

DPU MSc ESD/SLURC Learning Alliance

Understanding urban risk traps in Freetown

MSc Environment and Sustainable Development
Practice Module 2018-19

POLICY BRIEF N° 5

Multi-Hazards Related to Poor Solid Waste Management

Key Points

- Insufficient planning and management is at the base of Freetown's waste management system. Formal policies are focused on collection rather than treatment and efficient disposal, for example through recycling. Government and foreign-led interventions to rehabilitate the city's poor waste management system have been insufficient and inconsistent.
- There is a spatial inequality in waste collection services. Informal settlement dwellers, especially those living in proximity to dumpsites and coastal areas are persistently affected by the lack of a just and well organized collection system.
- Poor waste management contributes to the spread of environmental health risks. Efficient initiatives and practices can reduce citizen's vulnerability to daily risks, as well as contributing to reducing the impact of intensive disasters such as flooding.
- The urban poor of Freetown's informal waste sector have immense potential to contribute to the circular waste economy, even though livelihoods dependent on waste picking are currently not acknowledged.
- Partnerships between governmental and external organisations in promoting innovative community-based solutions to solid waste management are strongly encouraged.



Photo 1: Waste pickers work amongst flaming trash at Kingtom landfill site. (Russillo, 2018)

Summary

Freetown is a rapidly expanding city of almost 2 million inhabitants, many of whom reside in informal settlements. The 1991-2002 civil war contributed to the city's rapid and uncontrolled growth, resulting in the expansion of informal settlements. Overcrowding and poor solid waste management, characteristic of living conditions for the urban poor, promote the spread of infectious diseases. Furthermore, Freetown's undulated topography and tropical climate make it naturally prone to hazards such as landslides and floods (Johnson, 2009). Despite a lack of official public data, media sources indicate that inadequate solid waste management exacerbates intensive disasters such as flooding and curtails livelihoods, as well as coping capacities of low-income residents on a daily basis.

This policy brief addresses the multi-hazards related to poor solid waste management in Freetown and provides recommendations to mitigate and prevent the perpetuation of urban risk traps. It is organised as follows: Firstly, the role of solid waste is outlined as a driver of risk traps for Freetown's residents. Secondly, a spatial analysis of the formal waste management system shows the distribution of hazards across the city. Thirdly, an overview of interventions in waste management is provided in parallel to important local initiatives. Lastly, recommendations set out some appropriate steps necessary to improve solid waste management in Freetown.

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Poor Waste Management: Risk Traps and Vulnerability

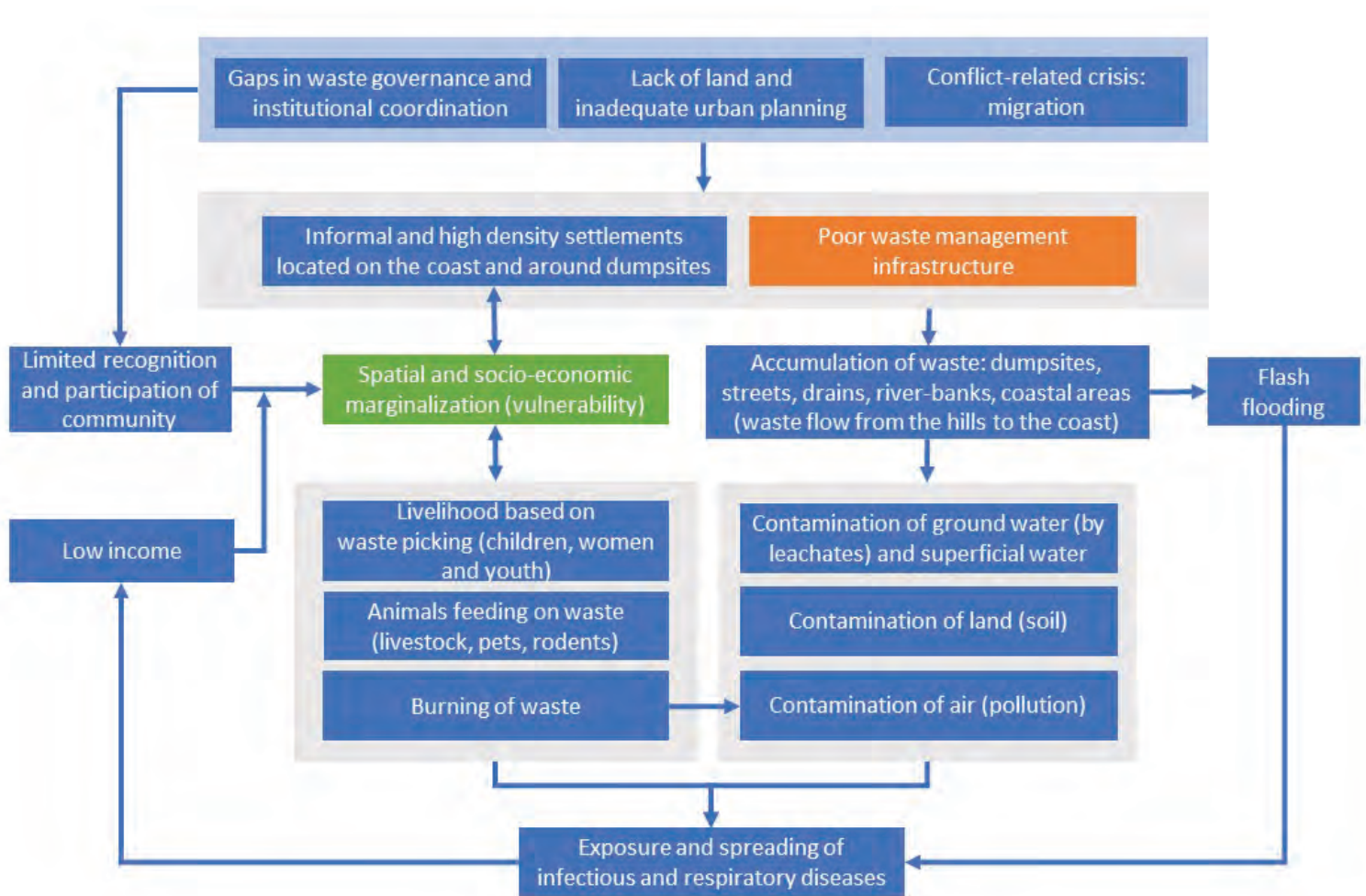


Figure 1: Accumulation of Risks in Freetown's Informal Settlements

Poor waste management is a driver of vicious cycles of risk accumulation and risk traps; such cycles are a daily occurrence across Freetown, particularly within its informal settlements (see Figure 1). Informal and high-density settlements located on the coast, near streams and around official dumpsites are significantly affected. Waste accumulation is often higher in these areas due to the low frequency of collection, which also forces residents to use nearby water bodies as dumping sites (Gogra et al., 2009). This exacerbates the extent of flooding and produces higher risks of health hazards such as malaria, typhoid, diarrhoea and cholera.

Such infectious diseases particularly affect children, pregnant women and elderly people, who have weaker immune systems and limited physical capabilities. The exposure to those diseases impacts their ability to work which in turn increases socio-economic vulnerability. With limited employment opportunities, waste is a valuable source of livelihood for many.

From scavenging through toxic material in landfills for plastics, cans and metal objects for housing construction, low-income groups are subjected to high insecurity on a daily basis. A proper recognition and organization of waste recovery and recycling is clearly lacking in Freetown.

Furthermore, the open burning of waste on formal and informal dumpsites is a common practice that increases the exposure to respiratory infections, especially in children and women who sort through reusable waste (Kamara, 2018). Leachates from landfills often contain heavy metals which contaminate soils, groundwater and drinking and food supplies (Gogra et al., 2009).

Some residents in bay areas are compelled to extend available land into the sea by piling up large deposits of waste, a practice known as banking. Residents will then construct their homes upon the new land created. The waste used for this purpose is primarily water sachets and empty bottles, but also quantities of household waste

including food scraps and often human faeces (Torr, 2018). This process of land reclamation allows for the accommodation of more people. However, residents still need to pay rent and experience frequent flooding associated with high rainfall runoff and high tide elevation. While banking can be seen as an innovative response to tackle housing shortages, residents are at an increased risk of material damage and livelihood deterioration from flooding.

The exposure to hazards of floods, respiratory infections, and the spread of infectious water and vector borne diseases are progressively ingrained in the daily lives of low-income residents in Freetown. This deteriorates their economic circumstances, erodes their coping capacity, hinders any form of recovery and contributes to the reproduction and perpetuation of vicious risk cycles. Poor waste management therefore causes spatial vulnerabilities and socio-economic marginalisation especially of informal residents in Freetown, in turn limiting recognition and participation of the urban poor in designing and implementing interventions.

Spatialising Freetown's Waste Management System and Related Hazards

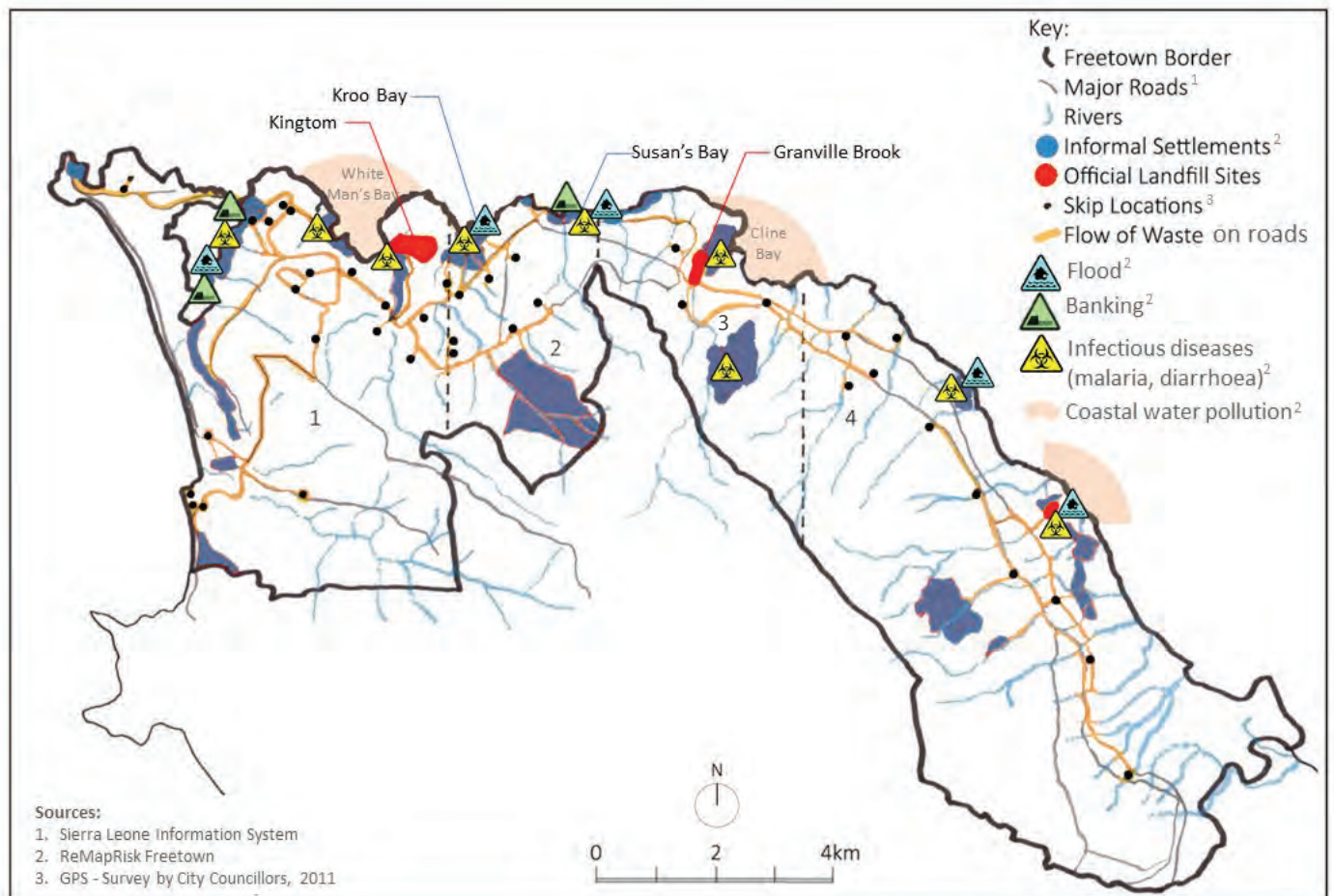


Figure 2: Spatial mapping of formal waste management systems, waste flows, and significant related hazards

This map identifies Freetown's official waste collection and distribution system, currently run by Freetown Waste Management Company (FWMC). As illustrated by the orange flow line, trucks transport the waste (with 6m³ skips) along major roads which are connected to landfill sites. The skips are connected to the main roads and the three official landfill sites. The frequency of waste collection is uneven across the four zones (1-4 on the map), depending on whether skips are located on major roads, which larger collection vehicles can access more easily. Informal settlements are not properly served by the official system and road network. Thus,

low-income groups are forced to dispose of waste through alternative means and/or use private waste collectors, unregulated by FWMC, that charge a fee depending on the neighbourhood. An overall improvement of the road network and distribution of skips may consequently alleviate this spatial injustice and the toll on those dwellers.

Moreover, it becomes clear that, in the absence of an inclusive waste collection system, rivers act as unofficial routes for the flow of waste from informal settlements. Consequently, waste flows to the sea and accumulates around coastal settlements,

causing water pollution. Coastal settlements such as Cline Bay, White Man's Bay, Kroo Bay located near landfills suffer especially from water contamination, exposing residents to higher risks of developing infectious diseases such as malaria and diarrhea.

As demonstrated in Table 1, the West of Freetown (Zone 1) has the highest collection rates, with 1000 more monthly skip collections than Zones 2-4, despite a significantly lower population density. Western Freetown was originally the preferred location of European settlers during colonialism and remains to this day the wealthier part of the city. The hazards related to poor solid waste management can be alleviated if the distribution of skips and collection services reflect population density rather than affluence.

	Location	Estimated Population	No. of Skips	Monthly Collection Rates	Total Monthly Collections	Pop. Per Skip Collection
Zone 1	West	410,000	26	50	1300	315
Zone 2	Central West	285,000	8	25	200	1425
Zone 3	Central East	210,000	9	20	180	1167
Zone 4	East	200,000	11	30	330	606

Table 1: Waste Collection and Population Served (adapted from: Sood, 2004)

It is important to note that this map does not show all waste generated, much of which is burnt, dumped and buried informally for lack of other disposal options. There are estimated to be 500 illegal dump sites across the city: 70-75% of these are in the East. Official collection accounts for a maximum of only 40% of total waste generated in Freetown, although this figure could be significantly lower (Abarca and de Vreede, 2013).

Formal Waste Management Practices

	2003-2005	2007	2012-2017	2017		2018
Actor	National Youth Multipurpose Cooperative Society (NYMCOS)	Klin Salone	Masada Waste Management Company	Operation Clean Freetown	Freetown Waste Management Company (FWMC)	Monthly Clean Up Day Initiative
Collection	Door to door collection.	Youth groups charged with the collection of waste.	Door to door collection funded by subscription fees.	Door to door collection, bin installation and more collection points.	Door to door collection funded by subscription fees.	Citizens to clean up the waste surrounding their homes.
Treatment	n/a	n/a	n/a	n/a	Separated and sent to Guinea for recycling.	n/a
Disposal	n/a	n/a	n/a	Compacting landfills to create more space.	n/a	n/a

Table 2: Governmental Waste Management Practices 2003-Present

Table 2 summarises government-led waste management activities to date and shows the inconsistency of official waste management in Freetown. The lack of a consistent central governing body has created a distinct lack of direction on waste treatment and disposal strategies. In May 2003, the National Youth Multipurpose Cooperative Society (NYMCOS) was formed by the Ministry of Youth and Sports (MoYS). The MoYS assigned voluntary waste collection duties to the NYMCOS that included the cleaning of public spaces, streets and gutters. The Klin Salone youth organization was then founded in 2007 to coordinate youth groups in communities to collect and transport waste. However, this project was terminated due to financial and logistical constraints (Gogra et al., 2009).

Masada was charged with the waste management of Freetown in 2012. The company implemented a door-to-door collection system that was funded through a subscription fee. Yet, Masada effectively stopped their operations in the city and terminated their contract in 2017, though it was meant to last 49 years, when Freetown defaulted on their payments (Dumbuya, n.d.). Later that year, the FWMC took over the management of waste from Masada and separated it to be sent for recycling in Guinea.

In 2017, the government, with several partnerships, launched Operation Clean Freetown as a post-Ebola development initiative. The program was set to unfold in

phases, starting with an increase in waste collection points and micro-enterprises of door-to-door waste collection led by youth, who would, as part of phase two, implement subscription fees for households benefiting from regular waste collection. FCC committed to enforce local by-laws to ensure the program's success. The extent of the implementation of these phases and their effectiveness, however, is hard to measure. In 2018, President Julius Maada Bio established the first Saturday of every month as a clean-up day, which suggests that continuous efforts are needed. However, most waste collected has usually been dealt with by burning in open fires, thereby potentially creating more health hazards.

Another recent governmental effort is the 'Cleanest Zone Competition' launched by the FCC in October 2018. This competition encourages community participation in waste management through government compensations. Thus, it raises awareness about the importance of proper waste management and community stewardship. The cleanest and most improved zone will be rewarded, in January 2019, with four government-sponsored improvements: 10 solar-powered street lights, 1 water point, 500 meters of road paved with recycled plastic outdoor tiles, and 10 scholarships to complement the quality free education initiative (FCC, 2018).



Photo 2: National cleaning day in Sierra Leone (BBC, 2018)

Foreign Intervention

	1980-1990	1995-1999	1999-2002	2014-2015	2017-Present
Actor	<u>Kreditanstalt fuer Wiederaufbau</u> (Germany)	World Bank	British Government	UNDP, Global Environment Facility (GEF) & WHO.	UNDP
Aid Provided	10 skip trucks 2 tippers 2 front-end loaders 3 monitoring vehicles 1 truck bulldozer	2 skip trucks 2 monitoring vehicles 30 skip containers	4 skip trucks 3 cesspit emptier trucks 2 tippers	Ebola response: Sterilization of medical equipment and victim burial assistance	150 youths trained in recycling

Table 3: Foreign Intervention: 1980's - Present.

International organizations have played an important role, particularly in post-recovery times. From 1980-2002, Freetown received various types of equipment (see Table 3) from Germany, Britain and the World Bank, however poor maintenance has led to their deterioration. Additionally, the nature of the equipment made it large and therefore unsuitable for use on Freetown's narrow roads.

Foreign intervention minimised the impacts of the 2014 Ebola epidemic. Prior to their intervention Kingtom landfill was being used as a burial site for Ebola victims, preventing waste picking activities and hence leading to a waste accumulation crisis (Bronner, 2014). The presence of UNDP, WHO & GEF was critical in aiding residents to properly treat and bury bodies and with the sterilisation of medical equipment (Douillet, 2014).

A 2017 UNDP programme tackling solid waste management is also in operation. The \$400,000 project has engaged 150 youth (80% women) with skills to add value to solid waste - turning plastic waste into bags, hats and mats; producing decorative floor tiles from plastic; and making bio-charcoal briquettes from organic waste in Old Wharf, Culvert and Cockle Bay (UN, 2018).

Composting is an efficient waste management strategy as it is cheap and environmentally sustainable. Although most solid waste generated is organic (70%), official composting capabilities in Freetown are poor (Abarca and de Vreede, 2013). To reuse and contain this would be a significant step forward in the reduction of waste accumulation. However, composting is limited to two drying beds for liquid waste located within the Kingtom landfill site. These were built in 1994, no longer function properly, and when used leak refuse into the surrounding areas (Preneta, 2015).



Photo 3: A woman in Freetown makes bags from recycled plastic. (Conteh, 2018)



Photo 4: Women separate organic produce in their settlement to produce compost. (United Nations Sierra Leone, 2017)

Informal Waste Management



Photo 5: Boys walk in a river to collect scrap metal in Kroo Bay, Freetown. (Kari, 2017)

Informal waste management practices exist across Freetown in a variety of forms. They replace lacking formal policies and collectively contribute significantly to an informal economy. Firstly, there are numerous recycling practices by individuals across Freetown that mirror the UNDP projects. Plastic is collected as a valuable resource and transformed into new products. In Cockle Bay, women go door to door to buy plastic waste and weave it into useful accessories such as bags and hats (Roussos, 2015).

Plastics recycling equally represents a valuable opportunity for local businesses. Le Plastics, a waste management company with a plastic recycling plant in Kingtom, sorts, cleans and recycles all types of waste plastic to sell in baled, flaked and pelletized form, or as a biodegradable compost. The company also uses plastic to cover roads which they argue is critical to improve accessibility. They are working on establishing distribution of bins to homes or companies for only plastic waste collection as it is more efficient to sort at the source and reduces the number of people waste picking as a livelihood (which comes with extensive risks). The group is hoping to continue establishing micro-recycling businesses which integrate environmental management with livelihood support in Freetown and beyond (Le Plastics, 2018).

Waste collection is a profitable business as there is a global market for it. In Freetown, the Sogi Scrap Yard, a group with headquarters in Hong Kong, regularly purchases iron to sell abroad. Other scrap dealers ship brass, iron and copper to Asian countries (such as China and India) while aluminium stays in Sierra Leone to be

repurposed. Plastic bottles are shipped to China, slippers and plastic sachets to Guinea, and textiles are collected by waste pickers and kept for personal use (Abarca and de Vreede, 2013).

With a distinct gap in official composting practices shown above, new initiatives have appeared in Freetown to that effect.



Photo 6: Waste picking along the coast of Freetown. (Smith, 2018)



Photo 7: Recycled plastic bag production. (UN Sierra Leone, 2018)

In Bo City and Makeni, youths are tasked with collecting organic waste, which they turn into small balls of combustible material to replace coal. Not only is it cheaper and more environmentally friendly, it helps to clean up their communities. Similarly, 'Alice and Charles Organic Compost' is a small enterprise that pays local youths to collect household waste which is then turned into organic fertilizer to sell to local enterprises. These developments improve living standards through the reduction of waste, pollution and health hazards, and creating by creating employment and revenue (WASH Learnings, 2015). They should perhaps be explored in areas of the city. It could also be suggested that the FCC partake in and further such projects rather than relying solely on the local communities.

While the informal activities of waste pickers on the two official dumpsites is well documented, information on organised community-based organizations (CBOs) is lacking, despite their importance in coordinating waste management practices in Freetown. For example, the Culvert area has its own waste management committee. The above mentioned Klin Salone youth organization was able to implement waste management practices with the help of the Dumpsite Scavenger Association, a group of 25 waste pickers on Granville Brooke.



Photo 8: Plastic separation for recycling. (UN Sierra Leone, 2018)

Conclusion

Solid waste generation in Freetown far exceeds collection and management capacities. Reducing environmental health risks associated with the multi-hazards of solid waste management is a priority. With significant job unemployment, thousands of the city's residents make a living out of waste; whether by banking their homes, or selling scavenged plastics, cans, metallic objects. Investing in recycling initiatives could deliver several co-benefits such as generating income in a circular economy model while contributing to reduce waste. Community participation, involvement and integration of the rapidly growing informal waste sector into municipal waste management strategies could improve the current situation. At the same time, it could contribute to sensitising the population on maintaining their community's cleanliness, as well as regulating scavenging on landfills, which increases people's risk of contracting infection diseases. In this sense, we emphasize the importance of raising awareness and supporting community engagement through government projects such as the Cleanest Zone Competition launched in 2018. Through this along with the upscaling and replication of innovative recycling initiatives such as the UNDP-supported program, lie opportunities to close Freetown's circular waste management loop.

Recommendations

1. Strategic intervention is required to upgrade current infrastructure of official waste collection system. Improving road networks and adjusting skips and dumpsite locations could significantly contribute to a more spatially just and efficient flow of waste. Also, participatory mapping could serve as a tool to collect more accurate data on waste generation and flow, and this information can be used for future planning.

2. Supporting recycling programs such as Le Plastics, an initiative that is currently distributing bins to homes and other start-ups for plastic-only collection is recommended. This could increase efficiency in waste collection and ease the burden on informal waste pickers. In addition, the processing of bio-degradable (organic) materials – food waste, cardboard, paper – could significantly reduce waste accumulation and further upgrade composting.

3. Enabling CBOs (Community-based Organisations) through government incentives and external organisations to raise awareness, build local capacities and enhance community based solid waste management.

4. Education is crucial in building the local capacities of the residents of Freetown, by enabling the maintenance of proper waste management practices, independent of international aid. Through government incentives, programmes such as the Cleanest Zone Competition can be transformative in fostering community stewardship and waste management.



Photo 9: Participatory mapping in Freetown as a data-collection method. (SLURC, 2017)



Photo 10: Le Plastics working on a new warehouse in Kingtom landfill site. (Le Plastics, 2018)



Photo 11: A healthworker in Dwarzack, Freetown, educating locals on sanitation methods. (Fox, 2017)

Acknowledgements

We would like to express gratitude and thanks to the professors and staff at the Development Planning Unit (DPU) of University College London (UCL), who played a crucial role in the successful completion of this brief. In particular we would like to acknowledge the support of Dr. Adriana Allen and Ms. Rita Lambert who provided continuous guidance, for which we are incredibly grateful. We also appreciate the help of Mr. Alexander Stone who shared his personal experiences from Freetown with us during the preparation of this document.

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