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## Assessing waste management services in Kigali



- In brief:**
- Kigali's rapid population and economic growth over the last two decades has meant a steady increase in the amount of Municipal solid waste.
  - Despite laudable efforts by the city to deal with issues related to waste management, it is unclear whether the waste collection system will be able to simultaneously increase service quality and deal with future waste generation.
  - This study examines the waste management in Kigali using a "systems view," with the aim of better understanding and addressing bottlenecks and potential issues in waste generation, waste collection, waste disposal, and waste beneficiation.
  - The findings of this study suggest that Kigali City is facing key shortcomings in a number of areas including: discrepancies in the number of households actually receiving waste collection services; issues with the way the current landfill is being managed; and hurdles to move from a linearly managed waste system to a circular economy, with a robust market for beneficiation.
  - The authors' analysis suggests that the system can be strengthened by elevating the institutional prominence of Solid Waste Management and developing a comprehensive Integrated Waste Management Plan.

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## Overview of the research

Rwanda is a rapidly urbanising country experiencing major economic transformations, and Kigali is a focal point for many of these changes. Rwanda's urban population more than doubled since 2002, while economically, the country has experienced a record of strong economic growth, with almost all additional GDP growth being generated in Kigali.

A major consequence of Kigali's population and economic growth is ever increasing volumes of Municipal solid waste. While there are no definitive estimates of the amount of waste generated across the city, various studies completed over the last 8 years have shown a steady increase in the amount of waste generated in the city, increasing from around 400 tons per day to 1,000 tons per day. Waste characterisation studies indicate that the majority of waste has consistently remained organic.

Over the last decade, Rwanda has recognised poor solid waste management practices as a key impediment to sustainable development. This is reflected in SWM targets at the national and city level. However, keeping up with demand for waste collection services and preventing environmental pollution is becoming increasingly problematic.

This study takes a mixed-methods approach to understand how the waste management system operates in Kigali. Waste system related information was collected from various sources including national household surveys (most notably EICV 2016-2017 and the Census 2012), internal reports and publicly available research, as well as interviews and data provided by stakeholders who form part of the city's SWM system. Broadly, our work consisted of:

- Desk-research of existing legal frameworks, policies, and research documents.
- Waste flow modeling using national survey data.
- Primary research using key informant interviews with waste collection companies, recycling companies, and government institutions including the City of Kigali, REMA, RURA, and Sector officials.

## Policy motivation for research

The sustainable management of waste is critical for the sustainable development of Kigali for a number of reasons:

- Firstly, a well-managed solid waste management system is critical to a safe and clean urban habitat for residents. Solid waste management services form one of the four key urban services, in addition to provision of safe drinking water, electricity, and improved sanitation.
- Secondly, effectively dealing with solid waste management is critical in preventing environmental degradation.
- Thirdly, moving from waste management to resource management (through beneficiation) will reduce waste and stimulate the green economy.
- Finally, if Kigali is to continue as an example for well-managed urbanisation on the continent, deficiencies in solid waste management ought to be a key priority.

## Policy impact

The study identifies key bottlenecks in the Kigali Waste Management System and the ways in which suboptimal institutional arrangements, a lack of coordination and data sharing, and the absence of a

long-term plan has contributed to deficiencies. We derive several key recommendations from these findings.

## Findings

Key research questions	Summary of key findings
What is the institutional and legal structure of solid waste management in Kigali and how are national level initiatives implemented at the city level?	Overall, waste management in the city is fragmented with activities being regulated by organisations that deal with the environment, utilities regulation, water and sanitation, and local governance. In terms of implementation, the city of Kigali plays a central role in delivering waste management services. However, the central role of the city of Kigali is not reflective of its resources or coordination capacity to deliver new strategies and projects.
What estimates does the city have for the amount and type of waste that is generated, and how is this likely to change over time?	Few quantitative assessments of the total amount of waste generated exist but reputable sources put it between 500-1,000 tons per day. The composition of the waste generated in Kigali shows that organics dominate (~70%). When accounting for population growth and changing economic profiles, it is possible that waste generation rates could double over the next ten years, from approximately 1,000 tons being generated per day to approximately 2,000 tons per day by 2030.
What proportion of households have access to solid waste management services and how has that changed over time?	Estimates of households with access to waste management services are generally low despite previous research highlighting the contrary. Estimates from EICV5 put the proportion of households that report access to waste management services in Kigali at approximately 49% (65% in urban areas). Estimates from the Census data indicate that the proportion of households that have access to waste collection services increased by 34 percentage points between 2002 and 2012.
What are the key shortcomings at the landfill site and how might they be addressed?	The Nduba landfill can be characterised as an open-air dumping site. The Nduba landfill faces a number of environmental problems including leachate, vermin, and spontaneous combustions. The city ought to devise a phased landfill operation to closure plan.
How are waste management finances currently handled, and what is Kigali's estimated amount of cost-recovery?	The city has allocated 2.55% and 2.16% of its total operating budget in the 2018/19 and 2019/20 financial years, respectively, to solid waste management. Compared to international benchmarks, these allocations are likely smaller than necessary to manage a sustainable system. The budget for landfill management in 2018/2019 is RWF 316 million, translating to a unit cost of RWF 2,484 per ton. This is approximately \$2.70 per ton, which when benchmarked against international costs, is insufficient to cover basic activities involved in the operation of a sanitary landfill. Finally, estimates indicate that the city recovers only 23.3% of budgeted landfill costs and 12.3% of actual costs incurred.

## Policy recommendations

Our recommendations for improving Kigali's waste management system are divided into long-term and short-term initiatives.

### Short term

- **Improvements in the collection and aggregation of data across the current waste management system.** A number of short term interventions that could significantly improve data collection, while also allowing for analytics to better undertake long-term strategic planning, would include: collecting data from waste collection companies such as the current number of trucks and total tonnage of each truck, the number of trips to landfill, and the total number of households services per sector; developing standard reporting templates and a central data store that Sector officials report into; installing a weighbridge at the landfill to log all vehicles; and commissioning a topographical survey of the landfill, which could be done by aerial survey, to facilitate operations to closure planning.
- **More effectively structure SWM at the City of Kigali by increasing capacity and adding technical skills.** Such a structure would effectively allocate responsibility along three functional lines: operations, (capital and engineering) projects, and waste minimisation. A senior manager with skills in strategy development, technical leadership, and operations should lead the three individuals accountable for these service lines.
- **Improving management of the Nduba Landfill.** In the short term, it is critical that the city prepares a landfill management turnaround plan to address operational deficiencies, installs groundwater monitoring infrastructure, develops a monitoring plan, and identifies new areas in which to develop sanitary landfill cells.

### Long term

- **Developing a waste strategy and implementation plan for improved waste management.** A coherent plan is essential to ensure the waste management system is improved in the long-term. Usually referred to as an integrated waste management plan (IWMP), this type of approach evaluates the whole system and recommends strategies and interventions that balance competing demands to ensure an optimal solution for waste management.
- **Elevating the prominence of waste management by developing a clearer waste management policy and responsive institutional structure.** Current waste management arrangements in Kigali are spread across a variety of different ministries and institutions, all of which follow waste management regulations that only form a small portion of their overall mandate. While the system is currently working, fragmented, unfocused, and potentially incoherent waste management legislation can have serious consequences for the effective management of waste.