Energy Solutions For Displacement Settings Project - Kenya

A Scoping Study on Status of E-waste in Kakuma and Kalobeyei
Summary Report on the key findings

Support to UNHCR in facilitating the operationalisation of the Global Compact on Refugees in the Humanitarian-Development-Peace Nexus

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SNV

WEEE CENTRE
Managing e-Waste for a Safe Enviroment

Acknowledgement

The scoping study was undertaken by GIZ Kenya in partnership with the Netherlands Development Organization (SNV) and the Waste in Electrical and Electronic Equipment (WEEE) Centre under the Energy Solutions for Displacement Settings (ESDS) project, which is part of the German Federal Ministry for Economic Cooperation and Development (BMZ) commissioned programme, Support to UNHCR in Facilitating the Operationalisation of the Global Compact on Refugees in the Humanitarian-Development-Peace Nexus.

The study was carried out in 2024 to understand the status of e-waste in the target locations, including, the types of e-waste and waste management practices in those locations, as well as the major contributors and actors in the value chain. The findings were used to inform the design and delivery of e-waste management campaigns and training measures targeting appliance vendors and users such as households, businesses, and social institutions in the locations.

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Design/Layout:
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Nairobi, August 2024

Table of Content

List of figures

1. Introduction

Electronic Waste (e-waste) is rapidly becoming a major global issue, driven by the increasing demand for electronic devices due to rising incomes, urbanization, and industrialization. Unfortunately, many electronic devices have short lifespans and are often seen as difficult or costly to repair. Brands invest heavily in promoting the latest models, rendering older technology obsolete, even if it still works. The proliferation of Electrical and Electronic Equipment is undeniable and necessary worldwide, but it has also led to a substantial increase in discarded equipment. Technological advancements have further shortened the lifespan of Electrical and Electronic Equipment products, resulting in more devices reaching their End of Life. These discarded products collectively constitute electrical and electronic waste or e-waste.

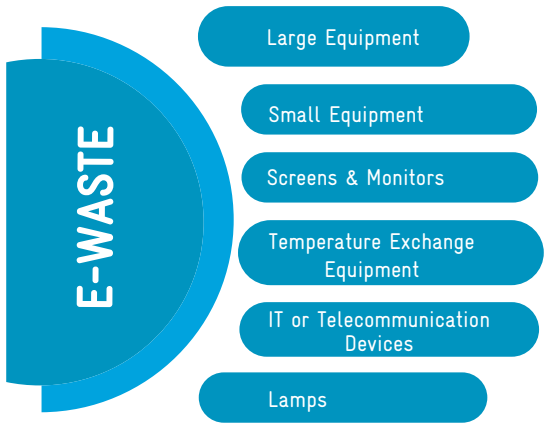

Figure 1: *Categories of e-waste*

E-waste can be categorized into six main types: large equipment, small equipment, screens and monitors, IT or telecommunication devices, temperature exchange equipment, and lamps. Unfortunately, the escalating quantities of e-waste pose a global threat due to their potential environmental and health hazards when mishandled. E-waste contains a wide array of hazardous substances that can harm both public health and the environment. However, e-waste is not solely a source of toxic materials with adverse environmental and health impacts.

It also contains valuable materials that the recycling sector in many countries is keen to recover due to their high economic value. These valuable materials include precious metals like gold, silver, and platinum, base metals such as copper and zinc, and rare earth minerals like cerium and neodymium. These materials hold economic significance for industries and recycling companies, helping to reduce the depletion of natural resources and promote a circular economy.

In Kenya, a sustainability challenge looms due to the surplus of non-recycled e-waste and a high youth unemployment rate. Annually, Kenya generates a staggering 51,300 tonnes of e-waste, with only 1% undergoing formal recycling[1]. The remaining 99% ends up in dump sites and waterways, leading to soil, water, and air pollution, and ultimately entering the food chain. Most of this e-waste remains stockpiled in homes, offices, and storage facilities due to limited awareness and recycling options.

The issue of Electronic Waste (e-waste) is particularly acute in vulnerable communities such as the Kakuma and Kalobeyei refugee settlements.

These regions have experienced a surge in electronic products, particularly solar devices, distributed by development partners or sold by private sector companies to meet essential energy needs.

However, as time progresses, these products either malfunction or reach their end-of-life, creating a pressing challenge of e-waste management.

The lack of proper disposal channels exacerbates this issue, leading to widespread pollution and environmental degradation.

[1] https://www.nema.go.ke/index.php?option=com_content&view=article&id=348&Itemid=534

The accumulation of e-waste not only poses significant health risks to the refugee population but also threatens the surrounding ecosystem. Without intervention, the improper disposal of e-waste could lead to severe health problems for refugees and further exacerbate their already challenging living conditions.

End of Life Electrical and Electronic Equipment or e-waste are processed and disposed using crude methods such as dumping in open land spaces or refuse dumps as well as open burning as currently operational in large dump site and other informal settlements in Kenya.

The rate at which scavengers are found on the heaps of the electronic wastes show that some of the electronic users do not understand the hazards associated with the use of faulty electronic equipment dumped haphazardly at electronic markets and dumpsites. It is however, unfortunate that e-waste contain hazardous chemical substances which include heavy metals: lead, mercury, cadmium and persistent organic pollutants such as Polychlorinated Biphenyls and Brominate Flames Retardants. These toxic chemicals may be released into the environment with the crude disposal methods in use and in the process cause high risks to human health and the environment as some of these toxic constituents are carcinogenic and endocrine disruptors.

Figure 2: *Examples of e-waste*

Electrical and Electronic Equipment are made of a multitude of components, some containing toxic substances that have an adverse impact on human health and the environment if not handled properly. Often, these hazards arise due to the improper recycling and disposal processes used. It can have serious repercussions for those in proximity to places where e-waste is recycled or burnt. E-waste is often categorized into three types, white goods refer to household appliances, brown goods emanate from audio and visual appliances while grey goods are mostly drawn from ICT devices. Waste from the white and brown goods is less toxic as compared with grey goods[2]. A computer contains highly toxic elements like lead, cadmium, mercury, beryllium, polyvinyl chloride and phosphor compounds which are hazardous to human health.

These toxic chemicals may be released into the environment with the crude disposal methods in use and in the process cause high risks to human health and the environment as some of these toxic constituents are carcinogenic and endocrine disruptors.

Some of them can cause lung diseases called beryllicosis or lung cancer, primarily through inhalation; damage to vital organs such as the brain and kidneys. Weak technical capacity and lack of appropriate institutional framework are challenges that could hinder adequate e-waste management.

[2] E-waste is often categorized into three types, white goods refer to household appliances, brown goods emanate from audio and visual appliances while grey goods are mostly drawn from ICT devices.

2. Status of e-waste in Kakuma and Kalobeyei: A scoping study

2.1 Objectives of the Study

This scoping study sought to delve into the multifaceted realm of e-waste in Kakuma and Kalobeyei, unraveling critical insights that will inform strategies for responsible disposal and resource utilization. The objectives of the scoping study were to:

- Identify the different types of e-waste in existence, for example lanterns, solar home systems and off-grids.
- Identify the major contributors of the e-waste including vendors and users.
- Identify the e-waste value chain actors, roles, and interlinkages at the different levels.
- Gather information on the current e-waste management practices including barriers and drivers to influence appropriate e-waste management practices.
- Gather information on product functionalities to help users and vendors determine the products' end life to facilitate proper disposal.and on-grid appliances.

2.2 Study Methodology

The scoping study was exploratory and cross-sectional in methodology. This approach was suited in exploring the status of e-waste, a multidimensional construct, particularly in Turkana County (Kakuma refugee camps and Kalobeyei refugee settlement). The methodology ensured that appropriate data was collected to comprehensively address information needs that would guide decision making. A secondary literature review of existing local, national and global resources on e-waste management with an emphasis being placed on the avoidance or minimization of field data collection to the most necessary data gaps required to inform the overall subsequent activities of designing and running a targeted e-waste management awareness campaign and vendors/end-users training needs. Where there was no existing data, or incomplete, incomprehensible or unreliable, or needed to be supplemented or broken down before becoming relevant to the scoping study objectives, the researchers treated such data as not available and applied the primary data collection methodology to obtain the precise data needed. This methodology employed both quantitative and qualitative data collection techniques comprising household, business and institutional randomly sampled surveys, and key informant interviews.

During the data acquisition period, the researchers developed selective perception of the entire e-waste management sector. By doing this, the methods were fine-tuned to observe and describe very specific aspects of e-waste management in Turkana West (Kakuma refugee camps and Kalobeyei refugee settlement). To have an overview of important data that were obtained during the data acquisition phase, a summary of sources of information as well as key figures have been listed.

2.3. The Survey Sample

Out of a target sample of 180 interviews, 217 interviews were achieved with households in Kakuma and Kalobeyei (167), Institutions (33) and SMEs/Entrepreneurs (17). The achieved sample is as broken down below with 59% being male respondents while 41% were women.

Category	Target	Achieved
Households	153	167
▪ Kakuma	93	99
▪ Kalobeyei	60	68
SMEs	9	17
Institutions	18	33
▪ Government Entities	3	1
▪ Learning Institutions	6	14
▪ NGOs	9	18
TOTAL	180	217

Figure 3: *Survey sample*

Most of the surveyed households (54%) reported a monthly income of KES 5,000 (approx. USD 40), 33% reported earning above KES 30,000 (approx. USD 230), whereas 11% generated between KES 10,000 – 20,000 (approx. USD 77 - 153). In terms of education 74% of the respondents had attained primary school education, 13% had attained secondary school education, 7% had a college certificate, while 4% had a university degree; only 2% had not attained any form of education. In terms of employment status, the survey covered unemployed (50%), students (21%) and employed (23%).

In terms of age, 9 of the surveyed entrepreneurs were between 30 - 39 years whereas 8 were youth aged 18 - 29 years. With regards to education attainment, 10 of the surveyed entrepreneurs were college graduates whereas 7 admitted having a secondary school certificate.

70% of the surveyed institutions were from Kakuma, while 30% were in Kalobeyei. In terms of the category of the institutions 55% were NGOs, 42% were learning institutions whereas only one was a government entity.

2.4 Key findings

This section provides a summary of the main findings. It is worth noting that the findings presented are based mainly on field data collected from Kakuma refugee camps and Kalobeyei refugee settlement only, the host towns were not surveyed. However, this report has also attempted to provide insights of the situation at the host villages informed by secondary data and WEEE Centre's growing local presence and interventions on e-waste management within the study locations.

1. Awareness of e-waste: Among surveyed households, only 28% were aware of e-waste, with a majority (72%) encountering the term for the first time. Younger age groups showed higher awareness. Conversely, nearly 50% of surveyed entrepreneurs had prior knowledge of e-waste. A past environmental impact assessment in select host communities within Turkana County also identified low awareness levels amongst households regarding e-waste and a disparity across age groups.

2. Ownership of electronic devices and those not in use: The main electronic items owned by surveyed households included smartphones, non-smartphones, televisions, and audio devices. On the other hand, most entrepreneurs reported to own smartphones, non-smartphones, audio devices, microwaves, and desktop computers, with unused devices also including desktops, laptops, televisions, and audio devices. Common electronic devices found in offices include laptops, desktops, printers, telephones, and fans. Key to note is that individual households and businesses were identified as the primary sources of discarded electronics brought in by the surveyed entrepreneurs. Figure 4 below shows a summary of devices reported as currently not in use by the entrepreneurs.

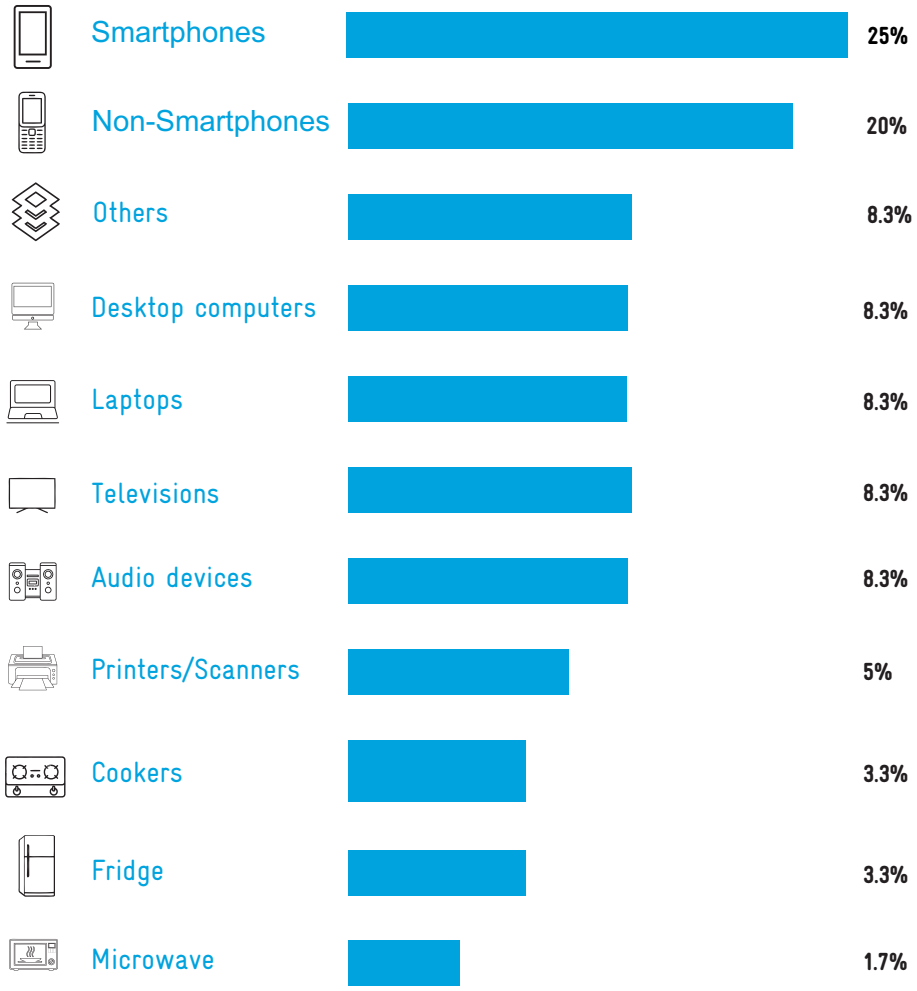

Figure 4: *Electronic devices owned but not currently used by entrepreneurs*

3. Common methods of discarding e-waste: Households primarily disposed off spoiled electronic devices by throwing them away (20%), keeping them (15%), donating them (14%), selling/trading them (14%) and disposing them for free (12%). Among entrepreneurs, the reported e-waste disposal mechanisms included incineration or burning (35.3%), collection by private firms (17.6%), retention (17.6%), landfill disposal (11.8%) and selling them (11.8%). On the other hand, surveyed organizations reported disposing off devices through donations, via informal collectors and licensed recyclers like the WEEE Centre. It is interesting to note that only 13% of households knew about the existence of the WEEE Centre, and only one entrepreneur

reported knowledge of the same. Institutions, however, seemed slightly more knowledgeable with 21% of them confirming they had heard and knew about WEEE Centre's operations in the area. The awareness was higher among NGOs than learning and government institutions.

4. Reasons for non-utilization of e-waste management services: Beside a lower lack of awareness on e-waste services, other reasons reported by surveyed households and entrepreneurs included lack of convenient disposal locations (23%) and high service costs (11%). The respondents also expressed safety concerns regarding such services as shown in figure 5 below. These barriers require a multi-faceted approach involving public awareness campaigns, infrastructure development, and policy interventions.

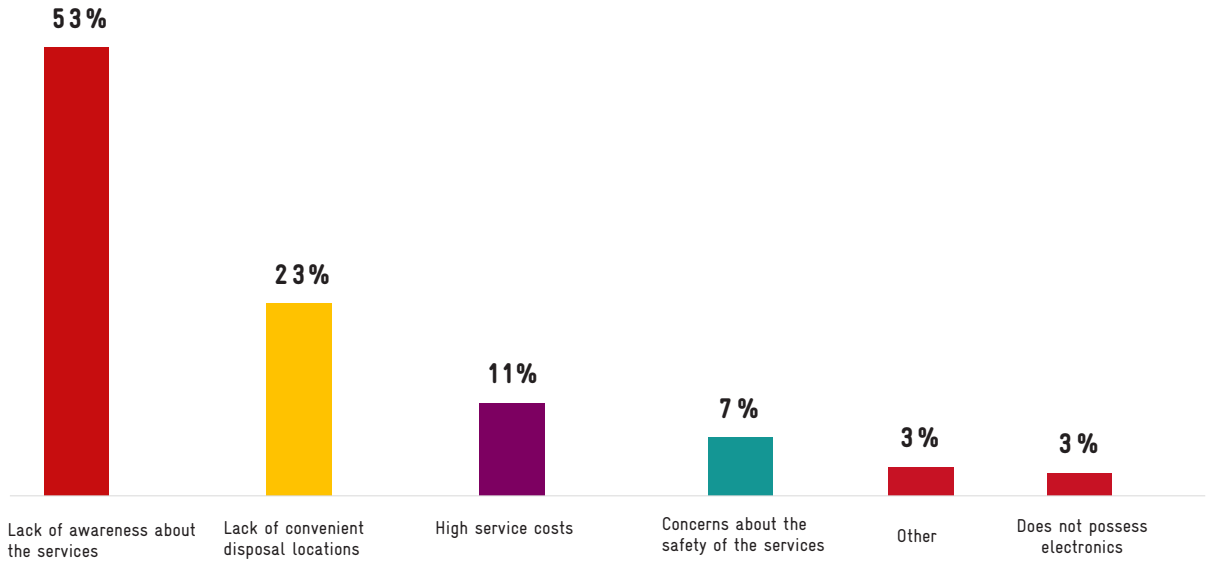

Figure 5: *Reasons for not using e-waste management services*

5. Responsibility for e-waste disposal within institutions: Surveyed institutions mentioned administrative offices, Centre managers, ICT persons and logistics officers as the main departments or personnel responsible for e -waste disposal at organizational level. It was also evident that some institutions have specific committees charged with this responsibility as shown in figure 6 below. A further analysis of the findings indicated that existence of committees is more prevalent in Kakuma than Kalobeyei. By assigning specific roles and responsibilities to these key individuals and departments, organizations can effectively manage e-waste disposal and ensure compliance with environmental regulations. Additionally, fostering collaboration and communication among different stakeholders can help streamline e-waste management processes and promote a culture of sustainability within the organization. The study did not establish who takes the key responsibility in ensuring e-waste management at household and businesses level, given the earlier finding that these segments indicated limited awareness of the existence of e-waste management services, among other concerns earlier indicated in figure 5.

6. Existence of e-waste management policies or strategies: Asked whether the institutions had their own e-waste management policy or strategy in place, 55% of the surveyed institutions indicated that they did not have

an e-waste management strategy/ policy, 21% highlighted they had a strategy, 15% had a policy while 9% had both a policy and a strategy. This suggests that a significant proportion of institutions may not have comprehensive frameworks in place to guide their e-waste management efforts.

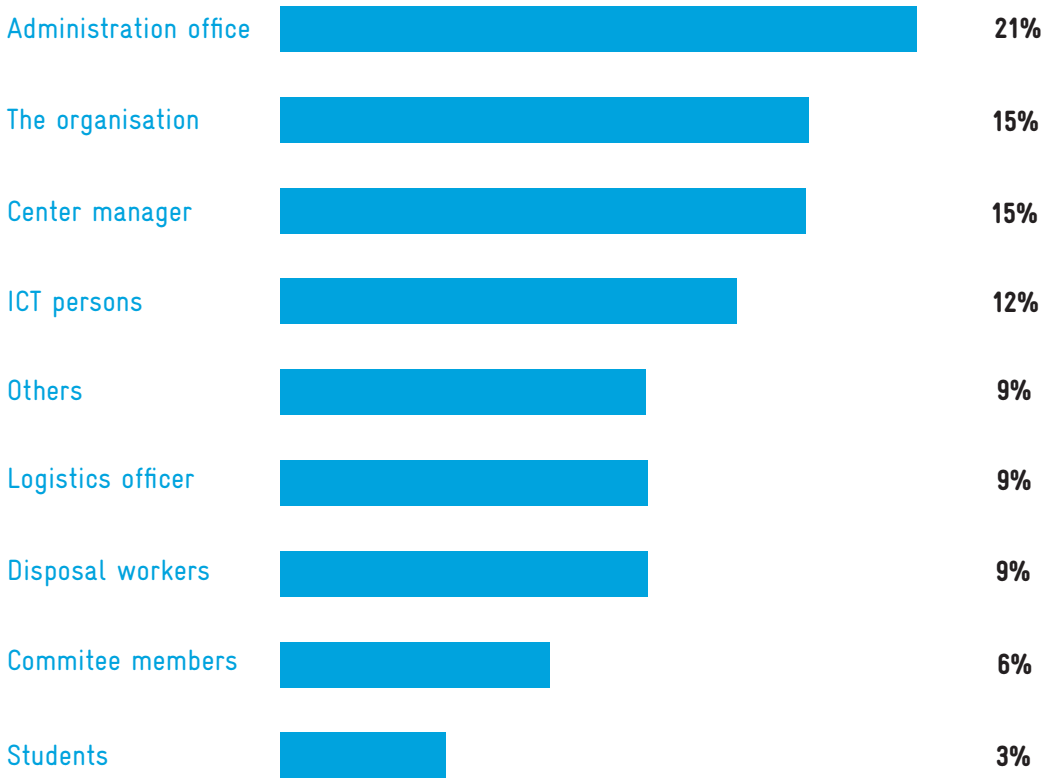

Figure 6: *Existing structures for e-waste disposal among surveyed institutions*

7. Initiatives that can facilitate adoption of e-waste management services in displacement settings: 29% of respondents reported that having an increased understanding of the harmful effects of improper handling of e-waste, for example effects on the environment, could encourage their adoption of e-waste management practices, with more men than women citing this. This was closely followed by a suggestion to increase awareness campaigns as reported by 27% of respondents (where more women than men shared this perception) and ease access to collection points or pick up services at 22%. Implementing these three key initiatives requires collaboration among government agencies, environmental organizations, businesses, and communities. By prioritizing education, awareness, and accessibility, stakeholders can work together to promote responsible e-waste disposal practices and mitigate the adverse environmental and health impacts associated with improper e-waste management. These findings also highlight the importance of tailored approaches to engage different demographic groups and gender in e-waste management initiatives.

8. Sources of information on e-waste management services: Among household respondents who reported knowledge of e-waste management services, it was established that this information was obtained mainly via social media (21%), radio broadcasts (17%), word of mouth (17%), TV broadcasts (8%) and community gatherings (8%) respectively. Businesses suggested that the use of community gatherings and establishment

of a local education center as powerful tools to improve the accessibility of information locally. A multi-channel approach in dissemination of information, leveraging a combination of social media, radio broadcasts, television programs, and community outreach initiatives can therefore be adopted to run effective awareness or educational campaigns. Detailed findings are as presented in figure 7 below. The social media platforms of WhatsApp (28%), Facebook (16%), YouTube (16%), TikTok (14%), and Instagram (9%) were revealed as the most often used/accessed platforms for receiving news in general.

Figure 7: *Reported sources of information on e-waste management service*

9. Incentives to promote e-waste management: The study sought to establish whether there were incentives that can be introduced or promoted to enhance behavioral change and adoption of e-waste management practices in Kakuma refugee camps and Kalobeyei refugee settlements. The key incentives suggested are cash tokens (56%), product awards in exchange for awareness creation (20%), employment opportunities (8%), and ease in accessibility of devices or equipment that require e-waste management services (8%). These incentives underscore the diverse motivations and preferences of individuals when considering participation in e-waste management initiatives.

By tailoring incentive programs to align with these preferences and needs, stakeholders can effectively encourage greater adoption of Waste Management Services and promote sustainable practices in electronic waste disposal.

10. Willingness to pay for e-waste services: While respondents cited the need for incentives to increase e-waste management practices. It was important also to analyze the willingness to pay for e-waste services as charged by service providers. The findings indicate that 88% of the surveyed institutions admitted being willing to dispose of e-waste at a fee. This was more defined for institutions in Kalobeyei than Kakuma. The government institutions indicated a lower willingness to pay for reasons cited as either the responsibility of e-waste management as already bestowed on somebody else, or the institution is not allowed to dispose e-waste at a fee. The disparity between institutional responses may be attributed to various factors, such as differences in institutional priorities, budget constraints, or access to waste management infrastructure and services. On the other hand, 71% of the surveyed entrepreneurs were willing to pay someone to collect e-waste. Those that were less willing cited that the main reasons they would not pay to have their e-waste collected was because of lack of funds and since it does not directly benefit them. Understanding these differences can inform targeted interventions and support efforts to promote sustainable waste management practices across both locations and various clientele. The survey did not establish the willingness to pay by households and businesses, which is considered one of the study limitations.

3. Recommendations on e-waste management in displacement settings

- Launch targeted awareness campaigns specifically designed to enrich the understanding of e-waste especially among households and entrepreneurs, with a particular emphasis on reaching out to older demographics who may have limited awareness. Consider gender preferences when designing and running the campaigns.
- Use communication mechanisms leveraging on most preferred or frequently used channels such as social media, radio listenership and community gatherings.
- Enhance the accessibility of e-waste management services, the strategic establishing of disposal facilities in convenient locations and offering cost-effective service options.
- Introduce incentivization programs by e-waste management service providers aimed at motivating households and entrepreneurs to actively engage in proper e-waste handling and effectively addressing concerns surrounding the perceived high costs of these services.
- Encourage institutions to develop comprehensive e-waste management strategies/policies and provide targeted training and capacity-building programs to enhance their understanding of e-waste management and ensure compliance with relevant regulations and guidelines.