
WASTE MANAGEMENT STATUS: PROGRAMMES/UNDERTAKINGS AND INNOVATIONS IN LUSAKA



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List of Abbreviations

LCC.....	Lusaka City Council
CBE.....	Community-Based Enterprise
CUDP	Comprehensive Urban Development Plan
KYN.....	Know Your Neighbor
SWM.....	Solid Waste Management
WMU.....	Waste Management Unit
ZEMA.....	Zambia Environmental Management Agency

Executive Summary

As of 2017, the Lusaka City Council (LCC) indicates that the City of Lusaka generates approximately a million tons of waste annually and only about 30-40% of that is collected and taken to the dumpsite. When compared to waste management practices, successes and pitfalls in the region, the City of Lusaka has a waste management crisis. The City has one dumpsite which is basically a damaged site in need of re-engineering and redesign. The dumpsite is the mother of all problems in waste management in Lusaka. Related to this is over reliance on inappropriate technology that does not support efficient service delivery in a city that is largely informal with many areas being inaccessible due to settlement form that has many structures with no direct access by a proper road. Thus, the infrastructure and physical planning challenges are compounding the waste management issue in the city. The report further reveals that another major problem impacting waste management in Lusaka is uncoordinated and poorly organised institutional arrangements dealing with waste management in the city. While the mandate to manage waste falls on Lusaka City, pseudo decentralisation, lack of freedom in the Waste Management Unit at Lusaka City Council and limited ploughing back of revenue from waste management activities, make the local authority hugely limited in capacity and decision-making to fix the problem. The city has the legal and policy mandate but has weak democratic and no pragmatic space to act and deliver adequate services in the waste sector. Further, the report has revealed a low and poorly organised private sector involvement in the waste management sector in Lusaka. The Franchise companies are limited in geographical and demographic coverage of their services while solid waste Community-based Enterprises (CBEs) face all sorts of problems ranging from lack of independence to operate as SMEs, to lack of equipment and poor levels of subscription from the public.

In sum, the report argues that the waste management complexities in Lusaka are driven by city governance and management dynamics that configure ill-informed decision-making and investments to deliver services for the people. The mismatch between policy and actions in dealing with the waste management crisis is more pronounced in informal settlements. The problems are compounded by limited use of ICTs to build a social discourse on waste and allow for dialogue to shape policies, programming and actions to address the crisis.

On a positive note, the report has revealed increasing efforts to innovatively address the waste crisis in Lusaka. The emerging innovations include efforts to create a demand driven waste management efforts by Manja Pamodzi. In cities where waste has been better managed, efforts targeted at creating value for waste and motivating people to engage in waste management

entrepreneurship have proved innovative and ground-breaking. The Manja Pamodzi is a classic example of creating value along all the stages of the waste value chain. In the programme, waste generators know the monetary value of the waste they generate. Aggregators based in communities are connected to waste sources and can easily meet targets to supply waste recycling companies. Waste recycling companies have a reliable source of raw materials to use for production of new materials for both industrial and domestic usage. Efforts still need to be made to recruit more waste generators to join the waste reuse, recycling and recovery efforts. Another ground-breaking innovation in Lusaka is the Know Your Neighbor (KYN) Project where governance gaps and community leadership challenges are being fixed in selected communities in Lusaka. If well-coordinated, the KYN Initiative and the Manja Pamodzi can radically transform the City. However, a coordinated strategy needs to be formulated to facilitate a working relationship between demand and governance aspects of waste management in Lusaka. The Manja Pamodzi Programme is a technical one while the Know Your Neighbor Initiative is a political one. The two need to be integrated to fix the ills facing waste management in the City.

This report argues that waste in African cities is both a political and technical issue and sustainable effort must be two-pronged. The new strategy needs to focus on sensitization on both residents and service providers to promote sustainable waste management practices, a rethink on the dumpsite, and recruitment of more youths to capture value from waste. Waste management by informal actors like scavengers, informal recycling and small-scale compost production from waste can be considered as a specialized activity, thus, integrated in the City's strategy of waste management. The report further indicates that use of Information and Communications Technology (ICTs) can drastically improve engagements between Lusaka City Council and citizens on all aspects of waste management in the City. The report calls for a strategy to anchor the emerging efforts in e-Platforms that facilitate residents' insertion of both responsibilities and voice in the waste management programmes and strategies.

1.0 Introduction

Solid Waste Management (SWM) ranks as one of the most challenging aspect of urban management in African cities as elsewhere in the developing countries. Solid waste in most African countries has emerged as a crisis for state and local governments, and environmental protection agencies. With most African cities rapidly urbanizing, managing waste has become a significant challenge and in need for prioritized action by stakeholders. This report is based on reviewed literature on solid waste management practices, status and innovations in Lusaka. To provide a comparative analysis of waste management status and innovations in the region, a brief review of literature on Lilongwe, Blantyre, Harare and Gaborone has been provided. This report is structured by four main sections. The first section provides literature-based analysis on waste situation in Lusaka. The second section provides summary findings from key stakeholders in the waste management sector in the City of Lusaka. The third section analyses solid waste management status and innovations in the four cities in Southern Africa. The fourth section analyses use and potential for Information and Communication Technologies (ICT) to improve public services in African cities. Finally, a set of critical reflections and recommendations have been provided in the conclusion section. In the following section, the methodology used to come up with this report is described.

2.0 Methodology

This report is based on a case study method and is structured as a comparative case analysis. The materials for this report were generated using two key methodologies namely, literature review and key informant interviews. Literature was reviewed on waste management practices, successes and pitfalls in the City of Lusaka. Further, literature was reviewed on waste management in Lilongwe, Blantyre, Harare and Gaborone. The review focused on factors and lessons that characterize successful and failed approaches in managing waste in the mentioned cities. Literature on use of ICT in service delivery was reviewed to determine the role of ICTs in improving public services.

Key informant interviews were done with the key actors in the waste management sector in Lusaka. These actors included five Departments at Lusaka City Council (LCC), Zambia Environmental Management Authority (ZEMA), Millennium Challenge Account Zambia, Trash Back Zambia, People's Process on Housing and Poverty in Zambia (PPHPZ), 8 CBEs in Kanyama Ward 10, the Know Your Neighbor Initiator and Leader, and a representative from Chapata Water Trusts. The interview data has been integrated with literature-based information to provide an analysis of the status on waste management and innovations in Lusaka. In the following section, the report provides an analysis of waste management policies and practices in Lusaka.

3.0 Dual Policy and Quality of SWM Services in Lusaka

The dual strategy aims to enhance environmental protection and pollution control, promote sustainable waste management practices, protect human health and regulate the use of natural resources. It is based on the National Environmental Action Plan (NEAP) principles of 1994 which are: the right of the citizen to a clean environment, the participation of the local communities and the private sector in national resource management and obligatory Environmental Impact Assessment of major development project in all sectors (ECZ (now ZEMA), 2004). The strategy identifies the importance of increase investment in equipment infrastructure and capacity building for waste management services (Muller, et al., 2017). Findings from personal interviews and observation shows that while the policy sounds progressive, actions to steadily invest in the sector has been limited and most systems and equipment are obsolete. There is no clear mechanism in the City to ensure constituency in building a robust Solid Waste Management Unit (SWM). Thus, the findings allow this report to assert that the policy has not been localized to the City space, hence, implementation remains unactualized. Chibinda (2016) in a study on ‘Municipal Solid Waste in a Circular Economy Perspective: a case study of Lusaka’, found incoherencies between policies and institutional organization, which in part were also explained by waste management policies that mainly focus on the public health dimension of waste management which hinders other aspects to be considered for a closed resource loop system development.

Formal private sector operators collect waste door-to-door or provide skip buckets for larger generators or housing estates in the conversional (planned) areas, while micro-franchising of primary waste collection through contract to community-based enterprises (CBEs). The CBEs do waste management in peri-urban (informal) areas (UN-HABITAT, 2010). Thus, the SWM policy for Lusaka is duo and services differ as such. The formal areas are serviced by formal franchise companies while the informal areas are serviced by small scale CBEs (Siyachiyako, 2016). The legal framework on environmental management (Environmental Management Act No. 12 of 2011) and that which sets the operations of the local authorities (the Local Government Act Cap 281), to a larger extent, have contributed to the scenario that Siyachiyako (2016) puts across. Not only do the two legislations remain emphasized on formal solid waste management methods in an urban environment that is significantly characterized with informality, they are focused on regulatory mechanism. There is little attention on economic value capture out of solid waste.

An important revelation from the reviewed literature and as Muller et al., (2017) also observed, is that informal sector players in solid waste are not included in the mainstream policy and legislative framework and as such they are not recognized as part of the formal municipal waste management

systems. Muller et al., (2017) further indicated that informal waste collectors which are important contributors to the local economy, public health and environmental sustainability, are prevalent in the city of Lusaka, recycling almost as much as the formal sector though still at 3% of the recyclable waste, contributing to a cost saving of nearly 1.5 million euro on waste collection.

3.1 Solid Waste Management in Lusaka City – Trends and patterns

Lusaka is the largest city and is the political and economic capital of Zambia. The city is regarded as one of the fastest growing cities in Sub-Saharan Africa. According to the MasterCard New Growth Index [based on historical data and predictions on variables such as growth in Gross Domestic Product (GDP) per capita, infrastructure development and how easy it is to do business in the cities], Lusaka ranked seventh out of the top 11 African cities within the ‘medium to highest potential of growth’ classification (MasterCard, 2015).

The demographic and geographic expansion of the city has been sustained for decades and these trends are occurring within a framework of low employment opportunities in the formal sector. Thus, street vending and informal markets accommodate often the promising livelihood activity. This has increased the waste accumulation in the city, which worsened the already deteriorating municipal solid waste management capacity internally and externally. A study in 1996, showed that of the 80% of waste generated in Lusaka, 60% came from high density area – mostly unplanned settlements (Majura, 1997). These statistics may also be true for the current situation and possibly higher, with recent estimates indicating that over 60% of the city’s population lives and works informally. Linking the informal entity of the city in a predominantly formal SWM system accounts for the larger part of the external challenges LCC is facing in SWM. Waste management in informal settlements present a myriad of challenges ranging from low subscription levels, lack of infrastructure to allow for easy accessibility, and to sort the waste and package properly before collection by authorities.

Internally, there are operational challenges affecting efficient management of solid waste in the city that range from political influences to institutional incapacities. A senior official at the Waste Management Unit (WMU) at LCC argued during a personal interview that the Unit needs ‘freedom’ to operate and deliver results for the public. Siyachiyako (2016) argues that intra- and inter political party and intergovernmental power struggles, often drawn along lines of political affiliation and survivalist and materialistic affiliations and identities have hindered effective progression of decentralized and profitable waste management operations.

Further, interview data shows that the charges for waste collection by community-based enterprises are very low and are not fixed (Personal Interview, Community Development Officer, Waste Management Unit, Lusaka City Council, 24/05/2018). The charges are subject to change due to political interference especially by Ward Councilors leaving the CBEs very vulnerable and incapacitated. During a personal interview with Community Development Officer, Waste Management Unit, Lusaka City Council, 24/05/2018, she recounted the following:

For instance, in Chipata settlement waste collection is paid through water trusts where an additional charge of K 0.1 is added to the cost of water for CBEs to collect waste everywhere in the community. However, the area councilor has sunk a borehole where he is charging K0.3 for water while the water trust is charging K0.4 per 20 litres of water. So, residents opt to get water from the councilor resulting in financial losses for the CBEs. In addition, when there is a crisis like cholera outbreak, government declares water as free and this means no revenue for CBEs, but community still expects them to collect waste from every household. Then there was a meeting I attended to sensitize people on the dangers of throwing waste into drainages where the councilor and the MP announced that they had bought a tractor and were reducing the price for waste collection. This left CBEs operating in the area shocked as the councilor would be charging K5 per day and K30 per month for waste collection. This again leaves the CBEs without business and vulnerable. They are simply struggling to operate and make profit.”

Efforts by the donor community to build the capacity of community-based SWM system collapsed just after the donors left the system. Community Development Officer Waste Management Unit in the department of Public Health recounted during a personal interview on 24/05/2018 that:

“DANIDA supported the construction of the landfill. The coming on board of various partners including Care International led to the creation of CBEs around 2000 in Lusaka and volunteers received training in waste management. DANINDA also bought 15cubic containers for waste disposal, tractors and hook trucks. After the project ended that’s when things started to change slowly under Lusaka city council. The capacity is now very low, and failure is everywhere.”

These inefficiencies discussed above are a significant constitute of the failures of the SWM system in the City. As of 2017, Lusaka City Council (LCC) indicates that the city of Lusaka generates approximately a million tons of waste annually and only about half of that is collected¹. The city has only one legal dumping site for solid waste, Chunga Dump Site, fondly called the Chunga Landfill, located on the northern part of the city and sits on a 10acre piece of land.

¹Nawa D., 2017. Where does Lusaka’s waste go. Zambia Daily Mail; Published on 15th October 2017. Available at: <https://www.daily-mail.co.zm/where-does-lusaka-waste-go/> (Accessed on 28/04/2018)

“Normally we receive in a busy day between 600tons and slightly above 1000tons on a busy day. But during cholera time we experienced triple that like 18 000 ton to 23 000 tons between January and March”,

(Personal Interview, Foreman at Chunga Landfill, 29/05/2018).

The land fill was built in 2004 and designed to service Lusaka for 25 years (Muller et al., 2017). The site has operational challenges such that waste handling is not effectively done to efficiently use the site. A casing example is the lack of weighing facilities, as was noted by Majura (1997) and confirmed by the visit to the Damp Site on 7th June 2018. The site is equipped with pipes for collecting the methane gas, however, the improper distribution of garbage prevents the methane from being captured properly (Muller et al., 2017). Further, looking at the location of Chunga Dump Site, Majura (1997) observes that the distance from most settlements precludes the use of slow-moving vehicles such as tractors, in the solid waste collection during traffic peak hours. This leave the collection to specialized vehicles which are expensive to acquire and maintain. It is worth pointing out here that strategies on improving network infrastructure such as roads in the city, should be based on comprehensive considerations to provide ease movement of service vehicles of a varied type and kind. The Chunga Dumpsite epitomises everything that has gone wrong with waste management in the City. During the site visit on 29th May 2018 and on 6th June 2018, it was established that the capacity of the Landfill is very low and cannot handle the volume of waste being generated in the city, or the proportion being dumped there daily. The facility has poor access control with some section of the boundary wall fence collapsed, leaving it open to scavengers (see Figure 3.1).



Figure 3.1: Boundary wall of the Chunga Dump Site (Source: CURP, 2017)

It has plenty of dysfunctional equipment such as loaders, weighing machines and access infrastructure is very restrictive (see Figure 3.2 below).



Figure 3.2: Chunga Dump Site waste handling (receiving) area (Source: CURP, 2017)

3.2 Governance framework of waste in Lusaka: institutional framework and delivery

Interview data with from key stakeholders show that it is believed and expected that the task to manage waste in Lusaka is for Lusaka City Council. However, waste management in Zambia is a shared activity among various state agencies, private sector actors and individual households and waste management enterprises. The national government agencies that actively participate in the sector include (as shown in Figure 3.3); the Zambia Environmental Management Agency (ZEMA) which provides the policy and regulatory framework for all actors involved in solid waste management. The Ministry of Water Development, Sanitation and Environmental Protection provides the highest level policy and political framework in SWM activities.



Figure 3.3: Governance framework for Lusaka (Muller et al, 2017:13)

From these national level institutions, the Ministry of Local Government and city/municipal institutions derive their mandate and frameworks for implementation of all activities in solid waste management. Solid Waste Management is a statutory responsibility of the Lusaka City Council which is established under the Local Government Act Cap 281 of the Laws of Zambia. Other waste regulations and mandatory responsibilities are as ascribed by the Environmental Management Act of 2011. Within the ambits of the Environmental Management Act is the Extended Producer Responsibility (EPR) and the National Solid Waste Management Strategy which are with the aim of enhancing effective solid waste management in the country. The environmental regulations are a guiding instrument when designing urban management strategies. They are part of the informants to spatial policies within cities and towns in Zambia.

The Comprehensive Urban Development Plan (CUDP) for the City of Lusaka in line with the two legislations mentioned above give effect to the waste management status and innovations in the City of Lusaka. It was formulated with the technical assistance from the Japanese International Cooperation Agency (JICA). The plan was launched in 2009 and was projected to guide the development of Lusaka City up to 2030. Some of the notable urban development trends identified in the plan were firstly an increase in the Lusaka urban population estimated at 33% in 2007. Currently, urbanization rate for Lusaka City stands at 61.1% (MLGH, 2017). Secondly, a rise in several urban settlements beyond the boundary of Lusaka City. The third was overall urban settlement growth. The settlement growth in planned areas increased from 11% in 2001 to 16% in 2007 while unplanned

settlements increased from 7% to 11% of the overall city region. Appropriate and effective land-use management and control mechanism were some of the primary challenges identified in the plan that the city was facing. This primarily due to a legislative gap in the spatial law that could have enforced urban growth management mechanisms. These mechanisms included SWM, especially the practicalities of implementing solid waste management systems in a sprawling city which is also significantly informal.

Creating institutional strategies that effectively link the communities into the mainstream SWM regimes while recognizing their informal characters still stands a bigger challenge in implementing urban growth management in the CUDP. At LCC Waste Manage Unit at the zone level, the franchise companies and community-based solid waste management firms are required to work according to the national waste management regulations and policies. However, interviews with key stakeholders shows that adherence to these regulations are not fully complied with because Lusaka City Council through its Solid Waste Management Unit faces challenges that include inadequate equipment, inadequate staff and limited finances to ensure effective and undisrupted operations.

3.3 Manifested Solid Waste Crisis in Lusaka: A combination of failures

Given that the mandated lead in managing waste in the City faces major institutional limitations as evidenced by broken down equipment such as trucks, loaders, and lack of fuel, pseudo decentralization, Muller et al (2017:13) estimates that only about “40% of waste is reaching the Chunga dumpsite, 60% is illegally dumped or burnt in people’s backyards”. The percentage of households with regular waste collection in Lusaka stands at 26.3%, creating a waste crisis for the city of Lusaka. This is against the required regulation which demands consistent and predictable waste management services for all in the City. Other challenges impacting adversely on the capacity of LCC to operate according to the national regulations, include insufficient number of appropriate vehicles for waste collection, improper bin collection systems, distances to collection bins, lack of information around collection schedules, unwillingness of users to pay cost-reflective fees for the service, and substandard infrastructure (Guerrero et al., 2013).

These challenges above were echoed by all stakeholders interviewed during the research process. The Senior official at LCC attribute very poor waste management performance in the City to lack of re-investment of the revenue collected from waste management activities, a situation he attributes to excessive external interference in the operation of the Unit (Personal interview, Senior Official, Waste management Unit, Lusaka City Council, 24/05/2018). The resultant effective of a poor service delivery and very low coverage results in ‘hills’ of waste as shown in Figures 3.4 building up in

residential areas especially in informal settlements across the City. Figure 3.5 depicts the challenge of dumping at secondary pits where Community-based enterprises with the support of LCC are expected to collect the waste. The hips of waste in secondary dump sites in informal areas build up presenting another SWM challenge. The presence of these hips of waste across the City gives meaning to what a Senior Official in the Solid Waste Management Unit at LCC words of ‘a solid waste crisis’ in Lusaka (Personal Interview, Senior Official, Waste Management Unit, LCC, 24/05/2018).



Figure 3.4: Illegal dumping of commingled waste in Kalikiliki Settlement (Picture, courtesy of Global Environmental Change Project, UNZA)



Figure 3.5: Secondary dump site in Kalikiliki-Mtendere area of Lusaka (Picture, courtesy of Global Environmental Change Project, UNZA)

The Waste Management Unit at LCC has additional challenges which hinder efforts by various stakeholders to actualize waste recovery and recycling. Most of the waste generated in the informal settlements of the City show a wide range of waste types which are not separated at source. The study by the University of Zambia found that the highest proportion is debris (yard waste in Figures 3.6) which account for over 50% of the total waste generated by households in informal settlements of Kalikiliki and Kanyama Ward 10 areas. Figure 3.7 the waste types in Kalikiliki which is an unplanned settlement in the city of Lusaka.



Figure 3.6: Waste separation activity by UNZA staff (Picture, courtesy of Global Environmental Change Project, UNZA)

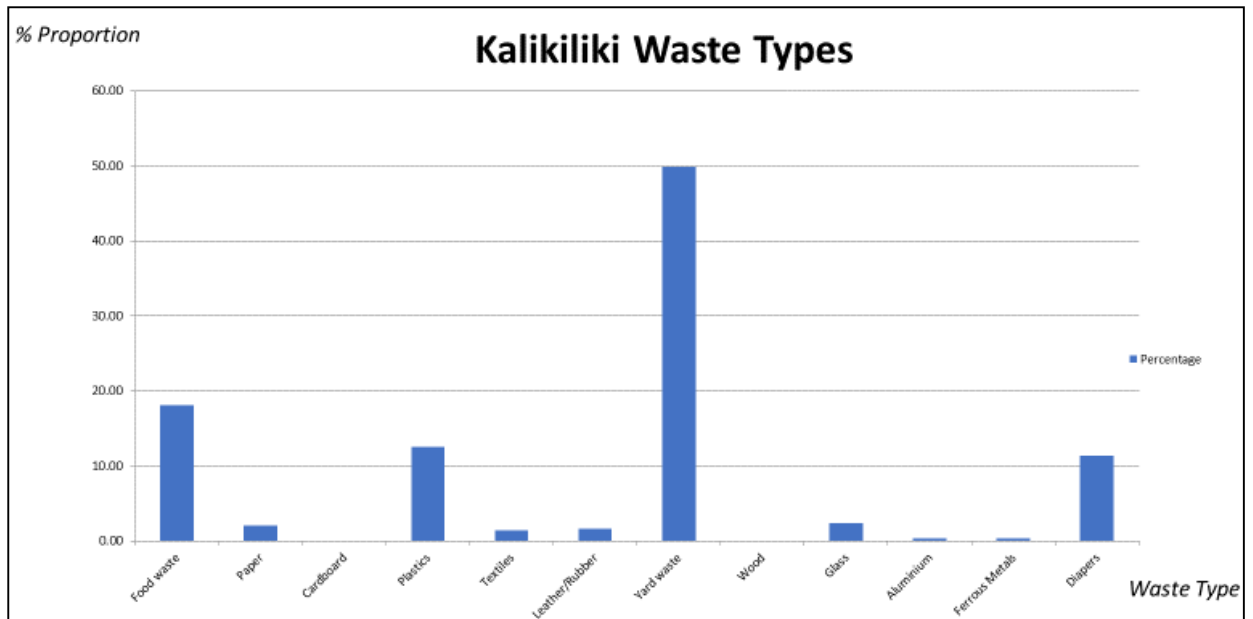


Figure 3.7: Waste generation and types in Kalikiliki settlements in Lusaka (Picture, courtesy of Global Environmental Change Project, UNZA)

Food waste, diapers and plastics constitute increasingly complex challenge for the City. Lack of robust programs to ensure waste separation at source hampers sporadic efforts to reuse and recycle waste in the City. In addition, lack of specialized equipment to transport separated waste for various purposes hampers progress made to promote waste separation and obtain value from trash. Franchise companies and CBEs as well as the LCC face the same challenges with regards to supplicated equipment for transportation of separated waste. Previous studies show that the City lacks use of technology for separating waste or turning waste into a resource and a weak solid waste management policy and enforcement (Babayemi and Dauda, 2009; Zurbrugg, 2003).

Literature-based narratives on Solid Waste Management (SWM) in developing countries struggles with techniques and technology that fits within the Southern city complexities. Oqwueleka (2009) observes that approaches in SWM promoted by development agencies and donors often fail in the developing countries as they involve centralized, undiversified technological and technical systems, which do not distinguish the different needs and heterogeneity that characterize the Southern city. Equipment supplied from global North manufacturers and 'best practices' from the North fail to make sense of complexities and governance dynamics that are typical in Southern cities. The copied systems and technologies being applied in most African cities are not only capital intensive and expensive to maintain but may not be suited for the urban form and characteristics such as road size and the urban informality. Thus, waste separation, waste collection, recycling and recuse seem very problematic and is an economical abyss' in Southern African cities (Van Dijk, 2008). The

inappropriate technology used in the SWM sector in Lusaka is a major factor on the poor service coverage in the sector. Interview data with CBEs shows that to promote waste separation, three things need to happen. The first is an Enhanced sensitization strategy to promote separation at source. Second is the procure equipment to transport separated waste for various purposes and the third is the promotion of waste reuse, recycling and recovery at all stages of waste value chain.

3.4 Failures in governance manifest in up-hazard SWM

It is argued that when solid waste systems fail it is seldom a technical reason but a governance aspect bordering on the politics, economics or institutional frameworks (Wilson et al., 2012). To a larger extent, effectiveness of SWM systems depends on governance strategies that are framed within nuances of the urban process and complexities. These factors are not only affected by the incapacities of municipal authorities to manage waste, but also capacity to effectively become innovative and creative in SWM. For Lusaka, where implementation of the Decentralization Policy is still weak and in infancy stages, it is unlikely that the local authorities have capabilities to independently make decision and policies in solid waste management. The research participants based at LCC lamented the overriding role of political influence in solid waste management systems in Lusaka, limited spaces for independent decision-making on the part of those on the coal-face of waste management crises in the City (Interview, Waste Management Officer, SWM Unit, LCC, 24/05/2018).

Further, the City suffers from interference from central government on many city issues including street vending, charges on waste collection services in informal settlements among others. Wilson et al. (2012) further contend that to have an effective SWM systems, governance strategies must be inclusive by providing transparent spaces for stakeholders to contribute as users, providers and enablers; financially sustainable, and should have a base of sound institutions and pro-active policies. Thus, this study argues that waste management crisis in Lusaka is a function of malfunctional governance framework and decision-making systems and processes. The financial and political risks in SWM in Lusaka are very high. The pricing for waste management services in informal areas is done by CBEs but subject to LCC which is also regulated by central government and the happenings in the political space. The approved rates per month range from anything from K5 to K60 per month. When there is a crisis like the outbreak of cholera in 2017-2018, the CBEs are actually 'commanded' to provide a free service to their communities (Focus Group Discussion, Kanyama Ward 10 CBEs, 28/05/2018). This makes the financial viability of the CBEs very weak, have low capacity to deliver services effectively. After crises, the CBEs are expected by both government (Central and LCC) and

the public to continue providing efficient services to all community members. The interviewed CBEs consider expectation hypocritical and mythical.

Muller et al (2017) reports that for medium-income households, franchise companies charge anything from K60-K90 per month and these are much freer from political interference and the ‘long arm’ of the central government. For High-income households, franchise companies charge anything from K70-K130 while for big businesses and industrial areas, the charges range from K120 to 300 per month. For SMEs and NGOs, the charges range from K90 to K 150. The range of the charges show that it is more profitable and financially attractive to venture into the waste management as franchise operating in formal areas. For informal settlements, the level of subscription is very low, and CBEs struggle with low financial capacity to manage the waste in their jurisdictions. Given that fewer numbers subscribe to the CBEs, it entails that most of the residents of the city do illegal and informal dumping as shown in Figure 3.8. As a result, low levels of success in the SWM in Lusaka, as Figure 3.8 below illustrates, residents of the City resort to use basic forms of waste management such as collection from home, while a majority of the residents depend on illegal ways such as burying, burning and dumping at undesignated sites.

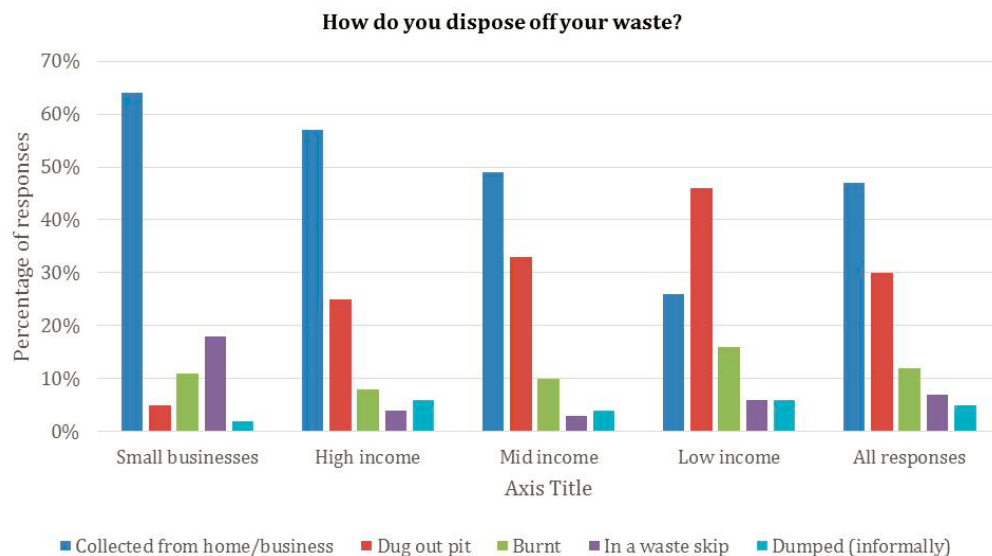


Figure 3.8: Waste management practices in the City of Lusaka (Muller et al, 2017)

Following from these limitation in the formal sector coupled with increasing informality (UN-Habitat, 2014), it is logical to argue that the city has more of burning, burying and illegal dumping than formal collection and sustainable waste management. While the potential for separation is high, practical activities on waste separation are still not widespread in the City.

3.4.1 Emerging innovations in SWM in Lusaka

Lusaka has seen an increasing number of innovations in SWM. The exploration of these innovative methods and approaches is driven by the private sector, non-governmental organizations and the cooperating partners. Two innovations discussed in the subsequent sections i.e., Maja Pamodzi Programme and the Know Your Neighbor Initiative exhibit impressive potential in transforming the waste management situation in the city.

3.4.1.1 In Conversations with Innovators: Manja Pamodzi

On 29th May 2018, the research team spend a ‘day’ with the Manager, **Misheck Simwanza-** of one of the innovative projects of in the waste sector in Lusaka, the Manja Pamodzi Programme.

Lusaka City Council is grappling with the increasing challenge of waste because almost all the waste that is produced in Lusaka is ending up at the land fill. In our programme, the Manja Pamodzi, we have identified an opportunity in recyclable waste so that we empower people. The programme is empowering citizens with opportunities to make a living out of waste while recycling companies have a reliable source of raw materials. The programme is creating entrepreneurship opportunities whereby waste collectors are linked to recycling companies through aggregators. The programme involves the private sector, Millennium Challenge Zambia, Start Up entrepreneurs and waste generators. The programme seeks to build strong connections among the actors along the waste value chain and create value for all involved. In terms of waste recovery, we have seen an increase, in terms of the waste that is being recovered. There been a lot of investment in waste management, we have seen the recycling of plastic bags, recycling of woven sacks, recycling of batteries, as well as metals and are increasingly being recycled. Manja Pamodzi it successful in that it’s bringing in aggregators of waste together and putting value on waste. In the Millennium Challenge Account programme, we have several community-based enterprises, there is several franchises, a number of private companies that have come in support specifically to help Lusaka city council to manage solid waste. We have *Newtech* recycling which is found in garden compound and we have Land N MATRIX are found in industrial area. What we have seen so far is that if people get sensitized, they begin to appreciate that waste is a resource that individuals, households and companies can utilise to fight poverty and create employment, especially for the youth. We have invested in sensitization to ensure that people know the economic value of waste and the importance of appropriate ways of managing waste to promote good health. We have worked with other actors such as Trash Back to involve schools and sensitization the young to create awareness about good waste management practices and refraining from burying, burning and throwing away.

Key challenges impacting the programme include the inability to reach out to all areas of Lusaka so that we can collect as much recyclable waste as possible. Manja Pamodzi is only able to provide opportunities to collect and recycle just about 5 tonnes in a day meaning that over 65 tonnes represent capacity deficit. The other challenge we face in this programme is inadequate transportation equipment. As a local authority, we have offered a 15-tonne truck and two other 15 tonne trucks as donations to aggregators to collect solid, but this is very inadequate given that the daily waste volume that needs to be collected is much more than our transport capacity. Thus, aggregators have to wait, and, in the end, we have many complaints. In addition, there is high levels of lack of awareness on issues of solid waste management and this is impacting waste collection from the communities, especially in informal settlements. Lack of separation at source presents a major challenge to all of us in the industry and efforts. There is need to advocate for mechanisms to create awareness for separation at the source and ensure that franchises and CBEs manage waste in a sustainable way as required by law. Trash Back has advised that introducing ICT would enhance efficiency in terms payment compliance, obtain feedback from customers and stakeholders and ensure massive reach to the public.

3.4.1.2 In Conversations with Innovators: Know Your Neighbor Initiative

On 24th May 2018, I spent a ‘day’ with the Councilor for Kapwepwe ward 25 Councilor Patrick M Salubusa. The objective was to appreciate the efforts being made in his Ward to address solid waste crisis.

“I realized that the problem of solid waste cannot be left in the hands of the local authority alone and required active participation by all stakeholders especially those that throw garbage late at night as the number one stakeholder. The first thing was to identify who throws garbage at night indiscriminately. Then we started the ‘*Know your Neighbour Project*’ and we called it initially as the Kapwepwe Crime Prevention Association. We invited the officer in charge from Matero police Mr. Racheal Moono as the guest of honour. Towards the end of the meeting we created the Kapwepwe Crime Prevention Association with 24 leaders for the 12 zones to have the responsibility to fight crime in Kapwepwe ward 25. Then crime prevention and waste management portfolios were combined because the people who were throwing waste were also seen to be a security threat to the community. We believe we cannot separate improper waste management from crime in our communities. Thus, after a merge of portfolios, we created Kapwepwe Crime and Garbage Prevention Association. Thereafter we said they cannot work without knowing each other. That’s how we came up with the Know Your Neighbour concept. In the Know Your Neighbour Initiative, a maximum of 25 households form a Know Your Neighbour Club. The members of the Committee know each other and interact with one another easily. Thus, leadership on sustainable waste management and crime prevention are at the very local scale. These clubs have their own

Committees and leadership structures. The Know Your Know Neighbour slogan is 'If you see something, say something'. Operations have revealed that most of the garbage throwing culprits were coming from the neighbouring Lima ward and not Kapwepwe ward. We arrested some people who were throwing garbage at Petroda filling station and took them to Lilanda police and this has led to significant behavioural change in nearby communities.

Know your neighbour clubs have one representative who represents them at zone level. From the zone we pick two people who represent the people at ward level. These people act as a link between the ward and the people and between the people and Lusaka city council. At Lusaka City Council we have identified one officer from each department at the Council who are part of Know Your Neighbour Team. We have also identified some entertaining and artistic activities that will help draw people's attention. Twelve ambassadors have been identified per zone comprising eleven musicians and one comedian. Apart from building leadership structures at the local level and use creative activities to attract people attention, every Friday is a mass cleaning day where we identify a space to clean and all our Know Your Neighbour members actively participate in the exercise in the Ward. Our Know Your Neighbour (KYN) members support CBEs to ensure a clean environment. The Know Your Neighbour Clubs are also act as cooperatives for collecting waste. When they perform as cooperatives, the revenue is shared between CBEs and the cooperatives. This has worked well in Disai settlement, the CBEs and the Clubs share the revenue collected from the waste management activities. The tasks are also shared in equal terms based on revenue proportions. The coming of the Know Your Neighbour concept has made it easy for stakeholders to sensitize people in the ward about the importance of subscription for waste collection to the CBEs. Ward Development Committees are very excited with the concept of Know Your Neighbour clubs because it is not only a tool for crime prevention and waste issues but also for good governance concept."

4.0 Innovations in Solid Waste Management in Sub Saharan Africa

The World Bank (2012) estimates that world global production of Municipal Solid Waste (MSW) will be at about 1.3 billion tons per year in 2012 and is predicted to grow to 2.2 billion tons per year by 2025. The Sub-Saharan Africa (SSA) region produces around 62 million tons of waste per year (5% of the global production). Massive and fast accumulation of waste is difficult to handle especially in urban areas of Africa where space is scarce and where municipal services are inadequate (Van Dijk, 2008). For Sub-Saharan African countries, the gap between waste management policy and legislation and actual waste management practices is widening. This has been driven by on-going capacity constraints or non-existence of waste management facilities for different waste streams (UNIDO, 2009). The single largest implementation challenge remains the creation of capacity for environmentally sound management mechanisms for appropriate recovery and recycling of various

waste streams across Africa. In addition, most legislations and by-laws in Sub Saharan African cities, place waste management responsibilities entirely on municipalities which are insufficiently equipped and funded. Thus, there is increasing transfer of waste management responsibilities from it being a state responsibility to be a private sector responsibility with no clear strategy on how to ensure sufficiency in delivery services for all. These arguments expose a significant bottleneck in actualizing innovation in waste management across the region. The challenge with most cities in Africa is lack of effectively institutionalization of actor-involvement in solid waste management with mechanisms that reward the involvement by incentivizing the participation as a motivating strategy. Those that have argued from a sustainable development perspective like Aliu et. al., (2014:68) point out that;

Sustainable municipal solid waste management practices, [...] recognizes provider inclusivity, private sector participation through large number of small and micro service providers, community environmental groups [...]

A major challenge for public authorities is to create policy framework that create an enabling environment for effective participation of other actors such as SMEs in the waste management industry (UN-HABITAT, 2014). However, few cities have attempted to push for innovations to ensure sustainable solid waste management. In the following sections, a review of three cases are presented. It analyses solid waste management practices, successes and pitfalls.

4.1.1 Case Study 1: Lilongwe and Blantyre Cities in Malawi

Malawi has 50.7% of its population living under the national poverty line and is one of the poorest countries in the world (World Bank, 2012). Waste is a problem in urban areas. Public services struggle to collect all the waste produced which leads to inappropriate dumping and sanitary issues (Mkwambisi, 2007). In 2008, there were 13.1 million inhabitants in Malawi, among which 670,000 were living in Lilongwe, the capital located in the center of the country, which has an annual growth rate of 4.3%, while 662,000 people were living in Blantyre, the commercial hub located in the southern part of the country with an annual growth rate of 2.8% (Census, 2008). Like all fast urbanizing cities in the world, Lilongwe and Blantyre are challenged by the accumulation of waste due to the increase of their urban population and the limited resources of their public services. In 2010 the production of MSW in Lilongwe was estimated at 4kg per capita per day. However, the city is only able to collect 30% of this waste (Barré, 2014). Similarly, 300 tons of wastes are produced per day in Blantyre and only 28% is collected by the municipality (Barré, 2014).

4.1.1.1 Waste in urban Malawi- Lilongwe and Blantyre

The population of Lilongwe produces around 95.000 tons of MSW per year and that of Blantyre around 100.000 tons per year. The amount of waste produced and the amount that is uncollected are summarized in Table 4.1.

Table 4.1: Waste production in urban Malawi

	Total production of municipal waste (ton/year)	Amount collected by public services (ton/year)	Remaining uncollected waste (ton/year)
Lilongwe	95.000	28.500	66.500
Blantyre*	100.000	30.000	70.000

According to Takomborerwa (2011), Blantyre city produces 220,000 tons of waste per year and the city collects and transports around 25% of it to the dump sites. In both cities over 66,000 tons of wastes are left in the streets or on market sites. Barré (2014) observed that people burn their waste to avoid waste accumulation and nauseous odours. This common practice is also used by Perez Investment, a company involved in residential waste collection and compost, which “segregates the waste they collect, takes the organic waste to make compost and burns the remaining waste” (Perez Investment Director (PID) interview, March 2013, cited in Barré, 2014).

4.1.1.2 Waste businesses and innovations in urban Malawi

There are four main types of waste which are commonly converted, reused and/or marketed in urban Malawi: organic waste (i.e. food waste from restaurants, leaves, maize brand, vegetables peels), plastic (i.e. all plastic except fully printed plastic bags, rubber and condoms), glass bottles (i.e. beer bottles, soda bottles) and paper (see Table 4.2). The recycling and re-using of plastic bottles and capsules of beer for art occurs in some areas of Lilongwe. Paper recycling business does exist with fabrication of briquettes being one of the end products. However, the market is for such products is underdeveloped and is very small.

Table 4.2: Wastes in urban Malawi; source, conversion and actors

Waste	Conversion process	Actors	Main waste sources
Organic (food, plants...)	Processed into compost	Private sector (small and large scale companies) CBOs	Gardening activity, market waste, restaurants, residential waste
Plastic	Recycled into plastic new items	Plastic industries (large scale companies) Waste pickers	Plastic industries buy waste from waste pickers who collect plastic in the streets and/or dump sites
Glass bottle	Re-used	Drink companies (large scale companies) Bars	Small deposit on every bottle. Money is given back when bars or individuals returns the bottles
Paper	Recycled into briquettes or into toilet paper	CBO Private companies	Office paper, books

Source: Barré (2014)

One unique feature and innovation in both Lilongwe and Blantyre is the active involvement of non-state actors in the SWM business and value chain (See Table 4.3 and 4.4 below).

Table 4.3: Waste process activity; starting point

Stakeholders	Activity	Starting date
Four Seasons Nursery	Gardening company, compost production, purchase and selling	The gardening activity started in 1995 and produces compost for itself, but has started to purchase and sell compost since 2009
Mtandire CBO	Compost production and selling	2009
Perez investment	Waste collecting and compost production	2012
New ID investment	Waste collecting	2012
AYASE	NGO involved in compost production and selling	The project started in 2011 and was stopped in 2013
Shore Rubber	Plastic industry, recycling plastic	Started recycling in 2009
Plastico Industry	Plastic industry, recycling plastic	Started recycling in 2011

Source: Barré (2014)

Table 4.4:Stakeholder involvement in SWM in Urban Malawi

	Skills & knowledge	Organic waste collected in 2012	Compost produced in 2012	Comments
<i>Four seasons Nursery</i> (large scale gardening company)	Expert, aware and trained in compost technology	864 tons	288 tons	Waste collected from gardening activity and own restaurant and coffee shop
CBO Mtandire (52 women in total 14 were present during the interview)	Good skills trained by Bunda College and <i>Four Seasons Nursery</i>	2,500 tons total Or 50 tons per woman	840 tons total Or 17 tons per woman	These numbers are averaged since some women work full time while others only work part time
<i>Perez investment</i>	Poor skills on how to make compost	Unknown	36 tons	Collects waste from residential housing and use the organic part to make compost
NGO: AYASE	Good skills supported by Mzuzu University	Unknown	20 tons*	Produces and sells. Uses part of its production for a demonstration field. At the start, it gave its production for free to create a demand

Source: Barré (2014)

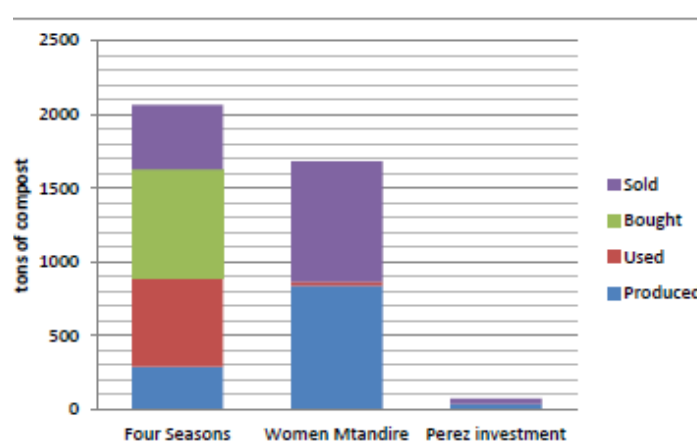


Figure 4.1: Compost production and commercialization in the two cities (Barré, 2014)

Plastic recycling and plastic recovery, unlike compost activity, is only handled by the large-scale companies. Plastic industries obtain plastic by collecting their own waste and by purchasing plastic waste from waste pickers. In this regard the plastic recovery market structure is completely different from that of the market of compost; plastic waste is less abundant (6% or less of the residential waste in poor areas) and is not collected by the companies but by waste pickers. There are two leading companies, one located in Lilongwe (Shore Rubber) and one located in Blantyre (Plastico Industry) (See Table 4.5 below). Both recycle plastic bought from waste pickers and also processed their own plastic waste as of 2012.

Table 4.5: Plastics collected and recycled

	Plastic waste collected in 2012 (tons)	Estimation of plastic used for recycling in 2012 (tons)	Price per kilo of plastic waste
Shore Rubber (Lilongwe)	1,000	500	40 to 80 MK but have stopped for the moment (0.1 to 0.2 USD)
Plastico industry (Blantyre)	1,300	650	220 MK (0.54 USD)

Source: Barré (2014)

Highlighting some facts and trends from characterizing solid waste enterprises in the two cities:

- Few stakeholders predominate the market
- Small scale producers are highly dependent on their customers. It is a demand-driven business
- Fuel is an important factor in the market's regulation
- The CBEs cannot collect organic waste in other areas because they cannot afford the price of fuel for transport.
- Involvement of broad range of stakeholders creates opportunities for innovation, demand driven waste-based entrepreneurship businesses in both cities.

4.2 Case Study 2: Status of Solid Waste Management in Harare

Harare is the capital city of Zimbabwe with a population of about 2 million. Harare City is now facing more rapid population growth, and the implication is an increase in the volume of municipal waste (Engineers, Z. D. B. C. (2014)). The approach to waste management in Harare has been rather fragmentary and reactive – concentrating more on the collection and disposal aspects of waste management.

The municipal government has been facing numerous challenges such as lack of equipment for waste management along the value chain. While at national government level solid waste management is legislated for, the formulation of a national and local strategies to sustainably manage the waste is absent. Thus, efforts for transforming solid waste management operations and practices are not integrated and well-coordinated. Zimbabwe's urban waste collection rates have dropped from at least 80% (mid 90s) to as low as 50% in Harare in the period of post 2010. Harare faces a challenge of historical waste due to failed approaches to waste management over a long period of time (Practical Action Southern Africa, 2006; International Labour Office (ILO), 2007). The Harare City Council's failure to collect refuse in high density suburbs has forced residents to dump rubbish on illegal and informal dumpsites. Areas worst affected are low-income residential areas and informal settlements, with some new developments not receiving services at all.

The low waste collection levels have triggered wide spread illegal open dumping and backyard incineration. This is despite the fact that the Harare City has a grand vision to become a world class city by 2025. Service levels have remained largely the same because major structural challenges such as low staffing levels, policies among others have remained unaddressed. The challenges of waste management are paramount in informal settlements in Harare City.

4.2.1 Categorization of Harare's Wastes

According to the ILO (2007) there are six major classifications of waste generators in Harare. Generally, the waste generated in the city has high proportions of imported non-biodegradable waste such as glass, plastics, metals, paper, and cardboard. Current total quantities of wastes generated from all sources and characteristics of Harare's waste streams are not officially known and data about waste in the City is not available. Information and data on informal settlements is unavailable as most waste generation and management activities have are not documented. Nevertheless, ILO (2007) has attempted to categorize the major six waste types in the city as highlighted in Table 4.6 below.

Table 4.6: The Six Major categories of wastes in Harare, ILO (2007)

Source	Typical waste generators	Types of solid wastes
Household or domestic	Single and multifamily dwellings	Food wastes, paper, cardboard, plastics, cans, yard waste, textiles, leather, wood, glass, and household hazardous wastes etc.
Commercial	Stores, markets, office buildings, restaurants, shops, bars	Packaging and container materials (cardboard and plastics), used office paper, wood shavings, food waste, hazardous waste, electronic-waste etc.
Industrial	Light and heavy manufacturing	Housekeeping wastes, packaging, food waste, demolition materials, slag, mineral tailings, electronic-waste, batteries, pesticides, coolants, lubricants etc.
Institutional	Police camps, barracks, schools, hospitals, prisons	Food wastes, used paper and plastics, used needles, syringes, and gloves, wood, steel, concrete wastes etc.
Street Sweepings/ Municipal services	High density neighbourhoods	Dust/sand, leaves, paper, human and animal excreta, sludge water, electronic-waste etc.
Construction debris	New and old building sites	Wood, brick-stones, concrete, glass and metals.

4.2.2 Waste Collection Practices in Harare

According to a 2010 survey carried out by TARSC, solid waste services in Harare were found to be extremely limited. The Harare City Council suspended door-to-door refuse collection several years ago after the council waste management equipment was grounded. It was reintroduced in 2010 in selected areas of the City, with much of the informal settlements remain without a service in solid waste management. Households in medium and low-density areas pay on average between US\$12 and US\$15 per month, whilst those in high-density areas pay between US\$0.70 and US\$10 per month for refuse collection. As a result, households often use various receptacles to collect solid waste in their houses, most frequently metal/plastic bags, which they empty in an outside plastic bin or in the streets. Residents do not generally get support from council for accessing bins and either have to buy these themselves or get them free from private companies and NGOs. As a result, households have resorted to using private collectors or alternative methods, such as digging pits inside their yards, burning waste and illegal dumping on roadsides and open spaces. Table 4.7 shows the waste collection policy for Harare.

Table 4.7: Solid waste collection Frequency policy

Sector	Policy on frequency of refuse collection
Household	Once a week
Industrial sites	Once a week
CBD	Daily
Market place	Daily
Hotels	Daily
Hospitals	Once a week
Schools	Once a week
Colleges	Once a week

(Source: ILO, 2007)

Given highly inadequate number of equipment and low levels of staffing, the policy is not adhered to and waste is often deposited in small illegal dumps along Harare's city streets, market and business districts, making collection inefficient and expensive. The waste problem in the City of Harare has become a cross cutting issue that has no immediate solution. Overlapping institutional arrangements, poor local revenue collection, poor relationships among councilors, citizens, the private sector, NGOs, and lack of accountability and transparency have all contributed to poor urban governance that has manifested itself in poor waste management in Harare. Key features of the waste management system in Harare include

- The City taking full charge of the system
- Active participation of the private sector
- Active role of the community
- The Creation of value in waste allowing for exports
- Scavengers integrated as part of an integral actors in dealing with waste in the City

4.3 Case Study 3: Waste Management in Urban Botswana

The capital of Botswana is Gaborone, which is in the southeast part of the country. The major instrument used for the solid waste management in Botswana is the Waste Management Act (Laws of Botswana, 2011) and the Botswana's Strategy for Waste Management (Botswana Environmental Information System, 2011). Botswana seeks to promote integrated waste management to ensure sustainable practices in the sector.

The Integrated Sustainable Waste Management (ISWM) identifies the solid waste streams as a resource for the development of various products rather than seeing it simply as waste. As shown in Figure 4.2, the ISWM is taken as one of the background for understanding the different sections of the solid waste management in Gaborone. In Gaborone, closing the Material Flows Industrial Ecology has evolved as an important strategy for improving environmental conditions. An important element in the industrial ecology is the concept of closing the material loops of any product by directing the used product, which is considered as waste to the production process (Lyons, 2007).

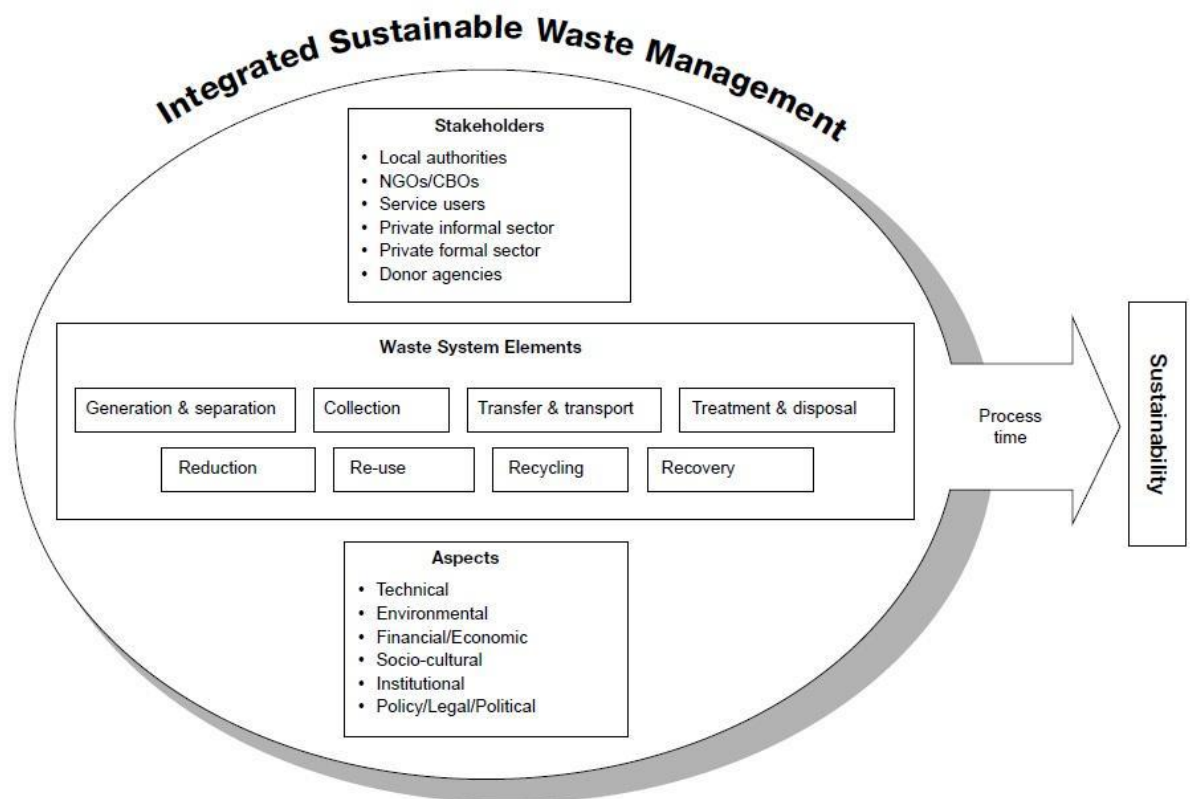


Figure 4.2: ISWM, Suresh & Vijayakumar (2012)

4.3.1 Waste categories in Gaborone

The solid waste management status in Gaborone is characterized by various components which get discarded by residents in both low and high-income areas. As summarised in Figure 4.3 below, household solid waste constitutes the largest amount of waste at the landfill in Gaborone.

Waste type	Quantity
Selected solid waste (tonnes/yr)	
Solid waste at landfill	270,425
Solid hazardous waste	1,560
Hazardous clinical waste	2,500
Scrap metal waste	20,000
Household waste	250,000
Miscellaneous waste	
Liquid hazardous waste (000m3)	34,610
Tires (number)	90,651
Household dry cell batteries (number)	24,000
Lead acid batteries (number)	46,000
Oil waste (000 liters annually)	5,600

Figure 4.3: Waste categorisation in Gaborone, (Kgosiesele & Zhaohui, 2010)

4.3.2 Waste management in Gaborone

The current waste management situation is characterized by the inability of local authorities to collect all the waste generated. Nationally, it is estimated that only 40% of the generated waste is collected for disposal. Waste collection and transportation is limited by inadequate equipment, personnel and financial resources facing all local authorities. Available evidence reveals that there are no recycling plans in Botswana. Most of local recycling companies are only involved in collection of recycling materials, which are later exported to other countries, including South Africa. The major recycling programme includes collection of metal scraps from motor vehicles, metal scraps from beverage and preserved cans, and waste paper.

4.3.3 Waste collection system in Gaborone

The household wastes are collected by the Gaborone City Council. The city council's primary focus is on the household waste sector. It collects household waste or general waste, garden waste and soil waste from every household in Gaborone. The general waste contains almost all waste from all kinds of plastic, food, paper, glass. There is no source separation of any kind of waste in Gaborone, hence individuals just mix up all the wastes that are generated from household and throw it in a bin. Two kinds of households can be found in Gaborone; the first kind is the individuals living in separate houses, and the other is the individuals living in apartments. People in separate houses collect their general waste and place it in a polyethylene bag outside their houses and people living in apartments have a separate garbage container or drop-off centre to throw away their generated household waste. The general waste is collected free of cost by the city council. The garden waste generated by the household usually containing leaves, trees and plants, are collected by the city council at a cost of 400 Pula per seven-ton truck. The soil wastes generated from the household are collected by the city council at a cost of 500 Pula per seven-ton truck. The wastes from households are collected once or twice a week. Waste from commercial, industrial and private organisations is collected by private companies. The city council issues contracts to private companies to collect wastes generated from commercial, industrial, and institutions, and it also involves in regular supervision to check whether the waste generated from these private sectors are collected regularly. The Gaborone city is divided into three zones by the city council based on the geography for ease of waste collection. The vehicles collect the waste from each of these zones every week.

The waste collection by the city council has geographical restrictions and hence the collection of household waste from the new city borders is not covered by the city council at present. In such cases, the people living in these peripheral areas take care of their household waste by themselves. They

collect their household waste in their vehicles and dump it at a landfill on their own. The private companies mostly do not recycle the waste recovered; rather, they transport it to South Africa for further recycling. As far as organic waste fractions are considered, there are no methods employed for the treatment of these waste streams. Figures 4.4 and 4.5 below indicate the waste flows in the City of Gaborone.

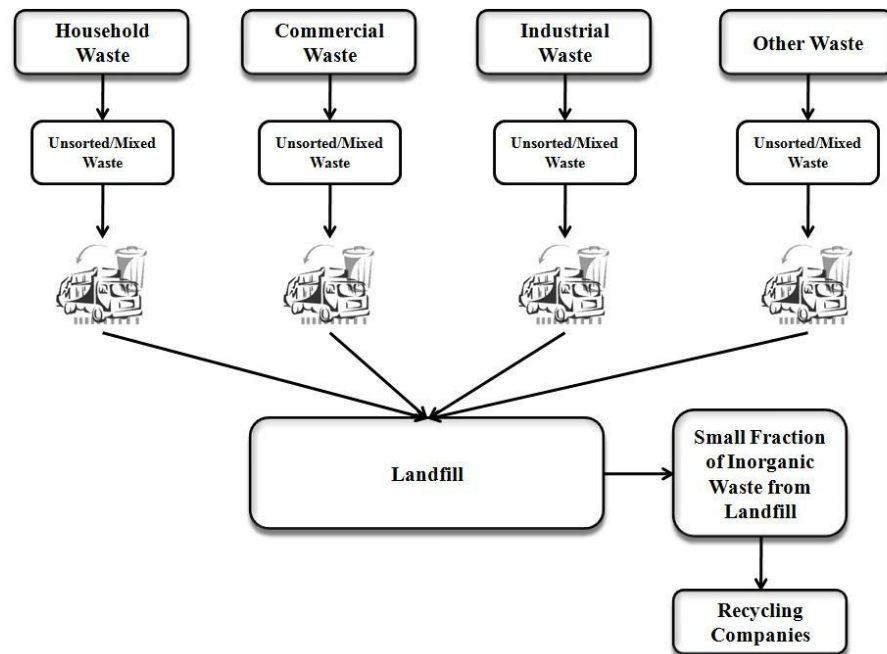


Figure 4.4: Waste flow in Gaborone, (Kgosiesele & Zhaohui, 2010)

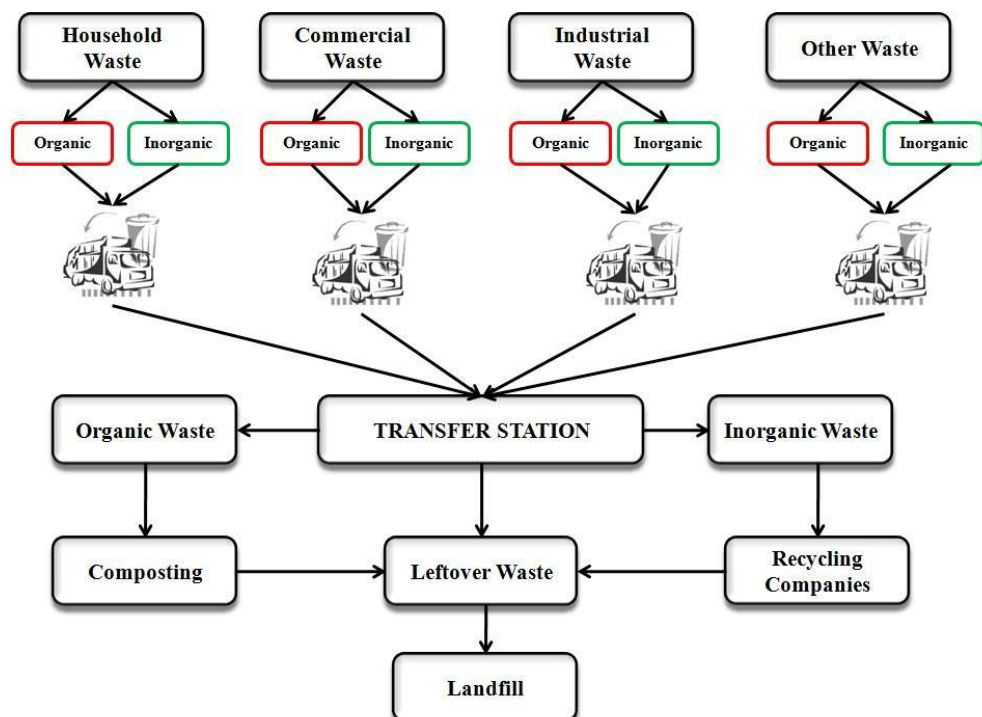


Figure 4.5: Waste flows in Gaborone, (Kgosiesele & Zhaohui, 2010)

In the proceeding section, the report provides an analysis of use of ICT in public service provision in Sub-Saharan African cities.

5.0 ICT for Improved Public Service Delivery in African Cities

Adam et al. (2011) and Visser and Twinomurinzi (2009) argue that while failures are recorded in many instances where ICTs are deployed to improve public service delivery, ICT-enabled public service delivery, if implemented effectively, can improve access to public services, increase efficiency, transparency and accountability of government and political processes in African cities. ICT initiatives have the potential to empower citizens by enabling them to participate in the decision-making processes of governments and to hold service providers accountable. Ineffective service delivery problems are commonly associated with inadequate targeting of the poor, supply-driven service planning, elitist selection of programmes, an inadequate voice for the poor and their inability to reach the government and service providers (Adam et al, 2011).

A World Bank Survey (Adam et al., 2011) shows that when citizens see the benefits of a given government services or product, demand for a such a good is likely to pick up and government revenue would increase. ICTs are therefore necessary for creating a demand-driven solution and in broadening the participation of actors as service providers and as consumers. However, it should be noted that associated factors, like pro-poor policies, decentralized decision-making reform, education, basic infrastructure and political will, are all prerequisites for effective service delivery in every circumstance. Insufficient fulfilment of these conditions will likely lead to inadequate outcomes, despite having a sufficient ICT platforms and systems. Thus, use of ICTs should be accompanied by structural reforms to address the core problems of low staffing levels, policy design and pseudo decentralisation in most African cities.

5.1 Accountability, Transparency, Citizen Collaboration and Interaction

To ensure success in any policy, programme or strategy to improve service delivery for the public, effective communication is necessary between governments and citizens. Policy and programme design need strategic and broad-based inputs from stakeholders who include service consumers. State-citizen engagements need to be well planned and should be sustained to inform policy formulation, programme and strategy implementation as well as programme monitoring. This cycle needs to start with governments providing timely, comprehensive information on their activities, expenditures and policies, limitations so that informed debate between all the parties can ensue (Adam, et al, 2011). To hold a public servant accountable, one must first find out information about that public servant's decisions and actions (transparency), but one then must go further if one is to

hold leaders and policy officials to account for their decisions and actions. Thus, at the heart of transforming public services is the need to engage more effectively with citizens and to ensure that they have both choice and voice. ICT can provide useful tools to improve public services and enable better user engagement and increased revenue (Visser and Twinomurinzi, 2009).

5.2 ICTs and Social Democracy for Better Social Services

Service seekers, service providers and service facilitators seek to collaborate with one another to achieve a win-win and pragmatic service delivery arrangement. Public agencies are increasingly making use of ICT, especially the Internet, to enlist participation from their constituencies and promote vitality in the service delivery sector. Actors have sought to use e-participation to shape policy and cause radical transformation in the services sector (Visser and Twinomurinzi, 2009). The internet has been used by service providers to understand requirements by consumers and to get feedback on services rendered. Further, the Internet serves as a platform to rally public opinion and generate advocacy of issues. e-Participation has degrees of citizen involvement as shown in Figure 5.1. At the lowest level the citizen has access to information, which is not necessarily complete, and has no means of interacting with government. At the level of greatest citizen empowerment, government agents and actions can be effectively monitored and are held accountable and legal or other action may be taken by members of society to remedy any poor service. Thus, the use of ICTs promotes development of social democracy as an ingredient in promoting better services for the public.

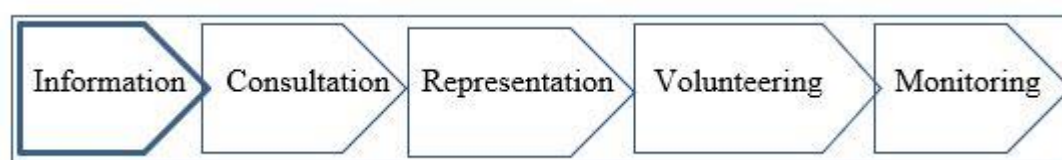


Figure 5.1: Creation of Social Democracy through ICTs, (Visser and Twinomurinzi, 2009)

Information – this is a one-way relationship in which citizens receive information from government agencies, civil society organisations, private sector firms and other service providers. Citizens, though information, are viewed as users.

Consultation – This is a two-way interaction such as forums, surveys, and polls which includes formulating opinions on issues already set out by service providers and active engagement in defining policy content.

Representation - Presence of citizens within institutions where decision-making takes place which implies settings where citizens can set up the agenda and define the policy contents therein.

Volunteering – this includes settings wherein citizens could volunteer to be in policy making circles (for affirmative action, the most excluded and vulnerable can be called upon to participate).

Monitoring – it includes giving citizens the watchdog role where they monitor public policies and can evaluate public services

Visser and Twinomurinzi (2009) accounts that today, most government websites in Cape Verde allow citizens to interact with the government electronically through a chat application. Cape Verde serves as a unique example where e-Participation is taken very seriously in the design and implementation of public services policies and programmes. Thus, citizen engagement via websites (ICT) entails the ability of a website to provide content and interactive capabilities that facilitates citizen participation in civic life (Coleman, Lieber, Mendelson, & Kurpius, 2008; Karkin & Janssen, 2014). Citizen engagement via e-platforms encompass the tools available on the website through which citizens can use to interact with government entities such as satisfaction questionnaires and tools for submitting requests, such as policy proposals and citizen feedback on government initiatives. It also entails social platforms that allow citizens to freely and easily communicate to police officials and amongst themselves as consumers.

5.3 Social Media and its power to fix Complex Urban Problems

There is a broad recognition that government information belongs to the people and technology is enabling a new wave of sharing this information. Some practical uses have already been identified and implemented in government, at state as well as local level. For example, with a tweet or text - potholes, broken street lights and other issues are being reported and fixed in many instances in Africa and beyond (Visser and Twinomurinzi, 2009). Online networking and the exchange of information through social media encourage opinion building in ways that compel governments to become more responsive to the demands of society. Clear advantages of mobile phones for developing countries providing electronic services through mobile devices to citizens, is an emerging trend and a new frontier in public service delivery offering various advantages. There is high mobile phone penetration covering a large percentage of the population in Africa and the mobile network is steadily expanding. Furthermore, residents can use mobile services to network and make demands on service

delivery anytime and anywhere in the city. Thus, if well implemented, social media platforms can support report of waste management issues and challenges at their convenience and at affordable prices. With prepaid, it is relatively easy for the poor to afford mobile services and use mobile internet to impact on service delivery in the cities.

The convergence of data, voice and video, and convergence of networks are making mobile devices adaptable to a range of needs of and services to citizens. As shown in Figures 5.2 to 5.5 below, the Smart Harare is an example of how ICT can be deployed to improve service delivery in an African city like Harare. SMART Harare is an e-platform where the public share and communicates services issues to the City and among another. The essence of the platform² is to solicit for action from relevant stakeholders. Issues addressed include fixing potholes, street lighting, garbage, water and sanitation issues, security, fires among others. The platform provides both opportunities to report issues and to link consumers with service providers. The platform provides a mix ICT channels and products such as spaces for web posting and telephone channels for reporting any service related issue in the City.

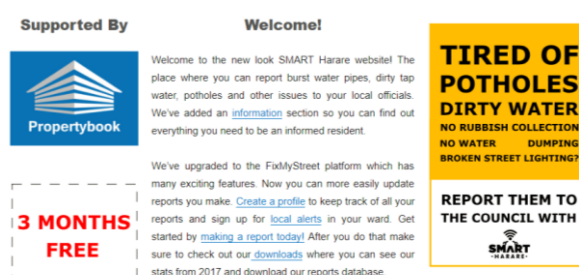


Figure 5.2: Smart Harare, <http://www.smartharare.org/>

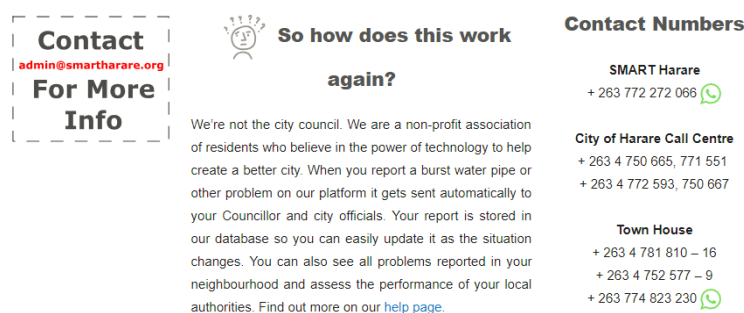



Figure 5.3: ICT for better services in Harare, <http://www.smartharare.org/>

² <http://www.smartharare.org/>

★★★★★ **Everyday is your chance to make this City a little better**

Our theme this month is focused on small efforts by residents to improve our city. It's time to bring the sunshine back to our city. Follow us on [Facebook](#) to keep updated on our monthly campaigns.

 **Open Data**

We believe in [open data](#). All reports made on the SMART platform are available for download to residents, local government, academia and civil society. You can [view a map of current reports](#) on our platform or [download historical data](#).

Rowan Martin
+ 263 4 753 000 – 19

Harare Water
+ 263 4 700 087

Waste Management
+ 263 4 770 339

Fire & Ambulance
+ 263 4 783 981-4

Metropolitan Police
+ 263 4 751 896 / 20

Figure 5.4: Public platform for fixing service problems, <http://www.smartharare.org/>

 **LATEST REPORTS**

- [No water on kenny rd, 28th May](#)

We have not had water for over a week in this area. Council came to repair a leak at avondale post office but went away shutting off the water and not returning back. The area has many water leaks around the block e.g Kensington Shops, bridge as per image. Report on SMARTHare
- [Very rough cement slabs, 22nd May](#)

Please could the cement slabs that hold the railway tracks be levelled off, as our cars are taking quite a hammering going over them, as well as the small railway lines by the garage. Report on SMARTHare
- [Burst pipe, 22nd May](#)

There has been water seeping out of here for the last 2 months. Please could this be sorted out. Report on SMARTHare
- [Water running down this road towards Willowvale Slip Road, 22nd May](#)

This water has been running for close on 2 weeks now and the slip road that is running parallel to Willowvale Road, is now deep craters that the water is sitting in and ruining the road further. The cost of maintaining vehicles is costly and even worse for this area. THIS NEEDS TO BE SORTED [...]

Figure 5.5: ICT Platform for dialogue on issue, <http://www.smartharare.org/>

5.4 Citizen Engagement and Building of Dialogue Processes

Figure 5.6 below illustrates how citizens and service providers interact using ICT platforms and how this affects service delivery and improve municipal governance. Dialogue encompasses the ability of e-platforms to provide tools that capture citizen comments, as well as options for citizens to subscribe to information and receive regular updates on policy, programme and strategy issue on given public services (Karkin and Janssen, 2014). There are similarities between citizen engagement and dialogue; however, Karkin and Janssen (2014) note that the key difference is that citizen engagement focuses on a broader set of functions, while dialogue is based on capturing online comments. In South Africa, Van Belle and Cupido (2013) showed that citizens were keen to engage in dialogue with local government officials via e-government technologies, thus necessitating governments to provide more e-government platforms for interfacing with citizens in fostering dialogue.

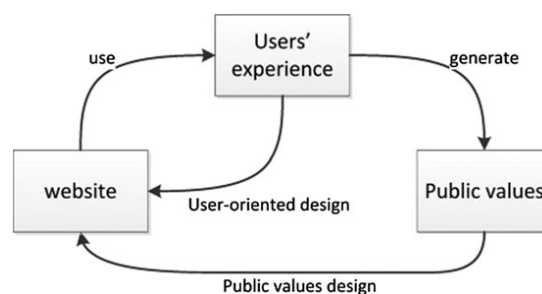


Figure 5.6: Design of e-Government Websites (Karkin & Janssen, 2014)

6.0 Conclusions and recommendations

The report has detailed that waste management practices in Lusaka are not designed to achieve environmental sustainability and financial self-sustaining. The final destination of the waste in the City is the damaged and poorly managed dumpsite. With only 30-40% of the waste reaching the Chunga Dumpsite, the challenge to sustainably fix the waste crisis in the City needs a major rethink on various aspects such as cost recovery, waste governance and promoting waste reductionist methodologies and approaches. The emerging approaches used by Manja Pamodzi and Know Your Neighbor Initiatives begin to address the technical and governance aspects of the waste crisis respectively. However, to achieve groundbreaking successes, the two initiatives need to be accompanied by structural transformations and need to be integrated. Use of ICTs has potential to radically create new spaces for state-resident engagements with potential to engender a more targeted and robust policy and strategy formulation and implementation. The use of ICTs has the potential to reimagine the concept of sensitization of both policy and elected officials and the public on sustainable waste management practices and approaches. The ICTs is seen in this report as having the possibility to promote a bi-directional conversation between service consumers and service providers that can radically give the power to citizens to work with the local authority to design and monitor implementation of waste management practices in the City. The role of the youth is promotion of ICT to reimagine the arrangements in waste management in Lusaka is a crucial factor. Thus, schools, Universities and colleges as well as community centres and initiatives like the KYN initiatives need to be seen and consider as innovation centres in fixing the waste crisis for Lusaka.

Recommendations

1. The biggest issue driving waste management in Lusaka revolves around institutional arrangements in solid waste management. Failure in waste management points to questions of city governance. The report recommends a thorough turn around on waste governance and institutional mandates on waste. The primary mandate to manage waste in the City must lie at the local level. To make this a pragmatic reality, the study recommends that the Waste Management Unit (WMU) at Lusaka City Council need increased freedom to make well informed and financially viable decisions on waste management aspects that include inter alia, cost recovery mechanisms, procurement of equipment, capacity building for CBEs, and issuing of penalties for erring waste management firms and waste generators. Increased freedom at the WMU will potentially facilitate increased revenue collection from waste management activities, ploughing back of the revenue into the WMU system and infrastructure, and increase transparency on use of revenue generated by WMU. This requires review of Council Standing Orders on revenue Management and budgeting systems at LCC.

In his institutional rearrangement, the study further recommends removing secondary waste collection points (communal waste collection points based in communities where CBEs are expected to clear by taking the waste to the Chunga Land Fill).

2. The study has established that without a functional land fill, all efforts on waste management will not yield the desired results. Thus, the study recommends formulation and implementation of a plan to redesign and construct a new land fill for Lusaka. This is essentially important given that not all waste generated in Lusaka can be recycled or recovered. The City will continue to have waste that will require to be deposited at a land fill. A public-private partnership (PPP) could be explored for this project.
3. The study established that the capacity of CBEs is very low, and this is one of the key drivers of inappropriate waste management practices in Lusaka. This study therefore recommends that capacity building in terms of training in contemporary waste management practices, entrepreneurship in the waste sector, and occupational health be streamlined in Council programmes. Further aspects of capacity building should involve capital acquisition and business management among the CBEs.
4. The study established that low levels of awareness on contemporary waste management practices among actors in the sector is a major issue driving poor practices in solid waste management in Lusaka. Waste generators do not fully appreciate the monetary value of waste while the waste management enterprises do not provide a full range of appropriate services to nature the supply-demand dynamics in the waste sector. Waste management needs to be anchored on the demand side of the equation. This would only occur if both sides of the business appreciate and benefit from waste management in Lusaka. Important lessons can be learnt from cities like Gaborone in Botswana and other cities that have records of good waste management practices in the region. Locally, lessons can be learnt from the Manja Pamodzi and the Know Your Neighbor Initiatives.
5. This study also established that state-society relations in the waste management sector is very poor and unstructured. While social media usage by residents is recorded to be reasonably high, authorities have not used this to ensure a mass reach to the residents to communicate their initiatives in the waste sector to ensure public awareness and support on critical issues such as subscription, penalties, pricing structure, penalties for poor compliance, waste reductionist measures among others.
6. The study recommends mass dissemination of this report. This should be done in a targeted manner to create a shared and broad understanding of the status of waste management in the City. Thus, policy briefs could be the immediate mechanism to ensure the report is appreciated and considered for action by high level policy officials in central government, the Mayor and Town Clerk for Lusaka, Chief Executive Officers in the Waste Management enterprises, community leaders and Civil society organisations. Policy briefs based on this report could establish a shared discourse and practical strategies for addressing the waste crisis in Lusaka.

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