. Thanks to this powerful network, waste pickers now receive monthly payment for their services as

mandated by the Constitutional Court of Colombia⁷³. In Mumbai, India, the NGO SMS was initially a women's liberation organisation that progressively started working with female waste pickers. They initiated the creation of self-help groups with about 10 members in each group. Women meet on a regular basis to share experience, save money, get training etc. Today SMS has about 500 self-help groups, totalling

5,000 female waste pickers in India. Some SMS groups are now organised into cooperatives which are also within the Parisar Vikas Sangh federation (translating into an organisation to improve the environment), the federation provides marketing and policy advocacy services for its cooperatives. Aggregators could also be organised into groups or cooperatives to supply materials to processors.

Box 3: Improving cooperatives systems: the way forward in Brazil

One of the key challenges for cooperatives in Brazil is to diversify their revenue sources to have a more stable business model that allows them to offer better working conditions to waste workers, acquire better facilities and have more negotiating power with buyers. Brazilian cooperatives have identified four levers to diversify their revenue sources:

1. Increase the number of contracts with municipalities, which delegates to cooperatives the management of recyclable waste.
2. Develop service offers with private companies ('large generators').
3. The exemption or reduction of taxes on sales of recyclable materials by cooperatives.

4. A financial recognition by public powers of the environmental service they provide.

However, cooperatives struggle to activate these four levers, mainly because of the formalisation levels each of them implies. Regulation maturity of Rio de Janeiro cooperatives is completed through five administrative procedures. These procedures are the same for cooperatives of all sectors and demand important organisation, time, and financial costs, which are not adapted to the capacities of waste workers' cooperatives. To support cooperatives with the barriers they face, the Brazilian Federal government has launched programs such as CATAFORTE I, II and III. These support the organisation, the logistic structure and economic model of waste worker cooperatives. Yet, cooperatives still demand a legal framework more adapted

to their case and a reduction of the administrative burden. Regarding the recognition of the environmental service provided by cooperatives, the city of Diadema was the first to remunerate the cooperatives for this. This achievement was in part allowed by a network of cooperatives, Coopcent ABC, which works in partnership with the Intermunicipal Consortium of Greater ABC (State of São Paulo) and the National Secretariat for Solidarity Economy of the Ministry of Labour and Employment.

Like Coopcent ABC, other networks of cooperatives are being formed in Brazil, to increase negotiating power with public authorities and to advocate for an improved legal framework for cooperatives. This could allow them to activate the four levers identified to diversify their revenue sources and take an increasingly important place in the management of recyclable waste.

Action #13

Encouraging financial inclusion of informal waste workers to increase their earnings and support formalisation

Cities have the opportunity to **facilitate financial inclusion of waste workers** from the bottom to the top. Easing access to bank services, saving accounts and microcredits can help waste workers at the bottom of the value chain to buy equipment and assets to help raise their income.

Cities can work closely with NGOs, cooperatives and financial institutions to raise awareness among these issues and build innovative cooperation. This is particularly relevant for women, migrants and young people who face greater barriers preventing access to financial services for several reasons including lack of education, discrimination from financial institutions, lack of collateral and in general difficulty meeting lending requirements. Hence, facilitating access to financial opportunities represents a major opportunity for gender transformative measures and intersectional approaches, addressing simultaneously practical, strategic and structural barriers. For instance, in Mumbai in India the NGO SMS promotes

the creation of self-help groups where female waste workers save money, at each meeting every woman gives about INR 50 (\$0.6 USD) and the sum is available as a loan to any member who needs financial support. Hence, women no longer have to rely on their in-laws, junk shops, scrap shop dealers, and informal lenders to get access to financial resources. India has also established a national financial inclusion program for waste pickers holding occupational ID cards that gives access to low-interest loans.

Cities can also implement guarantee schemes to further support women and migrants who often have no official property rights and no ownership of lands or assets that they could use as collateral to access loans.

Facilitating financial inclusion (through microcredits, startup grants, loans, saving tools etc.) of aggregators can also boost the informal waste system to be more efficient, notably if they invest to develop their business and build safer, larger, and more sustainable facilities.

Facilitating financial inclusion (through microcredits, startup grants, loans, saving tools etc.) of aggregators can also boost the informal waste system to be more efficient.

Box 4: Powering the inclusion of informal waste workers through digital solutions

New technologies represent a significant opportunity to better consider the informal economy and optimise its functioning but can also be a risk for informal workers.

There are at least three ways in which digital tools can help cities improve the inclusion of informal waste workers in the value chain.

- **Support the collection of data and mapping of key stakeholders along the value chain:** even simple technologies like GPS signals can help build mapping of key stakeholders in the value chain, especially at the aggregator level as well as better understand the flows of waste in cities. In India, the Chennai-based start-up Kabadiwalla Connect offered the first mapping of the city's aggregators and facilitated transaction-based material tracking and traceability.
- **Limit asymmetries of information and increase transparency:** digital technologies can also facilitate operations and connect stakeholders to exchange waste and

transparent information (especially on prices) be it through a B2C approach (connecting waste generators to waste collectors) or a B2B approach (connecting waste workers among them). The city of Lagos uses the Pakam App which allows households to declare a certain amount of recyclable waste that formal collectors can collect. Many similar start-ups have been created in the past few years in the waste industry leveraging informal waste workers (Wecyclers in Lagos, Coliba in Ivory Coast, Plastic Bank in Haiti, rePARTN in Ghana, etc.). Many of these start-ups are seeking collaboration with the public sector to benefit from their support, network and skills.

- **Foster financial inclusion through mobile money:** mobile money has the capacity to improve safety of payments and make it possible to develop credit scoring and eased access to funding for waste actors, including in the informal sphere.

However, when designing such solutions, stakeholders should take into consideration the existing digital divide and

unequalled mastery of digital technologies among stakeholders. It is important to ensure that all actors have not only access to devices (and the internet) but also know how to use these tools. This is particularly relevant for women and most disadvantaged groups who do not necessarily own a smartphone. Keeping digital solutions as simple as possible by leveraging existing usages rather than trying to create new ones is often a key success factor (e.g. in some cases, sharing basic information through current social media is a more effective first step than creating an entirely new platform requiring the download of an unknown app that requires training to be used).

This also raises concerns regarding privacy and personal information misuse since informal workers have to create a profile and provide personal data. Migrants can be particularly reluctant to use such tools for fear of being displaced or relocated. Regulation on privacy and protection of personal information should accompany the development of these tools. Cities can ensure that sufficient information is shared with users about how data are used and shared, they can also advocate for more protection in national legislations.

Action #14

Advocating for additional investment in schools and supporting existing local initiatives to limit child labour in waste-related activities

Cities have the opportunity to further support female informal waste workers by advocating with national government or other local powers for more **investment in kindergartens and schools for children of waste pickers**. They can also work with NGOs and associations which launch initiatives around kindergartens and education close to collection sites. This will greatly contribute to reducing the practical constraints

that female informal waste workers encounter. For instance, in India, the Chintan Environmental Research and Action group implemented the No Child in Trash programme, running 18 learning centres for over 2,000 children that serve as a bridge for children working at dumpsites before attending school. In India, a special scholarship programme for waste pickers' children was also established for waste pickers with ID cards.



3.4. Taking action as awareness raisers

Action #15

Providing information on and access to available social security and insurance schemes to mitigate occupational hazards and health issues

Given that a major vulnerability of informal waste workers, particularly at the bottom of the value chain, is their exposure to occupational hazards and health issues, it is imperative that cities give them **information on and access to existing social security and insurance schemes (if any)**. For instance, the city of Pune provides health insurance for every registered waste picker. Several actions can be taken such as: dialogues with health service providers and practitioners at different levels so

that they become aware of the specific needs of informal waste workers and notably those of disadvantaged groups in the waste sector; providing information and education via adapted channels in which informal waste workers live and work (for instance close to dumpsites, landfills, collection centres, etc) with particular attention paid to women, migrants and youths; and interventions to improve workplace health and safety, including urban design initiatives and bringing health providers into the workplace.

“Given women and other disadvantaged groups are disproportionately affected by health risks from waste pollution and occupational hazards, it is imperative that cities provide accessible information on and access to existing social security and insurance schemes.

Women and other disadvantaged groups are disproportionately affected by health risks from waste pollution and occupational hazards. This is due to a combination of socio-economic, cultural and physiological factors that particularly affect women, notably the level of exposure, behavioural patterns, age, biological effects like endocrine disruption or nutritional deficiencies. For instance, women tend to be more exposed to chemicals as they perform the sorting, washing and disposal of waste, sometimes through burning which liberates highly toxic pollutants, heavy metals, etc. These chemicals get passed on to children during pregnancy. Hence, adopting gender-responsive and transformative approaches as well

as intersectional perspective in the design and implementation of health services is the key to addressing these specific needs. Access and information should therefore be provided especially to women waste workers and their children, as well as migrants who are often highly isolated and face language barriers. This will directly address practical constraints faced by informal waste workers – notably access to services – particularly the most disadvantaged groups.

When no scheme is available, cities could push for ambitious policies at the national level to include waste pickers and the informal economy in social protection and support policies.

Action #16

Support the implementation of segregation at source through behavioural changes to improve informal waste workers' situations and ease waste management

Better segregation at source is necessary to facilitate the work of waste pickers and sorters and improve safety while enhancing their productivity. If waste is properly segregated, recyclables retain better quality, and have a higher value on the market. If people segregate properly at home, organic/wet waste collection, which is often perceived as the dirtiest, can become a cleaner, safer and more dignified process. Cities can take action to **promote citizen engagement in waste separation**. This can be done through simple messaging like stickers, magnets, bin colours, pictures, but also through door-to-door in-person instruction,

community meetings, website guides, instructional videos, pamphlets, sortation games, information on the radio, TV adds, articles in the press, social network posts, training children at school, etc. In India, Indore is considered one of the cleanest cities in the country and practises a 6-bin waste segregation at source for households and commercial establishments (dry, wet, plastic, e-waste, domestic sanitary, domestic hazardous). Indore also has a collection of user fees, and high penalty charges.

The example of Buenos Aires is interesting as cooperatives have advocated for the inclusion

of informal waste workers into the waste management system and notably for former women collectors to become promoters of the environment (“promotoras ambientales”)⁷⁴. They are in charge of raising awareness among inhabitants and their activities are financed by the municipality. There are currently 60 environmental promoters from 5 different cooperatives, and this job is reserved for women. They intervene in schools to sensitise students to recycling and sorting at source. They conduct surveys among households and businesses to find out if they sort, how much recyclable waste they produce and if they are already connected with a collector. This information is used to compile reports so that cooperatives can establish a strategy adapted to these urban areas. They contribute to the recognition of the social and ecological role of the cooperatives through

the creation of an interpersonal relationship with the inhabitants. Hiring only women was part of a gender transformative strategy to recognise and empower female waste workers notably via public speaking. Raising awareness about segregation at source can also be an opportunity for gender transformative measures. Indeed, women tend to be the ones in charge of household cleaning, hence they are the ones dealing with household waste. Creating campaigns that are geared towards women would result in greater and more effective behavioural changes. Women can also be relied upon to share such awareness with the members of their family and children. Moreover, segregation information campaigns can also be an opportunity to engage men and boys regarding this topic and more broadly to change behaviour and gender roles related to household chores.

Action #18

Fighting social stigma around waste-related jobs among citizens to value the essential service provided by these workers

Cities can design and implement awareness campaigns regarding informal waste pickers’ contribution and fight the stigmatisation they suffer, working hand-in-hand with local associations, NGOs, artists, community leaders, etc. For instance, in Brazil, the organisation Pimp My Carroça⁷⁵ and the graffiti artist Thiago Mundano painted waste pickers’ carts to bring colour and humour to improve the self-esteem and social acceptance of waste workers. The organisation holds festivals in Sao Paulo where waste pickers bring their carts to mechanics for free repairs. Other professionals (doctors, dentists, psychologists, hairdressers, etc.) attend and provide them pro bono services. Projeto Relix is another

behaviour-changing program to raise awareness about waste issues and minimise the negative stigma of waste pickers. They use art to change how people view waste pickers and to promote recycling and overall environmental sustainability. One of their techniques is to gather artists and hold a free, public play with the five superheroes of sustainability (repair, refuse, reduce, reuse and recycle). These productions include a waste picker as the primary character and waste pickers themselves often attend. They also use photography to show the lives of waste pickers; instead of picturing them at landfills they take pictures of them in their daily life to show that they are people like everyone.

Action #17

Raising awareness and training policy makers, city officials and staff members about gender responsive and intersectional approaches

Systematic and effective capacity-building for gender mainstreaming and an intersectional approach for policy makers, city officials, staff members is an important step towards increasing awareness and setting up relevant actions. Gender responsive and transformative actions require long-term and

persistent integration into all actions and cooperation within different city directorates.

Staff should have the tools and knowledge to integrate gender and more broadly inclusive actions into their work and be trained on concepts such as intersectionality.

A billboard campaign recognising informal worker contribution, Accra

Source: NKACC commissioned by C40



Annex 1.

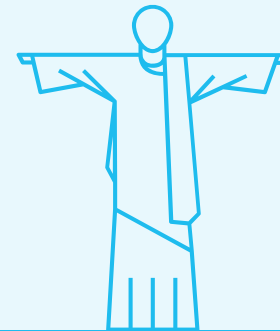


Woman selling food at Cable and Wireless Hub, Accra

Source: C40 Cities.

Understanding who the waste workers are:
Human-centric value chains in the cities of Rio de Janeiro, Accra and Lagos.

Rio de Janeiro



Rio de Janeiro, Brazil

Overview of waste management in Rio de Janeiro

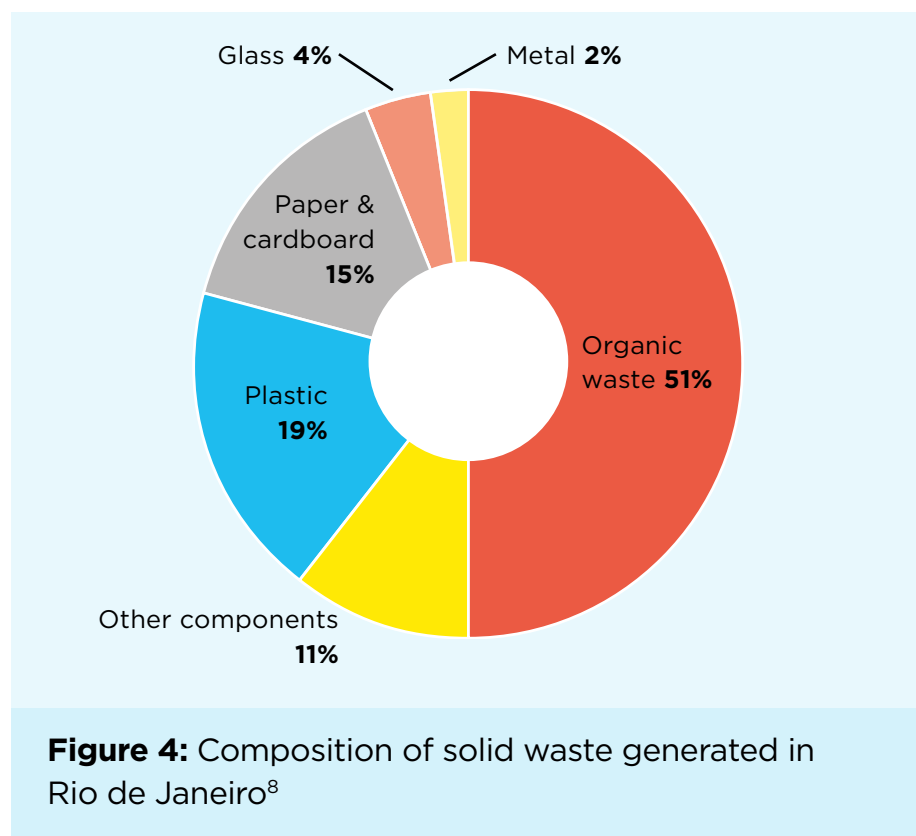
A complex socio-demographic and urban structure which represents a real challenge for an effective waste management system

Rio de Janeiro, the capital of the eponymous State, is the second largest city after Sao Paulo with over 12 million inhabitants in the Greater Rio de Janeiro large metropolitan area, and 6.7 million inhabitants in the inner city of Rio de Janeiro^{1,2}. Rio has been known for its “favelas”, where 23% of the city population live in slum-like conditions. Favela’s infrastructure is characterised by its pedestrian and organic architecture, with poor water, sanitation, and hygiene systems. It is estimated that 30% of Rio’s population is not connected to a formal sanitation system³. However, Rio de Janeiro has a coastline of 197 km in length, with more than 100 islands spreading over 37 km². This socio-demographic and geographic structure represents a major challenge in terms of waste collection and disposal.

An increasing generation of waste in a short period of time

With its thriving economic and cultural activities, Rio de Janeiro has attracted numerous internal migrants from other states, who seek better work, education, and housing opportunities. Rio de Janeiro is also the most visited destination in Brazil by foreign tourists, hosting 2 million foreign tourists every year⁴. This demographic pressure has resulted in rising solid waste generation over a short period of time⁵.

In 2020, around 3.2 million tonnes of solid waste were collected in the municipality, equivalent to 8,800 tonnes of solid waste per day. 86% of this waste is collected by public services, and it is made up of 54% of household waste, 28% of public waste and 4% of waste from services. The remaining 14% corresponds to extraordinary garbage and civil construction waste. The per capita waste generated is 1.3kg/habitant/day^{6,7}.



Rio's waste stream contains a large quantity of organic material, equivalent to approximately 50% of the waste collected. Regarding the remaining waste, 39% is recyclable waste and 11% other components such as wood, disposable absorbent pads, sheets, rags, electronics, or leather waste⁹.

Waste management regulation: collaboration with organised waste workers to improve the collection and segregation of recyclable waste

In Brazil, the responsibility of waste management is organised by municipalities. In Rio de Janeiro, it is the Municipal Secretary of the Environment

(SMAC) that is the central body and more specifically the Solid Waste Coordination Office (SMAC/ CRS), which coordinates, plans, and executes the most appropriate actions for waste management¹⁰. In accordance with Federal Law, municipalities in Brazil must define their municipal solid waste management plan (MSWMP) for the next 20 years, to be revised every 4 years, in order for the Federal Government to allocate financial resources¹¹. However, recent national regulations mandate cities work towards a sustainable and self-financed waste management system via taxes or fees.

Since the 2000s, Brazil and the city of Rio have taken steps to design a better waste management system in collaboration with waste workers organised in cooperatives.

Particularly, in 2002, following advocacy campaigns by NGOs and waste worker cooperatives, waste picking was officially recognised in the **Brazilian Classification of Occupations (CBO)**, which has increased their inclusion, and bargaining power (see Box 5). Though, this does not necessarily imply that all practitioners are formal and operate within a regulated framework.

In addition, the **National Policy on Solid Waste (PNRS)**, approved in 2010, marked an important change in national waste management. Considered one of the most forward-thinking federal waste laws in the world according to the Global Alliance of Waste Pickers, it aims to reduce generated waste, promote more sustainable consumption, abolish landfills, make packaging manufacturers accountable and

develop recycling processes in cooperation with waste workers' cooperatives¹². The Brazilian Government has recently approved a new National Solid Waste Plan to update the former PNRS and make waste management practices more effective (see Box 6).

Following this law, national capacity-building programs (named CATAFORTE I, II and III) were implemented to support the organisation, activities, and economic viability of waste worker cooperatives¹³. Even if the PNRS results were not up to its ambitions, the following policy and plans have clearly recognised the role played by informal waste workers in recyclable waste collection and segregation, and municipalities have started integrating them in the SWM value chain working more closely with cooperatives.

Box 5: Recognition of the waste picking activity in the Brazilian Classification of Occupations (CBO)

Waste pickers, or "catadores" are defined in the CBO as "those who pick, select and sell recyclable material such as paper, cardboard, glass, ferrous and non-ferrous and other reusable materials, whether working on their own or organized in associations or cooperatives as employees".

This has had important impacts on waste workers:

Official recognition of their occupation and its role in the waste management system and in the society, a real source of pride and dignity for waste pickers.

Capacity to organise collectively, give visibility to the activity and increase their bargaining power commercially or for advocacy.

Inclusion in official databases of the occupational category as it is

the case for the National Research by Household Sample (PNAD) and the Annual Listing of Social Information (RAIS).

Sources:
 (1) *Brazilian Classification of Occupations (2002)*, (2) *Statistics on Waste Pickers in Brazil, WIEGO (2011)*, (3) *Interview lead by Archipel&Co with two waste workers from a Belo Horizonte cooperative.*

Box 6: Implementation and results of the 2010 National Policy on Solid Waste (PNRS)

The 2010 policy is coordinated and implemented by the Ministry of Environment, and municipalities are responsible for drafting and executing waste management plans, in accordance with the PNRS. The PNRS sets the following goals:

- A recycling rate of 20% of the national waste by 2015.
- Eradication of open dump landfills & final waste disposal via sanitary landfills and/or incineration, provided there is an energetic return.
- Incentivisation of waste sorting.
- Participation of informal waste workers in the recycling process.

One of the key aspects of the PNRS is the elaboration of a reverse logistics plan that shares responsibilities for waste management between the private sector, particularly the packaging industry, and the municipalities. Even if the PNRS results were not equal to its ambitions, one point of satisfaction is the development of selective waste collection programs by municipalities, resulting in an important increase in the number of Brazilian municipalities selectively collecting their waste: from 57% in 2010 to 73% in 2020¹.

In 2022, the Brazilian Government approved a new National Solid Waste Plan to update the PNRS and make waste management practices more effective. The plan notably affirms the role of informal workers in waste collection and segregation and updates Brazil's

objectives on SWM. It notably states that 95% of municipalities will offer a formal contract for waste worker cooperatives by 2040.

Sources: Based on the following documents: (i) "Uma visão comentada sobre a lei da PNRS", Revista Petrus, Edmilson Rodrigues da Costa (2011), (ii) "Brazil's National Solid Waste Policy and its Inadequacies in Rio's Baixada Fluminense", RioOnWatch (2019), (iii), "Webinars Tetra Pak - Panorama nacional da coleta seletiva em 2020 e as expectativas para o futuro", minute 13:27, CEMPRE (2020), and (iv) "Brazil approves the National Solid Waste Plan", GPC (2022).

¹ Data released by Abrelpe (Brazilian Association of Public Cleaning and Special Waste Companies).

Human-centric value chain: portraits of waste workers

Formal value chain: the municipal company oversees the whole waste management system delegating part of the activities to private actors and cooperatives

The Municipal Company for Urban Cleaning - "Companhia Municipal de Limpeza Urbana" - (COMLURB), is responsible for the waste management of Rio de Janeiro municipality. It is one of the largest public cleaning organisations in Latin America¹⁴. COMLURB is a mixed-economy corporation in which the City of Rio de Janeiro is the majority shareholder¹⁵. Activities are financed through collection fees, which are incorporated into Rio's property taxes¹⁶.

COMLURB's responsibility includes, among others, household collection and street cleaning, free collection of bulky goods and household debris, and street cleaning in low-income communities, transfer and final disposal of waste and treatment, composting and refuse-derived fuel production¹⁷. Some of these services are delegated to other actors through concession contracts.

The regular door-to-door collection services for waste generated in residences and small businesses are performed by COMLURB employees, known as "garis"¹⁸. In 2022, garis earn on average \$264 USD for a 44 hour-workweek¹⁹. They

are in majority men with complete pre-high school education and are, on average, 29 years old²⁰.

Waste collected by COMLURB's Garis is transported to one of the **5 waste transfer stations** ("Estações de Transferência de Resíduos" (ETR)). These facilities are operated by **waste worker cooperatives** that manually sort materials in order to recover recyclables. These cooperatives employ about 160 people from neighbouring low-income communities. Waste that is not diverted is transported from transfer stations to final disposal by COMLURB to be landfilled^{21,22}. Waste workers working in the ETR often work in better conditions as they receive support, although limited, from COMLURB for safer work practices and environment. Conditions are not ideal as the waste received is of mixed nature, and cooperative workers sort manually through it.

Non-organised informal waste workers and cooperatives not employed in transfer stations are among those who face the most extreme working conditions, notably in terms of health, since they receive no protection and work on the streets or at dump sites where waste is mixed and can be hazardous²³.

The municipality also has nine **Voluntary Delivery Points** (PEV), administered by COMLURB and which receive dry recyclable waste from residents that is then



transferred to sorting centres. This collection system has limitations. In 2020, out of all the waste collected by COMLURB, only 1.1% was properly segregated at the source by households²⁴. This leaves considerable room for improvement for segregation at source given that it is estimated that 39% of municipal waste is made of recyclables.

CTR Seropédica, Rio's sanitary landfill is located 70 km from the city centre. With an area of 220 hectares, the landfill receives 9,000 TPD of waste from the city of Rio de Janeiro and other surrounding municipalities. Officially, no recyclable waste can be disposed of there and legally, waste workers are not allowed to access the site²⁵.

Regarding organic waste, the city operates a 200-TPD **composting project** and a **biomethanization plant** that has the capacity to process 30 TPD from large organic waste generators (e.g., wholesale

food markets). Yet, the composting program faces challenges associated with converting low-quality organic waste into quality compost due to poor segregation at source before collection^{26,27}. Similarly, the biomethanation plant is currently only processing 3TPD and not functioning continuously, due to limited segregate collection.

Waste produced by private large generators, such as supermarkets or malls, must be managed by private operators contracted and paid for by the large generators themselves according to legislation²⁸.

Processors of recyclable waste are formal private industries. Their main activities are (1) the purchase of recyclable waste, mostly in cash, such as from aggregators; (2) reprocessing, recycling, decontamination, and re-refining waste, and (3) commercialising recyclable materials to the chemical-recycling industry.

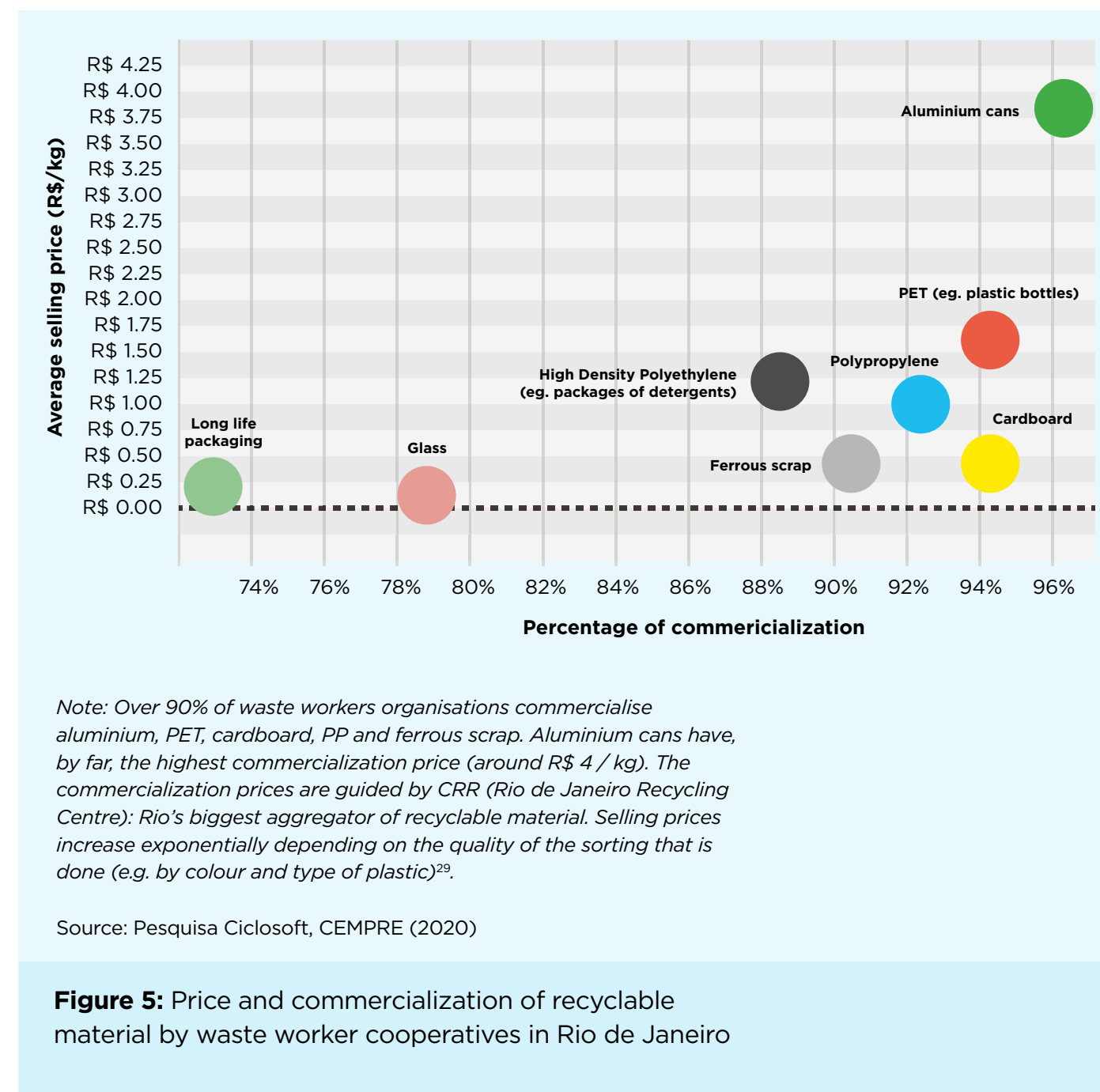


Figure 5: Price and commercialization of recyclable material by waste worker cooperatives in Rio de Janeiro

Informal value chain: a key role in collection and segregation of recyclable waste

Low levels of segregated household waste collected by COMLURB leaves room for other actors to intervene in the waste

value chain and this is where informal waste workers have filled the gap specialising in the collection and segregation of recyclable waste³⁰.

Organised workers in cooperatives intervene at various stages: at the collection, sorting and aggregation stage phases.

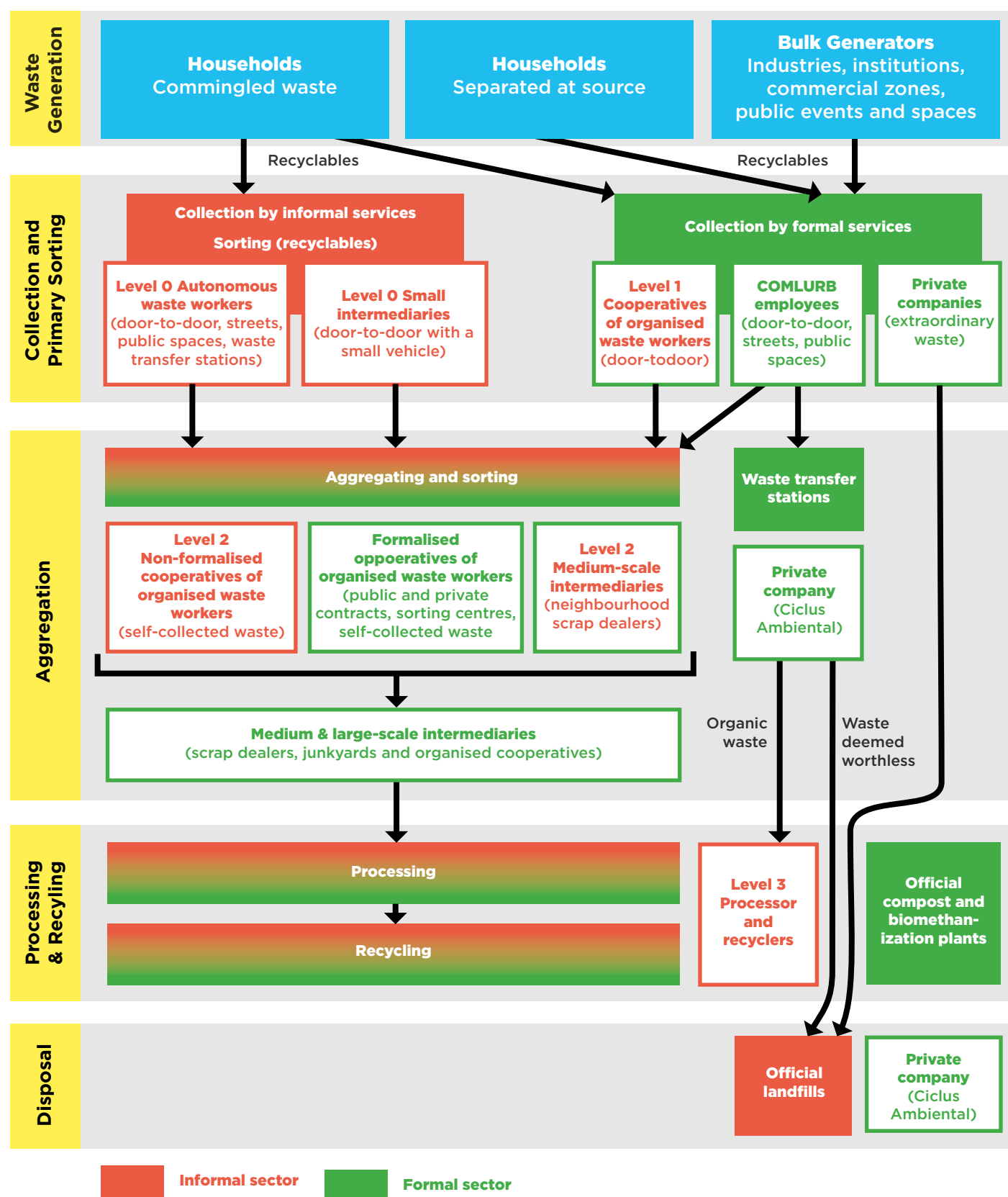
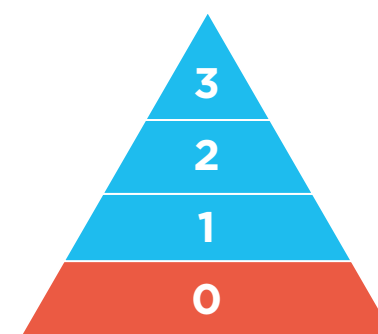


Figure 6: Rio's solid waste management value chain (simplified) and main waste workers involved. Source: Archipel&Co



Level 0 – Collectors: autonomous (or unorganised) waste workers and small intermediaries

Autonomous waste workers: they perform an important part of the collection of the city's recyclable waste. While 39% of the overall collected waste in the city is recyclables but that only 1.1% of waste is segregated at source by households, autonomous waste workers are actually the ones sorting mixed waste, and picking most recyclables^{31,32}.

They concentrate on the collection and segregation of recyclable waste with high financial value and easily transportable, principally aluminium cans and PET. This specialisation and the expertise developed by autonomous workers, created by the presence of a stable recycling market, contribute to Brazil's 98% recovery rate for aluminium, making the country a world leader in the recycling of aluminium cans³³. However, they do not benefit from waste segregation at source, given they have no contract with the city. Therefore, they primarily pick up waste from streets, favelas, beaches and household waste uncollected by COMLURB or cooperatives. As a result, waste is mixed and waste workers must manually segregate waste while collecting it, leading to high sanitary risks.

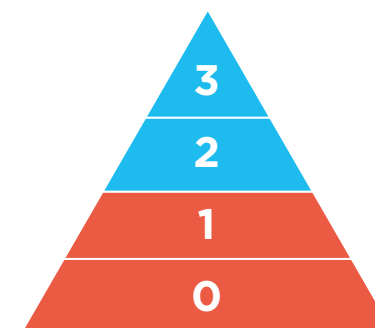
Before 2010 and the implementation of the PNRS, the main sources of waste for autonomous workers were dumps,

irregular deposits, or landfills. For example, in the Jardim Gramacho open dump site where all the waste collected by COMLURB was disposed until then³⁴, 2,500 waste workers, more than half of the total informal waste workers in the State of Rio de Janeiro, were living and working³⁵. Other illegal dumpsites (about 98 sites before 2010) were maintained by private individuals, companies, and even in partnership with drug traffic actors³⁶. Today, there are no more irregular landfills in the city, and only a few remain in the State, mainly temporary irregular deposits. CTR Seropédica, the state's main sanitary landfill, is not accessible to waste workers. Therefore, no waste workers are working in landfills in an unregulated or disorganised way.

Public authorities, with the willingness to train and organise waste workers into cooperatives, initiated a database effort in 2013³⁷. Even if the information has not been updated since 2013, it provides good insights into informal waste workers' profiles, activities, and vulnerabilities. 81% of the 3,084 waste workers surveyed still work autonomously, without being part of a waste workers' movement or a cooperative, and with precarious working conditions, they are referred to as "**catadores não-organizados**" or "**catadores de lixões**"³⁸ (see Table 4 for detailed information collected as part of this database).

Table 4: Profile, activities, and challenges faced by autonomous waste workers, based on the State of Rio de Janeiro register of 2013

Number	<ul style="list-style-type: none"> • 3,000³⁹ to 5,000⁴⁰. • Around 81% of Rio’s waste workers.
Profile⁴¹	<ul style="list-style-type: none"> • <i>Situation:</i> informal. • <i>Gender:</i> 62% of men. • <i>Age:</i> 1% are underaged, 15% are between 18 and 29 years old, 43% between 30 and 49 years old, 26% between 50 and 60 years and 14% are over 60 years old. • <i>Civil status:</i> 43% are single, 43% are married or live with a partner, 8% are separated or divorced and 6% are widowers. • <i>Education:</i> 9% have no education and are illiterate, 76% have incomplete primary education and 15% have full primary education or more. • <i>Children:</i> 2.9 children on average. • <i>Race:</i> 46% declare themselves brown, 25% black and 28% white. • <i>Family status:</i> 79% are the “person of reference”. • <i>Working time:</i> At a national level, most waste pickers, 56%, work 40 hours or more per week⁴².
Activity	<ul style="list-style-type: none"> • Recyclable waste collection in streets, on the beach, ETR and door-to-door: mainly aluminium and PET. • Recyclable waste segregation during collection.
Challenges faced	<ul style="list-style-type: none"> • Poor sanitary conditions when dealing with commingled waste. • No access to basic hygiene conditions (drinking water, toilets, etc.) and basic protection (gloves, glasses, etc.). • Competition with small intermediaries to access household waste. • Must collect recyclable materials in commingled household waste before the COMLURB’s collection. • Work accidents. • Low mobility. • Lack of storage space. • Incapacity to generate adequate revenues from their activity. • Administrative burden to integrate cooperatives. • Social and educational inadaptation to formal working conditions. • Lack of bargaining power.



Level 0-1 – Organised waste workers

Organised waste workers (catadores): some catadores are organised in cooperatives or associations and COMLURB has initiated partnerships with these structures to delegate part of the SWM activities. They provide sorting and aggregation services. Catadores working in these cooperatives must respect some

and more educated backgrounds, into alternative economies to survive, including the collection of recyclable waste. Since they have more social capital and better status, it allows them to set agreement with neighbourhoods, such as condominiums, or to own vehicles to collect their recyclable waste and they tend to be better off than the traditional waste pickers who collected waste previously⁴⁴.

rules, such as working hours or hierarchy, and receive a fixed salary. In general, these organisations provide better working conditions and income security than those faced by autonomous catadores. Nonetheless, organised workers remain a minority among catadores (about 19% according to 2013 database⁴⁵).

Table 5: Profile, activities, and challenges faced by organised waste workers, based on the State of Rio de Janeiro register of 2013

Number	<ul style="list-style-type: none"> • Around 500⁴⁶ to 1,000 waste workers. • Around 19% of Rio's waste workers.
Profile⁴⁷	<ul style="list-style-type: none"> • <i>Situation:</i> Semi-formal. • <i>Gender:</i> 59% of women. • <i>Age:</i> none are underaged, 16% are between 18 and 29 years old, 45% between 30 and 49 years old, 27% between 50 and 60 years and 12% are over 60 years old. • <i>Civil status:</i> 52% are single, 38% are married or live with a partner, 5% are separated or divorced and 4% are widowers. • <i>Education:</i> 4% have no education and are illiterate, 70% have incomplete primary education and 26% have full primary education or more. • <i>Children:</i> 2.7 children on average. • <i>Race:</i> 50% declare themselves brown, 20% black, 29% white, and 1% other. • <i>Family status:</i> 83% are the head of the household. • <i>Wage:</i> 17% earn less than half a minimum wage, 35% earn between half and an entire minimum wage and 48% earn between 1 and 2 minimum wages⁴⁸.
Activity	<ul style="list-style-type: none"> • Collection of recyclable waste from households (segregated at source) • Segregation of recyclable waste within the cooperative
Challenges faced	<ul style="list-style-type: none"> • Lack of adequate infrastructure. • Physical work. • Transport duration between the place of residence and the cooperative. • Lack of access to social protection. • Aspiration to have access to leisure. • Administrative regulation of their work.

Box 9: Organised waste workers from Belo Horizonte⁴⁹



Stories

Helena and Lívia* work in a waste workers cooperative of Belo Horizonte. Every morning, they wake up at 4am in the morning to be able to start working on time, at 7am. Helena has 2 hours of transport and 3 different buses to get to the cooperative, while Lívia is the person of reference in the family and must manage all the household chores before leaving for work. Once at work, they sort, wash, weigh and calculate the selling price of recyclable materials. This is physical work, but not as demanding as that of the young men in the cooperative who have to go out and collect materials.

Previously Helena was an autonomous waste worker who worked in open dumpsites. For her, it's night and day since she joined a cooperative. In terms of sanitation, she has access to toilets, can wash her hands easily and processes materials that have already gone through an initial sorting, unlike before when she had to sort all types of waste. She now works in a building with a roof that protects her from the rain, with dedicated sorting spaces. She feels less alone.

Both do not see any discrimination against women in their work. They believe that all waste workers do the same work, regardless of their gender. Moreover, there are more women than men in the cooperative.

Even though Lívia and Helena are proud of working in a cooperative, they understand the barriers

that prevent some autonomous waste workers from joining. Many need money quickly and cannot wait for a paycheck at the end of the month. Some also prefer to have their own schedule and do several jobs.

When they analyse how the situation of waste workers has evolved in Brazil, Lívia and Helena consider the recognition of the activity of waste picking by the CBO in 2002 as a turning point. Since then, they feel like a citizen who has a role in society. It has also allowed the creation of movements and organisations of waste pickers which give them visibility, a voice, and a community they can refer to.

However, they still see important challenges to overcome to improve their situation. Notably (1) the recognition of the environmental service they provide to the city, for which they feel they should be paid, (2) the increase in the number of contracts that the city signs with the cooperative, and (3) the tax rate on recyclable materials, which prevents them from making a better living from their work. Today their salaries allow them to meet their basic needs, but they also have the aspiration to access better health services and leisure.

*Note: *Names have been changed to ensure confidentiality. This text is based on interviews with waste workers that were conducted by Archipel&Co in November 2022, with the support of Sonia Dias, WIEGO waste specialist.*

Depending on the contracts signed by cooperatives, organised workers can collect and/or segregate recyclable waste. Waste is supposed to be dry recyclable waste sorted at source by households. However, there is little sorting of recyclables done at source by households, given that segregation is not mandatory, limiting the quantity of recyclables that the cooperatives receive, which jeopardises their economic model. In addition, cooperatives receive all kinds of recyclable waste, from the most valuable economically (aluminium cans or PET) to the less profitable, such as glass or cardboard.

The main example of this type of collaboration in Rio de Janeiro is the concession of the Irajá and Bangu Sorting Centres to waste

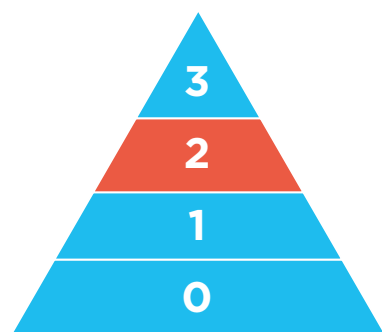
worker cooperatives during a 10-year contract, renewable for an equal period. The two mechanical sorting plants for dry recyclables, inaugurated in 2014 and 2016, receive recyclable waste sorted at source by households. They have a capacity of 20 and 30 TPD respectively⁵⁰. These sorting centres were born from the partnership signed between the municipality and the National Bank for Economic and Social Development (BNDES)⁵¹. However, not all of the sorting centres planned in the partnership have been built up to date.

In accordance with the legal framework, concessions take place only with regulated cooperatives. There are 26 in the city of Rio de Janeiro and 22 more in the Metropolitan area⁵².

Table 6: Profile, activities, and challenges faced by cooperative waste workers, based on the State of Rio de Janeiro Ciclosoft survey of 2020⁵³

Number	<ul style="list-style-type: none"> • 26 registered cooperatives in the city of Rio de Janeiro. • 22 registered cooperatives in the Metropolitan area of Rio de Janeiro⁵⁴.
Profile	<ul style="list-style-type: none"> • <i>Situation:</i> varies from informal to formal. Regulation maturity is achieved based on five aspects: (1) emission of fiscal notes: 44% of Rio cooperatives, (2) environmental license: 36%; (3) matriculation book: 51%; (4) status declaration: 73%; and (5) proof of registration and cadastral status (CNPJ): 98%. • <i>Size:</i> 19 waste workers per cooperative on average which is smaller than the national average of 27.
Activity	<ul style="list-style-type: none"> • Purchase of recyclable waste from large generators, small intermediaries, and autonomous waste workers. • Negotiation of delegation of services contracts with the city council concerning the collection and segregation of household recyclable waste. Type of links Rio cooperatives have with the city council: 12% have a contract; 31% an agreement; 25% have no link; and 33% "other types of links". • Management of organised waste workers. • Sale of sorted recyclable waste to medium and large intermediaries: on average 38 tonnes per month.
Challenges faced	<ul style="list-style-type: none"> • Lack of access to recyclable waste segregation at source. • Important taxes on recyclable waste. • Administrative burden and costs to formalise the cooperative (e.g. firefighting plan costs around \$5,700 USD). • Lack of access to affordable buildings and infrastructure. • Difficulty to have contracts with the city council. • Lack of working capital to enable the cooperatives to deliver the materials in sufficient amounts and with regular timing, hindering the joint sale of their materials.⁵⁵





Level 2 – Medium to large-scale intermediaries/aggregators: Scrap dealers and organised waste workers

Secondary sorting and waste aggregation are done by cooperatives but also medium and large intermediaries operating in the private sector. Waste aggregation is defined by two activities:

- **Activity #1:** The purchase of recyclable waste from catadores who have collected and done a first stage sorting. It is mainly performed by formal intermediaries operating in the private sector. They are commonly known as **“sucateiros” (scrap dealers)** and can specialise in one type of material or be generalists. For example, those specialised in iron and copper are known as **“ferro-velhos” (junkyards)**. When autonomous waste workers or small intermediaries sell the recyclable waste to scrap dealers, they receive an amount based on the price set by the industry for each material.
- **Activity #2:** More precise sorting of recyclable waste (e.g. by colour and type of plastic or separating aluminium from other materials with a magnet) and preparation for recycling (e.g. grinding plastic into flakes). It is performed by **scrap dealers** and some **waste worker cooperatives** that have the adequate infrastructure to perform this activity.

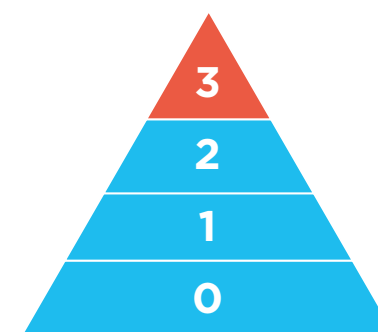
The objective of both activities is to increase the price of recyclable waste playing on two levers: quantity and quality. By increasing both, recyclers will pay a higher price for the merchandise. The reason why autonomous waste workers and most cooperatives do not sell directly to recyclers is because they cannot store important quantities of waste since they do not have the necessary infrastructure to sort materials properly and store large quantities. Some cooperatives have started to reunite into networks, to be able to increase their bargaining power and sell directly to recyclers.

Small-to-medium scale aggregators are mostly **scrap dealers**, who are considered formal since they are registered as legal companies. Nevertheless, their activities are not always regulated: they do not declare all the materials they buy and sell and do not always pay taxes. Very little information is accessible regarding them⁵⁶.

Medium to large-scale aggregators sometimes sell their materials through dedicated web platforms, such as OSucateiro.com. These platforms connect buyers and sellers of recyclable waste, who often negotiate via WhatsApp, making transactions difficult to track⁵⁷.

One of the recent objectives of the Prefecture Rio is to regulate the activity of scrap dealers. For example, the State Government has made it mandatory to register

and regulate junkyards with the Civil Police. Establishments will be obliged to issue invoices and keep record books of all commercial operations⁵⁸.



Level 3 – Processors

The processing activity of recyclable waste is fully formal and done by **private industries**. To facilitate dealings with other

players in the value chain, most recycling industries offer financial transactions in cash.

Challenges and vulnerabilities of waste workers in the waste value chain

Autonomous waste workers, particularly women, are exposed to difficult and dangerous working conditions and have low bargaining power

Autonomous waste workers do not have access to waste segregated at source by households or other actors. Thus, they are always dealing with mixed waste which is more difficult to sort and may contain hazardous waste. By sorting before COMLURB, the autonomous waste workers abandon what has no resale potential on site⁵⁹. They also lack access to basic sanitary and security infrastructure and equipment. Hence, working conditions are precarious: 55.5%

waste workers have had an accident at work, 95% perceived the danger of their working environment and 51.7% claimed they did not receive personal protective equipment⁶⁰.

Women are particularly at risk, notably when they are at the beginning of their reproductive lives resulting in lasting health issue for themselves and their children, due to exposure to environmental contamination during the embryonic period⁶¹.

Transport and storage of collected recyclable waste are part of the main challenges faced by autonomous waste workers. The vast majority do not have vehicles, suitable means of transportation, nor storage space. Subsequently,

this puts their physical conditions at risk, and they are forced to sell the collected waste rapidly to medium intermediaries. This reduces their bargaining power with the buyers and reinforces their financial precariousness.

Cooperatives are not always adapted to autonomous waste workers needs and habits

Cooperative work comes with rules, such as strict working time, a demand for results or a management hierarchy.

Autonomous waste workers work as their own “regulators” and do not follow any orders. They are rarely familiar with professional settings because of low socio-economic and educational background. Hence, joining a cooperative implies an important adaptation effort from their side.

In addition, **integrating a cooperative comes with administrative processes:** labour contracts, fixed wages, insurance, etc. Hence waste workers need to have up-to-date papers and sometimes a bank account, which can represent important barriers for autonomous informal workers.

Financially, most autonomous waste workers are in a financially precarious situation and have no savings. Hence, they need daily revenues to be able to pay for their daily basic expenses. Having a bi-monthly or monthly salary from a cooperative, can be an additional obstacle⁶². Due to their precarious situation, they may engage in several jobs and working on a fixed schedule with cooperatives or in a formal setting may prevent them from doing this.

Finally, cooperatives are based at a fixed location, which is not always close to the autonomous waste workers’ residence.

The mobility challenges in big cities and the long public transportation times can demotivate waste workers from joining cooperatives⁶³.

Regulations and taxations towards formalisation represent a major challenge for cooperatives

Regulation of Rio de Janeiro’s cooperatives is completed through five administrative procedures:

(1) emission of fiscal notes, (2) environmental licence, (3) matriculation book, (4) status declaration, and (5) Proof of Registration and Cadastral Status (CNPJ). These procedures require important financial resources, strong organisation, managerial skills and time, which the cooperatives do not always have .

Cooperatives’ main revenues come from the sale of sorted recyclable waste. Yet, they are taxed according to the type and quantity of waste they sell. Waste with high selling prices, such as PET, are also taxed with a greater priority. Today, reducing taxes on the sale of materials and having additional sources of revenue are part of the main cooperatives’ claims.

Hence administrative and financial regulations toward formalizations are difficult to fulfil for most cooperatives, leading to missed opportunities to work with public authorities who are less inclined to delegate services to cooperatives that are less mature in formalisation.

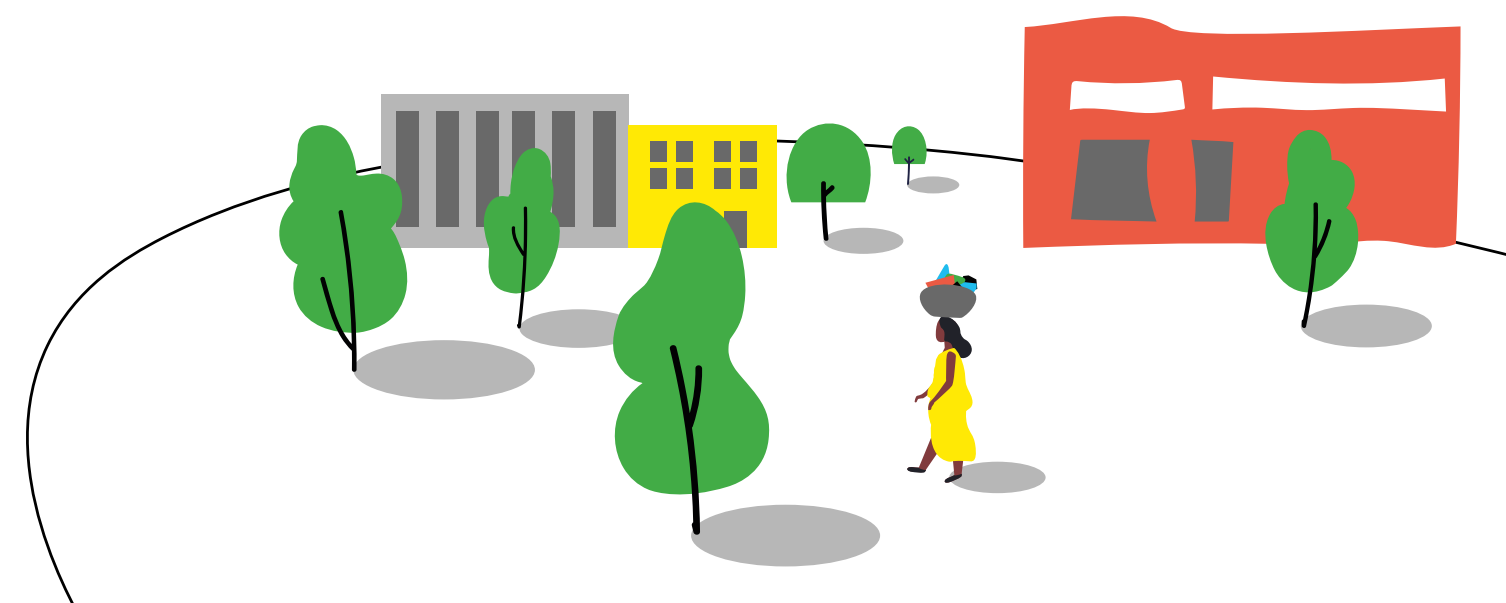
Waste workers’ cooperatives lack sufficient space and quality infrastructure

Cooperatives still face facility challenges. Cooperatives’ storage capacity is still too small, limiting the quantities of recyclable waste they can store and then sell. This reduces their negotiation power with medium and large intermediaries and prevents them from dealing directly with recyclers⁶⁵.

In addition, cooperatives are sometimes located in places that are difficult to access by public transportation, which complicates cooperative waste workers’ daily life and relationships with upstream waste sellers.

The evolution and modernization of the value chain puts some of the waste workers and cooperatives resources at risk

The closure of Jardim Gramacho open dump, which put 2,500 people out of work, exemplifies how changes in the formal value chain can impact the informal sector. The same situation is presented by interviewed waste workers in Belo Horizonte, where a new waste incineration project may burn waste that could have been valued by the waste worker cooperatives or autonomous waste workers. Hence, taking into consideration informal actors in SWM policies is essential to avoid adverse effects on already highly disadvantaged groups.

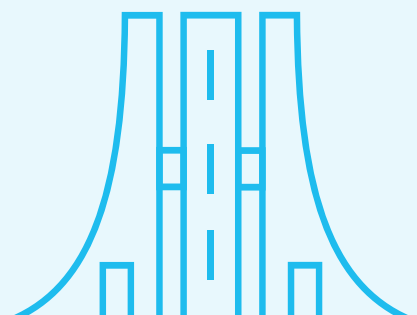




Informal worker selling on the beach, Rio de Janeiro

Source: Nathan Reboucas, Unsplash

Accra



Accra, Ghana

Overview of waste management in Accra

A complex governance with stakeholders operating at national, regional and local levels

In Ghana, multiple actors are involved in the governance of waste. They operate at national and local levels. At the national level, ministries such as the Ministry of Environment, Science, Technology and Innovation (MESTI) and the Ministry of Sanitation and Water Resources (MSWR) oversee an overall framework for waste management and environmental protection. At the local level, the Metropolitan, Municipal and District Assemblies (MMDAs) are responsible for waste management policies and their implementation. The Accra Metropolitan Assembly (AMA) is the political and administrative authority for the city of Accra.

In the Greater Accra Region, many actors at different decision-making levels are involved regarding waste

management policies: the Regional Coordinating Council; the Ministry of Local Government, Rural Development and Decentralisation (MLGRD); the Ministry of Employment and Labour Relations; the Ministry of Sanitation; and the Environmental Protection Agency. The MLGRD is the main governance authority in waste management, and its responsibilities are set out in the Local Government Act 1993 (Act 462), the latter include policy and planning, legislation on solid waste management, regulation, monitoring and enforcement of SWM activities.

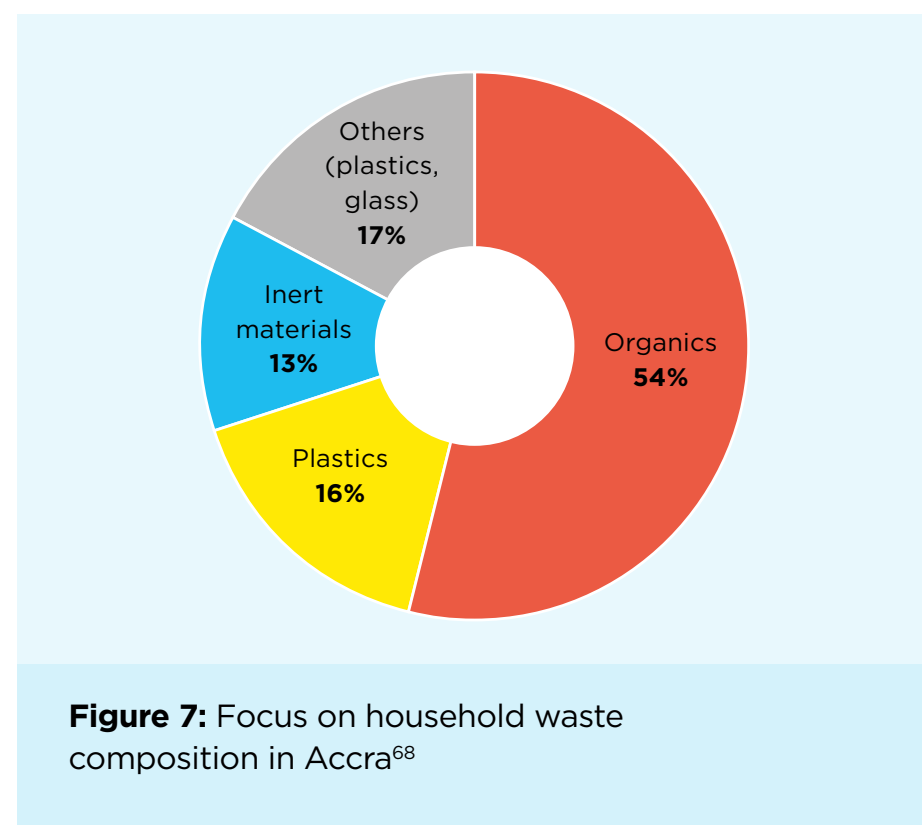
Due to administrative complexity and close links with neighbourhood municipalities, SWM requires decision making at the regional level. The city of Accra is in charge of setting user fees, enforcing SWM laws, provision of waste management infrastructure, contracting service providers and cancelling contracts in the case of non-performance.

A hybrid formal/informal solid waste management system in which recycling is facilitated by the informal sector

The city of Accra (2 million inhabitants) generates 2,200 tons of solid waste per day, a volume that is expected to rise to over 4,400 TPD by 2030.⁶⁶ In terms of waste composition, 53.84% is organic, 3.68% is paper and 16.05% is plastic components. Residuals are metals, glass, textiles, leather, and rubber.

Focusing on the waste generators, studies show that:

- Among households (see Figure 7): 54% of household waste is organic, 16% is plastics and 13% is inert materials mainly composed of silt and fines⁶⁷
- Among commercial establishments (restaurants/eateries, hotels and banks): 56% of waste is organic, 14% is plastics, 13% is textiles and 9% is paper.
- Among government agencies, hospitals and schools: there is a higher percentage of plastics.



Facing important and growing waste volumes due to rapid urbanisation and demographic growth, the authorities have realised that the system implemented was not sustainable for managing the increasing amount of waste. The authorities have, since the 2000s, delegated waste management to private actors through concessions. There are at least 15 private companies responsible for the collection of residential, commercial, and industrial waste within the Accra Metropolitan Assembly⁶⁹. They are paid on a polluter pays basis by collecting fees from waste generators – households and commercial establishments. The city estimates that private companies collect 88% of the waste generated in areas where they provide collection services. Private sector waste management is mainly based on the collection and transport of waste to landfills with minimal sorting and processing. However, the city and private actors are increasingly investing in waste recovery facilities (composting, recycling plants). For example, the city is currently investing in a major waste recovery plant, the large-scale Accra Composting and Recycling Plant that processes 2,400 tonnes of municipal solid waste and produces 240 tonnes of compost daily. The government, in collaboration with the World Bank through Greater Accra Resilient and Integrated Development program (GARID), has also recently launched development programs to support the municipality-owned recovery of waste through private infrastructures of intermediate size that should be launched such as buy-back centres close to the landfills. Accra has also invested in transfer stations to primarily sort waste. From there, part of

the organic waste goes to the composting plants and recyclables are sent to aggregators. Recently the AMA, in collaboration with the C40 City Finance Facility has announced the launch of a new project to segregate solid waste to start in 2023.

As the formal sector only covers part of the city’s waste collection, the informal sector operates in areas where private companies are unable to collect waste. The informal sector is present at all stages of the value chain: collection, treatment, and recycling. Recent studies show that the informal sector collects approximately 40% of the waste in the Greater Accra Metropolitan Area (GAMA)⁷⁰.

From a waste management cycle perspective (see Figure 8):

- **If waste is collected by formal actors**, it is transported to composting and recycling plants, directly to landfill in some cases and partly to transfer stations. In landfills, informal waste actors then sort the waste and take the recyclables to aggregators who then take it to recycling actors.
- **If the waste is collected by informal actors**, it is sorted by the collectors, who keep the high value waste for resale to aggregators. Some informal workers take the waste to one of the transfer stations located in the city to sort and store. The collected and primarily sorted waste by informal waste workers is then sold to aggregators who process (wash, sort, crush, etc.) and then sell to recycling actors.

Box 7: Transfer stations and the inclusion of informal waste collectors into the waste management ecosystem in Accra

In 2017 the AMA closed Accra's open dumps, which had disastrous impacts on the environment and led to safety challenges. The city changed its strategy by opening different transfer stations with waiting

areas for the waste collectors, including informal waste workers, to sort and store the recyclables before selling them to the middlemen. The city started to register, as part of this strategy, over 600 informal waste workers

to better include them in the waste management ecosystem. In 2019, it was estimated that the integration of waste collectors and the opening of transfer stations has helped to increase the salvaging of recyclables from 5% to 18%⁷¹.

Local authorities' efforts to better consider informal waste workers

Historically, when delegating public services, authorities have favoured the formal sector, without including informal waste workers in the contracts or discussions. Thus, informal waste workers tend to be suspicious of local government interests. However, the city of Accra is increasingly considering the role of informal waste workers in the value chain to envisage new types of collaboration. In 2017, the AMA launched a programme to integrate informal waste collectors into the waste management system, with the goals to improve waste collection rate, close down illegal landfills, and improve the working conditions of informal waste workers. Since then, more than 1,000 informal waste collectors have been registered and documented in the city's database. As a result of this, informal waste collectors increased from 28% to 48% between 2016 and 2018⁷². AMA has also launched

pilots to improve the working conditions and performance of waste workers. These pilots are mainly training courses related to their activities, such as capacity building on road safety and road traffic regulations, explanations of health insurance systems, financial literacy, riding licence for tricycles etc. Training is given to waste pickers, identified as leaders of informal waste worker groups, who can then raise awareness among their peers on these key topics⁷³. Lastly, AMA has put in place initiatives to directly improve the performance of informal waste pickers, such as facilitating access to driving licences.

In 2019, **the AMA launched its Accra Resilience Strategy** in which the city further outlines plans of promoting inclusion, particularly of informal economy⁷⁴. In this strategy, the city officially recognizes the "informal economy's contributions to resilience building". The main objectives of this strategy are to improve the quality of life for citizens working in the informal sector and/or living in informal

settlements, and to facilitate robust integration between the formal and informal sectors for improved economic, social, and environmental benefits.

The city has also initiated an informal sector needs assessment, through the C40 Inclusive Climate Action Programme, to help build trust and foster collaboration. Participatory stakeholder workshops were organised in

cooperation with C40 Cities. The city is also working with migrants to facilitate their access to financial support, healthcare and childcare, while improving waste management practices. Collaboration between the informal sector and the city government has increased waste-collection coverage from 75% to 90%, and recycling rates from 5% to 18%, saving the municipality \$5,460,000 USD in annual operating costs⁷⁵.

Box 8: Collaborating with the C40 Inclusive Climate Action Programme to strengthen relationships between the city of Accra and informal waste workers

Since 2021, with support from C40 Cities, the city of Accra has been implementing its Inclusive Climate Action Pilot Programme. The programme's goal is to strengthen collaboration between the city and the informal waste sector in ways that promote local ownership of climate projects and enhance the informal waste sector workers' access to co-benefits of climate action. As part of this programme, the city has undertaken an inclusive needs assessment which prioritised the participation, voice and visibility of informal waste sector leaders and actors. This approach has signalled a new interest in trust and relationship building between the city and the informal waste sector and showcased a new approach to informal work force integration – an example the city will adopt in other informal sectors.

This inclusive needs assessment process has resulted in issue identification from the informal sector perspective, a first in the city. Subsequently, the city has taken action following recommendations proposed by informal waste sector workers and city urban planners that participated in the process. There has been a significant improvement in engagement from the city, informal waste sector actors, civil society and various actors, which has led to mutual trust building. Through the programme, the city convened a regional stakeholder roundtable on informal sector engagement, which achieved a consensus on the development of a regional blueprint for informal waste sector integration. The city has also supported the capacity development of informal waste workers and city urban planners.

The city is additionally working to incorporate waste contracts and concessions for informal waste cooperatives, and is currently supporting the establishment of these cooperatives, which will be a vehicle for formal contracts and concessions.

With support from C40, the city has undertaken campaigns and advocacy through billboard messaging to engender a more positive public perception of the informal waste sector in the city. This will contribute to enhancing the safety of informal waste workers, help reduce labour exploitation faced by informal workers, and support decriminalisation of informal waste work in the city. The city's leadership has also committed to expanding mechanisms for social dialogue with informal waste sector actors.

Human-centric value chain: portraits of waste workers

A formal sector composed of private companies

The formal actors are mainly waste collection companies, about ten are operating in the Accra Metropolitan Assembly. Among them are Metropolitan Waste and Allied Services, Meskworld Company Limited, J Stannley-Owusu and Co. Ltd, Jekora Ventures, Liberty Waste Services Limited and Zoomlion Limited, which is the biggest. Although experts recognise that the ownership and leadership of these private waste companies are predominantly male, there is little official data to specify the profiles of the workers hired by these companies. There is a lack of representation of women among formal private companies in the waste sector.

The informal sector is composed of numerous actors, with specific roles and is largely dominated by men

In contrast to the formal sector, which is concentrated around a few companies and industries, the informal sector is distributed among many stakeholders, each with specific profiles and roles in the value chain. They constitute 30% of the city's waste management value chain⁷⁶. They often fill the gap for the waste uncollected by the formal players, notably for low-income communities who cannot afford the services of formal waste collectors or areas that are difficult to access like highly-populated informal settlements. Indeed, their smaller vehicles (load carts, tricycles, "Borla taxis") allow them to access these places. Most of them being local dwellers, they have a very good understanding of communities' waste management needs. They collect waste regularly and are more flexible (regarding pick up times and costs) which is highly appreciated by low-income communities.

The organisation and proportions of waste workers vary according to the type of value chain studied. However, it can be generically considered that the value chain includes the following.

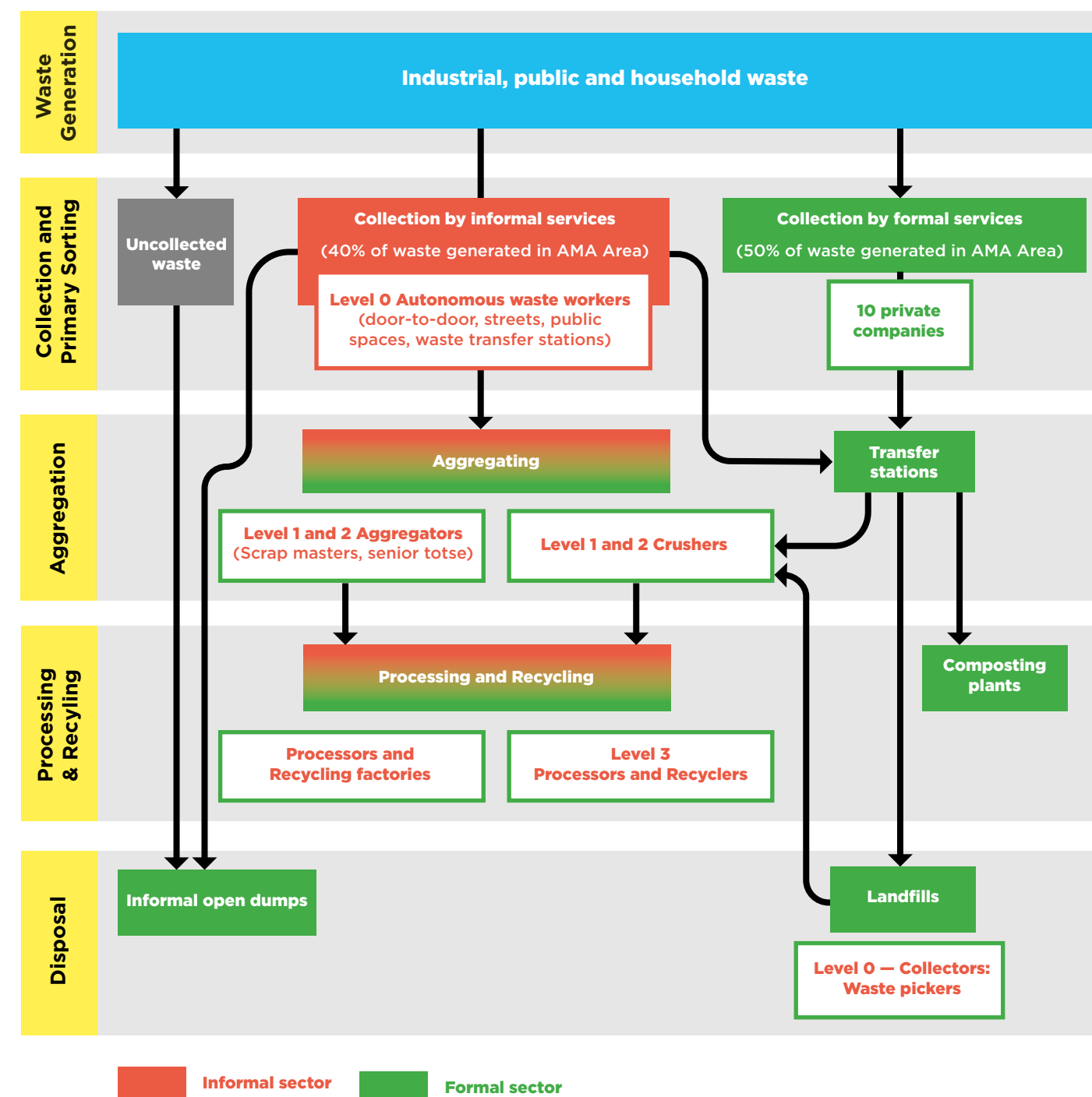
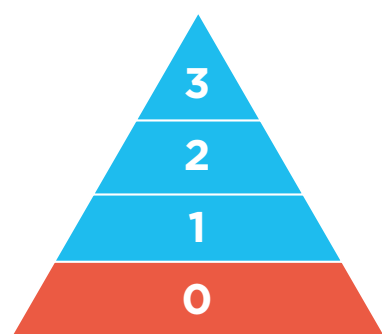


Figure 8: Accra's waste management value chain



Level 0 – Collectors

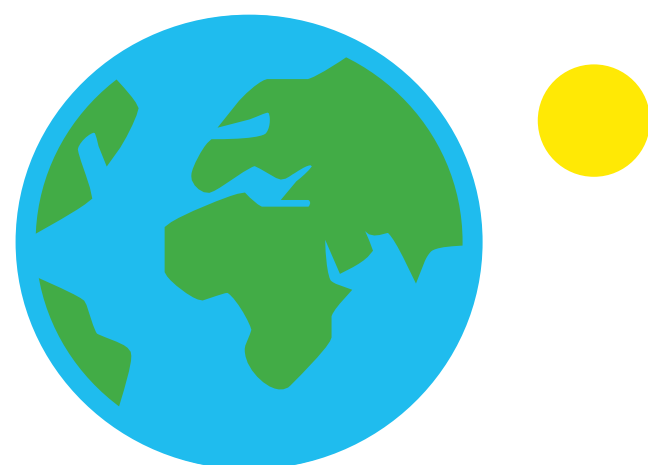
Waste collectors include tricycle operators and waste pickers who collect waste door-to-door in low-income areas or pick waste in the streets, and then sort and take the waste to landfills or to transfer stations made available by the city. They are sometimes equipped with motorised tricycles that allow them to move easily in low-income areas.

The most visible waste collectors in Accra are:

- The **Boria Taxi** operators provide direct waste collection services to clients, traders, or households, for a fee and mostly use motorised tricycles in their operations. They are mostly operating in the low income and slum areas in Accra (such as Nima, Chorkor, Sukura, and Agbogbloshie),

offering house-to-house waste collection and disposal services where formal waste contractors encounter access difficulties.

- **Waste pickers including scrap pickers** specialise in collecting valuables (mainly plastic or metal waste) from street sides, communities, markets, dumpsites or landfills.
- The **Kaya Borla** are informal workers who use baskets, sacks, and pushcarts to collect household and commercial waste providing it to dumping sites for a fee. They recover valuable materials and sell them to buyers and aggregators to earn additional income. However, this is the least common group of waste collectors in Accra in recent times.



Box 12: Waste pickers and sorters Accra, Ghana



Stories

Lydia has been working as an informal waste worker for over 20 years. Currently, she is the National President of the Borla Taxi and Tricycle Operators Association of Ghana. Members of this association are waste workers who collect waste from households, markets, restaurants, etc., using tricycles. Most of them do not own their tricycles but rent them from other people for 18 to 24-month periods under a “work-and-pay” contract. One of the main challenges borla tricycle operators face is insufficient space or transfer stations for waste disposal and transit. In some cases, they wait long days before they can dispose of their waste for subsequent collection trips. This constrains their efficiency and profitability; a lot of people are discouraged and leave the job due to difficult working conditions – driven by insufficient waste infrastructure and systems.

While the situation may be improving from what it was some years back, informal waste workers still experience

challenges with their operations in communities as there remain some rather negative perceptions about informal waste workers. They are easily misunderstood, badly perceived, and often discriminated against by some local authorities and community residents. Despite this, Lydia is proud to be working as an informal waste worker and of her work’s contribution to society. Informal waste collectors reduce the amount of waste burned and dumped improperly in the streets and waterways. Lydia observes that this has led to a drastic reduction in the cases of cholera, diarrhoea and malaria in the city. It also helps mitigate climate change. She notes that recent initiatives from local municipalities and district assemblies to integrate informal waste workers are encouraging and the informal waste sector’s voice is progressively represented and heard by public partners.

*Note: *Based on an interview done as part of the Inclusive Climate Action in Accra with Lydia Bamfo.*

With C40’s support, the city of Accra is implementing an inclusive approach to engaging informal waste actors. This new approach is prioritising the voice and participation of informal waste workers and is contributing to strengthening the voice of informal workers in city waste processes. Additionally, the pilot has undertaken a local advocacy and campaigns to advocate for further inclusion of informal waste workers

in city waste processes. The campaign aims to also promote a more positive public perception of informal waste workers.

There are different commodity-based waste collectors operating in Accra⁷⁷:

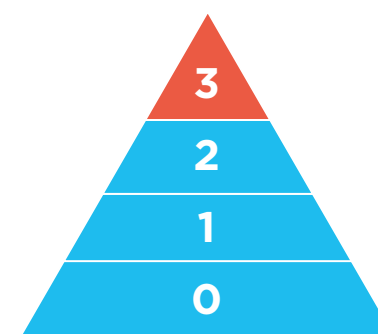
- **Plastics waste pickers:** primarily work on dumpsites, collecting plastics and then sell it to itinerant buyers.

- Scrap boys and van dealers:** are itinerant scrap metal purchasers who either buy waste metal from households and mechanic shops, or buy from other waste pickers, etc. They usually work in pairs and use 4-wheel push trucks from the generation point to a metal yard and deliver metal waste to scrap masters who provide capital for their trade.
- Totse:** are itinerant glass and plastic waste buyers. They roam the neighbourhoods, from household to household collecting glass and plastics, or buy from pickers for resale in the domestic and export markets. There are junior totse and senior totse. The junior totse are contract partners, they receive capital from the senior totse for their trade.

Waste pickers are predominantly men (80%⁷⁸). Some directly pick waste in the landfills where waste has been disposed of by the formal sector. The number of waste pickers in the Greater Accra region is estimated at 7,800⁷⁹.

In order to bring their interests to the attention of the authorities and major economic players, informal waste workers have organised themselves into associations.

Today there are about 14⁸⁰ associations of informal waste workers in Ghana. For example, the Kpone Landfill Waste Pickers Association, created in 2018, has helped improve relations with the municipality, waste pickers' working conditions by lobbying to develop more inclusive policies, and the organisation of waste pickers, etc.



Level 3 – Processors and Recyclers

Recyclers buy waste from pickers, crushers or aggregators and transform the materials into new products. There are both formal and informal players, but large-scale recyclers are mainly formal.

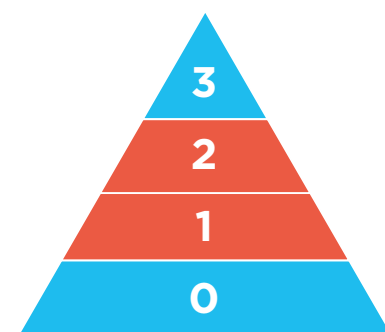
Data is scarce on informal waste players in general. However, it is known that informal waste workers often have low education levels and that many of them are migrants (from other regions in Ghana but also from neighbouring countries like Nigeria, Burkina Faso, Niger, and Liberia).

The informal waste sector is also male-dominated and women in the sector mostly work in the plastic waste chain. The vast majority of informal waste workers do not have any insurance or social safety nets.

The plastics sector provides further insights into the socio-demographic dynamics of waste workers

More information exists for the plastic value chain, as it is a well-developed industry in Ghana. Research has been carried out to analyse the socio-economic profiles of the different informal actors involved in this specific value chain, which provide interesting insights for gender disparities within the waste value chain.

Indeed, in the plastic value chain, women are mainly located at the bottom, working autonomously and informally, notably as itinerant pickers. They often only have access to the lowest value materials, limiting their capacity to earn a decent livelihood.



Level 1 and 2 – Aggregators and Crushers

Aggregators buy waste from waste pickers and collectors and process it (washing, sorting, and packing) in order to sell it to recyclers. Similarly, they usually specialise in a commodity:

- Scrap masters** are middle-aged persons operating in the scrap metal yard. They provide daily capital to scrap boys and van dealers to purchase recovered metal waste. They own open spaces or sheds where they extract and store metals.

- Senior Totse** are similar to scrap masters but specialised in glass and plastics. They provide capital to junior totse to purchase glass and plastics from generators.

Crushers buy from waste pickers and crush or flake plastic into pieces to sell to recycling centres.

Depending on their size, assets and investment capacity, aggregators and crushers can be more or less better off upstream in the value chain. They are mostly men.



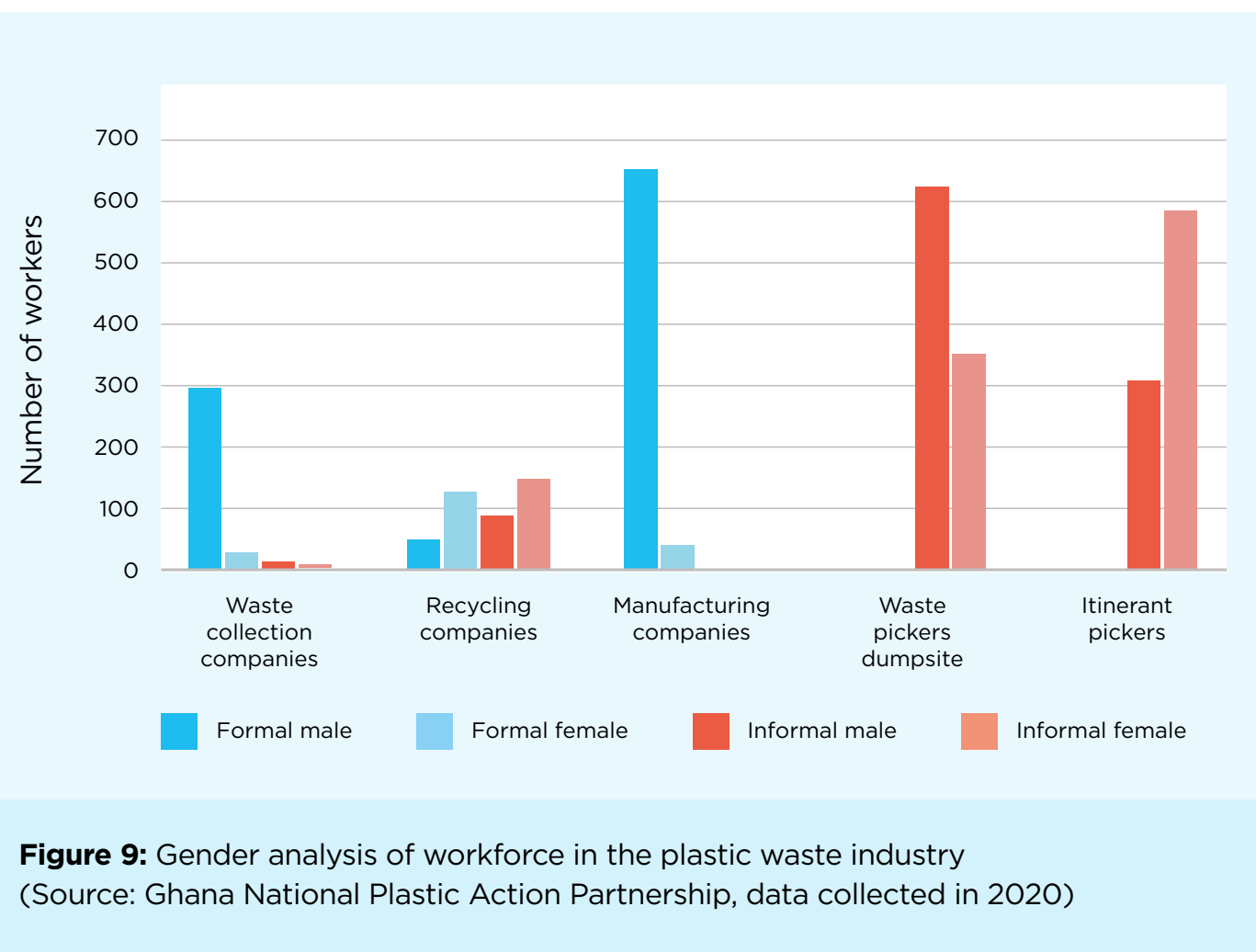


Figure 9: Gender analysis of workforce in the plastic waste industry (Source: Ghana National Plastic Action Partnership, data collected in 2020)

Upstream in the value chain, the presence of women is increasingly rare. When they are involved, they are more likely to perform tasks such as sorting or cleaning. According to the study “Gender Analysis of the Plastics and Plastic Waste Sectors in Ghana” (2021) published by the Global Plastic Action Partnership, women represent 81%⁸¹ of the workforce in waste sorting and 99% in waste washing at the aggregation stage, while 90% of aggregating facilities are managed by men.

These men in management and ownership positions are very often former waste pickers who have climbed up the value chain by accumulating financial resources and investing in facilities. The top of the value chain is also male dominated, with only 20% of CEOs and business owners in the plastics chain being women. This can be explained by the barriers they face to accumulate capital and climb up the value chain, lower education levels, family constraints, gender norms.

Challenges and vulnerabilities of waste workers in waste value chains

At the bottom of the value chain: poor and unsafe working conditions, lower bargaining power, lack of consideration

The working environments of waste pickers are particularly hazardous to their health. They are exposed to illnesses related to contact with hazardous materials, respiratory diseases related to breathing toxic gases and fumes, and even throat cancer. In addition to these serious illnesses, waste pickers are also at risk of daily injuries: road accidents, rat or snake bites, and electrical shocks that can become serious if medical attention is not provided. In terms of health risks, women appear to be even more vulnerable than men because the lack of access to dedicated facilities (toilets, etc.) can cause them health problems specific to their physical characteristics (menstruation, pregnancy, etc.).

Despite the efforts run by the city, stigmatisation of waste pickers in Accra is still high. **They suffer from social stigma and difficult relationships with residents in the AMA. Informal waste actors are often perceived as a ‘nuisance’ or as conveying a ‘negative’ image for the city.**

The lack of regulation by public authorities gives power to the

actors upstream of the value chain. As a result, workers at the lower ends of the value chain are greatly exploited, which leads to high financial instability for waste pickers.

Limited access to facilities and appropriate storage is a major issue. The lack of material storage and transport infrastructure is also an obstacle for the economic development of waste pickers. With no or minor transport equipment, they can only pick small quantities of waste. Since they don’t have access to storage spaces, they need to sell these small quantities rapidly, reducing their bargaining power on prices and limiting their income generation capacity.

Several socio-economic factors limit women’s upward mobility in the value chain

Lack of education/low levels of education is more present among female waste pickers. Lack of education limits the ability of waste pickers to move up the value chain. Women are particularly affected as studies show that most women receive no education while 50% of men have received at least a primary education⁸². This lack of education represents an obstacle for most women wanting to climb up the value chain.

Female workers have lower income than men. Women usually have less income in the informal waste economy than men. This is explained by various factors, including less time dedicated to work (as they are taking care of the family), specialisation in tasks that create less value (collection, sorting, washing), discrimination against women and higher labour exploitation from upstream actors.

Women also suffer from social stigma and high rates of harassment. Women waste workers face very high social stigma. Working in the informal waste sector, makes it more difficult for women to marry, which limits their ability to increase their income and/or leave the landfills. They are also exposed to sexual assaults and harassment.

As a result of these factors, less than 10%⁸³ of waste sector associations' leadership is made up of women. **The lack of representation of women, notably among workers' associations, results in the limited consideration of their needs, vulnerabilities and capacities.**

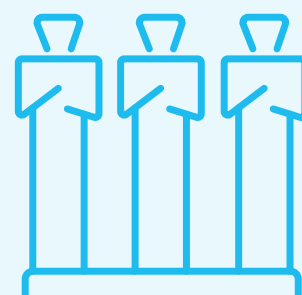
Young people have little bargaining power against more powerful actors in the value chain

Young people generally have lower incomes than older waste pickers. There is a correlation between income and experience in landfills or collection. Young people, with less experience, have a smaller network and are not always aware of the standard prices charged. Actors in the middle of the value chain exploit their lack of training and experience to drive prices down.

Migrants are very present among waste pickers

Migrants represent a large part of waste workers (up to 75%⁸⁴) in the Greater Accra Region due to high unemployment, legislative and language barriers. Due to these employment barriers, working in the waste sector is hence more accessible than working in other sectors for migrants. The majority of them are coming from other parts of the country while the rest come from other countries, notably Nigeria, Burkina Faso, Niger and Liberia. Migrants from other countries often face an important language barrier that limits their negotiations and bargaining, thus exposing them to exploitative bargaining. Migratory flows are perceived by local waste workers as new competition, which gives rise to tensions between the different communities.

Lagos



Lagos, Nigeria

Overview of waste management in Lagos

Governance at the local level based on public-private partnership

The city of Lagos is located in the state of Lagos which contains 20 Local Government Areas (LGAs) and 37 Local Council Development Areas (LCDAs). The state government of Lagos has powers of planning, taxation and delivering social services.

With a population of over 15 million inhabitants⁸⁵ Lagos is experiencing significant population growth, which contributes to the increasing amount of waste. Studies show that the city produces 13,000 metric tonnes of waste per day, bringing the annual waste production to 4.7 million tonnes⁸⁶. Most of this waste is organic (45%), the rest being composed of 10% paper, 15% plastics and a minority of textiles, metal, and inks⁸⁷.

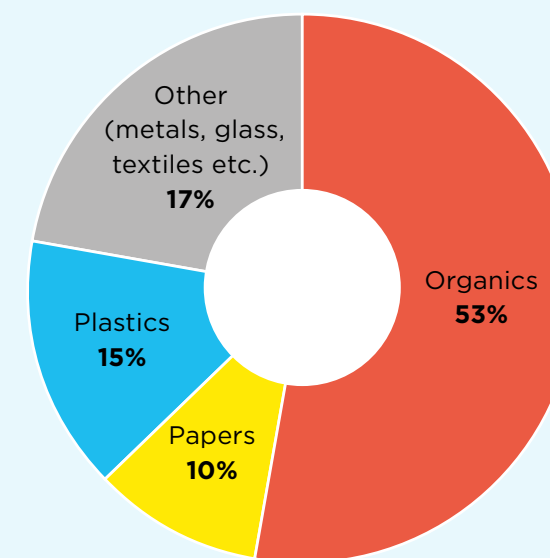


Figure 10: Composition of Lagos's waste⁸⁸

This waste represents a major environmental challenge because it is a source of greenhouse gas emissions. The waste sector is responsible for 25% of the total GHG in Lagos State⁸⁹ – it pollutes rivers and groundwater. Waste management thus presents a significant opportunity for improvement in the city of Lagos and the surrounding cities and regions. In Nigeria, solid waste management (SWM) is mainly managed at the State level and it is the constitutional responsibility of local governments. In Lagos, the regulator is **Lagos State Waste Management Authority** (LAWMA) which has delegated the service to the private sector. The tasks assigned to the private sector are therefore defined by LAWMA, and include operations of public waste, domestic waste, landfill, and transfer loading stations.

These private actors are referred to as Private Sector Participators (PSPs). They are mandated to provide waste services in the 20 Local Government Areas and the 37 Local Council Development Areas (LCDA) by collecting both industrial and domestic waste. PSPs were introduced in the early 2000's to take over the waste collection efforts. Many of them were small to medium-sized companies composed of former informal waste workers which the State government helped to regroup into formal companies to access finance schemes. Collection from these private operators is carried out once or twice a week. Most of the waste collected by PSPs is directly transferred into one of the four official landfills in

Lagos: Olusosun, which is the biggest; Solous 2 and 3; and Ewu Elepe. These landfills receive about 50%⁹⁰ of the solid waste generated in the state.

However, the formal sector does not recover all the waste generated, nor recycles all materials. A large portion of the waste collected directly goes to landfill, which is regulated by the state. Several factors such as the topography of some areas in the city, which prevents compactors from passing for collection or the people's unwillingness to pay for a service which they consider should be free explain the coverage gap. Limited public finance also explains the restricted formal collection: despite having 400 PSPs⁹¹ in Lagos State, the city now has 700 collection trucks but estimates that 1,200 compactors would be required to achieve an optimal collection level. To fill the gap, informal actors are involved in all stages of the value chain: collection, sorting, treatment, and recycling. These informal workers collect waste in areas hardly covered by private operators, especially in low-income areas.

Collaborations between formal and informal waste sectors are underway

The city of Lagos is currently developing innovative approaches to collaborate with the informal stakeholders in the value chain. The city is currently enlarging the audience of the Pakam App to informal stakeholders. This application supported by local

authorities (LAWMA, Lagos State Environmental Protection Agency and the Ministry of the Environment & Water resources) allows households to declare a certain amount of recyclable waste that recyclers can collect with the objective to limit the

number of recyclables in the landfills by bringing it directly to aggregators. The application enables individuals to order waste collection as well as households joining together to ask for a collective collection of their waste.

Box 9: The Pakam App facilitates recycling in Lagos

The Pakam App was developed by the startup Pakam Technology in 2019. It is used by households to declare their amount of segregated waste and request for its collection. Households can also gather

and ask for collective collection. The objective is to enhance and optimise waste collection with technology and data to promote environmentally friendly behaviour and circulatory economy. The municipality of Lagos is currently

considering expanding the access to this app to informal waste collectors as well as middlemen and buyers which would contribute to a more inclusive waste value chain and better price transparency.

The waste economy in Lagos is huge. The formal and informal players are highly connected domestically, and notably between Nigerian cities. The sector has also established links into trans-border trade with neighbouring countries (Ghana, Cameroon, Equatorial Guinea, Togo, Mali, Niger) and distant countries (Asia and Europe). Lagos plays a critical role as a regional hub for the informal e-waste economy.

Informal waste workers fill the gap left by formal waste services

Depending on the type of collection, waste follows different journeys (see Figure 11)

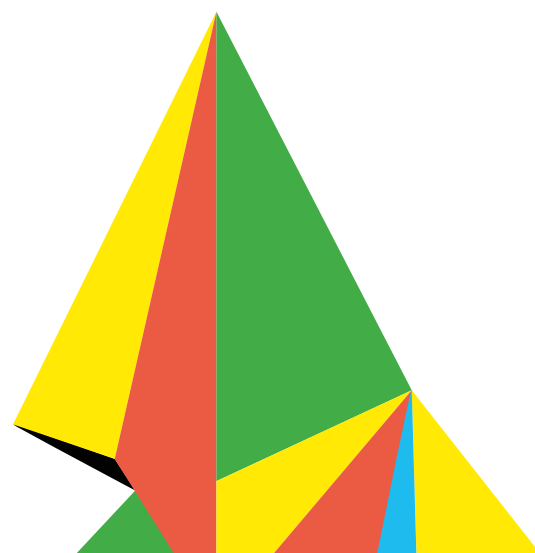
- **When waste is collected by the formal sector**, most of it is still sent to landfills. Once in the landfill, the recyclable materials are collected by informal waste workers (landfill scavengers). This waste is then sold to middlemen. These middlemen are aggregators that can be formal or informal and vary in terms of size, process, and equipment. In the past few years, the government has been investing to better sort, treat and recycle waste at the city level. Local authorities have been building collection hubs where formalised recyclers (who sometimes work with the informal sector) collect and segregate waste. The objective is to regulate prices at these hubs managed by formalised

recyclers, which could lead to better opportunities for informal waste stakeholders. At the top of the value chain, the government has made some investment to build composting plants where the organic waste from the formal waste collection will be valued into energy production. The city is also seeking to incentivise separate waste (two bins for general waste and recyclables introduced in early 2022). On agreed dates, PSPs and formal recyclers will pick up the organic and recyclable waste. The incentive mechanism is if the waste is not segregated, city dwellers pay more money for the service.

- **When the waste is collected by informal collectors** (door-to-door, on the street or in open dumps), waste is sorted by these workers who select

the valuable materials they will be able to sell to middlemen. Official landfills are often far away from waste collectors' collection areas, so they sort out recyclable waste that is sold to middlemen, waste with lower or no value is deposited in open dumpsites.

The recycling and sale of collected and sorted waste is well connected with many local and formal actors. Some local industries depend entirely on the collection of raw materials by waste pickers. There is also an international market for this waste which is often sent to Europe or Asia. E-waste is a major commodity for informal waste workers in Lagos. The e-waste sector is organised in seven clusters: the markets of Westminster, Alaba Lawanson, Ikeja Computer Village, Ojota scrap market, Sulous dumpsite and Olososun dumpsite.



Human-centric value chain: portraits of waste workers

Waste management is divided between the formal and informal sectors. Each of these actors is involved in different tasks and/

or geographies. When it comes to the informal sector, finding reliable data is still a challenge.

Box 10: The association of Scrap and waste pickers of Lagos (ASWOL) registers waste pickers on a new website in collaboration with LAWMA Lagos

The association representing waste pickers in Lagos has announced in December 2022 registering up to 3,700 waste pickers on its website in order to help semi-formalise their activities.

Registration was done in cooperation with the city. The objective being to foster their integration into the waste management system in the city and make it possible for citizens to verify their identities. Profiles of

waste pickers are verified thanks to their National Identity number. The objective is to train and eventually support them in using a readily available app such as the Pakam App supported by the local authorities.

The city of Lagos has started mapping some of the informal workers to collect data and accelerate the census of these workers. Different pieces of literature and field-studies enable access to orders of magnitude in terms of the number of workers involved and their key sociodemographic characteristics. Most studies suggest that a range

of 5,000 to 15,000 informal waste workers are involved along the value chain in Lagos.

Upstream actors, such as industries and aggregators are the stakeholders capturing much of the value of recyclable materials collected and sorted by informal waste workers at the bottom of the value chain.

Apart from collection, the formal sector is involved in high value-added activities

At the bottom of the value chain, **formal PSPs** are employed by private companies, which have a mix of men and women⁹². PSP operators are mostly Yoruba's but also Igbo's.

Upstream in the value chain, many **aggregators** in Lagos are formal as well as **larger recycling facilities**. Formal aggregators are registered companies who buy waste from informal workers in order to process it (washing and crushing depending on their capacities and level of equipment) and resell it to larger recycling facilities. Some of these aggregators are organising alternative household collection systems to collect waste before it is taken to the landfills and potentially contaminated by other waste. They are organised in the Lagos Recyclers Association (LAGRA), which aims to promote the circular economy in the context of waste

management and has gathered 300 members. Workers working for aggregators to sort, and wash waste are often women workers paid based on the quantity of waste they have managed to process on a daily basis. These tasks, which are done in a fixed place and repetitive, are often delegated to women while picking and collecting is more frequently conducted by men. This illustrates gender roles in the waste treatment and the impact of social norms (notably in terms of mobility and visibility in the public space).

This informal sector is hierarchically organised and interacts regularly with the formal sector

On the informal side, informal waste workers are organised in a hierarchy where each has a well-defined role. Most informal workers are at the bottom of the value chain. The informal stakeholders, from the bottom to the middle of the value chain can be defined as follows.

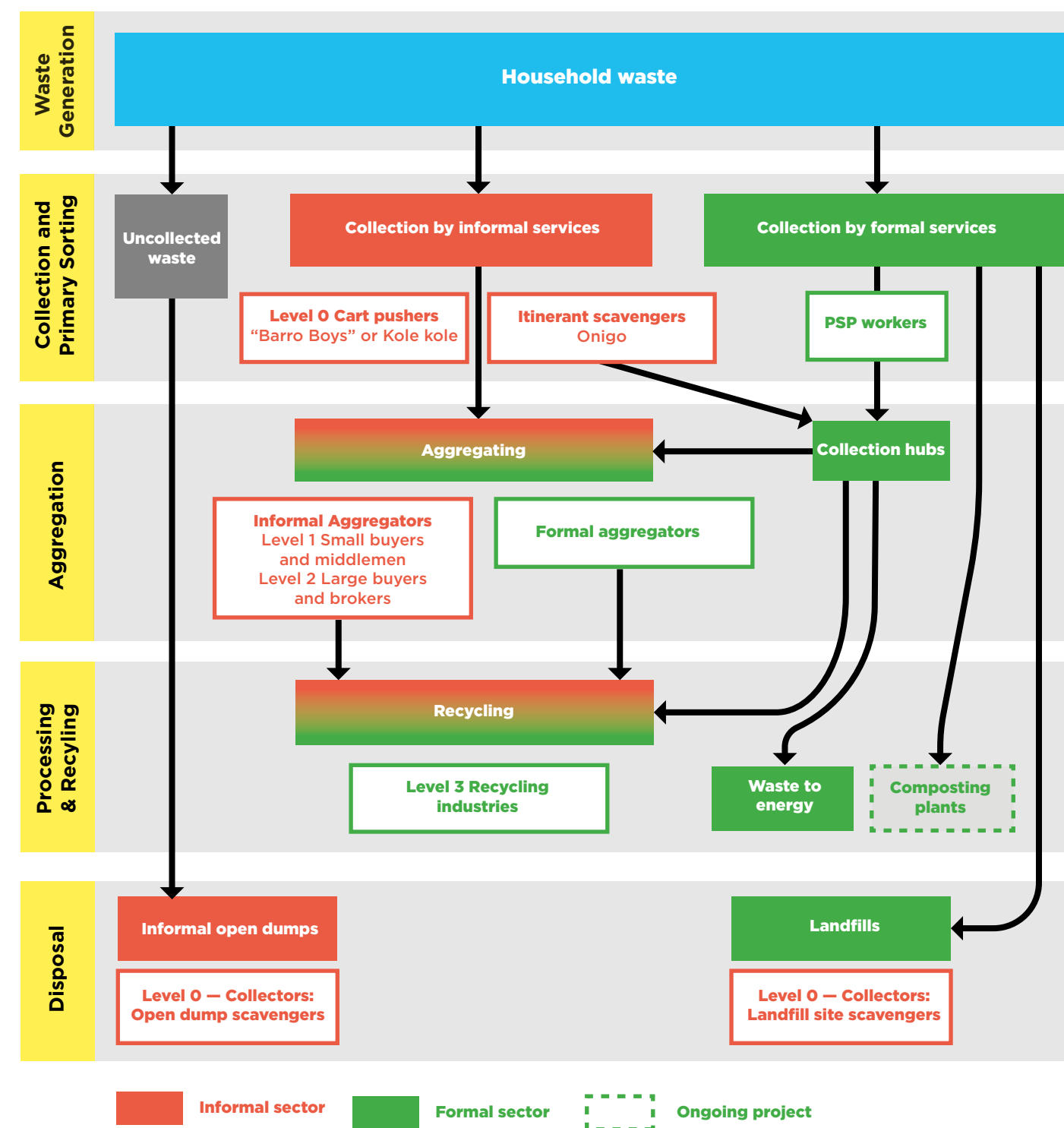
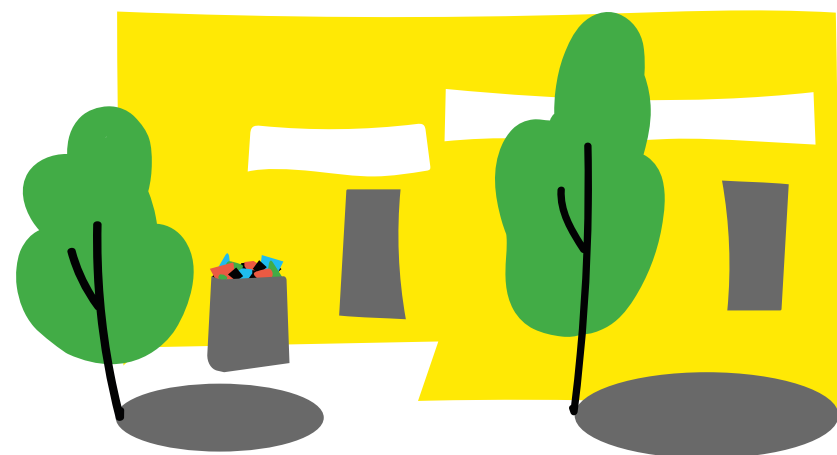
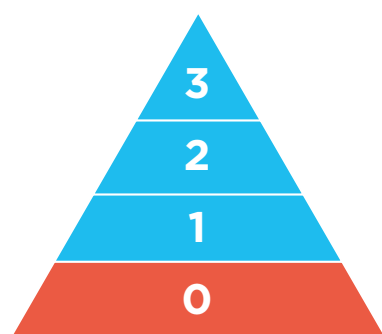


Figure 11: Lagos' solid waste management value chain (simplified) and main waste workers involved. Source: Archipel&Co



Level 0 – Collectors: Itinerant scavengers, Cart pushers, Open dump and landfill scavengers

- Itinerant scavengers** pick waste in the streets and sell it to informal or formal aggregators. They are mainly men⁹³.
- Cart pushers, ‘Barro boys’ or ‘kole kole’** collect waste door-to-door for a fee. They sort the waste collected from households in order to resell the recyclable waste at a higher value or they collect only valuable recyclable waste. They work mainly in low-income areas where the formal sector cannot go. They are usually considered more available (anytime during the week or even the weekend) and sometimes cheaper than the PSPs who come once or twice a week. However, the city has tried to limit the activities of these workers who do not systematically dispose of the waste properly, sometimes leaving it in unauthorised locations, outside of landfills and dumpsites. They are also sometimes blamed for being responsible for assaults and aggressions towards city dwellers. Studies conducted on these workers have shown that many of them are male, internal migrants from northern Nigeria (Hausa’s)⁹⁴.
- Open dump scavengers** collect materials such as clothes, plastic, PET, soles, and metal from informal dumps. Men and women carry out this step, although research found out that men are 30 times more prevalent than women⁹⁵. They tend to work in groups.
- Landfill site scavengers** recover recyclable materials from formal landfills to resell it to formal and/or informal aggregators. The landfill environment is very competitive. Most of the workers waiting for the trucks to dump the waste are men. Collecting the most valuable waste out of trucks is very physical, dangerous and requires strength. Consequently, women are usually working further away in the landfills.

Box 15: Waste pickers and sorters Lagos, Nigeria



Stories

Joy* is a 44-year-old woman from Benue State. She is married with children. She works mainly as a street picker. She collects only plastic waste. The collected waste is then sold to waste sorters or recyclers who pay her based on the quantity. Even though she finds the job dirty, she appreciates the quick payment she can receive by selling what she has collected. This activity is her only source of income. She has joined a cooperative that helps her when certain tasks are too complicated to perform. Before she joined, she was working with her friends.

Chanze*, is a young single woman from Abia State. She works at the recycling station “Greenhill Recycling” which sorts and recycles plastic waste. She joined the company as she saw a billboard promoting jobs in the recycling industry. She is a

student and joined the company to pay for her studies. She is paid depending on the amount of waste she processes, once every fortnight. This allows her to buy supplies and books for her classes. Although she is happy to work for the company, she recognises that stereotypes persist, with many people finding the job dirty and for males. Her parents are opposed to the idea of her joining this company, she says “My parents don’t allow me, they say I shouldn’t do it”.

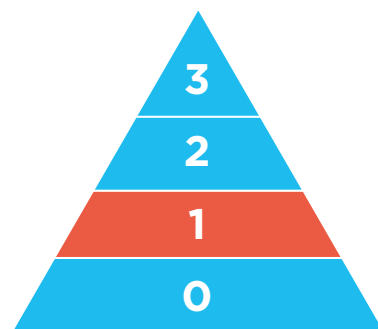
*Note: *Names have been changed to ensure confidentiality. This text is based on interviews that were conducted in November 2022, with the support of Temilade Salami, author of the Article “Formalising the “informal”: to what extent can the informal waste sector be integrated into the formal waste management sector in Lagos.*

Male scavengers tend to collect higher-value materials like metal. On the contrary, female scavengers tend to collect more PET bottles, paper, and polythene packaging material. Hence, there is a segregation of commodity types between male and female collectors due to physical differences, perceived limited skills and knowledge of valuable materials, and gender role in the waste sector. The age of informal waste pickers can range from 10 to 70, but most are aged between 30 and 40. They have very low education levels and often cannot read or write. Working as a scavenger is also a safety net for

widowed or single women⁹⁶. There are a lot of migrants among waste scavengers. The Hausa ethnic group is the most represented (migrants from Northern Nigeria). A large part is Muslim and the rest are Christian. Those working at landfill sites often live in shacks as a community in the immediate vicinity, living in very poor conditions with minimal basic infrastructure. Working in the waste sector is advantageous for several reasons: the job is very flexible and provides a higher level of income than what they could earn in other sectors given their education level. On average, scavengers and cart pushers work

between 9 to 10 hours per day and 5 to 6 days per week, while women tend to work much less (5 to 6 hours and 4 to 5 days per week). Male scavengers earn between 2 and 3 times more than female scavengers⁹⁷.

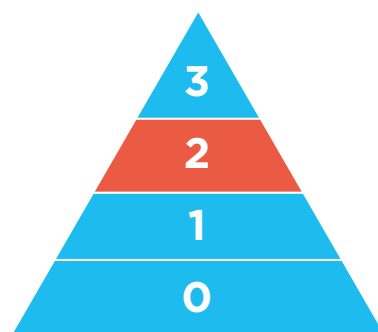
Some workers are organised in associations and cooperatives. For instance, the Federation of Informal Workers' Organizations of Nigeria (FIWON) operates in Lagos and Osun to facilitate access to insurance for its members.



Level 1 – Small to medium scale aggregators

- **Small buyers and middlemen:** buy materials directly from waste pickers depending on the type of waste. They have some sort of specialisation as some dedicated scavengers recover and sell them

particular commodities. They often have a personal and close relationship with waste pickers. They are frequently considered a cartel which limits the arrival of new players in the business.

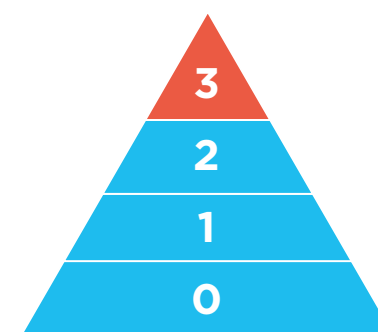


Level 2 – Large scale aggregators

- **Large buyers/brokers:** operate on a larger scale buying from small buyers and middlemen. They generally have large capital and sell directly to industries. They sometimes have contractual agreements with small buyers in order to ensure supply, with adequate amounts and quality of materials. They often specialise in the purchase and

resale of specific materials (plastics, paper, metal, etc.). They have direct relationships with the industries to which they sell raw materials.

Some research found that the majority of these informal aggregators (small to large scale) are Hausa men. They have a lot of power and control the purchase prices.



Level 3 – Processors and Recycling industries

- **Small and medium scale industries and larger recycling companies** are at the end of the value chain, and they process and recycle materials collected from the streets or landfills. They deal directly with large buyers and brokers and have huge capital requirements and supply needs. They often resell their materials abroad, particularly in Asia and Europe.

In terms of gender representation, higher up the informal value chain, less women are present. The collection of recyclables is generally dominated by men. Women's roles are often limited to activities such as cleaning and/or sorting men's collections. They receive only a small part of the value, most of it being captured by those who resell the clean and sorted or recycled waste.

Challenges and vulnerabilities of informal waste workers in the waste value chain

The informal stakeholders at the bottom of the value chain are the most vulnerable, especially due to poor working conditions and environments and their limited capacity to negotiate with the rest of the value chain.

directly in their work areas, where toxic and dangerous products are handled. Many have cardiovascular disorders, chronic respiratory diseases, or skin problems⁹⁸. The lack of personal protective equipment as well as low medical care is a fundamental issue. Waste workers lack access to but also do not perceive the value of medical care as it takes away from their working time and financial resources. Not using health services hinders prevention, detection and treatment of many diseases related to waste workers' activities. These difficult working conditions make waste workers vulnerable and can limit their progress along the value chain. Studies show that 54%⁹⁹ of waste pickers have suffered from health problems that have affected their careers.

At the bottom of the value chain: informal waste workers suffer from poor and unsafe working conditions, lower bargaining power, lack of recognition and high stigmatisation

The majority of informal waste workers work in highly polluted and dangerous environments, putting their health in danger. Many of them also live close to or

The actors at the bottom of the value chain (landfill scavengers, cart pushers, itinerant scavengers, open dump scavengers) have little bargaining power compared to the actors upstream the value chain. Their capacity to negotiate prices is very limited and they are highly dependent on aggregators.

There are also barriers to entry into certain activities because some ethnicities are more represented than others in the value chain, and discrimination persists.

The Hausa are notably the most represented ethnic group, they are also very present in the middle of the value chain (among the aggregators), they tend to facilitate their counterparts' ascension within the value chain.

Informal middlemen and aggregators are constrained by the lack of access to financial resources

For informal aggregators which are often smaller than formal ones, their capacity to process waste frequently depends on their capacity to invest in materials and equipment. The fact that they work informally prevents them from getting access to formal credits, limiting their financial capacity and therefore their growth potential.

Female waste workers face specific barriers resulting in lower income compared to male counterparts

Women tend to have lower income. **They earn lower income due to lower added-value tasks and less working hours.** This is linked to the fact that women work less than men because they are looking after their children. For example, studies showed that while men arrive on site around 9.00am, women can only arrive around 11.00am. By having shorter working hours, women mechanically collect less waste than men. As the waste trucks arrive at the landfills early in the morning, women also miss out on higher value materials. The fact that women are not able to work as much as men is mainly due to the fact that they are often single with children, whereas the majority of men are married and have their partners looking after the children. Studies¹⁰⁰ conducted on landfills show that female scavengers spend half the time of men and earn on average half the amount of money earned by men.

Another reason for the difference in income between women and men is that women collect mostly low-value recyclables (paper, cardboard, plastics)¹⁰¹. Women's lack of specialisation in the collection of higher value-added materials is attributable to their lack of knowledge and skills in processing these materials. The physical difference also explains women's specialisation in low value, lighter, and less

dangerous materials. As waste collection is a competition between waste workers, men often intimidate women when they are competing with them for high-value materials. Women also often censor themselves, seeing themselves as naturally weaker in this competition.

Women suffer from lower levels of representation in associations. Different waste workers associations have been created in Nigeria. The National Association of Scrap and Waste Workers of Nigeria (NASWON) aims to organise waste workers according to their specialisation and location. NASWON is also a platform for working with the government on the development of public, private, local and international initiatives to improve the living and working conditions of waste workers. Some cooperatives have also emerged to support workers at the bottom of the value chain to protect their interests from the middlemen (aggregators). By paying a weekly fee to the cooperative, the latter facilitates the work of recovery, storage, etc., and ensures more stable prices for waste workers. However, women have less representation in waste workers' associations. For example, in the Olusosun dumpsite waste workers' association, 83% of the members are men while 17% are women¹⁰². This lack of representation limits the consideration of women's specific needs and vulnerabilities, including in discussions with the authorities.

Finally, women at the bottom of the value chain stay much longer than men at this level.

More than 45% of women spend 10 years or more in landfills, while 72% of men spend less than 10 years as landfill scavengers.¹⁰³ There is therefore low mobility for women along the value chain, which is mainly explained by their lack of resources to acquire the necessary equipment and facilities (storage space, etc.). This lack of mobility is also explained by the fact that the majority of women are Yoruba and Igbo, which are ethnic groups less represented in the middle of the value chain overall. The Yoruba are more represented among PSPs¹⁵ who have very little interaction with aggregators. The lack of ethnic allies in the middle of the value chain makes moving up the chain more difficult.

Migrants are particularly constrained to climb up the value chain

Migrants in the informal waste value chain mainly come from Northern Nigeria and are concentrated at the bottom of the value chain. These migrants are often seasonal leaving during the planting season. The language barrier limits their integration and their ability to negotiate with the actors further up the value chain.

Informal worker transporting recyclable waste, Lagos

Source: Ade, Unsplash



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C40 CITIES

Women informal workers
sorting plastic at informal
recycling hub, Accra

Source: NKACC commissioned
by C40

