

# Uganda's Jinja City Waste Data Management Goes Digital: How the DataCities' SafiSiti Platform is poised to change the status quo

By *Johnstone Baguma & Kellen Kanyunyuzi*

## 1. Introduction

This article presents part of interventions (in Urban Waste Management) undertaken by the DataCities Consortium ([ToroDev](#), [Sunbird AI](#) and [UN Global Pulse](#)), to contribute to the building of practical and resilient data systems in Uganda's emerging cities, since 2023. The piloting of these interventions is currently underway in cities of Jinja and Fort Portal, in the eastern and western regions of the country, respectively. Here, we introduce the SafiSiti Waste Management Data System that is an initiative and artifact aimed at supporting the generation of data and processing it to support routine and complex city decisions, planning, budgeting and policymaking processes for a cleaner and smarter Jinja City. The genesis of the SafiSiti originates from the baselining and co-creation activities between DataCities team and city authority between 2023 and 2025. Ultimately, SafiSiti is expected to support the city's vision of transitioning into an industrial and tourism city in Uganda.

## 2. Background to Urban Waste Management Phenomenon

Globally, urban waste generation is rising at an unprecedented rate. The United Nations Environment Programme (UNEP) projects that municipal solid waste could increase from approximately 2.1 billion tonnes in 2023 to nearly 3.8 billion tonnes by 2050, if current patterns of consumption and urbanization continue (Lenkiewicz et al., 2024). Across Africa, rapid urban growth, infrastructure deficits, and limited municipal financing mean that a significant proportion of about 70% of waste remains uncollected or openly dumped, with serious implications for flooding, pollution, climate emissions, and public health (UNEP, 2018; Kaza et al., 2018).

In Uganda, national assessments and policy analyses including the [National Environment Act, 2019](#) (NEMA, 2026) and solid waste management guidance and [regulations 2020](#), highlight persistent systemic gaps in urban waste management and policy analyses highlight similar systemic gaps including low recycling rates, inadequate engineered landfills, and overstretched facilities such as the Kiteezi Landfill in Kampala, reflecting the difficulty urban authorities face in keeping pace with population growth and expanding commercial activity.

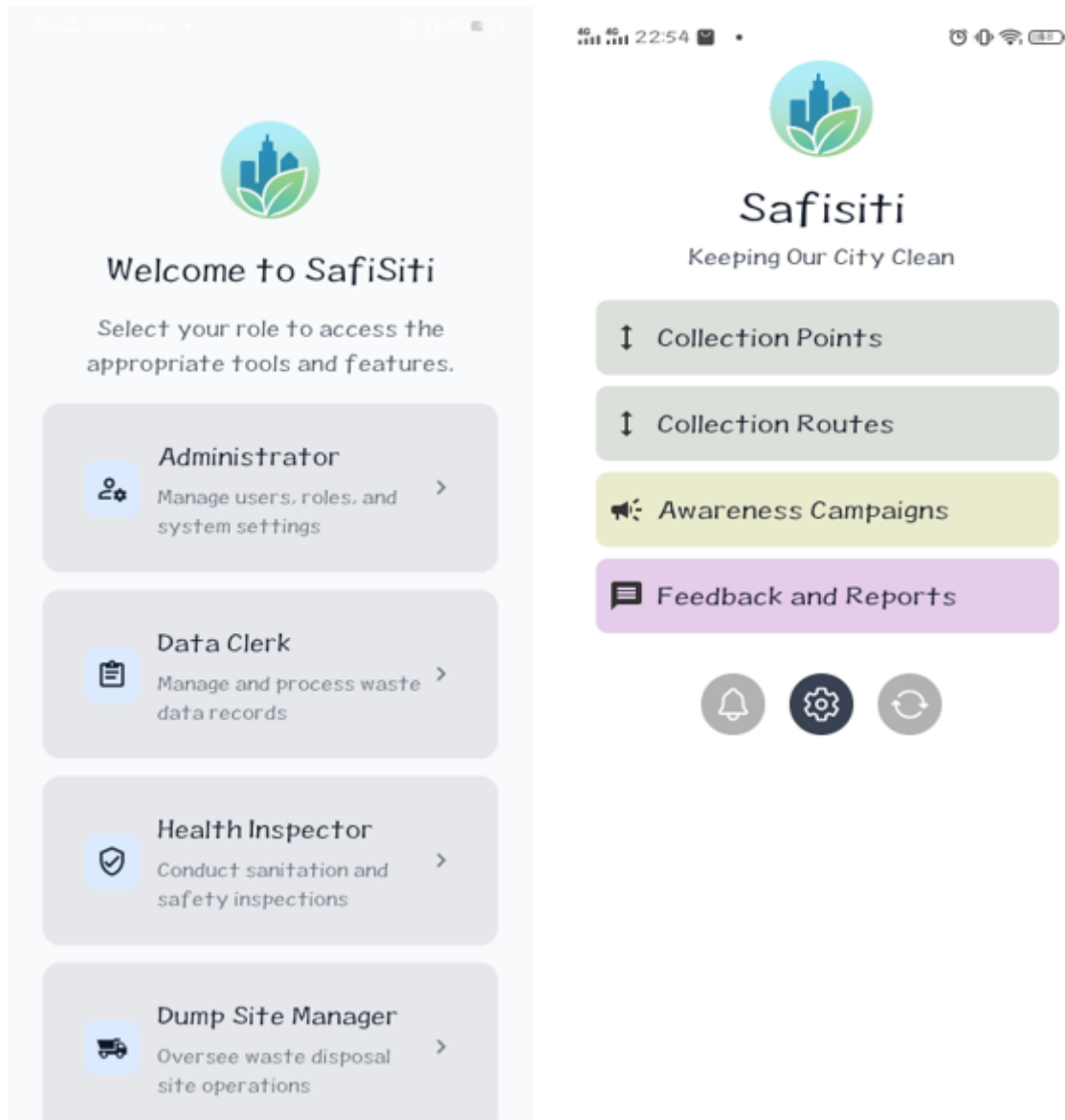
Within the above broader context and reflecting on the earlier [study](#) and development of key performance indicators ([KPIs](#)) by the DataCities Initiative (Kanyunyuzi et al., 2024), Jinja City mirrors both continental and national trends, rising daily waste volumes, limited segregation at

source, financing constraints, and the need for stronger coordination between the city and private service providers. With support from the DataCities initiative on urban waste management through the SafiSiti Platform, Jinja City is working to address these challenges by strengthening urban waste data governance, improving waste tracking and service monitoring systems, and promoting evidence-informed planning. This positions the city as an emerging example of how emerging cities in Uganda and Africa can transition from reactive urban waste management toward more sustainable, data-driven and urban waste management systems.

### **3. How the DataCities Program is Building a Practical Data Use Case to Change the above Urban Waste Management Status Quo**

Several streets of Jinja City are currently witnessing a decisive shift in how urban waste management services are delivered. As the city grows into a modern tourism and industrial destination in Uganda, so does the volume and complexity of the waste generated by its households, visitors markets, investors in manufacturing and SME businesses. For years, managing this flow relied on paper-based reporting, an off-head experience of city public health inspectors supplemented by a manual paper-based system (Kanyunyuzi et al., 2024). The foregoing made it difficult for the city to verify efficient service delivery, measure waste volume accurately, disaggregate it and plan for the urban future like safe waste disposal and recycling using reliable data and data analytics. .

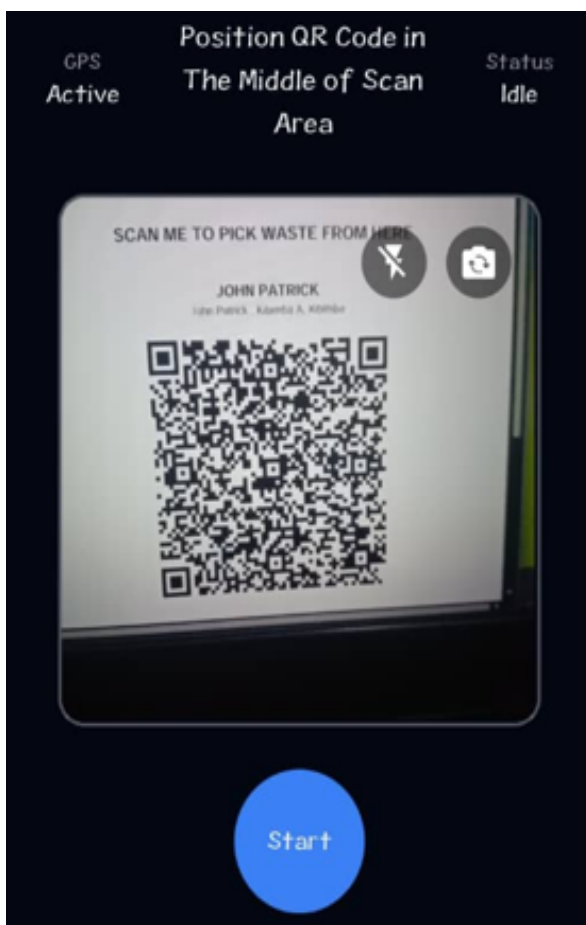
Today, that era of “guess estimation” is steadily being eliminated into data-enabled forecasting, disaggregation and evidence-informed routine decision and policymaking, as Jinja, in partnership with DataCities programme, lays the foundation for data-driven urban public health governance through the new SafiSiti Waste Management Data System.



*Above: Some interfaces of the SafiSiti Waste Management Data System*

This transformation, technically implemented by [ToroDev-ODA](#) with the supervision of Jinja City Authority, is a core part of the DataCities Phase II (2025–2027) initiative. The journey toward digital waste management in Jinja City began with a structured waste collection points’ registration exercise in the Nalufenya and Central East wards in November and December 2025. Working side-by-side with Village Health Teams (VHTs) of Uganda’s Ministry of Health and City Health Inspectors, we trained data collectors, mapped and geo-referenced 1,496 waste collection points in the city so far. By categorizing every household and business, the city is creating its first-ever structured digital waste database for these pilot areas, finally answering the critical questions of who generates waste, what type of waste and where they are located.

At the heart of the new waste management data system is a unique QR code assigned to each registered location or waste collection point. These codes act as digital links to securely protected household profiles, which waste service providers now scan during collection. Each scan generates a time-stamped record that feeds directly into a centralized administrative dashboard, providing a level of oversight that was previously unimaginable. With 95% of these QR codes successfully activated in the pilot wards of Jinja City, waste digital tracking is now live across the pilot wards. Even at the city dumpsite, deliveries are being recorded digitally, building a promising foundation for strengthening the accountability of the entire waste value chain from the doorstep to the final disposal and recycling destination.



Recognizing that digital technology is only as good as the people who use it, the transition includes intensive orientations/sensitization and technical training for a wide range of city stakeholders. From Health Inspectors and Waste Service Providers to the Dumpsite Manager, the City IT Officer and the City Statistician, the team is now equipped to manage the data system. By establishing administrator accounts for the Data Quality Assurance Team members, the DataCities programme partnership ensures that Jinja City maintains full “ownership and control over its waste data” - a key urban data

governance component. This is more than a simple digital technology rollout; it is a fundamental shift in how waste management services are monitored, verified and governed..

The early potential of SafiSiti is already visible; collection events are verified at the waste collection points, responsible city officials can now monitor waste service delivery performance in real-time, using evidence rather than periodic paper reports to drive their decisions. The pilot is expected to prove that digital systems can thrive within a government authority/agency when co-designed with the users.

#### **4. Existing Challenges affecting the SafiSiti Waste Data Management System**

Nevertheless, the journey has also highlighted important lessons and challenges for the future. In a dynamic growing urban environment, waste generator data must be continuously updated to account for new residences/tenants, SME businesses and large-scale manufacturing enterprises. A significant remaining gap is the absence of a physical weighbridge at the dumpsite; while the city can track when waste is collected, it still needs accurate weight data for better infrastructure planning and revenue forecasting. Furthermore, the city should aim at integrating the informal recycling actors into the waste management system (Yoshida, 2025). It should also create a database and develop clear terms of reference and MOUs, since they are key players in the waste management value chain and also get a complete picture of how much waste is being recycled.

As Jinja City moves forward, the focus shifts towards making this digital data tool a permanent citywide standard of managing waste service delivery. Priority is being given to formalizing Memoranda of Understanding (MoUs) with service providers to embed SafiSiti into their standard operating procedures. With a goal of expanding coverage to additional wards and continuing to invest in digital tools, Jinja can shift from reactive waste management to proactive, evidence-informed waste management service delivery. The building blocks are in place, setting a powerful model for data-driven city waste management across Uganda.

#### **5. Evidence Informed Policy Outcomes for Jinja City's Urban Waste Management Supported by the SafiSiti System**

A defining strength of the SafiSiti Waste Management Data System is that it goes beyond digitizing operations to drive tangible policy and institutional reforms (Yoshida, 2025). The platform has catalyzed the formalization of public-private partnerships (PPPs) for urban waste management between city authorities and licensed waste service providers. Through structured Memoranda of Understanding (MoUs) drafted before the City Clerk, the Technical Planning Committee (TPC) and the City Executive Committee, roles and responsibilities are clearly defined, data-sharing obligations

are formalized, and performance standards are linked to digital data reporting. This ensures that service providers are no longer operating under informal arrangements, but within transparent, accountable, and measurable contractual frameworks with the city authority of Jinja.

At the regulatory level still, SafiSiti Waste Management Data System is expected to review and strengthen the city waste management ordinance in Jinja with evidence. By integrating this digital data monitoring tool into local waste management regulations, enforcement is expected to become practical and evidence-informed. Inspectors can verify compliance through real-time reporting, illegal dumping hotspots can be mapped and documented, and non-compliance can be addressed using verifiable data. This alignment between technology and regulation strengthens the legal foundation of urban environmental management in Jinja City, while improving transparency and consistency in enforcement.

This SafiSiti digital platform will also contribute to the testing and validation of the institutionalization of Urban Data Governance by Use Case Approach within city administration. Clear protocols are established regarding data ownership, access rights, privacy safeguards, and reporting standards within the PPP MoUs, contracts and the ordinances. By defining how waste-related data is collected, stored, and used, emerging cities can transition from fragmented data systems to structured, reliable datasets that can inform routine, complex urban decision and policymaking (Suyeno et al., 2025). Further, this strengthens oversight functions within city council and technical planning committees and ensures that waste management data supports broader urban planning objectives.

Perhaps most significantly, SafiSiti Waste Management Data System enables evidence-informed budgeting and planning for environmental conservation and cleanliness of Jinja City as a key tourist destination in Uganda.. With real-time data on registered households, service coverage, collection frequency, and operational performance, the city authority can allocate collection trucks, personnel, and financial resources based on verified waste management service demand rather than random estimates. Underserved areas in the city can be identified and prioritized, while operational inefficiencies can be addressed proactively (Yoshida, 2025; Suyeno et al., 2025). This marks a shift from reactive urban waste management to strategic, data-driven urban governance. By embedding digital systems into policy frameworks, contractual agreements, budgeting and planning processes, SafiSiti is on a journey of transforming urban waste management from a routine council service into a structured governance function grounded in accountability, transparency, and measurable outcomes.

## 6. References

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