SWEEP - Solid Waste Management in Kakuma and Kalobeyei, Kenya

Final version of the Scoping study report
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WASTE

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Executive summary

The report presents a scoping study on the state of Solid Waste Management (SWM) in Kakuma Refugee Camp and the Kalobeyei Settlement, two of the largest refugee hosting areas in Kenya. Commissioned by Last Mile Climate and developed by WASTE, the study underscores the critical role that SWM plays in emergency response settings, particularly within refugee camps, where daily waste generation is significant and growing.

The report uses the Integrated Sustainable Waste Management (ISWM) framework to analyze the current SWM system across three key dimensions: ***stakeholders***, ***physical infrastructure***, and ***governance***. Stakeholders include national and local government bodies like the National Environment Management Authority (NEMA), County and National Governments, international organizations such as UNHCR and WFP, CBOs, the private sector (e.g., Mr. Green Africa), and the refugee and host populations. Despite these multiple actors, the study finds that solid waste services, including collection, recovery, and disposal, remain insufficient, with large amounts of waste being either openly burned or dumped in unauthorized areas.

The physical infrastructure for SWM in both Kakuma and Kalobeyei is inadequate. Probably waste generation is not very high, but existing collection services cover only a fraction of the population. Most waste is left unmanaged, leading to environmental degradation and health risks. Moreover, current efforts to promote recycling, especially plastic waste recovery, are still in early stages, though promising initiatives such as those led by Peace Winds Japan and the Danish Refugee Council (DRC) are laying a foundation for future improvements.

Key challenges identified in the report include a lack of reliable data on waste generation and composition, limited financial resources to scale up infrastructure, low public awareness about the importance of proper waste management, and an absence of a formal landfill or safe disposal site for residual waste. Additionally, the informal sector and local recycling initiatives face market distortions and logistical challenges, particularly due to the 700 km distance from Nairobi, where much of the recycling takes place.

However, the report also highlights several opportunities. There is growing interest among stakeholders to address SWM, particularly as part of broader efforts to create employment opportunities, improve livelihoods, and foster environmental sustainability in the refugee and host communities. The involvement of private sector companies like Mr. Green Africa in plastic recycling, combined with efforts to enhance local waste management capacity, holds significant potential for progress. Furthermore, innovative financial mechanisms, such as plastic credits and Extended Producer Responsibility (EPR) schemes, could unlock new funding streams to support sustainable SWM systems.

Based on the findings, the report offers several recommendations. It calls for the establishment of a coordinated SWM platform to align all stakeholders and develop a joint strategy. Additionally, it stresses the need for a detailed feasibility study, including waste characterization.

In summary, while significant challenges remain, a sustainable and inclusive SWM system in Kakuma and Kalobeyei can be realized. Such a system would not only improve environmental and public health outcomes but also contribute to local economic development by creating green jobs and recycling initiatives.

1. Introduction

An MOU establishes a cooperative framework between The Last Mile Climate, DRC and WASTE NL to establish SWEEP, the Partnership for Sustainable Waste Employment and Environmental Progress. SWEEP partnership, aims at scaling up waste management in displacement settings, such as refugee camps, while also creating green and decent jobs for people living in these areas. The partnership seeks to leverage the unique strengths and expertise of each organization to foster a multi-stakeholder platform that includes private sector waste companies, refugee-led organizations, UN agencies, government bodies, and other relevant stakeholders.

Kakuma, a refugee settlement in the North of Kenya has been chosen as starting point of the SWEEP partnership to improve the SWM system and creating green jobs at the same time. Therefore an exploratory field visit took place in September 2024 to assess the SWM situation in the refugee settlements and the host communities to obtain information about possible improvements and actors involved.

Solid waste management is a crucial component of any emergency response in any location globally. In a refugee settlement, waste is generated daily by the affected population, sector relief activities (construction material, facility waste, etc) and the functional activities of each organisation/agency active in the settlement (offices, warehouses, fleet workshop, hotels/guesthouses). Also in Kakuma solid waste management has become a major issue as quantities of waste are increasing and complexity of waste materials will require a major effort in operations.

The present report is the result of this scoping mission. It is a rapid appraisal based on a 5 days visit to the Kakuma refugee settlement and Kalobeyei, a stakeholder meeting in Kakuma and a consultation workshop in Nairobi and review of relevant literature. It presents the main features and enabled to elaborate key issues, opportunities and recommendations to improve the SWM system in both refugee settlements and host communities.

2. Starting points – setting the baseline

2.1 Present situation - ISWM analysis[1]

Integrated Sustainable Waste Management (ISWM) Model is a model that allows the analysis of the present situation of solid waste management in the Kakuma Refugee Camp (KRC) and Kalobeyei Integrated Settlement (KIS) and also the host communities of Kakuma town and Kalobeyei village. It acknowledges the importance of three dimensions (see figure 1):

1. All the **stakeholders (actors)** involved in solid waste management activities, including municipalities/host communties; regional and national governments; waste generators/service users (including industry, business, institutions and households); producers; solid waste service providers within the service chain and operators of the waste value chain (whether public or private sector, formal or informal, large or small); civil society and non-governmental organizations (NGOs); international agencies; etc.
2. All the **physical** elements (operational infrastructure) of the system, from waste generation through storage, collection, transport, transfer, recycling, recovery, treatment and disposal.
3. All the **governance** (strategic) aspects, including supporting policy and legal framework and capacity to develop and implement plans, appropriate financial supporting instruments to support its implementation and ensure financial sustainability, social aspects related to awareness raising, communication, as well as institucional capacity.

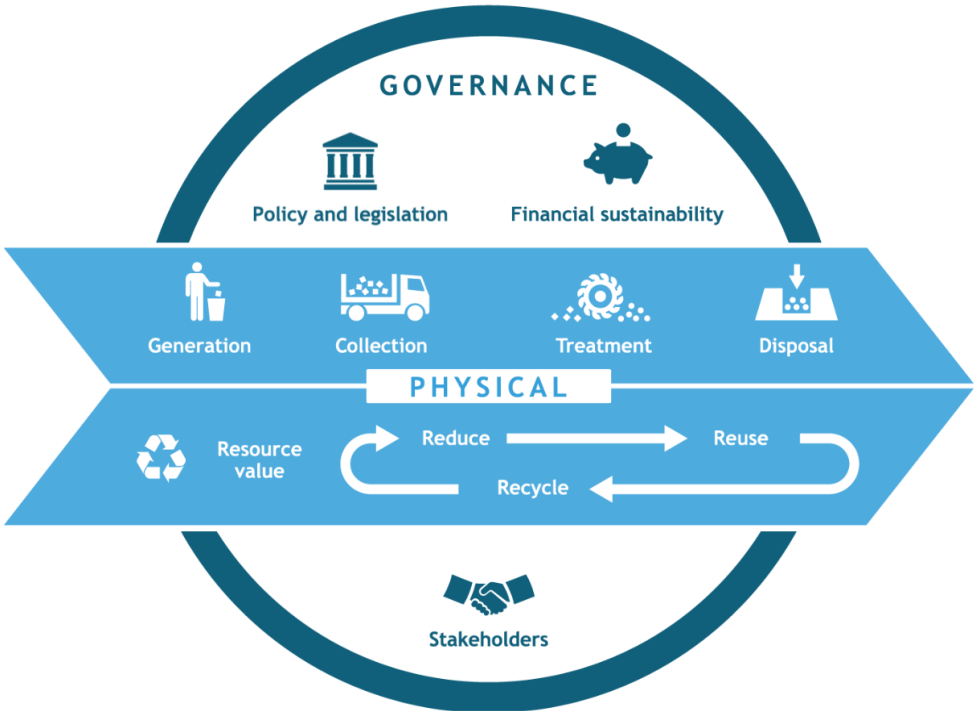

Figure 1. The Integrated Sustainable Waste Management (ISWM) framework

2.2 Stakeholders/actors involved

The main stakeholders of the Kakuma solid waste management system identified are:

[1] EAWAG and GWMO based on the WASTE ISWM model

Government

the following Government agencies are essential to consider when it comes to Solid Waste Management in the context of the Kakuma Refugee Camp and Kalobeyei Integrated Settlement :

National Environment Management Authority (NEMA) – is a Kenyan government agency responsible for the management of the environment and environmental policy. This includes development of regulations around solid and plastic waste management.

DRS (Department of Refugees Services) under the Ministry of Interior and National Administration is mandated by National law to undertake the management and assistance of refugees and asylum seekers in the Kenya. Among the major services offered by the Department of Refugee Services are to receive and register refugees and asylum seekers and to issue them with important documentation. They also have a coordination role in solid waste management.

Turkana County Government Turcana county is second largest county in Kenya and by law responsible for establishing solid waste management systems in the county.

Municipality of Kakuma The Municipality, officially created in February 2023, covers approx. 632 square kilometers (including the Kakuma Refugee Camp and Kalobeyei Integrated Settlement and also the host communities of Kakuma town and Kalobeyei village. The municipaliyt has taken over functions related to waste and land management, IDEP, water services, early childhood education (ECDE), child protective services, emergency services, and road repair.

Camp Management

The camp falls under the jurisdiction of the Kenyan Government and the Department of Refugee Affairs. Since the adoption of the Kenya Refugee Act in 2007, a CampManager has been appointed to oversee camp affairs and liaison with humanitarian agencies. The Act paves the way for the Kenyan Government to eventually assume full management of Kakuma Refugee Camp[2].

(International) NGOs

UNHCR is responsible for full administration of the Kakuma Refugee Settlement and therefore is responsible for provision of WASH services including solid waste collection services. Besides this, UNHCR is an important generator of solid waste materials in the camp by their provision of rations to the refugees in packaging materials such as tins, jerry cans and carton boxes.

WFP (World Food Program) is also a generator of solid and plastic waste due to their camphouse activities and provision of food rations to the refugees.

Peace Winds is a Japan-based NGO that works around various social issues around the world. In Kenya, Peace Winds Japan support refugees from neighbouring countries and host communities in Dadaab, Kakuma and Kalobeyei providing shelters, (drinking) water facilities and latrines. Since 2 years Peace Winds Japan has been given the responsibility to implement a solid waste management system and signs of infrastructure and collection mechanisms are present but not fully operational.

Turcana Christian Development Mission (TCDM): local organization working for more than 10 years on the empowerment of communities through sustainable development initiatives in education, health services, water and sanitation and relief of poverty. Are in charge of MRF operations (including crusher and baler) in the fair recycling project.

[2] About Kakuma Refugee Camp – KANERE – A Refugee Free Press

Image 1: The crusher active at the MRF operated by TCDM

GIZ/INTEGRATION consulting group provide capacaty building to create jobs by providing emplyement oriented skill training to refugees. Within the framework of their Promotion of Climate-related Environmental Education (ProCEEd) project GIZ is exploring the creation of jobs out of Climate Change issuses, environment, solid and plastic waste.
LWF (Lutheran World Federation) support CBOs in clean up campaigns and creating awareness environmental issues.
CBOs/local NGOS/Youth groups/SHGs/SACCOs active in clean up and collection of SWM in the Kakamu refugee settlement area

Private sector

Mr. Green a plastic recycling company in Nairobi producing secondary raw materials for the plastic manufacturing industry integrating informal Waste Collectors into their value chain by applying fair trade prinicples. Mr. Green Africa is the private partner in the fair recycling project together with Unilever.
Taka Taka solutions and other plastic recycling companies in Nairobi can provide a market for the plastic waste materials (rigid and flexibles) in the Kakuma area.
Other recycling companies In Nairobi several recycling companies are present which can provide a market for rigid and flexible plastic waste.
KEPRO The Kenya Association of Waste Recyclers; Activities: advocacy, education, awareness and communication campaigns.

Financial sector

IFC is interested in investing in waste management companies in the Kakuma Refugee Settlement which can provide solutions to sanitation and solid waste problems.
KKCF: Kakuma Kalobeiy challenge fund: Home - KKCF (kkcfke.org)

Informal sector

Kakuma is a refugee camp with its own informal economy including informal exchange and sales of food items but also collecting plastic waste items and selling them to aggregators.

Local population

The refugee and host population of Kakuma play an important role in the solid waste management system by generating and handling waste in the households and in their willingness to pay for delivered services.

SHGs, CBOs, youth groups, SACCOs

Several groups have been formed in the Kakuma refugee settlement undertaking cleanup campaigns and collection of solid waste. Piece Wind Japan has created xx youth groups from which xx are licenced to collect solid waste from shops and waste bins.

Kalobeyei Integrated Youth Progress: KIYP is an all- inclusive, non-partisan and nonprofit community-based organization working to implement sustainable programs that improve access to equal opportunity, development and lifesaving services now and for future generation.

2.3 The physical elements/infrastructure

The physical elements (infrastructure) of the system, starting from waste generation followed by collection, transport, transfer, recycling, recovery, treatment and final disposal. They are described for the solid waste management system of Kakuma refugee settlement in the next sections after the description of the demographics of location.

Geography, climate and demographics

Kakuma Refugee Camp is located in the North-western region of Kenya. The camp was established in 1992 following the arrival of the "Lost Boys of Sudan". During that year, large groups of Ethiopian refugees fled their country following the fall of the Ethiopian government. Somalia had also experienced high insecurity and civil strife causing people to flee.

Kakuma camp lies in a semi-arid climate where the temperature rises to as high as 40°C; it is very humid but dry due to which agriculture is difficult in the Kakuma camp. This led to a rift between the locals of Turkana and the refugees about cattle and land ownership. The refugees were not allowed to keep any animals which limited their source of income[3].

Kakuma has two areas of operation: Kakuma Refugee Camp and the Kalobeyei Integrated Settlement. Kakuma Camp is divided into four areas: Kakuma 1, 2, 3 and 4 whilst the Kalobeyei Integrated Settlement comprises of 3 villages: Village 1, 2 and 3. At the other site of the river is the host community: Kakuma municipality. According to the statistics provided by UNHCR *(Source: UNHCR 31 August 2024, https://www.unhcr.org/ke/what-we-do/reports-and-publications/kenya-operation-statistics* the population of refugees in Kakuma camp and Kalobeyei settlement is approximately 215,000 and 75,000 respectively (August 2024), representing 37% of registered refugees and asylum-seekers in Kenya. The countries of origin are primarily Somalia, South Sudan, Ethiopia and DRC, with 20 countries represented in the camps. The population of the local host communities in Kakuma is estimated between 50,000-65,000 and 20,000 for Kalobeyei (2018) (https://www.unhcr.org/ke/kalobeyei-settlement).

[3] Refugee Camp Kakuma: 10 Facts You Should Know - (re-thinkingthefuture.com)

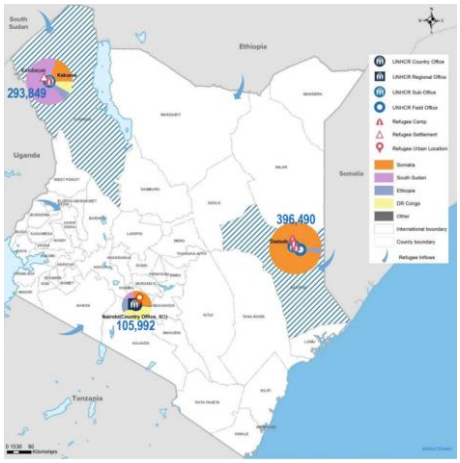

Figure 2: Map of Kenya with location of Kakuma Refugee Settlement in the Tukana County (Source: UNHCR 31 August 2024, https://reporting.unhcr.org/publications)

Food and Health Facilities in Kakuma

A 90-bed main hospital with the possibility and practice of referral to other hospitals in Kenya is set up in the camp. Additionally, there are a total of five satellite clinics with a total capacity of 520. Apart from the minority who were able to establish shops, the majority of residents in Kakuma depend on the food rations supplied for survival. The World Food Program (WFP) provides refugees with rations twice a month based on the nutritional value required. Since 2015 the WFP started using digital cash that gives freedom to the refugees in matters of the choice and variety of food options; which is also good for the local economy.

2.3.1 Solid waste generation and composition

Reliable information on Solid waste generation and composition is essential in order to plan a sustainable SWM system and to assess the requirements of all components such as storage facilities (containers or bins), transportation vehicles and a sanitary landfill site.

UNHabitat executed a limited characterization study in Kakuma and Kalobeye to determine the generation and composition of solid waste in this area[4]. Based on their findings they concluded that each person generates approximately 0.7 kg/day. However considering the income level of these communities and the fact that the sampling was only conducted for one day, this amount seems to be very high. In Cox bazar, a refugee settlement in Bangladesh, five waste characterization studies have taken place with a result between 0.110 up to 0.174 kg/cap/day. These results are more realistic taking into account the low financial capacity of the population. It is important to consider that the existing generation rate is likely to increase in the future with the development of the local economy and also will have a higher level of complexity due to the fact that more complex packaging material and innovative products will be brought to the camp community.

In the UNHabitat study plastic percentages varied between 11 and 20 % but again there is a uncertainty in these results based on the low sampling number, the high content of dust and ash in the sample and the low percentage of organic waste in the sample.

[4] Solid Waste Management in Kakuma and Kalobeyei, UNHabitat

2.3.2 Waste storage, collection, transfer and transport

Collection coverage in Kakuma Camp, Kalobeyei and the Kakuma municipality is very low. Peace Winds, an NGO from Japan, has started to capacitate youth groups to collect waste. They have been provided with a hand cart and training on separation at source. Peace Winds installed 235 sets of waste bins (organic and recyclables) at several places in the camp, Kakuma municipality and Kalobeyei. Some collection takes place from shops by the county but this seems very minimal. This is done by a private contractor hired by the county. The shops do not pay for the waste collection service.

Picture waste bins

Many households in the study area are not serviced with any form of waste collection and openly burn their waste or dispose it in nearby dumping places.

2.3.3 Waste recovery and recycling

Since beginning of 2023 Peace Winds and since July 2021 DRC started their activities in Kakuma creating awareness about the value in plastic waste, sorting and providing a market to plastic waste by involving plastic waste recyclers such as Mr. Green Africa and Taka Taka, both situated in Nairobi, at 700 km distance. Several aggregators in the refugee settlement and the host communities are now collecting, sorting and storing plastic waste, mainly rigid plastic and PET bottles.

2.3.4 Final disposal

There is one dumpsite located outside of Kakuma and Kalobeyei settlements. This site is used by contracted waste management companies that collect waste from shops, offices, hotels, etc. It is not used very often and waste burning is practiced. Several illegal dumpsites are situated in the settlements and the surroundings.

Image 2: One of the illegal dump sites in the Kakuma refugee camp

2.4 Governance (strategic) Aspects

In the following sections the main governance aspects will be discussed: the policy framework including the institutional framework and the financial aspects.

2.4.1 Policy framework

The following national regulations and strategies need to be taken into account when designing and implementing SWM systems in the camp and host communities:

The **National Waste Management Strategy 2015-2030** provides a framework for promoting waste reduction, reuse and recycling. The "Clean Kenya Campaign," launched in 2018, is an initiative to improve waste collection and raise public awareness about responsible waste management practices.

The Solid Waste Management Act 2022 is the first of its kind to comprehensively deal with waste management in Kenya in the framework of the circular and green economy moving the country towards zero waste goals whilst improving the livelihoods of 50,000 waste pickers in the country, as well as promoting investments in clean energy and agriculture, through waste-to-energy and waste-to-manure facilities respectively. It aligns with Kenya's Vision 2030 and the National Sustainable Waste Management Law, emphasizing the principles of reducing, reusing, and recycling waste (the 3Rs).

Refugee Policy/ Refugee Act Nov 2021

Despite Kenya being designated as a country that complies with the Comprehensive Refugee Response Framework, there is a fracture in the policy perspectives between the national and local government when it comes to hosting refugees. Whilst the the Refugee Bill of 2019 states that "Refugees shall be enabled to contribute to the economic and social development of Kenya by facilitating access to, and issuance of, the required documentation at both levels of Government", there is no mention of an issuance of work permits for those who have obtained refugee status, nor are rights given regarding self-employment or social security, which limit potential for refugee inclusion and for local communities to benefit fully from hosting refugees[5].

2.4.2 Financial aspects

It seems that solid waste management was overlooked to be taken care of in the Kakuma refugee camp and funds to establish infrastructure and operations to manage solid waste sustainably were not foreseen. Only recently, since 2023 two humanitarian organizations, Peace Winds and DRC, implemented solid waste projects with funding from Japan and Danmark.

The county government allocates a budget for Solid Waste Management[4] which is made available by the National Government but this seems not to be sufficient to establish the needed infrastructure in the host communities and certainly not in the refugee settlements. The baseline study of UN HABITAT[6] shows a very low willingness of refugees to pay for a reliable waste collection service due to unavailability of funds and low awareness of the perception of waste as a problem. The willingness to pay for collection services is a little bit higher in the host community.

[5] *210618_kakuma_kalobeyei_profile_single_page.pdf (unhabitat.org)*
[6] *Solid waste management in Kakuma and Kalobeyei, UNHABITAT, 11 July 2018*

3. Major SWM initiatives

In the Kakuma Refugee settlement 2 major initiatives are identified: the first one lead by Piece Winds Japan and the second one by DRC to implement Solid Waste Management systems with the help of several CBOs. Next to this, also on a global scale Solid Waste Management in emergency settings is gaining attention as is shown by the the WREC project and the Joint Initiative.

3.1 Project for Establishment of Decentralized Solid Waste Management System for a Recyclable Society – Peace Winds Japan

Government of Japan, launched a three-year project in March 2023. This initiative, known as the 'Project for Establishment of Decentralized Solid Waste Management System for a Recyclable Society,' aims to create a community-based, decentralized waste management system in Kakuma and Kalobeyei.

The project operates on six fundamental pillars:

1. Awareness and Education: Raising community awareness on waste separation and proper disposal practices.
2. Infrastructure Development: Installing waste collection bins, providing transportation vehicles, and establishing transfer stations.
3. Alternative Waste Management Pathways: Promoting composting of organic waste and engaging recyclers.
4. Partnerships and Collaboration: Strengthening coordination with UNHCR, government bodies, and local partners.
5. Community Engagement: Training local community-based organizations (CBOs) and waste management promoters.
6. Monitoring and Evaluation: Regularly assessing the project's impact and making necessary adjustments.

Key Achievements

- Training and Capacity Building: Around 150 people from community-based organizations and 250 waste management promoters have been trained.
- Infrastructure Installation: 235 sets of metallic waste bins and 254 plastic bins have been installed at key locations.
- Transportation Solutions: Ten tricycle vehicles and several hand carts have been provided to facilitate waste collection.
- Waste Management Plans: Each of the ten CBOs has developed waste collection plans, and markets have specific strategies to handle waste.

Additionally, 13 waste transfer stations are being constructed to improve the waste management infrastructure. Plans for the future include constructing a Material Recovery Facility (MRF) and a Plastic Recycling Plant to further enhance waste management capabilities.

3.2 The Fair Recycling Project

The Fair Recycling Project in Kakuma, Kenya, focuses on managing plastic waste in the refugee camp and surrounding communities. This initiative aimed to address the growing challenge of plastic pollution while promoting sustainable practices and community engagement.

Key aspects of the project include:

- **Plastic Waste Collection and Sorting**: The project establishes systems for collecting and sorting plastic waste, encouraging community members to participate actively in recycling efforts.

- **Training and Capacity Building**: Participants receive training on effective waste management techniques, including how to recycle plastics and create value-added products from waste materials.

- **Job Creation**: By setting up recycling operations, the project generates employment opportunities for local residents and refugees, helping to improve livelihoods.

- **Environmental Awareness**: The initiative raises awareness about the environmental impacts of plastic waste, promoting responsible waste disposal and encouraging community members to reduce plastic usage.

- **Community Cohesion**: The project fosters collaboration between refugees and local residents, enhancing social ties and creating a shared sense of responsibility for environmental stewardship.

Overall, the Fair Recycling Project in Kakuma not only addresses plastic waste management but also empowers individuals and promotes a more sustainable and resilient community.

3.3 WREC

WREC (Waste management & measuring, Reverse logistics, Environmentally sustainable procurement & transport, and Circular economy): The WREC is coordinated by the Global Logistics Cluster and supported by a coalition of humanitarian organisations, including the Danish Refugee Council (DRC), the International Federation of Red Cross and Red Crescent Societies (IFRC), Save the Children International, and the World Food Programme who, together, offer a uniquely wide operational reach.

3.4 Joint Initiative

Joint initiative for Greener Humanitarian Assistance: with a strategic focus on enhanced coordination among supply chain actors working on environmental issues, and improved packaging sustainability.

4. Learnings from best practices in SWM in refugee settlements globally

4.1 Cox Bazaar Bangladesh

Key learnings from Cox Bazaar that can be used in Kakuma:

1. The establishment of the SWM system and the operations need to be fully subsidized by UNHCR/WFP and/or other donor organisations. Refugees will not be able to pay for the actual costs of the service of waste collection.
2. The SWM model implemented in Cox Bazaar including household waste separation at source, door-to-door collection 6 days per week by trained waste collectors, transportation to a recycling center and residual waste to a safe disposal site is quite successful and is a low cost SWM system which can be copied to the Kakuma refugee camp with some adaption.
3. Disposal of residual waste in sanitary landfills: To protect the environment and public health, all residual waste which cannot be avoided, reused or recycled must be safely disposed in a sanitary landfill. The use of sanitary landfills has been identified as the only adequate technological solution for the safe disposal of residual domestic solid waste in Cox's Bazar district.

4.2 Algeria: Turning plastic waste into furniture: The Sahara refugees running their own recycling workshop (imagine5.com)

5.SWEEP stakeholders' round table engagement in Kakuma

On Thursday 26 September 2024 a round table meeting was held at the Cairo Hotel, Kakuma with key stakeholders involved in the solid waste management system both in the refugee settings in Kakuma and the host town communities.

Participants included representatives from local, regional and national government authorities, CBO's, NGO's, national and international humanitarian organisations, international development agencies and operators active in the solid waste management system (see annex 1 for list of participants.

The agenda started with Government introductions followed by brief introductory presentations by DRC, Last Mile Climate and WASTE Netherlands (annex 2 includes the full agenda). Several participatory exercises were conducted to assess the current status of the solid waste management system in Kakuma and the role of each of the participating organisations within the system. The exercises focussed on:

1. Assessing how each participating organisation influenced the SWM system in Kakuma with their interventions and also how they are affected by the same SWM system in Kakuma. This was done through an individual exercise.
2. Identifying where the interventions of each organisation concentrated within the SWM system in Kakuma and the enabling environment that influences the system. This was done in combination with a brief 3-5 minute presentation each organisation gave.
3. Identifying those postive and negative issues that affect the SWM system in Kakuma, both at local level and at national level. This was done in breakout groups.

The results of the exercises are discussed below.

5.1 Exercise-1: Influence – Being affected diagram

At the start of the workshop the participants were asked to assess the current invention of their organisation in relation to solid waste management in Kakuma. They were asked:

a. To what degree does the intervention of your organisation influence SWM in Kakuma? They could rate their intervention from no influence (value 0) to high influence (value 10).
b. To what degree is the intervention of your organisation affected by SWM in Kakuma? They could rate their intervention from no influence (value 0) to high influence (value 10).

They were asked to do same exercise at the end of the workshop, with the emphasis shifted to how they saw their invention in five years in the future.

The foto below shows the results of the exercise, whereby it should be noted that not all organisations did the exercise for both time frames, and that for some organisations different members did the exercise (an average of the two opinions was included in the overview presented in figures 4 and 5.

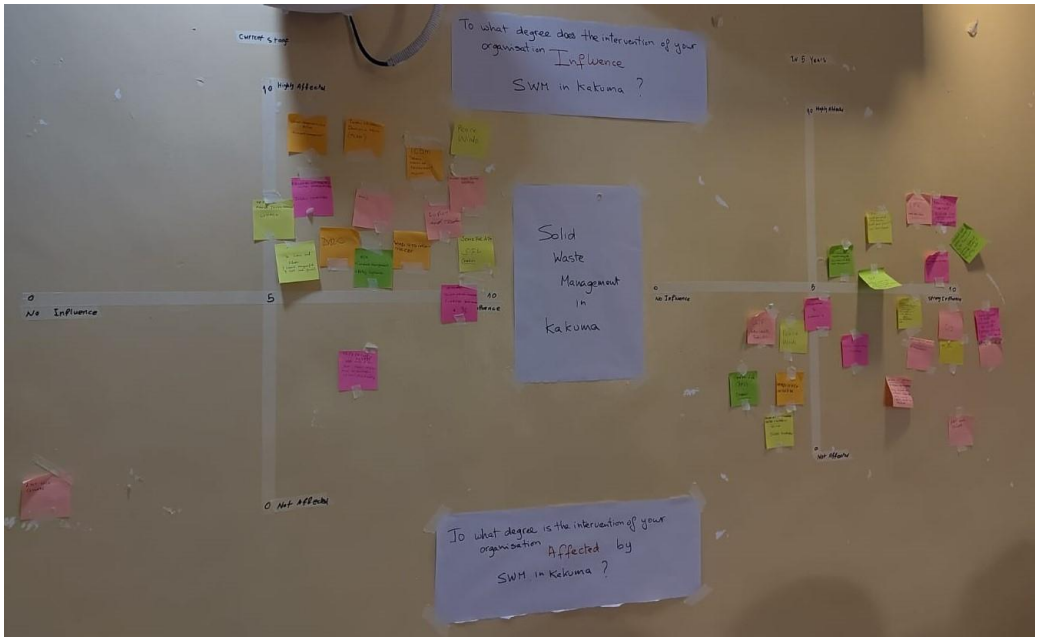

Figure 3: Results of the Influence-Affected Diagram

Nearly all participating organisations assessed that their **current interventions** influenced moderately to strongly solid waste management in Kakuma, whilst at the same time they considered that they were affected moderately to highly by the SWM system; see figure 4.

All of the organisations considered that in five years' time there would be a considerable change terms of their influence and the degree in which they were being affected, see figure 5. In nearly cases they considered that they would have less influence and also would be less affected.

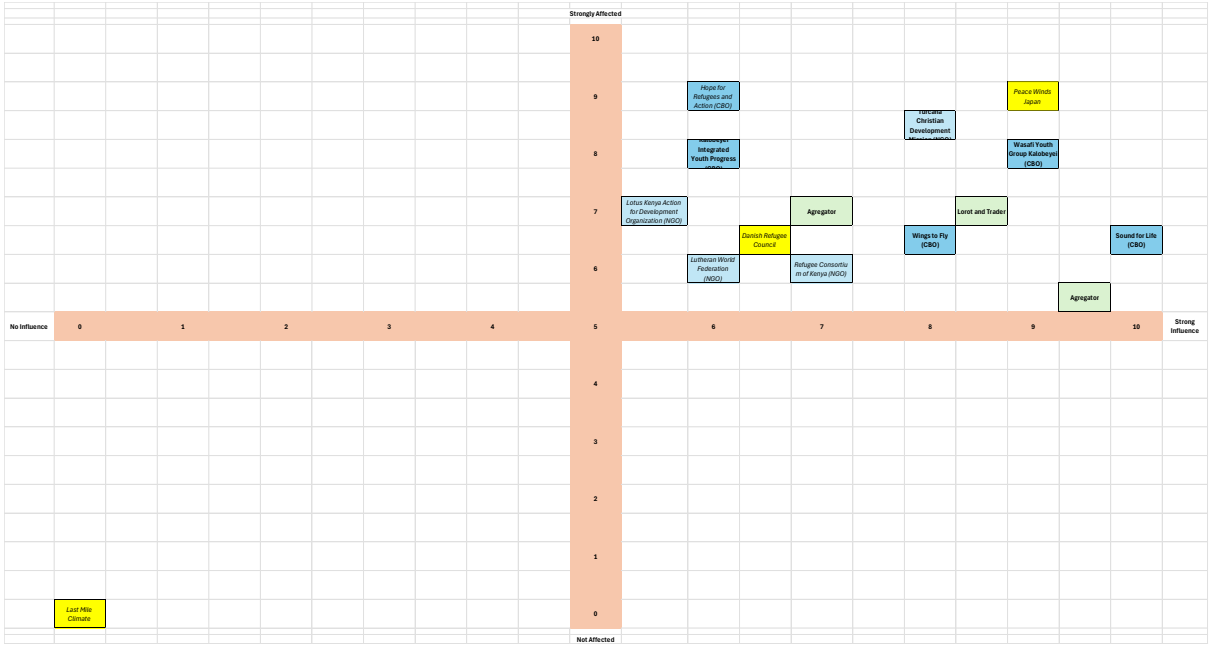

Figure 4: Influence-Affected Diagram for current interventions of the organisation in SWM in Kakuma

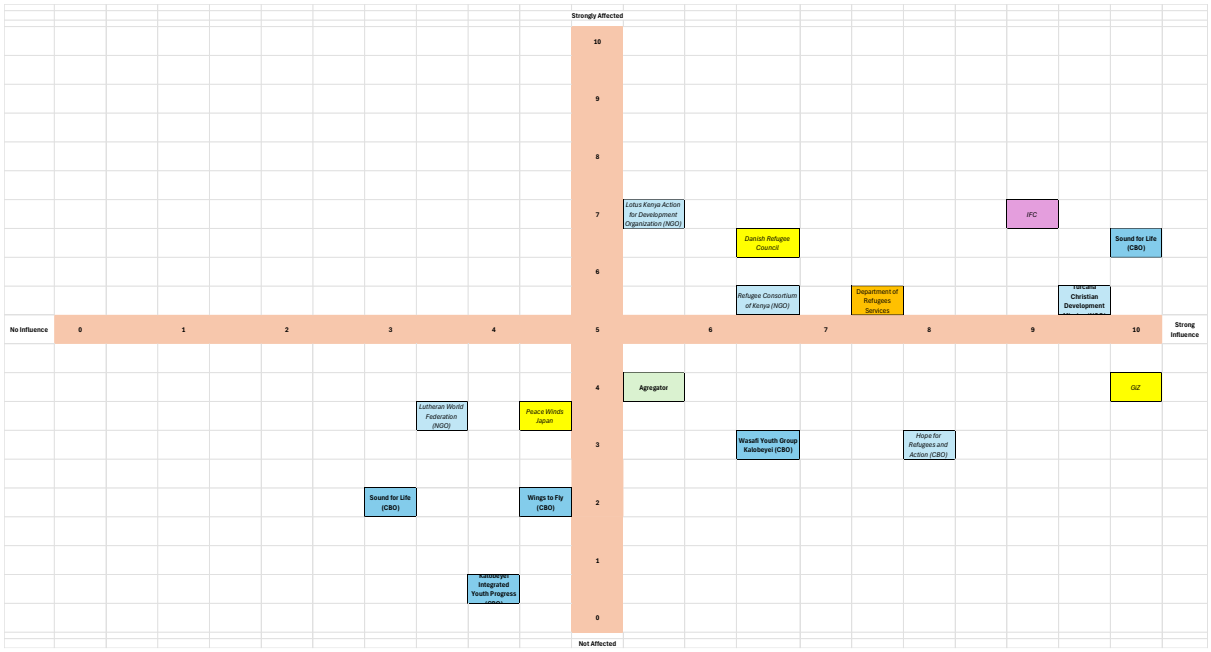

Figure 5: Influence-Affected Diagram based on interventions of the organisation in SWM in Kakuma after 5 years.

5.2 Exercise-2: Identification of interventions with SWM system

After sharing a brief presentation on their intervention the organisation were asked to assess in what fases of the solid waste service chain and the solid waste value chain concentrated and also whether their interventions formed part of the enabling environment. There was no limit to the fases and or elements of the enabling environment they wanted to included.

Figures 6 to 8 demonstrate the results of the exercise, where the interventions of the organisations highlighted in **bold** are considered direct interventions and the ones in *italic* as indirect interventions.

The CBOs identified that their interventions concentrated in direct involvement in collection and sorting of waste materials whilst for some this also included disposal and composting activities.

Community engagement was a common activity for all CBOs and the NGOs, whilst the government organisations focussed on governance, and monitoring and evaluation.

Peace Wings Japan, GiZ and IFC were identified as having a facilitating and enabling role throughout the entire system, rather then a direct operational role.

Fases of the Waste Service Chain System			
Generation	**Collection and transportation**	**Disposal**	**Open burning**
World Food Programme	**Sound for Life (CBO)**	**Kalobeyei Integrated Youth Progress (CBO)**	**World Food Programme**
Peace Winds Japan	**Wings to Fly (CBO)**	**Wasafi Youth Group Kalobeyei (CBO)**	
Kakuma Municipality	**Kalobeyei Integrated Youth Progress (CBO)**	**Sound for Life (CBO)**	
	Wasafi Youth Group Kalobeyei (CBO)	*Peace Winds Japan*	
	Lotus Kenya Action for Development Organization (NGO)	**World Food Programme**	
	Turcana Christian Development Mission (NGO)	**GiZ**	
	Lutheran World Federation (NGO)	*IFC*	
	Peace Winds Japan		
	World Food Programme		
	IFC		

Figure 6: Focus of the interventions of the organisations in the SWM system in Kakuma.

Fases of the Waste Value Chain System			
Sorting	**MRF (grinding / baling)**	**Recycling**	**Composting**
Sound for Life (CBO)	*Turcana Christian Development Mission (NGO)*	**Wings to Fly (CBO)**	**Sound for Life (CBO)**
Kalobeyei Integrated Youth Progress (CBO)	*Peace Winds Japan*	*Peace Winds Japan*	**Kalobeyei Integrated Youth Progress (CBO)**
Wasafi Youth Group Kalobeyei (CBO)	*Kakuma Municipality*	*World Food Programme*	*Peace Winds Japan*
Turcana Christian Development Mission (NGO)		*IFC*	*GiZ*
Peace Winds Japan		*GiZ*	

Figure 7: Focus of the interventions of the organisations in the SWM system in Kakuma.

Enabling Environment of the Kakuma Solid Waste System				
Governance	**Community Engagement**	**Business Development**	**Finance**	**Monitoring and evaluation**
Kakuma Municipality Turkana County Department of Health Services Department of Refugees Services	Wings to Fly (CBO) Sound for Life (CBO) Kalobeyei Integrated Youth Progress (CBO)	Kakuma Municipality Sound for Life (CBO) Kalobeyei Integrated Youth Progress (CBO)	IFC	Kakuma Municipality Turkana County Department of Health Services Department of Refugees Services
Refugee Consortium of Kenya (NGO)	Wasafi Youth Group Kalobeyei (CBO)	Refugee Consortium of Kenya (NGO)		World Food Programme
IFC	Refugee Consortium of Kenya (NGO) Lutheran World Federation (NGO)	IFC GiZ		IFC
	Kakuma Municipality Turkana County Department of Health Services Department of Refugees Services			
	Peace Winds Japan			
	IFC			

Figure 8: Focus of the interventions of the organisations in the enabling environment of the SWM system in Kakuma.

5.3 Exercise-3: Identification of how to come to effective SWM in Kakuma

During the breakout session three mixed working groups were given the task to assess: ***How to come to effective SWM in Kakuma?*** The discussion was facilitated by WASTE staff, focussing on the negative and positive issues that are of influence both within the Kakuma municipality borders and outside of Kakuma. The main findings from the groups are presented below.

Issues that affect SWM within in Kakuma	
Negative issues	**Positive issues**
Lack of common goal	Increasing number of CBOs working in SWM
Lack of awareness of impact of solid waste	Solid waste actors showing up
No technical expertise	Improved cleanliness
No common awareness that there is technical working group formed	Availability of law enforcement
Final disposal is done in open dumping site, nuisance and danger of illegal disposal	Awareness about negative impacts of SWM has increased
Lack of data on solid waste	Creation of jobs / employment
Lack of willingness to pay for solid waste	There are innovations to make products out of waste
Collection of solid waste not implemented everywhere in the camps and in the host towns	Market creation for SWM
There are currently no licenses for the CBOs	Assessment of data collection by most NGOs
There is a need to identify leadership of Tech WG and coordination between UNCHR and the local (municipal) government	Municipality formed in Kakuma

Issues that affect SWM within in Kakuma	
Negative issues	**Positive issues**
Lack of energy (3 phase), water and sewerage	Wash-Technical working group
Land is a resource (it is cheap) but acquiring communal land is bureaucratic	Plastic being collected in Kakuma
Tension in distance between waste generation and disposal	Project data is available
Child labor	Provide licenses for CBOs
Lack of financial sustainability	
Lack of storage sites for plastic	
Lack of coordination in working group	
Uncoordinated rates of plastic / fee for HH collection	
Lack of demand for recyclables and delayed payment	
No clear disposal sites, and lack of SOP	
Increased solid waste generation	
Short duration of implementation of projects, lack of sustainability	
Replication of NGOs activities and lack of coordination	

National issues that affect SWM in Kakuma	
Negative issues	**Positive issues**
Lack of Government Policy Enforcement	Existing legal framework on waste management
No compliance of national law, and national legislation not customized to counties	Willingness of SWM actors to by the raw (sorted) recycle materials
Lack of willingness to enforce	Regulation in place for operation for SWM
Inadequate solid waste regulation	Promotion of financing structure
Inconsistency in political will	Existence of EPR legal framework
Lack of awareness of EPR	Availability of recycling industry
Inadequate system on EPR utilization	Focus on different waste streams
Inaccessibility to Recycling Industry	Political will to improve SWM
No regional policy that is equal / similar in Uganda and Ethiopia	Interest / market improving
Uganda demand for recyclables is disturbing the Kenyan Market (Nairobi market)	(County) Fees are encouraging recycling to decentralize throughout the country
County levy, payment of fees during transportation, high transport costs to market in Nairobi	Creation of jobs
Lack of incentives	Availability of equipment, sorting, grinding, baling, laboratories
Nuisance / danger of illegal disposal	
Lack of system to support CBOs	
Limited data on SWM (at national level)	
Duplication of Government Roles (NEMA and County Government level)	
Monopoly of recyclers and middle persons, price imposition	
High costs of documents (permits, licenses and certification) for SWM facilities and vehicles	

6. Key issues/challenges

Based on observations and consultations during the visit and the described analysis in chapter 2, the following key issues and challenges can be identified:

Generation/composition/separation at source

- Scarcity of solid waste data/key indicators, that limits (strategic) planning for short/long term SWM activities, including: quantities of waste generated, composition of waste; quantities of waste (especially packing material) generated by humanitarian agencies (especially those responsible for food distribution), key waste management practices at generation (household) level, quantities of waste collected and disposed.
- The amount of waste generated is relative low. The packaging materials encountered include all main (inter) national brands, also those bound by the (inter) national EPR policies.
- The amount and complexicity of waste materials will increase due to increased economy of the region with more incoming goods and packaging materials. This includes also electronic waste (batteries and solar panels) and medical and small hazardeous waste.
- Procurement policies and internal reverse logistics principles from humanitarian agencies influence the waste generated from central food and goods distribution activities.
- With the shift to cash transfer from central food distribution, the consumption of goods in the camps is influenced by the open economic nature of the camp and thus there is less central control of the (potential) waste materials coming into the camps and generated.
- The dusty and dry environment mean that cleaning and sweeping activities of the area surrounding the building leads to high percentaje of sand, dust and ashes (from cooking) in the waste stream.
- Source separation focusses primarily on (plastic) packaging materials and hard plastics with an economic value
- Limited home composting is found, although organic food waste is used as fodder.
- Dumping and open burning of waste at household level is common practice, as from the small businesses located along the so-called market streets.

Awareness and perception of waste

- There is limited awareness of importance of SWM, in specific of the negative consequences of mismanagement on public health and on the environment.
- There is awareness of a waste value chain and of the value of certain types of waste materials (specially plastic packaging).
- The Kakuma camps are of multicultural nature with refugees from 15-20 nationalities. As such different cultural perspectives towards waste have to be considered, including the cultural acceptance to touch waste matter.
- Misconception that the entire waste management system can be financed from the sale of waste (recyclable) materials. It is a misconception that financial sustainability can be based on „Waste to Wealth“. This might be valid to a certain degree for the waste value chain, but is not applicable to the waste service chain.

Collection

- Provision of solid waste collection of services is not a long term intergrated part of camp management. Collection coverage is very low. Although some CBOs are trained in waste collection and are provided with hand carts, collection of household waste is very limited. Although some CBOs are trained in waste collection and are provided with hand carts, collection of household waste is very limited, with no clear evidence of route planning and schedules. The selected communal bins seems too small for the quantity of waste generated, are difficult to empty and lead to doubling handling of the waste.
- Any SWM system cannot be completed without a solution for residual waste that is environmentally friendly. A large percentage of solid waste (up to 70-80%) could be recovered through collection of recyclables and treatment of organic waste, **but there will always be waste that cannot be recycled or composted.** This is the primary limitation of the SWM systems developed in the Kakuma refugee settlement, where there is currently no sanitary landfill for both the refugee camp and the host communities.

Recovery and recycling

- Separate collection systems of plastics are established, working in competition
- Only hard plastic is collected, sorted and stored, flexibile plastic waste is not collected and littered or burnt
- Market is distorted by competition and providing high prices, strong dependance on Nairobi markets, confusion about market opportunities
- MRF with crusher and baler operational with 3 fase electricity, which is not readily available in the refugee settlement; only 10 km away from the camp, leading to increase transportation costs of collected plastics.
- Access to water and (3-fase) electricity are key obstacles for local recycling

Waste disposal

- Dumping and open burning of waste at household level is common practice, as is open burning in the commercial sections (streets) of the camps.
- No sanitary landfill site is present for safe disposal of solid waste

Institutional/governance

- Lack of coordination amongst key stakeholders and no clear owner of the problem
- Recent formation of Kakuma municipality with hand over of SWM responsibities, lack of capacity and resources to implement sustainable SWM system
- National legislation demanding safe SWM systems

Financing of waste management

- Insufficient funds are present to deal with increasing waste volumes and more complex waste streams.
- Cost of transportation to national recycling market: due to fees (produce cess) levied by each county, in addition to the distance of 800 km from Nairobi.

- Without devising a financial mechanism to cover the expense of SWM operations, the viability of the services is at risk.

7. Opportunities

- Multiple SWM and PWM initiatives are present. These different ongoing interventions in the camps and host communities are a clear signal of the growing effort of the actors to progressively improve the situation on the ground.
- There is a technical working group, with a TOR.
- There is a willingness to improve, acknowledgement of the necessity, especially in the field of job creation related to solid waste management
- Potential to generate employment including local plastic recycling, beyond collection and volume reduction
- Potential local demand (within humanitarion agencies) for recycled products
- More attention due to increased priority under agencies, see initiatvies
- Refugees have become aware about SWM and the value of plastic waste

8. Recommendations

This scoping study helps us to understand the very specific challenges related to implementing a sustainable SWM system in the Kakuma and Kalobeiy camps and host communities. It demonstrates how the current interventions, existing infrastructure, systems and processes related to SWM are insufficient in meeting the requirements and have several negative environmental and health impacts and will not be sustainable in the long term.

At the same time, this study helped to identify the numerous opportunities linked to SWM such as implementing plastic recycling locally and generating employment and jobs at the same time. Based on our finding the following recommendations can be given:

1. **Establish a SWM coordination platform that will implement a participatory planning process**
   While SWM comes under the WASH Sector's responsibility within the humanitarian cluster approach, a joint approach by all actors is needed with alignment on a joint strategy and action plan. This needs to be implemented using a participatory planning process.
2. Execute a detailed SWM feasibility study with a characterization study of the generation and composition of solid wast in both the refugee and host settlements using the UN Habitat WaCT methodology, , including the procurement protocols and policies of humanitarian agencies
3. **Develop a strategy on solid waste management** in general instead of giving to much focus to value chain interventions.
4. **Provide a safe disposal site for residual waste**
   Any SWM system cannot be completed without a solution for residual waste that is environmentally friendly.
5. **Implement decentralized composting, combined with grey water treatment and kitchen gardens**
6. Explore innovative finance mechanisms such as plastic credits/EPR to bring additional funding to the SWM system
7. Develop plastic waste recycling business models based on the type and quantity of plastic waste avaialable taking into account the lack of water and lack of energy:
   - Shredding rigid plastic waste into flakes selling it to Nairobi and/or Uganda
   - Baling PET bottles and selling it to Nairobi and/or Uganda
   - Producing construction materials (beams, poles, planks) or bricks out of flexible waste mixed with sand
   - Small scale production: collecting plastic waste, sorting and producing simple products that don't need complex machinery (f. i. manual injection mould machine): Injection pers | JW-Machines
   - Also consider and on the consumer goods present in the camps that could be manufactured from recycled plastics, including furniture, toys at schools.

The service chain and value chain in waste management

In waste management systems we identify two important chains that are interlinked: the service chain and the value chain (see figure 2).

The **service chain** is about providing services to remove waste from their point of generation to a (dump or disposal) site where they are burned, buried or stored. Often transfer sites are present which is the case in Bamako. These services are traditionally a **public sector** activity; and removal and disposal of waste are considered a public responsibility but can be outsourced to private service providers (GIEs or private waste collection companies).

The **value chain** of solid waste (organic and inorganic waste) involves activities that add value to waste in such a way that as a result products can be sold to customers. This is the chain where the informal sector (waste pickers and informal scrap dealers) are active.