SOLID WASTE MINIMISATION INFRASTRUCTURE:



A SOLUTION TO INFORMAL SETTLEMENT SOLID WASTE MANAGEMENT

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1. Introduction

Municipalities' conventional solid waste removal models – which rely on waste collection and maintaining landfills – have become unsustainable. For example, in June 2025 the City of Tshwane presented its 2024 assessments of its landfill sites. The city only had four operational landfill sites – two were within 3 years of reaching their end of life, and the other two within 12 and 13 years respectively.[1] In the same year, the City of Johannesburg predicted that without waste minimisation interventions in combination with landfill extensions their landfill sites would reach capacity within 2.5 years.[2]

In informal settlements, high population density, limited vehicle access, and poor infrastructure create additional persistent challenges to conventional refuse removal. As a result, many settlements receive no or irregular solid waste collection services.

While recycling and other waste minimisation efforts reduce the volume of waste sent to landfill sites, these interventions can have an even more significant impact within informal settlements. They present viable economic opportunities as reused, recycled, and composted waste becomes a valuable community resource.

The Asivikelane Initiative was founded in 2020 and is coordinated and led by several grassroots partner organisations spread across South Africa.[3] At its core, Asivikelane aims to improve access to basic services for people living in informal settlements and to build meaningful relationships between these communities, government, and other key stakeholders. Asivikelane convenes multi-stakeholder hubs of informal settlement residents, municipal officials, civil society partners, training colleges, and oversight institutions to tackle service delivery challenges. These hubs are a space for participants to work together to find sustainable solutions to service delivery issues and related budget issues.

The Asivikelane Solid Waste Hub Cluster focuses on waste management in informal settlements and has identified investment in solid waste minimisation infrastructure as a key solution to improving waste management in these areas. This approach draws on waste-minimisation pilots conducted in informal settlements in the municipalities of Cape Town and Tshwane, as well as research commissioned by Asivikelane on local and international infrastructure solutions that have been implemented – or could be implemented – in informal settlements. The pilots explored what residents can and want to do to minimise waste and helped identify the infrastructure needed to support sustainable waste-minimisation practices. Community Facilitators (CFs) working in the Tshwane pilots reviewed the research recommendations and, drawing on their field experience and community priorities, identified the most suitable infrastructure solutions. Targeted government investment in this infrastructure designed to address the issues identified by residents would be essential for the long-term success of waste minimisation in informal settlements.

[1] https://static.pmg.org.za/250513_City_of_Tshwane_Presentation.pdf

[2] https://pmg.org.za/files/250513DFFE_Parliament_Portfolio_Comittee_13_MAY_2025.pptx

[3] https://asivikelane.org/

2. The proposed model

At its core, the proposed model is a modular, containerised Waste Management Compound – a cluster of integrated infrastructure elements that together address the full waste minimisation cycle, from source separation through to recycling, upcycling, and composting. The model consists of five core elements and one optional element.

1. Buy-back centre	A facility where residents bring sorted recyclables to exchange for cash, based on the volume or weight of the material. A buy-back centre (BBC) makes waste separation personally and immediately beneficial to the resident. It also generates sustainable income for the community-based operators who manage it. Existing BBCs demonstrate that these facilities can operate out of brick-and-mortar buildings, static container-based set-ups or mobile units (such as trailers that rotate among different areas).
2. Swap shop	A dedicated space where residents can exchange recyclables for essential household goods and food items. The recyclables are either exchanged directly for goods, redeemed for vouchers or converted into points saved toward larger purchases. Swap shops broaden the incentive base and make participation accessible to residents and their children who may prefer essential goods over cash. These swap shops have been piloted across several South African municipalities by various stakeholders. Like buy-back centres, they offer design flexibility and can be housed in brick-and-mortar buildings, shipping containers or mobile units.
3. Waste storage area	Ideally, the model should include a structured area where recyclable waste collected by the swap shop and buy-back centre can be safely and temporarily stored before being collected by the private recycling industry.
4. Sorting area	Such an area can either be integrated into the waste storage space or set up as a separate zone with clearly marked recycling bins. Residents have identified a lack of space to sort recyclables as one of the key obstacles to their recycling efforts.
5. Composting site	An organic waste diversion facility, converting food and garden waste into compost for use in community food gardens or for sale. This component draws directly from lessons learnt in composting pilots across seven settlements in Tshwane, where residents rehabilitated dumpsites into food gardens using compost produced from diverted organic waste. Given considerations such as odour and pest management, it is advisable to locate the composting site within walking distance of the settlement but slightly separated from the main compound.
6. Upcycling workshop (optional)	A creative and productive space where non-recyclable or low-value waste materials are converted into marketable products. This component adds an income-generating dimension that links waste management directly to local economic development. Community Facilitators in Tshwane have already started upcycling their waste, with some residents making brooms from recycled plastic bottles.

3. Conclusion

Informal settlement residents and municipalities can choose to implement all the components outlined above or start with one or two if land availability and resources are limited. With the exception of the composting site, the infrastructure for these components can vary from temporary units (e.g., shipping containers) to permanent brick-and-mortar structures, with buy-back centres and swap shops even operating from mobile units. Producer Responsibility Organisations (PROs) can support these initiatives by contributing resources and infrastructure. We also recognise that these interventions can come with their own public financial management challenges including financing, procurement and auditing.

Ultimately, solid waste management in informal settlements will only succeed if municipalities enable minimisation efforts through investment in appropriate infrastructure, with or without the support of other stakeholders. And this must be coupled with dependable municipal collection of non-recyclable waste.