Solid Waste Management in Kakuma Refugee Camp and Kalobeyei Integrated Settlement, Kenya

A Scoping Study

SWEEP PARTNERSHIP

Last Mile Climate

DRC DANISH REFUGEE COUNCIL

WASTE

This publication was commissioned by Last Mile Climate as part of the Sustainable Waste Employment and Environmental Progress (SWEEP) partnership. The scoping study documented in this publication was carried out by WASTE in November 2024.

Date of publication: March 2025

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List of Abbreviations

CBO	Community-based organisation
DRC	Danish Refugee Council
DRS	Department of Refugees Services
EPR	Extended Producer Responsibility
GIZ	Deutsche_Gesellschaft_fürDeutsche Gesellschaft für Internationale Zusammenarbeit
IFC	International Finance Corporation
IFRC	International Federation of Red Cross and Red Crescent Societies
ISWM	Integrated Sustainable Waste Management
KAWR	Kenya Association of Waste Recyclers
KEPRO	Kenya Extended Producer Responsibility Organization
KIS	Kalobeyei Integrated Settlement
KIYP	Kalobeyei Integrated Youth Progress
KKCF	Kakuma Kalobeyei Challenge Fund
KRC	Kakuma Refugee Camp
LWF	Lutheran World Federation
MoU	Memorandum of Understanding
MRF	Material Recovery Facility
NEMA	National Environment Management Authority
NGOs	Non-governmental organisations
ProCeed	Promotion of Climate-related Environmental Education
PWJ	Peace Winds Japan
SWEEP	Sustainable Waste Employment and Environmental Progress
SWM	Solid Waste Management
TCDM	Turcana Christian Development Mission
UNCHR	United Nations High Commissioner for Refugees
WaCT	Waste Wise Cities Tool
WASH	Water, Sanitation and Hygiene
WFP	World Food programme
WREC	Waste management & measuring, Reverse logistics, Environmentally sustainable procurement & transport, and Circular economy

Executive summary

This report presents a scoping study on the state of solid waste management (SWM) in Kakuma Refugee Camp (KRC) and the Kalobeyei Integrated Settlement (KIS) 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 continueing to grow and become more complex in composition.

The report uses the Integrated Sustainable Waste Management (ISWM) framework to analyse the current SWM system across three key dimensions: ***stakeholders***, ***physical infrastructure***, and ***governance***. Stakeholders include the refugee and host populations, national and local government bodies like the National Environment Management Authority (NEMA), county and national governments, international organisations such as the United Nations High Commissioner for Refugees (UNHCR) and the World Food programme (WFP), community-based organisations (CBOs) and the private sector. Despite there being many stakeholders involved, 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 unauthorised areas.

The physical infrastructure for SWM in both KRC and KIS is inadequate. It is assumed that waste generation is low, but still existing collection services cover only a fraction of the population. Most waste is left unmanaged, leading to environmental degradation and health risks, and current efforts to promote recycling, especially plastic waste recovery, are still in early stages. Promising initiatives such as those led by Peace Winds Japan (PWJ) and the Danish Refugee Council (DRC) are, however, 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 750 km distance from Nairobi, where much of the recycling takes place.

However, the report also highlights several opportunities. There is a growing interest among stakeholders to address SWM, particularly as part of broader efforts to create employment opportunities, improve livelihoods and working conditions, 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, also holds 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 building upon the current initiatives being undertaken in the Kakuma settlement. Additionally, it stresses the need for a detailed feasibility study, including a waste characterisation study to obtain reliable data.

In summary, while significant challenges remain, a sustainable and inclusive SWM system in KRC and KIS can be realised. 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

A Memorandum of Understanding (MOU) establishes a cooperative framework between The Last Mile Climate, DRC and WASTE to establish the Sustainable Waste Employment and Environmental Progress (SWEEP) partnership.

The SWEEP partnership aims to scale 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 organisation to foster a multi-stakeholder platform that includes private sector waste companies, refugee-led organisations, UN agencies, government bodies, and other stakeholders.

The partnership recognises that solid waste management must form a crucial component of any emergency response to global displacement crises. 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).

Kakuma refugee camp and the adjoining Kalobeyei integrated ssettlement in the North of Kenya, has been chosen as starting point of the SWEEP partnership to improve the SWM system and create green jobs at the same time. Solid waste management has now become a major issue within Kakuma as quantities of waste are increasing and the complexity of waste materials will require a major effort in operations. Therefore, an exploratory scoping mission 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.

This report presents the findings of this exploratory scoping mission. It is a rapid appraisal based on a five-day visit to the Kakuma refugee settlement and Kalobeyei, a stakeholder meeting in Kakuma and a consultation workshop in Nairobi and review of relevant literature (desk research). It presents the current context, 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 - Integrated Sustainable Waste Management analysis

The Integrated Sustainable Waste Management (ISWM)[1] concept is a model developed by WASTE that enabled an 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. The ISWM assessment tools have been applied globally and acknowledge 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 organisations (NGOs) such as international agencies.
2. All the **physical** elements (operational infrastructure) of the system, including waste generation, 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.

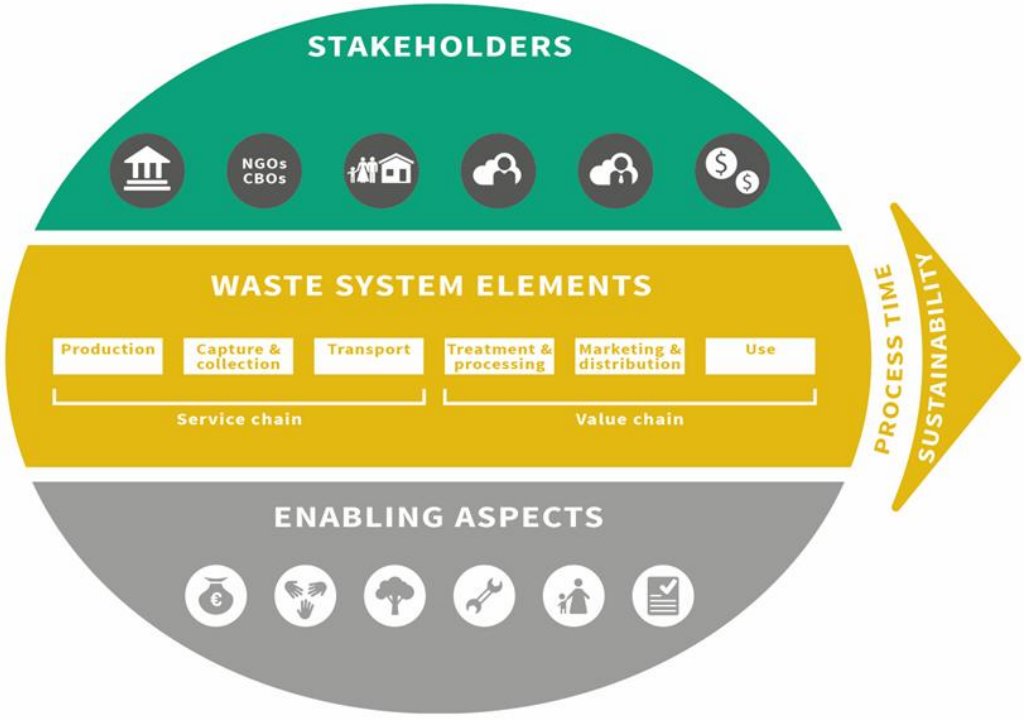


Figure 1: The Integrated Sustainable Waste Management (ISWM) framework

[1] 'Integrated Sustainable Waste Management- the Concept, Tools for Decision-makers Experiences from the Urban Waste Expertise Programme (1995-2001), 2001. The foundation for this document was laid during the first workshop of the Working Group on Solid Waste Management in Low income Countries, which was held in Ittingen, Switzerland in 1994. In preparation for the workshop WASTE wrote an Action Plan document, which later led to the articulating of the Integrated Sustainable Waste Management concept.

2.2 Stakeholders/actors involved

The main stakeholders within the KRC and KIS solid waste management (SWM) system identified are:

Government

- **The 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.
- **Department of Refugees Services (DRS)** 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 Kenya. The major services offered by the DRS include, among other responsibilities, receiving and registering refugees and asylum seekers and issuing them with important documentation. They also have a coordination role in SWM.
- **The Turkana County Government** who oversee the second largest county in Kenya, Turkana, are by law responsible for establishing SWM systems in the county.
- **The Municipality of Kakuma,** officially created in February 2023, covers approximately 632 km^2 including the KRC and KIS and also the host communities of Kakuma town and Kalobeyei village. The municipaliy has taken over functions related to waste and land management, water services, early childhood education, child protective services, emergency services, and road repair.
- **The Kenyan Government and the Department of Refugee Affairs'** jurisdiction includes camp management. Since the adoption of the Kenya Refugee Act in 2007, a Camp Manager has been appointed to oversee camp affairs and liaise with humanitarian agencies. The Act paves the way for the Kenyan Government to eventually assume full management of Kakuma Refugee Camp[2].

(International) Non-governemental organisations (NGOs)

- **UNHCR** is responsible for the full administration of the KRC and KIS and therefore is responsible for provision of water, sanitation and hygiene (WASH) services including solid waste collection services. Besides this, UNHCR is an important generator of solid waste materials in the camp through their provision of rations in packaging materials such as tins, jerry cans and carton boxes.
- **The World Food Programme (WFP)** is also a generator of solid and plastic waste due to their warehouse activities and provision of food rations to the refugees.
- **Peace Winds Japan (PWJ)** is a Japan-based NGO that works around various social issues around the world. In Kenya, PWJ supports refugees from neighbouring countries and host communities in Dadaab, Kakuma and Kalobeyei providing shelters, (drinking) water facilities and latrines. For the last two years PWJ has been responsible for implementing a solid waste management system. As a result of this responsibility, signs of infrastructure and collection mechanisms are present but not fully operational.
- **Turcana Christian Development Mission (TCDM)** is a local organisation who has been working on the empowerment of communities through sustainable development initiatives in education, health services, water and sanitation and relief of poverty for over 10 years. TCDM are in charge of the Material Recovery Facility (MRF) operations (including a crusher and baler) in the Fair Recycling Project.

[2] 'About Kakuma Refugee Camp', *Kanere*, Accessed February 2025. https://kanere.org/about-kakuma-refugee-camp/

Figure 2: The crusher active at the MRF operated by TCDM

- **GIZ[3] /INTEGRATION consulting group** provide employment oriented skill training to refugees to create jobs. Within the framework of their *Promotion of Climate-related Environmental Education* project GIZ is exploring the creation of jobs out of climate change issues, environment, solid and plastic waste.
- **The Lutheran World Federation (LWF)** support CBOs in clean up campaigns and creating awareness about environmental issues.

Private sector

- **Mr. Green Africa** is 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 princples. 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.
- **Kenya Extended Producer Responsibility Organization (KEPRO)** is the leading producer responsibility organization bringing together key stakeholders to properly manage non-hazardous post-consumer packaging waste in Kenya.
- **The Kenya Association of Waste Recyclers (KAWR)** activities include advocacy, education, awareness and communication campaigns.

Financial sector

- **International Finance Corporation (IFC)** is interested in investing in waste management companies in the KRC and KIS which can provide solutions to sanitation and solid waste problems.

[3] Deutsche_Gesellschaft_fürDeutsche Gesellschaft für Internationale Zusammenarbeit

- **The Kakuma Kalobeyei Challenge Fund (KKCF)**: is designed to unlock the economic potential of refugees and their hosts in Turkana County by increasing private sector investments.

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.

CBOs and youth groups

- Several groups have been formed in KRC undertaking clean up campaigns and collection of solid waste. PWJ has created youth groups licenced to collect solid waste from shops and waste bins.
- Kalobeyei Integrated Youth Progress (KIYP) is an inclusive, non-partisan, non-profit community-based organisation working to implement sustainable programmes that improve access to equal opportunity, development and lifesaving services now and for future generations.

2.3 The demographics and physical elements/infrastructure

This section will explore the demographics of the area and the state of each physical element within the SWM system. The physical elements (infrastructure) of the SWM system include; waste generation, collection, transport, transfer, recycling, recovery, treatment and final disposal.

Geography, climate and demographics

Kakuma is located in the North-western region of Kenya and is situated near the Nabek river. 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 can rise to as high as 40°C, and it is very humid but dry making agriculture difficult in the Kakuma camp. This led to tension 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[4].

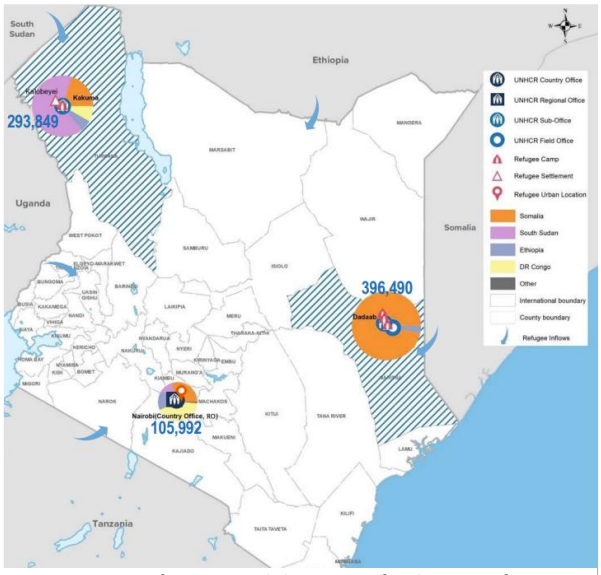


Figure 3: Map of Kenya with location of Kakuma Refugee Settlement in the Tukana County.

[4]'Refugee Camp Kakuma: 10 Facts You Should Know', *Rethinking the Future*, accessed February 2025. https://www.re-thinkingthefuture.com/architectural-community/a7971-refugee-camp-kakuma-10-facts-you-should-know/

Kakuma has two areas of operation: Kakuma Refugee Camp (KRC) and the Kalobeyei Integrated Settlement (KIS). KRC is divided into four areas: Kakuma 1, 2, 3 and 4 whilst KIS comprises of three villages: Village 1, 2 and 3. At the other side of the river is the host community: Kakuma municipality. According to the statistics provided by UNHCR[5] the population of refugees in KRC and KIS is approximately 215,000 and 75,000 respectively (July 2024), representing 37% of registered refugees and asylum-seekers in Kenya. The countries of origin are primarily Somalia, South Sudan, Ethiopia and the Democratic Republic of Congo, with 20 countries represented in the camps. The population of the local host communities in KRC is estimated between 50,000 - 65,000 and 20,000 for KIS (2018).

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. Except for a minority who has been able to establish shops, the majority of residents in KRC and KIS depend on the food rations supplied for survival. The WFP provides refugees with rations twice a month based on the nutritional value required. Since 2015 the WFP started using digital cash to give refugees the freedom to choose from a variety of food options which has also been good for the local economy.

2.3.1 Solid waste generation and composition

Reliable information on solid waste generation and composition is essential 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.

UN-Habitat executed a limited characterisation study in KRC and KIS to determine the generation and composition of solid waste in this area[6]. Based on their findings they concluded that each person generates approximately 0.7 kg/day. However, considering the income level of these communities, the fact that the sampling was only conducted for one day and comparative to other settlements, this amount seems too high. For example, in Cox's Bazar, a refugee settlement in Bangladesh, five waste characterisation studies have taken place with a result between 0.11 - 0.174 kg/cap/day. These results are more realistic considering the low financial capacity of the population. It is also important to consider that due to the development of the local economy, the existing waste generation rate is likely to increase, alongside the complexity of packaging material with more innovative products entering the camp.

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

2.3.2 Waste storage, collection, transfer and transport

Collection coverage in KRC, KIS and the Kakuma municipality is very low, but PWJ has started to capacitate youth groups to collect waste. They have been provided with a hand cart and training on separation at source. PWJ has also installed 235 sets of waste bins (organic and recyclables) at several

[5] 'KENYA: Registered refugees and asylum-seekers', *UNHCR Kenya,* 31 July 2024. https://www.unhcr.org/ke/what-we-do/reports-and-publications/kenya-operation-statistics

[6] Solid waste management in Kakuma and Kalobeyei*, UN-Habitat,* 11 July 2018

places in KRC, Kakuma municipality and KIS. The county has hired a private contractor to collect from shops, but this seems very minimal and the shops do not pay for the waste collection service.

Figure 4: Waste bins installed by PWJ

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

DRC began activities in Kakuma in July 2021, and subsequently PWJ began in 2023. These activities include creating awareness about the value in plastic waste, and 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, a 700 km distance away from Kakuma. 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 KRC and KIS (see figure 5). 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.

Figure 5: 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 including the policy framework and the financial aspects.

2.4.1 Policy framework

The following national regulations and strategies need to be considered 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. It is moving the country towards zero waste goals whilst improving the livelihoods of 50,000 waste workers 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, emphasising 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 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 limits potential for refugee inclusion and for local communities to benefit fully from hosting refugees[7].

2.4.2 Financial aspects

It appears that SWM was overlooked in KRC and KIS and funds to establish infrastructure and operations to manage solid waste sustainably were not foreseen. It is only since 2023, that two humanitarian organisations, PWJ and DRC, have implemented solid waste projects with funding from Japan and Denmark.

The county government allocates a budget for SWM which is made available by the National Government, but this is insufficient to establish the needed infrastructure in the host communities and certainly not in the refugee settlements. The baseline study of UN-Habitat[8] shows a very low willingness of refugees to pay for a reliable waste collection service due to their limited income situation 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.

[7] 'Kakuma & Kalobeyei Spatial Profile', *UN Habitat,* June 2021.
https://unhabitat.org/sites/default/files/2021/06/210618_kakuma_kalobeyei_profile_single_page.pdf
[8] Solid waste management in Kakuma and Kalobeyei, *UN-Habitat,* 11 July 2018

3. Major SWM initiatives

In KRC and KIS two major initiatives are identified: the first one led by PWJ and the second one by DRC to implement SWM systems with the help of several CBOs. Next to this, on a global scale, SWM in emergency settings is gaining attention as is shown by the the WREC project and the Joint Initiative. These are outlined in the sections below.

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, decentralised waste management system in KRC and KIS.
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 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 CBOs 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 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 KRC, KIS and the surrounding communities. This initiative aims 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 decent 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 DRC, the International Federation of Red Cross and Red Crescent Societies (IFRC), Save the Children International, and the WFP 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

Several best practices exist globally in other refugee settlement which can be analysed to obtain key learnings that can be used in the Kakuma Camp. Cox's Bazar in Bangladesh has the best developed SWM system and in Algeria an interesting example has been identified where refugees turn plastic waste into furniture.

4.1 Cox's Bazar Bangladesh

Since 2017, Cox's Bazar, Bangladesh, has been hosting nearly 1 million refugees from Myanmar, creating one of the world's largest humanitarian crises. Waste management has become a major challenge due to the lack of infrastructure in the refugee camps. Additionally, the distance between the camps and recycling industries, located far away in Chittagong and Dhaka, further complicates waste disposal. The developed SWM system in Cox's Bazar has been largely successful and provides some valuable lessons.

Key learnings from Cox's Bazar that can be used in Kakuma:

1. The establishment of the SWM system and the operations need to be subsidised 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 and disposal. Recycling activities can cover part of the costs.
2. The SWM model implemented in Cox's Bazar includes household waste separation at source, door-to-door collection six days per week by trained waste collectors, transportation to a recycling center and transporting residual waste to a safe disposal site. The system is quite successful and is a low cost SWM system which can be replicated with some adaptation.
3. To protect the environment and public health, all residual waste which cannot be avoided, reused or recycled must be safely disposed of 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[9]

A team of refugees in the Sahara Desert, displaced by a long-standing territorial conflict, has set up their own recycling workshop with the help of Precious Plastic, a global initiative focused on teaching plastic recycling and providing knowledge about plastic recycling machines through open-source designs. These refugees, living in camps run by the UNHCR, have faced challenges with plastic waste due to a lack of infrastructure. The new workshop allows them to recycle plastic, turning waste into useful products like benches and school desks. The project is part of a larger effort to reduce pollution and provide sustainable solutions in the desert. The machines used are specially designed to handle harsh desert conditions, and the local team is learning valuable skills to improve their environment. The initiative has already processed large amounts of plastic and is poised to expand further, offering long-term benefits to the community.

[9] 'The Sahara refugees running their own recycling workshop', *imagine5,* accessed Febuary 2025. https://imagine5.com/articles/the-sahara-refugees-running-their-own-recycling-workshop/

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 SWM system.

The agenda started with Government introductions followed by brief introductory presentations by DRC, Last Mile Climate and WASTE (see *Annex 1* for the full agenda). Several participatory exercises based on the ISWM assesment concept and Diamond approach were conducted to assess the current state of the SWM 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 the 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 addressed below.

5.1 Exercise-1: Influence – Affected diagram

At the start of the workshop the participants were asked to assess the current intervention of their organisation in relation to SWM 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 strong (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 strong (high) influence (value 10).

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

The photos 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 7 and 8*). The results refer to the colour codes of the actors presented in *Table 1* on the following page; whilst the detailed results are included in *Annex 1 and 2*.

Actor
CBO
Government
International NGO
International Funding Agency
NGO
Agregator

Table 1: Colour codes of actors used in tables and figures in this chapter

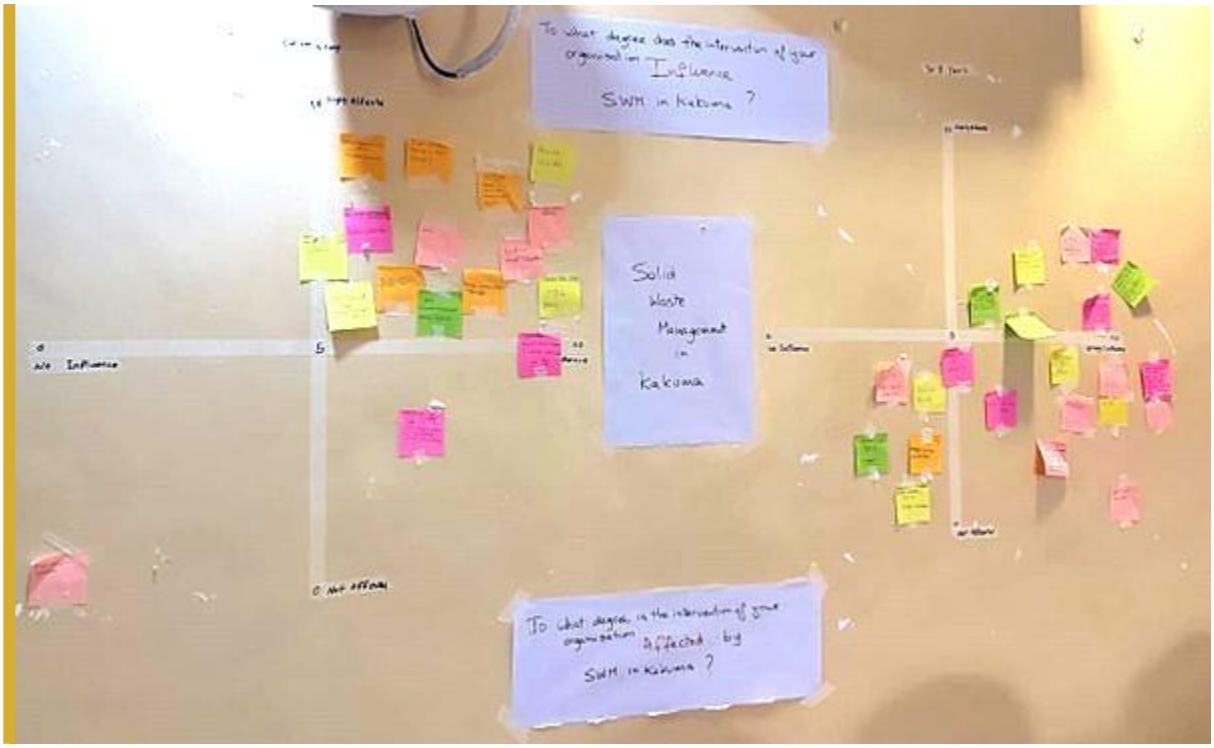


Figure 6: Results of the Influence-Affected Diagram

Nearly all participating organisations concluded that their **current interventions** influenced the SWM system in Kakuma moderately to strongly, whilst at the same time they considered that the SWM system affected them moderately to strongly; see *Figure 7*.

All of the organisations considered that in five years' time there would be a considerable change in terms of their influence and the degree in which they were being affected, see *Figure 8*. In nearly all cases they considered that they would have less influence and would be less affected.

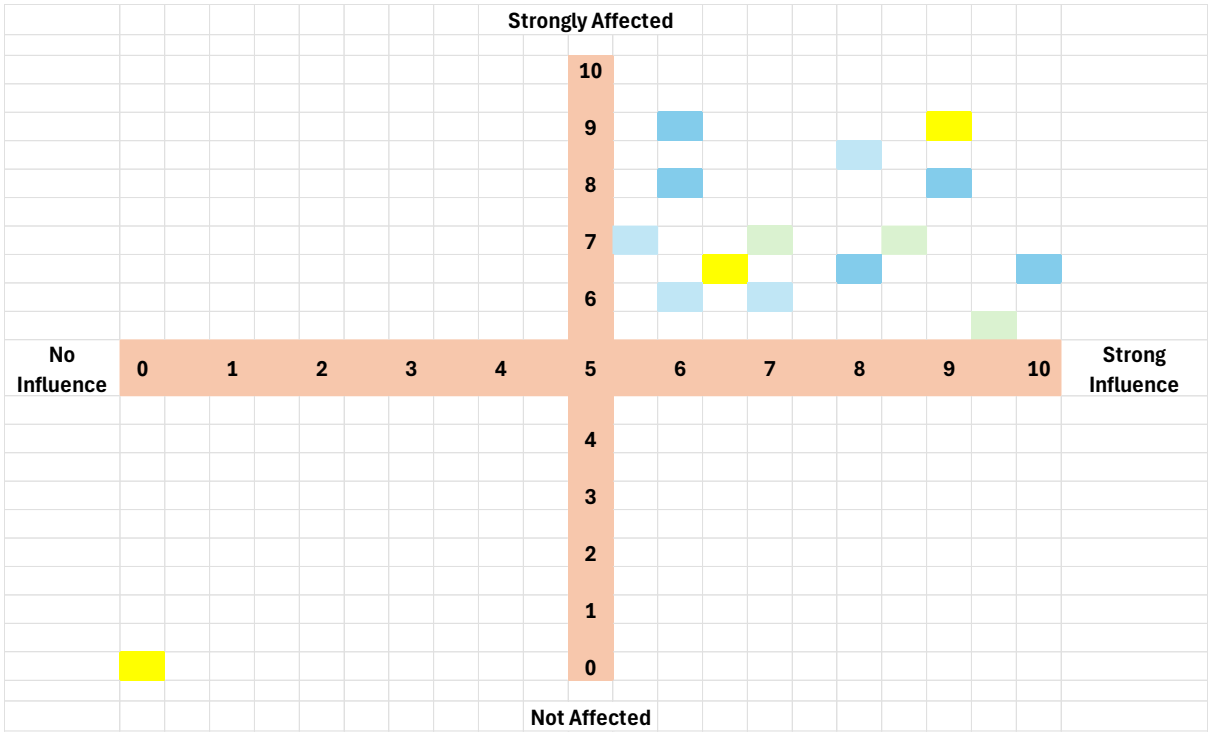


Figure 7: Influence-Affected Diagram for current interventions of the organisation in SWM in Kakuma

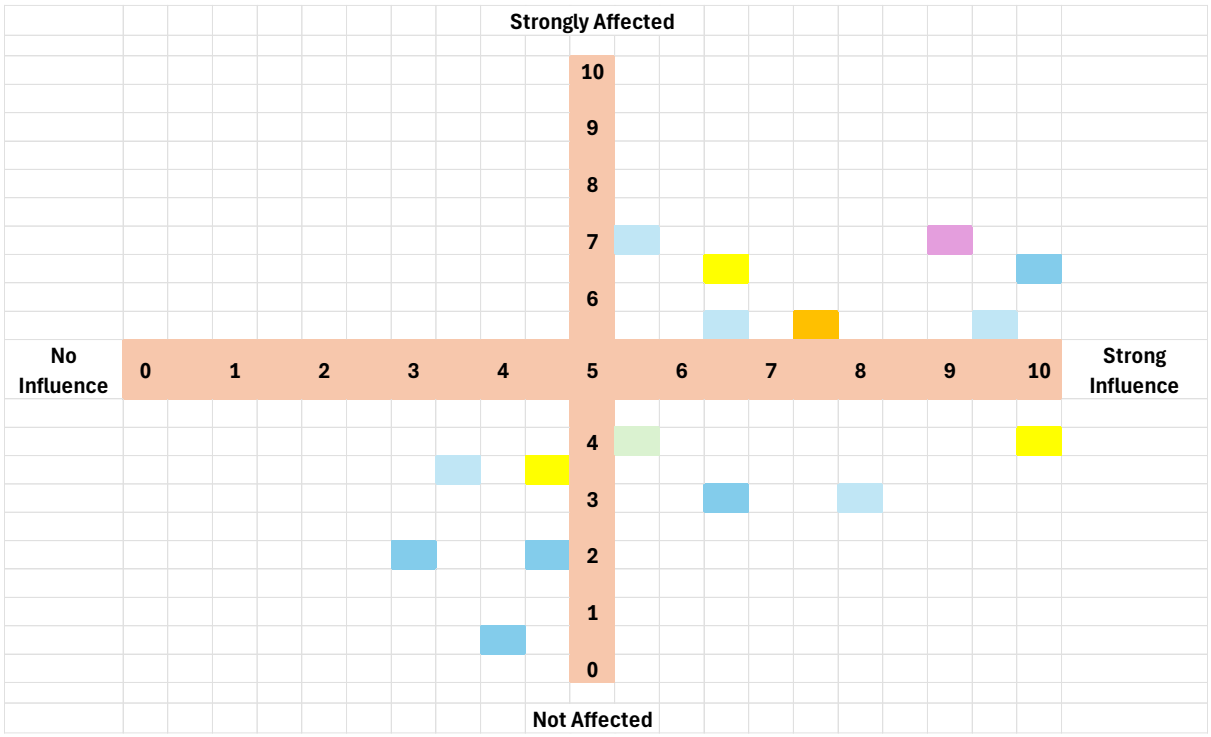


Figure 8: Influence-Affected Diagram based on interventions of the organisation in SWM in Kakuma after five years

5.2 Exercise-2: Identification of interventions with SWM system

After sharing a brief presentation on their intervention each organisation was asked to assess in what phases of the solid waste service chain and the solid waste value chain their activities are concentrated and also whether their interventions formed part of the enabling environment. There was no limit to the number of phases and/or elements of the enabling environment they could include.

Figure 9: Discussion around challenges in SWM in Kakuma

Tables 2, 3 and 4 on the following pages 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 (results also continue to refer to the colour codes of the actors presented in *Table 1* on page 16).

The CBOs identified that their interventions were 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 the CBOs and NGOs, whilst the government organisations focussed on governance, and monitoring and evaluation.

PWJ, GIZ and IFC were identified as having a facilitating and enabling role throughout the entire system, rather than a direct operational role.

Phases 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		

Table 2: Focus of the interventions of the organisations in the SWM system in Kakuma

Phases 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*	

Table 3: 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	Wings to Fly (CBO)	Kakuma Municipality	IFC	Kakuma Municipality
Turkana County Department of Health Services	Sound for Life (CBO)	Sound for Life (CBO)		Turkana County Department of Health Services
Department of Refugees Services	Kalobeyei Integrated Youth Progress (CBO)	Kalobeyei Integrated Youth Progress (CBO)		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)	IFC		IFC
	Lutheran World Federation (NGO)	GiZ		
	Kakuma Municipality			
	Turkana County Department of Health Services			
	Department of Refugees Services			
	Peace Winds Japan			
	IFC			

Table 4: 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 on the following pages.

Local issues that affect SWM 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 technical working group and coordination between UNCHR and the local (municipal) government	Municipality formed in Kakuma
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 labour	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 household collection	
Lack of demand for recyclables and delayed payment	
No clear disposal sites, and lack of standard operating procedure	
Increased solid waste generation	
Short duration of implementation of projects, lack of sustainability	
Replication of NGOs activities and lack of coordination	

Table 5: Local issues that affect SWM in Kakuma identified in workshop discussions

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 customised to counties	Willingness of SWM actors to buy the raw (sorted) recycled 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 utilisation	Focus on different waste streams
Inaccessibility of 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 decentralise 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	

Table 6: National issues that affect SWM in Kakuma identified in workshop discussions

The findings of the workshop confirmed that whilst there is currently no official waste service provision, either by local government or the organisations responsible for the management of the refugee settlements, a variety of (inter)national organisations are active in solid waste management in Kakuma municipality, with the focus on collection and recovery of recyclable materials.

There is a strong awareness amongst these organisations of national developments, including vigilent legislation, required licenses, policies under development, and financial instruments in place. Similarly the private sector actors within the national value chain (which is concentrated around Nairobi) have extended their reach to the remote areas of northern Kenya, resulting in a dynamic of recovery of materials that can be commercialised.

The waste management sector in Kakuma is still relatively young and going through the initial stages on its path to reaching institutional maturity with clear roles and responsibilities defined and implemented for the public and private actors. There was an agreement among the workshop participants that the recently installed municipal (and county) government have a key role in this process, and should lead this multi-stakeholder process of establishing an effective and sustainable solid waste management system.

6. Key issues/challenges

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

Generation/composition/separation at source

- Scarcity of solid waste data/key indicators 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 relatively 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 a high percentage 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 the importance of SWM, specifically the negative consequences of mismanagement on public health and on the environment.
- There is awareness of a waste value chain and the value of certain types of waste materials (specially plastic packaging).
- The KRC and KIS 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.
- There is a 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 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 and there is no clear evidence of route planning and schedules. The selected communal bins seem too small for the quantity of waste generated, are difficult to empty and lead to double handling of the waste.
- An SWM system is incomplete 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 KRC and KIS, 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.
- The market is distorted by competition and providing high prices, strong dependance on Nairobi markets and confusion about market opportunities.
- An MRF exists with a crusher and baler operational with 3 phase electricity, 10 km away from the camp leading to increase transportation costs of collected plastics.
- Access to water and (3 phase) 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.
- The recently formed Kakuma municipality were given SWM responsibities but have a lack of capacity and resources to implement a 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 levied by each county, in addition to the distance of 750 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

Based on observations and consultations during the visit, the following opportunities for helping to improve solid waste management (SWM) in KRC and KIS have been identified:

- 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.
- Willingness to improve and acknowledgement of the necessity of sustainable SWM especially in the field of job creation related to solid waste management and recycling.
- Potential to generate employment including local plastic recycling, beyond material recovery, collection and volume reduction which feeds primarily the national markets upstream in Nairobi.
- Potential local demand (within humanitarion agencies) for recycled products, including building materials and furniture.
- More attention due to increased priority under agencies.
- Refugees have become increasingly aware of the need (and benefit) of an effective and sound SWM system, devoid of open burning and untreated dumping of waste.
- There is increasing awareness of the existence of a national value chain, and hence the potential value of recyclable material, especially (plastic) packaging material.

8. Recommendations

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

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 findings 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. Special atention needs to be given to the (leading) role of the local governments in this process, in view of the roles and responsibilities they have according to the national solid waste framework.

2. **Execute a detailed SWM feasibility study with a characterisation study of the generation and composition of solid waste** in both the refugee and host settlements using the UN-Habitat Waste Wise Cities Tool (WaCT) methodology[10], including the procurement protocols and policies of humanitarian agencies. This study should not only consider the solid waste generated by the households and the commercial establishments, but also the solid waste generated through the programmes implemented by humanitarian agencies and organisations.

3. **Develop a mid-term strategy on sustainable SWM** in general instead of giving too much focus to value chain interventions. This strategy should provide a vision, concrete objectives, activities and investment projections for collection, transfer of waste, treatment of the organic (wet) fraction, optimisation of the recyclables (dry) fraction, safe disposal of the residual fraction (including a separate solution for hazardeous waste). The strategy should also include a cost analysis of the system and proposals for financing mechanisms and secure and sustainable revenues streams to finance the operation of the different components of the system.

4. **Both service chain and value chain need to be taken into account**. In waste management systems we identify two important chains that are interlinked: the service chain and the value chain (see Figure 13). 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. 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 (private

[10] 'Waste Wise Cities Tool', *UN Habitat*, 2021. https://unhabitat.org/sites/default/files/2021-02/Waste%20wise%20cities%20tool%20-%20EN%207%20%281%29.pdf

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) is active.

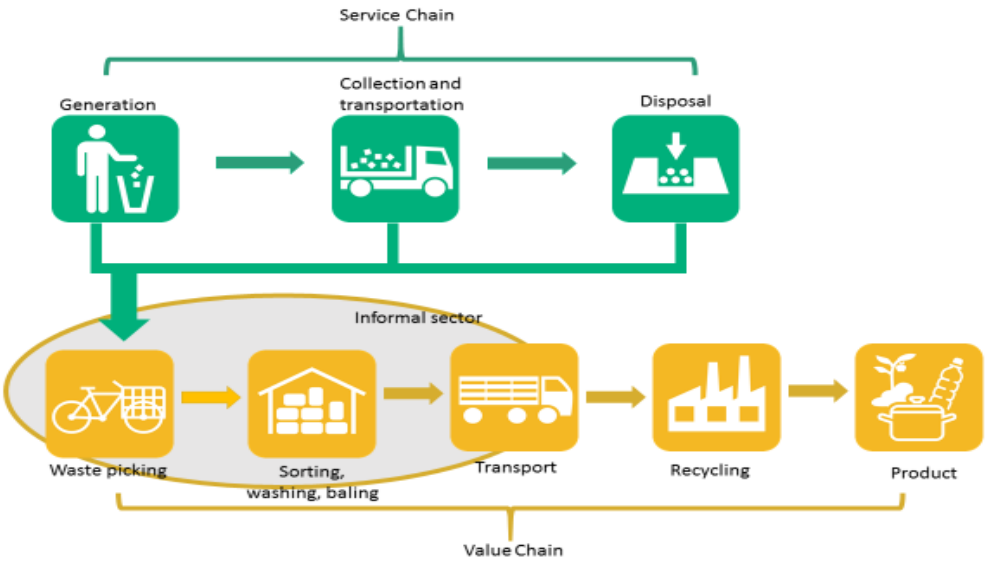


Figure 10: Waste service and value chain interlinking

5. **Provide a safe disposal site for residual waste as** an SWM system is incomplete without a solution for residual waste that meets environmental and sanitary standards.

6. **Implement decentralised composting** combined with grey water treatment and kitchen gardens.

7. **Explore innovative finance mechanisms** such as plastic credits/EPR to bring additional funding to the SWM system.

8. **Develop plastic waste recycling business models** based on the type and quantity of plastic waste available taking into account the lack of water and lack of energy:
   - Shredding rigid plastic waste into flakes and selling in Nairobi and/or Uganda
   - Baling PET bottles and selling them in 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 which consumer goods present in the camps could be manufactured from recycled plastics, including furniture, toys at schools etc.

List of Annexes

Annex 1: SWEEP stakeholders' round table agenda

Annex 2: Influence-Affected (full) Diagram for current interventions of the organisation in SWM in Kakuma

Annex 3: Influence-Affected (full) Diagram based on interventions of the organisation in SWM in Kakuma after five years

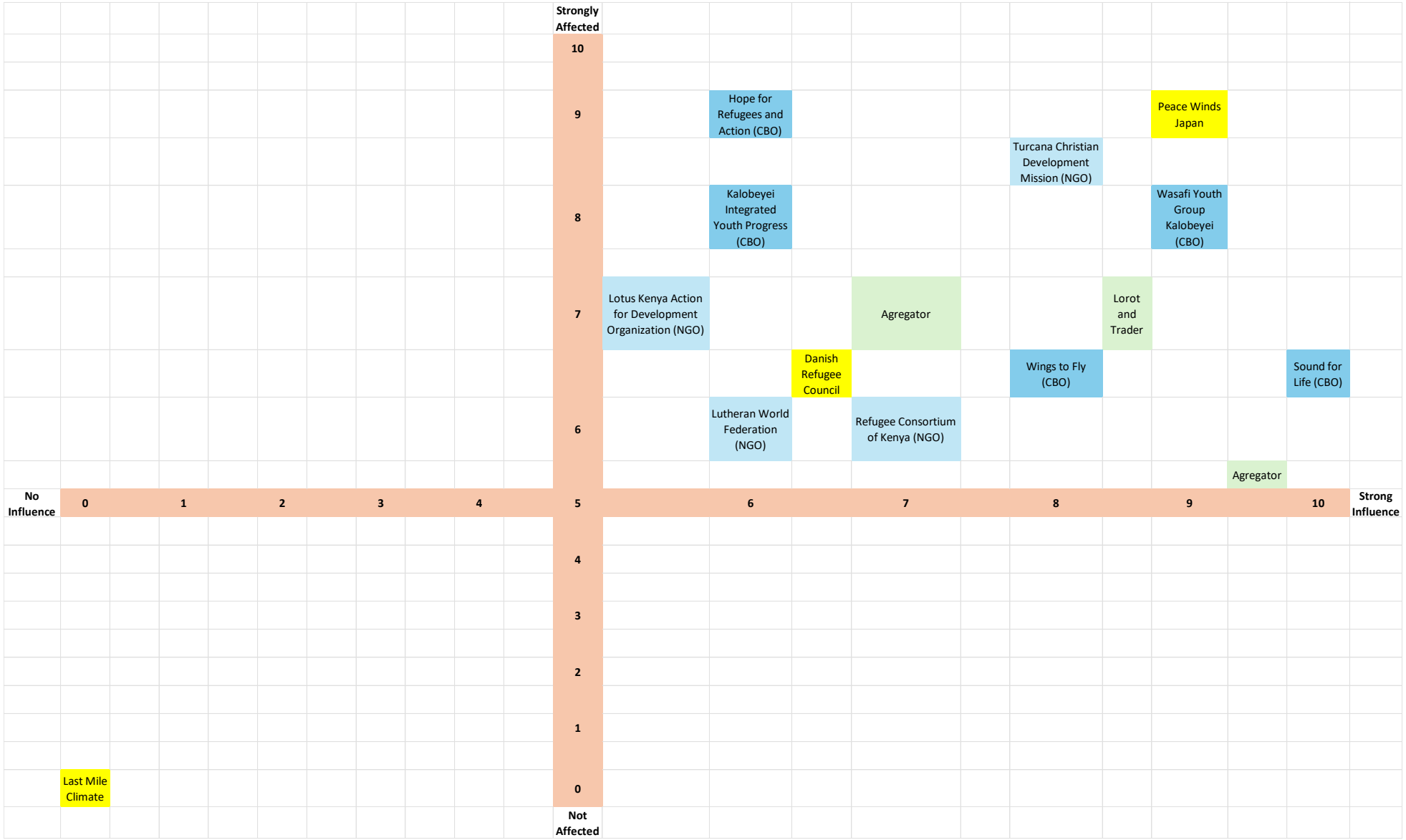
Annex 1: SWEEP stakeholders round table engagement agenda

SWEEP STAKEHOLDERS' ROUND TABLE ENGAGEMENT AT CAIRO HOTEL - KAKUMA

26TH SEPTEMBER 2024

TIME	SESSION	FACILITATOR
8:30am - 9:00am	Arriving of guests and breakfast	David Oyori, Alex Muasya
9:00am - 9:10am	Introductions, leveling of expectations and sharing of the meeting objectives	Hassan Dubat
9:10am - 9:30am	Government introductions: • County Environment • Municipality Manager • DRS Manager • DCC	Hassan Dubat
9:30am - 9:45am	BRIEF: • Area Manager - DRC • Last Mile Climate • WASTE Netherlands	Maurice Ala
9:45am - 10:15am	**TEA BREAK**	
10:15am - 10:45am	Breakout sessions - 3	WASTE Netherlands
10:45am - 11:20am	Plenary discussions	WASTE Netherlands
11.20am - 12:20pm	Open conversations about sustainable waste management in Turkana West. Presentations from participants: • TCDM • UNHCR • GIZ • DCA • Peace Winds • TDH • NEMA • Inko Moko • Save The Children • RCK • FilmAid • CBOs	David Oyori
12:20pm – 1:00pm	Way forward	DRC & WASTE Netherlands
1:00pm	Lunch and departure	All

Annex 2: Influence-Affected (full) Diagram for current interventions of the organisation in SWM in Kakuma



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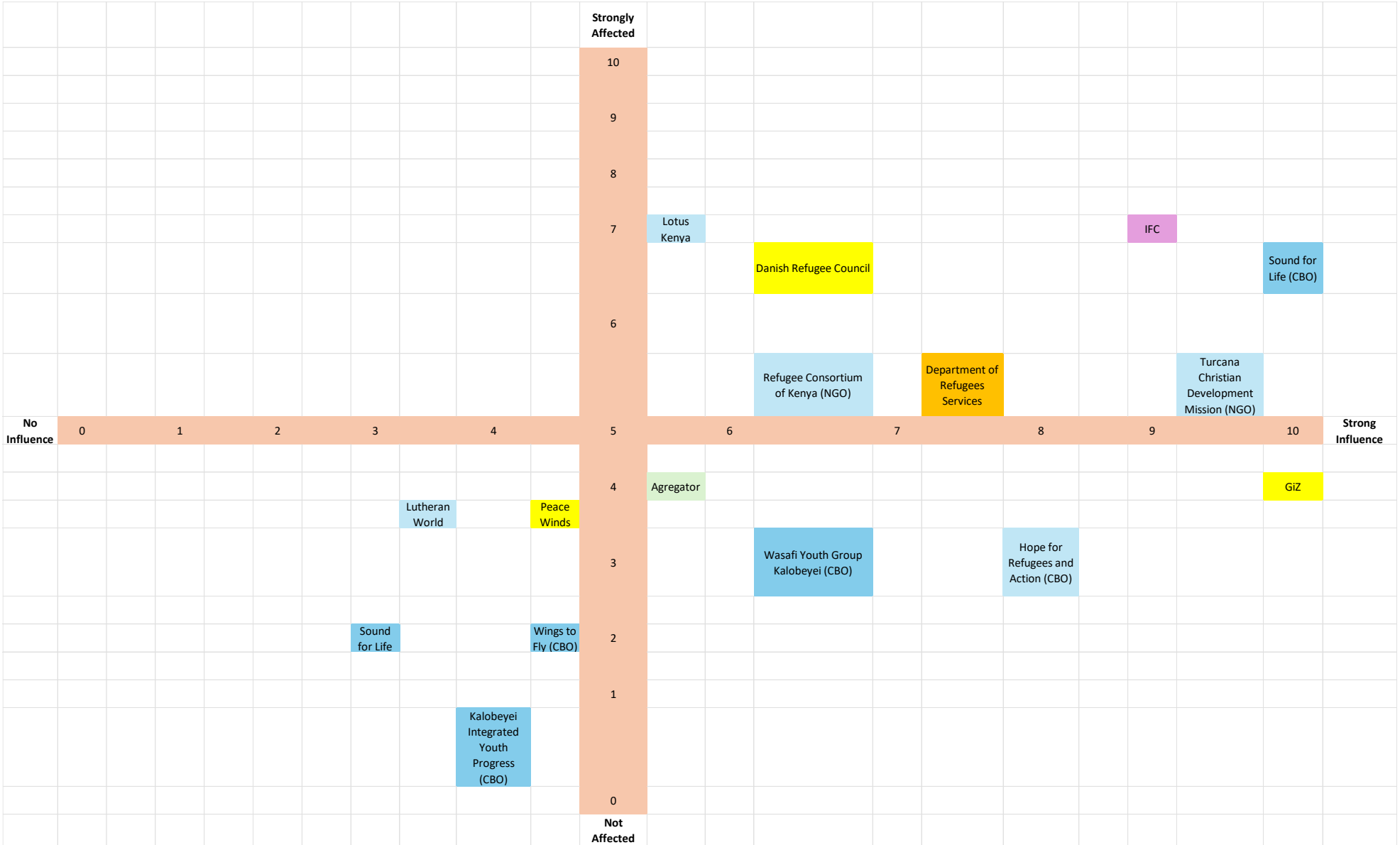

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