



**United Nations**

Department of  
Economic and  
Social Affairs



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# The Waste Crisis:

## Accelerating National to Local Policy Action

Evidence-based strategies for  
sustainable solutions

*Summary for Policymakers*



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**Suggested citation:** United Nations Department of Economic and Social Affairs (2024). The Waste Crisis: Accelerating National to Local Policy Action. Evidence-based strategies for sustainable solutions. Summary for Policymakers.

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United Nations publication issued by the United Nations Department of Economic and Social Affairs

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**COVER PHOTOGRAPH:** © Sara Castro-Hallgren

**SWEDEN:** A second life for plastics – A local plastic waste recycling facility sorts plastics into colours to ensure a value chain for reusing plastics and minimizing the waste footprint in Europe.

# Summary for Policymakers

## SUMMARY HIGHLIGHTS

Rising waste and pollution levels threaten ecosystems and human health, particularly in developing countries. Governments must prioritize waste management and actively pursue a zero-waste future.

## KEY FINDINGS

**The world is in a global waste crisis.** 2 billion tons of municipal solid waste (MSW) are generated annually, with this figure expected to double by 2050.

**Waste management systems are insufficient.** Only 62% of MSW is managed in controlled facilities.

**Vulnerable communities are heavily impacted.** Poor waste management disproportionately affects vulnerable groups, especially women and children.

**Significant data deficiencies exist.** This hinders effective waste management and policy action.

**Coordinated efforts are required.** Successful waste management demands collaboration at all levels, prioritizing evidence-based strategies, stakeholder engagement, and innovating financing for a zero-waste future.

## Introduction

**Growing levels of waste and pollution are jeopardizing our ecosystems and affecting human health globally.** In 2022, UN Member States agreed on a resolution to create a legally binding agreement by 2024 to end plastic pollution, while also adopting a resolution proclaiming 30 March as the International Day of Zero Waste.<sup>1</sup> With an urgent call-to-action voiced by Member States during the first High-Level Meeting of the United Nations General Assembly on Zero Waste held on 30 March 2023, the international community recognized the pressing need to address the escalating crisis of poor and inadequate waste management that is affecting the health of people, ecosystems, and economies.

**With 2 billion tons of municipal solid waste generated annually and projections indicating a potential doubling of this figure by 2050, the severity of the pollution crisis cannot be overstated.**<sup>2</sup> Stressing the necessity for immediate and concerted action, the United Nations can support Member States in developing comprehensive strategies to combat waste on multiple fronts given challenges and opportunities for ensuring sustainable waste management.

**In this context, the United Nations Office for Sustainable Development (UNOSD), under the Division for Sustainable Development Goals of the United Nations Department for Economic and Social Affairs (UN DESA), is leading a policy support initiative for United Nations Member States to strengthen evidence-based policymaking, data, capacity and governance systems for integrated solid waste management and resource circularity.**

As a key step in orienting policy support, this report assesses the current and future state for solid waste management from national to local level.

**The report addresses the interlinkages between our current global production and consumption systems, which has led to a waste crisis requiring renewed attention on sustainable waste management policy and practice.** Developed through a consultative process with inputs from experts across Member States, the United Nations, and civil society, the report reviews current sustainable waste management policies and explores future policy scenarios to accelerate progress toward the Sustainable Development Goals (SDGs) and a zero-waste future. Box 1 showcases important data concerning the worldwide status of waste and its management.

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<sup>1</sup> UN (2022).

<sup>2</sup> UNEP (2024a).

## Box 1: Key Statistics

- Humanity generates an estimated **2.3 billion tons** of municipal solid waste (MSW) annually and waste generation could rise by more than **77 per cent by the end of 2050**.<sup>3</sup>
- Global production of plastics increased **97 per cent between 2000 and 2019**, while plastic waste increased **126 per cent** over the same period.<sup>4</sup>
- **62 million tons** of e-waste was produced in 2022, up **82 per cent from 2010**.<sup>5</sup>
- **8.2 per cent** of e-waste is shipped across borders, of which **65 per cent** was shipped from high-income to middle- and low-income countries.<sup>5</sup>
- Only **62 per cent** of MSW is managed in controlled facilities across the world.<sup>6</sup>
- Approximately **90 per cent** of waste in low-income countries is discarded in unregulated dumps or burned openly.<sup>7</sup>
- The highest proportions of uncontrolled disposal occur in Sub-Saharan Africa, Central and South Asia, Central America, the Caribbean, and Oceania.
- Due to unsustainable production and consumption patterns, greenhouse gas emissions have **more than doubled in the last 50 years**.<sup>8</sup>
- The waste sector contributes an estimated **20 per cent** of human-caused methane emissions.<sup>9</sup>

Source: UNEP (2024a), OECD (2022), UNITAR (2024), UNEP (2024a), World Bank (2019), UNEP (2024c), NASA (2022)

The trends and statistics highlighted in Box 1 underscore an alarming situation that disproportionately affects poor and vulnerable communities, particularly women and children working informally in waste picking. Inadequate data potentially underestimates the waste crisis and limits the reach and impact of policy for these communities and the ability to address negative environmental externalities.

While waste is directly related to key targets under the 2030 Agenda's Sustainable Development Goals, waste management and resource circularity impacts all 17 SDGs (Figure 1). Improving national waste management is essential to confront the triple planetary crisis of pollution, biodiversity loss and climate change.

Figure 1: How solid waste management can contribute to the Sustainable Development Goals



Graphic supplied with assistance from Zoë Lenkiewicz, WasteAid UK and contributor to Be Waste Wise.

Source: UNEP (2019a)

A focus on the informal sector needs to be a priority in developing countries to ensure the principles of Leaving No One Behind can be fully achieved. This sector operates primarily because there is economic benefit for the workers in collecting and separating waste and selling materials. Gender differences and the vulnerability of women and children is particularly apparent in the sector, which attracts women and youth unable to find decent work in the formal sector. This striking reality urgently calls for national governments to accelerate progress on formulating and implementing evidence-based policies for a waste to resources approach, including waste management, recovery, and recycling systems.

<sup>3</sup> UNEP (2024a).

<sup>4</sup> OECD (2022).

<sup>5</sup> UNITAR (2024).

<sup>6</sup> UNEP (2024a).

<sup>7</sup> World Bank (2019).

<sup>8</sup> UNEP (2024c).

<sup>9</sup> NASA (2022).

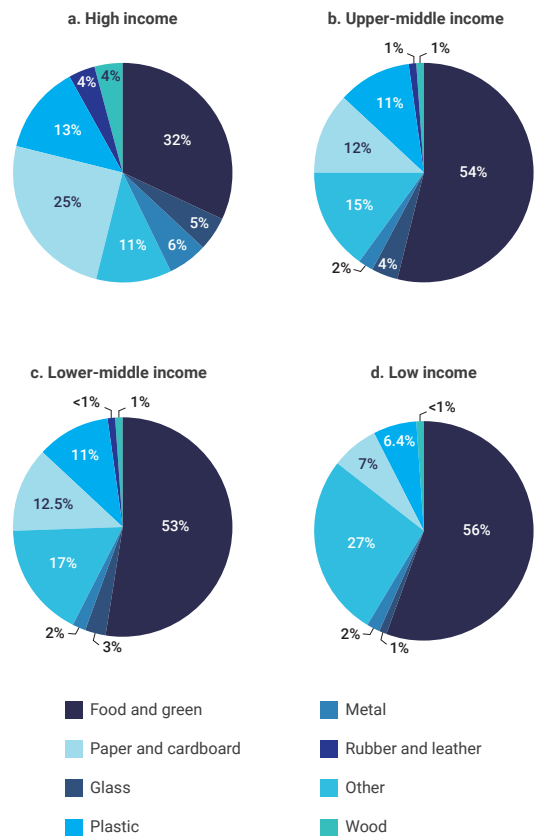
# I. Background

## Changing Waste Composition amid Development

**Waste can be seen as a marker of humanity's planetary impact.**

The amount of waste generated as countries and regions develop, serves as a data point on the inefficiency of production and consumption models, as well as on the ecological footprint of these. The total type and amount of waste varies by income at micro- and macro-economic level. Globally, organic waste from food and other sources comprises the largest component of waste, followed by paper, cardboard, and plastics.<sup>10,11</sup>

**The rise in plastic waste is also alarming, with significant amounts entering aquatic ecosystems.**<sup>12</sup> In response to the plastic pollution crisis, UN Member States endorsed a resolution in 2022 to address the full life cycle of plastic and establish an international legally binding agreement by 2024 to end plastic pollution.



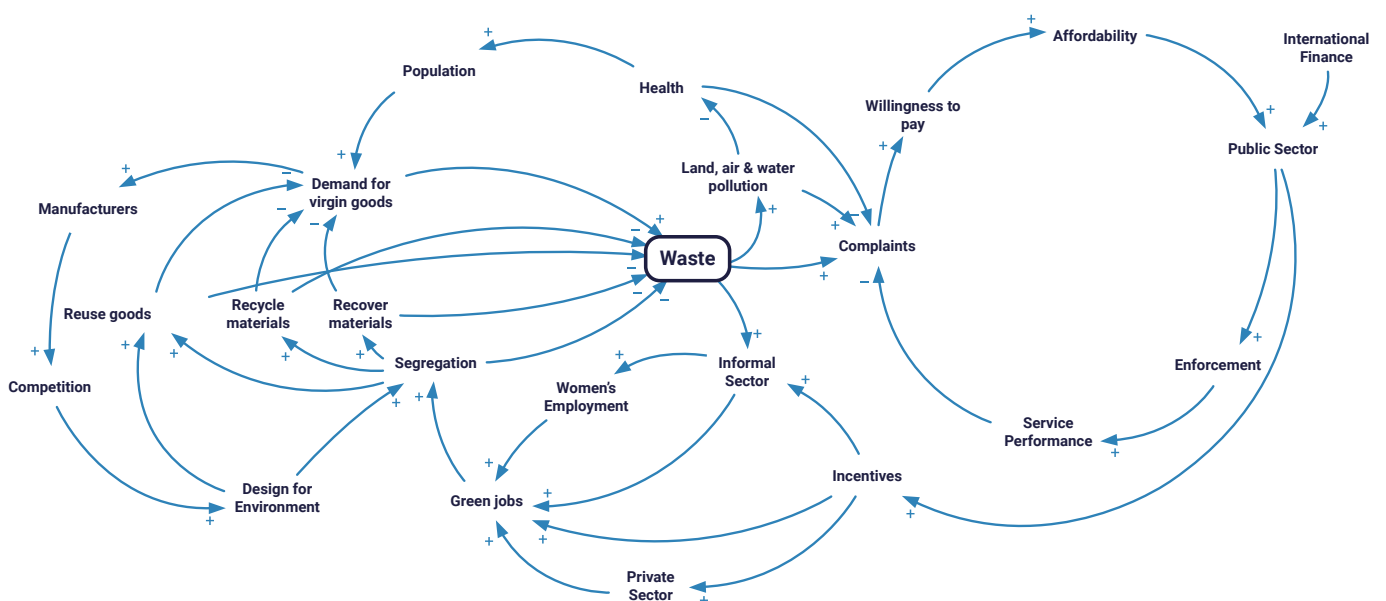
Source: World Bank (2018).

Figure 2: Waste composition by income level

## The Waste System

The life cycle of waste is not a linear or circular process, Figure 3 depicts a generic waste system for developing countries, and demonstrates that it is an interconnected web. This suggests a systemic approach to waste management is required.

Figure 3: The waste system for developing countries



<sup>10</sup> UNEP (2024b).

<sup>11</sup> World Bank (2018).

<sup>12</sup> UNEP (2021b).

**The life cycle of solid waste involves generation, collection, transport, sorting, recycling, recovery, treatment, and disposal.**<sup>13</sup> These stages can be seen in Figure 4. Waste is generated at each stage of the life cycle, starting from extraction from the Earth, processing, manufacturing and on until the post use stage. The effective reduction of waste requires tools to adequately assess the problem and then to implement appropriate solutions at all stages of the life cycle, and within the waste system as a whole; however, developing countries often lack investments in the central infrastructure required to apply the life cycle approach in practice.

Figure 4: Life cycle approach to solid waste management



Source: White, Franke and Hindie (1995).

**Globally, 16 per cent of MSW remains uncollected, with 39 per cent managed in uncontrolled facilities.**<sup>14</sup>

The highest proportions of uncontrolled disposal occur in Sub-Saharan Africa, Central and South Asia, Central America, the Caribbean, and Oceania.<sup>15</sup> Developing countries face significant challenges in waste management, including limited data, inadequate funding, and insufficient technology. Insufficient systems lead to adverse health outcomes, environmental damage, and substandard development pathways. Key barriers to effective waste management include complexity, lack of urgency, data deficiencies, underestimated climate impacts, lack of inclusion, undervalued informal sector, inadequate legislation, weak local enforcement, and insufficient funding mechanisms.

**There are complex challenges for governments in improving waste management practices.** The waste system is a complex web and there is no single way of arriving at 'the' waste solution. Effective management requires multilateral engagement between local and national governments, as well as integrated solutions that are suitable to each local context. Focusing on local implementation compared to national policies has provided 10 key lessons, based on analysis of multilateral engagements. Box 2 highlights these lessons.

### Box 2: Key Lessons from Multilateral Engagements

- Adopting a whole value chain approach to view waste as a resource.
- Integrating resource efficiency into macro-economic policies.
- Promoting eco-industrial parks and regional infrastructure.
- Formulating policies for partnerships to expand markets for environmentally sound goods.
- Diverting waste from landfill to recycling and recovery facilities.
- Fostering a culture of science, innovation, and technology for policy development.
- Supporting research on statistical improvement, material flows, and resource productivity.
- Promoting local government cooperation for integrated production and consumption systems.
- Developing facilities to manage disaster waste in an environmentally sound manner.
- Advocating for a national approach to circular economic development.

<sup>13</sup> White, Franke, and Hindie (1995).

<sup>14</sup> UNEP (2024a).

<sup>15</sup> UNEP (2024a).

## II. Moving towards Zero-Waste

**Zero-waste policies aim to minimize waste generation and maximize resource efficiency. Implementing successful solutions requires a multi-stakeholder approach at both national and local levels.** While national initiatives bring a degree of scale and coordination, it is local government that can mobilize local resources to reflect national interests and priorities, enhancing vertical policy coherence; however, a key waste management challenge, predominantly affecting developing countries, is lack of resources such as human capacity, and access to funding and technologies to manage rapidly increasing waste quantities in an environmentally sustainable manner. Additionally, a lack of data presents significant issues for policymakers as they are not able to adequately plan for expansion of services, including waste management. Governments require greater knowledge, skills and data and overall capacity to promote an integrated solid waste management system that forms part of a circular economy.

### The Importance of Waste Management Data

**Data is critical to provide information on the current state of the waste system as well as future trends and the successes of waste management programmes.** However, an in-depth understanding of waste-related issues is hindered by the lack of relevant waste data, with particularly inadequate data collection in low- to middle-income countries.<sup>16</sup> The United Nations and international community have made significant progress in developing tools especially for municipal-level data collection, but more national data with comprehensive policymaking and investment is required to tackle a fast-growing challenge.



**TIMOR LESTE** : Women and children search a garbage dump for cans to sell. ©UN Photo/Martine Perret.

**Data from the United Nations Statistics Division's Country Files shows that higher income countries collect data on waste frequently, while data from low-income countries is approximately 15 years old.**<sup>17</sup>

The importance of this data is that it enables informed decision-making, allows for trends to be identified and hence resource allocation. Robust data also contributes to an enabling environment to attract financial investment.

#### Box 3: Waste-related SDG indicators

**11.6.1** Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated by cities

**12.3.1** (a) Food loss index and (b) food waste index

**12.4.1** Number of parties to international agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement

**12.4.2** (a) Hazardous waste generated per capita; and (b) proportion of hazardous waste treated, by type of treatment

**12.5.1** National recycling rate, tons of material recycled

**14.1.1** (a) Index of coastal eutrophication; and (b) plastic debris density

**Limited data availability also poses significant challenges for the waste-related Sustainable Development Goal indicators (Box 3).**

SDG 11 (Sustainable Cities and Communities), which includes urban solid waste data, has the most insufficient data of all SDGs.<sup>18</sup> SDG 12 (Responsible Consumption and Production) shows progress, but an acceleration is needed especially to close gaps related to key targets on national recycling and resource efficiency. On the other hand, SDG 14 (Life Below Water) shows specific challenges related to indicator 14.1 on marine plastic debris density.

<sup>16</sup> UNEP (2015).

<sup>17</sup> UNSD (2023a).

<sup>18</sup> UNSD (2023c).

**Determining the current status of waste management requires quantitative data on the life cycle of waste from collection to disposal.** Frequently, developing countries have significant data gaps. Examination of recent regional waste management outlooks<sup>19,20</sup> shows that there are 14 main data gaps in waste and resource management (Box 4). Progress towards sustainable waste management can only be effective when these gaps are filled.

#### Box 4: Primary data gaps

- **Accuracy** - It is not known whether the data being reported is estimated or measured, and if it is measured, the accuracy of the measurements and whether they are repeatable.
- **Classifications** - Common classifications of waste and waste types remain an issue.
- **Full cost accounting** - There is limited knowledge of the operational costs that the city sustains for MSW services. The cost of disposal is often only a small part of the cost of waste.
- **Indicators** - Indicators for getting more granular data are either absent or not widely used.
- **Informal sector** - The informal sector represents a significant part of the waste sector and often does not feature in official data, hence its contribution is not adequately captured.
- **Information management systems** - Recording and updating data in information management systems often has a considerable lag time.
- **Geospatial or remote sensing data** – Data collected using more innovative methods such as through satellite or Earth sensing can identify significant methane (CH<sub>4</sub>) plume emissions from space providing longitudinal and precise data on the anthropogenic emissions sources from waste, including in controlled and uncontrolled sites.<sup>21</sup>
- **Longitudinal data** - Data over a long period of time is most useful to observe trends, and to develop evidence upon which waste reduction interventions can be based.
- **Monitoring and reporting** - Often countries do not have sufficiently sophisticated systems to enable them to generate data.<sup>22</sup>
- **Standard definitions** - Along with classifications, standard definitions of what constitutes waste remain an issue. Waste is a generic term, and countries often adopt definitions in line with their needs.
- **Ward level data** - Data at levels that are more granular than citywide is often absent, such data would enable more tailored interventions to be implemented.
- **Waste collection emissions** - Greenhouse gas emissions due to motorized waste collections are generally classified under transport emissions rather than waste.
- **Waste destination** - Whether waste is dumped (legally or illegally), incinerated (with or without energy recovery and greenhouse emissions from processing), sent to landfill or diverted back into the circular economy through, for example, composting, all have important ramifications when considering programmes for waste reduction.
- **Waste other than MSW** - Waste streams like commercial and industrial, e-waste, plastics, trends and quantities of marine litter, hazardous waste quantities are often sparsely reported.

Source: <sup>21</sup> NASA Jet Propulsion Laboratory (2024)

<sup>19</sup> UNEP (2017).

<sup>20</sup> UNEP (2019a).

<sup>21</sup> NASA Jet propulsion Laboratory (2024) For more information see: <https://methane.jpl.nasa.gov/>

<sup>22</sup> UNEP IETC (n.d)



## A Critical Need for Capacity Development

**One of the key impediments to waste reduction and resource circularity is the lack of capacity within national and local governments, as well as the industry sector.** A staple feature of the gaps in effective waste management, as identified by various countries and United Nations organizations, is the lack of capacity at government level, both nationally and locally, to progress an integrated solid waste management system that forms part of a circular economy. Specific capacity gaps have been identified by several developing countries at the local government level.<sup>23</sup> These can be seen in Box 5.

### Box 5: Capacity Gaps Identified by Developing Countries

- Technical capacity to enforce hazardous waste regulations;
- Regulations implementation and guidelines development;
- Understanding each party's rights and responsibilities in managing waste through public-private-partnerships;
- Developing plastic recycling facilities or infrastructure to practice waste collection; and
- Inadequate knowledge within the changing national policy environment.

**Strengthening these sectors is fundamental to making progress. Without the right skills, any new programmes or infrastructure introduced will be, at best, sub-optimal, and, at worst, a complete failure.** The role of innovation, technology transfer and capacity building will be needed to drive the shift towards zero-waste, requiring the waste management systems to be efficient, equitable and environmentally sound.

**There have been advancements and plans to partially address this situation. There is a realization amongst several developing countries that public-private partnerships can be a pathway to improved solid waste management.**

Public-private partnerships can be challenging to establish but might present opportunities for infrastructure planning and improvements. There is no single model for public-private partnerships, but they tend to entail more operational and collaborative relationships than conventional contracting. Of particular importance is getting the appropriate governance structures in place.

**Governance issues feature strongly in the ability of developing countries to implement a waste legislative framework.** Many countries have legislative instruments that have enforcement and monitoring provisions, but they are often poorly administered. The absence of enforcement is often due to deficiencies in the capacity of national and local government to supply services or manage stakeholders in the private and community sectors including non-government organizations.

**Capacity-building in monitoring and enforcement at the national and local levels is often needed to improve legislative compliance to improve solid waste management practices which will require adequate funding.** There are different delivery models ranging from national or local government taking control, to industry stakeholders or community groups, churches and civil society organizations undertaking waste management actions. This is coupled with low levels of expertise of operators and competing priorities of government officials and departments which impede progress. Adding to this problem is the lack of capacity and incentives in the private sector in developing countries to introduce appropriate programmes and technologies to implement a transition to a circular economy.

<sup>23</sup> UNEP IETC (n.d).

**A key barrier for effective solid waste management in developing countries is the lack of infrastructure, outdated technology, or inadequate processing materials.** National and local governments need to have the capacity to assess the appropriateness of potential technologies, based on scale of operation envisaged, skills needed to operate and maintain the technology, markets for the end products and affordability. Other key challenges to enable technology transfer include access to finance, shortages of skilled labor to provide services related to the design, installation, and maintenance.<sup>24</sup> Table 1 provides a summary of some high and low technology solutions that can be utilized by developing countries to improve their waste management practices.

Table 1: Environmentally sustainable high and low technology solutions

Low Technology Solutions	High Technology Solutions
Animal feed production from biomass	Incineration for MSW*
Biogas digesters	Incineration with energy recovery*
Co-combustion in an industrial facility	Landfills: Sanitary
Composting biomass: Home composting	Material Recovery Facilities (clean)
Composting biomass: Windrow systems	Mechanical Biological Treatment
Controlled dumps	Sorter: Optical for material separation
Gasification for biomass	Sorter: Pneumatic for material separation
Hazardous waste: separation into hazard classes	
Hazardous waste: takeback systems	
Incineration: high-temperature, small-scale for medical waste	
Landfill gas capture systems	
Landfills: semi-aerobic systems (Fukuoka)	
Landfills: Inert substances	
Leachate management systems	
Material Recovery Facilities (dirty)	
Pyrolizer for wood	
Recyclables: Collection bins	
Recyclables: compactors	
Recyclables: grinders	
Sorter: Mechanical for material separation	
Sorter: Gravimetric for material separation	
Sorter: Magnetic for material separation	
Waste collection vehicles	
Waste Bins: Community	
Waste Bins: Individual households	
Waste Separation: Tipping floor	

*\*Note: Though these are not environmentally sustainable solutions, they can form a transitional solution that is better than some others, such as open dumping of waste.*

Source: UNEP (2015; 2018b; 2018c; 2019a).

**Several of the targets within the Sustainable Development Goals refer to technology transfer as one of the means of implementation, including Target 12.a (Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production).**<sup>25</sup> Movement from a linear society to a circular economy will require significant technological interventions; however, there are a number of essential factors that need to be considered for technology transfer. These factors can be seen in Box 6.

<sup>24</sup> UNEP (2018c).

<sup>25</sup> UNDESA (2024).

## Box 6: Essential Factors for Technology Transfer

- A sound policy and regulatory framework at the national level especially for Public Private Partnerships.
- Vertical cooperation between national and local governments.
- Government incentives such as tax breaks, subsidies, preferential financing, or expedited regulatory approval.
- Financing requirements as there are limited financing capacities in developing countries, especially at the local level where communities may lack adequate waste management services and existing infrastructure may be deteriorating due to poor maintenance.
- Capacity building across national and local governments and the private sector.
- A strong science-policy-business interface which can drive a technology-oriented or R&D oriented culture and infrastructure.



**SWEDEN:** An entrepreneur at his waste recycling facility views plastic waste sorted into colours and types for potential resale, providing a second life for plastics. © Sara Castro-Hallgren

**Having established the gaps in capacity, governance, and technology, the actions needed to progress are complex.** Implementing successful solutions requires a multi-stakeholder approach with the public sector at both national and local levels, the private sector and the informal sector working together.

**The key to advancement of the circular economy is action at the local level.** Local government's role is critical and includes taking into account the income level of constituents, the cultural context and the nature of the area, metropolitan or rural. Interventions that are effective in one context do not necessarily work in a different profile. Recommendations for expanding capacity in developing countries can be found in Box 7.

### Box 7: Recommendations for Expanding Capacity

- Identify the priority data gaps that must be addressed to advance a circular economy, enabling national and local governments to enhance their capacity for monitoring and data collection.
- National government to work collaboratively with local government. This will ensure that governments at various levels (e.g., metropolitan, municipal, district and rural) can share experiences and develop culturally and environmentally suitable programmes to move towards zero-waste in their jurisdictions.
- Programmes of action should include a mixture of goals that can be achieved quickly (typically focused on the lower parts of the waste management hierarchy – recycling to disposal), including the more aspirational, long-term ones (typically focused on prevention and reduction).
- Futureproof against changes in government policies by focusing on achievable, effective targets that directly benefit local communities.
- Build capacity at the local level so that appropriately sized technologies can be implemented, operated, and maintained. This also includes the capacity to assess performance and improvements in waste management.
- Develop cooperation across national government agencies that work in the waste sector so that a coordinated and manageable programme is rolled out to local governments.
- Organize sustainable funding to ensure that programmes are successfully implemented.
- Ensure effective, direct communication with relevant stakeholders and general public and foster community engagement and participation, focusing on marginalized groups and women in the informal sector.
- Promote inclusive decision-making processes to ensure diverse perspectives and culturally sensitive waste reduction strategies.

### The Role of Social and Cultural Factors

Any successful integrated waste management programme requires significant emphasis on social and cultural factors. When designing waste management programs, it is critical that governments:

- **Prioritize a culturally sensitive and collaborative approach** for stakeholder engagement.
- **Involve local communities** (including the informal sector) and prioritize programs that create opportunities for local communities and underprivileged segments of communities.
- **Provide stability for informal workers** through policies and legal frameworks to improve their working conditions, including equal pay for equal work.
- **Address cultural attitudes towards waste** to tailor interventions that resonate with local values and norms.

## Formulating Policy

**Policy is a crucial tool for accelerating solutions to the waste crisis.** Policy at the national level needs to align between ministries and departments with different waste management responsibilities. These tools also need to align with those at the local level. Policymakers have a variety of tools available to them,<sup>26</sup> these tools can be seen in Box 8. The effectiveness of these tools is greatest when used in combinations that are appropriate to the context, culture and socio-economic conditions of the country under consideration.

### Box 8: Tools for Policymakers

- **Data and information collection** for analysis and dissemination that can influence behaviours and decision making;
- **Economic instruments** – this includes financial incentives and disincentives, such as extended producer responsibility (EPR) or end-of-life financial incentives;
- **Education and training** of the producers, consumers, the general public and others;
- **Executive decision making** (in close consultation with affected parties);
- **Harnessing the commitment of the community** and the non-government sector – this includes local governments, private businesses, and the informal sector;
- **Regulation and enforcement** (examples include marine and port regulations for waste dumping or requiring environmental impact assessments before construction of landfills);
- **Voluntary agreements** (with industry groups and the industrial sector)

**It is important to note that appropriate sector engagement is fundamental to accelerating waste policy implementation.** The starting point for an improvement in solid waste management practices is for national governments to identify key stakeholders and ensure their engagement in initiatives through distribution of responsibilities. Dialogue between national and local governments should be extensive and ongoing as national governments have the key to providing legislative support and engaging with national organizations and businesses where needed while local government has the connections to unlock local support.

## Financing a Waste to Resources Transition

**The economic benefits of instituting an integrated waste management system extend across various facets of the economy.** Investing in environmentally sound waste management will enable the creation or expansion of a formal waste industry with associated decent employment, environmental management, and advancement opportunities. Important aspects for financing waste management initiatives include full cost accounting, gaining the finance, and investigating financial incentives.

**Development of a case for finance should include a full cost accounting approach to highlight the economic, social, and environmental costs and benefits.** To move to a zero-waste society, a price component needs to be included at all stages of the life cycle, and a system of incentives and disincentives can be utilized to help guide people's choices. To consider the full cost of waste, accounting needs to start at the beginning of the life cycle, from the extraction of raw materials from the Earth (air, water, and land) that are then transformed through manufacturing, transported, used, and finally reach the end-of-life stage. It also needs to include environmental and social costs of activities, as well as the health effects on disposal workers and the surrounding communities.

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<sup>26</sup> UNEP and UNITAR (2013).

**A variety of sources can provide means to fund waste management programmes, including international finance, private sector participation and community contributions.** In addition, incomes from pricing mechanisms (i.e., local fees from waste handling and/or landfilling and extended producer responsibility schemes) can be ring-fenced for investments in waste management improvement projects. Public-Private Partnerships should also not be overlooked as they represent an opportunity for private sector engagement.

**The scale of funding needed depends on the desired outcomes.** Each of the options suggested above needs to be implemented in a way that is culturally appropriate for the target community. It is also important the money collected under the schemes, or any waste management charges, is ringfenced for reinvestment back into the sector. Box 9 highlights recommendations and considerations for financing waste management programs.

### **Box 9: Recommendations for Financing Waste Management Programs**

- A full cost accounting approach should be adopted when considering projects in order to better understand the economic, social and environmental costs and benefits of plans.
- A balanced package of projects, from small to large, at the local and national levels should be considered.
- Opportunities for funding at the local level should include taxes and charges as well as community support for small businesses to help them get started or expand.
- Funding programmes for sustainable waste management at national level should be aligned with government priorities, as well as international ones. National funding mechanisms should consider inclusion of incentives and disincentives to encourage behaviour change to better waste management practices.



**MADAGASCAR** : Andralanitra dumpsite, Antananarivo. © Emily Carroll

*With 2 billion tons of municipal solid waste generated annually and projections indicating a potential doubling of this figure by 2050, the severity of the pollution crisis cannot be overstated. This striking reality urgently calls for national governments to accelerate progress on formulating and implementing evidence-based policies for a waste to resources approach.*

### III. Next Steps for Policymakers

**Developed countries have made significant progress toward a circular economy, while many developing countries struggle with basic services.** Effective waste management requires coordinated efforts across national and local levels, integrating waste as a resource throughout its life cycle. Involving the informal sector and addressing socio-economic differences are critical for successful waste management policies.

**Many developing countries have national policies, including legislation, to address solid waste management, but its transition to the local level is not as advanced.** To increase policy uptake at the local level, support taking account of different societal contexts between countries and urban-rural divides is needed. In addition, waste responsibility at national government level is often handled by different ministries that effectively split policy and operational responsibilities, requiring greater inter-ministerial coordination for concerted action on the growing waste volumes many countries face.

**At the local level, there is a need for coordination between government, stakeholders representing businesses from throughout the life cycle of products, and the scientific community, to enable creation of conditions that deliver on successful programmes.** One of the conditions to take into account is that waste is not only generated at the end of use stage, but also at all stages of the life cycle. Hence, to increase the circularity of materials and reduce waste, a life cycle approach should be taken. Additionally, communities should be encouraged to view waste as a resource.

**In many developing countries a key stakeholder providing waste services at local level is the informal sector.** Collecting data on informal waste collection and formalizing these workers into new waste treatment infrastructure is a complex and context-specific process. The informal sector is often composed of women, disadvantaged groups, and minorities. Their input is vital, as collectively they operate as a significant portion of the waste sector, and ways need to be found to integrate them into policies and investments in the transition to a circular economy.

**There is a need to enhance source segregation.** Segregation of waste should occur as close to the point in the life cycle where it is generated (e.g. production or collection) as possible. Landfill mining should also be considered as a means of reclaiming valuable materials. This can take place at both the small scale (through the informal sector) and large scale (through the formal sector).

**Limited data availability poses challenges for waste-related SDG indicators.** A systems approach, focusing on the entire life cycle of waste and leveraging data for behavioural change, is essential. To address the waste crisis, policy makers should create evidence-based public policies that guide the adoption of science, technology, and innovation, along with financing mechanisms and data management capacities. Box 10 highlights the key actionable steps that can be taken by policymakers to accelerate progress towards a zero-waste future.

## Box 10: Key Actionable Steps

- Adopt a waste-to-resources mindset across government and society by adopting whole-of-government and whole-of-society approaches.
- Explore value chains to ascertain where waste is occurring. This exploration should include all aspects of waste including a multimedia approach (solid, liquid, gas and energy).
- Set integrated solid waste management as a national priority, including for growing sources of waste such as plastics and waste from electrical and electronic equipment (WEEE or e-waste).
- Assess the current state of solid waste management, through all stages of the lifecycle, from national to local levels.
- Ascertain current capacity and needs for governance, science and technology, finance and data management at all levels.
- Invest in technological innovation to address waste challenges and unlock opportunities for sustainable waste reduction.
- Engage stakeholders throughout the process, including the informal sector and vulnerable groups.
- Explore public-private partnerships wherever it is appropriate to have them, and particularly if the public sector has the capacity to be a full partner.
- Facilitate knowledge-sharing and peer learning opportunities among national and local governments facing similar waste management challenges.
- Define legislation and regulation needs, to support fulfilment of national priorities and international commitments.
- Prepare national budgets and explore funding mechanisms, including through innovative sources.
- Monitor and ensure compliance, including at local level, adopting innovative data sources and methods such as through the use of digital technologies and remote sensing.

**The adoption and implementation of these measures will facilitate the transition to sustainable waste management and resource circularity, contributing to global environmental, economic, and social benefits.** As data and public governance is strengthened globally, countries, communities and households will be able to truly measure the shift towards zero-waste mitigating humanity's footprint on the Earth for generations to come.



**REPUBLIC OF KOREA:** National to local efforts – In 2015, Seoul and Incheon, Gyeonggi Province and the Ministry of Environment embarked on a journey to transform Sudokwon Landfill, Incheon, one of the largest in the world, from a brown landfill site to a beautiful public park. © SLC



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