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Collaboration | Commitment | Circularity | Community

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WASTE REDEFINED

A Practical Toolkit to Sustainable Waste Management Practices in Kenya

2nd Edition | 2025

Foreword

Dr. Mamo B. Mamo, PhD, EBS
Director General
National Environment Management Authority (NEMA)

The publication of the "Waste Redefined: A Practical Toolkit for Sustainable Waste Management Practices in Kenya" marks an important step in advancing Kenya's journey toward a clean, healthy, and circular economy. Building on the foundations of the first Waste Collectors' Toolkit (2023), this second edition translates the country's progressive waste management policies into practical, actionable steps that empower all actors, government, private sector, and communities alike, to turn waste into opportunity.

Kenya's Sustainable Waste Management Act (2022) and Extended Producer Responsibility (EPR) Regulations (2024) have provided an ambitious framework for managing waste sustainably. Yet, the greatest challenge lies not in policy design, but in implementation.

This manual bridges that gap. It offers clear guidance, from the establishment of aggregation centers and data tracking systems to occupational safety protocols for waste pickers and compliance tools for producers.

Jointly developed by the Kenya Extended Producer Responsibility Organization (KEPRO) and Danish Industry (DI) East Africa, with technical input from NEMA, county governments, recyclers, producers, and civil society, this toolkit embodies Kenya's spirit of partnership and inclusivity. It recognizes that effective waste management depends on empowering the people who work daily at the heart of the system, these being the waste collectors, recyclers, and community-based organizations, integrating them into formal structures, and providing access to training, resources, and markets.

At its core, Waste Redefined is more than a manual; it is a blueprint for transformation. It encourages counties to harmonize practices, producers to adopt circular business models, and communities to champion behavioural change. By embedding environmental education and awareness into every page, this manual ensures that sustainability becomes not just a policy objective but a lived practice across Kenya.

As we move toward a future defined by innovation, inclusion, and accountability, this toolkit stands as a vital resource to help operationalize Kenya's zero-waste vision. I invite all users, policy-makers, practitioners, and citizens, to embrace its guidance and to work together to make "Waste Redefined" not just a title, but a national reality.

Foreword

On behalf of the National Environmental Complaints Committee (NECC), I am honored to introduce this manual, developed by the Kenya Extended Producer Responsibility Organization (KEPRO). This publication marks a significant milestone for KEPRO, capturing its leadership in promoting Extended Producer Responsibility (EPR) and supporting Kenya's transition toward a circular economy, especially in waste management.

This manual goes beyond being a reference document. It is a practical guide designed to equip waste collectors, producers, and community stakeholders with clear, actionable strategies for improving waste segregation, compliance, and recycling. It reflects the realities of our local context, bringing together lessons from the field, tested approaches, and tools that can be immediately applied to strengthen efficiency and accountability in the waste value chain.

For NECC, whose mandate is to safeguard environmental rights and ensure compliance with environmental laws, this manual demonstrates how collaboration between regulators industry, and citizens can drive meaningful change. By documenting KEPRO's experiences and innovations, it not only empowers practitioners but also sets a benchmark for other sectors seeking to embed sustainability in their operations.

I congratulate KEPRO on this achievement and urge all stakeholders to actively use the manual as a working resource. It is my hope that this effort will inspire greater responsibility, innovation, and collective action in tackling the waste challenge and protecting the environment for generations to come.

Mary Njogu,
Committee Secretary
National Environment Complaints Committee

In nature, nothing is wasted.

> This manual translates policy into actionable steps, from establishing aggregation centers to applying safety protocols for waste pickers and using data templates to track recovery rates.

Preface

This publication is a follow-up of the Waste Collectors Toolkit developed in 2024. As a new edition, this practical guide has been developed to address a persistent and practical gap in Kenya's waste management landscape: the absence of clear, standardized guidance on implementing the country's growing body of waste-related laws and policies. While frameworks such as the Sustainable Waste Management Act (2022) and the Extended Producer Responsibility (EPR) Regulations (2024) have set a strong foundation, there remains limited technical direction, especially for county governments, informal waste actors, and producers, on how to translate these requirements into action.

The manual fills this void by offering practical, hands-on tools and guidance rooted in Kenya's lived waste management realities. It responds to the need for harmonized approaches across counties, clarity for producers on compliance, and structured inclusion of informal waste actors in formal systems. This manual translates policy into actionable steps, from establishing aggregation centers to applying safety protocols for waste pickers and using data templates to track recovery rates.

Unlike general policy reviews or theoretical frameworks, this manual is grounded in real-world experience. It draws from extensive stakeholder consultations, pilot initiatives, and direct engagement with the people and institutions managing Kenya's waste systems every day.

What distinguishes this edition is its sharp focus on functionality and inclusion. It reflects a growing understanding that infrastructure alone cannot achieve waste management; it requires empowered actors, coordinated systems, and clear roles for everyone from producers to grassroots collectors. It also aligns closely with Kenya's shift toward a circular economy and a just transition, with tools to ensure no actor is left behind.

This manual is designed for practical, day-to-day use across sectors and counties. Whether you are developing a county waste management plan, operationalizing a producer's take-back scheme, or organizing a waste picker cooperative, this resource is structured to support your work in real time.

We invite all stakeholders across public institutions, private enterprises, and community groups, to use this manual as a practical guide to building more effective, inclusive, and sustainable waste systems in Kenya.

Message from the Chairperson

I am pleased to introduce the second edition of KEPRO's publication: Waste Redefined – A Practical Toolkit to Sustainable Waste Management Practices in Kenya. This updated manual is not simply a collection of best practices; it reflects the lessons we've learned on the ground, the progress we continue to make, and the systemic shifts required to move Kenya toward a circular and inclusive waste economy. The first edition of the Waste Collectors' Toolkit (2023) reached over 5000 waste collectors across 41 counties. It was widely used in training sessions, capacity-building workshops, and by county governments as a reference for compliance with the Sustainable Waste Management Act. Feedback from users highlighted that it simplified complex legal and technical concepts into practical steps for day-to-day operations, resulting in better record keeping, improved safety practices, and stronger engagement with Producer Responsibility Organizations (PROs). The second edition builds on these successes but also responds to emerging needs in the sector. Its main objectives are to:

- Update content in line with new regulations and market dynamics.
- Include expanded guidance on segregation at source, Extended Producer Responsibility (EPR), and circular economy opportunities.
- Make the toolkit more inclusive by reflecting the role of informal actors and SMEs.

In recent years, Kenya's waste management landscape has changed significantly. National legislation has advanced, from the ban on single-use plastics to the enactment of the Sustainable Waste Management Act, 2022, and the EPR Regulations, 2024. However, we know from experience that policies are only as effective as their implementation. This toolkit was created in response to that reality. It is designed to help bridge the persistent gap between policy and practice, particularly at the county level, where waste management responsibilities are most visible and pressing. Furthermore, the toolkit provides practical, context-specific tools and frameworks for a range of users, including county governments, informal waste actors, producer responsibility organizations, educators, and waste management operators. It equips actors with knowledge on segregation, occupational health and safety, aggregation, cooperative formation, and data collection areas where structured guidance has long been missing.

Over the past year, we have seen promising signs of change. Take-back schemes initiated by producers are beginning to take root. Youth-led school campaigns are generating awareness and mobilizing action around recycling. Once invisible in policy, waste picker groups are organizing into cooperatives and participating in the formal value chain. These developments are not accidental, they result from deliberate collaboration, targeted investment, and policy alignment. This toolkit seeks to consolidate those successes and scale them across the country. I want to thank every contributor to this edition, from government officials and recyclers to grassroots organizers and technical experts. Special thanks go to our Danish Industry East Africa partners, whose support has made this manual a practical, high-impact resource for Kenya and the broader region. We cannot afford to treat this publication as a compliance manual alone. It is a roadmap for collectively shifting Kenya from a culture of disposal to one of recovery, responsibility, and resilience. The future of waste in Kenya does not lie in landfills; it lies in product redesign, regenerative systems, data-informed planning, and empowered communities. As KEPRO, we are committed to walking this path alongside producers, policymakers, informal sector actors, and the public. Let this toolkit serve as a call to action for all stakeholders to accelerate Kenya's transition to a just, zero-waste future.

Stephen Muli

Stephen Muli
Board Chair,
Kenya Extended Producer Responsibility Organization (KEPRO)

Message from DI East Africa

Waste Redefined: A Practical Toolkit to Sustainable Waste Management serves as a guide for all stakeholders in the waste value chain. A lot has happened in Kenya the past year on the regulatory side, making it more complicated for packaging producers to comply but at the same time creating more opportunities for recyclers and waste collectors as the instituted value of waste is going up.

Apart from monetizing waste to increase collection, a special focus is on creating more formal jobs in the waste management industry. We need to improve the working conditions for waste collectors to create more decent and worthy jobs that can provide livelihoods.

For this to succeed, KEPRO is working actively with trade union bodies, and this toolkit includes road maps for how CBOs and workers can organize themselves. For this, we are also thankful for the partnership with the Danish Trade Union Development Agency.

KEPRO and Danish Industry have partnered on this agenda since the formation of KEPRO. KEPRO has since become the primary packaging PRO in Kenya.

To emphasize that sustainable waste management is an industry, we are also proud to support KEPRO in their accelerator programme, which invites in cohorts of Kenyan waste collection and recycling companies to train them in business development.

Klaus Lehn Christensen

Klaus Lehn Christensen,
East Africa Manager,
The Confederation of Danish Industry

List of Acronyms

CBO	Community Based Organization
COTU	Central Organization of Trade Unions (Kenya)
DI	Danish Industry East Africa
EPR	Extended Producer Responsibility
GDP	Gross Domestic Product
ILO	International Labour Organization
IWS	Informal Waste Services
KEPRO	Kenya Extended Producer Responsibility Organization
KPP	Kenya Plastic Pact
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
PPE	Personal protective equipment
PPP	Public-Private Partnership
PRO	Producer Responsibility Organization
SDG	Sustainable Development Goals
SWM	Solid Waste Management
SWMA	Sustainable Waste Management Act
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-Habitat	United Nations Human Settlements Programme (formerly UNCHS (Habitat)
DFIs	Development Finance Institutions
EPROK	Electronic-waste Producer Responsibility Organization of Kenya
HAPROK	Hazardous Waste Producer Responsibility Organization of Kenya
ICIS	Independent Commodity Intelligence Services
IWAS	Informal Waste Actors
JICA	Japan International Cooperation Agency
LME	London Metal Exchange
MFIs	Microfinance Institutions
OECD	Organisation for Economic Co-operation and Development
WSR	Waste Shipment Regulation

Acknowledgements

We extend our deepest gratitude to all stakeholders who played a crucial role in developing this manual. Your time, effort, and expertise have made this resource possible and relevant.

At KEPRO, we value the spirit of collaboration reflected in this work. We appreciate the national and county government representatives whose insights continue to guide policy and implementation, as well as the private sector stakeholders whose perspectives on compliance and innovation have strengthened policy development.

We thank the waste management experts, environmentalists, and professionals whose input has shaped this toolkit into a comprehensive and practical resource. We also recognize the waste collectors, the backbone of the waste management ecosystem, whose lived experiences provide a grounded understanding of the sector's strengths, opportunities, and challenges.

We are grateful to the organizations and individuals who contributed their expertise, including JICA, Nairobi Metro CBOs Waste Management Network, Hand in Hand East Africa, NCBA, Armaan Ltd, IOPPK, EPROK, MTAKA, Media Council of Kenya, COTU, County Government of Kiambu, NEMA, and KEPRO staff, especially Ms. Cynthia Wainaina, who led the development of this publication.

Waste is only waste if it's misplaced.

Executive Summary

About the Toolkit

Waste Redefined: A Practical Toolkit to Sustainable Waste Management in Kenya Second Edition (2025) is a hands-on, field-tested resource designed to accelerate Kenya's transition toward a circular, inclusive, and zero-waste economy. Jointly developed by the Kenya Extended Producer Responsibility Organization (KEPRO) and Danish Industry (DI) East Africa, this toolkit addresses the persistent implementation gap between Kenya's progressive waste legislation and practical, on-the-ground action.

This edition builds on the success of the Waste Collectors toolkit, published in 2024, and responds to new challenges and opportunities presented by the Sustainable Waste Management Act (2022) and the Extended Producer Responsibility (EPR) Regulations (2024). Unlike traditional policy manuals, it is deeply practical, crafted with the direct input of county governments, National Environment Management Authority, Central Organization of Trade Union, informal waste actors, producers, recyclers, and civil society.

Users of the Toolkit

The toolkit supports actors across the value chain to:

- Design systems that meet compliance thresholds.
- Establish inclusive partnerships that bring informal waste workers into formal frameworks.
- Access templates and checklists to improve compliance efficiency.
- Make data-driven decisions to improve efficiency and environmental outcomes.

Purpose of the Toolkit

The toolkit is intended to serve as a national implementation guide, aligning technical practices with regulatory obligations, local realities, and Kenya's circular economy aspirations. Its specific objectives include:

1. **Bridging Policy and Practice**
   Transform complex laws into clear, implementable steps that counties, producers, waste pickers, and recyclers can follow.

2. **Supporting EPR Compliance**
   Equip producers and importers with the tools to meet legal obligations under the 2024 EPR Regulations, including registration, reporting, packaging design, and financing waste recovery.

3. **Formalizing Informal Waste Actors**
   Provide pathways for Community-Based Organizations (CBOs), cooperatives, and individual waste pickers to access recognition, protection, and economic opportunities.

4. **Standardizing Waste Management Approaches**
   Harmonize practices across counties especially on segregation at source, aggregation center development, data reporting, and contractor engagement.

5. **Strengthening Circular Economy Ecosystems**
   Enable investment in reuse, recycling, composting, and waste-to-energy systems by demystifying technical and financial requirements.

6. **Empowering Local Action**
   Give community groups, schools, and grassroots innovators the tools to drive behavioral change, build local resilience, and become key actors in the zero-waste transition.

Structure of the Toolkit

Policy and Legal Frameworks

- Overview of all key national laws and regulations
- Alignment with SDGs and global best practices
- Breakdown of compliance-timelines, mandates and stakeholder roles

People: Actors and Inclusion

- Mapping of key actors: informal waste pickers, transporters, PROs, county officials
- Just transition principles and how to integrate informal actors: Formalization checklist
- CBO registration guide, and social protection.

Progress: Circular Economy and EPR implementation

- How to register as a producer/ importer
- Joining KEPRO and declaring volumes
- Building take-back schemes and public awareness programs. Monitoring, reporting and financing tools

Tools and Templates

- Sample MoUs, contracts, operating procedures, safety protocols and financial plans
- CBA clause library, OSH checklists, price monitoring dashboards

Innovation and Case Studies

- Innovation and case studies:
  Case studies from Nairobi Metropolitan CBOs Network, Mtaka, Danish Industry

Call to Action

- Role-specific action points for national government, counties, producers: communities and NEMA
- Advocacy messages to catalyze change across levels

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Introduction

Knechtel (2007) famously describes waste as a mirror of humanity, a reflection of what we consume and how we live, value, and create systems to sustain our lifestyles. Waste is an inevitable byproduct of human activity. As long as consumption exists, so too will waste. However, while waste may be constant, how we manage it is not. It evolves with social structures, economic systems, technological innovations, and policy choices.

According to the United Nations Environment Programme (UNEP), approximately 2 billion tons of municipal solid waste are produced yearly. The Global Waste Management Outlook 2024 further highlights that this number will rise to 3.8 billion tons by 2050. This dramatic increase poses a significant challenge for policymakers, businesses, and communities, especially in regions grappling with limited infrastructure, inadequate funding, and environmental degradation.

The transition from agrarian to industrial societies, particularly since the Industrial Revolution, has exponentially increased waste volumes. The linear economic model, based on extraction, production, consumption, and disposal, has driven high material throughput, often without accounting for the environmental costs.

This has led to a culture of disposability and overconsumption in high-income countries, with per capita waste generation far exceeding that of lower-income nations. However, many countries have invested heavily in waste management systems, from stringent landfill regulations to advanced recycling and waste-to-energy technologies.

In contrast, lower-income regions face a paradox, particularly in parts of Africa and Asia. They generate less waste per capita but carry a disproportionate share of the environmental and public health burdens associated with poor waste management.

Rapid urbanization, population growth, and changing consumption patterns outpace infrastructure development. Informal settlements and inadequate service delivery mean that waste often ends up in open dumpsites or rivers or is burned. Such practices harm both people and the planet.

Kenya, like many other African nations, is at a pivotal moment. With a population projected to double by 2050 and urban areas expanding rapidly, the country faces rising pressure on its waste systems. While essential, economic growth brings increased demand for goods and services, many of which are packaged in difficult or costly materials to dispose of safely. The affordability of single-use plastics and non-recyclable products adds to the challenge.

Despite these issues, there are signs of progress and growing recognition that waste can be a resource, not just a problem to be managed. The last decade has seen a noticeable shift from take-make-dispose models to more circular approaches focused on reuse, recycling, and recovery. Businesses are investing in sustainable packaging and take-back schemes. Citizens are participating in clean-up campaigns and source segregation initiatives. Governments are reforming legislation to embed circular economy principles into national frameworks.

“ It is about moving from a world burdened by waste to one that sees waste as a driver of innovation and sustainability.”

However, this transition is not without hurdles. It requires robust policy support, inclusive stakeholder engagement, infrastructure investment, and behavior change at every level. Moreover, it also offers immense opportunities: new green jobs, cleaner cities, and more resilient communities.

As this toolkit will show, achieving sustainable waste management is not just about building better infrastructure; it is about rethinking systems, empowering people, and closing the loop between what we consume and discard. It is about moving from a world burdened by waste to one that sees waste as a driver of innovation and sustainability.

1.1 Regulatory Frameworks Towards a Zero Waste Future in Kenya

Kenya has made significant strides in transforming its waste management landscape in recent years, propelled by growing environmental awareness, international commitments, and homegrown policy innovation. At the heart of this transformation is the shift from reactive waste handling to proactive, sustainable solutions grounded in circular economy principles and zero waste.

A landmark moment came in 2017, when Kenya implemented a bold ban on single-use plastic carrier bags. This decisive move, widely lauded as one of the most progressive environmental actions on the continent, signaled the beginning of a new chapter in national waste governance. It catalyzed a broader dialogue on plastic pollution, reshaped consumer behavior, and compelled manufacturers to rethink packaging design and material use.

Building on this momentum, the Kenyan private sector industry collaborated with the Kenya Association of Manufacturers to develop the Kenya Plastic Action Plan[1]. The plan is a comprehensive strategy to eliminate plastic waste leakage into the environment. It outlines goals such as designing out unnecessary plastic, increasing recycling rates, and fostering investment in local recycling infrastructure. Furthermore, it positions the private sector not merely as a pollution contributor but as a key driver of circularity.

The next policy leap came with the enactment of the Sustainable Waste Management Act (SWMA) in 2022, a landmark legislation redefining Kenya's waste policy landscape. The Act emphasizes waste as a resource and integrates the principles of zero waste, inclusivity, and circularity. Among its key provisions are:

Mandatory segregation of waste at source.

County-level development of Integrated Waste Management Plans (IWMPs)

Formal recognition of waste pickers and their integration into the waste value chain.

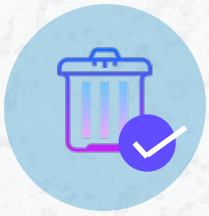
Establishment of Material Recovery Facilities (MRFs)

> Kenya's policy direction reflects a clear commitment to tackle the growing waste crisis not through incremental fixes but through systemic transformation.

[1]https://kam.co.ke/kam-launches-kenya-plastic-action-plan/

A landmark moment came in 2017, when Kenya implemented a bold ban on single-use plastic carrier bags.

Incentives for private sector participation and innovation.



Creation of a Waste Management Council to guide implementation and monitor compliance.

These regulations formalized the concept of lifecycle accountability, making it mandatory for producers to take responsibility for the waste generated by their products. This marked a critical shift from voluntary environmental stewardship to enforceable obligations. It also led to establishing Producer Responsibility Organizations (PROs) like KEPRO, which serve as collective platforms for managing post-consumer waste. These progressive reforms culminated in the enactment of the Extended Producer Responsibility (EPR) Regulations' gazettement in 2024 under the Environmental Management and Coordination Act (EMCA).

Evidently, Kenya's policy direction reflects a clear commitment to tackle the growing waste crisis not through incremental fixes but through systemic transformation. Supporting this shift are complementary initiatives such as the Draft National E-Waste Management Strategy, which targets the fast-growing threat of electronic waste, and Kenya's alignment with global conventions like the Basel Convention on the control of hazardous waste.

These regulatory advances offer environmental protection and unlock new economic opportunities while safeguarding public health and ensuring a just transition for informal waste workers. By embedding sustainability into product design, encouraging stakeholder collaboration, and strengthening accountability mechanisms, Kenya is laying the foundation for a truly zero-waste future. The journey will require sustained political will, strategic investment, and collective action. However, the direction is clear: Kenya is moving from managing waste as an afterthought to designing waste out of the system altogether.

1.2 Breakdown of Legislation

Kenya's waste management framework is grounded in robust laws and policies that promote environmental protection, public health, and circular economy principles. These laws span the Constitution, national acts, environmental regulations, and county-level mandates. Together, they form the legal foundation for sustainable waste management practices nationwide.

The Constitution of Kenya, 2010

The supreme law of the land embeds environmental rights and responsibilities:

- Article 42: Guarantees every person the right to a clean and healthy environment.
- Article 69: Obligates the State to ensure sustainable exploitation and management of natural resources.
- Article 70: Provides citizens with the legal recourse to seek redress in cases of environmental harm.

Environmental Management and Coordination Act (EMCA), Cap 387

The principal legal instrument for environmental protection and management.
Establishes the National Environment Management Authority (NEMA) and provides for:

- Environmental Impact Assessments (EIAs).
- Licensing of waste transporters and disposal sites.
- Penalties for pollution and improper waste handling.

Environmental Management and Coordination (Waste Management) Regulations, 2024

A key regulation for managing waste across Kenya.

- Classifies waste into hazardous, biomedical, industrial, organic, and recyclablecategories, with clear segregation requirements.
- Mandates licensing and compliance for waste transporters, disposal sites, treatment plants, and biomedical waste operators.
- Defines responsibilities for waste generators, transporters, and site operators, emphasizing cleaner production, safe handling, and recycling.
- Establishes rules for hazardous and biomedical waste management, supported by EIAs, audits, and a National Waste Information System for tracking.

Environmental Management and Coordination (E-Waste) Regulations (Draft)

Focused on the management of electronic and electrical waste

- Introduces Extended Producer Responsibility (EPR) for electronics producers and importers.
- Establishes safe collection, treatment, and disposal procedures for e-waste.

Environmental Management and Coordination (Management and Control of Plastic Packaging Materials) Regulations, 2024

In response to plastic pollution, these regulations:

- Ban the manufacture, importation, and use of plastic carrier bags.
- Encourage alternatives such as reusable and biodegradable packaging materials.

The Sustainable Waste Management Act, 2022

A transformative law guiding Kenya's transition to a circular economy.
Repeals parts of the 2006 regulations and strengthens institutional mechanisms.
Mandates:

- Segregation of waste at source.
  County development of Integrated Waste Management Plans (IWMPs).
- Establishment of Material Recovery Facilities (MRFs).
- Promotes inclusion of informal waste pickers.
- Creates the Waste Management Council for national oversight.

The Sustainable Waste Management (Extended Producer Responsibility) Regulations, 2024

Builds on the 2020 EPR framework with stricter enforcement and oversight. Requires:

- Producer registration and reporting.
- Waste recovery and recycling targets.
- Support for eco-design and sustainable packaging.
- Strengthens collaboration between producers, recyclers, and aggregators.

Public Health Act (Cap 242)

Links waste management to public health protection.
Section 115: Deems improper waste disposal a public nuisance.
Empowers local authorities to enforce sanitation and cleanliness standards.

Occupational Safety and Health Act (OSHA), 2007

Addresses waste handling and disposal in workplaces.

- Ensures safe disposal of hazardous and medical waste.
- Protects workers from exposure to dangerous materials.

County Governments Act, 2012

Devolves waste management responsibilities to county governments. Counties are mandated to:

- Provide solid waste services.
- Develop county-level waste management laws aligned with national policy.

Complementary Strategies and Policies

a. National Solid Waste Management Strategy (2015)

- Promotes the 3Rs: Reduce, Reuse, Recycle.
- Provides a roadmap for improving municipal waste systems.

b. National Sustainable Waste Management Policy (2021)

- Anchors zero waste principles in the national vision.
- Supports technology adoption and inclusive participation.

c. Kenya Vision 2030

- Environmental sustainability, including solid waste management, should be placed under the Green Economy Pillar.

1.3 Linking Waste Management to the Sustainable Development Goals (SDGs)

Since their adoption at the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012, the Sustainable Development Goals (SDGs) have provided a comprehensive roadmap for countries to achieve sustainability across multiple sectors. Each goal includes specific targets, making it possible to draw clear linkages between the SDGs and various areas of development.

In the context of waste management, while Goal 11, Sustainable Cities and Communities, directly addresses urban waste challenges, sustainable waste practices also contribute significantly to several other goals. These cross-cutting impacts are illustrated below.

SDG 1: No Poverty

Many informal waste workers earn low, unregulated wages with no job security. Fair pay and better working conditions can reduce poverty and support decent livelihoods.

SDG 2: Zero Hunger

Effective waste management helps tackle food waste, which affects global hunger. Large amounts of food are lost from farm to fork, while many people remain food insecure. Better sorting, redistribution, and composting can reduce waste and improve food access.

SDG 3: Good Health and Well-being:

Poor waste management exposes communities and waste workers to health risks such as infections, respiratory issues, and injuries. Safe handling, proper disposal, and protective measures help reduce these risks and promote healthier living environments

SDG 4: Quality Education

Integrating waste management into all levels of education builds awareness and develops technical skills. This strengthens professional capacity and promotes sustainable practices from an early age.

SDG 5: Gender Equality

Women, especially in low-income communities, are often disproportionately affected by poor waste management and face barriers to participating in waste management jobs. Promoting gender equality in waste management can ensure women have equal access to employment opportunities, training, and decision-making roles, improving both their livelihoods and community well-being

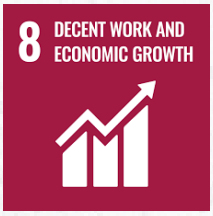
SDG 6: Clean Water and Sanitation

Improper waste management can contaminate water sources, leading to health issues and environmental degradation. Conversely, effective waste management reduces pollution and promotes proper sanitation, improving overall public health and water quality.

SDG 7: Affordable and Clean Energy

Waste management can contribute to clean energy by utilizing waste-to-energy technologies to generate electricity and heat. This helps reduce reliance on non-renewable energy sources, making energy more sustainable and accessible.

SDG 8: Decent Work and Economic Growth



Sustainable waste management can create meaningful job opportunities, particularly in recycling and waste-to-energy sectors. By formalizing the waste industry and improving workers' conditions, it not only boosts local economies but also ensures safe, fair, and sustainable employment for waste workers

SDG 9: Industry, Innovation, and Infrastructure

Waste management encourages the growth of innovative technologies, such as advanced recycling processes and waste-to-energy systems. Investing in modern waste infrastructure enhances urban resilience, reduces environmental impact, and supports the development of green technologies in industries.

SDG 10: Reduced Inequality

Marginalized communities often bear the brunt of poor waste management, facing inadequate sanitation and higher exposure to environmental hazards. Ensuring fair waste services, creating job opportunities in waste management for these communities, and addressing their specific needs can help reduce these disparities and promote social inclusion.

SDG11: Sustainable Cities and Communities

Inefficient waste management in cities leads to pollution, overcrowded landfills, and health risks. By implementing adequate waste segregation, recycling, and waste-to-energy initiatives, cities can reduce their environmental footprint, improve public health, and build more sustainable and resilient communities.

SDG 12: Responsible Consumption and Production

A circular economy mirrors consumption patterns that reduce waste and prioritize the sustainable use of resources, supporting responsible production and consumption. To achieve this, behavior change should be the center of creating awareness.

SDG 13: Climate Action

Inefficient waste management, primarily through landfills and open burning, releases harmful greenhouse gases that exacerbate climate change. Solutions such as effective recycling, composting, and waste-to-energy solutions cut waste's carbon footprint and contribute to climate change mitigation efforts.

1.4 Understanding the Extent of the Solid Waste Management Crisis

Effective waste management begins with understanding the nature of the waste we generate. Classifying waste helps inform decisions on how it should be collected, handled, treated, and disposed of, and whether it can be reused, recycled, or recovered.

What Is Waste?

Waste generally refers to any material that is discarded, unwanted, or no longer fit for its original purpose. Standard terms interchangeably include refuse, rubbish, trash, debris, junk, leftovers, and garbage. However, precise classification is essential for policy and operational purposes.

Municipal Solid Waste (MSW)

Municipal Solid Waste (MSW) is a broad term encompassing waste generated by:

- Households
- Commercial establishments
- Public institutions (schools, hospitals, prisons, etc.)
- Public spaces (streets, markets, bus stops, parks)

According to UN-Habitat (2010)[2] MSW includes both household waste and similar waste generated by non-residential entities. Some jurisdictions may also include construction and demolition debris in this category.

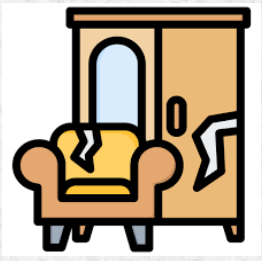
In Kenya, the Nairobi City Council's Solid Waste Management Act (2015)[3] defines MSW as "everyday waste items generated by commercial establishments and households."

Typical fractions of MSW include:

Packaging waste (plastics, paper, cartons)

Food and organic waste

Sanitary waste (diapers, menstrual products)



Household discards (broken furniture, electronics)

[2]https://unhabitat.org/sites/default/files/2021/02/solid_waste_management_in_the_worlds_cities_water_and_sanitation_in_the_worlds_cities_2010.pdf
[3]https://nairobi.go.ke/wp-content/uploads/Nairobi-City-County-Solid-Waste-Management-Act-2015-2.pdf

Categories of Waste (by Nature and Risk)

Organic Waste: Biodegradable waste such as food scraps, yard trimmings, and soiled paper.

Recyclable Waste: Materials that can be processed and reused, such as plastics, glass, metals, and paper.

General Waste: Non-recyclable, non-hazardous waste like ceramics, used tissues, and rubber bands.

Hazardous Waste: Waste that poses a risk to health or the environment, such as batteries, pesticides, e-waste, and biomedical waste.

Biomedical Waste: Generated from hospitals, clinics, or research facilities; includes sharps, soiled dressings, and

Electronic Waste (E-Waste): Obsolete or discarded electronic devices, often containing toxic materials like lead or

1.5 The Missed Opportunity in Kenya's Waste Landscape

Kenya is at a critical juncture in its waste management journey. Massively volumes of potentially valuable waste, ranging from plastics and organics to metals, textiles, and e-waste, are generated nationwide daily. Yet, instead of being recovered and reintegrated into the economy, the majority of this waste ends up in open dumpsites, incinerators, or landfills, where its economic, social, and environmental value is lost.

According to the Global Waste Management Outlook 2024, the global municipal solid waste stream holds an estimated value of over USD 8 billion annually. However, in developing contexts like Kenya, the infrastructure to harness this value remains largely underdeveloped or poorly coordinated. As a result:

- Recyclables are routinely buried in landfills or left to pollute the environment.
- Waste is openly burned, releasing dangerous pollutants into the air.
- Organic waste decomposes without control, producing methane and contributing to climate change.
- Informal waste workers, who play a crucial role in recovery, often work without protective gear, recognition, or fair compensation.

The result is a triple loss: environmental degradation, missed economic opportunity, and social injustice.

Kenya's Reality

Kenya's rapid urbanization and rising consumption levels have exacerbated the strain on already limited waste systems. While the Sustainable Waste Management Act, 2022 and the Extended Producer Responsibility Regulations, 2024 have begun to redefine waste as a resource, the practical systems to support this vision are still emerging. The country faces several persistent challenges:

- Inadequate recovery infrastructure, such as sorting stations and material recovery facilities (MRFs);
- Limited investment in logistics and collection systems tailored to local realities;
- Low and insecure wages for informal waste workers, despite their essential role;
- Weak coordination among counties, producers, and community stakeholders.

Unlocking the Potential

The untapped potential of waste in Kenya is immense. When effectively recovered and reintegrated, waste materials can:

- Create green, dignified jobs across the recycling and reuse value chain.
- Generate income for local governments and entrepreneurs.
- Reduce the burden on landfills and mitigate environmental harm.
- Strengthen local climate resilience by cutting emissions and supporting circular production models.

If municipal solid waste was to be packed into standard shipping containers and placed end-to-end, this waste would wrap around the Earth's equator 25 times, or further than travelling to the moon and back.

Source: Global Waste Management Outlook, 2004

Variation in Waste Volumes

Waste generation is dynamic and influenced by various socioeconomic and environmental factors, including income levels, seasonal variations, and consumption patterns. According to a recent study by Firmansyah F. et al. (2024), waste volumes fluctuate across seasons and throughout the week. The research reveals that waste generation tends to increase during weekends compared to weekdays, and is typically higher in summer than in winter. Notably, the study also found that individuals in higher income brackets tend to dispose of less waste overall, as they are more likely to engage in recycling, reuse, and other sustainable consumption practices.

This pattern aligns with earlier findings by the Japan International Cooperation Agency (JICA), which conducted a study in Nairobi in 2010. The study highlighted significant differences in waste generation across income groups and seasonal conditions. For instance, higher-income areas produced more waste during wet seasons, a trend attributed to increased energy consumption and the use of packaged goods. (Refer to Table below)

These insights reinforce the need for localized waste management solutions that reflect the lived realities of specific communities, rather than one-size-fits-all approaches. In Nairobi, for example, deploying flexible waste collection schedules that account for increased weekend waste in high-income estates while strengthening sorting and recovery efforts in informal settlements can lead to more effective and equitable waste system outcomes.

Income Group	Average Waste Generation Amount During Wet Season (KG/ Day)	Average Waste Generation Amount During Dry Season (KG/ Day)
High-income group area	3.01	2.70
Middle-income group area	22.43	2.31
Low-middle income group area	1.40	1.86
Low-income group area	0.90	0.74
Slum area	1.55	1.53

02

People

2.0 People: Waste Management Actors

Solid waste management continues to pose a significant challenge in many emerging countries. According to UNEP[4] only about 50% of urban waste in these regions is collected or disposed of in ways that meet acceptable environmental standards.

One of the primary barriers municipalities face is the high cost associated with effective waste management. Limited budget allocations often hinder the implementation of comprehensive waste systems. In response, formal and informal actors have stepped in to fill this gap, increasingly recognizing waste as a valuable resource rather than mere refuse destined for landfills.

Informal waste workers, comprising individuals, families, and small-scale private enterprises, play a vital role in this landscape. Operating primarily outside the formal waste management system, these actors are typically not recognized, financed, or regulated by official authorities. Despite this, their activities span key stages of the waste value chain, including collection, sorting, recovery, and recycling.

Research by CWG & GIZ[5] shows that, in many developing countries, informal actors are responsible for between 50% and 100% of waste collection. Their significant contribution underlines their critical role in enhancing resource recovery and supporting more sustainable waste management practices.

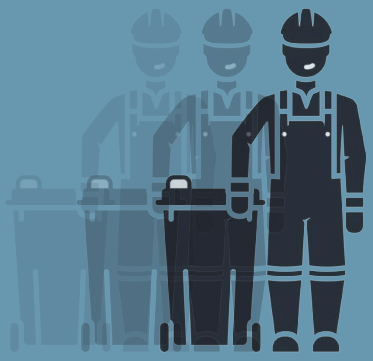
2.1 Categories of Waste Collectors in Kenya

Category 1
They focus on waste generated by households, small businesses, and markets. Their activities primarily involve collecting, sorting, and, to some extent, processing waste materials before selling them to intermediaries or recyclers.

Category 2
They operate in and around dumpsites or major landfills such as Dandora. Many of these individuals and families have been engaged in waste picking for generations, forming clan-like structures that reflect deep-rooted social networks.

Category 3
Consists of opportunistic waste collectors who scavenge across various urban spaces, including streets, drainage systems, rivers, dumpsites, and other public areas, depending on the availability and accessibility of waste.

A quasi-fourth category
blends characteristics of Group 1 with those of individuals temporarily hired by local authorities for public clean-up campaigns or assigned to maintain specific public spaces (Kloettschen et al.,2024).



[4]United Nations Environment Programme (2015), Global Waste Management Outlook, UNEP, Nairobi
[5] CWG – Collaborative Working Group. GIZ - Deutsche Gesellschaft für Internationale Zusammenarbeit. The Economics of the Informal Sector in Solid Waste Management. © CWG, GIZ 2011

2.2 Challenges Faced by Informal Waste Actors

While the contribution of waste collectors, especially those in the informal sector, is widely recognized globally, the challenges they face are often neglected. Addressing these issues is essential for improving their working conditions and livelihoods and promoting cleaner, healthier, and more sustainable urban environments.

Challenges faced by waste collectors can be classified into: health, regulation, social, and economic as shown below.

Source: KEPRO

i) Health Risks and Hazards

Informal waste workers are exposed to various health risks and hazards due to the materials they come into contact with. In most developing countries, waste is mixed, and these workers have to sort the recyclables from the pile of non-recyclable waste. Due to this nature of work, numerous conditions increase the rate of exposure to hazards, including contact with biological waste and hazardous chemicals.

The most common hazards reported by waste workers include physical, biological, chemical, and musculoskeletal hazards (Muhammad H. et al., 2024). Other hazards include ergonomic strains and psychosocial stressors like stigma and burnout. For example, in Nakuru, waste pickers operate in hazardous conditions, frequently exposed to infectious medical waste and toxic smoke, which pose serious health risks[6].

A study by the African Population and Health Research Center (APHRC) highlights that waste workers face a high risk of occupational injuries. Notably, while a number of workers have received tetanus immunization, the study also found that awareness of Hepatitis B and its associated risks remains low among many of them.

Diseases	Number
Allergies	20 (100%)
Stomach Pain	10 (50%)
Asthma and bronchitis lungs	9 (45%)
Cough and cold	5 (25%)
Vomiting	5 (25%)
Hearing Disorder	4 (20%)
Fever	3 (15%)
Typhoid	2 (10%)
Malaria	1 (5%)

[6]https://ejatlas.org/print/waste-pickers-of-nakuru-suffer-from-harassment-exclusion-and-hazardous-conditions-kenya

The following are ways to improve the health and safety of waste workers:

a) Hazard Identification and Risk Assessment

Regular inspections of waste sites and collection routes are essential. Identifying and categorizing hazards allows for focused safety measures.

b) Consult and Engage Workers

Introduce safety improvements through feedback loops, ensuring their input is considered and creating a sense of ownership.

c) Apply the Hierarchy of Controls

• Eliminate hazardous practices such as the open dumping of medical waste, which pose serious health and environmental risks. Instead, promote safe and compliant disposal methods, including segregation at source, use of color-coded containers, secure transportation, and treatment technologies such as autoclaving, incineration, or encapsulation, in line with national regulations and WHO guidelines.

• Replace manual waste sorting with safer, mechanized tools and technologies, such as magnetic belts, conveyor systems, and automated sorting equipment. These innovations significantly reduce direct human contact with hazardous materials, sharp objects, and contaminated waste, thereby lowering the risk of injury and infection.

• Implement engineered safety controls to minimize occupational hazards for waste management operators. These include the provision of covered, puncture-resistant bins to reduce exposure to infectious or sharp waste and ergonomically designed trolleys to minimize physical strain and reduce the risk of musculoskeletal injuries.

• Promote occupational health measures, such as mandatory vaccination against Tetanus and Hepatitis B, especially for frontline waste workers who are frequently exposed to biomedical waste and contaminated materials. These preventive healthcare interventions are essential in reducing the risk of infection and ensuring the long-term well-being of waste handlers.

• Strengthen administrative controls by establishing and enforcing clear Standard Operating Procedures (SOPs) that guide every stage of waste handling, from collection and sorting to transportation and disposal. These procedures should be tailored to specific waste streams, including hazardous and medical waste, and aligned with legal and safety requirements.

• Ensure the consistent supply and proper use of Personal Protective Equipment (PPE) for all waste management workers. Priority items include sturdy boots, heavy-duty gloves, face masks, and protective overalls, all of which must be well-fitting and appropriate for the nature of waste handled.

d) Integrate Waste Workers into Public Health Services

Ensure waste workers are included in national health programs, offering vaccinations, testing, and wellness checks to prioritize their health.

e) Address Mental Health and Stigma

Conduct campaigns that recognize waste workers as "Environmental Stewards," thereby reducing stigma and supporting mental health through peer groups and better terms of service.

f) Develop a National Occupational Health and Safety Data Monitoring System

The database will be key to systematically collect, analyze, and report on OHS indicators specific to the waste management sector. This centralized database should track key metrics such as workplace injuries, exposure incidents, vaccination coverage, PPE compliance, and training records.

ii) Regulation and Lack of Recognition

Kenya's legal ecosystem does not recognize waste pickers nor support their work, meaning they remain largely invisible in law. The 2021 National Sustainable Waste Management Policy acknowledges the informal sector's role and calls for formalizing waste picker groups. However, in practice, Kenya's waste laws focus on licensed firms and industry without granting rights or protections to pickers. As a result, waste pickers operate outside formal labor and social-security systems.

Many waste pickers operate without formal contracts or permits, leaving them unable to claim compensation, medical leave, or other legal protections in the event of injury or illness. This lack of recognition also exposes them to the risk of eviction, arrest, and harassment by authorities. Research from various Kenyan cities highlights that waste pickers often face discrimination and intimidation from police and local officials, largely because their work remains informal and outside regulatory oversight.

iii) Social

The informal waste sector is frequently stigmatized and perceived as a "dirty job," with waste workers often labeled as unhygienic or dangerous. Such negative perceptions create significant social and psychological pressure, limiting their ability to operate freely and safely within communities.
This stigma undermines the dignity of waste workers and contributes to their marginalization and exclusion from social and economic systems.

As a result, many waste collectors are denied access to essential services, recognition, and legal protections.

Many recyclers view recyclables sourced from the informal sector as low-quality or contaminated, diminishing trust in their value.

This alienation severely restricts their income-generating opportunities and perpetuates cycles of poverty and inequality, despite their vital role in waste management and environmental protection.

iv) Economy

The informal status of waste workers also negatively affects how recyclers perceive the collected materials. Many recyclers view recyclables sourced from the informal sector as low-quality or contaminated, diminishing trust in their value. This perception is primarily driven by the absence of standardized regulations, formal training, and adequate infrastructure to support proper collection, handling, and sorting practices.

Consequently, despite their significant contribution to resource recovery and circular economy efforts, informal waste actors are often underpaid and undervalued. The disconnect between effort and compensation perpetuates economic hardship for these workers, weakening the recycling value chain's overall efficiency and sustainability.

2.3 Integrating the Informal Waste Actors towards a Just and Green Transition

Opinion article by COTU

A just transition towards a low-carbon, circular economy cannot succeed without acknowledging the people who already keep materials in circulation: the informal waste actors who recover, sort, and trade recyclables in streets, dumpsites, and neighborhoods worldwide.

In Kenya alone, waste pickers and small-scale aggregators capture 60–70 % of post-consumer recyclable plastics before entering formal value chains. However, most continue to work outside labour law protection, exposed to occupational hazards and price volatility while supplying feedstock that underpins domestic manufacturing and trans boundary trade in secondary raw materials. The challenge, therefore, is twofold: to lift IWAs out of informality into decent work, and to reshape trade and producer responsibility systems so that the resulting green jobs are secure, fairly remunerated, and climate compatible.

Why Trade Matters

Recyclable materials are commodities. Their prices and movement respond to trade policy, shipping costs, and international standards. Since the Basel Convention's "plastic waste amendments" came into force on 1 January 2021, many mixed plastic streams require prior informed consent for export, tightening destination controls, and spurring investments in domestic reprocessing capacity.

As of May 2024, the European Union's revised Waste Shipment Regulation (WSR) prohibits exports of unsorted plastic waste to non-OECD countries and demands full electronic traceability for shipments that do continue[7]. Such measures reduce arbitrage opportunities but simultaneously create market space and potential decent work inside source countries, if informal recyclers can be integrated into compliant supply chains.

Kenya's Sustainable Waste Management (Extended Producer Responsibility) Regulations, 2024 oblige producers to finance collection and recycling, opening pathways for IWAs to become registered service agents or shareholders in Producer Responsibility Organizations (PROs).

2.3.1 A Just Transition Framework for IWAs

Drawing on the ILO's Recommendation 204 on the Transition from the Informal to the Formal Economy, a just transition pathway for waste work should rest on four mutually reinforcing pillars: formalization, decent work standards, social dialogue, and environmental integrity.

- **Formalization and Legal Recognition:** National legislation must explicitly recognize waste picking as work and create simple registration categories that allow IWAs to obtain licenses, trade permits, and social security numbers without prohibitive fees. The Sustainable Waste Management Act,2022, broadly defines "waste service providers." Implementing guidelines should list cooperative waste picker groups alongside conventional contractors.

- **Decent Work and Occupational Safety:** Waste processing facilities should embed minimum price floors, payment schedules, provision of protective gear, and vaccination against tetanus and hepatitis B, Health insurance and inclusion in NSSF/ SHIF schemes convert hazardous survival work into stable green employment.

- **Social Dialogue and Collective Bargaining:** Trade unions and waste picker associations must be allowed at the negotiating table when countries draft EPR rollout plans or award municipal collection tenders. Organizing support can come from established federations, such as COTU Kenya, which represents workers in adjacent sectors such as transport and manufacturing. Collective agreements can codify price indices linked to resin markets, ensuring IWAs share in the upside when commodity prices rise.

- **Environmental Integrity and Circularity:** Integrating IWAs should not dilute environmental standards. Training on source segregation, material quality, and data reporting helps recyclers meet the traceability requirements set by importing jurisdictions and Kenya's EPR registry, thereby safeguarding market access ensuring IWAs share in the upside when commodity prices rise.

[7]https://environment.ec.europa.eu/news/first-non-oecd-countries-request-eligibility-import-non-hazardous-eu-waste-2025-02-24_en

Value Chain Entry Points

- **Producer Responsibility Organizations**
  The new Regulations allow producers to meet EPR obligations collectively. PROs need grassroots collection networks, especially formal contracts with waste picker cooperatives, that can deliver post-consumer packaging at lower logistic cost while fulfilling social impact criteria increasingly demanded by brand owners. Experience from São Paulo and Pune shows that when cooperatives receive guaranteed offtake prices, segregation at the household level improves, and landfill-bound volumes decline[8].

- **Aggregators and Material Recovery Facilities (MRFs)**
  Many IWAs already sell to mid-scale aggregators who own balers or shredders. Concessional loans for machinery, via development banks or green bonds, can upgrade these nodes, increase material value, and create semi-skilled jobs without displacing existing pickers.

- **Export Platforms**
  Stricter EU and Basel rules mean that only clean, single polymer bales can leave the country. Cooperatives that achieve this quality threshold can command premium prices. Establishing bonded consolidation hubs under Kenya Revenue Authority oversight would let registered picker groups pool volumes and comply with customs requirements, capturing higher margins domestically.

A just transition pathway for waste work should rest on four mutually reinforcing pillars:

Formalization

Decent work standards

Social dialogue

Environmental integrity

[8]https://www.grida.no/publications/2255

Trade Union Actions

a) Mapping and Organizing

Conduct rapid participatory mapping of waste picker hotspots, using ILO ACTRAV's R204 worker mapping toolkit, to identify leaders and establish sectoral unions.

b) Negotiation with PROs and Municipalities

Use collective bargaining to embed floor prices, safety clauses, and social security contributions in service contracts.

c) Advocacy for Fiscal Incentives

Lobby Treasury for a zero-rated import duty on protective equipment and recycling machinery, conditional on companies sourcing at least 30 % of feedstock from formally registered IWAs.

d) Skills and Certification

Partner with NITA to create a Recognition of Prior Learning (RPL) pathway for waste pickers, enabling career progression to machine operators or quality control technicians.

Policy Recommendations

National governments must coordinate the environment, labour, and trade ministries to align EPR schemes with ILO R204 principles. County governments should reserve collection zones for cooperatives to avoid displacement by capital-intensive contractors.

International partners can channel climate finance into upgrading informal recycling systems, simultaneously cutting greenhouse gas emissions from virgin plastic production and delivering decent work.

Finally, trade agreement negotiators should consider adding social clause language that recognizes IWAS as contributors to circular economy targets and guarantees them access to grievance mechanisms when material prices collapse.

Recommendations for Trade Union Action

The following practical modules, templates, and checklists can be used to guide unions and allied organizations in integrating informal waste actors (IWAs) into decent, climate-compatible work:

a) Rapid Organizing Starter Pack

It's imperative to develop a detailed step-by-step guide for mapping dumpsite and street waste picker clusters, facilitating the election of representatives, and supporting the formal registration of a sectoral union or cooperative in line with the provisions of Kenya's Social Development Act. The guide includes sample membership registration forms available in both Kiswahili and English.

b) Model Memorandum of Understanding (MoU) with Producer Responsibility Organizations

Producer Responsibility Organizations should develop a template contract that sets:
(ii) A guaranteed floor price is indexed to virgin resin benchmarks.
(iii) Bi-weekly electronic payments through mobile money.
(iv) Provision of PPE, vaccinations, and OSH training; and
(v) A grievance handling clause anchored in the Labour Relations Act.

c) Collective Bargaining Agreement (CBA) Clause Library

Be prepared to adapt collective bargaining language to include progressive labor provisions that reflect the evolving needs of waste workers. This may include the introduction of wage escalator clauses tied to fluctuations in international scrap commodity prices, ensuring workers benefit fairly when material values rise.

d) Occupational Safety & Health (OSH) Checklist

Develop a pictorial checklist that is aligned with OSHA 2007 and Basel POP contaminant thresholds. The checklist should specify the safe handling of mixed plastic bales, sharps, e-waste, and medical residues. If possible, the checklist should also include links to suppliers of certified gloves, boots, and masks with negotiated union discounts.

e) Social Protection Enrollment Flowchart

Curate a one-page process map showing how informal pickers can enroll in NSSF and SHIF, with QR codes for online portals and a script for bulk USSD registration drives coordinated by shop stewards.

f) Price Monitoring Dashboard

Develop an Excel or LibreOffice spreadsheet preloaded with automated formulas that convert global commodity benchmarks, specifically the London Metal Exchange (LME) and ICIS resin price indices, into localized buying center prices. This tool is designed to empower waste picker unions and cooperatives by providing real-time price comparisons, enabling them to activate wage renegotiation clauses when price margins between international markets and local rates significantly widen.

g) Advocacy Brief on Trade Policy

Develop a concise two-page explainer that summarizes the key provisions and implications of the Basel Convention plastic waste amendments, the European Union Waste Shipment Regulation 2024, and Kenya's Extended Producer Responsibility (EPR) regulations. The document should include simplified talking points and advocacy messages tailored for union leaders and cooperative representatives to use when lobbying Parliament, county assemblies, or other regulatory bodies.

The aim is to build their capacity to articulate how global and national policy shifts impact local waste economies, especially in relation to trade restrictions, material pricing, and producer obligations.

h) Financing Toolkit for Cooperative Upgrading

A curated directory of financing options tailored for the waste and recycling sector, including concessional loan windows, such as the Kenya Development Bank's Green Bond Facility, grant programmes, and supplier credit schemes for essential equipment like balers, shredders, and personal protective gear.

The directory will also include a sample business plan to guide cooperatives, unions, and micro-entrepreneurs in developing bankable proposals and accessing financing for scaling up operations and improving safety standards.

i) Gender and Youth Inclusion Module

A structured set of activities and monitoring questions designed to promote gender equity and youth inclusion within the recycling value chain. The activities will intentionally prioritize the participation of women and young waste pickers in leadership development, cooperative governance, and decision-making spaces.

The monitoring component will include measurable indicators to track their representation in leadership roles, assess equitable access to training opportunities, and ensure fair distribution of newly created formal jobs and income-generating roles.

j) Just Transition Scorecard

A tailored self-assessment matrix adapted from the ILO's Just Transition Guidelines, designed to support unions, municipalities, and Producer Responsibility Organizations in systematically tracking progress across key dimensions of an inclusive and sustainable transition.

These include formalizing waste picker roles, ensuring wage security and income stability, establishing occupational safety and health standards, providing access to social protection, and establishing measurable climate impact indicators such as emissions reduction and resource recovery rates.

The matrix promotes evidence-based planning, participatory evaluation, and continuous improvement toward equitable integration of informal workers in the circular economy.

The activities will intentionally prioritize the participation of women and young waste pickers in leadership development, cooperative governance, and decision-making spaces.

2.3.2 Checklist For Formalization of Waste Workers

Formalizing informal waste workers is key to achieving wholesome circular economy practices. As previously explored, informal waste actors are often disadvantaged and left out of the equation despite being instrumental actors in boosting recycling efforts. With the lack of a proper framework for formalizing waste workers in Kenya, the recommended course of action is to set up a Community-Based Organization (CBO), the least formally recognized organization in Kenya, rank-wise.

Key Steps of Forming a CBO

Pre-Registration Checklist

- **Create an eCitizen Account**

All members or office bearers involved in the registration must have active accounts on eCitizen.

- **Conduct a Name Search**

Submit a name search request via eCitizen to confirm the CBO name is unique and available for use.

- **Attend Pre-Registration Training**

Participate in mandatory training by the State Department for Social Protection (schedule available through the Sub-County Social Development Office).

Documentation Checklist

Attach the following documents when submitting your registration:

- **Meeting Minutes**
  - Include minutes from the meeting where the decision to form the CBO was made.
  - Must show the election of officials (Chairperson, Secretary, Treasurer, etc.).

- **Member List**
  - Names, ID numbers, mobile numbers, positions, and signatures of all members.
  - Should be typed and properly signed.

- **CBO Constitution**
  - Must be signed and structured, clearly stating:
    - Name and objectives
    - Membership criteria
    - Organizational structure
    - Meetings, elections, and financial procedures
    - Conflict resolution and dissolution clauses

- **Copies of National IDs**
  - Attach clear photocopies of identification documents for all members/officers.

- **Memorandum of Understanding (MOU) (if applicable)**
  - Required if the CBO is formed through the merger of multiple groups.

- **Original Certificates of Affiliate Groups (if applicable)**
  - Needed when combining existing registered groups into a new CBO.

Submission & Payment

- **Submit Application via eCitizen**
  - Fill in the online application form under the Ministry of Labour and Social Protection > Social Development.

- **Pay the Registration Fee**
  - Pay the approved fee online via eCitizen payment options.

Post-Registration Requirements

After receiving your CBO certificate, ensure you:

- **Renew Registration Annually**
  - File a renewal application annually through eCitizen or at the Sub-County Social Development Office.

- **Submit Quarterly Progress Reports**
  - Keep the Registering Authority informed of your activities and achievements.

- **Grant Access to Records**
  - Provide records and documentation upon request by government authorities.

2.3.3 Benefits of Forming a CBO for Waste Management

The formation of Community-Based Organizations presents a strategic and sustainable approach to addressing the systemic challenges waste collectors face, particularly those operating in the informal sector. By organizing into formal groups, waste collectors can enhance their visibility, improve working conditions, and actively contribute to the efficiency and inclusivity of local waste management systems. The following are key benefits of forming CBOs:

1. **Formal Recognition and Legitimacy**
CBO registration grants waste collectors legal recognition, enabling engagement with authorities, access to municipal opportunities, and inclusion in urban planning.

2. **Strengthened Collective Bargaining Power**
Operating collectively allows waste workers to secure fair prices, advocate for better conditions, and engage stakeholders from a stronger position.

3. **Access to Capacity Building and Training**
CBOs gain more opportunities for training in safety, waste management, and business skills, enhancing professionalism and efficiency.

4. **Enhanced Financial Inclusion and Resource Mobilization**
Registered CBOs can access funding, pool resources, and invest in shared assets like equipment and infrastructure.

5. **Improved Working Conditions and Health Outcomes**
Collective action enables access to protective gear and sanitation, ensuring safer environments and reduced health risks.

6. **Increased Community Engagement and Public Awareness**
CBOs sensitize communities on segregation, recycling, and dignity in waste work, shifting perceptions and reducing stigma.

7. **Integration into Municipal Waste Systems and EPR Schemes**
CBOs can partner with municipalities and producers through contracts and EPR frameworks to support collection, sorting, and recycling.

How CBOs Can Access Green Financing for Waste-Management Projects in Kenya

Community-based organizations (CBOs) are uniquely positioned to deliver practical, low- cost solutions to urban and rural waste problems. To scale impact, however, many CBOs need outside capital, and green finance is built precisely to fund projects that generate environmental outcomes alongside social benefits. Below is a concise, practical guide that shows what finance is available, what funders look for, and the steps a CBO can take to turn a local waste-management idea into a bankable green investment.

Why Green Finance Matters

Green finance channels funds to projects that reduce emissions, conserve resources, or otherwise improve environmental quality, while often delivering jobs, income, and better public services. For CBOs focusing on segregation at source, community material-recovery facilities (MRFs), recycling cooperatives or small composting hubs, green finance can fund equipment, working capital, and the technical assistance needed to reach sustainability.

Types of green finance suited to CBOs

- **Grants and concessional funds:** Best for pilots, community mobilization, training and feasibility studies.
- **Concessional loans / green loans:** Useful for purchasing tricycles, balers, or small MRF equipment when repayment terms are soft.
- **Blended finance:** Combines grants with private capital to lower investor risk and unlock bigger pools of money.
- **Results-based finance:** Payments tied to measurable outcomes (tonnes diverted, recycling rates), attractive when robust monitoring is possible.
- **Crowdfunding and community bonds:** Mobilize local buy-in and small investors for clearly defined projects.
- **Carbon or circularity revenues:** Possible if projects can credibly measure emissions reductions or material reuse and meet MRV requirements.

What Funders Look For

Funders want clarity on impact, financial sustainability, and accountability. A competitive CBO proposal should include:

- A clear problem statement
- A succinct use-of-proceeds
- A basic business model showing how the project will generate revenue (sale of recyclables, service fees, offtake agreements)
- Measurable KPIs (tonnes diverted, % segregation, jobs created), and a simple risk mitigation plan.
- Evidence of local support e.g letters from county offices, buyer commitments, or community endorsements significantly strengthens an application.

Practical Steps to Prepare a Bankable Project

i. Draft a 1–3 page project brief:
Make sure to include an executive summary, use-of-funds, KPIs, and expected outcomes. Keep it simple and numbers-driven.

ii. Build a costed budget and 3-year cashflow:
Even basic financials demonstrate seriousness and repayment/ sustainability assumptions.

iii. Plan MRV (Monitoring, Reporting & Verification):
Define how you will measure tonnes diverted and other KPIs such as daily logs, weighbridge records, and periodic third-party checks where possible. Investors increasingly insist on transparent MRV. **iv. Secure letters of support or offtake.**
Agreements with recyclers, aggregators, or the county government reduce market risk.

v. Match the instrument to the stage:
Grants are more suitable for pilots, concessional loans for CapEx, blended finance or results-based instruments are for scaling.

vi. Reduce costs and increase credibility:
Small CBO projects can face high transaction or verification costs. Two practical solutions to solve this:

a. Aggregate - Form consortia or pooled projects so multiple CBOs are financed together, lowering per-project costs;

b. Partner. Work with local NGOs, universities, or intermediaries that can provide technical assistance and cheap verification. These approaches make projects more attractive to DFIs, corporates, and blended-finance vehicles.

Where To Look For Funds

Corporate partnerships (EPR schemes, service contracts)

County climate funds and ward climate committees (engage early)

DFIs and international blended-finance programmes (often via intermediaries)

SACCOs and MFIs for small loans (present a concise repayment plan)

National donor programmes and environment ministry grants

Start locally, plan like an investor

As a CBO, you should think like a project developer: start with a clear, measurable impact case and a credible business model, prepare transparent records, and pick the finance instrument that fits the project stage. Aggregation and partnerships reduce costs and unlock larger capital. With straightforward documentation and solid local backing, community waste projects can access green finance to scale impact, create jobs, and turn local waste into an economic resource[12].

1 Opportunities and Practice of Green Finance in Kenya (FSD Kenya & partners).
2 Green Investment Opportunities and Regulatory Shifts (regional report)

2.4 Waste Generators / Consumers

Waste generators, individuals, households, institutions, businesses, and industries, are the first and most critical link in the waste value chain. Every choice made at this stage directly determines how effectively waste can be managed downstream. By taking responsibility for how waste is produced, handled, and disposed of, generators can significantly reduce environmental harm, enhance safety, and strengthen resource recovery.

Core Responsibilities of Waste Generators

All waste generators are expected to:

- Minimize waste at source by practicing responsible consumption.
- Segregate waste at the point of generation to enable reuse, recycling, and safe disposal.
- Handle and store waste safely to prevent pollution, accidents, and health hazards.
- Comply with local and national waste management laws and guidelines.

Practical Steps for Sustainable Waste Management

1. Segregate Waste at Source

- Adopt color-coded bins or clear labeling to separate waste into:
  - Organic/Biodegradable (food scraps, garden waste)
  - Recyclables (plastics, paper, glass, metals)
  - Hazardous waste (batteries, e-waste, medical waste)
  - Residual waste (non-recyclables)
- Train staff, family, and community members to ensure correct sorting.

2. Reduce Waste Generation

- Eliminate single-use items by switching to reusable or refillable alternatives.
- Buy in bulk or choose products with minimal packaging.
- Digitize systems and records to cut paper waste.

3. Promote Reuse and Recycling

- Reuse packaging, containers, and equipment where possible.
- Partner with local recyclers or deliver sorted waste to Material Recovery Facilities (MRFs).
- Donate usable items (furniture, electronics, clothing) to charities or reuse centers.

4. Compost Organic Waste

- Establish household, institutional, or market-level composting systems.
- Apply compost in gardens, farms, or community greening initiatives.

5. Participate in Education and Awareness

- Take part in workshops, training sessions, or community programs.
- Share best practices with peers and encourage behavioral change.

6. Ensure Legal Compliance

- Familiarize yourself with the Sustainable Waste Management Act, 2022 and county-level by-laws.
- Support and align with government and community waste management initiatives.

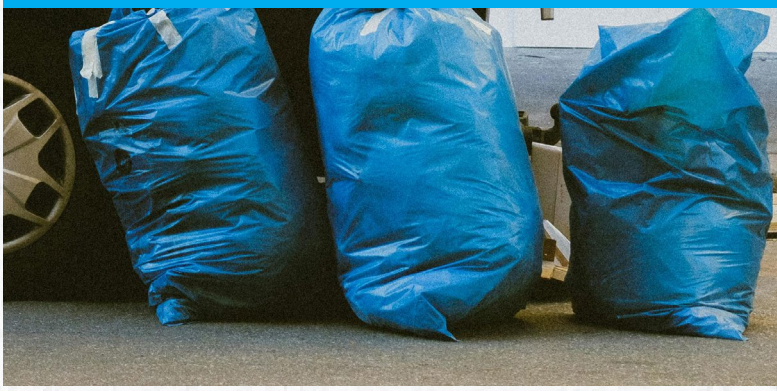
When waste generators embrace sustainable practices, the entire waste value chain becomes more efficient, inclusive, and environmentally sound. The benefits include:

- Reduced waste volumes reaching landfills.
- Lower greenhouse gas emissions.
- Improved public health and safer communities.
- Creation of green jobs, especially for waste collectors and informal actors.

2.5 Waste Transporters

On 18th June 2025, NEMA issued a new notice requiring all waste transporters to segregate waste during transportation. The directive provides clear guidelines for separating hazardous waste from non-hazardous waste and further mandates the sorting of non-hazardous waste into organic waste, general waste, and recyclable fractions. This step is aimed at enhancing compliance with the Sustainable Waste Management Act, improving safety in handling waste, and promoting efficient recovery of resources within the circular economy framework.

Every generator's action counts. Responsible waste management begins at the source—and it begins with you.



REPUBLIC OF KENYA

nema

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

PUBLIC NOTICE

TRANSPORTATION OF SEGREGATED WASTE

The National Environment Management Authority was established under Environmental Management and Coordination Act (EMCA) 1999 to exercise general supervision over all environmental matters and is the principal instrument of government in implementation of all environmental policies.

The Authority wishes to draw your attention to legal notice 178 dated 4th November, 2024, Environmental Management and Co-ordination (Waste Management) Regulations, 2024 Section 5 and 7 which states that:

i) **A Waste Generator** shall collect, segregate and dispose waste in a manner that does not pollute the Environment.

ii) **A Waste Generator** shall segregate waste by:
- Separating hazardous waste from non-hazardous waste; and
- Segregating non- hazardous waste into organic and non-organic fractions.

iii) The waste segregated, shall be placed in a clearly labeled and color coded receptacles, bins, containers and bags.

iv) The Regulation has set out the National Waste Color Code **(refer to Second Schedule)** whereby waste fractions and their associated color coding scheme are as follows;
- **Organic waste (Green color bins)**
- **General waste (Black color bins) and**
- **Recyclables (Blue color bins)**

Section 7 of the Waste Management Regulations 2024 requires Waste Service Providers to collect, handle and transport segregated waste and deliver it to facilities that are licensed and designated.

The Authority wishes to remind you that one of the waste transport license conditions is that waste should be transported in segregated state. This implies that you should **NOT** transport mixed waste. Hence the Authority recommends the following:

1. Demand that your customer's segregate waste at source and store it in the appropriate color coded bags.
2. Ensure that the different color coded bags with waste do not mix by either compartmentalizing your vehicle into 2 compartments or transporting waste on different days.

Reference is made to section 21 (3) which states that a waste service provider who fails to manage waste in accordance with the Sustainable Waste Management (SWM) Act 2022 commits an offence and shall on conviction, be liable to a fine not exceeding Ksh 50,000 or imprisonment for a term of six months or both. In addition NEMA may consider suspension of the waste transportation license for a period not exceeding 6 months.

NEMA has commenced enforcement of Sustainable Waste Management (SWM) Act 2022 and Waste Management Regulations 2024 on requirement for waste segregation and appropriate transportation and directs you to comply accordingly.

DATED: 18th June, 2025

DIRECTOR GENERAL
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Report Environmental Incidents / Complaints through 0741 101 100 | 0786 101 100 | incidence@nema.go.ke

Kenya Vision 2030

Action Steps for Waste Collectors

Here are practical tips and reminders that waste pickers/collectors can implement now:

- **Wear Your PPE:**
  Gloves, boots, and a face mask are non-negotiable. Keep extras on hand. If a collection point or NGO offers free PPE, take it. Teach new members proper PPE use.

- **Sort at the Source:**
  Whenever you collect from a home or business, ask them to put waste into at least two groups: (a) wet/organic and (b) dry recyclables. Load your bags or cart accordingly.

- **Keep Clean Loads:**
  Even a little contamination (like food residue or mixed trash in recyclables) can make your load worthless. Invest a few minutes in cleaning and organizing your collected materials.

- **Join Forces:**
  Form or join a cooperative or association. Work together to pool resources (like hiring a common storage space or transport). A small team can split tasks (one person collects organics, another plastic, etc.) to maximize efficiency.

- **Make Records:**
  Track what you collect each day and how much you sell it for. This helps you bargain for better prices and shows producers/countries the value of your work.

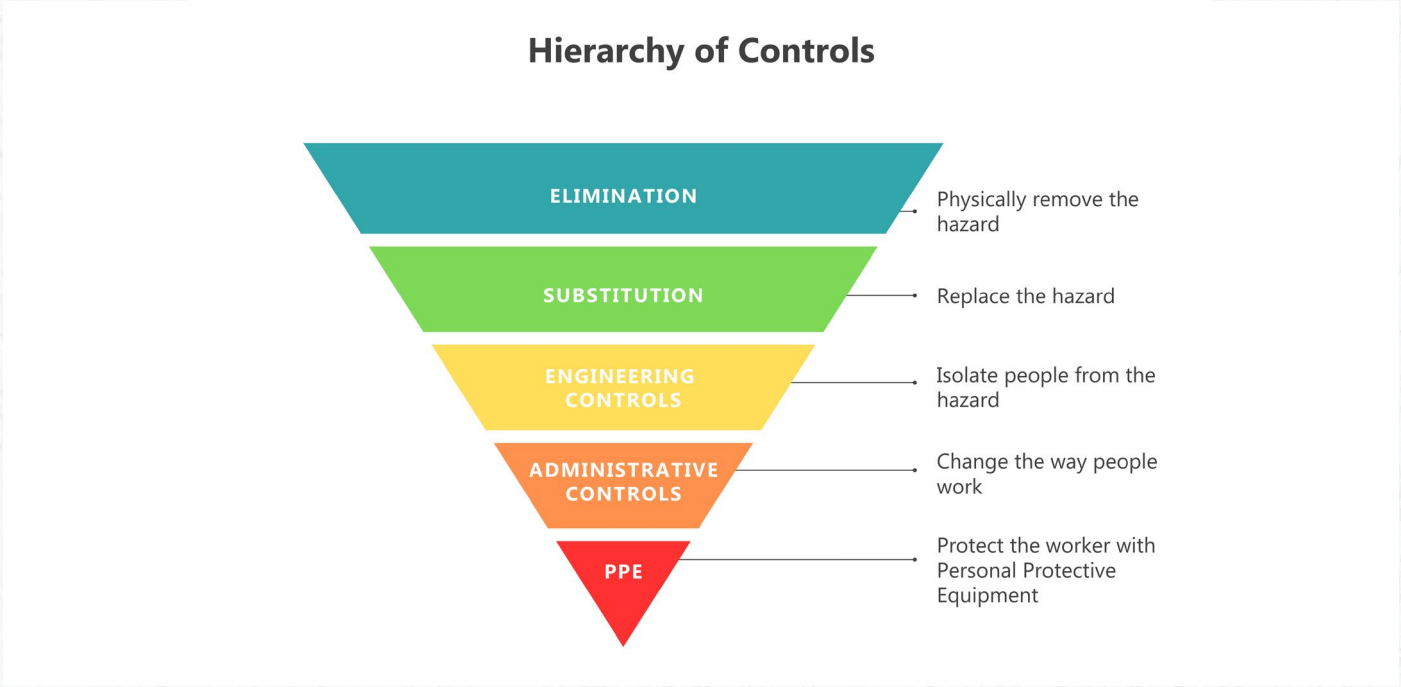
- **Engage the Community:**
  Conduct or participate in waste-sorting drives in your area. Schools, churches, and markets often need volunteers for clean-up events. Such activities can yield extra recyclables and build your reputation.

- **Know Your Rights:**
  You have a role under Kenya's new laws. If an official tries to shut you down, remind them that the SWM Act calls for your inclusion. If you face harassment, report it to local waste authorities or NGOs. Formalizing, your group can offer legal protection.

- **Educate Yourself:**
  Attend any training offered (often by NGOs or county governments). Learn about market prices for materials, new sorting techniques, or even basic business skills. The more you know, the better you can manage your work as a business.

03

Planet: The Waste Management Ecosystem



Understanding waste management is crucial in addressing waste generation and disposal's environmental and health impacts. Waste, in its various forms, is a byproduct of human activity, and its management spans a broad spectrum of processes.

These processes include the generation of waste, its collection, sorting, recycling, and finally, its safe disposal. How waste is handled, from the point it is created to its final disposal, has significant implications for the environment, public health, and resource conservation.

3.0 Waste Management Hierarchy

The essence of a hierarchy is to highlight the best practices that should come first, all the way down to the least favored practices. This ranking method, particularly in waste management, takes note of the environment as the instrumental factor that should inform people/consumers' behavior.

However, more practices have shifted toward landfilling, open dumping, and burning. Despite being the least favored methods, these practices deliver convenience due to their low-cost factor at the expense of polluting the environment. The primary objective of a waste management hierarchy is to minimize environmental impacts during waste disposal, ensuring protection across terrestrial, riverine, aquatic, and atmospheric ecosystems.

The above waste hierarchy inverted pyramid ranks waste management strategies from most to least preferred based on their sustainability and environmental impact, as explained below:

- **Refuse / Rethink / Redesign (Most preferred)**
  Core idea: Eliminate waste before it even exists.
  Examples: Avoid unnecessary packaging, eliminate single-use items, redesign products for longevity, and rethink consumption habits.
  Goal: Prevent resource use at the design and production stage.

- **Reduce and Reuse**
  Reduce: Reduce the quantity of materials used in production and consumption (e.g., buy less, choose durable goods).
  Reuse: Use products multiple times for the same or new purpose instead of discarding them, for example refillable bottles.

- **Preparation for Reuse**
  Focus: Inspecting, cleaning, or repairing products to be reused safely without further processing.
  Goal: Extend product lifespan and reduce the need for new resource input.

- **Recycling / Composting / Anaerobic Digestion**
  Recycling: Processing materials (plastic, paper, metals) into new products.
  Composting: Biologically decomposing organic waste into soil conditioners.

Anaerobic digestion: Breaking down organic waste in oxygen-free environments to produce biogas and fertilizer.
Key condition: Works best when materials are source-separated to maintain quality.

- **Material and Chemical Recovery**
  Definition: Recovering usable materials or energy from mixed waste streams through advanced technologies.
  Examples: Waste-to-energy plants, chemical feedstock recovery. Use: It is often a step before final disposal, but it is less desirable than recycling due to resource and energy loss.

- **Residuals Management**
  Description: Safe disposal of non-recoverable waste.
  Options: Engineered landfilling of biologically stabilized waste, with minimal environmental impact.
  Note: This tier deals with unavoidable waste that cannot be reused or recovered.

- **Waste Disposal (Least preferred)**
  Examples: Open dumping, uncontrolled burning, and unsorted landfilling.
  Consequences: Highly polluting, harmful to health, and often non-compliant with circular economy goals.

Tier	Action Category	Purpose
1	Refuse/Rethink/Redesign	Prevent waste creation
2	Reduce & Reuse	Lower consumption and extend product life
3	Preparation for Reuse	Ready items for reuse through minor treatment
4	Recycling & Composting	Convert waste into new resources or energy
5	Material/Chemical Recovery	Recover value from mixed waste
6	Residuals Management	Safely dispose of non-recoverable materials
7	Waste Disposal	Avoided due to environmental and health risks

3.1 Mapping the Journey Toward Sustainable Waste Disposal

3.1.2 Generation

Waste generation is closely tied to economic growth. As a nation's GDP increases, so does consumer demand for goods, often met by producing low-cost, short-lived items that are challenging to manage at end-of-life.

In Kenya, research shows that the volume and composition of waste vary significantly across low-, middle-, and high-income groups, and even fluctuate with changing weather patterns.

Despite these variations, one common factor cuts across all socioeconomic categories: consumer behavior at the point of disposal.

Segregation at source has emerged as a key strategy for improving waste management outcomes. It enhances the quality and value of recyclable materials, reduces contamination, and significantly decreases the volume of waste sent to landfills. This, in turn, eases the burden on counties tasked with managing municipal solid waste.

What Does Policy Say:
The Sustainable Waste Management Act 2022, Section 12, mandates that all waste generators segregate their waste at source. The county governments have been mandated to establish waste management infrastructure that promotes and incentivizes source segregation, collection, and reuse, such as a material recovery facility.

Actor	Role
Consumers, Institutions	Segregate waste at source by separating recyclables, organic, and non-recyclable materials.
County Government	Provide infrastructure to support segregation and recovery of waste.
National Government	Provide policy and further guidance on waste segregation that addresses the bottlenecks.
Education Sector	Introduce waste segregation as a learning topic that also includes practical learning.
Waste Management Operators	Collect, transport, and recycle segregated waste; ensure safe disposal of non-recyclable materials.

Actor	Role
Non-Governmental Organizations	Raise awareness, provide training, and support community-driven waste segregation initiatives.
Producers (retailers, brand owners, manufacturers etc).	Encourage customers to segregate waste by providing recycling bins and promoting eco-friendly packaging.
Community Leaders	Facilitate local initiatives and guide community members on effective waste segregation practices.

The National Environment Management Authority has guided segregation using colour-coded bins to make this more effective. The table below gives examples of the different types of waste that go into the colour-coded bins:

Organic Waste	General Waste	Recyclable Waste
Apple core Banana peel Coffee Grounds Food Leftovers Egg shells Yard Trimmings Tea Bags Paper Towels Houseplant clippings Wood waste	Diaper Styrofoam container Plastic Wrap Cigarette Butt Broken Ceramics Used Tissues Dustpan Sweepings Hair Rubber bands Candy Wrappers	Cardboard box Glass bottle Aluminium Can Plastic milk jug Newspaper Magazines Steel Cans Plastic Bottles Used envelopes Paper bags

Colour-coded bins *Source: NEMA*

Waste Generators

Waste generators are individuals, households, institutions, businesses, and industries that produce waste as a result of their daily operations or consumption patterns. As the first point in the waste value chain, they have a critical role to play in promoting sustainable waste management practices.

Their actions directly influence the efficiency, safety, and environmental impact of waste handling, collection, and disposal processes.

Responsibilities of Waste Generators

Waste generators are expected to:

- Minimize the amount of waste they produce through responsible consumption.
- Segregate waste at the point of generation to enable reuse, recycling, or safe disposal.
- Handle and store waste properly to avoid pollution, injuries, or health hazards.
- Comply with local and national waste management regulations.
- Participate in awareness, training, and local waste reduction initiatives.

Key Steps for Sustainable Waste Management

To improve sustainability in waste management, waste generators should follow these key steps:

i) Segregate Waste at Source

- Use color-coded bins or labels to separate waste into categories such as:
- Organic/Biodegradable (food scraps, garden waste)
- Recyclables (plastics, paper, glass, metal)
- Hazardous waste (batteries, e-waste, medical waste)
- Residual waste (non-recyclables)
- Train staff or household members on proper sorting practices.

ii) Reduce Waste Generation

- Avoid single-use items and opt for reusable or refillable alternatives.
- Procure in bulk or buy products with minimal packaging.
- Implement digital systems to reduce paper waste.

iii) Promote Reuse and Recycling

- Reuse containers, packaging, and equipment where possible.
- Establish links with local recyclers or Material Recovery Facilities (MRFs).
- Donate functional items (furniture, electronics, clothing) to charities or reuse centers.

iv) Compost Organic Waste

- For households, institutions, and markets, set up composting systems for food and garden waste.
- Use compost for gardening or community greening initiatives.
- Participate in Education and Awareness Programs
- Attend community waste management training sessions or workshops.
- Encourage peer learning and share best practices within your network.

v) Comply with Legal Requirements

- Understand and adhere to the provisions of the Sustainable Waste Management Act, 2022.
- Support county and national government efforts to improve environmental outcomes.

Why It Matters

When waste generators adopt sustainable practices, the entire waste value chain becomes more efficient, inclusive, and environmentally sound. It reduces the volume of waste sent to landfills, lowers greenhouse gas emissions, protects public health, and supports green jobs, particularly for waste collectors and informal actors.

When waste generators adopt sustainable practices, the entire waste value chain becomes more efficient, inclusive, and environmentally sound.

Source: pexels.com

Skip bins
Source: thewastegroup.com

3.1.3 Collection

Collection is a critical phase in the waste management process. It essentially bridges the gap between waste generation and disposal or recycling. The efficiency of waste collection directly impacts the effectiveness of the entire waste management system, from reducing environmental pollution to enhancing recycling rates. Various waste collection systems are designed to suit different types of waste, infrastructure, and population. These systems ensure that waste is efficiently collected, transported, and delivered to the appropriate facilities. egories: consumer behavior at the point of disposal.

a. Kerbside or door-to-door Collection system

In urban settings, kerbside collection systems are the most preferred due to their convenience for households. They involve collecting waste directly from premises. This low-risk collection method promotes waste recycling, especially with waste segregation at the source.

b. Drop-Off Collection Systems

An alternative option to the previous method, drop-off collection systems are a cost-effective option for most local authorities. The technique involves voluntarily dropping off waste at designated collection centers. For local authorities, this minimizes fuel consumption and allows proper planning of waste collection on a routine basis.

c. Buy-Back collection systems

Buy-Back Centers are formal collection points where individuals, households, and waste pickers can bring sorted, recyclable materials and receive monetary compensation. These centers are designed to promote recycling and create income-generating opportunities, particularly for communities and informal waste collectors.

d. Deposit-Refund Collection System

A Deposit-Refund Collection System is a recycling initiative designed to encourage the return of beverage containers. Consumers pay a small deposit when purchasing goods in a single-use container, such as a bottle or can. This deposit is refunded when the container is returned to a designated collection point for recycling.

What Does Policy Say:
The National Sustainable Waste Management Policy 2021 gives various roles to the national and county governments to facilitate the effective and efficient collection of waste. For instance, the policy mandates that the county establish "waste collection centers."

The national government is expected to develop and formalize trade-in, take-back schemes, and innovative approaches to collecting specific reusable products, packaging, and other recyclable materials.

3.1.4 Sorting

Sorting is a pivotal step in the waste management chain. It directly influences the recoverability, recyclability, and overall value of waste materials. This process involves separating waste into key categories such as organics, plastics, paper, glass, metals, and hazardous waste. Sorting can occur at the point of generation (source sorting) or later at centralized facilities through mechanical or manual means.

When implemented effectively, sorting significantly improves the quality and volume of recoverable materials, reduces contamination, and enhances the economic viability of recycling operations. Sorting at the household, institutional, or commercial level plays a crucial role in minimizing the amount of waste that ends up in landfills. It also lowers processing costs and supports more efficient downstream systems like composting and material recovery.

However, despite its importance, source-level sorting remains underutilized. This is often due to limited public awareness, lack of proper infrastructure, and

Sorting involves separating waste into key categories such as organics, plastics, paper, glass, metals, and hazardous waste.

Source: pexels.com

weak enforcement of existing waste management regulations.

Plastic is among the most misunderstood waste streams, requiring more detailed classification beyond just "plastic waste." Understanding the resin identification codes is essential to improving plastic recovery and ensuring effective sorting. This system is designed to categorize plastics based on their polymer type. This classification supports both households and recyclers in making informed decisions during the sorting process.

Understanding Resin Identification Codes (RIC) to Facilitate Plastic Sorting.

Consumer packaging has played a vital role in delivering value throughout a product's lifecycle, including at the point of disposal. It ensures products are secure, clean, safe, and saleable, preventing spillage, spoilage, and contamination. From a logistics perspective, packaging facilitates efficient handling, storage, and distribution, resulting in cost savings that help keep consumer prices affordable.

Moreover, well-designed packaging reduces waste by minimizing product loss and optimizing transport. In many cases, it has also helped reduce the volume of solid waste sent to landfills, lowering the overall environmental footprint associated with producing and moving goods.

The waste collectors can help increase the value of plastic waste by segregating it early, as per the codes below.

COMPREHENSIVE SORTING GUIDE

PLASTIC

Alternative names - Planyo, Mali, Maziwa, Machupa, Gundu, Gunia, Marondo, Sahani, Farafana, Nywele

MATERIAL TYPE	SORTING/ LABEL CODE	RECYCLABLE	HANDLING NOTES	EXAMPLES
PET 1		Yes	Clean, crush bottles, remove caps	Water bottles, juice bottles
HDPE 2		Yes	Rinse, remove labels if possible	Storage bins, shampoo and conditioner bottles, plastic pallets
PVC- 3		Rarely	Avoid mixing with other plastics	Plumbing pipes, floor carpets
LDPE - 4		Sometimes	Thin films, check local rules	Furniture, bread bags, carpet shrink wraps, squeezable bottles
PP 5 - (Polypropylene)		Yes	Rinse, sort separately	Yogurt containers, margarine containers
PP 6 - (Polystyrene)		Rarely	Avoid if contaminated with food	Fast food trays, egg cartons
Other 7 - (Laminates)		No	Usually non-recyclable, check alternatives	Snack wrappers are used for chips (crisps)

GLASS

Alternative names -Chupa, Tingli, Vunjika.

MATERIAL TYPE	SORTING/ LABEL CODE	RECYCLABLE	HANDLING NOTES	EXAMPLES
Glass - Clear		Yes	Remove lids, do not mix colours	Water bottles (mineral and purified water), soft drinks and juices, alcoholic spirits (vodka, gin, rum, tequila), cold brew coffee and iced tea
Glass - Green		Yes	Sort separately from clear and amber	Beer (e.g., Heineken, Carlsberg, Stella Artois, sparkling water (e.g., Perrier, San Pellegrino), wine (especially white wine and rosé)
Glass - Amber		Yes	Sort and clean	Liquid medicines (cough syrups, tinctures), prescription drugs, eye drops and ear drops, essential oils

ELECTRONICS

Alternative names -Waya, Coppers, Uradi, Orodha

MATERIAL TYPE	SORTING/ LABEL CODE	RECYCLABLE	HANDLING NOTES	EXAMPLES
E- waste - Consumer Electronics		Yes	Remove batteries, sort components. Use drop off points to avoid contamination	Mobile phones, chargers, radios, TVs, electric wires.

COMPOSITES

MATERIAL TYPE	SORTING/ LABEL CODE	RECYCLABLE	HANDLING NOTES	EXAMPLES
Paper and Miscellaneous metals		Not easily recyclable	Wherever possible, remove metallic attachments (e.g., staples, clips, spirals) before disposal.	Envelopes with metallic clasps, coffee/instant beverage sachets
PapPet - Paper and plastic		Conditionally recyclable.	Keep separate from pure paper and pure plastic streams.	Petfood bags, disposable plates, icecream tubs
Paper and fibreboard/ aluminium		Not easily recyclable	Avoid mixing with other plastics	Beverage cartons with aluminium lining (e.g., long-life milk or juice Tetra Paks), chocolate wrappers with paper outer and foil inner, instant soup and stock cube cartons lined with aluminium.
C/PAP (or PapAl) - Paper and cardboard/plastic/aluminium		Recyclable	Belongs to the composite packaging category , do not mix with normal paper/cardboard recycling	Paper cartons with aluminium lining used to preserve liquids such as juices.
CSL (Card-stock laminate) - Biodegradable plastic		Partially recyclable	CSL (Card-stock laminate) - Biodegradable plastic	Brochures, greeting cards, flyers etc.
Plastics/ Aluminium		Not easily recyclable	Should not go into single-stream plastic or metal bins unless a facility has specific sorting technology	Toothpaste tubes

PAPER

Alternative names -Vitabu, Katoni, Cote, Kotte

MATERIAL TYPE	SORTING/ LABEL CODE	RECYCLABLE	HANDLING NOTES	EXAMPLES
Paper		Yes	Remove attachments such as staples, tape, plastic covers, and spiral bindings before sorting.	Paper straws, paper bags, newspaper, books, magazines
Paperboard		Yes	Flatten before collection to save space and ease transportation	Cereal boxes, snack boxes
Cardboard		Yes	Keep dry – wet cardboard loses strength and contaminates clean recyclables.	Packaging, cardboard boxes

METAL

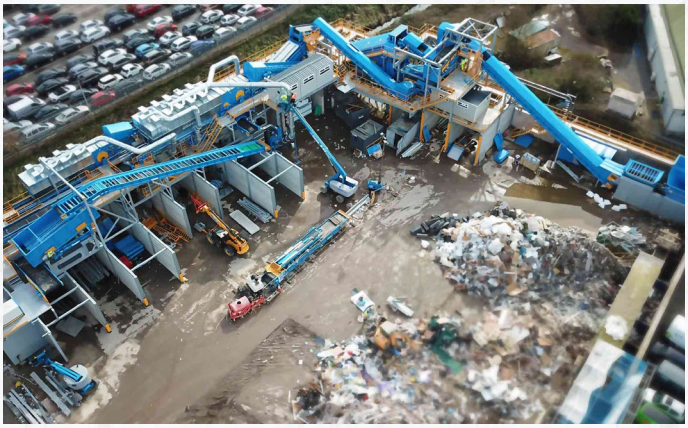
Alternative names -Mali, Silagi, Chuma, Chunde, Jest, , Mikebe, Mobutu, Brasho

MATERIAL TYPE	SORTING/ LABEL CODE	RECYCLABLE	HANDLING NOTES	EXAMPLES
Aluminium		Yes	Rinse, compress cans	Aluminium beverage cans (soda, beer, energy drinks), cookware (pots, pans, baking trays), Roofing sheets
Iron		Yes	Use magnets to test, rinse before recycling	Reinforcement bars (rebar) in concrete, structural beams and columns, bridges and rail tracks, manhole covers and gratings

3.1.5 Aggregation

Aggregation is gathering and consolidating waste materials before they are transferred to processing or recycling facilities. These areas or centers serve as temporary holding centers for various waste fractions brought in by waste pickers.

Materials managed in this stage are mostly recyclable and reusable items. This stage is essential for ensuring a steady flow of quality materials into the recycling value chain and plays a key role in promoting a circular economy.



Waste Aggregation Centre
Source: ETM Recycling

Different Forms of Aggregation Centres

a) Collection Point

A collection point is a designated location where the public or specific users temporarily deposit waste for scheduled pickup by waste management service providers. These points are often the first interface between waste generators and the formal waste management system.

Key Characteristics:

- Located in accessible public or semi-public spaces e.g., bus termini, matatu stages, within vehicles.
- Serves individual users or groups e.g., passengers placing trash in a bin inside a matatu.
- Designed for short-term storage either a few hours to a few days).
- Requires regular emptying to avoid overflow and contamination.
- Often involves signage or messaging encouraging proper disposal behavior.

Figure 1: Sample Collection Point by KEPRO

b) Holding Point

A holding point refers to a centralized location where waste collected from various sources is aggregated, temporarily stored, and sorted before being transported to its destination, for disposal, recycling, composting, or further processing.

Holding points serve as a critical link in the waste management chain, enabling efficient logistics coordination, volume consolidation, and preliminary handling of waste materials.

These facilities vary depending on the waste type and intended end-use. Common examples include transfer stations, material recovery facilities, composting yards, recycling centers, and in some cases, sanitary landfills used as interim storage before final disposal.

Holding points facilitate bulk transportation and reduce the number of direct trips to distant processing or disposal sites, lowering transport costs, minimizing environmental impacts, and improving the overall efficiency of waste management systems. In areas with decentralized collection systems, especially in urban settings, holding points, when equipped with proper infrastructure, also help streamline collection schedules and support segregation efforts.

Key Characteristics:

- Typically larger and more secure than collection points.
- Located in intermediary logistics zones like yards or waste transfer stations.
- Used by service providers or waste collectors to consolidate loads.
- May hold waste for longer durations up to 24–72 hours, under regulated conditions.
- Often equipped for sorting, weighing, or compacting.

Checklist for Setting up an Aggregation Center

Needs Assessment & Planning

- o Identify the type of materials to be aggregated, e.g., plastics, e-waste, paper, scrap metal.
- o Map out the source of materials, landfills, and waste collector groups.
- o Conduct a feasibility study to assess demand, supply chain dynamics, and location suitability.
- o Engage with key stakeholders (e.g., county government, NEMA, community groups).

Site Selection and Land Use

- o Choose a strategic location with access to roads, suppliers, and buyers.
- o Ensure compliance with zoning and land use policies.
- o Secure proof of land ownership or lease agreement.
- o Conduct an Environmental Impact Assessment.

Infrastructure Setup

- o Construct, purchase or renovate structures for:
  - Sorting and weighing
  - Storage/warehousing
  - Office/administration
  - Sanitation (toilets, handwashing stations)
  - Install signage, fencing, and basic safety features (fire extinguishers, lighting, ventilation).
  - Provide basic utilities (water, electricity, drainage).

Licensing and Regulatory Compliance

- o Register the operating entity (e.g., as a CBO, cooperative, company).
- o Obtain a Business Permit from the county government.
- o Apply for relevant licenses e.g:
  - NEMA Waste Handler's License (for waste materials) - County permits

Equipment and Logistics

- o Procure or lease essential tools and equipment:
  - Weighing scales
  - Sorting tables, bins, bags
  - Balers, shredders (if processing)
  - PPEs (gloves, boots, masks, reflective jackets)
- o Set up a system for transport of materials (motorbike, cart, tuk tuk, truck).

Staffing and Capacity Building

Hire key personnel:

- o Centre Manager/Supervisor
- o Sorters, loaders, record keepers, security

Train staff and suppliers on:

- o Occupational health and safety
- o Material sorting and handling
- o Record-keeping and weighing procedures
- o Establish a code of conduct or operating rules

Operations and Record-Keeping

- o Develop a system for daily operations:
  - Material intake and outflow logs
  - Pricing and payments
  - Inventory tracking
- o Maintain a supplier database (e.g., waste pickers, farmers).
- o Create a reporting template for volume, income, and challenges.

Financial Management

- o Open a bank account for the aggregation centre.
- o Set up a simple bookkeeping system (manual or digital).
- o Explore funding or partnerships with NGOs, donors, or government programs.
- o Determine a pricing model and payment plan for suppliers and customers.

Community Engagement and Branding

- o Raise awareness among local stakeholders about the center's purpose and benefits.
- o Conduct onboarding sessions for waste pickers or suppliers.
- o Develop branding: t-shirts, flyers, WhatsApp group, etc.
- o Build partnerships with recyclers, transporters, and processors.

3.1.6 Solid Waste Management

i) Recycling

Recycling is one of the critical components of the waste management ecosystem. The concept has since evolved into one of the important actions in dealing with growing waste. Recycled plastics are often converted into post-consumer resin (PCR), which is largely used to describe material derived from any recycled plastic material.

When producers and manufacturers opt to use recycled plastics in their production, it generally contributes to a solution to the global burden of plastic waste by keeping plastic out of landfills.

There are currently two methods of recycling: chemical and mechanical recycling. Chemical recycling covers several processes, including pyrolysis, solvolysis, solvent-based purification, and gasification. These processes involve splitting polymer chains to derive fuels such as naphtha and crude oils.

Conversely, mechanical recycling preserves the nature of the waste fraction by crushing the plastic and turning it into granulate. The granulates are then used as raw material to manufacture new products[9].

Manufacturing products using recycled plastics translates to energy savings . PCR lowers energy consumption by at least 79% and reduces GHG emissions by at least 67%.

- US Plastics Pact

Value Addition in Recycling

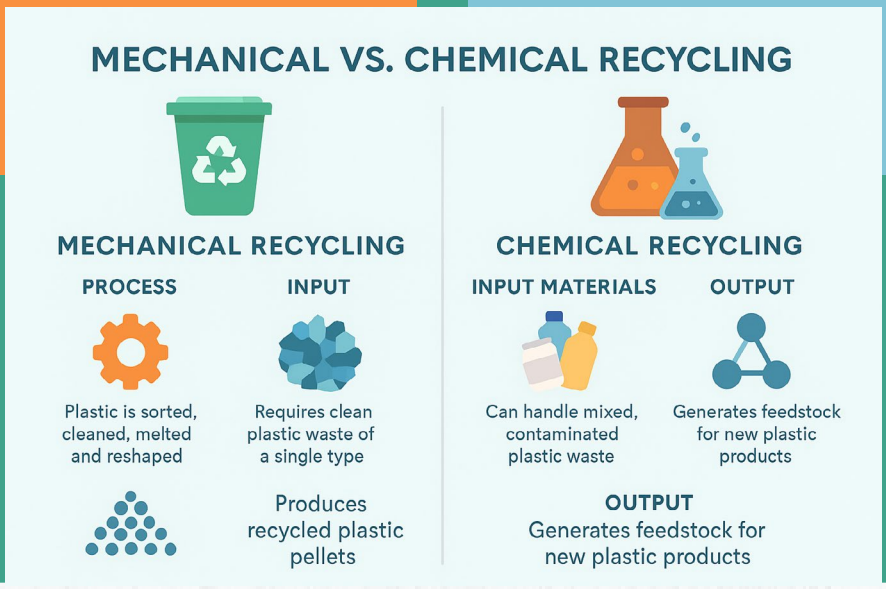
Value addition in recycling goes beyond simply reusing materials. It's about creatively reengineering waste into premium, market-ready products. This transformation boosts the economic worth of recycled goods and fuels innovation in sustainable manufacturing.

Mechanical Recycling

- A cheaper method to responsibly address plastic pollution
- Infrastructure is readily available
- The continuous breakdown of plastic does not allow for repeated recycling, reducing its quality and value.

Chemical Recycling

- An expensive venture due to the resin used in the process.
- Infrastructure and technology are not readily available and require considerable investment.
- Supports repeated plastic recycling since it creates a new polymer without breaking down the plastic.



[9]https://www.areyour.org/en/2025/04/24/mechanical-recycling-a-concrete-solution-for-the-circular-economy/

Moreover, turning discarded items into high-performance materials or entirely new products enhances the viability of recycling systems, conserves finite natural resources, and plays a pivotal role in reducing environmental impact. It's a cornerstone of the circular economy, where waste becomes a resource rather than a burden.

Methods of Value Addition

The process of adding value to recyclables begins at the very first stage: sorting and segregation at the source. Proper separation of waste by type (e.g., plastics, metals, paper) ensures cleaner input materials that are easier and more cost-effective to process. This step is critical for maintaining the quality and integrity of the final recycled products.

Once collected, recyclables undergo a series of mechanical and chemical processes tailored to the material type. These may include:

- **Shredding:** Breaking down large items into smaller, manageable pieces/flakes.
- **Washing:** Removing contaminants such as labels, food residue, and dirt.
- **Compacting:** Reducing volume for easier handling and transport.
- **Pelletizing**: Converting plastics into uniform pellets for reuse in manufacturing.

Key machines used in value addition include:

- **Balers:**

  These compress recyclables like plastics, paper, and metals into compact bales for easier handling, storage, and transport. Baling increases density, reducing logistical costs.

- **Compartmentalizers:**

  These are used to sort different waste streams into designated compartments, especially in material recovery facilities (MRFs), improving the efficiency of downstream processing.

- **Washing Machines**

  are essential for cleaning plastics and other materials. They remove contaminants such as labels, food residue, and dirt, ensuring a higher-quality end product.

- **Shredders and Granulators**:

  Used to reduce material size before further processing or melting.

Baler

Source: www.wastecare.com

Compartmentalizer

Source: Kadee Quality Products

Granulator

Source: www.gbman.net

Benefits of Recycling

- **Reduces Waste Sent to Landfills and Incinerators**

Recycling diverts materials from landfills, extending their lifespan and reducing methane emissions from decomposing waste.

- **Conserves Natural Resources**

It reduces the need to extract, refine, and process raw materials like timber, minerals, and fossil fuels.

- **Saves Energy**

Producing goods from recycled materials generally uses less energy than virgin materials (e.g., recycled aluminum uses up to 95% less energy).

- **Reduces Greenhouse Gas Emissions**

Lower energy use means fewer fossil fuels burned, helping to combat climate change.

- **Supports the Circular Economy**

Recycling keeps materials in use for longer, encouraging sustainable production and consumption models.

- **Creates Jobs and Stimulates the Economy**

Recycling and remanufacturing industries generate employment opportunities in collection, sorting, processing, and innovation.

- **Promotes Environmental Awareness**

It encourages individuals and institutions to consider products' lifecycles and adopt more sustainable behaviors.

Challenges of Recycling

- **High Initial and Operational Costs**

Setting up recycling infrastructure (collection, sorting, processing) can be expensive, especially in areas without existing systems.

- **Quality Degradation of Materials**

Some materials, like plastics and paper, degrade after multiple recycling cycles, limiting reuse without downcycling.

- **Contamination Challenges**

Mixed or improperly sorted waste can contaminate recycling streams, reducing efficiency and increasing processing costs.

- **Not All Materials Are Economically Recyclable**

Some materials are too costly or technically difficult to recycle compared to producing new ones, such as certain composite plastics or multilayered plastics, such as juice cartons or chip (crisps) bags.

- **Carbon Footprint from Transportation**

If recycling facilities are far from collection points, emissions from transport can offset some of the environmental benefits.

Designing Bottles That Can Actually Be Recycled

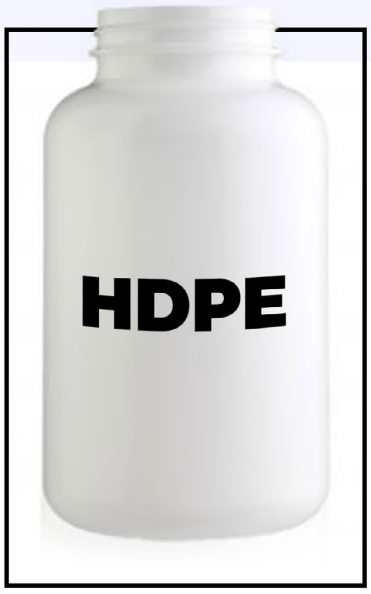
In Kenya, most plastic bottles are not recycled due to design flaws rather than a lack of infrastructure. This section offers practical guidance for designing PET and HDPE bottles and jars that are compatible with Kenya's recycling systems.

Design Guidelines for PET Bottles and Jars (e.g., Soda, Juice)

- Use clear or light blue PET. Avoid dark or opaque colours.
- Select HDPE or PP caps that float and can be easily separated.
- Avoid full-body shrink sleeves, especially those made from PVC or PETG.
- Use removable labels with water-soluble adhesive.
- Avoid direct printing; opt for laser-etched batch codes.
- Exclude metal liners or foil inside caps.

Design Guidelines for HDPE Bottles and Jars (e.g., Milk, Shampoo, Detergents)

- Use natural (uncoloured) or light-coloured HDPE.
- Avoid black plastic as it cannot be detected by standard sorting machines.
- Choose HDPE or PP closures; avoid metal or PET caps.
- Do not use PVC or paper labels, which hinder recycling.
- Inks and adhesives should be water-washable and non-toxic.
- Avoid direct printing across the container surface.



WHITE HDPE
(HIGH DENSITY POLYETHYLENE)
WIDE MOUTH PACKER

CLEAR PET
(POLYETHYLENE TEREPHTHALATE)
WIDE MOUTH PACKER

Common Design Features to Avoid

- Black plastic or carbon black pigments
- Full-body shrink sleeves made of incompatible plastics
- Oil-based or metallic direct printing
- Non-removable or non-washable labels
- PVC or multi-layered components
- Caps or seals that do not float (e.g., PET or PS)

Prioritize Reuse Where Possible

- Design for multiple use cycles using durable, scratch-resistant materials.
- Ensure packaging is easy to clean, with smooth surfaces and minimal crevices.
- Incorporate stackable or return-friendly shapes.
- Avoid limited-use branding or event-specific

Pre-Production Design Checklist

Design Consideration	Preferred Specification
Is the packaging mono-material?	Yes – PET or HDPE only
Are closures made from HDPE or PP?	Yes
Are labels removable in water?	Yes
Is the container colourless or light-toned?	Yes
Is direct printing avoided?	Yes
Are inks and adhesives non-toxic and washable?	Yes
Is the package suitable for multiple use cycles?	Ideally, yes

ii) Incineration

Incineration is another component of the waste management ecosystem, often used to address non-recyclable or hazardous waste. It involves the controlled combustion of waste materials at high temperatures, converting waste into ash, flue gas, and heat.

While not a substitute for recycling, incineration can complement other waste treatment methods when applied within a well-regulated system. Modern incineration facilities often operate as Waste-to-Energy (WTE) plants, generating electricity or heat from the combustion process. This offers an alternative energy source and contributes to reducing the volume of waste going to landfills.

Benefits of Incineration

- **Volume Reduction:** Reduces the volume of waste by up to 90%, decreasing pressure on landfills.
- **Energy Recovery:** Generates power and heat from waste, offering a supplementary energy source.
- **Hazardous Waste Elimination:** Safely treats toxic and infectious materials that pose risks in landfills.
- **Odour and Pest Control:** Operates in a closed system, limiting issues commonly associated with open dumping or poorly managed landfills.
- **Reduced Methane Emissions:** Unlike landfills, incineration does not produce methane, a potent greenhouse gas.

Challenges of Incineration

- **Air Pollution:** Emissions may include harmful pollutants such as dioxins, furans, and heavy metals, requiring advanced filtration systems.
- **High Setup and Operation Costs:** Incinerators are capital-intensive and require ongoing investment in pollution control and monitoring.
- **Ash Disposal:** Produces residual fly ash and bottom ash that must be carefully managed to prevent environmental contamination.
- **Potential to Discourage Recycling:** Overdependence on incineration can divert focus and resources away from more sustainable solutions like waste prevention and recycling.
- **Public Opposition:** Community resistance to incinerators remains high due to environmental justice concerns and fears about health impacts.

Although incineration can play a role in managing specific waste streams, it ranks lower in the waste management hierarchy than reuse, recycling, and reduction. It is best applied to residual waste that cannot be feasibly recovered, ensuring that valuable recyclable materials are not lost to combustion.

iii) Takeback Systems

Takeback systems are structured programs in which manufacturers, retailers, or designated organizations are responsible for collecting used products or packaging from consumers after use. These systems are designed to ensure that products are properly recycled, reused, or safely disposed of rather than ending up in landfills or polluting the environment.

The Extended Producer Responsibility Regulations, 2024 mandate that all producers, whether manufacturers, importers, or brand owners, establish effective takeback systems for managing their post-consumer waste. This legal requirement is a significant step toward embedding sustainability into the entire product lifecycle.

By placing the responsibility for waste management on producers, the regulations aim to:

- Encourage sustainable product and packaging design, making items easier to reuse, recycle, or safely dispose of.
- Promote behavior change among consumers, by creating accessible and incentivized return systems that make recycling a shared responsibility.

How Takeback Systems Work

Takeback systems typically involve:

a. Collection points at retail stores, recycling centers, or through mail-back programs.

b. Reverse logistics, where used items are transported back to manufacturers or recyclers.

c. Sorting and processing to recover valuable materials or refurbish products for reuse.

Common examples include **electronics return programs, battery recycling bins, and deposit-return schemes for beverage containers.**

Case Study : Apple's Trade-In Program

Apple Inc. operates one of the most recognized global takeback schemes through its Apple Trade-In Program. Customers can return their old Apple devices, such as iPhones, iPads, Macs, and Apple Watches, in exchange for store credit or free recycling. Devices that are still functional are refurbished and resold, while non-functional ones are dismantled and recycled using advanced material recovery techniques.

This program supports Apple's broader sustainability goals, including reducing electronic waste, recovering valuable materials like rare earth elements, and lowering the carbon footprint of new products. It also encourages consumers to participate in responsible disposal by offering a convenient and rewarding process.

Efficiency Benefits of Takeback Systems

1. Improved Resource Recovery

Takeback systems efficiently recover valuable materials like metals, plastics, and paper. This reduces the need for virgin resource extraction.

2. Reduced Environmental Impact

Takeback systems help lower greenhouse gas emissions, prevent pollution, and reduce products' environmental footprint by diverting waste from landfills and incinerators.

3. Producer Responsibility

These systems promote Extended Producer Responsibility, where manufacturers are held accountable for the entire lifecycle of their products. This encourages eco-friendly product design and more sustainable business practices.

4. Consumer Engagement

Takeback programs raise awareness and make it easier for consumers to participate in recycling efforts. Convenient drop-off points and incentives, like refunds or discounts, increase participation rates.

5. Cost Savings and Efficiency

Centralized collection and processing reduce municipal waste management costs. Manufacturers can also benefit from reclaiming materials for use in new products thereby lowering production costs.

6. Data and Traceability

These systems often include tracking mechanisms that provide valuable data on product lifecycles, material flows, and recycling rates, helping improve future waste management strategies.

Need help in setting up a takeback scheme? Contact us or visit our website for more information.

iv) Composting and Black Soldier Fly (BSF) Treatment in Organic Waste Management

Composting and Black Soldier Fly (BSF) treatment are two effective biological approaches to managing organic waste. As the volume of food and agricultural waste continues to rise, these methods offer sustainable solutions that convert biodegradable waste into valuable end products, reducing the load on landfills while supporting regenerative agriculture.

Composting

Composting is the natural decomposition of organic matter into nutrient-rich compost, such as food scraps, crop residues, and garden waste. Through aerobic microbial activity, organic waste breaks down over time to form humus, which can be used as a soil conditioner or fertilizer.

There are several methods of composting, including:

- **Windrow Composting:** Organic waste is piled into long rows and turned periodically to maintain aeration.
- **Vermicomposting:** Uses earthworms, that is Eisenia fetida to break down organic material rapidly and produce worm castings.
- **In-vessel Composting:** Involves enclosed units that accelerate decomposition under controlled conditions.

Windrow Composting
Source: waste-technologies.co.uk

Vermicomposting
Source: gardeningknowhow.com

In-vessel Composting
Source: ecoponics.com.sg

Benefits of Composting

a. Transforms Waste into a Valuable Resource

Composting converts organic waste, such as food scraps, garden trimmings, and agricultural residue, into a nutrient-rich soil amendment known as compost. This natural fertilizer improves soil structure, boosts microbial activity, and enhances soil fertility, making it ideal for farming, gardening, and landscaping.

b. Reduces Greenhouse Gas Emissions

When organic waste is decomposed in landfills without oxygen, it produces methane, a potent greenhouse gas. Composting diverts this waste from landfills and allows it to break down aerobically, significantly reducing methane emissions and contributing to climate change mitigation.

c. Improves Soil Health and Water Efficiency

Compost enhances the soil's ability to retain moisture, reducing the need for frequent irrigation. It also decreases reliance on synthetic fertilizers, which can degrade soil health over time and contribute to water pollution through runoff.

d. Scalable and Accessible

Composting can be implemented at various levels:

- **Household scale:** Using kitchen compost bins or backyard compost piles.

• **Community scale:** Through neighborhood composting hubs or school gardens.
• **Municipal scale:** Via large-scale composting facilities that process organic waste from entire cities.

Challenges

• Requires proper segregation of organic waste to avoid contamination.
• May produce odours or attract pests if poorly managed.
• It takes several weeks to months, depending on the method used.

Black Soldier Fly (BSF) Treatment

BSF treatment is an emerging waste-to-value solution that uses the Black Soldier Fly (Hermetia illucens) larvae to break down organic waste, especially food scraps, market waste, and manure, within a short time frame. The larvae consume organic matter rapidly, converting it into high-protein biomass and frass organic residue.

How BSF Works

- Organic waste is collected and pre-processed.
- BSF eggs are introduced into the waste.
- Larvae feed and grow rapidly, reducing waste volume by up to 70%.
- Mature larvae are harvested and processed into animal feed (protein and oil).
- The remaining frass is used as organic fertilizer.

Benefits of BSF

a) Highly efficient waste conversion, with faster turnaround than composting.
b) Produces larvae rich in protein and fat, suitable for livestock and aquaculture feed.
c) Reduces greenhouse gas emissions associated with traditional organic waste disposal.
d) Frass enhances soil health and can complement or replace chemical fertilizers

Value Addition in Organic Waste Treatment

Value addition in composting and BSF treatment lies in transforming waste into marketable products:

• **Compost:** Sold to farmers, landscapers, and gardening markets.
• **BSF Larvae:** Processed into protein meal, oil, and pet or fish feed.
• **Frass:** Marketed as organic fertilizer for regenerative agriculture.

Compost Turners:
Source: ezmachinery.com.au

Dryers and Grinders
Source: http://finegrindingmill.com/

Sieving Machines
Source: Super Sivtek

Machines used include:

a) Compost Turners: Aerate and mix compost to maintain optimal microbial conditions.
b) Dryers and Grinders: Used in BSF systems to process larvae and frass.
c) Sieving Machines: Remove contaminants and standardize compost or frass texture.

v) Disposal and Landfilling

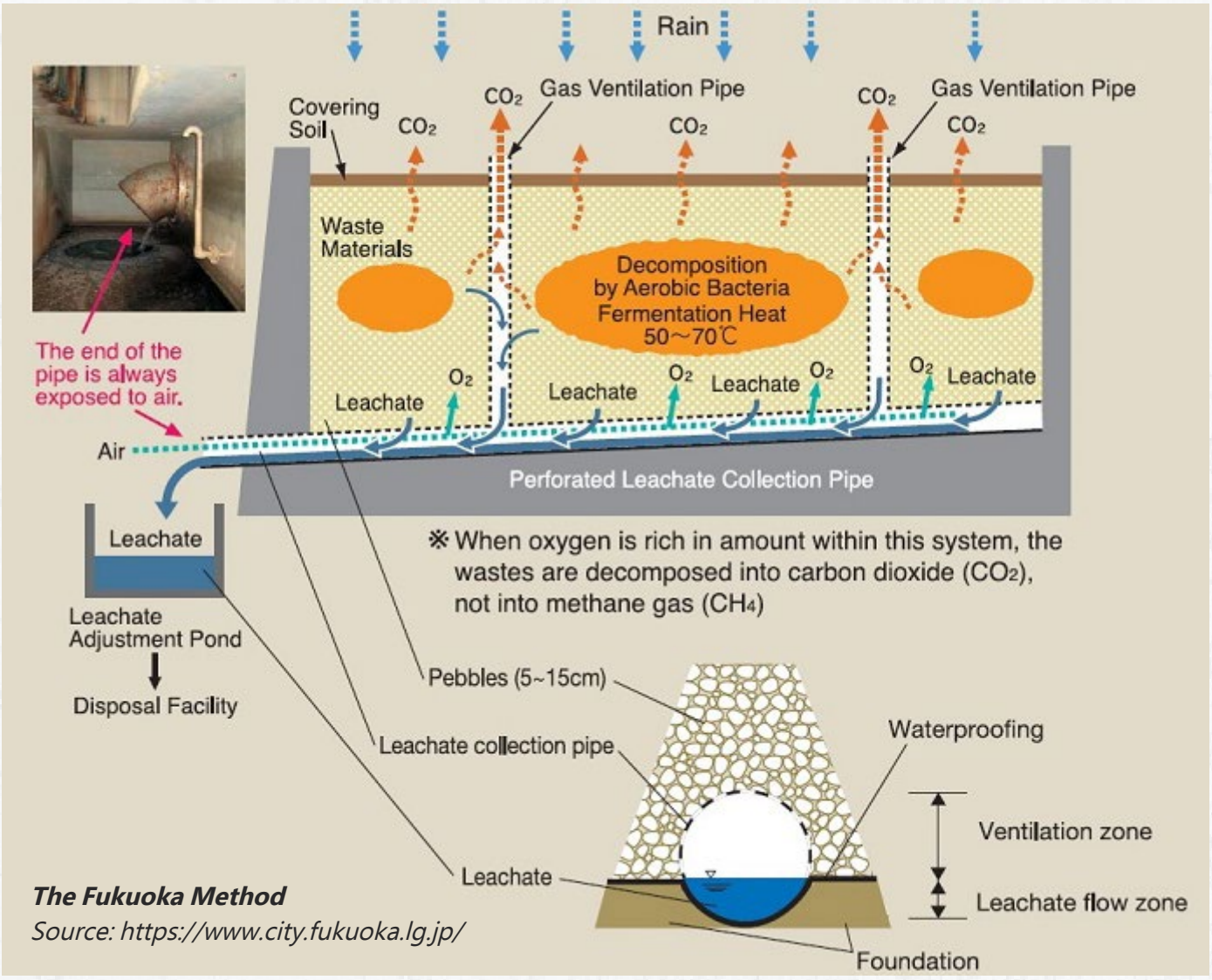
Landfills have been used for a long time and are the most common way to dispose of waste worldwide. Despite efforts to recycle and reuse, landfilling will likely remain popular. However, it is criticized for being hazardous to health and bad for the environment. Its effectiveness depends on technical, economic, and legal factors, which are often lacking in many places.

JICA, in partnership with UN-Habitat, has been at the forefront of improving landfilling technology in various countries, particularly within the Global South. Under the African Clean Cities Platform (ACCP), the two organizations have been actively working to enhance solid waste management practices by promoting the adoption of environmentally sound landfill technologies[10].

However, the underlying problem is that landfills generally contribute to emissions of greenhouse gases. For example, 45% of methane emissions in the UK come from landfills. Another problem related to landfilling is the generation of leachate, which can pollute the surrounding environment and contribute to groundwater pollution.

vi) The Fukuoka Method: A Low-Cost, Semi-Aerobic Landfill Solution

Developed in Japan in the 1960s, the Fukuoka Method is a semi-aerobic landfill system that improves waste decomposition and significantly reduces methane emissions. It works by introducing a network of perforated pipes at the base of the landfill to allow natural air circulation. This oxygen flow accelerates aerobic decomposition, stabilizes waste faster, and minimizes the production of harmful gases and leachate.



The Fukuoka Method

Source: https://www.city.fukuoka.lg.jp/

[10]https://www.africancleancities.org/about-accp

Key Benefits of the Fukuoka Method:

Reduces methane emissions by promoting aerobic rather than anaerobic decomposition.

Low-cost and adaptable, making it ideal for developing countries with limited resources.

Improves leachate quality and reduces the risk of groundwater contamination.

Requires minimal mechanical equipment, relying instead on natural ventilation.

This method has been successfully piloted in several countries across Asia and Africa, offering a practical and scalable solution for improving landfill management in the Global South[11]

Example of landfill adopting the fukuoka method in Kenya
Source: KEPRO

[11]https://www.jica.go.jp/english/information/seminar/2023/20231228.html

3.2 Why Data Matters in Solving Kenya's Waste Crisis

In cities and towns across Kenya, waste continues to pile up, from Nairobi's overflowing Dandora dumpsite to illegal dumping in informal settlements and rural towns. But there's a silent, powerful tool that can help clean up our environment and improve service delivery data. In simple terms, data is information, numbers, patterns, and facts, collected to understand what's happening and make better decisions. In waste management, this means tracking how much waste is produced, where it comes from, how it's collected, and how it's treated or dumped.

So why does this matter?

1. Planning Efficient Waste Collection

When counties and waste service providers have accurate data, they can plan better. For example, knowing how much waste is generated per household in Kayole versus Kilimani helps the Nairobi City County Government deploy trucks more efficiently. It reduces missed pickups in high-density areas and saves fuel on unnecessary trips. Some private waste collectors in Kenya have started using simple mobile apps to log collection routes, frequencies, and volumes. This has helped reduce operational costs and improve customer satisfaction.

With clear numbers on recycling rates, population served, and materials collected, governments can set realistic goals and check progress. In practice, cities like San Francisco use data to aim for zero waste. Smart bins helped San Fransisco cut trash overflow by 80%, illegal dumping by 64%, and street-cleaning calls by 66%[12].

2. Tracking What We Throw Away

Kenya's waste challenge is not just about quantity, it's about what we throw away. Are we separating food waste, plastics, glass, and paper? Are recyclables ending up in landfills because of poor segregation?

With data, counties can track the volumes of different waste streams and invest wisely. For example, Mombasa County's partnership with the Kenya PET Recycling Company (PETCO) helped map plastic waste hotspots, leading to targeted clean-ups and placement of collection bins along the beach. Similarly, data can show whether composting organic waste in Kisumu is reducing pressure on dumpsites, and how that impacts public health and urban farming.

3. Supporting the Circular Economy

Kenya has made strides in promoting the circular economy , where materials are reused, recycled, and kept in use longer. But without data, circularity is just a slogan. Initiatives like the MTaka platform use digital tools to record what waste is collected, by whom, and where it goes. This transparency helps formalize waste pickers, connects them with recyclers, and ensures producers are accountable through EPR frameworks.

For example, in New York City, giving trucks 360° cameras and GPS has made operations so much smoother that managers now "track every truck, monitor progress, and make real-time adjustments as needed", which translates to less pollution and cleaner streets[13]. Data also attracts investors and innovators who want to build recycling plants or plastic buyback centers. However, these projects need proof of a consistent material supply to be viable.

4. Engaging the Public

Data also plays a role in public participation. When citizens receive feedback, such as how much their estate recycles waste, or how many bins were misused, they are more likely to change their behavior.

Counties can leverage data dashboards, social media updates, or SMS alerts to inform residents and schools. This builds a culture of accountability and environmental responsibility. Some cities even gamify recycling. A good example is Singapore's myENV app, which uses digital rewards to encourage good sorting habits[14].

Waste management cannot be guesswork. Whether it's deploying trucks, designing policies, or involving the community, data is the fuel that powers clean cities. For Kenya to win the war on waste, we must invest in reliable and straightforward systems to collect, analyze, and act on waste data, from the household to the county level.

Because what gets measured gets managed.

Kenya's waste challenge is not just about quantity, it's about what we throw away. Are we separating food waste, plastics, glass, and paper? Are recyclables ending up in landfills because of poor segregation?

[12]Lettieri, G. (2024). Top US Cities for Smart Waste Management: RTS. Retrieved from https://www.rts.com/blog/smart-city-waste-management/#:~:text=As%20a%20zero,levels%2C%20temperature%20and%20fill%20rates

[13] Karidis A. (2025). New York City's Sanitation Department Leans Into Cutting Edge Technologies. https://www.waste360.com/route-optimization/new-york-city-s-sanitation-department-leans-into-cutting-edge-technologies

[14] https://www.futureelectronics.com/blog/article/3-smart-cities-using-technology-to-tackle-waste-management/#:~:text=In%20addition%2C%20Singapore%20has%20integrated,and%20encourage%20responsible%20waste%20behavior

04

Progress: Transitioning To a Circular Economy

The EPR Landscape

Kenya is actively taking the lead in addressing plastic waste pollution. In addition to regulatory enforcement, such as the ban on plastic bags, the introduction of EPR schemes further demonstrates the nation's commitment to ensuring a clean and healthy environment for its citizens.

What is EPR?

Extended Producer Responsibility (EPR) is a policy approach that shifts the responsibility for managing post-consumer waste back to the producer or manufacturer. Its principle is rooted in the Polluter Pays Principle. This key environmental management concept holds producers financially and physically accountable for the products they place on the market throughout their life cycle, including collection, recycling, and final disposal.

How Does it Work?

The EPR framework is not a novel concept globally. For example, South Africa has instituted EPR regulations for packaging and electronics. Australia has set National Packaging targets, which aim for 100% recyclable packaging by 202510.

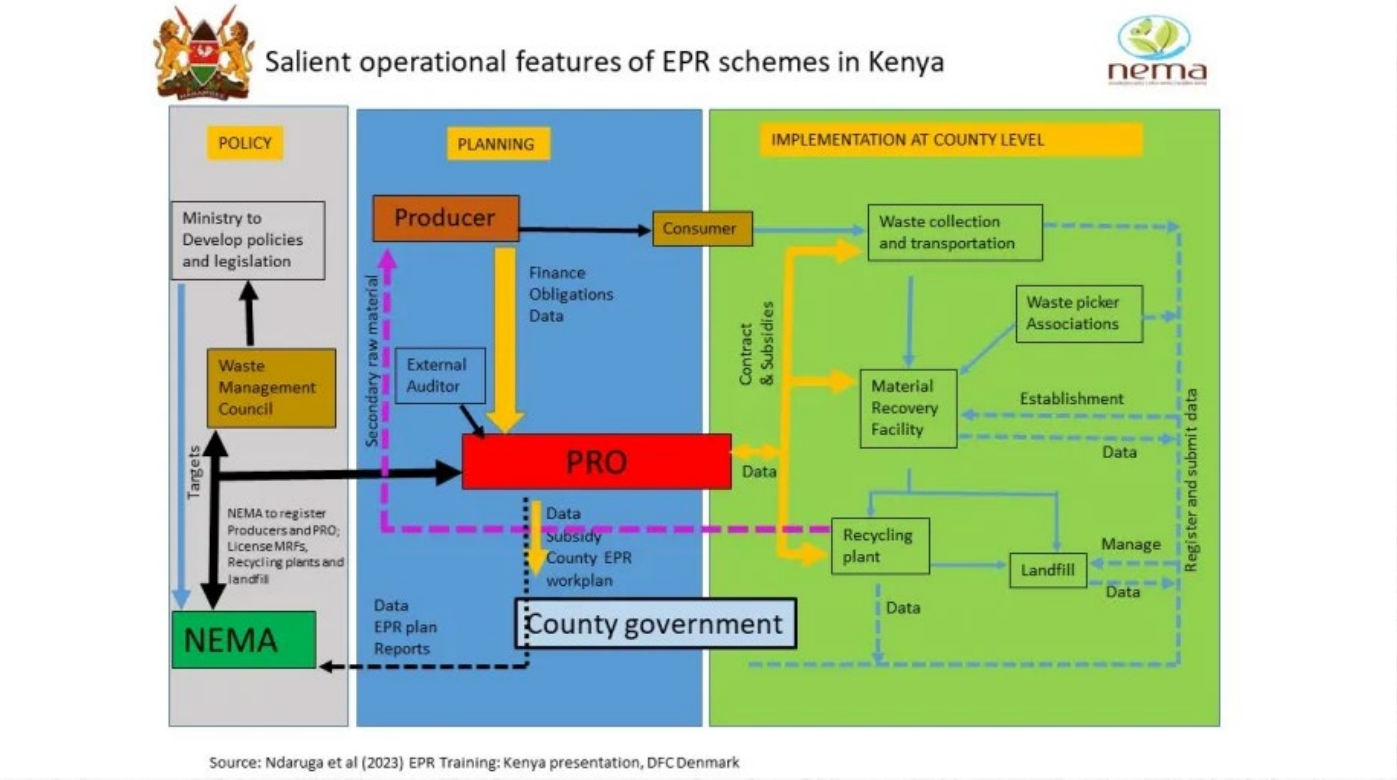
The success of the EPR framework is implemented through the registration of producers or manufacturers with accredited Producer Responsibility Organizations (PROs). These PROs act on behalf of producers to coordinate and manage post-consumer waste in compliance with national environmental standards and policies.

The Sustainable Waste Management Act, 2022 mandates all producers to develop and submit EPR plans to the National Environment Management Authority (NEMA), outlining how they intend to collect, treat, and dispose of waste arising from their products. These plans include strategies for setting up take-back schemes, awareness campaigns, and collaboration with local waste collectors, aggregators, and recyclers.

Additionally, the producers through PROs are also responsible for financing waste management activities, investing in infrastructure such as material recovery facilities, and regularly reporting data to NEMA to demonstrate compliance. Ideally, EPR encourages innovation by incentivizing producers to redesign products for longevity, recyclability, and minimal environmental impact.

The EPR regulations define the various waste fractions that are targeted under the scheme as denoted in the table below:

Product
Packaging for non-hazardous products (plastics, aluminium, composite, paper and its corrugates, glass, cardboard, and carton).
Hazardous products' packaging (Industrial chemicals, oil and lubricants, pharmaceuticals, agrochemicals, veterinary, cosmetics, paints, and solvents), treated wood, and agricultural films.
Electrical and Electronic Equipment, Mercury Auto Switches, thermostats, Battery and Accumulators.
End-of-life motor vehicles, automobiles, aircraft, locomotives.
Non-packaging items (Plastics, glass, paper, cardboard), Furniture (except wooden, metallic), Rubber and Tyres, textiles, leather, artificial hair, diapers, and sanitary towels.



Source: Ndaruga et al (2023) EPR Training: Kenya presentation, DFC Denmark

4.0 The Role of Producer Responsibility Organizations (PROs) in Supporting Waste Collectors

Case Study: Japan's EPR Practice for Package Waste Recycling

Japan launched its first EPR initiative for packaging waste in 1995, marking a significant shift toward sustainable waste management. This initiative emerged in response to the growing volume of packaging waste, particularly plastic, that was being landfilled.

At the time, packaging waste comprised approximately 60% of landfill content by volume. The EPR system was introduced to promote environmentally sound recycling and minimize waste diversion to landfills. The EPR law clearly defines the roles and responsibilities of all stakeholders involved in the packaging waste value chain. This well-structured governance model ensures transparency, accountability, and continuous improvement.

- **National Government:** The national government is responsible for developing overarching policies, monitoring implementation activities, and reviewing and revising the law to ensure long-term sustainability, transparency, and fairness. Its role includes enforcing regulations, evaluating performance, and ensuring a

ll players adhere to the rules.

- **Municipalities:** Local governments manage the primary collection, sorting, and pre-treatment of packaging waste. They must meet the specific sorting criteria set by Producer Responsibility Organizations, ensuring that the waste collected is suitable for recycling. Municipalities play a critical role in ensuring that the first stages of the recycling chain are efficient and effective.

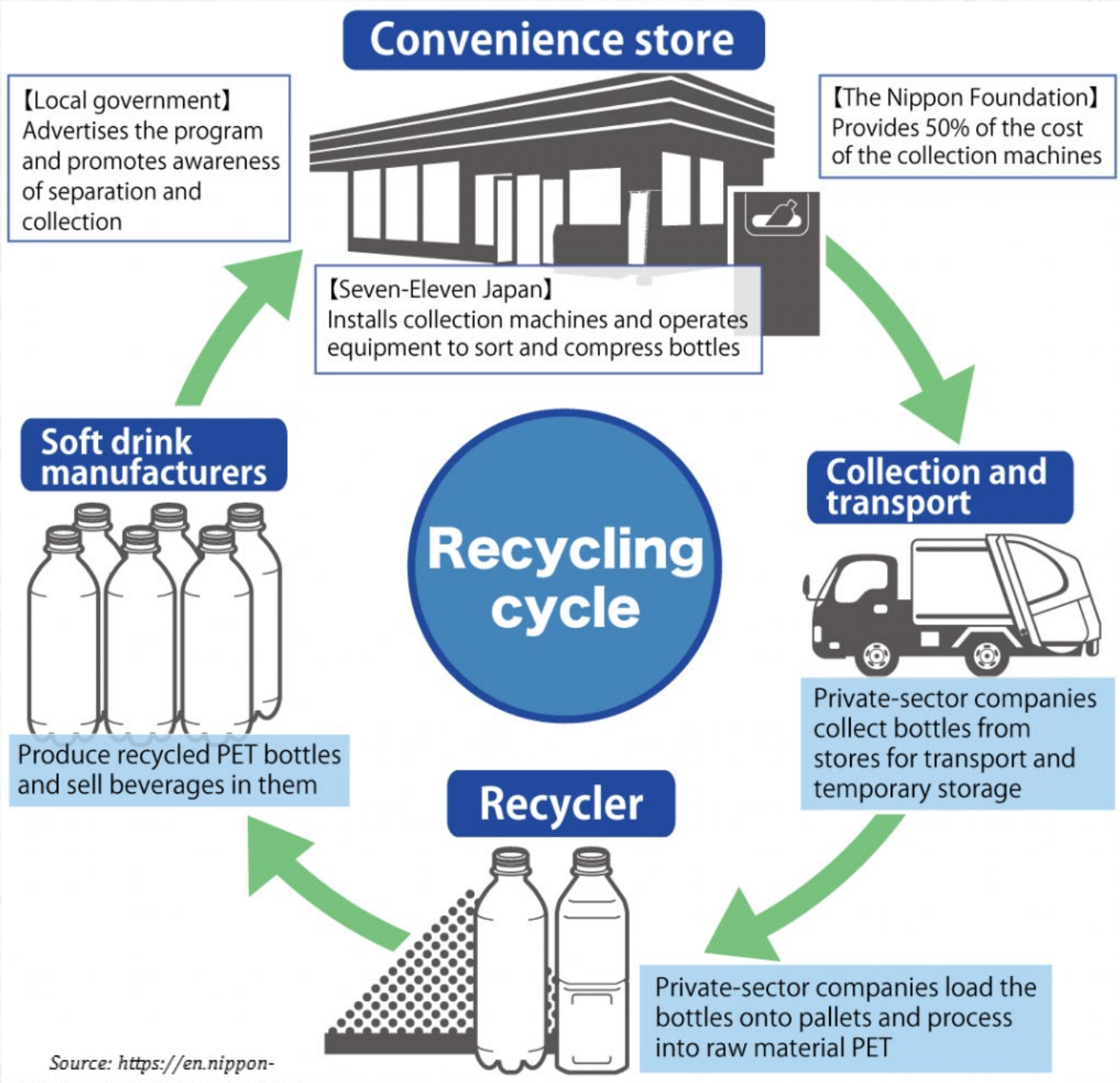
- **Producers/PROs:** Producers, individually or through PROs, are legally obligated to bear the recycling cost based on the packaging volume they introduce to the market. They also engage in bidding processes to acquire sorted materials from municipalities. This cost-bearing responsibility ensures that producers are financially invested in designing packaging that is easier to recycle and generates less waste.

- **Recyclers:** These entities process the collected and sorted packaging waste. They convert the waste into recycled materials and supply them to off-takers, including the original producers, thereby closing the loop in the recycling process.

One key factor behind Japan's EPR system's success is the commitment to sustainable, continuous improvement and collaboration among all stakeholders. The shared responsibility approach encourages each party to actively participate in creating an efficient and effective recycling ecosystem.

A notable example of successful collaboration in recent years is the partnership between large retail chains, municipalities, and producers to enhance PET bottle recycling. Retailers have set up store collection points, allowing consumers to return used PET bottles. Municipalities support the initiative through local logistics and public awareness campaigns. Meanwhile, producers use the recycled PET to manufacture new bottles, promoting bottle-to-bottle recycling. This practice has become widespread across Japan and is a leading example of high-grade PET bottle recycling.

Japan's experience demonstrates how a well-regulated EPR system, coupled with multi-stakeholder cooperation and a strong legal framework, can significantly enhance recycling rates, reduce landfill dependency, and foster a more circular economy.



Source: https://en.nippon-foundation.or.jp/news/articles/2020/20201030-51019.html

4.1 Driving Sustainable Practices-Beyond KEPRO's Mandate

Case Study: KEPRO

The growing challenge of waste management worldwide prompted the need for more proactive measures to manage the ever increasing packaging and product consumption and the negative consequences of the waste. Over the years, interventions underpinned by circular economy principles, such as reuse, reduction, repurposing, and recycling, have gained significant traction. One such policy approach is the extended producer responsibility, which seeks to reduce the volume of packaging consumed while encouraging a shift from linear to more circular models of business operations. EPR holds producers of goods and packaging responsible for their entire life cycle, including end-of-life disposal. By placing operational, technical, and financial obligations on producers, EPR's premise is to incentivize the production of more sustainable goods and packaging.

Globally, EPR continues to be a system disruptor, ensuring that significant volumes of waste are diverted from landfills. Notably, the traditional EPR models can be a detriment or benefit to existing waste actors, depending on the approach to implementation. The potential benefits and detriments of EPR notwithstanding, in practice, EPR systems often overlook waste pickers and other informal actors within the ecosystem. The same has brought forth increasing pressure on producer responsibility organizations and related entities to account for jobs created in their programmes, as it remains unclear how informal waste pickers are benefiting from the concept of 'just transition' as prescribed by the International Labor Organization (ILO) recommendation 204.

Globally, EPR continues to be a system disruptor, ensuring that significant volumes of waste are diverted from landfills.

The Promise of Inclusive PROs: Recognizing the Value of Informal Waste Workers

Across the globe, the informal waste and recovery sector (IWRS) is estimated to manage up to 60% of recyclable waste, especially plastics, diverting millions of tons from landfills and oceans. These workers sort, collect, and sell recyclables with efficiency and reach that even the most sophisticated formal systems often struggle to match. However, they remain largely unrecognized, unregulated, and vulnerable.

The global discourse is shifting. The message is clear from research on informal integration in cities like Pune and Cairoto UN-Habitat's call for a just transition that leaves no one behind. There can be no sustainable or equitable circular economy without including the informal sector.

According to the Women in Informal Employment: Globalizing and Organizing (WIEGO), the key principles for equitable EPR systems include, among others:

1. **Mandatory Integration:** PROs must ensure reclaimers are contractually included in collection and recycling chains, not sidelined by corporate monopolies.
2. **Fair Payment:** Reclaimers should receive service fees for collection and fair prices for materials, with price floors to counter market volatility.
3. **Transparency:** PROs must disclose financial flows and material traceability, with reclaimers represented in oversight bodies.
4. **Capacity Building:** Training, infrastructure (e.g., sorting facilities), and social protections (healthcare, safety gear) are essential.
5. **Collaborative Campaigns and programmes:** KEPRO has jointly undertaken campaigns and programmes with various Community-Based Organizations (CBOs) representing informal waste actors nationwide. These campaigns offer visibility, income, and respect to those on the frontlines of waste recovery.

What is KEPRO doing?

KEPRO as a forward-thinking PRO in Kenya recognises the invaluable role informal waste reclaimers play in plastic recovery. In line with both the Sustainable Waste Management Axt (SWMA) 2022 and the Extended Producer Responsibility (EPR) regulations 2024 as well as global sustainability goals, KEPRO has embraced a collaborative approach:

- Organizational Support & Engagement
- Capacity Building
- Fair Compensation Models
- Social Protection Advocacy

4.2 EPR Compliance: What it Means for Producers

Extended Producer Responsibility (EPR) shifts the responsibility for managing a product's end-of-life, including its waste, onto the producer. This means producers, not just consumers or governments, are financially and/or operationally responsible for the collection, recycling, and proper disposal of their products. EPR aims to incentivize sustainable product design, reduce waste, and promote a circular economy.

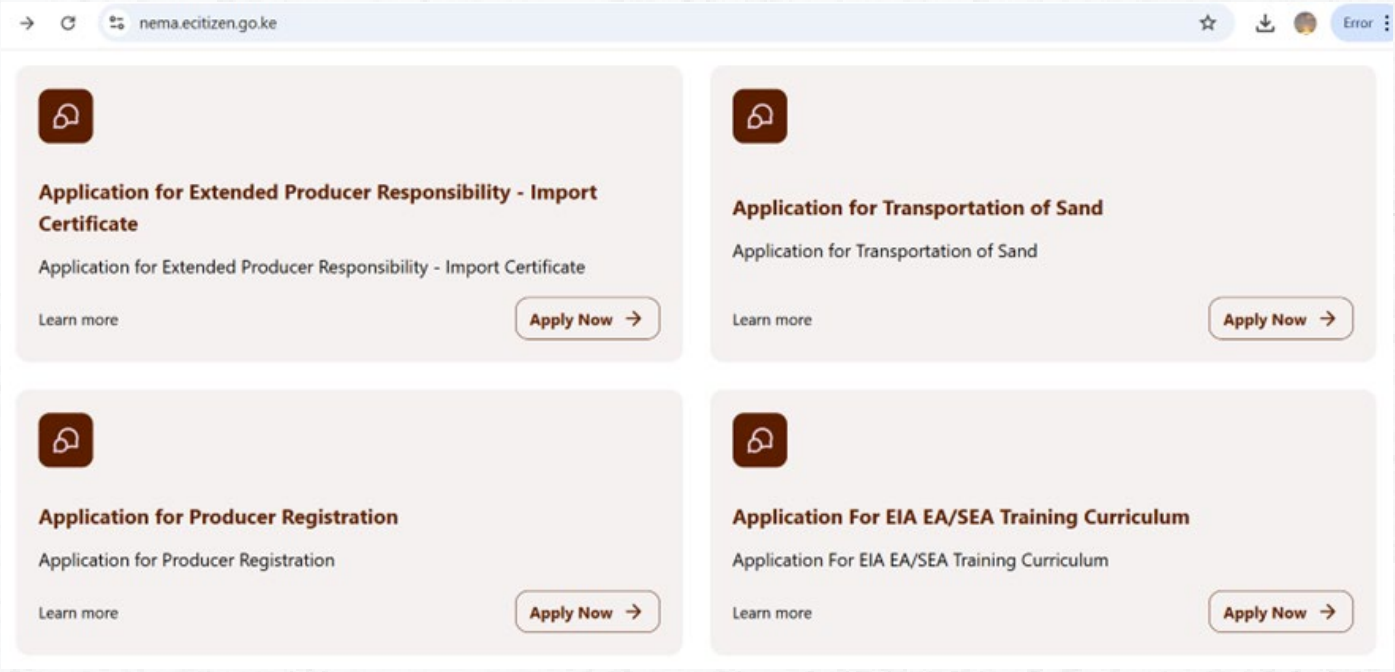
What EPR Means for Producers:

- **Financial Responsibility:** Producers must fund the costs of managing their products' waste, including collection, sorting, treatment, and recycling.
- **Operational Responsibility:** Producers may need to establish take-back schemes, collection systems, or other methods for managing their products at the end of their life.
- **Sustainable Design:** EPR encourages producers to design products that are more easily recycled, reused, or made from recycled materials.
- **Increased Transparency:** Producers are often required to report on their products' lifecycle, including waste management practices and recycling rates.
- **Potential for Innovation:** EPR can drive innovation in product design and waste management, creating opportunities for new business models and technologies.
- **Enhanced Brand Reputation:** Producers can enhance their brand image and reputation by demonstrating a commitment to sustainability and responsible waste management.
- **Compliance Requirements:** Producers must comply with specific EPR regulations, which may vary by product and location.
- **Cost Management:** Producers need to manage the costs associated with EPR compliance, including fees, operational expenses, and reporting requirements

4.2.1 EPR Compliance Procedures

a) How to Register with NEMA As A Producer

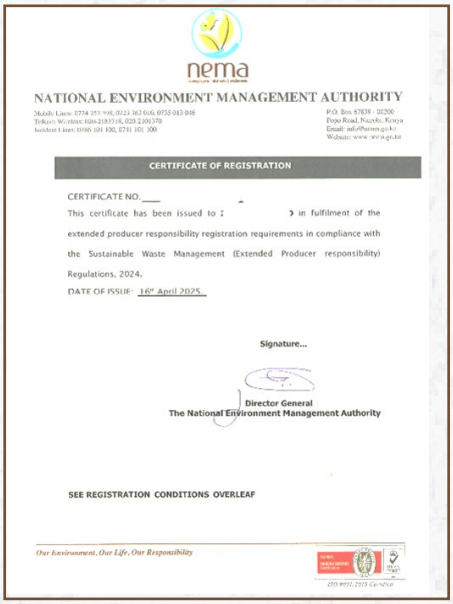
Producers are obligated to register with the authority prior to joining a collective compliance scheme or a producer responsibility organization, as stipulated in the Extended Producer Responsibility Regulations, 2024.



The steps below are a quick guide on how to navigate on EPR compliance;

- **Step 1: Log into the NEMA portal, www.nema.ecitizen.go.ke**
- **Step 2: Select "Application for Producer Registration".**
- **Step 3: Input Applicant details.**
- **Step 4: Input Producer details.**
- **Step 5: Attach product certification**
- **Step 6: Declaration**

A fee of Kes 5,050 is applicable when registering. After successful completion of the registration, you will then receive a registration certificate as shown below:


NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

CERTIFICATE OF REGISTRATION

CERTIFICATE NO.

This certificate has been issued to : in fulfilment of the extended producer responsibility registration requirements in compliance with the Sustainable Waste Management (Extended Producer responsibility) Regulations, 2024.

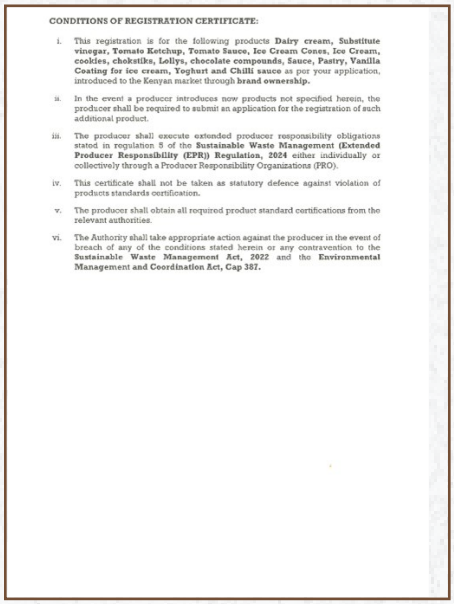
DATE OF ISSUE: 16th April 2025

Signature...

Director General
The National Environment Management Authority

SEE REGISTRATION CONDITIONS OVERLEAF

Our Environment, Our Life, Our Responsibility


CONDITIONS OF REGISTRATION CERTIFICATE:

i. This registration is for the following products **Dairy cream, Substitute vinegar, Tomato Ketchup, Tomato Sauce, Ice Cream Cones, Ice Cream, cookies, chokstiks, Lollys, chocolate compounds, Sauce, Pastry, Vanilla Coating for ice cream, Yoghurt and Chilli sauce** as per your application, introduced to the Kenyan market through **brand ownership.**

ii. In the event a producer introduces new products not specified herein, the producer shall be required to submit an application for the registration of such additional product.

iii. The producer shall execute extended producer responsibility obligations stated in regulation 5 of the **Sustainable Waste Management (Extended Producer Responsibility (EPR)) Regulation, 2024** either individually or collectively through a Producer Responsibility Organizations (PRO).

iv. This certificate shall not be taken as statutory defence against violation of products standards certification.

v. The producer shall obtain all required product standard certifications from the relevant authorities.

vi. The Authority shall take appropriate action against the producer in the event of breach of any of the conditions stated herein or any contravention to the **Sustainable Waste Management Act, 2022** and the **Environmental Management and Coordination Act, Cap 387.**

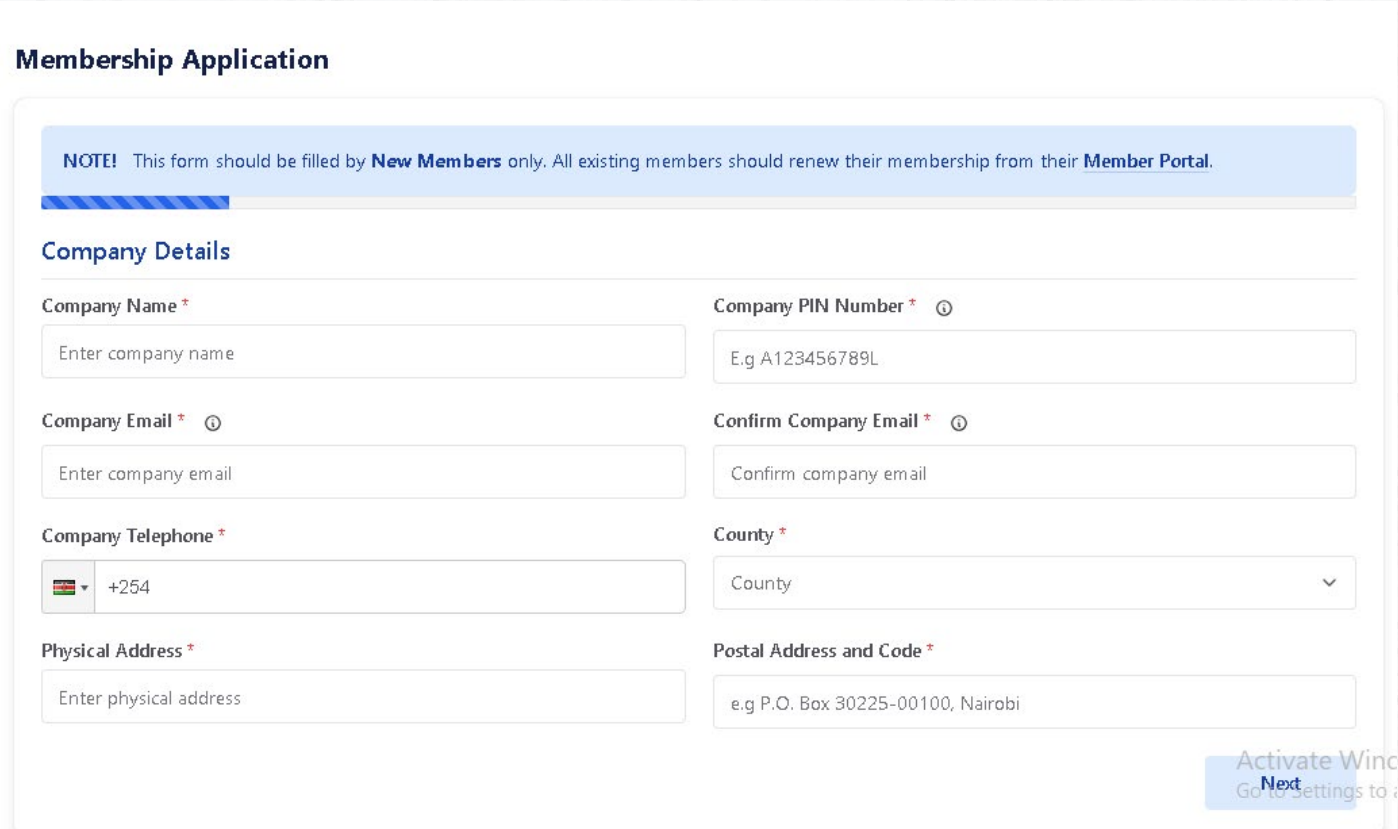
b) How to Register with KEPRO as a Member

Prior to registering with KEPRO, ensure that you have registered with the authority and have, in your possession, your certificate of registration/ number.

- **Step 1: Log into the KEPRO website, www.kepro.co.ke**
- **Step 2: Navigate to the 'Join KEPRO' tab.**
- **Step 3: Fill in the online form and attach the required documents such as company incorporation Certificate and KRA PIN Certificate**
- **Step 4: Submit your application**
- **Step 5: Once your application has been submitted and reviewed, you will receive a Proforma Invoice.**
- **Step 6: Once payment is made, you will receive a membership certificate.**

Declaration to Register as a Member

As a KEPRO member, you are expected to make Monthly Volume Declarations of the packaging items you introduce to the market. The declarations are made via the KEPRO Management System, whereby every new member is given guidance on upon joining.



4.3 Benefits of Being a KEPRO Member

Taking Legal Responsibility for Packaging Waste

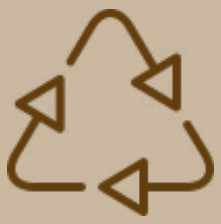
As a PRO, KEPRO assumes legal responsibility for the recovery and end-of-life management of post-consumer packaging waste on behalf of its members, which is in line with the EPR regulations. This responsibility extends across all 47 counties in Kenya, ensuring nationwide compliance and environmental stewardship.

Facilitating the Recovery of Post-Consumer Packaging Waste

KEPRO works closely with registered waste operators to support the efficient, ethical, and traceable recovery of packaging waste. Through our growing EPR network, we have contracted over 10 recyclers operating across 31 counties, ensuring that collected materials are diverted from landfills and processed sustainably.

Connecting Members to Waste Management Networks

To support effective compliance, KEPRO creates linkages between its members and waste management groups, enabling producers to tap into an established national collection and recovery infrastructure. These connections help reduce the environmental footprint of packaging by maximizing material recovery and supporting local recyclers.



Promoting Recyclable and Recoverable Packaging Design

KEPRO offers technical guidance to its members on packaging design, to enhance recyclability and recoverability. We collaborate with producers to review packaging materials and encourage upstream innovations that align with circular economy principles.

Driving Public Awareness on Packaging Waste Disposal

Consumer behavior plays a key role in the success of waste recovery systems. KEPRO leads public awareness and sensitization campaigns on proper segregation of post-consumer packaging waste, making it easier to collect clean, high-quality materials for recycling.

Streamlined Member Portal for Compliance and Declarations

Our user-friendly KEPRO Management System (KEPROms) provides a centralized, self-service portal where members can register, renew membership, and submit monthly packaging declarations. This digital system ensures real-time reporting, transparency, and compliance with Kenya's EPR framework.

4.4 Leading The Charge in Promoting Eco- Conscious with Electical Waste Management in Kenya:

Role of EPROK in meeting the Sustainable Waste Management Act of 2022

Kenya's Sustainable Waste Management Act, 2022, marked a critical shift toward a circular economy, mandating stricter waste management practices to reduce pollution, promote recycling, and hold producers accountable for the lifecycle of their products. A cornerstone of this legislation is the Extended Producer Responsibility (EPR) framework, which requires producers, importers, and brand owners to take financial and operational responsibility for collecting, recycling, or safely disposing of post-consumer waste. The EPR Regulations (2024) operationalize this mandate, setting clear targets for waste recovery and creating systems to ensure compliance.

To streamline EPR compliance, PPROs act as intermediaries between regulators such as Kenya's National Management Authority (NEMA), industries, and waste management stakeholders. PROs are collective entities that:

- **Pool resources from members to fund and manage waste collection and recycling programs efficiently.**
- **Develop infrastructure (e.g., collection hubs, recycling facilities) to meet EPR targets cost-effectively.**
- **Monitor and report on waste recovery data to ensure transparency and regulatory adherence.**

By centralizing these functions, PROs reduce the burden on individual companies while ensuring scalable, sustainable waste management systems.

The world faces a growing e-waste crisis. According to the Global E-Waste Monitor 2024, we generated 62 million metric tons of e-waste in 2022, but only 22% was recycled correctly. By 2030, the generated e-waste will reach 82 billion metric tons, with Africa being the fastest-growing region. By 2030, this could grow to 82 million tons, with Africa seeing the fastest growth.

In Kenya, NEMA reports that we produce over 51,000 metric tons of e-waste annually. This is not just a waste problem. It is a health crisis. When improperly handled, e-waste releases toxins like lead and mercury into our soil and water, contaminating our food supply. Waste collectors who breathe in toxic fumes while working face serious respiratory risks.

The E-waste Producer Responsibility of Kenya (EPROK) is tackling this challenge head-on. We help electronic and electrical manufacturers and importers meet their recycling responsibilities while supporting the waste pickers who form the backbone of our recycling system. We are making e-waste recycling safer and more effective through training, safety equipment, and awareness. We are also building partnerships with recyclers, innovators, and local governments to create better recycling systems and new ways to reuse materials. Together with county governments and NEMA, we educate communities about proper waste handling while tracking our progress toward national recycling goals.

Kenya's waste revolution needs everyone's participation. We invite county governments to work with us to create recycling centers and green jobs. We ask waste collectors and recyclers to join our network for better training and market access. We urge all electronics producers and importers to fulfill their environmental responsibilities by joining EPROK.

80,000 metric tons

E-Waste produced annually in Kenya, according to NEMA

4.5 Hazardous Waste Management in Kenya

Role of HAPROK in Meeting the Sustainable Waste Management Act 2022

By Andrew Sila, HAPROK Coordinator

The Sustainable Waste Management Act 2022 provides Kenya with a forward-looking framework to transition from a linear to a circular economy, emphasizing shared responsibility, environmental protection, and sustainable livelihoods. Within this framework, the Hazardous Waste Producer Responsibility Organization of Kenya (HAPROK) occupies a central role as the country's first dedicated Producer Responsibility Organization (PRO) mandated to coordinate Extended Producer Responsibility (EPR) for hazardous waste. Our work ensures that producers, regulators, and service providers act in alignment with national priorities while embracing international best practices.

1. Enabling Compliance and Producer Responsibility

The Act requires producers to take full responsibility for the products they place on the market throughout their life cycle, including post-consumer waste. HAPROK operationalizes this obligation by providing a structured compliance mechanism. Through membership, producers gain access to a transparent, collective system that manages registration, monitoring, collection, and environmentally sound disposal of hazardous waste. This ensures legal compliance while fostering accountability and corporate stewardship.

2. Strengthening Traceability and Risk Management

Hazardous waste presents significant risks to health and the environment if mismanaged. HAPROK addresses this challenge by implementing robust systems for data collection, tracking, and reporting. By ensuring cradle-to- grave traceability, we minimize risks of illegal dumping, contamination, and occupational exposure. This accountability framework supports regulators in enforcement while giving producers verifiable evidence of compliance—an essential pillar of the Sustainable Waste Management Act.

3. Building Capacity and Elevating Standards

Compliance cannot be achieved without awareness and capacity building across the waste value chain. HAPROK delivers training, workshops, and technical support to producers, collectors, and waste operators, ensuring that global best practices in hazardous waste management are localized and adopted. These initiatives elevate industry standards, reduce incidents of unsafe handling, and strengthen institutional capacity at county and national levels.

4. Driving Innovation and Circular Solution

In line with the Act's emphasis on sustainable production and consumption, HAPROK promotes innovation that reduces hazardous waste generation and supports safer alternatives. This includes encouraging eco-design, material substitution, resource recovery, and advanced treatment technologies. By fostering research partnerships and piloting new solutions, HAPROK contributes to Kenya's broader transition toward a circular economy—where waste is minimized and value is retained.

5. Fostering Collaboration and Policy Alignment

As a PRO, HAPROK serves as a bridge between producers, regulators, service providers, and communities. We work closely with the Ministry of Environment, NEMA, county governments, and other Producer Responsibility Organizations such as KEPRO to harmonize practices and ensure coherence in implementing the EPR Regulations of 2024. This collaborative approach strengthens Kenya's waste management ecosystem, prevents duplication of effort, and accelerates progress toward the Act's objective.

Conclusion

HAPROK's mandate extends beyond compliance; it is about shaping a safer, cleaner, and more sustainable Kenya. By embedding accountability, innovation, and collaboration into hazardous waste management, we support full realization of the Sustainable Waste Management Act 2022. Our vision is to ensure that hazardous waste producers not only meet their legal obligations but also actively contribute to environmental sustainability, public health protection, and the circular economy agenda.

4.6 Danish Industry and the Integration of the Circular Economy Principles

Case Study: Danish Industry East Africa

The Danish industry has been at the forefront of adopting circular economy principles and transforming traditional linear production models into more sustainable and efficient systems. This case outlines key strategies and initiatives Danish companies took to integrate circular economy principles, which include reducing waste, reusing materials, and recycling products to create a closed-loop system that enhances resource efficiency and minimizes environmental impact.

1. Waste Reduction and Resource Efficiency

Danish industries have implemented several waste reduction strategies to minimize resource use. The Danish company Novo Nordisk, a global leader in diabetes care, has adopted a 'Circular for Zero' strategy to eliminate all waste from its operations. This strategy involves optimizing production processes to reduce material losses and implementing advanced waste management systems to ensure residuals are reused or recycled.

2. Product Design for Sustainability

Product design is a critical aspect of the circular economy. The Danish Plastics Federation has published a Design Guideline for the packaging industry on integrating design into the business model. Another example is furniture company Fritz Hansen, a pioneer in integrating sustainable design principles. Fritz Hansen has embraced sustainable materials, such as FSC-certified wood and recycled textiles, in their product development. Furthermore, they have adopted modular design practices, allowing for easy repair and upgrading of their furniture, which extends product lifespans and reduces waste.

3. Recycling and Upcycling Initiatives

Carlsberg Group, a leading beverage company in Denmark, has pioneered several recycling and upcycling initiatives to close the loop in its production cycle. The company introduced the 'Carlsberg Circular Community,' a collaboration platform with key suppliers. This initiative has led to the development of their proprietary 'Green Fiber Bottle,' a biodegradable beer bottle made from sustainably sourced wood fibers.

4. Extended Producer Responsibility Programs.

EPR is another area where Danish industries excel. The electronics manufacturer Bang & Olufsen has implemented EPR programs, taking responsibility for the entire lifecycle of its products. This includes providing take-back schemes and refurbishment services, ensuring that electronic waste is minimized, and valuable materials are recovered and reused.

5. Collaborative Platforms and Innovation

Collaboration and innovation are essential for successfully integrating circular economy principles. The Danish partnership 'Cirkulær Økonomi i Byggebranchen' (Circular Economy in the Construction Industry) is a noteworthy example. This initiative brings together construction companies, architects, and waste management firms to promote the reuse of building materials and reduce construction waste. The partnership has led to the development of 'upcycled' building materials, such as bricks reclaimed from demolition sites.

6. Government Support and Policy Frameworks -

The Danish government plays a crucial role in supporting the integration of circular economy principles. Through initiatives like the 'Strategy for Circular Economy 2021-2032,' the government provides regulatory frameworks and financial incentives encouraging businesses to adopt circular practices. This supportive environment has enabled Danish companies to innovate and implement sustainable solutions more effectively.

In conclusion, Danish industries have successfully integrated circular economy principles through waste reduction, sustainable product design, recycling initiatives, EPR programs, and collaborative platforms. Supported by a robust policy framework, Danish companies have showcased how adopting circular economy practices benefits the environment and enhances competitiveness and long-term sustainability. The efforts of companies like Novo Nordisk, Fritz Hansen, Carlsberg Group, and Bang & Olufsen exemplify Denmark's leadership in the transition towards a more sustainable, circular economy.

Waste as a business case

From Waste Picking to Green Jobs: A Success Story of the Transition to Formal Jobs for Waste Management Operators

By Samuel Odamo
Nairobi Metropolitan Waste Network

The journey towards creating formal employment in the waste management sector has been challenging and unpredictable. It has been marked by volatility in the recyclable market, limited access to adequate funding, and the complexities of navigating a multi-layered regulatory ecosystem.

However, this journey has been defined by resilience, with lessons learned from overcoming challenges encountered at the upstream and downstream levels of the waste value chain.

From the perspective of entrepreneurs who view waste as a valuable resource, some of these external factors that induce these challenges are Pose significant threats. They fear that such challenges could deepen the economic and social marginalization of informal waste sector workers, such as waste pickers, collectors, and repairers, critical players in the waste management ecosystem who are often overlooked.

This could lead to a culture of intolerance towards waste management, further excluding these workers from the economic discourse and encouraging harmful disposal behaviors. In the long run, this marginalization undermines the development of essential waste management infrastructure, including Extended Producer Responsibility (EPR) and Producer Responsibility Organization (PRO) programs. It also hampers the collection of EPR fees and eco-levies, as seen with KEPRO.

Numerous barriers hinder the attainment of prosperity for those at various points within the waste value chain. The absence of access to formal contracts and social security protections for informal waste workers creates a volatile and precarious livelihood. Despite their critical role in waste collection, sorting, and recycling, these workers often remain outside formal economic systems, making it difficult for them to access opportunities for upward mobility or secure long-term employment.

At the entrepreneurial level, waste management businesses face challenges such as limited access to financing, inadequate infrastructure, and fluctuating market prices for recyclables. These barriers often prevent scaling waste management businesses and fully realizing the potential for creating green jobs within the sector. Regulatory complexities and the lack of institutional support further exacerbate these difficulties, leaving many entrepreneurs struggling to transition to a more formalized and sustainable operation.

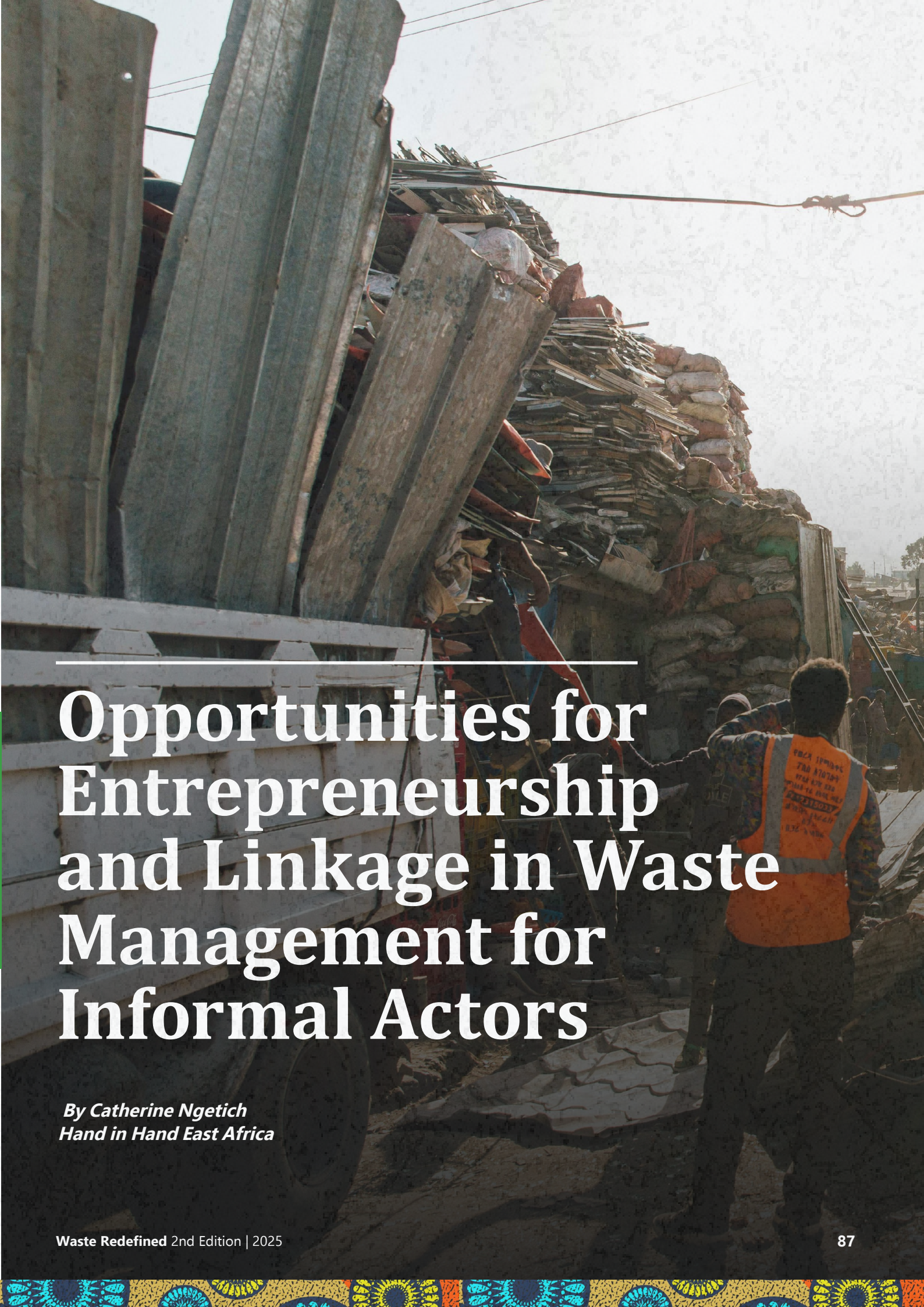
Transitioning waste management operators in Kenya from informal to formal, a process I have personally experienced alongside my peers and business partners, requires sustained political and institutional goodwill.

Kenya can also draw lessons from the Global North, where political and institutional support has been key in de-risking waste management. These regions have treated waste as a valuable resource, adopting a circular economy model supported by a robust and enabling ecosystem.

Despite these challenges, as a waste entrepreneur who started informally and is now working towards complete formalization, I have successfully created both direct and indirect employment opportunities. Additionally, our members, after enlisting in the KEPRO program, have diverted nearly one million tons of recyclable materials, including plastic waste, from ending up in landfills, contributing significantly to environmental sustainability.

" As Nairobi Metro CBOs Waste Management Network, an umbrella body bringing together Waste service providers and waste pickers with members cutting across all the 17 Sub Counties of Nairobi County and its Environ with 85 wards in total, we are beneficiaries of the KEPRO program "

These programs have enhanced the capacities of our members across various thematic areas, equipping us to better navigate the complexities of waste through provision the necessary support and infrastructure, both by KEPRO and other stakeholders, we can ensure that waste management operators transition to formal, create opportunities for green jobs, and that the entire waste management sector becomes an integral part of Kenya's economic growth, sustainable development goals and Vision 2030



Opportunities for Entrepreneurship and Linkage in Waste Management for Informal Actors

By Catherine Ngetich
Hand in Hand East Africa

Over 2% of the global population, approximately 15 million in low- and middle-income countries, work in the informal waste management business and earn their living from waste-related income activities. This population collects, sorts, and recycles 15% 20%of waste (World Bank, 2023), presenting immense opportunities for entrepreneurship and a promising solution to unemployment and environmental issues. In Kenya, whose urbanization growth is 3.7% annually (World Bank Group 2022), the unemployment rate of 13,2% (KNBS, 2019) is ripe for entrepreneurship as a driver for environmental sustainability, promotion of the right to a clean and healthy environment, as well as incentivizing waste collectors—all as envisaged in The Sustainable Waste Management Act of 2022.

On the contrary, income activities are informal and challenging, with high stigma; a feasibility study commissioned by Hand in Hand and done by the Stockholm Institute was revealed (SEI, 2022). The community-based waste entrepreneurs (CBWEs) are not well defined in the National frameworks and standard guidelines of effective and sustainable waste management, leaving the demand and opportunity in waste management inconsistent with the constantly growing economy and the entrepreneurial opportunity in environmental sustainability, job creation, and circular economy. The proposal is to take a bottom-up approach where the informal enterprises are formalized, linked to recyclers and manufacturers, and take advantage of Producer Extended Responsibility (EPR) co-benefits. By fostering entrepreneurship in waste management, informal waste actors can improve their livelihoods by:

1. Tailored training and mentorship programs for community-based waste entrepreneurs CBWEs

There is a need to enhance business skills, confidence, and motivation among waste collectors and entrepreneurs in waste enterprises. The aim here is to refine or develop business plans, build business records, and add value through Value Chains, which is a good step for The Authority records on waste management.

2. Formalization of Waste collection and sorting Enterprises

Collaboration between informal waste actors and private players can contribute to the formalization of waste management practices. This will improve resource access, foster innovation, and contribute to a more sustainable and circular economy. With the right policies, investments, and systems, these actors can unlock significant environmental and economic opportunities regionally and globally.

3. Digital Platforms for Waste Management

Digital platforms that link waste producers with informal waste actors represent another emerging business opportunity. These platforms can streamline

waste management practices, enabling waste enterprises to disaggregate waste and source out to off-takers. By fostering entrepreneurship in waste.

4. Recycling

Most informal waste actors need enhanced capacity to run large-scale recycling businesses. With a growing global demand for recycled materials, entrepreneurs can tap into the market, which is projected to reach $400 billion by 2027 (World Economic Forum). Entrepreneurs focusing on specific materials like plastics or metals can develop more efficient recycling systems, creating valuable jobs and contributing to environmental sustainability.

5. Waste-to-Energy Ventures

Waste-To-Energy (WTE) businesses represent another promising entrepreneurial opportunity. Informal waste actors often burn waste to extract energy, but with clean energy technologies, these practices can be formalized into profitable ventures. For instance, waste-to-biogas projects in Kenya provide local entrepreneurs with renewable energy solutions while addressing waste disposal challenges. Scaling such initiatives can lead to both environmental benefits and new business opportunities.

Informal waste actors often burn waste to extract energy

Challenges in Waste Entrepreneurship

- **Market Fluctuations:** Demand for recycled materials may vary, impacting business sustainability, especially with the ever-growing waste, highlighting the need for linkage.

- **Social Stigma:** Waste collection is often associated with poverty and poor working conditions, discouraging people from entering the sector without highlighting its significant contribution to environmental sustainability.

- **Health and Safety Risks:** Exposure to hazardous materials requires strict adherence to health and safety guidelines to protect workers. Most waste collectors do not adhere to such precautions, exposing themselves to various illnesses, which limits the sustainability of the enterprises.

- **Regulatory Barriers:** Complicated regulations and inconsistent enforcement hinder waste collectors from fully realizing their potential. These include a lack of legal recognition, limited access to capital, health and safety risks, and market access. Informal workers often face legal barriers that prevent access to formal waste management systems, equipment, or funding opportunities.

Entrepreneurship in waste management is a promising solution to unemployment and environmental issues in Kenya. By equipping informal waste actors with training, financial aid, and regulatory support, Kenya can accelerate its transition to a circular economy. With the right investments and collaboration, the informal waste sector can transform into a thriving industry that generates jobs, enhances environmental sustainability, and turns waste into valuable resources.

Potential Innovations in Waste Management: Advancing Sustainable Solutions

By Benson Abila
M-Taka

Waste management remains a pressing environmental challenge across Kenya, with landfills overflowing and informal dumpsites polluting ecosystems. However, technology and innovative solutions are transforming the sector, making waste collection, recycling, and disposal more efficient, sustainable, and rewarding. Integrating digital tools, artificial intelligence, and circular economy models is reshaping the future of waste management.

Research by the International Solid Waste Association (ISWA) has shown that mobile-based waste solutions can increase collection efficiency by 30%. The rise of mobile technology presents an opportunity to digitize and streamline waste management. Mobile apps like the M-taka app can connect households with waste collectors, allowing users to schedule pickups, track waste disposal, and receive incentives for responsible sorting. Additionally, integrating USSD codes ensures accessibility for those without smartphones, making participation in structured waste management easier. Additionally, according to a study by the European Environment Agency, RVMs have increased recycling rates by 40% in participating regions. Reverse vending machines (RVMs) reward users for recycling by providing cash, shopping vouchers, or transport credits in exchange for depositing used plastic bottles and aluminum cans. Such systems have been successfully adopted in various countries and can be a game-changer in reducing plastic waste in Kenya.

One of the biggest challenges in waste management is the informality of the waste sector. This leads to a disconnect between waste aggregators, including waste pickers and large-scale recyclers. Most large-scale recyclers face inconsistent supply and quality challenges, while most waste actors face challenges accessing the market, financing, and limited infrastructure. A digital waste marketplace connects waste pickers, aggregators, and large-scale recyclers, ensuring consistent supply and quality. It enhances transparency, provides market access, and facilitates fair pricing. Additionally, it streamlines financing, logistics, and infrastructure support, bridging gaps in the waste value chain while promoting efficiency, traceability, and sustainability in waste management.

Traditional waste collection is often uncoordinated, leading to inefficiencies, missed pickups, or overflowing bins. Smart bins, equipped with sensors and AI, are revolutionizing waste management by detecting waste levels in real time and sending alerts when full. Additionally, geo-coding and AI-powered route optimization use real-time data to map collection points, ensuring trucks follow the most efficient paths. This ensures timely collection while optimizing truck routes, reducing fuel costs, lowering carbon emissions, and improving service delivery. Moreover, with Extended Producer Responsibility (EPR) regulations requiring industries to take accountability for post-consumer waste, blockchain technology can enhance traceability and accountability in the waste management chain. A blockchain-based system records every stage of waste processing, ensuring compliance with regulations while discouraging illegal dumping and greenwashing practices.

Finally, organic waste accounts for a significant portion of municipal waste. Instead of allowing it to decompose in landfills and produce methane, biodegradable waste can be converted into biogas and organic fertilizers. Biogas plants and composting initiatives powered by innovative technology like BSF can transform food waste into a valuable resource, supporting clean energy and sustainable agriculture.

Innovations in waste management present a significant opportunity to transition towards a circular economy, where waste is not just disposed of but transformed into valuable resources. From smart bins and AI-driven optimization to blockchain-powered transparency and recycling marketplaces, these innovations can reshape Kenya's waste sector. By leveraging technology and policy-driven incentives, Kenya can achieve a more efficient, transparent, and sustainable waste management system, ensuring a cleaner environment for future generations.

Smart Bin
Source: exceedict.com

Innovations in waste management present a significant opportunity

Role of media in creating awareness of sustainable waste management practices

By Jacob Nyukuri

Media plays a significant role in awareness creation, attitude change, and behavior transformation of communities towards sustainable waste management. Through media like television, radio, newspapers, and the internet gives people vital information. The 2023 State of Media report by the Kenya Media Council recognizes that 47% of Kenyans get news from television, followed by 31% from radio, indicating the extensive coverage and potential influence of media if utilized to the fullest.

Historically, media platforms have been effective in raising awareness through investigative journalism, feature reporting, and expert interviews, unveiling the consequences of poor waste management, such as pollution, disease, and degradation of resources. Some impactful stories have informed policy changes and shift narratives.

Additionally, the media serves as a watchdog by exposing illegal dumping, unregulated waste facilities, and inaction of environmental laws to become effective, compelling governments and corporations to adopt green approaches.

Media-led public awareness campaigns have promoted recycling, composting, and community- and household-level waste reduction, educating citizens with success stories and solutions.Community and vernacular media provide localized content in local languages and cultural contexts, making the message more accessible and fostering sustainable practices.

New media have become more widespread, especially among young people and urban groups. Social media such as Twitter/X, Instagram, and WhatsApp facilitate the rapid dissemination of information regarding recycling, composting, and waste reduction. Social networks enhance these efforts even more, mobilizing youth and bringing communities together towards green activism.

With exponential growth of digital platforms, fact-checking is essential in the role of media in providing true and credible content that creates awareness of sustainable waste management in Kenya. Repelling misinformation and enhancingcredibility, fact-checking makes the media prompt informed action and contributes to a cleaner and more sustainable world. New media has a basic mandate to advance the awareness of Kenyan practices for sustainable management of waste using the wide scope, interactivity, and online live engagement offered by the web space to raise knowledge, sensitize, and activate communities. Using social networking websites, blog posts, and electronic news forums, new media offers a booming megaphone voice to messaging for the youths who are instrumental actors of transformation.

However, problems like limited resources, competing priorities, and communication can make the media ineffective. Cooperation among media, government, and environmental players is required to consolidate the message and achieve public education coordination.

The value of ethics in journalism is crucial; it promotes the effectiveness of the media in bringing about sustainable waste management awareness in Kenya. The media need to provide accuracy, fairness, and cultural sensitivity. Ethical media practice guides the way in which information is collected, covered, and conveyed, and directly affects the behavior and perception of the public. Responsible reporting calls leaders to accountability while encouraging intelligent discussion of durable solutions. Ethical regulation eschews injury from irresponsible reveals that can potentially ruin reputations or threaten projects in progress unfairly.

Apart from ethics, Media Information and Literacy (MIL) forums serve to raise awareness about sustainable waste management in Kenya by equipping communities with skills to critically read media content, recognize credible information, and move towards sustainable practice. By making communities capable of engaging with the media responsibly, these forums enable informed action and facilitate a cleaner, more sustainable world.

In conclusion, the Kenyan media is a critical driving force behind the awareness of sustainable waste management. Its sustenance of the drive to educate and inspire the public is pivotal to a cleaner, healthier, and more sustainable future.

Call to Action:

Advancing Waste Management Through Shared Responsibility

Kenya stands at a critical juncture in its journey toward a cleaner, healthier, and more circular economy. The Sustainable Waste Management Act, 2024 and the Extended Producer Responsibility (EPR) Regulations provide a transformative legal framework, but their success depends on the collective action of all stakeholders.

We call upon each actor in the waste management value chain to fully embrace their roles:

To the National Government

- Prioritize the implementation of the Sustainable Waste Management Act by strengthening inter-agency coordination, financing infrastructure development, and ensuring policies promote circularity and green jobs.
- Provide strategic leadership in scaling EPR across all sectors and enforcing accountability mechanisms.

To County Governments

- Counties are on the frontline of service delivery. Operationalize County Waste Management Committees, establish Material Recovery Facilities (MRFs), and develop localized EPR implementation plans.
- Invest in public awareness, waste segregation at source, and partner with private actors to create inclusive waste recovery systems.

To Producers and Brand Owners

- Take full responsibility for the lifecycle of your products. Register with licensed Producer Responsibility Organizations (PROs), track and report packaging waste, and invest in recoverable and recyclable packaging design.
- Collaborate with recyclers and communities to close the loop and reduce environmental harm.

To Consumers and Households

- Segregate your waste at source. Support clean recycling by placing plastic, organic, and residual waste in the correct bins.
- Make sustainable choices in what you buy, use reusable packaging, and report illegal dumping or poor service. Your daily habits shape our shared future.

To Resident Associations and Community-Based Organizations (CBOs)

- Mobilize and sensitize communities on waste segregation, composting, and the role of EPR.
- Champion local collection systems and link with waste pickers and recyclers. As trusted voices in the community, you play a critical role in influencing behavioral change from the ground up.

To NEMA

- Enhance the enforcement of EPR regulations by promoting fair market participation and ensuring that producers adhere to compliance requirements.
- Support counties in monitoring waste flows, vetting PROs, and holding stakeholders accountable. Foster innovation by enabling data-driven approaches and cross-sectoral partnerships that drive impact.

To Media

- Treat waste management as a critical, newsworthy issue that impacts health, livelihoods, and the environment, not just an occasional feature. Give it the same urgency as politics, economy, or sports.
- Go beyond reporting littering incidents, demystify the entire waste value chain. Explain how laws like the Sustainable Waste Management Act and the Plastic Waste Regulations, 2024 work, and what they mean for citizens, businesses, and government.
- Use storytelling to connect waste management to everyday life: showcase innovators, highlight green jobs, and put a human face on the work of waste pickers, recyclers, and community champions.

To Academic and Training Institutions (including TVETs)

- Embed waste management, circular economy, and sustainability principles into curricula across all disciplines, not just environmental studies, so that every graduate understands their role in building a cleaner, greener economy.
- Invest in research and innovation that provides practical, scalable solutions to local waste challenges, from materials recovery to waste-to-energy technologies.
- Strengthen partnerships with industry, Producer Responsibility Organizations (PROs), and communities to give students hands-on experience in waste auditing, recycling operations, and circular product design.
- Establish incubation hubs for green enterprises, supporting student-led startups that focus on waste reduction, reuse, and recycling.

Glossary of Terms

Aggregation points (kiwanja) – Designated areas where waste, especially recyclable materials, is temporarily collected and sorted before being transported to recycling or processing facilities.

Circular Economy - An economic model that aims to eliminate waste and pollution by keeping products, materials, and resources in use for as long as possible through reuse, repair, recycling, and regeneration.

Collection point - A designated location or structure where waste is temporarily gathered before being transported to a processing, recycling, or disposal facility. This can be a waste collection cage, skipper recycle bins, etc.

Circular Economy – A method of production where products and materials are kept in circulation, such as refurbishment, reuse, recycling, maintenance, and composting.

Design for Recycling – A proactive environmental management approach that ensures the packaging of products is recyclable and sustainable.

Extended Producer Responsibility - A policy that makes producers responsible for managing the environmental impacts of their products throughout the product lifecycle, especially after consumer use.

Frass: The organic residue left behind by insects, particularly larvae, after they have consumed and digested organic matter. In the context of Black Soldier Fly (BSF) treatment, frass refers to a mixture of insect waste, leftover food particles, and shed exoskeletons.

Gasification - A process that turns waste or organic materials into a gas by heating them to high temperatures with a small amount of oxygen or steam. This gas, called syngas, can produce electricity, fuel, or other valuable products.

Holding area- A designated space where waste is temporarily stored before it is processed, treated, recycled, or disposed of. This can be a yard or any outdoor space.

Material Recovery Facility—A specialized facility that receives, separates, and prepares recyclable material for marketing to end-user manufacturers.

Pyrolysis - A process that breaks down waste or organic materials by heating them without oxygen. This produces useful products like oil, gas, and char, which can be used for energy or as raw materials.
Recycling facility - A specialized site where waste materials are processed and transformed into reusable raw materials or new products

Solvolysis - A chemical recycling process that uses a solvent (like water, alcohol, or another liquid) to break down plastic or other materials into their basic building blocks. Solvent-based purification.

Sorting area – A temporary holding area waste collectors use to separate waste into specific categories.

Single-use plastics- Plastic products that are not recyclable and can only be disposed of after consumption.

Trading point - A designated area for buying and selling recyclable waste, also known as a buy-back center.

Value addition - The process of enhancing the value of a product through processing, packaging, or other interventions, transforming it into higher-value goods.

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Waste is a resource in the wrong place.

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