

## Healthy urban food, waste management and energy systems: Lessons from scaling up the Longacres Market initiative February 2024



Marketeers throwing waste into the skip bin, BORDA Zambia, 2022

### Introduction

Zambia grapples with a challenge shared by many east and southern African countries of effectively managing waste. Zambia generates 3.7 million tons of waste annually, a large share of which is valuable material that, regrettably, often goes unused. Among the numerous waste issues, food waste stands out as a critical concern, impacting not only food security, but also exacerbating greenhouse gas emissions and complicating waste disposal efforts (Fletcher, 2022). Addressing this multifaceted problem necessitates a deep understanding of the factors that influence waste-related behaviour. Strengthening adoption and scaling up of sustainable solutions calls, in part, for an understanding of the root causes of and strategies that minimise waste at in source, linking behaviour modification to environmental measures, planning, and informed decision-making.

### Longacres market and its approaches

Longacres market in Lusaka, the capital city of Zambia, is engaging in sustainable solid waste practices through the inclusion of the three Rs (reduce, reuse and recycle). The market is one of the busiest in the city. It has a diverse range of stores and stands, the majority of which are restaurants. The market serves a population of about 3 200 people.

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Prior to 2021, the market was producing enormous amounts of waste. It was literally submerged in organic waste. The market was a haven for disease, because it lacked adequate sanitation services. The hundreds of people that went to the market every day to buy goods and services or dine at the restaurants were also at risk of ill health, due to the combination of waste and substandard facilities.

In 2021, Bremen Overseas Research and Development Association (BORDA) Zambia initiated a programme of work at Longacres market. BORDA is a Zambian civil society organization that has specialised in promoting sustainable environmental protection through integrated solutions. The organization acquired funding from a German development agency, BMZ, to help establish solid waste management systems and proper sanitation solutions for Lusaka city markets. Longacres market was selected to be a pilot for the city-wide programme.



Waste management before the Initiative, BORDA Zambia, 2021

BORDA Zambia started by evaluating the market's solid waste management practices. As the overseers of the city's marketplaces, they included significant groups such as the Lusaka City Council, along with the neighbouring Lusaka Boys Secondary School, the Ministry of Education, and the Zambia Environmental Management Agency. They included marketeers as market users. BORDA Zambia, in partnership with the Lusaka City Council, arranged stakeholder meetings to educate marketers on the proper way to segregate garbage at the source and dispose of it in designated containers for additional processing.

The second step was creating a common stakeholder structure to ensure that the pilot ran smoothly. To guarantee sustainability, ownership of the project was transferred to the Lusaka City Council and the local market stakeholders. The team created educational resources and used workshops to in its capacity-building exercises. Among other things, marketers, teachers, and pupils received training in resource recovery, organic farming, and waste separation.

The third step strengthened the solid waste management. BORDA Zambia worked with the local team to build a decentralized organic solid waste management treatment system. A biogas digester was designed for the market by BORDA Zambia engineers. Macabe Construction and General Supplies, a local business in Lusaka, was contracted to handle the construction. To make it easier for individuals to transport waste from the source to the Material Recovery Facility, the company improved the route to the market. The company built a tank in 2022 to provide the water to run the digester, as there was no direct water source close by.



Material Recovery Facility. Longacres Market Paxina P, 2023

An efficient end-to-end waste management and disposal chain has now been established at the market. Solid waste from shops and market stands is collected, separated and disposed of in labelled waste bins at approved sites. Instead of accumulating at the dumpsite, waste is transferred from the bins to the material recovery facility, for onward recycling or reuse to generate revenue in an environmentally responsible way. The methane gas produced by the biogas digester lights the neighbouring school and three other sites. The school's organic garden is irrigated with treated water, using organic waste serves as fertilizer.

This paper seeks explores the learning from this pilot for the scale-up city wide. It has been produced within a series on integrated urban health in EQUINET to foster learning on promising approaches within east and southern Africa (ESA). The paper draws insights from the Longacres' experience, to inform national level scale-up of such initiatives. It explains the contextual, legal, governance and policy factors that could affect national scale-up and the options to address them.

## Methods

We implemented a policy analysis, examining Zambia's national and municipal level policies and guidelines to assess how they align with the Longacres market waste management programme and how they can facilitate or impede national scale-up. We examined waste management laws, environmental regulations, and governmental broader economic and social blueprints and policies. The following policies and regulations were included in the analysis: The 8th National Development Plan (8NDP); National Policy on the Environment; Zambia National Policy on Climate Change; Health National Adaptation Plan (2017); Local Government Act no.2 of 2019: Environmental Management Act no 12 of 2011; Solid Waste Regulation and Management Act No.20 of 2018 and the Public Health Act Cap 295. The findings are presented in *Table 1*, capturing in brief the provisions of each law and the mechanisms that affect the Longacres initiative. This paper draws on the policy analysis and four stakeholder interviews with personnel from Lusaka integrated Solid Waste Company, BORDA Zambia and Lusaka City Council Departments of Public Health and Housing to deepen and validate information.

## Policies and plans affecting the market initiative

*Table 1* summarises the findings from our policy analysis. In the context of the Longacres Market project, influential national plans and frameworks are the Eighth National Development Plan (8NDP), the Environmental Management Act No. 12 2011 and the more recent Solid Waste Regulations and Management No.20 2018 play critical roles (GRZ, 2011; 2018)

The 8NDP aligns with the initiative's goals. It provides a comprehensive strategy for sustainable development and job creation. The strategic focus of the 8NDP facilitates opportunities for funding and collaboration with government agencies. The Environmental Management Act 2011 stipulates that a person shall not 'collect, transport, sort, recover, treat, store, dispose of, or otherwise manage waste in a manner that results in an adverse effect, or creates a significant risk of an adverse effect occurring' and that a person who 'produces, collects, recovers, transports, keeps, treats or disposes of waste' shall take all reasonable measures to prevent any other person contravening these requirements (GoZ, 2011).

The Solid Waste Regulations and Management 2018 outline standards on solid waste management, solid waste categorization and handling. Owners or tenants are obliged by law to maintain a tidy area surrounding their property. The Act also sets standards for solid waste sorting. A waste generator shall sort, or cause to be sorted, various categories of solid waste into different groups or clusters, such as organic, plastic, paper, glass, metal or other regulated waste (GoZ, 2018). The Longacres market initiative adheres to such regulations, including classifying waste into categories such as organic, plastic, paper, glass, and metal waste and promoting sorting for effective recycling and trash management.

To ensure policy coherence, collaboration between the government and such initiatives is imperative. Enhanced resource allocation and policy alignment at both the local and national levels ensure compliance and successful implementation for scaling up of the project. This is further discussed later.

## Process enablers and implications for scale up

The Longacres initiative is supported by important process factors that may be important for national scaling-up.

The Longacres Market **involved key stakeholders** from inception. BORDA Zambia involved the Lusaka City Council, given their role as the custodians of markets in the city. They engaged marketeers as users of the market, and the neighbouring Lusaka Boys Secondary School. The stakeholders needed to understand the new solid waste system being introduced at the market and the overall objective of the Longacres Market Solid Waste management project. Involving stakeholders from the beginning helped stakeholders appreciate and understand what is involved in the project. Involvement and giving leadership to local actors in the planning and inclusion in decision-making helps with project ownership, commitment and participation in their waste management roles.



**Table 1: How national and municipal plans enabled or disabled the Longacres initiative**

Name + category of Policy /Governance framework Reference number (linked to reference list)	What it covers in brief	How it enabled the initiative and mechanisms Level of influence and why	Examples from the initiative How it presented challenges to implementation and mechanisms Level of influence and why Including information raised by key informants.
<b>National level</b>			
8th National Development Plan (8NDP); <i>National Plan</i> ; 15	Prioritises green growth, environmental safeguarding, climate change mitigation, and disaster risk reduction.	Encourages recycling and waste reduction, supports economic opportunities. The goal is poverty reduction and job creation With an emphasis on waste management, employment creation, and environmental sustainability, the 8NDP offered Zambia a strategic framework for sustainable development.	Waste separation occurs at shops and market stands, and it is appropriately collected and disposed of in designated facilities using labelled bins. Organic waste is moved to the biogas digester at the nearby school. Treated water is used for the organic garden at the school. The garden is income generating. The 8NDP covers a wide range of sectors and priorities at the national level. Funding of initiatives such as the Longacres Market is not a priority. However, it states that more money will be provided, including through the Constituency Development Fund (CDF) to ensure communities have clean and safe water supply. Improvements to ensure clean and safe environments will be made by improving systems for the removal of garbage and sewerage.
National Policy on the Environment; <i>Environmental Policy</i> ; 5	Focuses on environmental protection, sustainable natural resource utilization, and public awareness campaigns.	The NPE encourages community involvement in environmental decision-making. The NPE recognises the importance of environmental education.	The initiative engages with the marketeers who are the users, the Lusaka City Council employees, the neighbouring school, obtaining input and support for its waste management practices. The project has sensitised and raised awareness about responsible waste management and environmental protection among marketeers and all those working in the market.
Zambia National Policy on Climate Change <i>Environmental policy</i> ; 11	Aims for low-carbon, climate-resilient development avenues and incorporates climate change adaptation into national development goals.	Encourages the development of institutional capacities for effective climate change response and support capacity building for climate change response efforts.	BORDA Zambia has embraced climate-smart waste management practices, imparting awareness and education to all market stakeholders through training sessions and workshops. These initiatives include instruction on operating the bio-digester located adjacent to the market.
Health National Adaptation Plan (2017) <i>Health Framework</i> ; 10	Addresses climate change impacts on human health, emphasizing climate risk identification and adaptation measures.	Enhancing solid waste management, sanitation, and hygiene practices helps safeguard public health, which is one of the main objectives of the Health NAP.	The environment surrounding the market has become cleaner and more hygienic, with more liveable community conditions and improved public health in the market as a result of these efforts such as separation and disposing of waste at designated place and the enhanced sanitation facilities and hygiene in the market.
Local Government Act no.2 of 2019 <i>Legal and Administrative Framework</i> ; 8	Gives local authorities the responsibility to oversee markets while emphasizing the need for better waste management and infrastructure.	The Lusaka City Council (LCC) is in charge of overseeing the Longacres Market. It ensures that the project complies with every rule stipulated by law. The Act under which the initiative operates serves as a guide for the goals it has established.	The LCC members of staff have been facilitating in the training of the markets on Solid waste as well as the Laws and guidelines of Solid Waste Management
Environmental Management Act no 12 of 2011 <i>Environmental Framework</i> ; 6	Focuses on integrated environmental management, conservation, and sustainable use of natural resources	The act outlines compliance requirements and standards for waste management, ensuring that initiatives follow established environmental regulations.	Capacity strengthening trainings were conducted by BORDA Zambia on compliance and enforcement to promoted proper solid waste management at the market. In the trainings which took two days they wanted participants to know more about the laws and charges to use on enforcement.

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Solid Waste Regulation and Management 20, 2018 <i>Environmental</i> ; 7	Outlines regulations for the sustainable management of general solid waste services, and establishment and functions of waste management companies	provides procedures for managing and classifying various types of solid waste for the market.	The Act played a significant role in the initiative in that it emphasizes the three (3) Rs, that is, Reduce, Reuse and Recycle. This is intended to reduce the solid waste collected, transported and disposed of at the landfill is reduced. The Act was used during the implementation The market is cleaner compared to the past. There has been a reduction of solid waste overflowing at the skip bins. People know where to dispose of different types of waste. (KII)
Public Health Act Cap 295 <i>Health Framework</i> ; 3	Regulates public health matters, ensuring disease prevention and suppression	provides for the prevention and suppression of diseases and generally to regulate all matters connected with public health in Zambia.	This Act influenced the implementation of the project in setting the duty of every Local Authority to take all lawful, necessary and reasonably practicable measures for maintaining its district at all times in clean and sanitary condition, and for preventing the occurrence therein of, or for remedying or causing to be remedied, any nuisance or condition liable to be injurious or dangerous to health, and to take proceedings at law against any person causing or responsible for the continuance of any such nuisance or condition. The area around the previously broken water tap has been cleaned, and problems of filth, leaks, and blockages brought on by improper solid waste disposal addressed. The restrooms have been fixed, and female marketers attended an awareness workshop on menstrual health and hygiene management. To reduce infection, the session looked at how to incorporate menstrual health into the solid waste and sanitation project and proper disposal of sanitary towels properly. (KII)
<b>Municipal level: Each Local/municipal policy and governance framework is governed by the Local Government Act.</b>			
Elected Councils;	Local councils are elected bodies made up of members elected by periodical elections among the local community. They have the authority to enact policies: When local decisions are being made, these elected leaders represent the community's interests	They are mandated by the Local Government Act to manage solid waste in the city.	BORDA Zambia in collaboration with the Lusaka City Council train marketeers on how to separate waste at the source and discard it in specific bins for further (KII)
Integrated Development Plan (IDP) 11	A planning strategy that engages all community members in determining the best ways to accomplish positive long-term	The district's IDPs serve as a reference for all sectors' planning, budgeting, management, and decision-making processes.	Plans and activities of Initiatives such as the Longacres Market can be incorporated in the IDPs
Strategic Plans	Local governments develop strategic plans outlining their goals, priorities, and plans for community growth and service delivery.	Solid waste management is part of service delivery by the local government	
The Lusaka City Council (Municipal Solid Waste Management) By-laws, 2004, 4	These by-laws shall apply to the management of the municipal solid waste generated in, imported into or transferred through, the City of Lusaka and other waster which is managed together with or in the same facility as the municipal solid waste.	It provides duties of waste producers who shall facilitate the removal of solid waste from their premises.	The by-law had a significant impact on the initiative's execution because both the marketers and the employees of the Local Authority were required to follow the legal requirements. For example, using containers and bins for waste on the property was required and implemented. (KII)

**Stakeholder collaboration** helped the initiative get the resources and expertise it needed. BORDA Zambia worked with the Lusaka City Council through the department of Public Health to train the marketeers and workers at the market on solid waste. The course included information on the value addition of solid waste management, the effects of poorly managed waste on health, among other topics. In a collaboration with the Ministry of Education, the ministry assisted in meeting the challenge the market faced in not having enough space to construct the bio-digester for food waste. In 2021, BORDA Zambia applied to the Ministry of Education for permission to set up the biodigester at the Lusaka Boys Secondary School. The Ministry of Education referred them to the Zambia Environmental Management Agency, who assessed the environmental impact on the school and gave the idea a nod. The school administration then approved plans to construct the digester. School teachers and pupils were involved in the capacity building activities. They were also taught about separation of waste, resource recovery, organic gardening among other topics.

As a lesson learned, the integrated nature of the initiative means that scaling up requires careful mapping of all relevant stakeholders within each site, facilitating the collaborations with clear roles for each and mechanisms for sustaining the collaborations and the shared goals. Capacity building measures, embedded within the collaboration framework, such as involvement of school teachers and pupils in the Longacres case study, is one mechanism for enhancing the continued and mutually beneficial collaborations during scale up.

Another factor was **policy alignment**. It was crucial to make sure that the project complied with all applicable laws at all levels and policies pertaining to solid waste management. From the onset, one of the topics in the trainings was thus on relevant laws, regulations and guidelines. The participants in these trainings agreed to come up with penalties for failure to separate waste at the shop level as part of enforcement. Policy alignment also helped ensure that whatever was being done was guided by the laws. Co-production of enforcement strategies through mutually agreed penalties is a critical learning point for scale-up. It raises consciousness on policies and sanctions for violations of policies, and the potential for more sustainable and effective community policing systems.

**Resource mobilization** enabled the Longacres initiative. Adequate funding, equipment, and human resources were vital to implement waste management programmes. BORDA Zambia, through the German Development Agency, BMZ provided funding to put up the solid waste management system. BORDA Zambia engineers designed the decentralized organic solid waste management treatment system, and the biogas digester. A local firm based in Lusaka was contracted to construct the system. To make it easier for individuals to transport waste from the source to the Material Recovery Facility, the company also refurbished the road to the market, as noted earlier. They also built a tank to supply the water required for the digester to function. BORDA Zambia also supplied bins for marketers to dispose of various waste materials. The Lusaka City Council through the market levies collected at the market pays the water utility company to supply water to the market. Local innovation in funding, local contracting and looking at infrastructure from a systems perspective appears to be important for scale up. Beyond the core infrastructure, supporting and ancillary systems such as water, roads and transport need to be resourced. Investing revenues by the local authority demonstrates local institutionalisation and inclusion in local budgeting for sustainability as a key issue for scale-up.

As indicated earlier, **training** played a key role, providing skills and knowledge for capacities for better waste handling and separation procedures. Lusaka City Council and BORDA Zambia trained marketeers, school teachers and pupils in the separation of solid waste, in resource recovery, organic gardening and areas noted earlier. The knowledge acquired is being applied in in process.



Participants sorting waste during training. BORDA Zambia, 2022.

Training and capacity building programmes should be embedded within the design for project scale-up, promoting holistic skills that will link with initiatives such as organic farming, production of energy from waste, and urban green spaces and ecosystems.

## **Learning from challenges faced and how they were overcome**

The initiative had to deal with resource constraints. It can be difficult to operate with limited resources and finances. The initiative received equipment to manage waste from BORDA Zambia, as well as bins and facilities to dispose organic and recyclable waste. The Lusaka City Council provided skip bins. However, the marketeers had no proper facility to wash their bins, as they were stopped by market leaders from using the available tap water at the market. As a result, they were forced to use the same basins used for washing dishes to wash their hands. Including diverse stakeholders brings partners who can resource such activities during scale-up. Bringing all local actors is important for local project ownership and sustainability.

Poor revenue collections at the market affected the operations. The market levies were collected by the local authority through cashiers. However, at Longacres, marketeers were not paying on time and were in arrears. This affected revenue for services such as the water supply needed to run the biogas digester, affecting its operations. To better enforce the law, Lusaka City Council encouraged shop owners to make the payments making clear that the funds collected would support solid waste management. Workers were also advised to carry one bucket of water to put into the digester when they took organic waste to the feeder. Reliance on levies to fund critical processes may be problematic, especially during the initial phases of scale-up. Policy makers may thus need to devise low-cost approaches and contributions in kind or reliable budget to fund such critical areas.

With regards to **policy compliance**, the initiative experienced low compliance levels. Workers were constantly changing at the market, so most of those who were trained in the initial training programme were no longer working there. Shop owners are not orienting their new workers on the new methods of disposing of waste. Improper waste sorting prevents the bio digester from being used to its full potential. The digester was being filled with a variety of objects, including plastics, sticks, bones, and eggshells. The new people were accustomed to disposing of their waste in one place without sorting it. Some shops struggled to separate their waste because they only have one bin and some faced financial barriers to purchase additional bins. For scale-up, policy makers and implementers need to embed regular knowledge acquisition within implementing institutions' and ensure resources to implement knowledge acquired.

Alcohol abuse in the market has led to indiscipline and inappropriate behaviour, impacting on the project. When intoxicated, people – marketeers and clients- refuse to dispose of their waste in the proper locations. Staff have a difficult time cleaning because the opaque beer bottles and containers would be littered everywhere in the market. A standardized operating procedure has been proposed for the market that requires shops to have designated bins for waste disposal, maintaining cleanliness around the shops, banning the sale or consumption of alcohol, and adhering to prescribed operational hours (06:00 to 18:30), with penalties for rule violations. Proper disposal of solid waste is emphasised, and marketeers are responsible for educating customers on solid waste management rules.

The initiative calls for **cultural and behavioural change**, and changing deeply ingrained waste management practices and behaviours can be difficult. In the absence of a clear, visible and accessible system for sorting and disposing of waste, people get used to tossing it onto the streets and other improper places. As a result, when improvements are imposed, people do not modify their disposal behaviour out of pure habit and custom (Yousif and Scott, 2007). At the market, even though people are aware of the rules, many disregard appropriate waste separation. They do not cut vegetable stalks into smaller pieces, as instructed, before throwing them in the bio-digester. Some people underestimate the significance of managing solid waste and, when made aware of the correct disposal techniques, choose not to follow them.





Marketeers throwing waste into the skip bin, BORDA Zambia, 2022.

By transporting unsorted solid waste from surrounding homes, council employees worsen the problem. Vandalism is a further problem, such as in the theft of taps from the Decentralised Waste Management feeder at the market and school not long after their formal launch.

To address this, BORDA Zambia was asked to provide more sensitisation materials that can be stuck at strategic points such as the four entrances of the market to promote proper solid waste disposal. Secondly, the shop owners were tasked to orient their workers on waste management procedures at the market at regular intervals. This will ensure that even the new workers are fully aware of what is expected of them. The shop owners can further orient their customers too. Continued monitoring and enforcement is required to stop vandalism.

## Learning from co-benefits

The initiative is a comprehensive and integrated system covering every phase of the waste management process within the market. Efficient waste management reduces the adverse effects of garbage on the environment and ecosystems, promoting environmental sustainability. The Longacres Market has reduced solid waste overflowing at the skip bins, reducing air pollution and the clogging of the nearby drainage systems. This has improved the reticulation of rain water systems and flood management. People now know where to throw their different types of garbage.

Scaling up requires systematically profiling and promoting such associated co-benefits, including their contribution to managing climate change effects such as flooding management, energy shortages; the food and nutrition benefits from use of organic manure; and the promotion of urban green spaces through agriculture using the organic waste.

Effective waste management significantly diminishes health risks associated with improper waste, providing cleaner and healthier conditions, and enhancing the well-being of the community. The efforts put into proper waste management have transformed the environment around the market, fostering cleanliness and hygiene. The improved community conditions have enhanced public health among both marketeers and customers in the market (Phiri, 2023).

The waste management process described earlier and the contribution to biogas sourced energy, organic fertiliser have improved local incomes. The school's organic garden is irrigated with treated water, and organic fertilizer. It generates revenue, and in a circular economy, the produce grown is sold in bulk to market vendors who then resell it in the neighbourhood food market. These economic returns help to build wider stakeholder partnerships and support.

Promoting principles of a circular economy such as through production of methane gas from organic waste could help solve urban energy challenges in an equitable manner, when such projects are done in energy poor neighbourhoods. Using treated water from the biogas digester to irrigate the school's organic garden promotes water conservation and sustainable agricultural practices by reusing treated water for irrigation (Karthik Rajendran, 2012).

The training provided by the Longacres market initiative partners to the marketeers, the Lusaka City Council staff, school teachers and pupils generates longer term effects from increased knowledge and understating of sustainable waste management techniques.



## Reflections on further linkages at Longacres

The Longacres Market waste management effort in Zambia can itself yield more benefits by enhancing links with non-energy elements such as parks, water, and other environmental sustainability aspects.

Additional co-benefits could be derived from linkages to and promotion of **green spaces**. Green spaces are important for community health as well as the aesthetics of the environment when present in and near marketplaces. The green spaces can offer shade, better air quality, and a more enjoyable shopping experience. Adopting integrated urban planning strategies that clearly link the development of green spaces with waste management laws is vital, for example, through use of organic manure from composted bio-degradable waste in green space vegetation. This method contributes to a comprehensive and long-term growth strategy (Alberti, 2008).

Composting is a practical way of turning organic waste into useful biofertilizers (Modupe et al., 2020). Green spaces can potentially be used for growing urban food and herbs, improving the nutritional and health needs of urban dwellers. The organic manure from composting can be sold to raise funds for the market, which can be reinvested into the project. At Longacres market, the manure is being used in the school garden.



*School vegetable garden, Paxina P, 2023,*

However, there could be challenges especially if urban plans for the markets or even the surrounding areas do not include provision for green spaces, or if the spaces have been taken over by other developments. Composting using a bio-digester presents challenges when the users do not understand how it operates, requiring training on this.

To promote improved public health and hygiene, there is need to upgrade the sanitation infrastructure in and around the marketplace. At Longacres, the existing sanitation facilities were refurbished. A shower room was added to the female bathrooms to improve the conditions for managing menstrual hygiene. The programmes now need to educate and raise awareness on good personal hygiene and garbage disposal, including to promote uptake of the infrastructure for waste collection and sanitary facilities.

The Longacres market could strengthen the circular economy and resource efficiency by investing in technologies and processes for garbage recycling, upcycling, and repurposing. Waste recycling has processed waste to create new materials. Upcycling involves transforming discarded items into higher-value products, while repurposing involves finding alternative uses for existing items without significant alterations. All three concepts contribute to reducing waste and promoting sustainable practices. A challenge in this would be the low demand for goods derived from recycled resources. This calls for awareness and promotion of recycled goods, with government incentives for companies to use and market recycled materials.

## Overall learning and approaches for national scale-up

The Longacres Market waste management initiative's national scale-up in Zambia is an important task that needs careful thought and preparation. There is learning for this, drawing from the case study. It requires a comprehensive strategy that includes innovation, building capacity, involving stakeholders, updating laws, and committing to sustainable practices. Flexibility, adaptation, and learning from the case study are necessary in this.

It is necessary to take into account and interrogate the options, situations, and methods for a nationwide roll-out.

**Awareness and involvement of stakeholders** was key to implementation of the initiative, and any national scale-up option should be buttressed by this. Training, meaningful involvement, and active interaction among stakeholders is required, including to provide specific information and guidance. In addition to the market staff, it is important to involve local leadership such as the local councillor, to raise knowledge of the solid waste system and the wider integrated benefits of the initiative. Local schools are also assets for increasing awareness. As people spend more time at the market, marketeers should regularly engage and raise awareness on waste management issues. Awareness programmes that emphasise the advantages of environmentally friendly waste management can help address the programme resistance and promote the desired behaviour change. These programmes need to mobilise resources to sustain them, and partnerships could help with this, as can joint grant applications.

There is an opportunity for greater **collaboration more with local businesses** and private entities, establishing mutually beneficial partnerships that can contribute to the success of such projects. Companies and organisations that surround the market should be identified and made aware, including by the local authority, of the benefits of such an integrated and waste management system. Their employees also rely on markets for their food purchases. This can encourage private organisations to participate and support the initiatives.

The key partners in the Longacres project included the marketeers, Lusaka Boys Secondary School with the support of the District Board Secretary's office, Lusaka City Council, DNM Solutions, Tandem Zambia and BORDA Zambia. In other areas there will be other stakeholders. Stakeholder mapping is thus needed, to include vendors, leaders and technical actors, and the local business and private actors, raising interest within all to become partners in the project. For instance, companies can paint shops, including messages on the integrated solid waste management projects, as part of their corporate responsibility and sustainability. Partnering private sector could also leverage their financial resources and expertise to support the scale-up, as happened within Longacres with the Material Recovery facility (MRF) for recyclable waste.

To support scale-up there is need to conduct a thorough **review of the existing waste management policies, laws and regulations** to identify areas that need improvement. Some gaps have already been noted, as earlier described. Policy review can be done through stakeholder consultations, led by Ministry of Local Government under which the initiative was established. The ministry plays a key role in waste management regulation and governance as custodians of markets. The ministry has convening power to include other state departments such as the Ministry of Green Economy and Environment that is mandated to promote the effective and sustainable use of the environment, and mitigation of the effects of climate change. Other key stakeholders to involve in policy review are regulatory bodies such as the Zambia Environmental Management Agency, the principal environmental regulator, non-governmental organisations in related fields, research and academic institutions.

Opportunities exist to move beyond traditional waste management practices and adopt more efficient, sustainable, and technologically advanced/appropriate methods to address the challenges associated with waste generation and disposal. Setting up a material recovery facility for recyclable waste at the market has been beneficial. Recycled materials could be sold beyond the market. Markets can apply for funds for similar technological improvements from non-governmental organizations, alliances, or government support through local municipalities.

**In terms of the stages of implementation**, the Longacres initiative shows the importance of starting with audit of the current situation and mapping and engagement of **key stakeholders**, as described earlier in relation to the stakeholder meetings, and sensitisation training on key issues for and elements of the initiative. Active involvement of all involved in the initiative from the beginning is crucial.

This also calls for a step of actively **aligning, training for and sharing policies, national and local laws** and regulations to ensure legal and policy adherence in the initiative's procedures, plans, and activities. This is not only to avoid legal or policy conflicts, but also supports local standard setting, and contribution to wider national goals.

A key stage of implementation is in the implementation of **training programmes**. This is needed for marketeers and waste management personnel to acquire the skills and knowledge for the programme to be successful, that can also support other aspects of their day to day lives. Market vendors are more likely to actively participate and support the initiative's goals if they are knowledgeable about it.

**Resource mobilization** is crucial across all stages of the implementation cycle. Funds were initially sourced for the Longacres initiative through BORDA Zambia who provided all the necessary equipment and training of the marketeers. Having access to funds, equipment, and personnel is essential. Obtaining resources from various sources is crucial for a successful deployment. To scale-up in other city markets for instance, the Lusaka City Council who are the custodians of markets in the city need to lobby the government through the Ministry of Local Government for funds. Markets can also contribute through the market levies. Non-government organisations in the different localities can also help lobby for funds, while the local authority can also engage the private sector and international organisations.

This needs **good documentation and evidence** to share with those interested or those that may offer potential support. As a programme scaling up the market initiatives to new areas needs to embed from the beginning **monitoring and evaluation**, designed with stakeholders, shared locally with key stakeholders to show and build confidence in achievements, and to leverage wider policy and resource support.

## Conclusion

Zambia's battle with effective waste management mirrors challenges faced by many east and southern African countries. Waste holds valuable materials that often go unused. The Longacres market case study in Lusaka offers a way of turning this challenge into an opportunity. The market, which was previously devoid of sanitation facilities and buried in garbage, got a radical makeover with the help of BORDA Zambia and collaboration with the Lusaka City Council and wider stakeholders. Longacres demonstrates the successful installation of a decentralised system for managing organic waste, its linkage to energy systems through construction of a biogas digester and potential wider co-benefits in connections with food and urban green spaces.

The establishment of a comprehensive waste management system that includes education, capacity building, and infrastructure development and the direction of waste towards recycling or reuse and generates cash for environmentally conscious local stakeholders.

This paper, despite its limitations, illustrates the complex but practical nature of waste-related activities. It highlighted the critical role that policies and laws play, but also of the role of informed, participatory decision-making in sustainable solutions.

We intend the study to inform a comprehensive discussion of environmentally friendly waste management practices, first to strengthen links between the market and other areas of the circular economy in the same area of the market; secondly to encourage and inform the adaptation and expansion of the model in other markets in Zambia, and thirdly to share in the region and internationally, including in EQUINETs regional urban health community of practice in east and southern Africa.

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