SOLID WASTE INFORMATION MANAGEMENT SYSTEM (SWIMS) FOR LOCAL GOVERNMENTS IN UGANDA

AN INTEGRATED TOOL FOR BASELINE DATA AND CONCURRENT MONITORING

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Maps in this report are indicative and not to scale.

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1. Background

Generation of urban solid waste is estimated to be increased by as much as 300 per cent in Sub-Saharan Africa (SSA) from 174 million tonnes in 2016, to 522 million tonnes by 2050. About 70 per cent of the current generated waste is dumped in the open or mismanaged otherwise; hence this region is witnessing a burgeoning waste management crisis that is leading to irreversible environmental damage, as well as proving to be a serious economic challenge. The escalating challenge is often manifesting as overflowing dumpsites, polluted waterways, and public health hazards. The poor state of solid waste management is not attributable to a single cause, but is rather the product of a complex interplay of systemic failures. Among these, weak local governance, critical infrastructure deficits, and most fundamentally—a crippling absence of reliable data, form a vicious cycle that impedes effective planning and sustainable solutions.

Local governments are often the primary point of breakdown. Many municipal governments in SSA are severely under-resourced and lack the technical capacity, institutional frameworks, and political will to manage waste effectively. Responsibilities are frequently fragmented across different agencies with overlapping mandates, leading to a lack of accountability and coordination. Furthermore, rapid urbanisation has drastically outpaced the planning and budgetary capacities of city authorities. As a result, municipal waste collection services are often irregular and fail to cover entire cities, particularly sprawling informal settlements. This governance failure creates a vacuum where unregulated private actors and informal waste pickers become de facto managers of the waste stream, operating without formal recognition, protection, or integration into a city-wide system.

Compounding the governance crisis is a severe deficit in infrastructure. The SWM value chain—from collection and transportation to processing and final disposal—is broken at nearly every stage. Many cities rely on outdated and insufficient vehicle fleets for collection, leading to low coverage rates. The World Bank estimates that while over 40 per cent of waste in SSA is organic, less than ten per cent of cities have any form of composting or organic processing facility. The end of the chain is most alarming; the vast majority of collected waste is dumped in uncontrolled, open landfills. These sites are not engineered with liners or gas collection systems, leading to severe soil contamination, greenhouse gas emissions, and health risks for the communities living around them. The lack of investment in integrated

infrastructure, including recycling and recovery facilities, ensures that waste remains a problem rather than being converted into a resource.

However, the most critical yet often overlooked barrier to credible planning is the pervasive absence of accurate, timely data. Effective waste management requires data on the quantity, composition, generation patterns, and seasonal variations of the waste stream. In most SSA nations, this data is either non-existent, outdated, or wildly inaccurate. Without knowing how much waste is generated, what it is made of, or where it is coming from, authorities cannot design appropriate collection routes, select suitable treatment technologies, calculate necessary budgets, or measure the performance of interventions. For instance, a city might invest in an expensive incinerator only to find the waste is too wet and low in calorific value to burn efficiently, a mistake that could have been avoided with basic compositional data. The data gap also extends to the informal sector, whose significant contribution to recycling and recovery is largely unquantified, making their economic and environmental impact invisible to policymakers.

The poor state of solid waste management in Sub-Saharan Africa is a multifaceted crisis. Weak and under-resourced local governance structures fail to provide effective services or regulation. This is exacerbated by a critical lack of modern, integrated infrastructure for collection, processing, and disposal. Ultimately, these failures are perpetuated by a fundamental information gap; the absence of reliable data paralyses evidence-based decision-making and strategic investment, trapping cities in a cycle of reactive and inefficient management. Addressing this triad of challenges requires a coordinated approach that prioritises strengthening local institutions, investing in appropriate infrastructure, and most urgently, building robust data collection and monitoring systems to illuminate the path toward sustainable waste management.

2. Introduction

Solid waste management (SWM) is a critical component of sustainable urban development. As cities grow in population and expand economically, the generation of municipal solid waste increases significantly. If not managed properly, waste poses severe risks to public health, the environment, and the overall quality of urban life. Effective solid waste management goes beyond collection and disposal—it involves a systematic approach to waste segregation, recycling, treatment, and safe disposal, while also promoting resource recovery and circular economy principles. A key challenge faced by many cities, particularly in developing regions, is the lack of reliable and timely data on waste generation, collection, transportation, processing, and disposal. Without accurate data, it becomes difficult for city authorities to plan infrastructure, allocate budgets, monitor progress, and evaluate the effectiveness of policies and interventions. Data-driven decision-making allows urban local bodies (ULBs) to identify gaps, optimise resources, and implement solutions that are both environmentally sound and economically viable.

Purpose of the Solid Waste Information Management System (SWIMS)

This SWIMS is designed to capacitate local, regional, and national governments in Uganda to collect consistent and reliable information on how solid waste is generated, collected, and managed in their jurisdiction. The focus is on municipal solid waste, which includes waste from households, small businesses, markets, and all institutions.

The database will also provide a baseline to help local governments assess their status of waste management, identify service gaps and areas to improve, thus giving them an opportunity to take informed decision on planning, budgeting, infrastructure, human resource, etc. In addition, the proposed system will be critical in concurrent monitoring, assessing quality of service, and reporting performance data to other administrative verticals in the urban local governance for critical policy decisions.

Who should use SWIMS?

- Ministries, departments and agencies (MDAs)
- Elected representative in LGs
- Technical officers in LGs
- City Environment officer
- Community leaders
- Private sector and CSO actors

How to use it

- Answer only what is known or observable. If exact data is not available, use estimates.
- Please provide rationale if estimates are used.
- Use simple language. Short notes are helpful.
- If you do not have the data, leave it blank. It is more useful to acknowledge gaps than fill in incorrect assumptions.
- The city/municipality/town council profile needs to be filled only once.
- The solid waste management value chain information needs to be filled up at recurring intervals and depends upon the discretion of the enumerator and stakeholders.

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3. Urban Local Governments (ULGs) Profile

This section captures baseline information about the geographical, demographic, and socio-economic characteristics of the urban local governments (city councils/municipal councils/town councils). It provides context for understanding waste generation and management needs by documenting factors such as population size, density, key economic activities, and the distribution of residential, commercial, and institutional establishments. Accurate profiling helps in tailoring waste management strategies to the unique characteristics of a city/municipality/town council.

Table 1: General information

Category	Response	Instructions/Notes
Name of the ULGs		Name of the local government
Type of urban local government		City/Municipality/Town Council
Region		Specify region name
District(s)		List all applicable districts
Ward(s)		Total number of wards under the local government
Area in square kilometres		Total area
Main economic activity		Farming, business, industry, tourism, other (please specify)

Table 2: Demographics

Category	Response	Instruction/Notes
Current resident population		Number
Seasonal/Transient/Floating population		Number (commuters, visitors, non-residents)
Estimated population density		Number (person per square kilometre)
Total number of households		Number
COMMERCIAL ESTABLISHMENTS		
Markets		Approximate number
Shopping complexes		Approximate number
Hotels/Restaurants		Approximate number

Category	Response	Instruction/Notes
Informal businesses		Approximate number (scrap dealers, mechanics, etc.)
INSTITUTIONAL ESTABLISHMENTS		
Educational institutions		Number
Government establishments		Number
Private sector offices/ Establishments		Number
Hospitals and health clinics		Number
Places of worship		Churches, mosques, temples, if they generate waste Number
Any other institutional category (specify)		Mention details

Table 3: Ward-wise information

Ward number	Ward name	Population

*Add rows as needed

Ward number	Total number of households	Total number of commercial establishments	Total number of institutional establishments

4. Solid Waste Management Value Chain Information

4.1 Waste generation overview and municipal bye-law

This section quantifies the volume, composition, and sources of municipal solid waste in the city. It records the percentage of biodegradable, non-biodegradable, plastic, hazardous, and special waste streams, along with estimates of uncollected waste. It also documents relevant national and local policies, regulations, and by-laws that guide waste management practices, including segregation mandates, plastic bans, and Extended Producer Responsibility (EPR) provisions. This forms the evidence base for policy alignment and service planning.

Table 4: Waste generation data

S. no.	Details	Response	Instructions/Notes
MUNICIPAL SOLID WASTE GENERATION			
1	Estimated total waste generated per day (in tonnes)		Number (If not quantified, then: estimated population × per capita generation rate) (Refer to Annexure 1 for calculation)
2	Estimated percentage of waste that is biodegradable (food, garden, etc.)		Percentage
3	Estimated percentage of non-biodegradable waste (plastic, paper, metal, etc.)		Percentage
4	Estimated per cent of plastic waste in total waste		Percentage
5	Main type of waste sources in your area	☐ Households ☐ Markets ☐ Institutions ☐ Street vendors ☐ Industries ☐ Schools ☐ Healthcare	Tick all that apply
GENERATION OF OTHER WASTE			
1	Estimated quantity of healthcare/medical waste (separate if known)		Number (in tonne) Include from clinics, hospitals, etc.
2	Estimated quantity of e-waste generated (electronic goods, small appliances, etc.)		Number (in tonne) Consider all sources of generation such as households, commercial, institution etc.
3	Estimated quantity of construction/demolition waste (if relevant)		Number (in tonne) Consider all sources of generation such as households, commercial institution, etc.
4	Estimated quantity of domestic hazardous waste (if relevant)		Number (in tonne) Add details

Note: • Dry waste constitutes all non-biodegradable waste, i.e. plastics, paper, glass, metals, etc.
•   Biodegradable waste constitutes all biodegradable waste, i.e. food waste, horticulture waste, etc.
•   General and recyclable waste can fall under both categories.

Table 5: Municipal bye-law

S. no.	Details	Response	Instructions/Notes
1	Does your local government have solid waste management bye-law?		If yes, mention title and year of notification
2	Does the bye-law/existing regulations mandate the following: • Segregation/Source separation • Collection • Processing • Scientific disposal • User fees/Refuse collection charges • Penal provision for underperformance • Incentives/rewards to best performance • Plastic/SUP ban • Informal waste picker inclusion • Waste management by commercial/businesses	☐ Segregation/Source separation ☐ Collection ☐ Processing ☐ Scientific disposal ☐ User fees/Refuse collection charges ☐ Plastic/SUP ban ☐ Waste management by commercial/businesses	Select only if bye law is notified

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4.2 Segregation, collection, and transportation

This section examines the extent of source segregation of waste at households, businesses, and institutions, including categories applied (e.g., wet/dry, plastic, e-waste). It captures data on the coverage, frequency, and efficiency of collection services, formal and informal service providers, and community compliance. Transportation aspects include the type, capacity, and suitability of vehicles, presence of GPS tracking, and challenges such as infrastructure gaps. Together, these indicators assess the operational efficiency of waste movement from source to processing and disposal.

Table 6: Segregation, collection, and transportation

S. no.	Details	Response	Instructions/Notes
1	What is the current percentage of source separation in the city?		Approximate percentage If not calculated, refer to Annexure 2 for calculation
2	Specify the categories of segregation	☐ Biodegradable ☐ Non-biodegradable ☐ Plastic ☐ E-waste ☐ Hazardous ☐ Other	Tick all that apply
WASTE COLLECTION			
1	What is the current coverage of waste collection?		Percentage
2	What percentage of sources are covered by waste collection services?	☐ Municipality ☐ Private company ☐ NGO/CBO ☐ Informal waste workers ☐ Mixed arrangement	
3	How frequently is waste collected in most areas?		Daily/Every alternative days/Weekly/Other
4	Is there any formal agreement with CBOs, private firms, or informal groups on waste handling?		Yes/No
5	Is there a waste collection schedule and route planning?		Yes/No
6	Are there open dumps or informal collection points in your city/municipality/ town council ("waste hot-spots")?		Yes/No/Don't know
7	Are community bins or containers provided by the city?		Yes/No/Some areas only
8	How many frontline workers are involved in collection and street sweeping?		Number Workers including municipality, private, company, NGO, CBO, and informal waste workers

S. no.	Details	Response			Instructions/Notes
9	Are there major staff shortages affecting waste collection?				Yes/No/sometimes
WASTE TRANSPORTATION					
1	Who is responsible for transportation of waste?	☐ Municipality ☐ Private company ☐ Informal ☐ Shared			
2	Type and number of vehicles used for waste transportation	Type	Number	Capacity	
		Tractor-trailers			
		Compactor			
		Dumper placer			
		Tippers truck			
		Others (specify)			
3	Are vehicles designed to carry segregated waste separately?				Yes/No
4	If vehicles are designed to carry segregated waste separately, how many compartments are there in the vehicle?	☐ 2 compartments (biodegradable and non-biodegradable) ☐ 3 compartments (biodegradable, non-biodegradable, and others)			
5	Do waste vehicles have GPS tracking?				Yes/No/Some vehicles
6	Average number of trips made per day to dumpsite/processing location	Type	Trip /Day		
		Tractor-trailers			
		Compactor			
		Dumper placer			
		Tippers truck			
		Others (specify)			
7	What are the major constraints or challenges for transportation of waste?	☐ Shortage of waste collection and transport vehicles ☐ Frequent breakdown of existing trucks due to poor maintenance ☐ Lack of funding for fuel, repairs, and fleet expansion ☐ Unpaved or damaged roads making waste transport difficult ☐ Lack of designated transfer stations to reduce travel time ☐ Irregular collection schedules leading to waste accumulation ☐ Limited trained manpower for operating and maintaining transportation systems			
8	What is the distance of the dumpsite from the city?				Number in kilometres

Note: Centralised systems involve collecting waste at a central location for processing; decentralised systems focus on managing waste closer to its source, often at the community or household level.
Segregation or separation should at least be in two fractions—wet and dry waste.

4.3 Processing and treatment of waste

This section records the infrastructure, capacity, and operational status of facilities for composting, recycling, sorting, and other recovery methods. It also documents informal sector participation in waste recovery, market-specific waste management practices, and the utilisation of treatment products such as compost or biogas. This provides insights into the city's waste diversion rate and its contribution to circular economy goals.

Table 7: Processing and treatment of waste

S. no.	Details	Response			Instructions/Notes
1	Who is responsible for processing of city's waste?	☐ Municipality ☐ Private firm ☐ Informal ☐ Shared			
2	What percentage of the city's collected wet waste undergoes processing?				Percentage
3	What percentage of the city's collected dry waste undergoes processing?				Percentage
4	What are the types of waste treatment facilities in your city?	Facility type	Capacity (in tonne)	Actual processing (in tonne)	
		☐ Composting (home or community or centralised)			
		☐ Sorting or Material Recovery Facility (MRF)			(Tick all that apply)
		☐ Recycling			
		☐ BSF			
		☐ Others			
5	Are there any local groups doing composting?	☐ NGOs ☐ Farmers ☐ Women's groups ☐ Others			Tick as applicable
6	Is the end product of composting/biogas/BSF being utilised in any form?	☐ Sold to farmers ☐ Used in parks and gardens ☐ Land improvement/Soil rehab ☐ Given free ☐ Larvae used as animal feed ☐ Cooking fuel ☐ Electricity generation			Tick as applicable
7	Are there any private recyclers, scrap dealers, or sorting centres operating in the city?				Yes/No

S. no.	Details	Response	Instructions/Notes
8	If there any private recyclers, scrap dealers, or sorting centres operating in the city, what is the quantum of plastics waste channelised to the recyclers by them?		Number in tonnes
9	Estimated percentage of waste that is collected but remains untreated and dumped		Percentage

4.4 Plastic waste management

This section examines the scale, pathways, and management of plastic waste in the city. It collects data on the share of plastics in the waste stream, their recovery by formal and informal systems, and leakage into the environment. Focus is placed on identifying hotspots such as markets, open dumps, and stormwater drains, and on recording measures like drain nets, dustbins near nallas, and cleaning practices. The insights help track land-to-sea leakage and guide actions to reduce marine litter.

Table 8: Plastic waste management

S. no.	Details	Response	Instructions/Notes
1	What is the total quantity of plastics in the municipal waste stream?		Number in tonnes Include all plastic
2	How much of the collected plastic waste is formally managed (by municipality/ private firms) and informally recovered (waste pickers, recyclers)?		Percentage Formal and Informal
3	Are there significant "plastic leakage hotspots" in the city (e.g., open dumps, markets, drains, bus stations)?		Yes/No
4	Does plastic leakage through storm water drains or waterways contribute to clogging?		Yes/No
5	What measures are taken to intercept plastic leakage in your city?	☐ Nets installed in drains ☐ Plastic intercepted at drains/outfalls ☐ Dustbins placed near nalas/drains ☐ Regular drain cleaning ☐ Other (please specify)	Tick all that apply
6	Are there any city-level initiatives or programmes to reduce plastic leakage and marine litter (e.g., plastic ban, awareness campaigns, clean-up drives, recycling partnerships)?		Yes/No

4.5 Disposal and remediation

This section assesses final disposal practices, which includes the location, size, condition, and management of dumpsites or landfills. It examines environmental safeguards (e.g., fencing, leachate management, daily cover), health and safety concerns, and presence of informal waste pickers at disposal sites. It also includes actions taken to remediate or close legacy waste dumps through biomining, bio-capping, or other methods, and records any external technical or financial support received.

Table 9: Disposal and remediation

S. no.	Details	Response	Instructions/Notes
1	Is there a designated dumpsite/landfill used by the city?		Yes/No
2	What is total area of the site?		In acres or hectares
3	What is the current status of the site?	☐ Active use ☐ Almost full ☐ No longer used ☐ Other	
4	Is the site fenced or secured?		Yes/No/Partially
5	Is fresh waste currently being dumped at the site?		Yes/No/Sometimes
6	Does the site receive only municipal waste or mixed with other types?	☐ Municipal waste ☐ Medical ☐ Industrial ☐ Hazardous ☐ C&D	Tick all that apply
7	Are there informal waste pickers working at the site?		Yes/No
8	Does the site have access roads and is it usable during rainy season?		Yes/No/Partially
9	Is there any leachate collection or drainage system in place?		Yes/No/Not applicable
10	Are open fires or burning observed at the dumpsite?		Frequently/Occasionally/Rarely/Never
11	Any recorded health complaints or community concerns near the site?		Yes/No/Not tracked
12	Any recorded accidents, injuries, or fatalities at the site in the past 12 months?		Yes/No
13	If there have been recorded accidents, injuries, or fatalities at the site in the past 12 months, what measures the city has taken after observing the accident?		Brief detail

S. no.	Details	Response	Instructions/Notes
LEGACY WASTE REMEDIATION			
1	Is there an old/abandoned dumpsite present?		Yes/No/Don't know
2	What is the quantum legacy waste (in tonne)?		Number
3	Has the city taken any steps to rehabilitate or remediate the site?		Yes/No/Planned
4	If yes, what method is being used or will be used?	☐ Bio-capping ☐ Biomining ☐ Both ☐ Not sure	
5	Has the city received any external support (government, donor, NGO) for this?		Yes/No/Awaiting support

4.6 Stakeholder engagement

This section captures the city's efforts to involve and communicate with residents, businesses, and institutions on waste management issues. It documents public awareness campaigns, outreach methods, target audiences, and whether these initiatives have influenced behavior. It also records the roles of municipal bodies, NGOs, community groups, and private sector actors in promoting better waste practices.

Table 10: Stakeholder engagement

S. no.	Details	Response	Instructions/Notes
1	Has the city conducted any awareness campaigns related to solid waste in the last two years?		Yes/No/Not sure
2	If the city conducted any awareness campaigns related to solid waste in the last two years, what was the main message or goal?	☐ Segregation ☐ Reduce littering ☐ Home composting ☐ User fees ☐ General cleanliness ☐ Preventing waste burning ☐ Preventing usage of single-use plastic	
3	What methods were used to reach people?	☐ Door-to-door campaign ☐ Radio ☐ Community meetings ☐ Posters/Flyers ☐ School outreach ☐ Social media	
4	Who conducted the awareness campaign?	☐ Municipality ☐ Private firm ☐ NGO ☐ Community leaders ☐ Joint effort	
5	Do outreach and campaign led to a change of behavior in people?		Yes/Partially/No/ Cannot be assessed

4.7 Monitoring, operational and, institutional mechanism

This section evaluates the governance framework for SWM, including whether there is a dedicated waste management unit, clarity of roles, regular review meetings, complaint redress systems, and performance tracking mechanisms. It also records operational resources such as staffing levels, training, standard operating procedures, and provision of protective equipment. This will help in identifying institutional strengths and capacity gaps.

Table 11: Monitoring, operational, and institutional mechanism

Sl. No	Details	Response	Instructions/Notes
1	Is there a dedicated SWM department or unit in the municipality?		Yes/No
2	Are roles and responsibilities for waste management clearly defined?		Yes/No/Partially
3	Are these staff sufficient for the city's needs?		Yes/No/Severe shortages
4	Does the city conduct review meetings for solid waste management?		Yes/No
5	If the city conducts review meetings for solid waste management, how often does it happen?	☐ Weekly ☐ Monthly ☐ Quarterly ☐ Annually ☐ Irregular	
6	Does the municipality generate any reports or summaries followed by meeting?		Yes/No
7	Are reports on waste management shared with higher authorities?		Yes/No
8	Is there a helpline, WhatsApp number, or grievance system for SWM?		Yes/No
9	Are grievances documented?		Yes/No
10	Are measures taken based on the report?		Yes/No
11	Number of grievances received in last six months?		Number
12	Number of grievances resolved in last six months?		Number
13	What are the main complaints people raise about waste management?	☐ Irregular collection ☐ No collection at all ☐ Open dumping of waste ☐ Burning of waste	
14	Has staff involved in SWM received any training in the last two years?		Yes/No (Technical, behavioral, health and safety, etc.)
15	Do sanitation workers use attendance tracking systems (manual registers, fingerprint, etc.)?		Yes/No/Not consistently

4.8 Financial tracking of MSWM

This section documents the costs and revenues associated with municipal waste management, including expenditure on collection, transportation, processing, and disposal. It captures income from user fees, sale of recyclables or compost, and notes whether SWM finances are tracked separately. This enables financial planning, cost recovery analysis, and identification of funding gaps.

Table 12: Financial tracking of MSWM

S. no.	Details	Response	Instructions/Notes
1	What is the average annual budget for solid waste management (SWM) of your city/municipality/ town council?		Number (Fill amount in local currency (UGX))
2	What is the annual fund allocation /disbursement for solid waste management (SWM) of your city/ municipality/town council?		Number (Fill amount in local currency (UGX))
3	What is the annual expenditure on SWM?		Number (Fill amount in local currency (UGX))
4	Does the city collect user fees or charges?		Yes/No
5	If the city collects user fees or charges , who collect the user charge?	☐ Municipality ☐ Private company ☐ NGO/CBO ☐ Informal waste workers ☐ Mixed arrangement	
6	What is the revenue collected annually from user fees in last year?		Number (Fill amount in local currency (UGX))
7	Are there any revenues from sale of compost, recyclables, or scrap?		Yes/No
8	What is the revenue from sale of compost, recyclables, or scrap in last year?		Number (Fill amount in local currency (UGX))

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4.9 Inclusion of informal waste picker

This section recognises the role of informal workers in the waste value chain. It records their numbers, areas of operation, level of organisation, access rights, and any municipal recognition or support (e.g., ID cards, health services, exclusive collection zones). It also notes efforts to integrate them into formal systems and safeguard their welfare, contributing to an inclusive and socially just waste management.

Table 13: Informal waste picker inclusion

S. no.	Details	Response	Instructions/Notes
1	Are there informal waste pickers operating in your city/town?		Yes/No
2	Where do they typically work?	☐ Dumpsite ☐ Street bins ☐ Markets ☐ House-to-house ☐ Scrap shops	Tick all that apply
3	Approximate number of informal waste pickers active in your jurisdiction		Number
4	Are there waste buyer shops, junk dealers, or aggregators operating locally?		Yes/No
5	Are any informal groups organised into cooperatives or associations?		Yes/No
6	Has the municipality formally recognised informal waste pickers in any way?		Yes/No (For example, through ID cards, MoUs, permits, recognition letters, etc.)
7	Number of informal waste pickers municipality formally recognised in your jurisdiction		Number
8	Are any waste pickers linked to the municipal collection or sorting system?		Yes/No
9	Have any dialogues, consultations, or meetings been held with waste pickers or their groups?		Yes/No/Planned
10	Do they receive any health checkups, PPE (gloves, boots), or vaccinations?		Yes/No

4.10 Good practices

This section highlights innovative, effective, or replicable initiatives implemented in the last three years that have improved waste management outcomes. It records the initiative's scope, leadership, methods, impacts, and sustainability, as well as any recognition or plans for scale-up. Showcasing such practices helps inspire replication and guides resource allocation toward proven interventions.

Table 14: Good practices

S. no.	Details	Response	Instructions/Notes
1	Has your city/municipality/town council implemented any new or effective waste initiative in the past three years?		Yes/No
2	What is the initiative or intervention about?	☐ Segregation ☐ Biodegradable waste management ☐ Non-biodegradable waste management ☐ Single-use plastic ban ☐ Technological solution ☐ Dumpsite remediation ☐ Awareness ☐ Informal sector support ☐ Any others	
3	Who led or initiated it?	☐ Municipality ☐ NGO/CBO ☐ School ☐ Community ☐ Donor-funded project ☐ Joint effort	
4	What changes were observed as a result of the initiative?	☐ Visual cleanliness ☐ Improved source separation ☐ Composting ☐ Improved community participation ☐ Land reclamation ☐ Other	Tick all that apply
5	What is the current status of initiative?	☐ Active ☐ Completed ☐ Not continued ☐ Scaled up	
6	Any external recognition received for this work?		Yes/No (Examples include, award, media coverage, district mention, donor interest, etc.)

5. Rolling out of SWIMS

1. SETTING UP AN INSTITUTIONAL MECHANISM AT THE NATIONAL LEVEL

In order to create an inventory of all the local governments, it is critical to set up an institutional mechanism, or a committee headed by a senior nodal officer at the Ministry of Local Government/NEMA. The committee or the nodal officer should be tasked with coordinating with all the local governments through the regional/provincial administration, wherever applicable.

2. SETTING UP A DEADLINE

To ensure timely rolling out of SWIMS by all the local governments at the same time, it is critical to fix a deadline and communicate it to all the local governments and regional administrations, as deemed necessary. The national nodal institution should monitor the progress on the ground for needful intervention. A period of two to three months would be adequate to complete rolling out of the SWIMS and generate a centralised data inventory, including profile of the LGs.

3. COLLECTION OF DATA AT THE LOCAL GOVERNMENT LEVEL

The task of rolling out of the SWIMS and collecting data should be supervised by a designated nodal officer at every local government level. The nodal officer at the local government will deploy and mobilise necessary enumerators from the office of the LGs and/or the private entities to collect and furnish the required data for SWIMS within the stipulated timeline. The data should be gathered using online systems like a google form, mobile app, etc.

4. BACK-CHECK AND QUALITY AUDIT OF DATA

Before sharing the data with the regional or national governments, the local government should take a look at the collected data for back-check and consistency. Ideally, the administrative head of the local government may be given the responsibility of validating and signing off the data to the regional/national government. This will ensure transparency and accountability of the data which can be used by the government and various institutions for critical decisions in the future.

5. TECHNOLOGY FOR DATA COLLECTION, COMPILATION, AND REPORTING

The scale and complexity of rolling out of the SWIMS calls for the adoption of appropriate technology solutions and online submission of data. The technology must also provide all possible validation tools like date and time stamps, geo-tagging of specific data points, photo and video transfer, auto-compilation, dashboard creation, customised reporting, etc. The technology platform should be able to keep all the stakeholders connected for data collection, validation, and final approval before it is used for report generation and dashboard creation.

6. CAPACITY BUILDING

It is of paramount importance that all the stakeholders involved in rolling out the SWIMS are properly trained to understand all the templates, data collection procedures, validation and back-check for quality audits, concurrent monitoring, and reporting. Centre for Science and Environment (CSE) will provide the necessary capacity building and handholding support to all the stakeholders so that they are able to successfully roll out the SWIMS following the agreed timeline.

7. CUSTOMISATION

The draft SWIMS tool has been prepared following a process of consultation and feedback from the stakeholders. However, local governments and other stakeholders will always have the liberty to make changes in the templates depending on their requirements. CSE will facilitate such changes upon discussion and mutual agreement.

8. PREPARATION OF REPORT BASED ON CITY RANKING AND PROFILING

CSE team will help in analysing the collected data from all the local governments and prepare a comprehensive report and share the same with concerned authorities with specific recommendations for further course corrections and bridging the gaps. The national government may consider the report as a baseline for driving policy revisions, designing and redesigning implementation modalities and institutional arrangement, and continue to use the SWIMS to measures changes.

Annexure 1: Tools and methodologies for waste quantification and characterisation

WHY DO WE NEED WASTE DATA?
- **Waste quantification**: How much waste is generated in a city/town per day.
- **Waste composition**: What the waste is made of (organic, plastic, paper, glass, etc.).
- This information helps:
  - Plan waste collection and transportation.
  - Decide treatment options (composting, recycling, bio-CNG, landfilling).
  - Estimate future infrastructure needs.

1. Waste quantification

Step 1: Weigh waste from collection vehicles
- Use a weighbridge at landfill, transfer station, or processing facility.
- Record for each vehicle:
  - Type of vehicle
  - Number of trips
  - Waste weight per trip
- Formula: Total waste collected = Weight per trip × Number of trips

If no weighbridge is available:
- Measure vehicle volume.
- Multiply by average waste density (400–500 kg/m❖ for mixed waste).

Step 2: Include other waste streams
- Consider waste that is:
  - Dumped in open areas.
  - Picked by informal recyclers (plastics, bottles, scrap).
  - Not collected due to system gaps.

This means total waste generated is usually more than what reaches disposal sites.

Step 3: Sampling for quantification
- For long-term planning, collect samples daily for seven days in each season (dry and wet).
- Cover different waste sources (households, markets, institutions, shops).
- Formula: Per capita generation = Total waste ÷ Population.

2. Waste composition

Step 1: Select representative sampling areas
- Divide the city or town into categories:
  - Households: Low, middle, and high income.
  - Markets: Vegetable, meat, fish, grain, etc.
  - Institutions: Schools, hospitals, offices, etc.
  - Commercial areas: Shops, hotels, restaurants, etc.
  - Others: Places of worship, street sweepings, etc.
- Choose 100 sampling points per 100,000 people (adjust for smaller towns).
- Ensure all income groups and areas are covered.

Step 2: Collect waste samples
- Distribute storage bags/bins to selected households and establishments.
- Ask them to put all daily waste in these bags for three to seven consecutive days.
- Collect the bags each day and weigh immediately.

Step 3: Prepare for analysis
- Mix the daily waste samples together to form a representative pile.
- Use the Quartering and Coning method:
  1. Mix waste into a heap on the ground.
  2. Divide the heap into four equal parts.
  3. Remove two opposite parts and mix the remaining.
  4. Repeat until you get a 10 kilogram sample for analysis.

Step 4: Segregate and weigh waste components

Separate the 10 kilogram sample into categories:
- Organic (food + garden waste)
- Paper and cardboard
- Plastics (rigid, film, etc.)
- Metals
- Glass
- Textiles/rags
- Inerts (soil, sand, ash, stones, ceramics)
- Others (hazardous, electronic, etc.)
- Add more waste type if needed

Weigh each category and record the data.

Step 5: Calculate waste composition
- Formula: Percentage of each waste type = (Weight of that type ÷ Total sample weight) × 100
- Repeat for different areas and average the results.
- Extrapolate to city level using population data.

3. Frequency of study
- Repeat every three to five years.
- Conduct in different seasons (dry, rainy) as waste composition may change.
- Update data for population growth and lifestyle changes.

4. Key points to remember
- Always use protective gear (gloves, boots, masks).
- Record quantity, composition, and moisture of waste.
- Use weighbridges at transfer stations/landfills for total city waste estimates.
- In smaller towns (without weighbridge), estimate using truck volume × waste density (400–500 kg/m✽).

5. Simple reporting format

Waste type	Weight (kg)	Percentage of total waste
Organic		
Paper		
Plastic		
Glass		
Metal		
Textiles/Rags		
Inerts (soil/ash)		
Others		
Total		

Annexure 2: Segregation percentage calculation

A	B	C	D	E	F	G
Ward number	Ward name	Type of area	Total establishment	Total establishment (household + commercial + institution) segregating	Segregation percentage (E/F * 100)	Category (Wet, dry, sanitary and domestic hazardous wastes)
Total						

Notes

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