Solid Waste Survey Report for Homa Bay County

HOMA BAY COUNTY

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FOREWORD

H.E Gladys Nyasuna Wanga,
Governor,
Homa Bay County

I have the pleasure to present to you the Homa Bay County Solid Waste Survey Report that provides an overview of the status of solid waste management in the county. This Report is a conscious demonstration of my Government's appreciation of sustainable solid waste management as a tool for service delivery to our people. This Report will not only support Homa Bay County's endeavours towards a more sustainable and circular economy but will also inch us closer towards realization of the Zero Waste Agenda (where waste is a resource that is harnessed to create wealth, improve livelihoods and employment conditions and reduce pollution and environmental degradation). Inadequate solid waste management leads to proliferation of diseases and climate change due to environmental degradation. Poor waste management impacts on livelihoods of local communities and consequently impedes the achievement of Sustainable Development Goals (SDGs).

Through our commitments to sustainable development, our county aims to balance the broader economic and social challenges of development and environmental protection. For this reason, the county subscribes to the vision of a prosperous and equitable society living in harmony with the environment as envisioned in Article 42 of our Constitution under the fundamental right to a clean and healthy environment. Sound environmental management entails use of waste reduction technologies in production, sustainable production designs, resource efficiency & waste prevention, re-using products where possible and recovering value from such products. Even though the entire elimination of waste may not be practically feasible, as a county, we are looking forward to exploring a systematic and systemic application of an integrated waste management approach as a possible solution to our local challenges. It is no doubt that the challenge of poor waste management affects every person and institution in our society and for this reason, the survey that led to the development of this Report could not be undertaken without involving key stakeholders in the waste management value chain. I thank UN-Habitat for collaborating with my Government to undertake the survey and further extend my appreciation to the citizens of Homa Bay who took part in the survey as informants. Noting that Homa Bay County, in the past, missed an opportunity to develop a legal framework that addresses local waste management challenges because of lack of data on waste generated, collected, transported and disposed, I am optimistic that this Report will provide the much-needed data that will inform decision making as well as policy formulation in the future.

PREFACE

Oumar Sylla,
Oumar Sylla, Director,
Regional Office for
Africa,
UN-Habitat

The Strategic Plan of the United Nations Human Settlements Programme (UN-Habitat Strategic Plan 2020-2023) envisions "a better quality of life for all in an urbanizing world". UN-Habitat is helping states and Governments across the world to realise this vision by supporting four main areas of change: 1) reduced spatial inequality and poverty in communities across the urban-rural continuum; 2) enhanced shared prosperity of cities and regions; 3) strengthened climate action and improved urban environment; and 4) effective urban crisis prevention and response.

As part of the Strategic Plan's 3rd area of change, UN-Habitat has collaborated with Kenya's Homa Bay County in improving urban environment in the county and strengthening local climate action. Through the Regional Office for Africa and Urban Basic Services Section, a collaboration framework with the Homa Bay County was developed and an assessment of the performance of the County Municipal Solid Waste Management System (MSWM) conducted using the Waste Wise Cities Tool (WaCT), developed by UN-Habitat. This Homa Bay County Solid Waste Management Survey Report contains the findings of the assessment and further provides a reliable baseline for maintaining a circular and financially sustainable waste management system that efficiently uses natural resources, generates economic opportunities and establishes healthy living conditions for the residents of the County.

Since many secondary cities lack evidence-based data that hinder the development of waste management strategies, I would like to congratulate the Governor of Homa Bay, Hon. Gladys Wanga, for developing baselines that will enable Homa Bay County to effectively monitor the county's performance in managing waste in line with Sustainable Development Goal Indicator 11.6.1.

BACKGROUND

Andre Dzikus,
Chief,
Urban Basic Services Section,
UN-Habitat

UN-Habitat's Urban Basic Services Section (UBSS) addresses inequality in access to waste collection service in emerging countries and cities and has developed the Waste Wise Cities Tool (WaCT), a monitoring methodology of SDG 11.6.1, ("proportion of MSW collected and managed in controlled facilities out of total MSW generated in the city"), to monitor the progress globally towards achieving the waste related SDGs.

To address increasing waste management challenges in Africa (where the fastest urbanization coupled with waste generation that is expected to nearly triple by 2050 is observed) the African Clean Cities Platform (ACCP) was established in 2017 in Maputo, Mozambique by 24 African Member State representatives, Ministry of the Environment of Japan, JICA, the City of Yokohama, UNEP and UN-Habitat. The Secretariat of the ACCP is hosted at UN-Habitat and is supporting cities in knowledge and good practice sharing, capacity development for data and monitoring, and tangible project development.

Homa Bay county is one of the ACCP member cities and is collaborating to establish sustainable Municipal Solid Waste Management (MSWM) systems in the county. UN-Habitat, through the ACCP, conducted the SDG 11.6.1 assessment whose findings revealed that there is scope for improving waste collection coverage by improving the operations of existing disposal facilities. The results also showed the potential for organic waste recovery. Additionally, the results recommend the establishment of sustainable financial mechanisms or small-scale business models that would include subsidies to ensure cost recovery for waste value chain actors, as well as the development of MSWM strategies and master plan, incorporating feasibility studies.

As the secretariat of the ACCP, UN-Habitat's UBSS is honoured to be a part of this collaboration with Homa Bay and looks forward to supporting the County in the journey towards establishment of a sustainable MSWM system.

EXECUTIVE SUMMARY

Dr. Joash Aloo,
County Executive Committee Member, Environment Energy and Climate Change, Homa Bay County

Rapid and unplanned urbanization, lack of awareness, poor attitudes, industrialization and poor governance structures caused by inadequate financial and technical capacities have contributed to inadequate solid waste management in municipalities, including unsanitary waste management and disposal. In Homa Bay County, poor solid waste management has become a major concern for the municipalities and the absence of solid waste management baseline data only made it worse.

This Solid Waste Survey Report is a result of an assessment conducted to establish the status of solid waste in Homa Bay County. The assessment, conducted by the County with technical and financial support from UN-Habitat, applied the Waste Wise Cities Tool (WaCT) methodology to collect data on Municipal Solid Waste (MSW) generated, collected and managed in controlled facilities in the municipalities. The main objective of the WaCT assessment was to derive a systematic and comprehensive data and information on SWM, including the quantity and composition of municipal solid waste (MSW) and other factual information.

The total sample size of 90 households were collected. The household waste generation rates varied depending on income status. The 90 households were sampled from low, medium and high level of income in equal samples of 30 households per zone only within urban areas where waste is managed with an equivalent population of 199,280 which is 14% of total population projection for 2022. The waste composition analysis indicated that approximately 76 tonnes per day of municipal waste is generated in the urban areas of Homa Bay County, of which 26% is collected and Zero (0%) is managed in controlled facilities. Approximately 56tonnes (74%) of municipal solid waste remains uncollected and is released into the environment daily.

This Report will play a key role of informing county interventions on solid waste management at a time that the county is experiencing growth of new towns and settlements that require sustainable Municipal Solid Waste Management (MSWM) frameworks and infrastructure to support the management of waste at the local level. Additionally, this Report provides information that is essential, not only for effective planning and budgeting in the county, but also in checking the environmental control levels of waste management facilities as required by the Environmental Management and Coordination Act (EMCA, 2015).

ACKNOWLEDGMENT

Prof. Donald Ogweno,
County Chief Officer,
Environment,
Homa Bay County

The County Government of Homa Bay would like to acknowledge the support provided by the United Nations Human Settlements Programme (UN-Habitat) during the solid waste assessment process as well as during the preparation of this solid waste assessment report. On behalf of the county Government of Homa Bay, I would like to thank the UN-Habitat team that comprised of Jeremiah Ougo, Nao Takeuchi, Francesca Calisesi and Mercy Achieng' for their support during the entire period.

I wish to also mention that the role of the County Directorate of Environment was key during this assessment in the preparation of this Report. In this regard, my technical team that was led by Stacy Atieno Virginia and that comprised of the technical staff based in the sub-counties (Francis Obwanga, Flora Mitchel, Cosmas Ouma and Tobias Mboya) as well as the Municipal Boards and Managers in Homa Bay, Oyugis and Mbita, cannot go without mentioning. These county staff were instrumental in the waste assessment and audit processes and contributed to the formulation of key recommendations for a sound municipal solid waste management system in the County.

Most importantly, I thank the Governor, Her Excellency Gladys Wanga, for recognizing the importance of a sound municipal solid waste management system in delivering environmental, social and economic benefits for local communities.

Contents

Background

Homa Bay County is one of the 47 Counties in Kenya and lies between latitude 0°15' South and 0°52' South, and between longitudes 34° East and 35° East with a population of 1,131,950 persons (2019 census) equivalent of 262,036 households. The county covers an area of 4,267.1 Km^2 inclusive of the water surface which on its own covers an area of 1,227 km^2. The climate is inland equatorial, with temperatures ranging from a mean annual minimum of 17.1°C to a mean maximum of 34.8°C, with rainfall amounts of between 250mm and 700mm per annum.The county is located in South Western Kenya along Lake Victoria where it boarders Kisumu and Siaya counties to the North, Kisii and Nyamira counties to the East, Migori County to the South and Lake Victoria and the Republic of Uganda to the West. The major economic activities are agriculture (livestock, crop production, and fisheries), medium and small-size trade, mining, and quarrying, among others.

Solid Waste Management Challenges

According to the 2019 Population and Housing Census, the county had a population density of 3,150.3 persons per square kilometer, which is projected to increase to 405 persons per square kilometer by the year 2023. It is estimated that 14% of population is living in urban areas, where Homa Bay county Government is responsible for providing waste management. Homa Bay County has eight sub-counties which are Mbita, Ndhiwa, Homa Bay Town, Rangwe, Karachuonyo, Kabondo, Kasipul and Suba[1] . A total of five municipalities exist within the above sub-counties. These municipalities are Homa Bay, Kendu Bay, Mbita, Ndhiwa and Oyugis.

Urban Areas	Population (2019 Census)		
	Male	Female	**Total**
Homabay	21,440	23,507	**44,949**
Oyugis	9,286	10,661	**19,947**
Kendu Bay	2,920	3,144	**6,064**
Ndhiwa	2,182	2,580	**4,262**
Mbita	7,166	7,748	**14,916**

Each of these municipalities generate solid waste but lack sustainable Municipal Solid Waste Management (MSWM) frameworks and infrastructure to support the management of waste at the local level. Specifically, lack of solid waste management sanitary land fill sites contributes to poor waste management and uncontrolled dumping.

While the Municipal Solid Waste (MSW) function is centrally coordinated by the County Executive Committee Member (CECM) heading the Department of Water, Sanitation, Environment, Climate Change & Natural Resource, the department has made efforts to improve waste management and pollution control services by acquiring a landfill in Ndhiwa and a solid waste holding site in Mbita. The Department has also procured and installed litter bins, a waste truck, skips and noise meters all in bid to enhance waste segregation, recovery, recycling and creation of green jobs. The department has also rolled out cleaning services in the urban centres and is conducting campaigns on effective solid waste management.

1 CIDP 2023-2027.

Addressing the MSW data challenge in Homa Bay County

However, in order to improve on service delivery by effectively providing solid waste management services, the county Government requires adequate MSW data. Unfortunately, such MSW data is currently lacking in Homa Bay county. The absence of data negatively affects policy formulation and decision making and could contribute to bad governance. Based on this reality, the County Government of Homa Bay, with support from UN-Habitat, conducted an MSW Audit to establish the status of solid waste in the county using UN-Habitat Waste Wise Cities Tool (WaCT) that has been applied globally by United Nations Member States. With data availability, the county can monitor its contribution to SDG 11.6 on **"Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal solid waste generated, by the city."**

The WaCT Tool is a seven (7) step guide for collecting data on MSW generated, collected and managed in controlled facilities. The tool provides a household survey guide for total MSW generation, a questionnaire to identify the MSW recovery chain and criteria to check the environmental control level of waste management facilities in a city. The WaCT application survey was conducted between February-March 2023 in Homabay, Mbita and Oyugis municipalities, taking into account only the areas where MSW is managed with an equivalent population of 199,280, which is 14 % of total population projection for 2022[2].

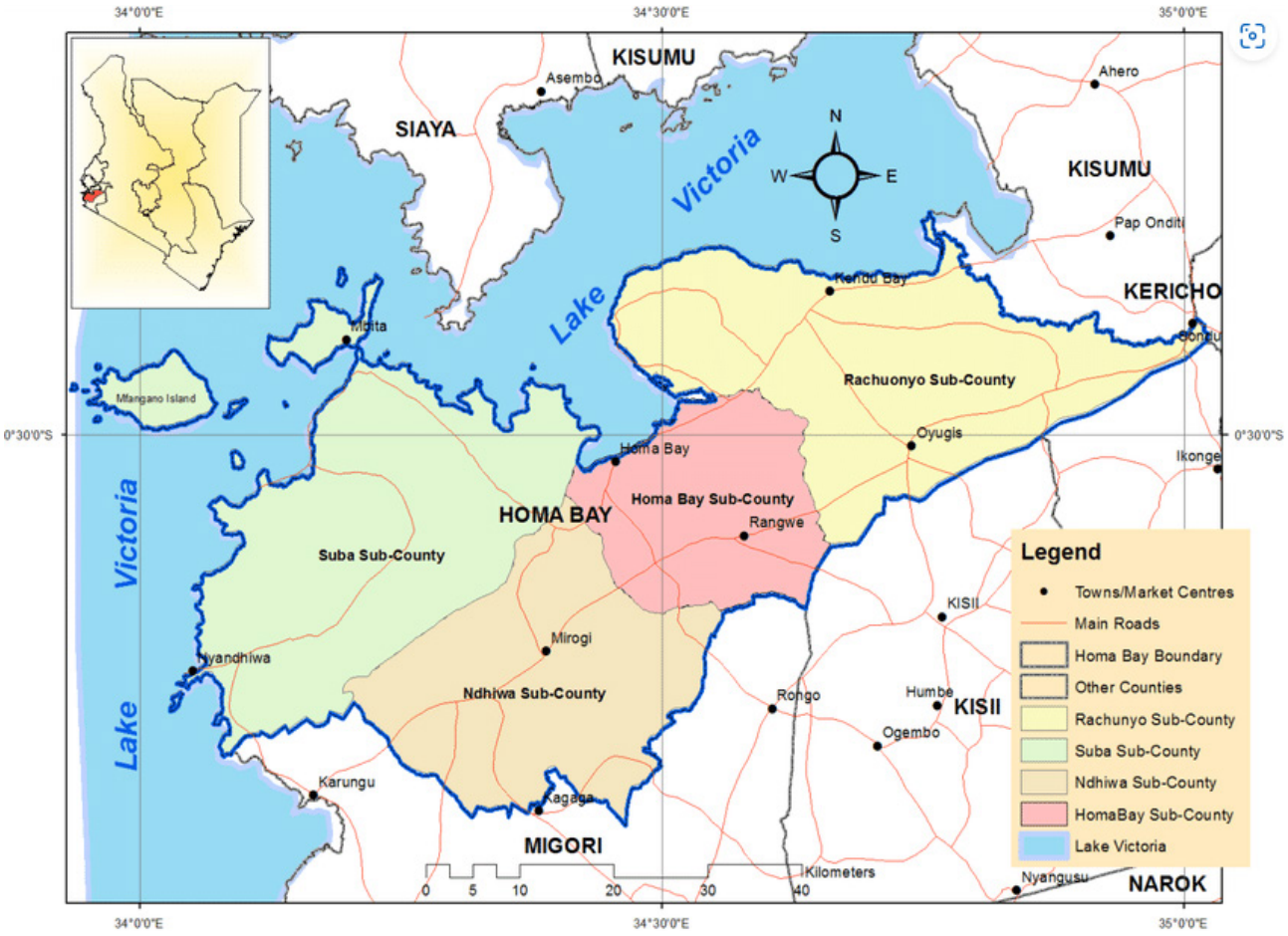


Figure 1: Map of Homa Bay County showing urban areas (municipalities, towns and market centres)

2 The population applied to the survey is based on the county Government's projection for 2022, which is 1,423,435. In accordance with county Government officials, the municipal solid waste management system currently covers urban areas only, therefore, the data analysis uses urban population only, which is 14 % of total population projection for 2022, meaning 199,280.


M-PESA
M-PESA

1. WaCT and WFD Survey Results

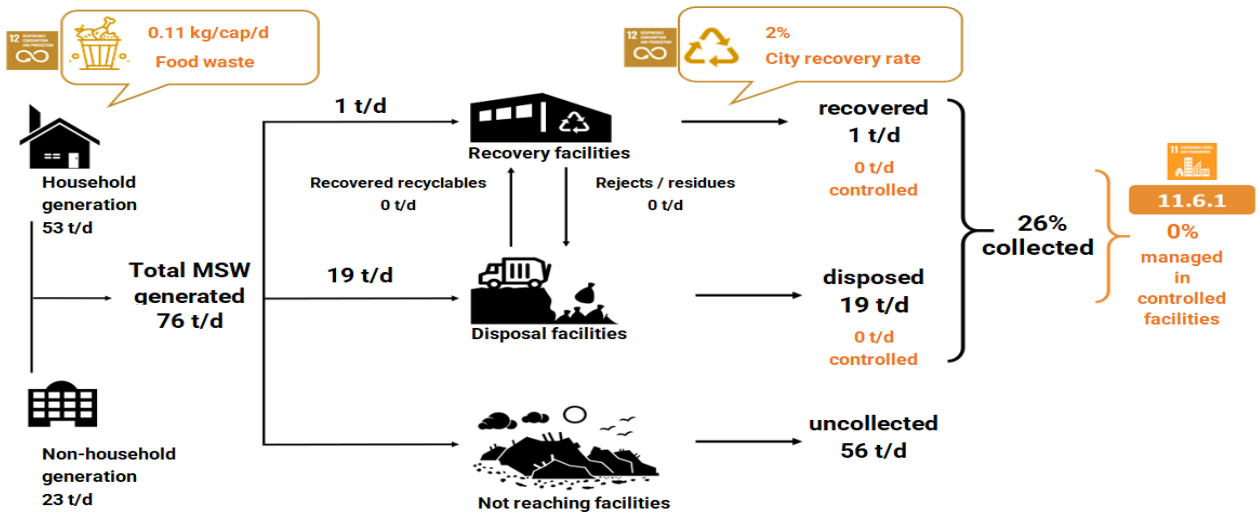
According to the WaCT survey, approximately 76 tonnes per day of MSW is generated in the urban areas of Homa Bay county. Only 26% of this is collected while 0 % is managed in controlled facilities. Approximately 56 tonnes (74%) per day of MSW remains uncollected and is released into the environment daily. The per capita MSW generation of the study area is 0.38 kg/capita/day. The average household MSW generation is 0.27 kg/capita/day and the food waste generation is 0.11 kg/capita/day.

Figure 3: Household waste generation and composition analysis in Homabay county Kenya

Table 1: Key WaCT and WFD Data in Homa Bay County Kenya

Income group	High income	Middle income	Low income
Waste generation rate (kg/capita/day)	0.26	0.30	0.26
Total population	19,928	59,784	119,568
Total MSW generated from household(t/day)	5	18	30
Total MSW generated from non-household sources (t/day)	23		
Total MSW generated (t/day)	76		
City Plastic Leakage into water bodies (kg/person/year)	0.9		

As per the survey findings, the informal sector takes the lead in waste recovery, managing a bit less than 1 tonne of recyclables daily, constituting approximately 2% of the total MSW generated. From these recyclables, a share is recovered by the informal waste pickers from the disposal site.



The diagram below shows the flow of plastic waste in the survey area with potential leakages and fate. Out of the total 1,892 tonnes/year of plastic waste generated, equivalent of 5 tonnes daily, 61% is unmanaged and leaking into the environment, which is an estimated of 1,147 tonnes per year, out of which 572 tonnes per year are retained on land, 378 tonnes per year are being openly burnt, 173 tonnes per year are leaking into water bodies (the equivalent of 0.9 kg/person/year) and 24 tonnes per year are trapped in drains. The largest source of plastic leakage into the environment is due to the uncollected waste which remains in the environment or is being openly burnt by residents as means of disposing their waste. The second largest source is from collection services, as waste is leaking from the open containers, or deposited on the ground, being accessible to animals. Other factors contributing to plastic leakage include the way waste is managed during recovery by the informal sector, the disposal site processes, and the handling of waste during transportation.

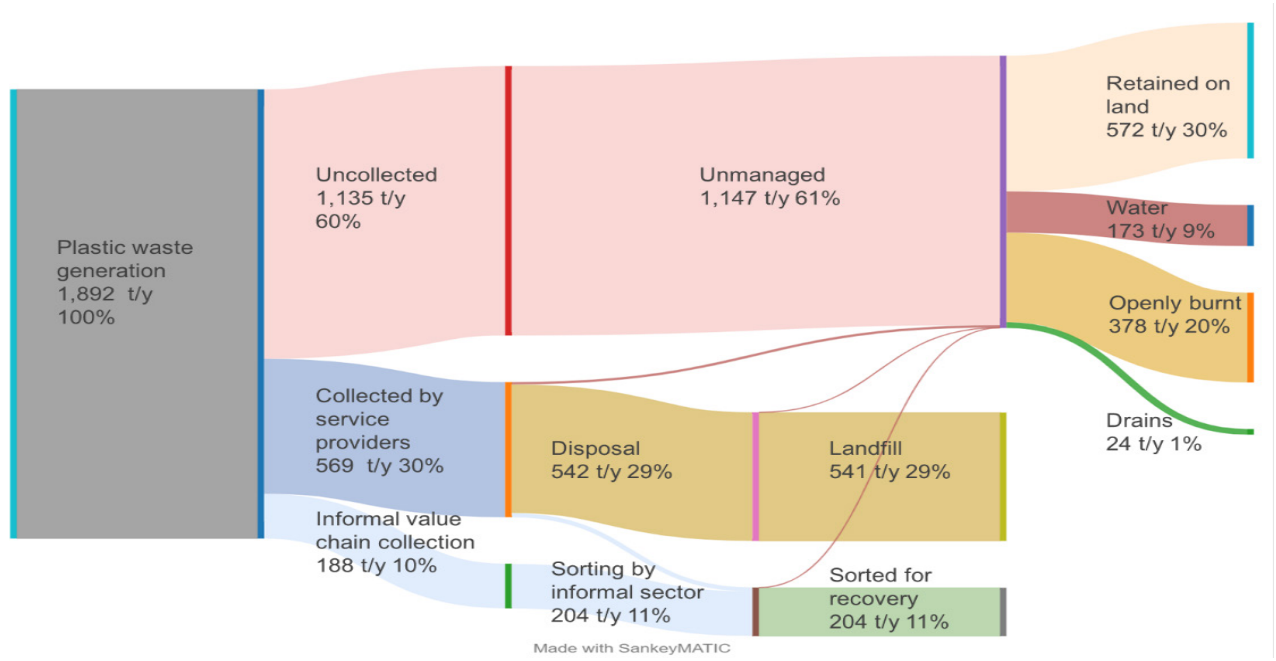


Figure 4: WFD results in Homa Bay urban areas, Kenya for Plastic Waste Stream (tonnes per year; % of the total generated plastic waste)

2. Policy and Infrastructure Gaps Analysis

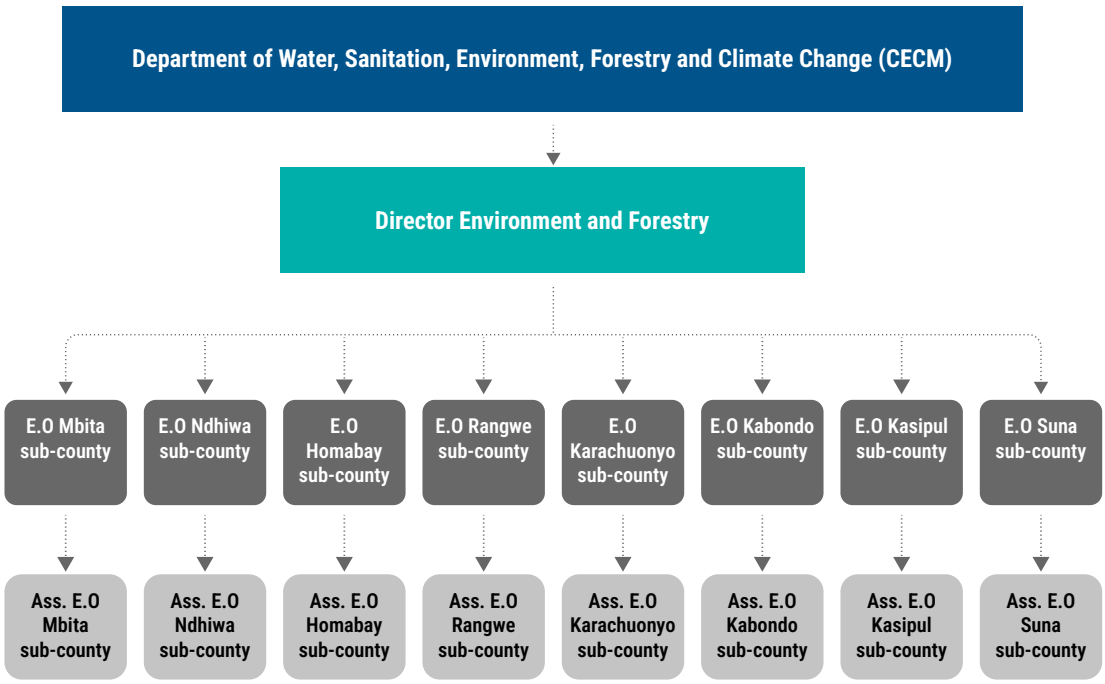
Status quo

Environmental Management and Coordination Act (EMCA 1999) as amended in 2015, is the main law governing environmental protection in Kenya. It provides the legal and institutional framework applicable to all local industries, including the petroleum sector. EMCA 1999 established the National Environment Management Authority (NEMA). The purpose of NEMA is to exercise general supervision and coordination over all matters relating to the environment and to be the principal instrument of the Government in the implementation of all policies relating to the environment. EMCA 1999 contains a broad spectrum of provisions directed at environmental protection, including licensing and permitting; monitoring and enforcement; protection of water bodies; conservation of biodiversity; environmental restoration; management of hazardous materials; air quality management; effluent discharges; and waste management. EMCA 1999 is the parent act from which a number of subordinate regulations stem. Due in part to its broad scope, EMCA 1999 fails to provide specific information necessary to give effect to its mandates. Consequently, reaching compliance requires studying EMCA 1999 in concurrence with the relevant subordinate regulation, e.g., the Environmental Management and Coordination (Waste Management) Regulations 2006.

At the local level, the Homa Bay County does not have any legislation framework (regulations, laws, policies, strategies, plans, etc) for SWM that could build upon the National frameworks. Homa Bay county lacks a solid waste management law (Act) or any related by-laws. While the County Finance Act (2020/2021) stipulates that businesses should pay for a permit, the nature of business is not specified in the Act thereby creating a lacunae that affect re-allocation of revenue to the solid waste sector and related waste activities.

The organisational structure of SWM in Homabay is as follows:

- SWM is managed under the Department of Water, Sanitation, Environment and Forestry, and climate change led by County Executive Committee Member (CECM).
- Director for Environment and Forestry reports to the CECM.
- Sub-county environment officers report to the Director for Environment and Forestry, representing 8 sub-counties.
- Under sub-counties there are assistant environment officers per town.



Waste collection and transfer

Homa Bay County Government is not the only formal entity providing waste collection services in the county. There are few other registered private waste collection companies or Community Based Organizations (CBOs) which have contracts or are registered with the county Government. In addition to this, there are a few individuals who operate informally by doing door-to-door collection for households.

Most households do not receive door-to-door waste collection services and bring their waste to the nearby designated collection points or skips for secondary collection by the county Government vehicles. In this scenario, there isn't a system in place where households pay the county Government for services. Certain households receive door-to-door waste collection services from CBOs or private waste collection companies in exchange for fees. CBOs typically deliver the collected waste to nearby collection points or skips, whereas companies collect the waste and transport it to landfill sites.

In Homa Bay town, there are 10 functional skips and 3 receptacles. Additionally, there are 2 skips in Mbita and 3 skips in Oyugis, totalling 15 skips and 3 receptacles under the county Government's ownership. These facilities serve to hold waste for a week before it's transported to disposal sites. Although strategically located throughout the entire county, their number proves inadequate, given that a significant majority of waste generators, around 65%, need to travel more than 500 meters to reach them, leading to instances of illegal dumping. In some cases, citizens who are within 100 meters of the receptacles, still resort to illegal dumping, underscoring the necessity for heightened public awareness. Additionally, it was observed that the receptacles have limited capacity to contain waste in a manner that prevents environmental pollution. Waste often spills over from the receptacles into the immediate vicinity, sparking concerns for public and environmental health.

Table 2: Status of waste collection equipment in Homa Bay County

Sub-county	Equipment	Qty	Functionality	Capacity	Frequency of collection
Homa Bay	Tipper truck Skip loader Skips Receptacles	1 1 10 3	Functional Functional Functional Functional	8 Tonnes 0.5 Tonnes 0.5 Tonnes	5 trips/day/truck for 6 days in a week
Mbita	Tipper truck Skips	1 2	Functional Functional	8 Tonnes	3 trips per week.
Oyugis	Waste tractor Skips	1 3	60% functional Functional	4 Tonnes 0.5	3 trips/day for 3 days in a week

Homa Bay and Mbita share the 2 waste collection trucks. The collection tractor in Oyugis sub-county is privately owned and very old. The County Government of Homa Bay procured 33 skips for the whole county in 2014. However, 30 skips were broken down by 2021. In 2022, the County Government procured 15 additional skips. Currently Homa Bay municipality has 10 skips, Mbita Municipality has 2 skips and Oyugis Municipality has 3 skips.

The shortage of skips has led to the proliferation of illegal disposal sites. The county's ability to effectively manage waste collection is hampered by generators not contributing towards collection services. The existing budget allocation of 40 million Ksh/year is solely designated for fuel expenses, and even this allocation is unreliable. Consequently, there are no funds allocated for repairs and maintenance, with vehicle breakdowns requiring more than a month for repairs. To ensure the sustainable provision of collection services, prioritizing cost recovery, particularly through payment for collection services, is crucial.

The key challenges related to waste collection and transfer in Homa Bay county are as follows:

- Lack of cost recovery mechanisms for sustainable waste collection services because waste generators are not adequately charged for collection services, i.e., most households do not pay any waste collection fee while businesses are only charged 100Ksh per single business permit (about 1 USD) annually, a fee intended to cover waste collection expenses. However, these funds are never allocated towards any MSW operations.
- Waste collection vehicles are inadequate and in run-down condition especially the one serving Oyugis due to lack of repairs and maintenance. The skips are not covered in transportation resulting in leakages.
- Lack of technical capacity and public awareness of using the skips properly.
- Challenges arise from the public's disposition and awareness concerning the safe disposal of waste. In specific regions, despite the proximity of skips to residents, they opt for either discarding waste in drains or resorting to open burning. Moreover, sporadic collection delays by the county contribute to instances of waste being openly burned at the receptacles.
- There is not sufficient equipment and PPE for workers such as street sweepers, drain cleaners and manual loaders of collection vehicles.
- Lack of legal framework for waste management and legislation framework (regulations, laws, policies, strategies, plans) for SWM.
- Inadequate waste receptacles.
- Lack of transfer stations.

Waste recovery

The survey found that 2% of total MSW generated in Homa Bay, which is around 1 t/day is recovered at the moment, out of 64 t/day of potentially recoverable waste is generated. It should be acknowledged that the entire recycling now is fully achieved by the informal sector, without any financial support from the county Government.

Recyclables are collected from households and disposal facilities by waste pickers and CBOs are also engaged in sales of recyclables from primary collection. Plastic materials are processed in chips or flakes and sent Nairobi, Kisumu and Uganda for manufacturing of plastic materials. Similarly, paper and metal are sent to Kisumu, Nairobi and Uganda for further processing. All surveyed recovery facilities are categorised as 'no control' according to operational control ladder. Considering that there are only two formal and a small number of informal stakeholders involved in the waste recovery sector in Homa Bay, the survey attempted to interview both, but this was not possible because some of the informal actors feared participation and refused to grant interviews.

The waste recovery value chain operations in the three sub-counties in Homa Bay are as follows:

- In the Oyugis municipality, two formal end-of-chain recyclers, Jimson Enterprise and Rosa Plastic Recycling, play a significant role by recovering roughly 90% of all materials across the municipality. As each of the municipalities possesses their own disposal sites, waste pickers operating in Oyugis directly supply these formal end-of-chain recyclers without intermediaries. Despite possessing the capacity to collect larger quantities of materials, they lack the necessary financial and equipment resources for locally processing and transforming the materials into new products. Their capabilities are currently limited to crushing and baling, followed by transportation to destinations such as Nairobi, Mombasa, and Uganda.

- In Homabay Municipality, an Apex trader known as Kamongo Scrap Yard is the primary recipient of HDPE plastics, in addition to other recoverable materials. These items are sourced from numerous small intermediate collectors, waste pickers, and individuals who scavenge valuable recyclables from skips and households. The Apex trader subsequently distributes the materials to Kisumu and Nairobi, and on occasion, even to Uganda. Additionally, within Homa Bay town, a trader specializing in scrap metals, Chrisantus Enterprise, collects a significant volume of scrap metals. These materials are sold in bulk to intermediaries, who then directly supply them to metal recycling companies.

- In Mbita Municipality there is one Apex trader for Scrap Metal with a capacity of 9 tonnes, selling directly to Mayuge Steel in Uganda and Kibos scrap Metal in Kisumu. There are also few small, informal intermediate traders who receive recyclables from waste pickers and individuals, collects them and sells them to the one Apex trader in Homa Bay.

The Figure below illustrates the recovered materials in Homa Bay daily. Out of the total, 73% is plastic, with 0.6 t/d HDPE, mixed plastics – 0.01 t/d, while paper / cardboard is recovered as much as 0.1 t/d, glass – 0.02 t/d, metal – 0.06 t/d and organics - 0.5 t/d.

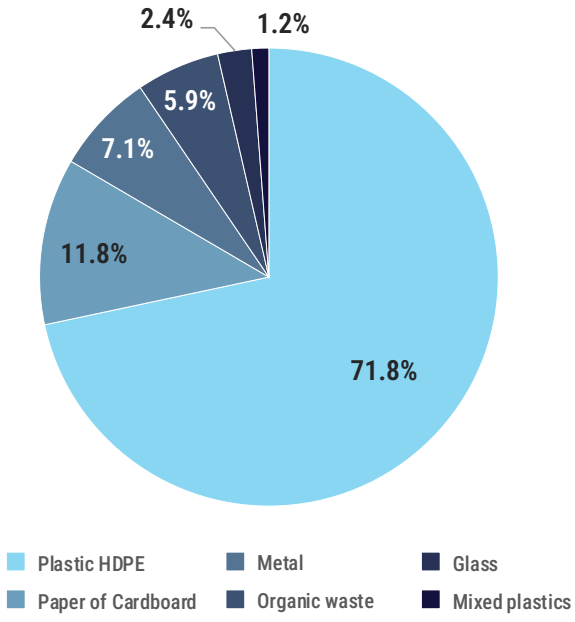


Figure 5: Breakdown of recovered materials in Homabay

The following table summarises the potential amount of recoverable waste in Homa Bay. In order to harness these recyclables, clean Material Recovery Facilities (MRFs) with a total capacity of 64t/day are required. Organic waste treatment facilities (e.g. composting, biogas, black-soldier flies, etc.) with a total capacity of 51t/day are needed to recover the organic waste generated in Homa Bay. It can be said that 50% of the materials can be realistically recovered if investment in collection and transportation systems are put in place together with proper source separation execution.

Table 3: Potential opportunities for waste recovery in Homabay

Waste category	Potential by expanding waste collection services (t/d)
Paper and cardboard	5
Plastic film	2
Plastic dense	3
Glass	1
Textiles/shoes	2
Organics	51
Total	**64**

Waste disposal

There are three designated disposal sites in the county: Makaburini, Kisui and Nyalenda. These are discussed below:

Makaburini dumpsite: This is the main disposal site in Homa Bay Municipality. It is approximately 1 acre in size and receives about 9.26 tonnes of MSW per day. It is an uncontrolled disposal site, and its boundary is less than 200 meters from the main road making it very accessible. In addition, the facility does not have a fence nor staff that regulate access to the site. Furthermore, it is constantly on fire which starts spontaneously because of methane reactions causing public health risks and environmental pollution. There is a group of 10 waste pickers, 4 women and 6 men who recover valuables including plastics, glass, paper and cardboard, metals, and organics (bones only). They depend on this dumpsite for their daily livelihood.

Kisui dumpsite: This serves Mbita Municipality, receiving approximately 4.5 tonnes of MSW per day, though its size is unknown but estimated to be 55 meters by 35 meters. Like Makaburini, the dumpsite at Mbita is an uncontrolled disposal site without access control, it is located 200 meters from the main road and hence easily accessible by the public. There are no waste pickers at this disposal site.

Nyalenda dumpsite: This serves Oyugis Municipality, receiving approximately 5 tonnes of MSW per day, estimated to be 2.69 acres. Nyalenda dumpsite is standing on a private land not owned by the County Government. It is also an uncontrolled disposal site without access control. The road leading to the site is inaccessible during the rainy season, as it becomes muddy. Since the site is isolated and out of reach, there are no illegal activities going on. There are no waste pickers at the site.

Figure 6 Makaburini dumpsite (left) and Nyalenda dumpsite (right)

The table below shows operational criteria for basic level of control set by Waste Wise Cities Tool met by the disposal sites. The criteria under "No" answer are areas which could be further improved so the disposal sites reach a higher level of control.

Table 4: Basic level of control area met by the disposal site in Homa Bay

Assessment areas	Questions	Makaburini	Kisui	Nyalenda
Security	Is there boundary and access control allowing single point of supervised access	No	No	No
Water control	Is there any perimeter drainage maintained around the site	No	No	No
Slope stabilisation	Are the slopes stabilised, mitigating risk of landslide	No	No	No
Waste handling, compaction and cover	Are waste trucks directed to a specific operational area of disposal	No	No	No
	Is there heavy mechanical equipment reliably available	No	No	No
	Is waste layered and compacted within the specific operational area	No	No	No
	Is there some use of cover material	No	No	No
Fire control	Is their zero evidence of burning of waste on the surface of the landfill	No	No	No
Staffing	Are staff on site during operational hours	No	No	No
Records	Is there a functional weighbridge in use	No	No	No
EHS	Are there toilets and hand washing stations	No	No	No
	Are basic personal protective equipment in use	No	No	No
Other	Is there a site drawing showing the landfill boundary and filling area	No	No	No

3. Financing Gaps Analysis

Annual budget for MSWM in the city and estimated budget per ton of MSW

The budgeting process for MSW is initially estimated by the Directorate for Environment and Forestry and proposed to the Treasury. This budget is intricately tied to the County Integrated Development Plan (CIDP) which spans a 5-year horizon. The development plan comprises Annual Development Plans (ADPs) for each financial year, detailing the financial requirements for various services, including MSW. Despite the careful fiscal and development planning and allocation process, challenges can arise during the allocation phase where the allocated budget is often found to be reduced. This impacts the Directorate's ability to fully fund MSW initiatives. Ultimately, the County Assembly plays a role in determining the specific funds that are allocated, while the actual funds received may deviate from the anticipated or planned amounts.

The table below shows the budget for the financial year 2022-2023. The total budget allocation was 37,300,000 KSH (equivalent to 253,225 USD) which translated to about 34.7 USD being allocated per ton of MSW collected in Homa Bay, respectively 9.1 USD per tonne of MSW generated.

Table 5: MSW Budget for financial year 2022-2023

S/No	ITEM	TOTAL KSH
1	Casual cleaning	21,000,000
2	1 Dumpsite	10,000,000
3	Waste receptacles	6,300,000
TOTAL		**37,300,000**

Homa Bay county Government requested the below budget for MSW services for 2023-2024. The total requested budget of 53,250,000 KSH (equivalent to 365,062 USD), which would translate to about 50 USD allocated per ton of MSW collected in Homa Bay, respectively 13.1 USD per ton of MSW generated.

Table 6: MSW Budget Requested for financial year 2023-2024

S/N.	DEVELOPMENT PRIORITIES	STRATEGIES	ANNUAL BUDGET (million Ksh)
1.	Enhance urban and rural areas sanitation	Disposal site	16
		Procurement of waste truck	10
		Procurement of Skips	10.5
		Purchase of litter bins	1.5
		Stakeholder engagement in solid waste management	2
		Capacity development of staff and citizens on solid waste management best practices.	5.25
		Partnership and exchange program on best practices	1
2.	Formulation of legal frame-works	Development of an Integrated solid waste management policy	5
		Development of waste management strategies for municipalities	2
TOTAL BUDGET			**53.25 (365,602 USD)**

The World Bank's "***What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050"*** provides a typical cost of collection, transfer and controlled disposal or sanitary landfill for countries with different income levels. It indicates that 45-115 USD / ton of waste is needed in lower-middle income countries. On the contrary, the budget allocated per ton of MSW generated in Homa Bay is 13.1 USD, indicating the fund to support sustainable MSW system operational cost in Homa Bay, which could both include private and public sources, needs to be doubled or tripled.

Sources of revenue and revenue collection mechanisms

Currently in Homa Bay County, there is no established legal framework for revenue collection in place. However, the county administration has set its sights on implementing a comprehensive policy for revenue collection within the next five years. This initiative aims to establish a structured framework that will facilitate efficient and transparent revenue collection processes in the county.

Private waste collectors are servicing residential areas, catering to low, middle, and high-income communities. These collectors operate under contracts, and the collection fees are largely determined by the operators themselves in an open competition framework. However, there is a lack of specific regulations in place to govern their operating and pricing structure for households (HHs) and the corresponding revenue return to the county. Consequently, private collectors may be hesitant to disclose the specifics of their collection fees, further underscoring the need for a transparent and standardized system to ensure fair practices and effective revenue sharing.

4. Recommendations

Based on the WaCT results and current understanding of the situation at the local level, the Homa Bay County's priority areas of intervention are to expand the waste collection coverage and controlled management of disposal sites. This could be achieved through key actions below:

- **Establishing legal framework for fee collection for MSWM in Homa Bay** to stabilize budget to fund the MSW activities. This could go in hand in hand with the review of County Finance Act 2017. This should allow an establishment of sustainable financial mechanisms or small-scale business models that would include subsidies to ensure cost recovery for CBOs or youth groups doing collection.

- **Develop MSWM strategies and masterplan** will be the first step for identifying areas of interventions listed below with more details in addition to regulatory frameworks. The plan can incorporate feasibility studies and/or business models for the listed interventions to be implemented.

- **Licensing waste collection groups** is necessary process for formalizing the informal youth groups and CBOs who are engaged in waste collection and/or recovery activities. Register those CBOs and give license to charge households for waste collection. The same system could be applied to privately operating waste collection companies.

- **Provision of 'Community Resource Recovery Centre' to registered CBOs** could go with licensing waste collection groups. Small-scale material recovery and transfer stations could be built and operated by licensed CBOs who sort and sell recyclables more efficiently. In urban and town setting where households do not have gardens, those sites could be combined with small scale bio-digester / containerised composting / black soldier flies and urban agriculture activities.

Figure 7: Examples of containerised composting (left-up, left-down and middle down), small scale material recovery and transfer station (right-up)[3] and small-scale bio-digester (right-down)[4]

3 ADB, 2013 Material Recovery Facility Toolkit
4 RWA Group "Decentralizing Recovery/Recycling System" option cards

Strengthening secondary waste collection by county Government, including purchase and proper maintenance of waste collection vehicles especially in Oyugis municipality. PPE provision and tools for the workers, in addition to upgrade the design of waste collection vehicles with covers with tarpaulins or makeshift nets to prevent spillage of waste are important.

- **Promotion of home composting** could be an effective measure to reduce MSW generation from households, considering the fact that the more than 70% of household waste is organic. This could be promoted particularly in the rural-setting where households have gardens. This could reduce the MSW generation to be collected by county Government drastically, saving county Government's budget for fuel and vehicle maintenance.

- **Sensitization and awareness raising on the importance of MSWM**, especially on the no littering, segregation at source, home-composting and importance of waste collection fee payment. School programmes or painting of waste collection receptors with children, in addition to clean-up activities could be organized and sensitization should also involve Mlango Kumi and Jua Kali.

- **Source separation.** Introduction of household separate collection of wet and dry waste would support efficient resource recovery, allowing organic waste to be turned into compost and recyclable materials to be processed and reused. Communal collection points could introduce three collection containers – organic waste, recyclables and residuals, for more efficient recovery of resources.

- **Turning dumpsites into "basic" controlled disposal sites,** though provision of access road, construction of cells, drainage, leachate collection and pond, etc. The criteria for the 'basic control' of disposal facilities provided in this report will be guiding principles for bringing the operational control of 4 dumpsites.

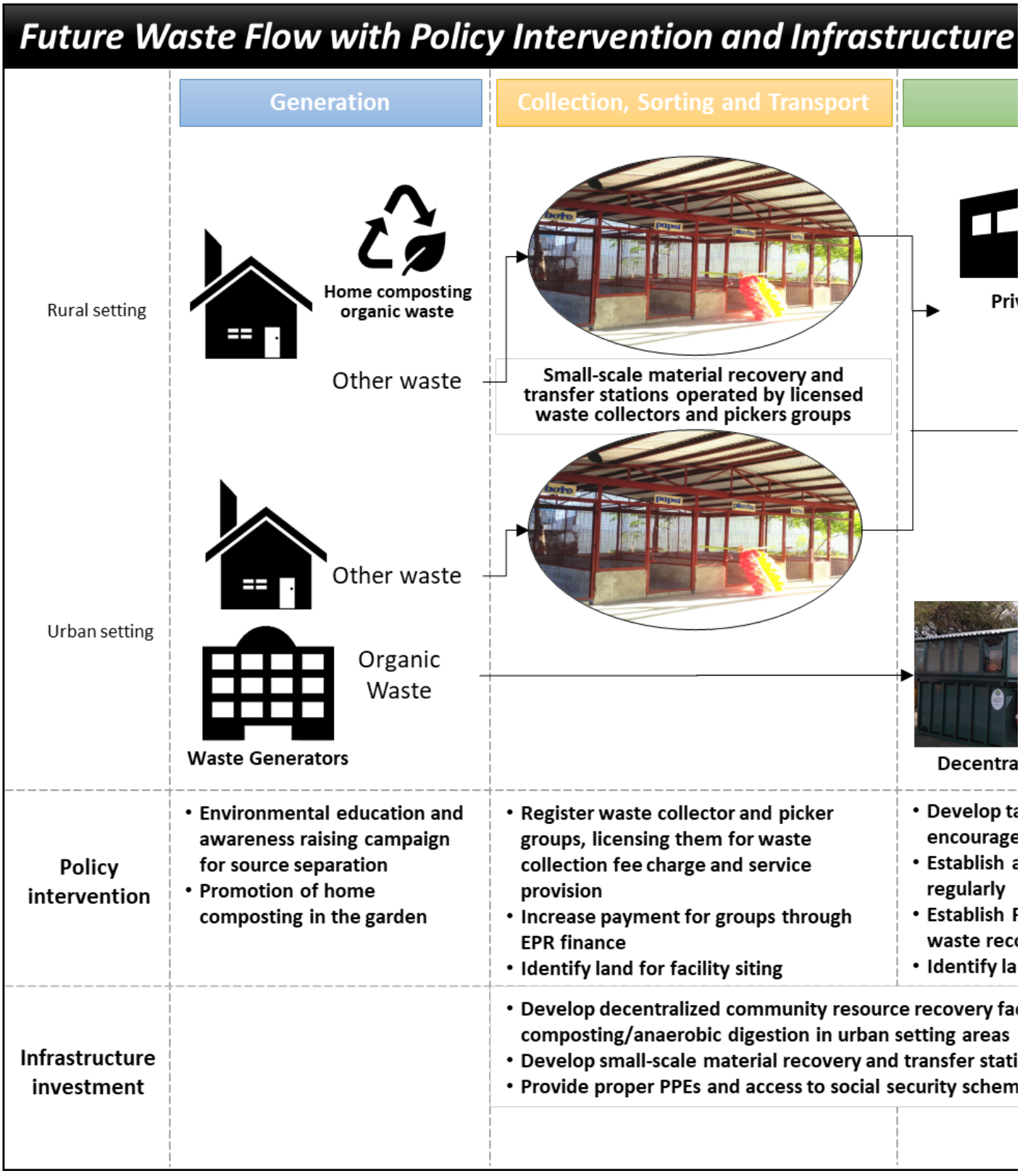


Figure 8: Future Waste Flow in Homabay with identified policy interventions and infrastructure investments areas through WaCT Application

Investment Areas in Homabay

Recovery

ivate Recycling Companies

Products and raw material

Un-recoverable fraction

County or private sector's trucks

alized organic waste recovery

Soil Improvement and gas

ax exemption/subsidy scheme for private waste recovery companies to
e registration of private waste recovery companies
a system to check on the control level of recovery facilities operation

Public-Private-Partnership scheme for private sector's investment for
overy businesses
ınd for facility siting

cilities with small-scale material recovery and transfer stations and

ions in rural setting areas
nes for workers (e.g. health care insurance, pension, etc.)

Disposal + WtE

Controlled landfill

- Improve operation control level at 4 dumpsites

UNITED NATIONS HUMAN
SETTLEMENTS PROGRAMME
P.O. Box 30030, Nairobi 00100, Kenya
Email: unhabitat-info@un.org