A Sustainable Waste Management Strategy for Informal Settlements and Hostels

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Contents

List of Abbreviations

CBO	Community Based Organisations
CEO	Chief Executive Officer
CoCT	City of Cape Town
CORC	Community Organisation Resource Centre
CoT	City of Tshwane
CSI	Corporate Social Investment
CSR	Corporate Social Responsibility
DAG	Development Action Group
EPR	Extended Producer Responsibility
EPWP	Expanded Public Works Programme
GDARD	Gauteng Department of Agriculture, Rural Development
GIS	Geographic Information System
IDF	Industrial Development Corporation
IDP	Integrated Development Plan
IWMP	Integrated Waste Management Plan
KPI	Key Performance Indicators
MFMA	Municipal Finance Management Act
MW	Madam Waste
NEMA	National Environmental Management Act
NEMWA	*National Environmental Management: Waste Act*
NWMS	National Waste Management Strategy
PRO	Producer Responsibility Organisations
SASDI	South African Spatial Data Infrastructure
SDG	Sustainable Development Goals
SEF	Social Employment Fund
SWOT	Strengths, Weaknesses, Opportunities and Threats
TLF	Tshwane Leadership Foundation
TVET	Technical Vocational Education and Training

UFC	Urban Futures Centre
WWF	World Wide Fund for Nature
WZW	Warwick Zero-Waste

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Executive Summary

The **Sustainable Waste Management Strategy for Informal Settlements and Hostels** outlines an integrated approach to addressing the waste management challenges in the City of Tshwane (CoT). These challenges are exacerbated by rapid urbanisation, insufficient service provision, and the unique socio-economic dynamics of informal settlements. This strategy recognises the importance of community-driven initiatives, stakeholder collaboration, and alignment with global sustainability goals.

Key Problem Statement

Urban waste management systems are under increasing strain due to the expansion of informal settlements. The lack of adequate waste collection, disposal, and minimisation practices leads to environmental degradation, public health risks, and economic inefficiencies. This strategy identifies the need for a localised, community-centric, and sustainable approach to waste management in informal settlements.

Objectives of the Strategy

This strategy is designed to:

1. Promote inclusive and collaborative leadership across municipal departments, community organisations, and private stakeholders.
2. Empower communities to actively participate in waste minimisation and recycling initiatives, fostering ownership and accountability.
3. Establish an enabling institutional and policy framework to support effective waste management practices.
4. Integrate waste prevention, reuse, and recycling into municipal operations and informal settlement profiles.
5. Develop comprehensive systems for data collection, monitoring, and evaluation to ensure continuous improvement and accountability.

Building Blocks of the Strategy

The strategy rests on the following foundations:

- **Community Engagement and Empowerment**: Strengthening the role of local residents and waste pickers in waste management processes.
- **Institutional and Policy Support**: Aligning with national frameworks such as the National Environmental Management: Waste Act and the Integrated Waste Management Plan.
- **Sustainable Economic Development**: Creating employment opportunities through recycling hubs, composting centres, and waste-to-energy initiatives.
- **Data-Driven Decision-Making**: Utilising GIS and community profiling to optimize waste collection and minimize inefficiencies.

- Partnerships and Collaboration: Leveraging multi-stakeholder approaches to enhance resource mobilisation and expertise sharing.

Strategic Framework

The strategy proposes a decentralization model for waste management in informal settlements, addressing both immediate waste collection needs and long-term goals for waste minimisation and resource recovery. Key activities include:

- Expanding access to waste services through localised collection points.
- Establishing recycling and composting hubs to reduce landfill dependency.
- Integrating gender-responsive procurement to ensure inclusive service provision.
- Utilising circular economy principles to transform waste into valuable resources.

Alignment with Sustainable Development Goals (SDGs)

The strategy directly supports multiple SDGs, including:

- SDG 1 & 2: Reducing poverty and hunger through rehabilitated dumpsites converted into food gardens.
- SDG 7: Promoting waste-to-energy solutions for sustainable energy access.
- SDG 11: Making human settlements inclusive and sustainable.
- SDG 13: Addressing climate change through reduced greenhouse gas emissions.
- SDG 15: Restoring ecosystems through tree planting and dumpsite rehabilitation.

The Sustainable Waste Management Strategy emphasises the critical role of collaboration, innovation, and community participation in tackling the waste challenges faced by informal settlements. By leveraging the unique strengths of all stakeholders, the CoT can lead the way in developing inclusive, sustainable, and resilient urban environments. This strategy sets the stage for a transformative approach to waste management that benefits both people and the planet.

1. Introduction

1.1 Impact of Urbanisation on Urban Waste Management

Urbanisation significantly impacts waste management in both South Africa and other developing countries, creating complex challenges for cities, particularly those with rapidly growing informal settlements. As populations surge in urban centres, the volume of waste generated increases, placing immense pressure on existing waste management infrastructures. The problem is not only the sheer volume of waste but also the lack of adequate services, poor infrastructure, and inefficient waste disposal methods, which often result in illegal dumping and environmental hazards.

Problem Statement: Urban waste management systems are under strain due to rapid urbanisation, especially in informal settlements, where waste services are either non-existent or insufficient. Informal settlements, by their nature, often lack basic services such as waste collection and sanitation. The growth of these settlements in cities such as Tshwane and Nairobi, exacerbated by socio-economic factors, leads to poor waste disposal practices. This can result in environmental degradation, public health risks, and the contamination of water sources (Kovacic, 2015; WWF, 2022). Informal and peri-urban areas often face a disproportionate lack of services, leading to waste accumulation in streets, illegal dumping, and the use of open burning as a means of disposal.

What Does This Mean for Cities?: For cities, this translates into multiple challenges, ranging from public health risks to strained municipal resources. Informal settlements, in particular, suffer from poor waste disposal, contributing to unsanitary living conditions. Waste in these areas often remains uncollected, attracting vermin and posing health hazards such as respiratory diseases due to burning or the pollution of local water bodies. In Nairobi, for example, only 54% of waste is collected, while informal areas bear the brunt of inadequate services (Kovacic, 2015).

Furthermore, waste management in informal settlements is not only a health issue but an environmental one. Uncollected waste often clogs drainage systems, leading to flooding during heavy rains. This increases the City's vulnerability to climate change impacts, including intensified flooding and water contamination.

The Need to Decentralise Waste Management: A centralized approach to waste management, where city governments provide services uniformly across all areas, often fails to address the unique challenges faced by informal settlements. Decentralizing waste management services—by empowering local communities, informal waste collectors, and micro-enterprises—can lead to more responsive, efficient, and sustainable waste practices. In South Africa and other African cities, informal waste pickers play a critical role in waste management. These individuals collect recyclable materials, contributing to the reduction of waste sent to landfills (WWF, 2022). However, their efforts are often unrecognised by municipal authorities.

As urbanization continues, there is an urgent need for cities to adopt decentralised waste management models that involve local actors, particularly in informal settlements. This would enable faster response times for waste collection, more localized waste sorting and recycling efforts, and ultimately, a more resilient and sustainable urban waste management system. Empowering community-based organizations, like those in Nairobi, where informal groups have taken on waste collection and recycling, can help fill the service gaps left by municipal systems (Kovacic, 2015). Similarly, South African cities are being forced to move away from using waste pickers in the current form, and more focus is being placed on formalising and including them in their intent to improve waste management across the country.

In conclusion, addressing the impact of urbanization on waste management requires innovative approaches that move beyond centralized systems. Decentralizing services, involving community stakeholders, and formalizing the role of informal waste collectors are critical steps towards achieving sustainable waste management in urban areas.

1.2 Strategy Rationale and Goals

The accumulation of waste in informal settlements in Tshwane has significant implications for the health and safety of residents, the environment, and the broader economy. The "Community Based Waste Management Strategy," spearheaded by the City of Tshwane, Asivikelane network and supported by C40 Cities, aims to address these challenges through a comprehensive, cooperative approach. Building on the foundational work already performed by Asivikelane, which encompasses a network of 500 informal settlements, this strategy empowers urban informal settlement residents to actively engage with the government in reforming basic service delivery.

The **primary goal is to ensure that waste in informal settlements in Tshwane is managed effectively, efficiently and sustainably**. To achieve this, it is essential to address the critical challenges identified by the communities and the City of Tshwane's Waste Management Division under the Environment and Agriculture Department. This involves mapping the layout of informal settlements, ensuring accessibility for waste removal vehicles, and establishing plans to get waste to collection points. Complementary strategies such as utilizing various categories of vehicles, managing access challenges posed by low-hanging electrical wires, and providing biodegradable plastic bags to households are also key components.

A **second vital goal** is to **facilitate waste minimisation**. This involves supporting separation at source of household waste, encouraging recycling, establishing recycling hubs or centres, and promoting composting initiatives. These measures will reduce pressure on municipal services and the environment while presenting economic development opportunities for residents.

To ensure the sustainable implementation of this integrated waste management strategy, several building blocks have been identified. These include:

1. Settlement and Service Delivery Data: Establishing and conducting profiling, using technology for data collection, and building a network of residents and waste inspectors to gather profiling information.

2. Financing the implementation of the Strategy: Identifying cost savings from waste minimisation, leveraging external (or internal) funding, and exploring trade-offs for long-term sustainability.
3. Institutionalisation and Ensuring Sustainability: Engaging residents and stakeholders, establishing a steering committee, embedding the strategy in municipal policies, and connecting the process to municipal performance management as well as financial and resource planning.
4. Local Economic Development: Connecting localised recycling and composting efforts to the formal economy and coordinating community programmes with existing government initiatives.
5. Capacity Building and Education: Providing ongoing training, formalising and accrediting such training, and securing budget and institutional support for educational programmes.

This cooperative and multifaceted approach, developed jointly by informal settlement residents, officials, Asivikelane partner organisations, and key stakeholders like C40, provides a robust foundation for a sustainable waste management strategy. It defines the roles and responsibilities of all stakeholders and builds the social capital needed for long-term success in service delivery. Ultimately, this strategy not only aims to mitigate the health, safety, and environmental risks associated with uncollected waste but also to create long-term economic opportunities for some of the most impoverished in Tshwane.

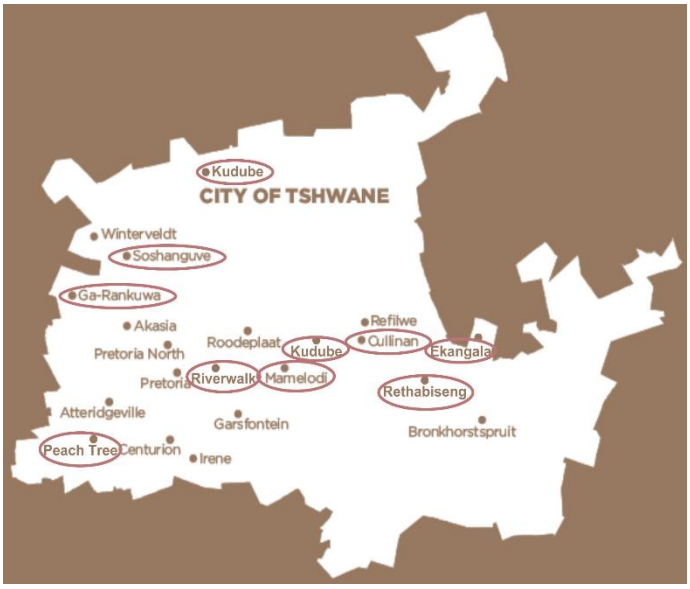
2. Landscape Analysis: Informal Settlements in Tshwane

2.1 Demographic Profile of Settlements in Tshwane

Locations:

The CoT, encompassing a diverse and rapidly growing metropolitan area, currently recognises 210 informal settlements, which reflect the City's dynamic socio-economic landscape.

Figure 1: Visual Representation of Settlement Locations (Morifi 2017)



These settlements are spread across various regions, with significant concentrations in Kameeldrift, Kudube, Mamelodi, Peach Tree, Ekangala, Pienaarspoort, Cullinan, Ga-Rankuwa, Rethabiseng, Riverwalk, Slovoville, and Soshanguve. The demographic and socio-economic profiles of these settlements reveal a complex tapestry of challenges and opportunities, from varied household compositions to diverse ownership structures and living conditions.

The City's commitment to upgrading these settlements, guided by its City-wide upgrading strategy and the principles of the Informal Settlements Upgrading Programme, aims to transform these areas into more sustainable and equitable communities.

Characteristics of Households:

The demographic makeup of Tshwane's informal settlements is diverse. According to the 2011 Census, households in these areas have an average size of 2.7 members, slightly lower than the metropolitan average of 2.9. This reflects a significant proportion of one-person households, which make up approximately 36% of households in these settlements compared to 29% in the metro as a whole. The majority (70%) of households are male-headed, although female-headed households tend to be larger when they comprise more than one person.

Socio-Economic Profile:

The socio-economic conditions in Tshwane's informal settlements present various challenges.

- Housing and Ownership: Approximately 44% of households living in shacks not in backyards regard themselves as owners, while 39% occupy their dwellings for free, and 14% rent their homes. This indicates a mix of ownership and occupancy arrangements, reflecting diverse economic situations among residents.
- Living Conditions: The City of Tshwane has been actively working to upgrade these settlements. As of 2023, 187 settlements have been assessed for upgrading, and 35 have progressed to Phase 2, which includes steps such as land acquisition agreements,

household registration, and the provision of interim basic water and sanitation services. The City currently provides rudimentary sanitation through chemical toilets to 106 settlements and water via mobile tankers to 150 settlements.

- Infrastructure and Services: The City's strategy to upgrade informal settlements involves comprehensive planning and development. This includes surveying and registering households, providing basic services, and conducting various preplanning studies to address environmental and infrastructural challenges. Upgraded settlements will benefit from improved access to water and sanitation, formalised roads, and waste management services.

Development Initiatives:

The City of Tshwane has committed to upgrading its informal settlements through a structured approach as outlined in its City-wide upgrading strategy approved in 2021. The strategy follows the principles of the Informal Settlements Upgrading Programme in accordance with the National Housing Code. Key milestones in the upgrading process include the acquisition of land, surveying, and providing basic services.

The City's efforts are aimed at creating a sustainable and inclusive urban environment, ensuring that residents of informal settlements have access to essential services and opportunities for economic development. The ongoing upgrades and provision of services are part of Tshwane's broader commitment to building a functional and equitable capital city for all its residents. However, it is important to note that the informal waste management strategy focuses on all informal settlements and is not limited to those that are going to be upgraded.

2.2 Status Quo of Waste Management Activities

The City of Tshwane's waste management budget lacks specific demarcation and breakdown for informal settlements, leaving a significant gap in service provision. Despite a 2.26% increase in the overall budget for contracted waste services for the 2023/24 financial year, there is no dedicated budget for refuse removal in these areas. Municipalities are governed by the Local Government: Municipal Structures Act (1998), Municipal Finance Management Act (MFMA, 2003) and relevant South African municipal by-laws, to ensure sound budgeting for service delivery in their jurisdictions.

Service Provision and Challenges

In a June 2003 community survey conducted by the community-based organisation – Asivikelane –focusing on service provision and challenges experienced in informal settlements. The sample size was 224 residents across 10 settlements, namely: Cemetery View, Itereleng, Mahlangu, Baghdad, Princess Park, Bundu Inn, Choba, Kameeldrift, Phomolong, and Jeffsville. The findings revealed that almost 90% of residents in informal settlements did not receive any waste removal services in the week prior to the survey. This inconsistency in service provision has been a recurring issue, with only 6.7% of residents reporting waste removal once a week, and less than 1% experiencing twice-weekly collections. In the absence of regular waste removal, residents often resort to burning waste, creating severe health hazards, or illegal dumping, which exacerbates environmental degradation.

Impact on Quality of Life

The inadequate waste management services have led to significant adverse effects on the residents' quality of life. Uncollected waste results in bad odours, with 73% of residents citing this as a major issue. The health and safety of children are compromised, with 71% of residents reporting dangers to children who play near or in the dumps. Additionally, 70% of residents expressed concerns about the attraction of rats, mice, and mosquitoes due to accumulated waste, and nearly 60% worried about the contamination of drinking water. More than half of the respondents noted that the settlements become visibly dirty, and a small but significant percentage pointed out that uncollected waste leads to blockages in drains and toilets.

Residents' Recommendations

Residents have voiced practical recommendations to improve waste management in their communities. The following recommendations are from the Asivikelane #37 report:

- Frequent Cleaning: More than half of the respondents want communal dumping sites cleaned more than once a week.
- Proximity and Accessibility: Around 25% of residents want designated waste collections sites within a five-minute walking distance from their homes, and communal bins placed close to communal taps and toilets.
- Regular Collection and Supplies: At least 30% of respondents prefer refuse collection directly from their homes and request regular provision of plastic bin bags once a week. Additionally, residents require three or more refuse bags per week, highlighting the insufficiency of the current provision of four bags per month.

Picture 1: Asivikelane Community Clean Up Initiative

Current and Future Strategies

The City of Tshwane's current strategy involves a weekly waste removal service and provision of refuse bags, but this has not been effectively implemented. A comprehensive waste policy for informal settlements would go a long way to ensure consistent service delivery and adherence to measurable standards. The city has expressed an aim to provide 100% of households with basic refuse removal services and to eliminate the current backlog, which is crucial for improving residents' living conditions.

Budgetary Considerations

Despite the City's commitment, the budget allocation remains unclear in terms of its impact on informal settlements. The provision for waste containers, including skips, has seen a substantial increase by 250% from the previous year, yet the specific allocation and implementation details

are not transparent. Enhanced budget allocations and clear policies targeting informal settlements could not only improve waste management but also potentially reduce the costs associated with cleaning illegal dumpsites, which exceeded R100 million in the 2022/23 budget year.

CoT Compared to Other Municipalities

The City of Cape Town (CoCT) has taken a more structured approach to waste management in informal settlements compared to Tshwane. The CoCT provides waste collection services in most informal settlements, although service delivery can be inconsistent due to access issues. Community-based initiatives are more prevalent, and the City has supported waste minimisation strategies, including the provision of skips and support for recycling efforts. However, challenges remain, particularly in densely populated informal settlements where infrastructure is lacking, and waste services are strained.

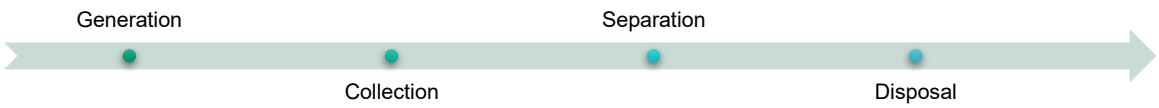
In eThekwini – Kwa Zulu Natal, informal settlements face similar challenges to CoT in terms of irregular waste collection and limited infrastructure. However, eThekwini Municipality has made strides in integrating informal waste pickers into the broader waste management system. Projects such as the Warwick Zero-Waste initiative demonstrate the municipality's efforts to support recycling and composting within informal communities (WWF, 2022).This collaboration between the City and informal sectors has helped reduce the volume of waste sent to landfills, though gaps in waste collection services persist in many areas.

This comparison highlights the varying degrees of success in addressing waste management in informal settlements across South African cities, with Cape Town and eThekwini showing more proactive approaches, while CoT faces more substantial challenges in providing adequate services.

2.3 Synthesis of Typical Value Chain & SWOT

The waste value chain in Tshwane's informal and peri-urban areas encompasses several stages, each with distinct challenges and opportunities. Understanding this chain is crucial for developing effective waste management strategies that can improve environmental health, economic opportunities, and overall community well-being.

Figure 2: Linear Waste Value Chain in Informal Settlements



1. Waste Generation

Sources of Waste:

- Households: The primary source of waste, generating a mix of organic waste (food scraps, yard waste), recyclables (plastics, paper, glass, metals), and non-recyclables (packaging, old clothing, etc.).

- Businesses and Informal Traders: Including small shops, street vendors, and markets, producing commercial waste such as packaging, organic waste, and broken or outdated goods.
- Construction Sites: Producing construction and demolition waste such as concrete, wood, and metals
- Illegal disposal of exported rubble material.

Key Challenges:

- Limited awareness and education on waste segregation.
- High volumes of waste generated by informal activities and markets.

2. Waste Collection

Collection Methods:

- Informal Waste Collectors: Individuals or small groups who gather recyclables and other valuable waste from households, businesses, and public spaces.
- Community-based Collection Initiatives: Local programmes where community members participate in organized waste collection efforts such as distributing municipal plastic bags and community clean up initiatives.
- Municipal Collection Services: Often limited or inconsistent in informal and peri-urban areas, leading to gaps in service coverage e.g. effective distribution of municipal plastic bags, waste collection and clearing illegal dumps.

Key Challenges:

- Inadequate infrastructure and resources for efficient waste collection.
- Irregular collection schedules, leading to waste accumulation and illegal dumping.
- Lack of protective gear and tools for informal waste collectors.

3. Waste Sorting, Storage and Processing

Sorting and storage Practices:

- At Source: Limited separation of recyclables and organic waste at the household or business level.
- Centralised Sorting: Informal collectors sort waste manually, often in open spaces, makeshift facilities or landfill sites close to their communities.
- Storage of Sorted Waste: Informal collectors do not have designated spaces to store sorted materials. The current options are limited to open spaces or makeshift facilities.

Processing Methods:

- Recycling: Recyclables like plastics, metals, and paper are sold to buy-back centres or intermediaries. Materials are generally collected from affluent areas and taken to these facilities, which tend to be located far from the informal settlements.
- Composting: Organic waste is sometimes composted, though this practice is not widespread.

Key Challenges:

- Insufficient sorting facilities and equipment.
- Health risks associated with manual sorting and lack of proper waste handling techniques.
- Limited market access and low value for recyclables.

4. Waste Disposal

Disposal Methods:

- Open Dumps: Common in informal areas where waste is often dumped in open spaces, leading to environmental and health hazards.
- Illegal Dumping: Waste is frequently dumped in unauthorized areas due to lack of access to formal disposal sites. From the on ground assessment, most of the illegal dumping is material in-flow from formal areas.
- Landfills: Primarily used via municipal waste collection, which regularly experiences issues due to a lack of collection from informal and peri-urban areas.

Key Challenges:

- Environmental pollution and public health risks from open and illegal dumping.
- Limited enforcement of waste disposal regulations.

SWOT Analysis for Waste Management Projects in Tshwane's Informal and Peri-Urban Areas

To effectively implement waste management projects in the CoT's informal and peri-urban areas, it is crucial to conduct a SWOT analysis. This analysis will help identify the strengths, weaknesses, opportunities, and threats linked to the building blocks of the strategy: resources for implementation. By understanding these factors, stakeholders can develop more effective strategies to improve waste management practices.

Table 1: SWOT Analysis for WM Projects in the CoT's Informal and Peri-urban areas

Strengths	Weaknesses
• Community Involvement and Engagement • Innovative Solutions • Educational Efforts	• Infrastructure Deficiencies • Financial Constraints • Regulatory and Enforcement Issues • Misuse of Municipal Resources
Opportunities	**Threats**
• Increased Funding and Investment • Technological Advancements • Policy and Regulatory Support	• Environmental and Health Risks • Socioeconomic Challenges • Political and Social Instability • Competition for Resources

Strengths

1. Community Involvement and Engagement

- Strong Community Networks: Community-based initiatives and informal waste collectors play a significant role in waste management. Their involvement ensures local knowledge and trust.

- Volunteer Programmes: Programmes such as CleanCitySA's Adopt A Street Volunteers Network demonstrate strong community participation and commitment to cleanliness.

2. Innovative Solutions
   - Recycling and Waste-to-Energy Initiatives: Projects such as Motobrix in Mathare showcase innovative approaches to turning waste into valuable products like briquettes.
   - Circular Economy Models: Initiatives such as the Warwick Zero-Waste Project illustrate the potential for creating sustainable, circular waste management systems.

3. Educational Efforts
   - Awareness Campaigns: Effective campaigns and workshops can educate the public about waste management, recycling, and the environmental impacts of waste.

Weaknesses

1. Infrastructure Deficiencies
   - Lack of Formal Collection Systems: Inconsistent and inadequate waste collection services in informal and peri-urban areas lead to illegal dumping and accumulation of waste.
   - Insufficient Sorting and Processing Facilities: Limited infrastructure for proper sorting and processing of waste hampers effective waste management.

2. Financial Constraints
   - Funding Shortages: Many publicly funded projects struggle with securing adequate funding for operations, expansion, and scaling up successful initiatives.
   - High Costs of Equipment and Technology: Financial barriers prevent the acquisition of necessary tools and machinery for efficient waste processing and recycling.

3. Regulatory and Enforcement Issues
   - Weak Enforcement: Lack of stringent enforcement of waste management regulations leads to widespread illegal dumping and non-compliance.
   - Policy Gaps: Inadequate policies and regulations to support and incentivise sustainable waste management practices.

4. Misuse of Municipal Resources
   - Infrastructure Vandalism: damage to public infrastructure linked to waste management affects service effective delivery and environmental health and safety..
   - Misuse of Resources: Ineffective use of disposal bags that are meant for waste collection.

Opportunities

1. Increased Funding and Investment
   - Access to Grants and Subsidies: Opportunities to apply for government and international grants to support waste management projects.
   - Private Sector Partnerships: Collaborations with businesses and investors can provide additional funding and resources.

2. Technological Advancements
   - Innovative Waste Processing Technologies: Adoption of advanced technologies for waste sorting, recycling, and waste-to-energy conversion can enhance efficiency and effectiveness.
   - Mobile Apps and Digital Platforms: Use of technology to coordinate waste collection, track progress, and engage the community.

3. Policy and Regulatory Support
   - Government Initiatives: Support from municipal and national governments through policies, regulations, and incentives for sustainable waste management.
   - Zero-Waste Frameworks: Implementation of zero-waste policies and frameworks to guide waste management practices.

4. Capacity Building and Training
   - Skills Development Programmes: Training for waste collectors, community leaders, and project coordinators to improve waste management skills and knowledge.
   - Educational Campaigns: Continuous public education to foster a culture of recycling and responsible waste disposal.
   - Income generation and entrepreneurial skills and business initiatives.

Threats

1. Environmental and Health Risks
   - Pollution and Health Hazards: Ineffective waste management leads to pollution, spreading of diseases, and other health risks in the community.
   - Climate Change Impacts: Extreme weather events can disrupt waste management operations and infrastructure.

2. Socioeconomic Challenges
   - High Poverty Levels: Economic hardships in informal and peri-urban areas limit residents' ability to pay for waste management services.
   - Resistance to Change: Cultural and behavioural resistance to new waste management practices can hinder implementation.

3. Political and Social Instability
   - Political Instability: Changes in political leadership and policies can disrupt ongoing waste management projects.
   - Social Unrest: Instances of social unrest and violence can negatively impact the safety and continuity of waste management operations.

4. Competition for Resources
   - Resource Allocation: Competing priorities for limited municipal resources can result in inadequate funding and support for waste management projects.

Community Engagement

Engaging residents in planning and monitoring waste management services is essential. From the scoping work carried out by Asivikelani, it was found that illegal dumping comprises material in-flow from suburban or formal areas. Residents can police these activities and redirect possible offenders to designated areas. Furthermore, residents can provide valuable insights into the most effective locations for communal collection sites, the distribution of refuse bags, and the overall delivery of waste services. Their involvement can help the City identify service gaps and improve the reliability and effectiveness of waste management practices.

In conclusion, while the City of Tshwane has made strides in addressing waste management in informal settlements, substantial challenges remain. Adequate budgeting, policy development, and active community engagement are crucial for ensuring effective and reliable waste management services, ultimately enhancing the quality of life for residents in Tshwane's informal settlements.

2.4 Consideration in Legislation

The CoT's waste management framework is primarily governed by municipal bylaws and national legislation. The primary legal instrument is the City of Tshwane Waste Management Bylaws, promulgated in August 2016. These bylaws provide a comprehensive framework for waste management within the city, detailing responsibilities, standards, and procedures for waste collection, disposal, and management. However, a significant gap exists in these bylaws concerning informal settlements, which are not explicitly covered, leading to inconsistencies and challenges in service provision.

National Legislation and Guidelines

1. *The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008):*

This is the cornerstone of waste management legislation in South Africa. It aims to protect health, well-being, and the environment by providing reasonable measures for the prevention of pollution and ecological degradation, and for securing ecologically sustainable development while promoting justifiable economic and social development.

The Act emphasizes the waste management hierarchy, prioritizing waste avoidance, reduction, reuse, recycling, and recovery before safe disposal. Municipalities, including the CoT, are mandated to align their waste management practices with these national objectives.

- Enablers:
    - Integrated Waste Management Plans (IWMPs): Mandates municipalities to develop IWMPs, promoting structured and strategic approaches to waste management.
    - Waste Hierarchy: Emphasizes waste reduction, reuse, recycling, recovery, and safe disposal, encouraging more sustainable practices.
- Inhibitors:

- Resource Constraints: Many municipalities, particularly those serving informal settlements, face significant resource limitations, hindering effective implementation.
- Capacity Issues: Limited technical and administrative capacity in local governments to develop and enforce IWMPs effectively.

2. *National Waste Management Strategy (NWMS), 2020:*

The National Waste Management Strategy (NWMS) 2020, updated from its 2011 version, aims to promote sustainable waste management practices through a circular economy approach, emphasizing waste reduction, recycling, and recovery. It aligns with the Sustainable Development Goals (SDGs) and South Africa's National Development Plan (NDP): Vision 2030. This iteration of the NWMS focuses on the Circular Economy, emphasizing the reduction of environmental impact through the reuse and recycling of materials. Key components include promoting waste minimization, improving waste service delivery, and encouraging sustainable waste management practices across sectors. It seeks to achieve a zero-waste society by integrating economic, social, and environmental dimensions.

- Enablers:
  - Community Engagement: Encourages community-based waste management initiatives, fostering local ownership and participation.
  - Capacity Building: Supports training and capacity building for local authorities and communities, enhancing waste management skills and knowledge.
- Inhibitors:
  - Financial Limitations: Insufficient funding for local authorities to implement the strategy effectively in informal settlements.
  - Public Awareness: Lack of widespread awareness and understanding of waste management practices among residents of informal settlements.

3. *National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998):*

NEMA provides the overarching framework for environmental governance and management in South Africa, promoting sustainable development and the integration of environmental considerations into all decision-making.

- Enablers:
  - Community Participation: Promotes the involvement of communities in environmental decision-making, ensuring that local needs and perspectives are considered.
  - Sustainable Development: Encourages practices that balance environmental protection with economic and social development.
- Inhibitors:
  - Complexity: The broad scope and complexity of NEMA can pose challenges for local implementation, especially in resource-constrained settings.

- Enforcement: Ensuring compliance with NEMA's provisions can be difficult in informal settlements lacking formal waste management systems.

4. *National Domestic Waste Collection Standards*

The National Domestic Waste Collection Standards were established under the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) to provide a uniform set of guidelines for the collection of domestic waste across South Africa. These standards are designed to ensure that waste collection services are accessible, affordable, and sustainable for all communities, including those in informal settlements. The standards aim to address historical imbalances in service provision, improve public health, and enhance environmental protection by setting minimum requirements for waste collection.

Overall, the standards are set based on the following principles agreed upon during the consultation process:

1. Equity;
2. Affordability and availability of resources within municipalities;
3. Clarity and ease at which the standards can be implemented;
4. Practicality; and
5. Community participation in design of applicable and appropriate collection systems.

- Enablers:
  - Equity and Accessibility: The standards mandate that all households, regardless of location, should receive equitable waste collection services. This ensures that informal settlements are not excluded from municipal waste collection efforts, thereby promoting environmental justice.
  - Community Participation: The standards encourage community involvement in designing and implementing waste collection systems. This participatory approach helps ensure that the services meet the needs of the community, and foster local ownership and accountability.
  - Health and Safety: The standards prioritise the health and safety of both waste collectors and the communities they serve by setting guidelines for the handling, storage, and transportation of waste. This includes the provision of personal protective equipment (PPE) for waste collectors and regular health check-ups, which are crucial in informal settlements where health risks may be higher due to inadequate infrastructure.
- Inhibitors:
  - Resource Constraints: The successful implementation of the standards requires significant financial and logistical resources, which many municipalities, particularly those serving informal settlements, may lack. The cost of providing regular waste collection services, appropriate receptacles, and necessary infrastructure can be prohibitive.
  - Infrastructure Deficiencies: The standards assume a certain level of infrastructure, such as accessible roads and established collection points, which may not exist in many informal settlements. This can make regular waste collection difficult and lead to service gaps.

- Enforcement Challenges: Ensuring compliance with the standards in informal settlements can be challenging due to weak enforcement mechanisms and the informal nature of many of these areas. Municipalities may struggle to enforce waste management regulations, leading to persistent issues such as illegal dumping and non-compliance with waste separation guidelines.

Municipal Level Frameworks

1. *City of Tshwane's Integrated Waste Management Plan (IWMP):*

The IWMP is crucial for all government spheres involved in waste management, ensuring effective planning and management. In accordance with NEMWA, IWMPs follow the waste management hierarchy: prevention, minimization, reuse, recycling, recovery, and disposal. Municipalities must develop and submit IWMPs to provincial environmental departments for approval. Once approved, IWMPs are incorporated into the municipal Integrated Development Plan (IDP), aligning local waste management strategies with broader developmental goals.

- Enablers:
  - Infrastructure Development: Focuses on enhancing waste management infrastructure and services, such as waste collection points and recycling centers.
  - Public-Private Partnerships: Promotes collaboration between the municipality, private sector, and communities, leveraging additional resources and expertise.
- Inhibitors:
  - Financial Constraints: Limited municipal budget for waste management, particularly in underserved informal settlements.
  - Service Coverage: Incomplete coverage of formal waste management services in informal areas, leading to gaps in waste collection and disposal.

2. *City of Tshwane By-laws:*

These by-laws regulate waste management practices within the municipality, including waste collection, recycling, and disposal, to ensure a clean and healthy urban environment.

- Enablers:
  - Legal Framework: Provides the legal backing for enforcing waste management practices, including penalties for non-compliance.
  - Compliance Promotion: Encourages adherence to waste management regulations through fines and penalties for illegal dumping.
- Inhibitors:
  - Enforcement Challenges: Difficulty in enforcing by-laws in informal settlements where formal waste management systems are lacking.
  - Community Engagement: Limited engagement with informal settlement communities, which can lead to non-compliance and ineffective waste management practices.

3. *Integrated Development Plans (IDPs)*

IDPs are strategic tools employed by municipalities in South Africa to guide economic and social development at the local level. Mandated by the Municipal Systems Act (Act No. 32 of 2000), IDPs are comprehensive plans that outline the priorities, goals, and strategies of a municipality over a five-year period. They serve as blueprints for municipal development, ensuring that the needs of the community are met in a sustainable and integrated manner.

- Enablers:
    - Holistic Approach: By incorporating waste management into the overall development strategy, IDPs ensure that waste management is not an isolated issue but part of a comprehensive plan for sustainable urban development.
    - Resource Allocation: IDPs help municipalities prioritise resource allocation, ensuring that sufficient funds and resources are dedicated to waste management projects in informal settlements. However, this is also one of the shortcomings of the IDPs because not many funds and resources have been allocated to primarily focus on the waste management in informal settlements. This is evidenced in how many informal settlements in the CoT do not have sufficient waste management.
    - Infrastructure Development: IDPs facilitate the integration of waste management infrastructure with other essential services such as water, sanitation, and housing, leading to more efficient and coordinated service delivery.

- Inhibitors:
    - Financial Constraints: Many municipalities face budgetary limitations that can impede the implementation of comprehensive waste management strategies outlined in their IDPs.
    - Coordination Issues: The complexity of coordinating various departments and stakeholders involved in waste management can pose challenges, leading to delays and inefficiencies in implementation. This could lead to delays in the implementation of the Informal Settlement Waste Management Strategy. This shows the need to create a plan to avoid delays due to a lack of coordination.
    - Service Delivery Gaps: Inadequate infrastructure and service delivery mechanisms in informal settlements can undermine the goals set out in the IDP, leading to persistent waste management issues.

- Trust and Cooperation: Building trust and cooperation between municipal authorities and informal settlement communities is essential but can be difficult to achieve, particularly in areas with a history of neglect or marginalisation.

Informal Settlements: A Legislative Gap

Despite the comprehensive nature of the national legislation and local bylaws, informal settlements in Tshwane face a legislative void. The current waste management bylaws lack specific provisions for the unique challenges of waste management in these areas. This absence of regulation has led to irregular and inadequate waste collection services, severely impacting the quality of life and environmental health of residents in informal settlements.

Picture 2: An Illegal Dump Site in an Informal Settlement

Recent Developments and Budgetary Considerations

The CoT's budget for the 2023/24 financial year included a 2.26% increase for contracted waste services. However, there is no specific allocation for informal settlements. The budget does allocate funds for the provision of waste containers, including skips, with a 250% increase from the previous year, but it does not specify the deployment of these resources in informal settlements.

Residents have consistently highlighted the need for more frequent waste removal services, provision of refuse bags, and the establishment of accessible communal collection sites.

Despite these clear needs, the legislative and budgetary framework has yet to comprehensively address these issues.

2.5 Recommendations for Legislative Amendments

To bridge the legislative gap and improve waste management in informal settlements, the following amendments and building blocks are recommended:

1. Development of a Comprehensive Waste Management Policy for Informal Settlements:
   - The CoT should develop and implement a specific waste management policy for informal settlements. This policy should include clear guidelines and standards for waste collection, disposal, and management tailored to the unique needs of these areas.

2. Amendments to the Waste Management Bylaws:
   - The current waste management bylaws should be amended to include specific provisions for informal settlements. These amendments should mandate regular waste collection, provision of refuse bags, and the establishment of communal collection sites within a reasonable distance from residents' homes.

3. Budget Allocations:

- Future budgets should include specific allocations for waste management in informal settlements. This should cover regular waste collection services, provision of refuse bags, and maintenance of collection sites. A detailed capital expenditure should be developed by the City's Finance Department to include waste management infrastructure required across the informal settlements. The operational expenditure should include human capital costs such as a Senior Project Manager within the Waste Management Division.

4. Community Involvement and Monitoring:

- Legislation should mandate the involvement of informal settlement residents in planning and monitoring waste management services. In addition, it should also institutionalise communication and participation mechanisms to meaningfully engage residents. This participatory approach ensures that services meet the actual needs of the community and facilitates accountability in service delivery.

5. Integration with National Waste Management Objectives:

- The CoT's waste management practices in informal settlements should align with the National Environmental Management: Waste Act's objectives. This includes prioritizing waste reduction, recycling, and sustainable disposal practices.

Effective waste management in Tshwane's informal settlements requires a robust legislative framework that addresses the unique challenges of these areas. By developing specific policies, amending existing bylaws, ensuring adequate budget allocations, and involving the community in decision-making processes, the City of Tshwane can significantly improve waste management services. This will not only enhance the quality of life for residents but also contribute to broader environmental sustainability goals.

NB: the recommendations are a culmination of work done by the service providers.

3. Pilot Project and Case Studies

3.1 Purpose of Waste Minimisation Pilot Project in Tshwane

Asivikelane undertook several pilot projects aimed at addressing critical issues within informal communities. These pilot projects are crucial in informing the Draft Waste Management Strategy for Informal Settlements, providing practical insights and data-driven approaches that can be scaled up and integrated into broader municipal frameworks. This discussion explores two significant pilot projects: the use of spatial data and adequate fault reporting for maintaining informal settlement taps and toilets, and the implementation of gender-responsive procurement for chemical toilets.

Spatial Data and Adequate Fault Reporting (2022)

Purpose and Implementation:

One of the most pressing challenges in informal settlements is the poor maintenance of basic sanitation facilities such as taps and toilets. This issue is exacerbated by inadequate fault reporting systems and a lack of spatial data to guide maintenance efforts. To address these challenges, Asivikelane, in collaboration with the Community Organisation Resource Centre (CORC) of the SASDI Alliance, conducted a GIS training and mapping exercise with residents and community leaders in eThekwini.

The primary goal of this pilot project was to improve the turnaround time for repairs and maintenance of taps and toilets by using spatial data to enhance fault reporting and service delivery responsiveness. The project involved collecting GIS data from ten informal settlements, enabling more accurate and efficient location of facilities in need of repair.

Desired Impact:

The desired impact of this pilot project was multifaceted:

- Improved Turnaround Time: By providing precise locations of faulty facilities, the maintenance teams could respond more quickly and efficiently.
- Enhanced Fault Reporting Systems: By integrating spatial data into fault reporting mechanisms, the systems became more accessible and functional for informal settlement residents, who often lack access to municipal accounts or street numbers.
- Systematic Changes: The project aimed to foster systematic changes that would ensure quicker response times and more proactive maintenance of communal taps and toilets.

The success of this pilot project demonstrated the potential for using spatial data to enhance service delivery in informal settlements. The lessons learned from this initiative highlight the importance of integrating innovative technologies and community involvement in the Draft Waste Management Strategy for Informal Settlements.

Gender-Responsive Procurement (2023)

Purpose and Implementation:

The Gender-Responsive Procurement pilot project was initiated to address the specific needs of women in informal settlements, particularly concerning the provision and maintenance of chemical toilets. In Knysna, a social audit conducted across 17 informal settlements revealed significant issues with the existing chemical toilets, including safety concerns and hygiene problems reported by women.

Community facilitators, working with the Development Action Group (DAG), advocated for gender-separated toilets to improve safety and hygiene. Their efforts resulted in the provision of gender-specific chemical toilets in several informal settlements, with support from local ward councillors and municipal officials.

Desired Impact

The desired impact of this pilot project included:

- Improved Safety and Hygiene: By providing separate toilets for men and women, the project aimed to address safety concerns and improve hygiene standards, particularly for women.
- Community Empowerment: The project demonstrated the importance of involving community members, particularly women, in decision-making processes related to service provision.
- Influence on Procurement Practices: The success of this initiative provided valuable insights into how gender-responsive procurement can be integrated into municipal procurement processes, ensuring that the specific needs of all community members are considered.

The Gender-Responsive Procurement project underscored the importance of inclusive and responsive service provision in informal settlements. The positive outcomes from this initiative provide a compelling case for incorporating gender considerations into the Draft Waste Management Strategy for Informal Settlements.

The pilot projects undertaken by Asivikelane illustrate the potential for innovative and community-driven approaches to enhance waste management and basic service delivery in informal settlements. By integrating spatial data for improved fault reporting and adopting gender-responsive procurement practices, these initiatives offer valuable lessons and practical solutions that can be scaled up and incorporated into the Draft Waste Management Strategy for Informal Settlements. These projects highlight the importance of leveraging technology, empowering communities, and fostering inclusive policies to address the unique challenges faced by informal settlements, ultimately improving the quality of life for residents and ensuring sustainable urban development.

3.2 Case Studies on Waste Management in Informal Settlements

Building from the pilot projects, this strategy reviews four case studies of different approaches to waste management in informal settlements. The review focuses on the following:

- *Location and Purpose*: aimed at understanding the characteristics of different locations and waste problems or challenges addressed.
- *Stakeholder and Community Involvement*: aimed at learning who comprised stakeholders, their roles and responsibilities as well as engagements with the community.
- *Duration and Impact*: aimed at assessing how long the projects were implemented and the stage at which they were transferred to communities or ended, and importantly the impact had on the communities.

After each case study, an analysis and key lessons are provided. These are intended to contribute towards the strategy development.

Case Study 1: CleanCitySA Extends a Hand to the Johannesburg Inner City Businesses

Location and Purpose:

CleanCitySA operates in the inner city of Johannesburg, aiming to restore and maintain the cleanliness of the area through its Adopt A Street Volunteers Network. The purpose is to engage the community, especially businesses, in keeping streets and open spaces clean while educating them about the environmental and health impacts of littering.

Stakeholders and Community Involvement:

The stakeholders include retail, residential, and commercial property owners, as well as the general public. Volunteers from the community adopt streets and open spaces, committing to weekly clean-ups. Dalu Cele, CEO of Clean City South Africa, highlights that the programme's success relies on the active participation of these stakeholders.

Duration and Impact:

Launched on September 5, 2020, the programme has seen significant impact over nearly three years. Volunteers have collected over 3,000 refuse bags of litter across 92 Saturday morning events at locations including Pullinger Kop Park, Pretoria Street, and Pieter Roos Park. The programme also provides incentives, such as Shoprite Checkers vouchers, to volunteers.

Focus on Waste Value Chain:

The initiative primarily focuses on waste collection, a crucial part of the waste management value chain, addressing immediate litter issues and preventing waste accumulation in the environment.

Key Lessons:

- Community engagement and incentives are vital for sustained volunteer participation.
- Collaboration with local businesses can enhance programme impact and reach.
- Regular, scheduled clean-up events can lead to significant environmental improvements over time.

Picture 3: Adopt A Street Volunteers Participating in the CleanCitySA Project

Case Study 2: Warwick Zero-Waste Project

Location and Purpose:

The Warwick Zero-Waste (WZW) Project operates in Durban, South Africa, focusing on creating sustainable climate change mitigation strategies through a zero-waste framework. The project diverts organic waste from the Durban Early Morning Market to compost at the Durban Botanical Gardens.

Stakeholders and Community Involvement:

Key stakeholders include DUT's Urban Futures Centre (UFC), local non-profits groundwork and Asiye eTafuleni, the municipality, informal traders, and the public. Dr. Tamlynn Fleetwood emphasizes the project's aim to empower informal traders and educate on climate change and zero-waste.

Duration and Impact:

The project is in its third and final year as part of an international zero-waste cluster. Despite challenges like COVID-19 and political instability, the project successfully diverted 4,096 kg of organic waste from landfills and implemented composting initiatives. It has also produced research outputs and facilitated engagement through the Africa Zero-Waste Hub.

Focus on Waste Value Chain:

The project addresses multiple stages of the waste value chain, including waste diversion, composting, and education. It also integrates informal waste pickers into the formal waste management system.

Key Lessons:

- Collaborative partnerships enhance project resilience and impact.
- Empowering marginalised communities can drive innovative solutions.
- Consistent monitoring and evaluation are crucial for project success and scalability.

Picture 4: Organic Waste Being Managed at the Durban Botanical Gardens

Picture 5: The Organising of Food Waste

Case Study 3: Mathare Youths Cleaning Environment by Turning Waste to Energy

Location and Purpose:

Motobrix operates in the Mathare slums of Nairobi, Kenya, transforming waste into eco-friendly briquettes. The initiative aims to address waste management issues while providing affordable, clean cooking energy to the community.

Stakeholders and Community Involvement:

Stakeholders include informal waste collectors, community members, and Motobrix team members. Founder Calvin Shikuku emphasizes the community-centered approach, with local youths collecting and processing waste.

Duration and Impact:

Founded in 2020, Motobrix has been operational for about four years. The initiative produces approximately 1,140 kg of briquettes weekly, serving around 200 families. It has recycled an estimated 50 tonnes of waste, significantly reducing local environmental pollution.

Focus on Waste Value Chain:

The project focuses on waste collection, processing, and energy production, transforming various types of waste into briquettes.

Key Lessons:

- Community-driven initiatives can effectively address local waste management challenges.
- Innovative waste-to-energy solutions can provide affordable, sustainable energy sources.
- Continuous improvement and scaling efforts are essential for long-term success and broader impact.

In conclusion, these case studies demonstrate the importance of community involvement, collaborative partnerships, and innovative approaches in waste management. Each project highlights different aspects of the waste value chain and provides valuable lessons for future initiatives.

Picture 6: Youths Collecting Waste for Briquetting

Picture 7: The Briquettes in Use

Case Study 4: 1to1, TLF and PlanAct - Community-Based Waste Management Strategy

Location and Purpose:

The Community-Based Waste Management Strategy was implemented in Tshwane, focusing on informal settlements within the City. The primary purpose of the project was to enhance waste management practices, improve sanitation, and foster community engagement in maintaining a cleaner and healthier living environment. Additionally, the project aligned with the Sustainable Development Goals (SDGs) by incorporating waste minimisation, recovery, and reduction approaches that addressed multiple social, economic, and environmental challenges in informal settlements.

Stakeholders

The key stakeholders involved in the project included:

- 1 to 1 Agency of Engagement (1to1): Served as a strategic partner and project manager.
- Tshwane Leadership Foundation (TLF): Partnered with 1to1 in executing the project.
- Industrial Development Corporation (IDC): Provided funding through the Social Employment Fund (SEF).
- Community Participants: 160 residents from informal settlements who actively participated in the project.
- City of Tshwane: Played a central role in coordinating waste management goals and integrating project outcomes into municipal strategies.
- Other Partners: Asivikelane and PlanAct contributed expertise and resources to ensure the project's success.

Duration:

The project ran from September 2023 to May 2024, spanning a total of eight months.

Community Involvement:

Community involvement was a cornerstone of the strategy, ensuring that local residents were active participants in project design and implementation. This involvement addressed critical aspects of waste management and broader community development goals.

- Addressing Poverty and Hunger (SDG 1 & SDG 2): Residents rehabilitated dumpsites into community food gardens, providing produce to child-headed households, people living with disabilities, and low-income families, thus contributing to the eradication of poverty and hunger.
- Promoting Gender Equality (SDG 5): The majority of SEF participants were women aged 18–59, placing women and girls at the forefront of initiatives aimed at improving waste management and community well-being, thereby empowering marginalized groups.
- Ensuring Affordable and Sustainable Energy (SDG 7): Community members explored waste-to-energy solutions such as biogas production, demonstrating the potential for small-scale, sustainable energy solutions in informal settlements.
- Fostering Economic Growth and Employment (SDG 8): The strategy provided decent employment opportunities, with participants receiving stipends for work in waste sorting, recycling, composting, and processing. Additionally, there is potential for cooperative models to employ more people within the community.
- Creating Sustainable Settlements (SDG 11): By addressing waste accumulation and minimizing the burning of waste, the project improved sanitation and safety, making informal settlements more inclusive, resilient, and sustainable.

Impact Achieved

The project delivered significant outcomes aligned with the SDGs, including:

- Waste Collection: Over 10,800 bags of waste were collected, resulting in cleaner streets and rehabilitated areas, reducing environmental hazards.
- Rehabilitated Ecosystems (SDG 15): Dumpsites were transformed into community green spaces, including tree-planting efforts that contributed to halting land degradation and combating biodiversity loss.
- Mitigating Climate Change (SDG 13): By diverting waste from landfills and promoting recycling and composting, the project reduced greenhouse gas emissions, aligning with climate action goals.
- Enhanced Livelihoods: The project provided a platform for residents to participate in activities beyond waste management, such as disaster response and community safety training.
- Partnerships for Sustainability (SDG 17): The strategy was driven by multi-stakeholder collaboration, illustrating how partnerships can strengthen local waste management systems and align with global sustainability frameworks.

Focus on the Waste Value Chain:

The project primarily focused on the: “collection and clearance” stages of the waste value chain. By mobilizing community members to collect waste and clear dumpsites, the initiative addressed the immediate challenge of waste accumulation and improved overall sanitation in the settlements.

Key Lessons:

Several key lessons emerged from the Asivikelane project:

1. **Community Empowerment is Critical:** Engaging residents in waste management fosters ownership and ensures sustainability, addressing poverty, hunger, and inclusion (SDG 1, SDG 2, and SDG 11).
2. **Gender-Inclusive Leadership:** Empowering women and girls enhances community impact and addresses inequality (SDG 5).
3. **Sustainable Energy Solutions:** Waste-to-energy initiatives provide scalable opportunities for informal settlements to access clean and affordable energy (SDG 7).
4. **Economic Opportunities Enhance Resilience:** Providing employment through waste management improves livelihoods and fosters sustainable economic growth (SDG 8).
5. **Environmental Rehabilitation Matters:** Converting dumpsites into green spaces combats desertification and biodiversity loss, while reducing emissions aligns with climate action goals (SDG 13 and SDG 15).
6. **Collaborative Partnerships Drive Success:** Multi-stakeholder collaborations ensure that waste management strategies are inclusive, effective, and aligned with global sustainability objectives (SDG 17).

The 1to1, TLF, and PlanAct Community-Based Waste Management Strategy highlights the potential for integrating community-driven waste initiatives with the Sustainable Development Goals. By promoting participation, fostering economic inclusion, and addressing critical environmental challenges, the strategy serves as a model for creating resilient and sustainable urban settlements.

Picture 8: Community Participants After

Picture 9: Food Garden by a Community Managing Waste

4. Proposed Integrated Strategy for Sustainable SWM Practices

4.1 Objectives of the Strategy

This strategy was prepared in partnership with the Waste Management Division, Human Settlements Department at the City of Tshwane, Asivikelane, C40 Cities, Madam Waste (MW) and other key stakeholders, with The City of Tshwane being recognised as a key and strategic enabler. Section Four is divided into two: the Stakeholder Matrix and the Integrated Strategy, which covers institutional, technical, financial, environmental and socio-economic aspects. It was developed on the basis of the following objectives:

- Objective 1: Foster Collaborative Leadership and Strategic Partnerships
  Ensure high-level engagement and commitment from decision-makers and key stakeholders to drive the implementation of sustainable waste management practices, positioning them as champions of the strategy's success.

- Objective 2: Empower Communities through Inclusive Participation
  Facilitate meaningful community engagement to address their waste management needs, while unlocking opportunities for their active participation in waste minimisation and recycling initiatives, fostering local ownership and empowerment.

- Objective 3: Establish an Enabling Policy and Institutional Framework
  Create and maintain a conducive policy, institutional, and operational environment that supports the effective execution of the waste management strategy, ensuring alignment with national and municipal waste management regulations and modern best practices.

- Objective 4: Promote Waste Minimisation and Sustainable Waste Management Solutions
  Integrate waste reduction, reuse, and recycling initiatives into community profiles and municipal operations, encouraging sustainable waste practices and resource recovery within informal settlements and the broader community.

- Objective 5: Implement Comprehensive Monitoring, Evaluation, and Data Management Systems
  Develop and sustain robust systems for data collection, analysis, monitoring, and evaluation to track progress, measure the impact of waste management initiatives, and ensure adaptive management that responds to emerging challenges and opportunities.

In addition, the strategy aims to create an enabling environment to align the City's waste management operations with modern waste management practices. To pursue one of the City's key objectives, which is to "*ensure that there is a hygienic environment to live and play delivered through effective waste collection and rubbish disposal to protect the environment and the health of residents; comply with environmental legislation; and ensure working landfill sites; and the*

implementation of recycling programmes". Furthermore, the strategy specifically addresses the following City strategic objectives:

- Strategic Objective 3: A business-friendly City that promotes Employment and Economic Growth.
- Strategic Objective 5: Maintain a Clean and Protected Natural Environment.

4.2 The Strategy's Enablers

The waste management challenges faced in the City of Tshwane's informal settlements and hostels cannot be solved by addressing physical components of waste collection and minimisation only. It requires a model that also includes stakeholders and governance components, where communities and key decision makers are involved. In addition, the strategy is designed on the foundation of nurturing mindset and encouraging project ownership by the communities.

Stakeholder as an Enabler

Three critical stakeholders are proposed:

1. City of Tshwane: The City of Tshwane is a strategic enabler of this waste management strategy, with several municipal departments playing a critical role. These departments include:
    - Waste Management
    - Human Settlements
    - Economic Development
    - City Planning
    - Environmental Management
    - Social Development
    - Health Services
    - Transport and Roads
    - Housing
    - Public Safety and Emergency Services

This list is not exhaustive, as additional departments such as Housing, Infrastructure Development, and Sanitation will also be key players in ensuring successful waste management practices, particularly in informal settlements and hostels. All relevant departments must collaborate to ensure an integrated approach.

1. Community Champions
2. The Community itself and Community Based Organisations (CBO)

Additional stakeholders include private companies in waste management (EPRs and PROs), product manufacturers and colleagues from the Expanded Public Works Programme (EPWP), the media and academia.

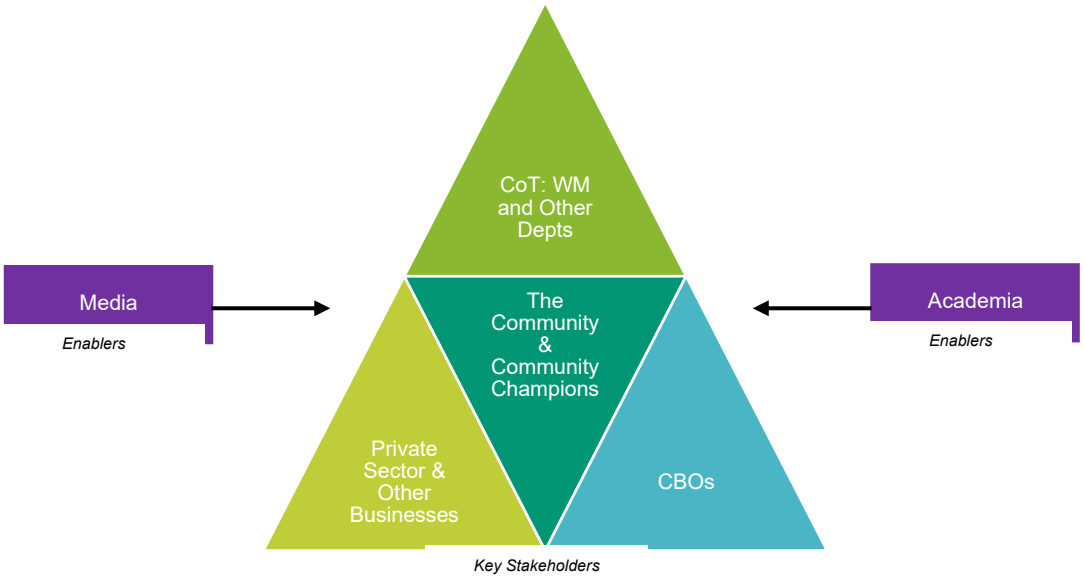


Figure 3: Stakeholder Matrix

Their roles and responsibilities entail:

Stakeholder	Role	Responsibility

City of Tshwane	Create a conducive environment that eases project implementation.
	
	Develop internal communications and partnerships with relevant departments (Human Settlements, Metro Police, EPWP, Gauteng Department of Agriculture, Rural Development and Environment)
		• Ensure municipal regulations are not an impediment.
		• Provide assistance with identification and development/permitting etc. of suitable locations for the community to conduct waste management activities, including disposal and recycling activities.
		• In accordance with legislation, provide basic services, fencing and signage.
		• The City of Tshwane must streamline stakeholder partnership processes by implementing a clear, structured communication strategy that ensures timely and transparent information sharing. This can be achieved through:
		  ◦ Dedicated Communication Platforms
		  ◦ Regular Stakeholder Meetings
		  ◦ Appointing Relationship Managers
		  ◦ Community-Focused Communication
		• City Planning to intentionally design-in or demarcate waste management spaces in current and future informal settlements (some in-situ developments)
		• GDARD and Human Settlements, identify underutilised spaces in informal settlements and convert into multi-purpose recycling centres or buy-back centres.
		• GDARD to offer conducive and favourable policy support, permitting, etc.

Stakeholder	Role	Responsibility
Community & Community Champions	Identify illegal dumping hotspots, establish cooperatives and welcome projects into the area.	• Communicate initiatives within the community (information sharing). • Identify and support Community Champions. • Community Champions to lead education & create awareness in communities, at schools & social gatherings in partnership with CoT's Education and Awareness Division. • Community Champions to lead in identifying context specific activities or needs that can be supported by the private sector.
Community Based Organisations	Provide technical support and training to capacitate Community Champions.	• Provide Community Champions with skills, knowledge and material about waste management & circular economy. • Support Community Champions with initiative design and implementation. • Assess specific activities or needs that can be supported by the private sector. • Directly provide education and awareness campaigns within Communities, • Facilitate engagements between Community Champions and the Community.
Private Sector and Other Business	Donate required equipment and plan volunteer programmes linked to CSI.	• Purchase recyclable material from demarcated areas. • Donate required equipment as part of activities or needs identified (linked to CSI) • Design or implement community volunteer programmes (e.g. training, gardening, marketing, etc). • Provide capacity building and mobile buy-back centres, • Consider mobile buy-back centres and infrastructure development. • Participate in existing programmes such as 'Adopt a Spot'[1] and create spaces for reclaimers
Media	Publicity and reporting.	• Publicise activities and opportunities for collaboration (community-based approach), as well as education and awareness campaigns. • Highlight the Community Champions and teams involved • Avenue for CBOs and other stakeholders to showcase their waste management efforts.

[1] https://www.tshwane.gov.za/?page_id=72645 – About the 'Adopt a Spot' Programme.

Stakeholder	Role	Responsibility
Academia (& Research Institutions)	Additional Training and Project Prototyping.	• Conduct practical training to capacitate Community Champions and prototype community led initiatives.
Metro Police	Enforce Waste Management ByLaws	• CBOs and Community Champions to organise a programme where Metro Police's ByLaw Enforcement Unit engages the community, provides information about the law and what happens when people are caught.

Table 2: Stakeholder Roles and Responsibilities

Partnerships are essential to the strategy's implementation. It is recommended that the City of Tshwane incorporates the Partnerships Framework into this strategy as well as the Integrated Waste Management Plan. There are Relationship Managers within the City who are responsible for these initiatives.

Governance as an Enabler

It is equally critical that various components of governance are considered. There are many components to consider however, this strategy specifically proposed those shown in the figure below. It is recommended that these are reviewed and customised alongside any policy or regulatory amendments that may affect project implementation in informal settlements and hostels.

Figure 4: Governance Enablers

Component	Rationale as an Enabler
Project Administration	This is at the centre of the strategy. The City of Tshwane's ability and capability to implement the strategy and achieve its objectives. Administration entails a system of project management, delegation, decision-making, engagements with office bearers, amongst others.

Component	Rationale as an Enabler
Strategic Alignment to Policies & Compliance	The strategy recognises all policies and regulations in favour of sustainable waste management. These include national, provincial and local level documents. In terms of compliance, the strategy was developed with the relevant by-laws in mind.
Stakeholder Interests, Strategy Adoption & Approval	Internal stakeholders include but not limited to: Councillors, Municipal Managers, Executive Committees, amongst other staff members. The strategy must be inclusive and reflective of the City's waste management objectives and enable them to create a favourable environment for buy-in and implementation. This can then lead to the strategy's adoption and approval process being met successfully.
Risk Management	Risks are inevitable and come in different forms. Risks linked to the strategy's administration, compliance and stakeholder interests must be reviewed regularly. Through project administration, they can be mitigated in accordance with local public administration processes.

Table 3: Governance Enables and their Rationale as an Enabler

4.2 Proposed Strategy

As indicated, this Sustainable Waste Management Strategy for Informal Settlements and Hostels is designed on the foundation of nurturing mindset and encouraging project ownership by the communities. It still considers the principles from the waste hierarchy which calls for waste prevention as the most preferred approach while disposal or landfilling is the least.

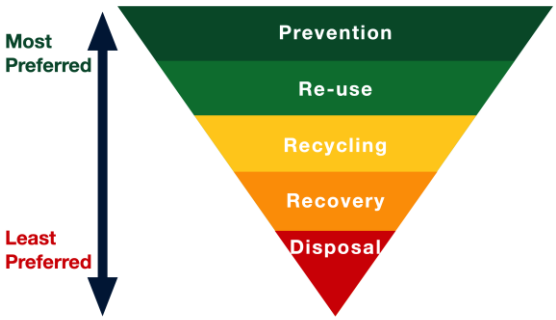


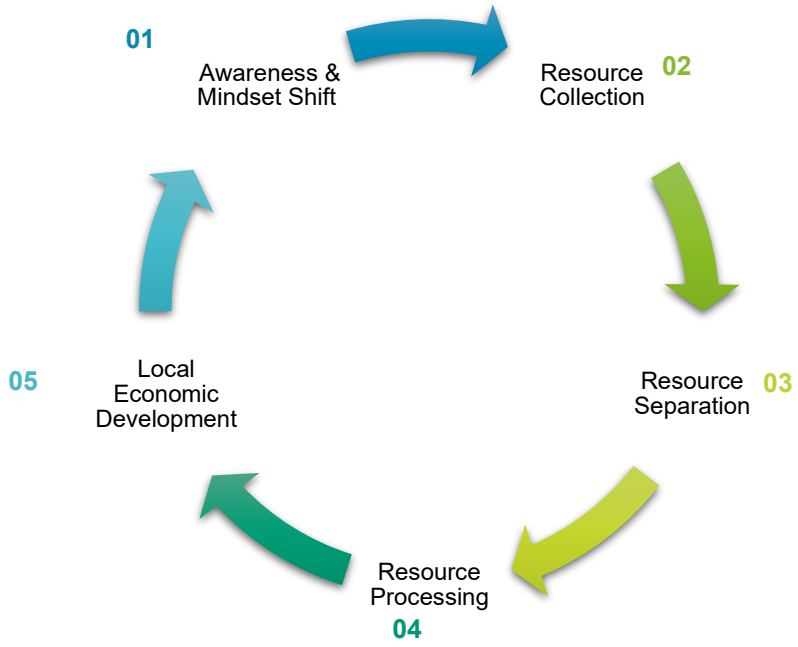
Figure 5: The Waste Management Hierarchy

The strategies below were developed by taking the following into consideration:

- Status Quo of Urban Waste and Impact of Poor Waste Management in Informal Settlements,
- Legislative Framework that supports municipal waste management and minimisation activities,
- Lessons Learned and Experiences from Pilot Projects and similar Case Studies.

NB: It is also proposed that these are customised for various settlements:

Figure 6: Community-led Strategy showcasing Socio-Economic Benefits



01 Awareness & Mindset - - > Waste Prevention: **Shift Implement community-led campaigns to provide ongoing mindset shifting content, activities and initiatives**

It is recommended that campaigns be led by an identified Community Champion(s) in order to encourage project buy-in, ownership and support the municipality's waste minimisation efforts. The Champions should receive customised training by collaborating with CBOs through a 'Train the Trainers' Programme, and be capacitated with information from CoT. The training should capacitate the Champions to gain a comprehensive understanding of their communities by focusing on spatial, social, regulatory and waste management activities in the settlements.

Thereafter, the Champions can design and implement 'mindset shifting and awareness' campaigns targeting community gatherings, schools, as well as mobilising communities on behalf of municipal and partner initiatives. This approach aims to support 'waste prevention' within communities. To ensure value addition and sustainability, it is recommended that the champions charge a minimum fee per group or can be subsidised through CSI.

- *Value Proposition*: through such initiatives, the partners are able to determine how mindset shifting and awareness have a direct impact on the environment, social and local economic development. The Champions' experiences can encourage other champions to become waste champions. This is also important for community ownership.

- *Benefits*: This strategy can result in community project ownership, namely: capacity development, and understanding of waste as a resource; economic opportunities attainable from waste.

02 Resource Collection - -> Re-use: Optimise current collection methods and customize new approaches

Through partnerships and support from CBOs, it is recommended that initiatives be customised for each settlement. From the pilot project experiences and case studies' key lessons, it is evident that customisation is needed. Settlement profiling is very important, particularly the local waste value chain.

In order to encourage resource re-use, the collection has to be improved. The strategy proposes enhancing current collection activities; providing the necessary financial, technical and non-financial support. These include but not limited to: the CoT increasing weekly kerbside collection, piloting a partnership with EPWP in each informal settlement and regular cleaning of illegal dumping. The City of Tshwane must consider procurement of waste carts or wheelbarrows and bags to facilitate collection activities. Using the Partnership Framework, recycling companies can be approached from a Corporate Social Investment (CSI) angle to support resources or facility development where further opportunities to re-use various waste streams are identified.

- *Value Proposition*: the proposition is twofold: (1) CoT leverages on private sector resources or donations for biodegradable and re-usable plastic bags, wheelbarrows, and second-hand processing equipment (as well as training) in return for CSI benefits, while the private sector itself (2) strengthens its working relations with the City, and is able to record tangible impact.
- *Benefits:* reduced infrastructure costs for CoT and environmentally friendly plastic bags as well as improved collection activities. The youth can also be encouraged to see opportunities for collection business services.

03 Resource Separation- - -> Recycle: Optimise current separation methods and customize new approaches

To improve decentralised recycling activities across settlements and hostels, resource separation is key. However, the activities must happen within the communities. It is proposed that underutilised open spaces designated by CoT can be earmarked as small-scale multi-purpose recycling facilities or rehabilitated as community open spaces with gardens and temporal waste storage prior to removal or transferring. This also includes spaces where open dumping is currently occurring. Clearing the land, demarcating separation activities and including some basic engineering (through EPWP) aids in decentralising access to a disposal site.

The 'Adopt a Spot' Programme can also be considered, or partnerships for mobile buy-back centres. Similarly, these interventions need to be customised to each settlement, taking into consideration their waste generation and management activities.

- *Value Proposition*: for the CoT, there will be reduced 'waste export' from settlements to landfills, decentralised recycling activities, efficient use of underutilised land, and improved waste separation within the settlements.
- *Benefits*: the separated and cleaned material can result in potential markets for private sector to offtake, centralised material, encourage active community participation and small business or job creation.

04 Resource Processing - - ->Recovery: New product development on site.

With the waste streams collected, separated and centralised within settlements, it becomes easier for the CoT, Community Champions, CBOs and Private Sector partners to categorise the biggest stream, quantity and investigate the most cost-effective processing approach. It is expected that waste streams will differ from one community to another.

Streams such as organic material can be processed on site using different composting methods whilst metal waste can be beneficiated by artisans into various forms of artwork. With proper site and operations management, the sites become points of sales for final products. Similarly, other organic material can be processed into mulching material and utilised for onsite gardening. Fresh produce can also be sold within and around the community.

- *Value proposition*: the CoT is able to show practical circular economy activities championed by community members; through the awareness and mindset shift campaigns, community members are exposed to income-generating opportunities offered through different waste streams; environmental benefits (cleaner neighbourhoods, community food gardens, better health and livelihoods).
- *Benefits*: the greater benefits are for the Community and Community Champions: decentralised job creation, skills development and community buy-in.

05 Local Economic Development: Develop, train and upskills Cooperatives/Individuals/Small Businesses, and establish meaningful partnerships (market access).

To further enhance the community-led strategy, it is necessary that cooperatives are identified, developed, trained and upskilled. It is recommended that CBOs and Community Champions lead this activity with support from Private Sector (volunteered training programmes) and academia (model prototyping) by linking activities to waste minimisation initiatives. Key themes to focus on: the cooperative model, business administration and operations, communication and leadership development, waste management and circular economy, as well as marketing and sales, to name a few. The

target audience can be limited to youth finishing matric or attending TVET colleges, with a willingness to participate in the sector.

Furthermore, it is proposed that this strategy be incorporated in the City's plan to develop Waste Incubator Programmes in informal settlements. The City of Tshwane intends to work with project implementors who would be expected to provide practical business development support to small businesses and cooperatives.

- *Value proposition*: the CoT becomes an enabler for local economic development in underexploited sectors such as waste; decentralise market opportunities for informal collectors; enhance awareness and showcasing small business opportunities within the community's immediate reach.
- *Benefits*: showcase business opportunities along the waste value chain, present benefits of cooperating as a community and reduced waste collection and minimisation burden for CoT.

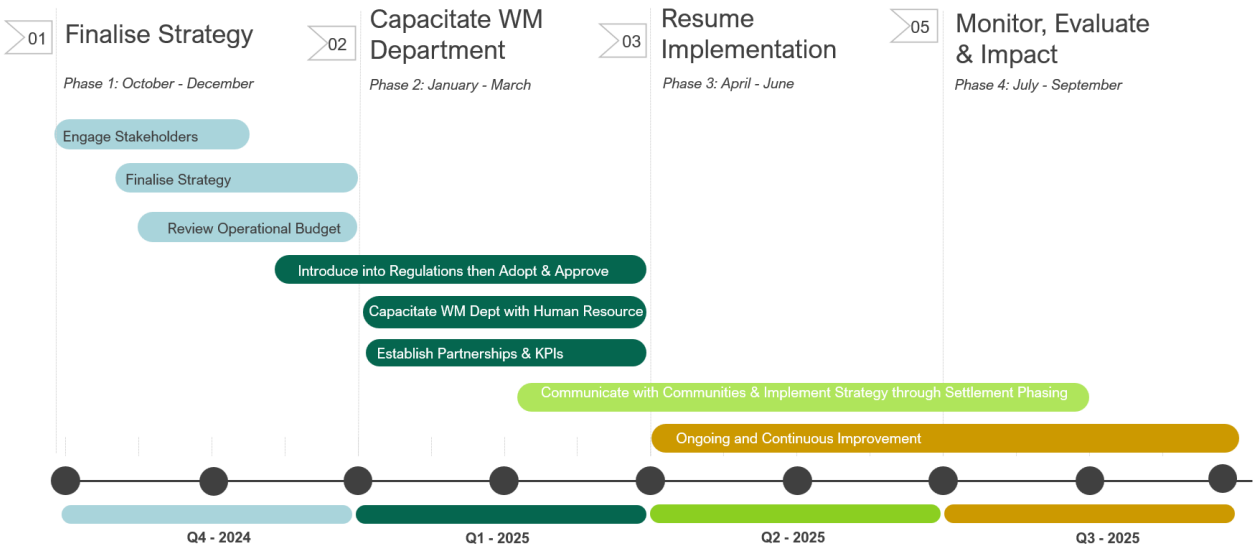
5. Implementation Roadmap

The roadmap should be viewed as a living document that can be updated using feedback from implementation experiences. A recap of the objectives:

- Objective 1: Identify and Ensure buy-in from Decision-makers (Strategy Enablers)
- Objective 2: Assess the Community's Needs and Untapped Opportunities for Participation and Empowerment
- Objective 3: Create an Enabling Environment for effective Strategy Implementation.
- Objective 4: Profile Communities and Integrate Waste Minimisation Initiatives.
- Objective 5: Develop robust systems for Data Collection, Monitoring & Evaluation

Phase one involves finalising the strategy, followed by phase two, capacitating the Waste Management Division. Phase three details steps to strategy implementation, which will then lead to phase four, ongoing monitoring, evaluation and impact assessment according to the objectives.

Figure 7: 12-Month Implementation Roadmap



NB: The list of stakeholders included in this roadmap is not limited to those proposed. They should be expanded.

Phase One: Finalise Strategy

Objective: Identify and Ensure buy-in from Decision-makers (Strategy Enablers)

1. *Engage Stakeholders*
    a. *Purpose*: Identify and engage stakeholders directly and indirectly involved in the design, adoption, resourcing, implementation, monitoring and impact assessment of the strategy.
    b. *Stakeholders*: Departments in the CoT (Waste Management Division, Communications Department), Councillors and Community Leaders, Community Based Organisations
    c. *Action*: Hold a Stakeholder Validation Workshop to review Strategy and Implementation Roadmap.
    d. *Tools*: -

2. *Finalise Strategy*
    a. *Purpose*: Receive feedback and buy-in required to finalise the strategy.
    b. *Stakeholders*: Departments in the CoT (Waste Management Division, Communications Department), Councillors and Community Leaders, Community Based Organisations
    c. *Action*: Finalise the Strategy and Implementation Roadmap.
    d. *Tools*: -

3. *Review Operational Budget*
    a. *Purpose*: Circulate the Strategy and Implementation Roadmap for Budget Consideration.
    b. *Stakeholders*: Departments in the CoT (Waste Management Division, Finance & Procurement Department, Human Settlements Department), Councillors, Community Based Organisations, Tshwane Metro Police Department**.
    c. *Action*: Finalise the Strategy and Implementation Roadmap.
    d. *Tools*: -

Table 4: Phase 1 Possible Risks and Mitigation Options

Possible Risks	Mitigation Options
Politics & Gatekeeping	The different divisions within the Waste Management Division can review, assess and use existing processes to address these risks. A critical division is Education and Awareness.
Intergovernmental Relations	
Gangsterism & Disputes	
Unreliable Collection Services	
Language Barriers	
Poor Social Cohesion & Xenophobia	
Ward Demarcation	
Lack of Openness to Change	

Phase Two: Capacitate the Waste Management Division

Objective: Assess the Community's Needs and Untapped Opportunities for Participation and Empowerment

1. *Introduce Strategy into Regulations*
    a. *Purpose*: Draw waste minimisation insights that can be included in waste regulations and guidelines.
    b. *Stakeholders*: Departments in the CoT: Waste Management Division, Environmental Health Department, Human Settlements Department*.
    c. *Action*: Update existing guidelines with insights focusing on informal settlements.
    d. *Tools*: -

2. *Capacitate WM Department with Resources*

It is proposed that the City of Tshwane's Waste Management Division appoints a Staff Member responsible for implementing the Informal Settlements Sustainable Waste Management Strategy and importantly, be the point of communication with stakeholders. The individual would receive support from a Senior Official within the Department.

Additional activities should include programme monitoring and evaluation, sharing insights with the media, establishing networks and partnerships and creating an enabling environment for external stakeholders to implement projects with the community and its champions.

    a. *Purpose*: Identify a skilled human resource to be responsible for the strategy's implementation, monitoring and impact assessment.
    b. *Stakeholders*: Departments in the CoT (Waste Management Division, Marketing and HR Department, Finance & Procurement Department, Human Settlements Department) *.
    c. *Action*: Develop scope of work for marketing and HR division.
    d. *Tools*: Recruitment Platform

3. *Establish Partnerships and KPIs*
    a. *Purpose*: Identify, develop and maintain relationships with stakeholders who resonate with the strategy's objectives.
    b. *Stakeholders*: Departments in the CoT (Waste Management, Communication and Marketing, Stakeholder Engagement), Councillors and Community Leaders, Community Based Organisations, Private Sector, External Media, Academia
    c. *Action*: Develop stakeholder database and value proposition, determine financing options (CSI, CSR, Internal Budget, External Grants), develop key performance indicators (KPI) attainable from the partnerships, and communication channels.
    d. *Tools*: Stakeholder Database, KPI template

Table 5: Phase 2 Possible Risks and Mitigation Options

Possible Risks	Mitigation Options
Land Ownership	These risks can be managed by the Human Settlements Department in Partnership with GDARD – linked to existing programmes being carried out.
Settlement Growth	
Inaccurate Data for Planning	
Intragovernmental Silos	

Phase Three: Resume Implementation

Objective: Create an Enabling Environment for effective Strategy Implementation.
Objective: Profile Communities and Integrate Waste Minimisation Initiatives.

It is proposed that the strategy's implementation takes a 'pilot approach' and be linked to the 'Adopt a Spot' Programme in relevant settlements. Furthermore, experiences from past pilot projects should be used to identify existing community activities and investigate how best to support their initiatives. Some programmes may have existing volunteers; thus it is recommended that CoT engage EPWP about operationalisation in such settlements.

1. *Settlement Phasing*
    a. *Purpose*: Create a phased approach to implementing the strategy across different informal settlements and link to waste minimisation initiatives.
    b. *Stakeholders*: Departments in the CoT, Councillors and Community Leaders, Community Based Organisations, Private Sector, External Media, Academia
    c. *Action*: Develop a Workplan or Project Implementation Plan, templates for reporting and marketing/communication strategy.
    d. *Tools*: -

Table 6: Phase 3 Possible Risks and Mitigation Options

Possible Risks	Mitigation Options
Lack of Political Will & Interest	Involve relevant political decision makers from inception to ensure their buy-in and ease bureaucracies.
Lack of Resources	
Too Much Bureaucracy	

Phase Four: Monitor, Evaluate & Impact

Objective: Develop robust systems for Data Collection, Monitoring & Evaluation

1. *Ongoing and Continuous Improvement*
    a. *Purpose*: Ongoing implementation and continuous improvement. Data sources include but are not limited to: waste audits, surveys and interviews, observations, reports, invoices, and records. Data required includes but not limited to: waste generation, waste generation and collection, segregation and recycling, disposal data, financial, participation rates, awareness programmes,
    b. *Stakeholders*: Departments in the CoT, Councillors and Community Leaders, Community Based Organisations, Private Sector, External Media, Academia
    c. *Action*: Frequently update/populate Work Plan or Project Implementation Plan, review reports, engage stakeholders and market/communicate impact via media.
    d. *Tools*: -

6. Recommendations and Way Forward

To begin the strategy implementation, it is highly recommended that the relevant internal processes and protocols are followed. Acceptance and adoption within the Environment and Agriculture Management Department as well as Office of the Speaker, amongst other departments, is absolutely imperative. It will refine roles and responsibilities beyond the Waste Management Division. To achieve this, below are key actions required from Departments (roles):

- Human Settlements: Continue to coordinate the city-wide settlement mapping programme (in all its facets), convene the Informal Settlement Incremental Upgrading linkage with existing or future plans, maintain an Informal Settlement database, work closely with all relevant line departments, lead and coordinate pipeline planning including prioritisation model for differentiated pipeline.

- City Planning: Finalisation and implementation of incremental planning arrangements in consultation with the Waste Management Division.

- Waste Management: Assistance via participation in Working Group processes in terms of optimised solid waste solutions; pilot implementation of optimised solid waste collection approach, assist in evaluation of it and potential upscaling and rollout.

- Legal: Assist with partnership framework implementation, as well as the 'Adopt a Spot' Programme.

- All service Departments to: Share data with Waste Management in real time relating to services provided, budget spent state of repair of services etc. (Waste Management Division will maintain the Excel database until such time as the Informal Settlement Waste Collection & Minimisation is fully operational).

- Coordinate and share annual and medium-term budgets and ensure these are in line with the City-wide Strategy and Pipeline Prioritisation.

7. Reference List

This reference list is an addition to various policy and legislative material discussed in the strategy:

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