



Workers load plastic waste in to bags at Kara, Ibafo, in Nigeria. The sprawling neighbouring Lagos megacity of 20 million people produces between 13,000 and 15,000 tons of waste per day. (Photo by PIUS UTOMI EKPEI/AFP via Getty Images)

## Creating cleaner cities: Sustainable strategies for urban waste management

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Rapid urbanisation and increased waste generation pose a challenge for solid waste management systems worldwide. As cities grow, municipalities must invest in sustainable, cost-effective waste management solutions, adapted to local contexts, to divert waste away from landfills, encourage compliance, and engage non-governmental actors in building cleaner, healthier, and more resilient urban environments.

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city budgets.

Over the next 30 years, urbanisation and development are expected to lead to a 70% increase in the volume of global waste. Additionally, waste composition is changing, with less biodegradable refuse and more chemical components, which in turn raises waste treatment costs. To tackle this evolving issue, municipalities need to invest in solid waste management (SWM) – understanding the underlying economics can help cities restructure their SWM systems and optimise municipal expenditures.

## Designing an effective waste management system

Municipalities can improve the efficiency of their SWM systems by adapting them to citizens' needs, neighbourhood design, and municipal capacity.

**Centralised models** involve municipalities collecting all city waste and disposing of it at a common location, such as landfills or incineration plants. While this model requires high administrative capacity and investment in collection, segregation, and transportation, it is less dependent on citizen engagement, reducing user error in the SWM process.

**Decentralised models** encourage communities to manage waste locally by raising awareness and creating common disposal points. They require less municipal financing, but rely on citizens' understanding and compliance with standards. Decentralised models are best suited to the disposal of organic or reusable materials – such as through neighbourhood composting hubs – where community effort can substitute for municipal spending.

Transport choices are critical in both models. Large trucks are suited to planned areas with wide roads, while smaller carts or tricycles are often the only viable option for dense informal settlements. Hybrid fleets – small vehicles that feed transfer stations and larger trucks that haul consolidated loads – can lower costs and extend service.

## Who contributes to managing solid waste?

To successfully manage increasing waste volumes, cities need to consider how to incorporate non-government actors – including private companies, the public, and the informal sector – in municipal SWM.

**Private companies** are frequently contracted to assist in waste collection and transportation services, allowing cities to outsource these processes. In Dar es Salaam, Tanzania, collection coverage increased from about 10% in 1994 to around 40% by 2001 after private actors were engaged. Some cities also form public-private partnerships, contracting out project finance, design, construction, or operation to private partners for a fixed period.

**Citizens** can also be 'providers' of SWM – this could be by managing their own waste in decentralised systems or preparing it for centralised disposal. However, without community leadership and clear guidelines, individuals often resort to the easiest solution: illegal dumping or burning. As such, cities should consider how to support households to participate positively in waste management. Accessible services and awareness campaigns can improve collection efficiency, as in Quelimane, Mozambique, where providing public information on blocked drains and flooding reduced solid waste in sewage canals by 8-15%.

The **informal sector** also provides key services. Unregistered and unregulated waste collection provides livelihoods for workers outside traditional labour markets, who collect and sell refuse, diverting waste from landfills. Informal workers often operate in neighbourhoods where public services are inadequate or inaccessible, such as informal settlements or lower-income areas. Informal workers are often highly stigmatised despite providing essential services in areas that formal systems are unable to reach. Cities such as Bogota, Colombia, Belo Horizonte, Brazil, and Pune, India, have incorporated waste pickers into municipal programmes, achieving wider coverage, higher recycling rates, and improved safety and income for workers at low fiscal cost.

## Ensuring compliance through punishments and incentives

To encourage participation, cities need both incentives and enforceable penalties. One method is imposing **finances or sanctions**. Rwanda's nationwide ban on single-use plastic bags combined high sanctions with affordable alternatives and public education, earning Kigali the nickname "cleanest city in Africa" and demonstrating how fines and visible enforcement discourage poor practices.

Cities can also promote **voluntary compliance** through education, signage, and behavioural nudges. Larger bins for recyclables and reminders of environmental impact can help communities, as was the case in the Lake Victoria crescent, Uganda.

A mix of appropriate penalties and improving public SWM knowledge can also be a powerful combination for cleaner cities.

## How can cities pay for waste management services?

Finally, cities must also consider how to pay for this essential system. SWM is a capital-intensive service that requires high operational spending, and is often the single largest budget item for municipalities. Many cities struggle to find cost recovery opportunities for SWM – studying financing mechanisms can help identify ways to recoup costs.

For example, cities can use **household charges**, such as property taxes or flat user charges, with standard payments for waste management. In Mandalay, Myanmar, for example, garbage collection is billed as a separate line item alongside building and street lighting fees, increasing citizens' awareness of the service. In Maputo, Mozambique, a waste tax attached to electricity bills (covering about 90% of households, with higher rates for higher-consuming households) raised cost recovery from below 40% to 62% within six years. These methods are easy to implement; however, if all households pay the same fees, it removes the incentive to reduce waste.

In contrast, **pay-as-you-throw** (PAYT) policies provide financial benefits for generating less waste, but are more challenging to enforce. Bo City in Sierra Leone introduced door-to-door collection with youth groups and a PAYT-style price list, while Bayawan in the Philippines uses pre-paid stickers for inorganic waste bags – both showing higher willingness to pay and less dumping. Proportional methods allow households to pay their fair share, but cities must be prepared to structure this model effectively. They can also levy **landfill taxes or gate fees** on collectors or transporters, encouraging waste reduction.

For all of these financing options, cities must tailor fee structures to their local contexts. Costs must be economically feasible for citizens, encourage some form of waste reduction, and align with both local and national environmental priorities.

## Planning for the future of waste

With urbanisation and changing waste streams, cities must prepare their SWM infrastructure for higher volumes and complexity by strengthening systems and investing in institutions compatible with local norms.

To learn more about policy options for improved solid waste management, please refer to the Cities that Work flagship synthesis paper, published as part of UN-Habitat's Urban October.

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