Improving the Municipal Solid Waste Management System in Taita Taveta County through the Go Blue Project

Municipal Solid Waste Management Audit Report for Taita Taveta County

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For further information, please contact:

Title: CEC

Taita Taveta County Government

Email:

Website:

Preface by

Oumar Sylla

Director (a.i), Regional Office for Africa, UN-Habitat

UN-Habitat has collaborated with Kenya's Taita Taveta County in strengthening climate action and improving urban environment in the county. Through our Regional Office for Africa and Urban Basic Services Branch, a collaboration framework with the Taita Taveta County was developed and an assessment and audit 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 *Municipal Solid Waste Management Audit Report for Taita Taveta County* contains the findings of the assessment and audit 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 Taita Taveta, Hon. Andrew Mwadime, for developing baselines that will enable Taita Taveta to effectively monitor the county's performance in managing waste in line with Sustainable Development Goal Indicator 11.6.1.

Kenya's Waste Management Regulations 2016 Section 4 (2) provides that "Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed off such waste in the manner provided for under the Regulations". The County of Taita Taveta has commenced the process of complying with this regulatory requirement by conducting an assessment and audit of the status of solid waste management in the county. This Audit Report provides a clear picture of the status of the current MSWM system, with reliable data on waste generated, collected, and managed in controlled facilities and unexploited potential of the recovery sector. Secondly, the report highlights the gaps in the infrastructure and policy system of the County and assesses the priority levels. Thirdly, it maps out the various actors of the MSWM chain, including the informal sector, and the desired future waste flow of the County further recommending a transition towards a circular economy as a basis to developing a MSWM strategy for Taita Taveta County.

The Audit, which is implemented under the Go Blue Project funded by the European Union, marks the first step towards evidence-based planning and monitoring of a prosperous circular economy within the coastal counties economic bloc (Jumuiya ya Kaunti za Pwani). It is one of the three outputs under the Activity "Enhancing Municipal Solid Waste Management System (MSWM) in Taita Taveta County" of the Go Blue Project. Upon finalizing the Audit, UN-Habitat will deliver a Solid Waste Management Strategy for the County as a second Output and support the upgrading of the Solid Waste Recovery Facility at Chakaleri, as the third Output. The three outputs are interconnected and are aimed at minimizing flow of waste from land into the ocean for a sustainable blue economy.

Foreword by

H.E Andrew Mwadime

Governor, Taita Taveta County

Taita Taveta is one of the six coastal counties of Kenya. The county's three main rivers, namely, Tsavo, Lumi and Voi, flow into the Indian Ocean. The county is home to major national parks and other tourist attraction sites such as Tsavo West and Tsavo East National Parks, Taita Hills Wildlife Sanctuary, LUMO Community Wildlife Sanctuary, Taita Hills, Lake Jipe and Chala, among others. With these magnificent sites, Taita Taveta county is considered to be "The Mothers of Reverend Beauty" in Kenya, with tourism being one of its historical economic activities, with yet, so much untapped potential.

Besides being a threat to natural ecosystems and human health, poor municipal solid waste management (MSWM) continues to negatively affect tourism activities in the county further undermining the economic potential of the county. In order to commence the journey towards sustainable waste management, the county government, under my leadership and with the support of the United Nations Human Settlements Programme (UN-Habitat), has conducted an assessment of the current status of MSWM in the county and prepared this Municipal Solid Waste Management Audit Report for Taita Taveta County that provides a clear picture of the current status of solid waste in the county and highlights infrastructure and policy gaps at every level of the MSWM value chain. This Report suggests recommendations for improving MSWM and visions the future waste flow, positioning the county on the path towards a circular economy.

It is my conviction that this Report enables Taita Taveta County to join the few Kenyan counties that have updated solid waste management baseline data, marking the first milestone towards the sustainable management of waste in the county. I sincerely thank UN-Habitat and the European Union Delegation to Kenya for the collaboration.

Acknowledgement by

Grantone Mwandawiro

County Executive Commitee Member (CECM),
Water, Environment, Sanitation, Climate Change & Natural Resources.
Ag. CECM Agriculture, Livestock, Fisheries and Irrigation
County Government of Taita Taveta.

The solid waste assessment, data collection and preparation of this *Municipal Solid Waste Management Audit Report for Taita Taveta County* has been made possible through the continuous engagement and precious contribution of numerous stakeholders, to whom the County Government would like to express its sincere gratitude.

The County Government acknowledges the role of the Go Blue Project, funded by the European Union Delegation in Kenya, in the preparation of this Audit Report. Special thanks to Florian Lux, Jeremiah Ougo, Francesca Calisesi and Joyce Klu from UN-Habitat for their technical and coordination support during the preparation of this Report.

The role of the county solid waste officers and technical staff based in the sub-counties and municipalities such as Voi, Mwatate, Wundanyi and Taveta, 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. I thank Hellen Masaka, County Waste Management Officer, for coordinating the day-to-day activities of the technical teams during the preparation of the Report.

Most importantly, we thank H.E Andrew Mwadime, the Governor of Taita Taveta County, for recognizing the importance of a sound municipal solid waste management system in delivering environmental, social, and economic benefits for local communities and for promoting a sustainable blue economy.

Last but not least, I would like to thank all the citizens of Taita Taveta County who participated in the data collection process and the waste stakeholders who participated and contributed to the various workshops and visioning a sound and circular future. We thank you all.

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Acronyms

3Cs	Confine, Compact, Cover
3Rs	Reduce, Reuse, Recycle
AICS	Italian Agency for Development Cooperation
CECM	County Executive Committee Member
CBO	Community Based Organisation
CO	Chief Officer
DCA	Data collection Application
ESIA	Environmental and Social Impact Assessment
EPR	Extended Producer Responsibility
EU	European Union
GIZ	The German Agency for International Development
HH	Household
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
MRF	Materials Recovery Facility
MSME	Micro-Small- and Medium-Enterprises
PPE	Personal Protective Equipment
PPP	Public-Private Partnership
UN-HABITAT	United Nations Human Settlements Programme
UNEP	United Nations Environment Programme
SDGs	Sustainable Development Goals
SWM	Solid Waste Management
T/DAY	Tonnes per day
WaCT	Waste Wise Cities Tool
WFD	Waste Flow Diagram
WABIs	Wasteaware Benchmark Indicators

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01

Introduction

1.1 Background of the project

The Go Blue Project *'Result Area 2: Connecting People, Cities and the Ocean: Innovative Land-Sea Planning and Management for a Sustainable and Resilient Kenyan Coast'* is implemented by UN-Habitat and UNEP and aims at enhancing land-sea planning and management by addressing key socio-economic and environmental challenges while stimulating benefits from the blue economy.

Specific objectives of the project include: developing an integrated, ecosystem-based land-sea planning framework that guides all other spatial planning and management activities for sustainable use and conservation of the blue economy in Kenya's 6 coastal counties - Mombasa, Kwale, Kilifi, Lamu, Taita Taveta and Tana River - under the coast regional economic block (JKP); enhancing technical and human capacity for integrated, ecosystem-based land-sea planning and management through capacity building interventions; and the implementation of pilot project activities in selected urban areas and communities of the six counties. Through these activities, the Project lays the basis of and contributes to a sustainable blue economy in Kenya. The Project is currently under implementation across the 6 coastal counties and has acknowledged that the role of local coastal communities as well as residents and neighbourhood associations is key in the implementation of the various project activities.

In Taita Taveta County, the Project aims at enhancing Municipal Solid Waste Management (MSWM) and decreasing plastic and other waste streams leaking into the environment, including water bodies, and increased waste collection and recovery rates. This is being achieved by carrying out a waste audit and developing an integrated solid waste management strategy for Taita Taveta county focusing on the four urban areas of the county: Mwatate, Taveta, Voi and Wundanyi, which have an estimated population of 360,000 majority of whom live in the urban and peri-urban areas without adequate and reliable municipal solid waste management system. Based on the Audit that has now been concluded, the Project will support the county to upgrade solid waste management recycling and aggregation facilities and support involvement of women and young people in waste recycling and management, particularly those involved in waste picking, to create jobs.

1.2 Scope of the report

A Waste Audit was conducted and a Waste Audit Report prepared to incorporate the following key areas: a presentation of the overall methodological approach and a review of the challenges and lessons learned in gathering data from different stakeholders in the MSWM value chain (covered in Section 3.1 of this Report):

- A complete assessment of the current status of MSWM in Taita Taveta County, looking at all SWM components (covered in Sections 3.3.1 to 3.3.3 of this Report)
- A comprehensive analysis of the policy/legal framework and infrastructural gaps at every level of SWM value chain (covered in section 3.3.4 of this Report)
- Suggested recommendations for the improvement of SWM system (covered in section 3.3.5 of this Report)

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02

Geographical and socioeconomic environment in Taita Taveta County

Located in the south Eastern parts of Kenya, Taita Taveta County covers an area of about 170 km2 and has an estimated population of 359,400[1]. The county is divided into four sub-counties that area largely urban: Voi; Mwatate; Wundanyi; and Taveta (Figure 1 with percent population distribution per sub-county). The commercial hub of the county is Voi sub-county which hosts 33% of the population and majority of the commercial enterprises and public and private institutions.

While Mwatate and Wundanyi are near Voi and even share common facilities such as the disposal site and recovery facilities, Taveta is isolated and located over 100 kilometres away from Voi and has its own disposal facility, as well as waste recovery system. Nonetheless, the governance of MSW in the four sub-counties is centrally managed by the Department of Water, Sanitation, Environment, Climate Change & Natural Resources located at Voi.
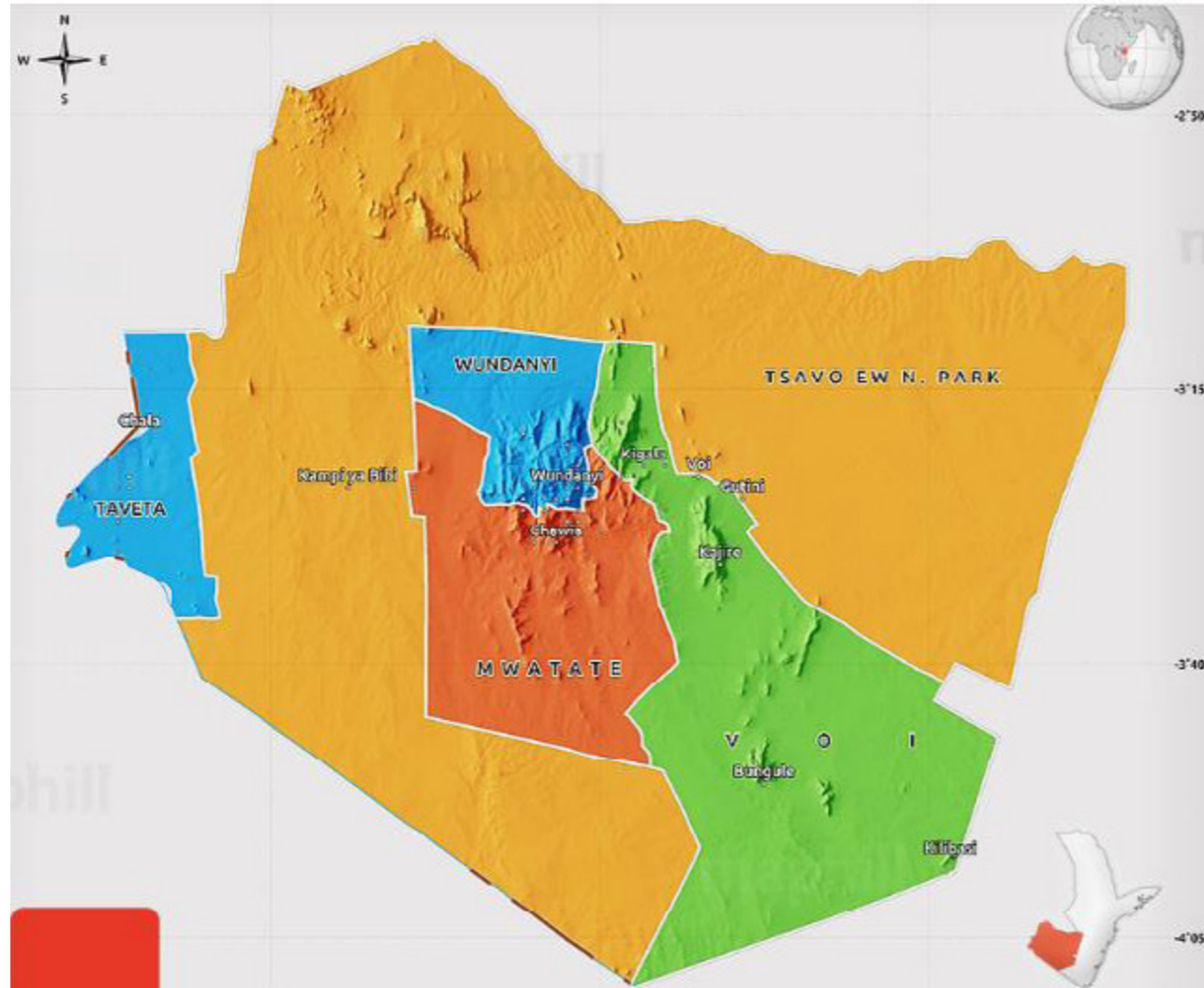
Figure 1: Map of Taita Taveta County showing percent population distribution per sub-county

Data on socio-economic distribution is not available but interviews with municipal officials indicated that about 50%, 30% and 20% of the entire population could be classified as low, middle and high income respectively. The county boasts of a rich tourism sector hosting the largest national park in Kenya, the Tsavo national park (East and West) which covers an area of 22 km2. Other key economic sectors include agriculture and gemstone mining. Despite this, the county's GDP, approximated 1million USD is one of the lowest in the country,

[1]2019 population census informed that Taita Taveta County had a population of 340,671 but this is projected to have increased to approximately 360,000 in 2022.

CHAPTER

03

Taita Taveta County Waste Assessment and Potential Plastic Leakage for Initial Policy and Infrastructure Gap Analysis

3.1 Overall approach, challenges and lessons learned

UN-Habitat conducted a waste audit in Taita Taveta County using the Waste Wise Cities Tool (WaCT), Waste Flow Diagram (WFD) and Waste Aware Bench Mark Indicators (WABIs).

3.1.1 Methodological approach

UN-Habitat started the coordination of the activities together with the relevant government officials in Taita Taveta County. Kick off meetings were organised as a first step before the start of the audit activities on the ground. Kick-off meetings were followed by a technical training workshop on three tools-WaCT, WFD and WABIs- for the county officials and the volunteers engaged to support the implementation of the audit.

These three tools incorporate methods for primary data collection on waste quantities and composition, materials flows (value chains) and governance aspects of SWM systems and provides an updated and comprehensive baseline assessment of MSWM. These tools are as follows:

01 The **Waste Wise Cities Tool (WaCT)**[2] was developed to support municipalities/cities in assessing and monitoring the Sustainable Development Goal (SDG) indicator 11.6.1: *"Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal solid waste generated, by the city"*.

Through a multi-step process, the WaCT provides a rapid overview of the physical components of SWM systems and quantifies parameters to help cities to better manage resources, mitigate and prevent environmental pollution, create business, employment and livelihood opportunities and shift towards a circular economy. In addition to SDG 11.6.1, it also assesses two SDG indicators related to circular economy in cities: *"Food waste generation"* (SDG 12.3.1) and *"Resource recovery systems"* (SDG 12.5.1).
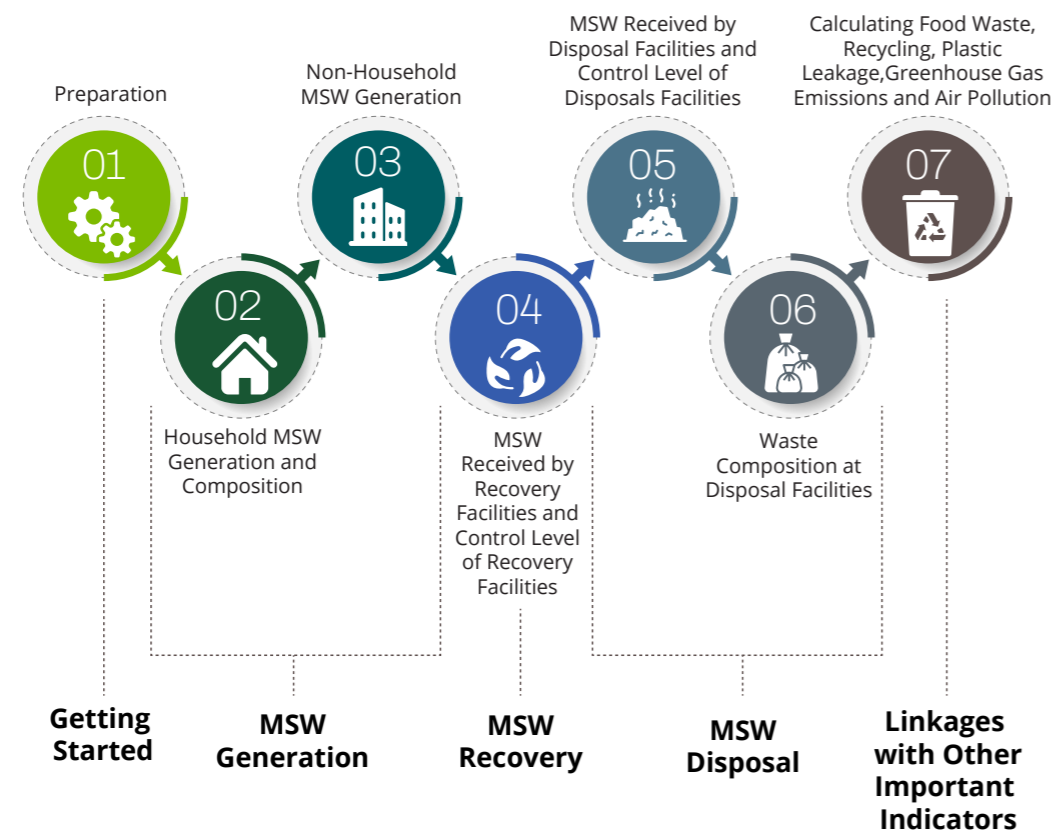

Figure 2: *Steps of the WaCT*

https://unhabitat.org/wwc-tool

02 The **Waste Flow Diagram (WFD)**[3] methodology mainly aims at mapping the flows of waste in municipal SWM systems and quantifying the source and fate of plastic pollution. The methodology is based on one side on the monitoring of the SDG 11.6.1 through the WaCT, completed by observational based assessment of sources and fate of plastic leakages.

03 The **Wasteaware Benchmark Indicators (WABIs)**[4] is a tool developed to assess the performance of the MSWM and recycling system in a city, municipality or group of municipalities in a standardised manner. The tool is composed by 12 indicators covering physical *(Coverage and quality of waste collection; Level of control and environmental protection of waste treatment and disposal; Level and quality of waste recovery)* and governance *(Inclusivity to the population and private sector; Financial sustainability; National and local institutional and policy frameworks)* components of SWM.

The detailed methodologies for these three tools are available through the links in the footnotes provided below. Collectively, these tools and methodologies provide the data and contextual input needed for the development of the SWM Strategy for Taita Taveta County.

3.2 Challenges and lessons learned

During the implementation, several challenges were experienced in terms of issues related to stakeholders' reluctance to cooperate in the audit and data quality from the city governments.

Table 1 Challenges and lessons learned during the WaCT application in Taita Taveta County

Challenges	Lessons learned
Household waste generation and composition	
• Some households opting out of the audit in the middle and some demanding for compensation for participating in the audit • Some low-income households that do not generate a lot of waste would go collecting waste from the streets and presenting as if it coming from their households so as not to disappoint the auditors.	• Having extra samples of households as back up is crucial. • Visiting households and getting them to commit before the audit starts should be part of the preparation • It is important for audit teams to visit households as frequently as possible to ensure the instructions are clear and also followed. This means auditors should ideally come from or reside in the sampled audit areas.
Collaboration with the waste recovery facilities	
• Difficulty in locating them as most are informal • Reluctance in sharing information for the fear of being investigated especially when they find out that the county officials are part of the audit team.	• Ideally, informal recovery facilities shall not be visited with government officials to not disrupt data gathering. Or rather, these officials should not introduce themselves as such.
Non-household waste generation	
• Lack of business licensing data for different institutions and premises	• The use of a 30% proxy to calculate the quantities generated by non-households is inevitable in such circumstance.

https://plasticpollution.leeds.ac.uk/toolkits/wfd/
https://rwm.global/

Challenges	Lessons learned
Waste quantities and composition at disposal sites	
• Lack of distinction of waste coming from low, middle and high income because all waste from all income levels are mixed together at receptacles from which trucks collect from • The activity had to be done directly under the scorching sun as there was no shade at the site • All waste pickers at the site demanding to be part of the exercise yet the funds were limited.	• In the case where all the waste is collected mixed, it makes composition analysis at the disposal site easier as only 2-3 trucks are needed for samples. • Having PPEs especially hats, having refreshments and planning for a day on which there will be a continuous flow of trucks to the dumpsite is important. These measures help to minimize the effects of working in an environment without protection from sun/rain. • Planning in advance with the leader of the waste pickers to select those who will take part in the exercise helps to manage expectations.
Collaboration and engagement with the municipality officials	
• The expectation of sitting allowances to attend workshops • Difficulty in clearly identifying low, middle- and high-income households • Lack of official register with up to date information on waste collection and recovery	• It is critical to provide step by step guidance on the selection of households in areas where socio-economic boundaries are not clearly defined.

3.3 Audit Results

The WaCT, WFD and WABIs results and an assessment of the SWM status quo is provided and followed by a set of recommendations. In addition, a summarized evaluation of the policy, legal, infrastructural and equipment gaps is presented.

3.3.1   WaCT Results

WaCT was applied as per the following steps:

- Selection of 9 sample neighbourhoods in consultation with the county within Taita Taveta, representing different income levels (3 higher-income, 3 middle-income and 3 lower-income neighbourhoods), with three neighbourhood in Voi and two neighbourhood in each of the other sub-counties.

- Training of one audit team within each selected neighbourhood (9 teams of 3 people in total), composed of municipal staff already involved in SWM;

- Random selection of ten (10) households within each selected neighbourhood (total of 90 households within Taita Taveta County). Two (2) Additional households within each selected neighbourhood (18 in total) were also part of the audit as backup should some of the households decide to opt out of the audit.

- Collection of waste in bags over an 8-days period in the selected households;

- Separation of different waste fraction and weighing over a full week – 7-days period (1st audit day discarded as it often includes some accumulated waste from previous days);

- Processing of the information and visualization of the results using the WaCT Data Collection Application (DCA), an excel-based data aggregation tool for the collected data

Note:

Voi is the most populated sub-county hence a selection of more neighbourhoods.

Figure 3: Household waste generation and composition analysis

MSW generation in Taita Taveta County

- The audit indicates a household waste generation rate per capita of 0.37 kg/person/day, 0.30 kg/person/day and 0.43 kg/person/day for high, middle, and low-income areas respectively, resulting in a total generation of MSW by households in Taita Taveta County of 1**36.4 tonnes/day** (see below).

- These generation rates are in the acceptable range compared to regional standards[5]. However, it is unusual for low income households to have higher per capita generation rates than their middle and high-income counterpart. In the case of Taita Taveta County, the higher generation rates in low income households can be explained by the typology of settlements where there are no pavements/cabro blocks but vegetation is present in compounds and sweeping results in the accumulation of significant quantities of soil, dust and other green waste, which is mixed with the waste for disposal.

- A proxy of **+30%[6]** was used to account for waste generated by non-household generators such as markets, commerce, private sector, public sector facilities, educational institutions, hospitals, hotels, etc. This results in a total estimated MSW generation in Taita Taveta of about 195 tonnes/day in 2022 (136.4 tonnes from households and 58.4 tonnes from non-household waste).

- Based on population growth projections at an annual population growth rate of **1.8%[7]**, and assuming the same per capita waste generation rates are maintained, the MSW generation in Taita Taveta is expected to increase to 232 tonnes/day by 2032. Future waste generation scenarios will be incorporated into the analysis that will form the basis for the Taita Taveta Solid Waste Strategy.

Table 2. *Key WaCT Data in Taita Taveta County*

Income group	High income	Middle income	Low income
Waste generation rate (kg/capita/day)	0.37	0.30	0.43
Total population	71,880	107,820	179,700
Total MSW generated from household(t/day)	27	32	77
Total MSW generated from non-household sources (t/day)	58		
Total MSW generated (t/day)	195		
City Plastic Leakage into water bodies (kg/person/year)	2.9		

[5]Average waste generation rate in sub-Saharan Africa region of 0.46kg/capita/day (What a Waste 2.0, World Bank, 2020).

[6]This proxy follows recommendations from the WaCT methodology (UN-Habitat, 2020). It is an average for all Taita Taveta County and is expected to be higher in some areas such as Voi (high concentration of businesses and institutions)

[7]https://www.citypopulation.de/en/kenya/admin/coast/06__taita_taveta/

Household and Disposal site composition

Figure 4 presents the results of waste composition at the point of generation (households) and point of disposal (dumpsite).
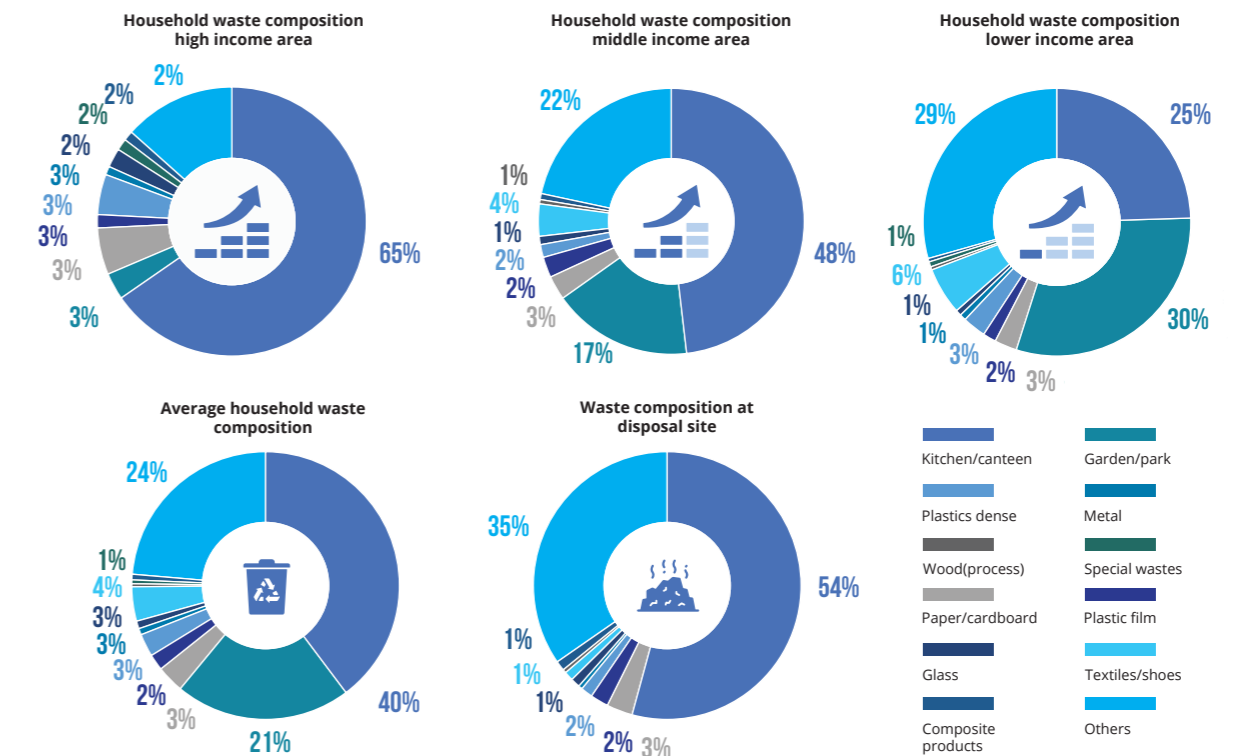

Figure 4: *Results of Household and dumpsite waste composition audit*

Based on the composition analysis;

- Up to 71% of waste generated by households is potentially recoverable and or recyclable, with organic waste - kitchen and garden - constituting the largest fraction (average 61% of all the waste generated).

- While it is expected that food waste would be highest in low income households and garden waste in high income households, in the case of Taita Taveta, the higher the income level, the higher the food waste and the lower the garden waste. The proportion of food waste and garden waste ranged from 65% and 3% respectively in high income to 25% and 30% respectively in low income. Observations made during the audit indicate that high income households have easy access to food and rarely keep domestic animals to feed on leftovers. In addition, their compounds are paved with minimum plantation. On the other hand, food is hard to come by in low income households and leftovers are fed to domestic animals. In addition, their compounds are surrounded by indigenous trees and plantations hence the high proportion of garden waste.

- Another significant fraction of waste that is worth noting is 'others', which is highest in low income (29%), followed by middle income (22%) and least in high income (13%). In low income, there is a lot of soil and dust ending up in the waste stream hence the high fraction of 'others' while in middle and high income, it is mainly due to diapers.

Note:

When food waste is fed to domestic animals it is not considered waste as it never ends up in the waste stream that the HHs generate. However, if HHs sell food waste or any recoverable materials that they are requested not to sell but to keep for the Audit since these might end up in the waste stream, then these should be captured as waste.

MSW flows

As presented in Figure 5, the application of the WaCT methodology in Taita Taveta County shows that out of the 195 tonnes/day of MSW generated, only 30% (59 tonnes/day) are collected. A majority of the collected waste (56 tonnes/day) ends up in disposal sites while only a small fraction, approximately 3 tonnes/day is recovered for recycling from households and non-household sources. At the disposal site, waste pickers scavenge approximately 1 tonne/day of recyclables. Unfortunately, these recovery efforts result in a recovery rate of only 1%.

The low collection and recovery rates mean that approximately 136 tonnes (70%) per day of MSW remains uncollected and is released into the environment. In addition, only 1% of all waste generated in Taita Taveta County is managed in an environmentally controlled environment implying that there is a great need for environmental protection in the MSWM sector.
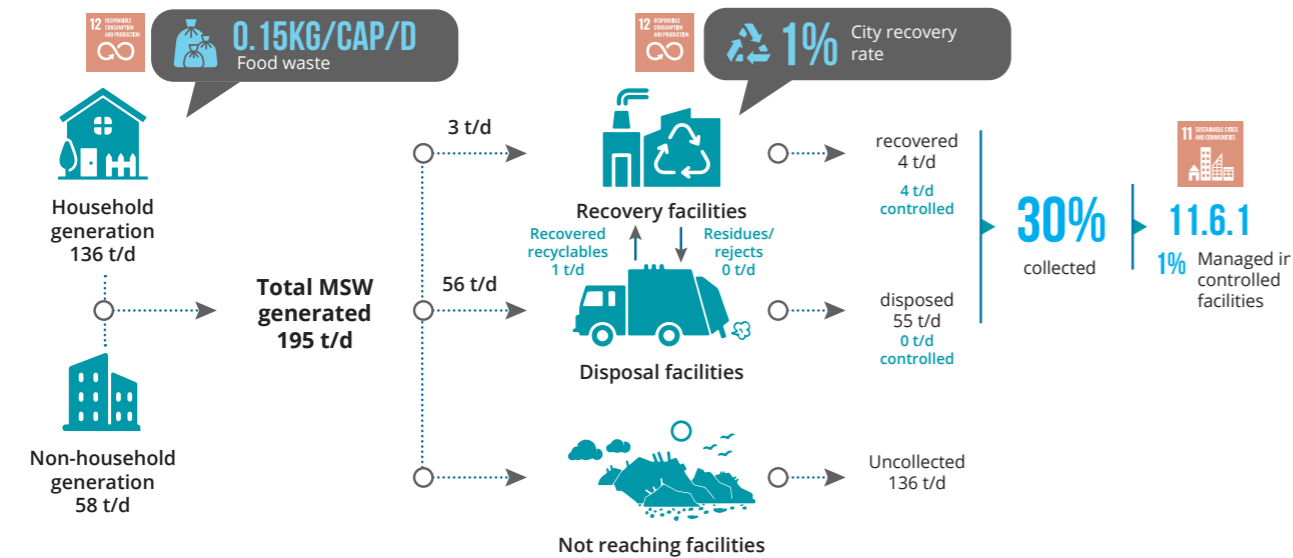
Figure 5: *WaCT flow chart results in Taita Taveta*

3.3.2   WFD Results

The use of the WFD completes the WaCT and helps in understanding and quantifying the mechanisms of pollution of the environment related to SWM, particularly the pollution of water systems from plastic waste. The WFD tool relies greatly on field observations. Some samples of these observations are presented in Figure 7.

An overview of the WFD results for Taita Taveta is presented in Figure 6. The analysis indicates that:

- A total of 3,329 tonnes of plastic waste is generated per year in the county. Out of this, approximately **71% (2,368 tonnes/year) is mismanaged** and therefore **leaking into the environment.**
- The largest source of plastic leakage in the environment is uncollected waste (93.2%), followed by leakages from disposal facilities (3.3%), collection and transportation services (3.1%), informal value collection and sorting facilities (0.3%) and finally formal sorting facilities (0.1%)

Figure 6: *WFD results in Taita Taveta County (All quantities are in tonnes/year)*

Unmanaged plastic waste has four fates: water, land, burning and drains, further explained below:

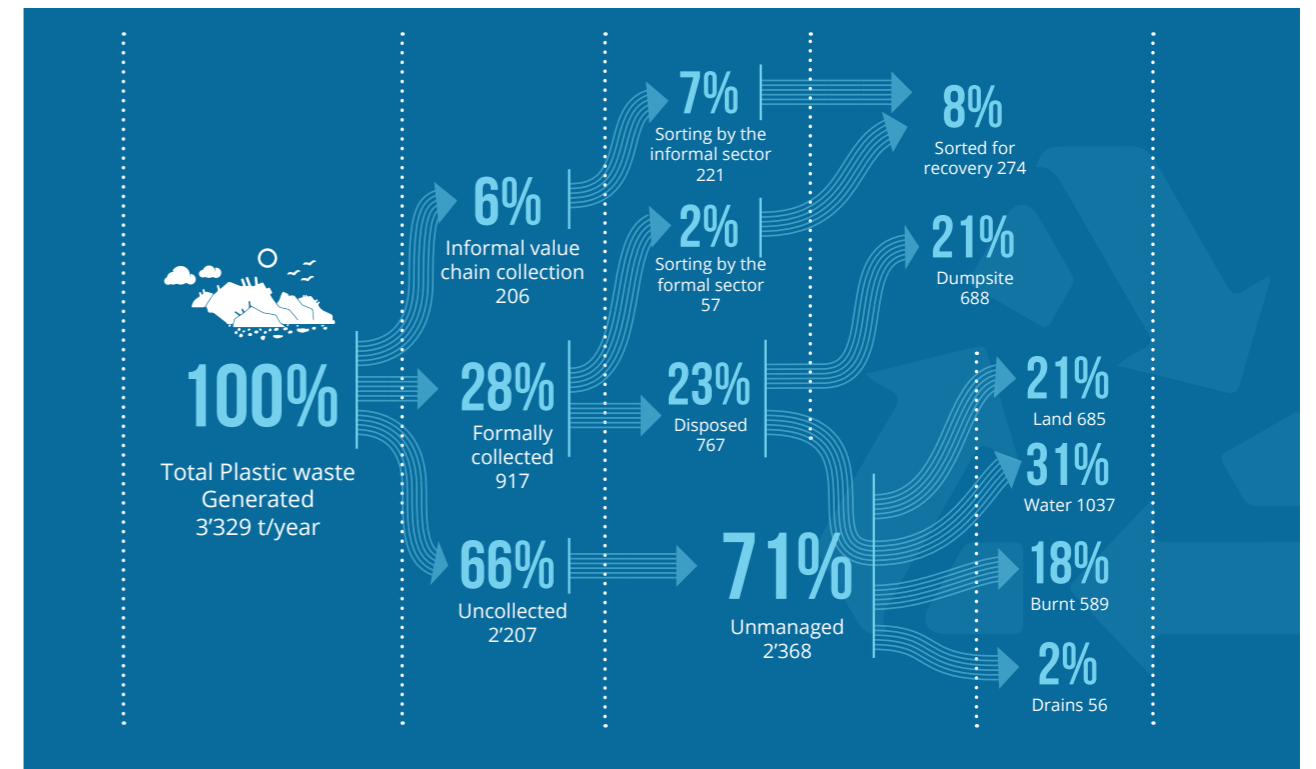- **Plastic in water:** Most of mismanaged plastic (representing 31% of all the plastic waste generated) end up in water bodies (e.g., rivers, oceans, etc.) through drainage channels - since most of the population without collection services dump their waste in storm drains. Noting that there is a seasonal river-Voi River- which originates from Taita Hills and flows past Voi town before finally emptying into the Indian Ocean, this is a significant audit finding. All storm drains in Voi sub-county are connected to the Voi River. Therefore, it is possible that a significant quantity of plastic waste originating from Taita Taveta County ends up in the Indian Ocean during the rainy seasons, contributing to plastic marine pollution. According to the WFD tool this is an equivalent to each person in Taita Taveta dumping 2.9 kg of plastic into the ocean annually.

- **Plastic on land:** Plastic on land refers to plastic waste which remains indefinitely on land by being entangled in vegetation, isolated on land with no ability to enter water or drains and buried by residents. This also includes any plastic waste that originally was on land but has subsequently been collected by street sweeping activities. The Audit results indicate that approximately 21% of all plastic waste in Taita Taveta County is left on land. This was corroborated by observations where significant quantities of plastic waste were observed on streets and public spaces.

- **Burnt plastic waste:** The Audit report indicates that 18% of plastic waste generated in Taita Taveta County is openly burned. Open burning of waste is a common practice among residents of Taita Taveta especially in low- and middle-income neighbourhoods. Burning pits in households and public spaces were observed during the audit exercise.

- **Plastic in drains:** This represents all the plastic that is cleaned from the drains and eventually placed in a location where such waste my not re-enter the drains at a later stage. In Taita Taveta, only 2% of plastic dumped in drains is cleaned through street cleaning and sweeping activities. All plastic waste that is not cleaned from the drains is assumed to eventually enter water systems.

Figure 7: Evidence of plastic on land in Taveta (top), Openly burned in Mwatate (middle) and in drains in Voi (bottom)

3.3.3   WABIs results

Figure 8 below provides a synthesis of the WABIs assessment for Taita Taveta County, based on the information collected and completed through the participatory consultation process with county officials. It shows the performance of MSWM system considering both governance and physical components.
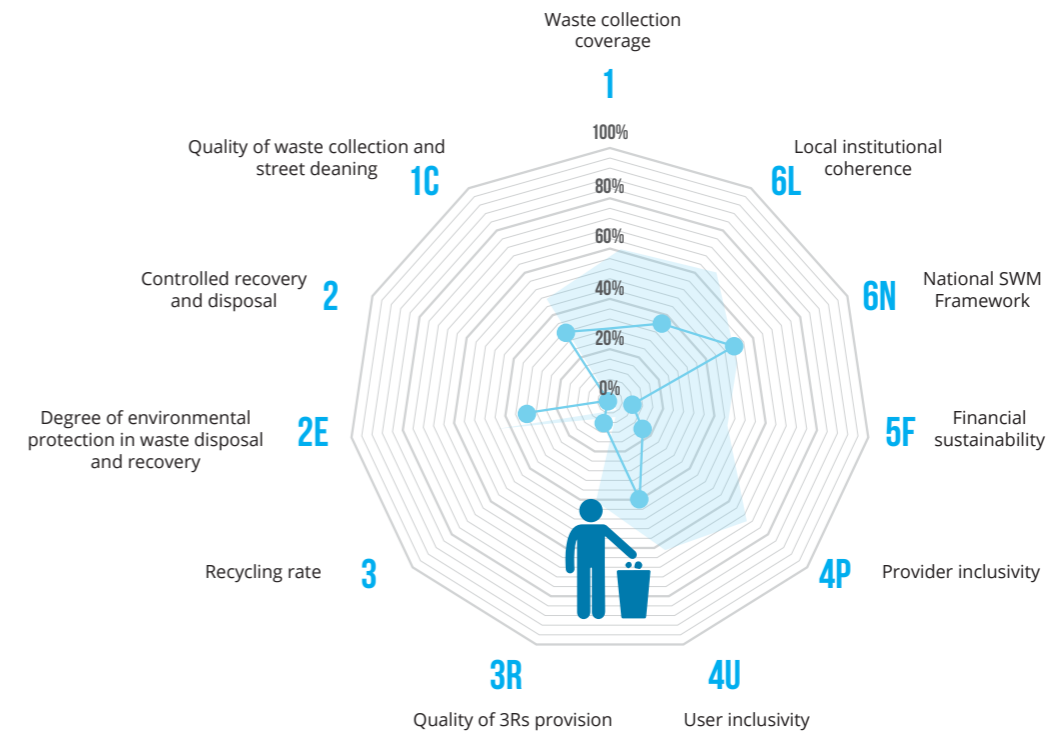
Figure 8: Results of the WABI Analysis

Performance of Physical components

Collection: The evaluation of the waste collection component through the WABIs is based on two indicators:

Indicator 1, Waste collection coverage, focuses on quantitative access to a reliable waste collection service, while Indicator 1C, Quality of waste collection and cleaning, aggregates a set of qualitative sub-indicators related to the appearance of the collection points, the effectiveness of street cleaning, waste collection in low-income districts, waste transport, the appropriateness of service planning and monitoring as well as Health and Safety of collection workers.

The results of *Indicator 1* are presented under the WaCT section, **30%** collection coverage while **Indicator IC,** Quality of waste collection and cleaning, **scored 38%.**

Disposal: *Indicator 2* represents the percentage of waste destined for recovery or disposal that is handled in at least a 'controlled' facility according to the WaCT guide and *indicator 2.E* assesses the level of control of these facilities.

The results for both indicators derive directly from the WaCT analysis, with *Indicator 2* **scoring 1%** while **2.E scoring 15%.** For both scores, the credit goes to recovery facilities as there is no control in the disposal facilities of Taita Taveta County.

3Rs: The Resource Value component - 3Rs (Reduce, Reuse, Recycle) is covered by two quantitative and qualitative indicators within the WABIs methodology.

The recycling rate *(Indicator 3)* was obtained through the WaCT methodology where this indicator scored **1%** -results are detailed in section 3.3.4 of this report (waste recovery).

The quality of resource management **(Indicator 3Rs)** assesses sub-indicators such as source separation, focus on top levels of waste hierarchy, integration of the informal sector and environmental protection from recycling activities. This indicator scored **13%** showing the need for improvement and boosting of the recovery sector.

Performance of Governance components

Inclusivity: Inclusivity addresses the degree of involvement, interest and influence of key groups of stakeholders, with separate indicators for user and provider inclusivity.

Indicator 4U (User inclusivity) represents the degree to which all users, or potential users, of the solid waste services (i.e. households, business and other waste generators) have access to services, and are involved in and influence how those services are planned and implemented.

Indicator 4P (Provider inclusivity) represents the degree to which service providers from both municipal and non-municipal (including the formal private, community or 'informal') sectors are included in the planning and implementation of solid waste and recycling services and activities.

The results of indicators 4U and 4P are **33%** and **10%** respectively. In terms of user inclusivity Taita there are occasional public awareness and consultations as well as a hotline for feedback mechanism though this isn't very effective. For provider inclusivity, the role of the informal sector particularly in waste recovery is recognised to some extent while the involvement of the private sector in SWM is limited to recovery only

Financial sustainability: Financial sustainability *(Indicator 5F)* represents the degree to which a city's solid waste management service is financially sustainable. It is a composite indicator made up by marking the level of transparency of cost accounting procedures, the adequacy of the total budget, irrespective of the source of revenues, the local cost recovery from commercial and institutional premises, the diversification of financial instruments (FIs), the coverage of waste disposal costs, focusing on how far disposal is 'priced', and finally the ability to raise capital for investment.

This indicator scored **10%** given that there is a very limited budget to cover waste collection and some access to capital investment funds. In addition, there is no cost recovery for MSWM services.

Policy, plans and institutions: Benchmark indicators for sound institutions and proactive policies include:

Indicator 6N (National SWM framework), which assesses the adequacy and degree of implementation of the national SWM framework and

Indicator 6L (Local institutional coherence), which measures the institutional strength and coherence of the municipal SWM functions.

Indicators 6N and 6L scored **50%** and **38%** respectively. Although there are legislations and guidelines for SWM at the national level, their implementation at the local level is limited. At the local level, there is a coherent organizational structure for SWM but its capacity is very limited and no local policies or strategies are in place.

Status quo

At the local level, Taita Taveta County does not have a legislation framework (regulations, laws, policies, strategies, plans) for SWM. While the County Finance Act 2017 stipulates that businesses should pay for a permit of KSH 300 (approximately 2.5 USD) annually, it does not specify the nature of business e.g., waste collection or recovery hence such revenue does not trickle down to support any SWM activity.

The organisational structure of SWM in Taita Taveta is as follows:

- SWM is under the Department of Water, Sanitation, Environment, Climate Change & Natural Resources headed by the County Executive Committee member (CECM) who oversees all the activities of the department.

- Under the CECM, there is a Chief Officer (CO), who is the chief accounting officer and manages all the budgets related to the department.

- Under the CO, there are a number of Directors: Water and Sanitation; Environment; Climate change; and Natural Resources, each being responsible for managing the technical, administrative and human resources components of service delivery as well as coordinating the implementation of local projects. The existing architecture in Taita Taveta has only one Director for climate change and SWM is domiciled in the Environment directorate, clearly causing a leadership gap at this level.

- Under the Director, there is a senior environment officer who oversees and coordinates the day-to-day operations in the entire county. He/she supervises all the environment officers stationed in the different sub-counties.

- Environment officers in sub-counties supervise waste collectors (loaders and drivers), street sweepers and drain cleaners. It is important to note that street sweeping and drain cleaning is limited to the central business districts (CBD) of each sub-county.

Figure 9 below provides a summary of the roles and responsibilities of the body responsible for SWM in Taita Taveta County.
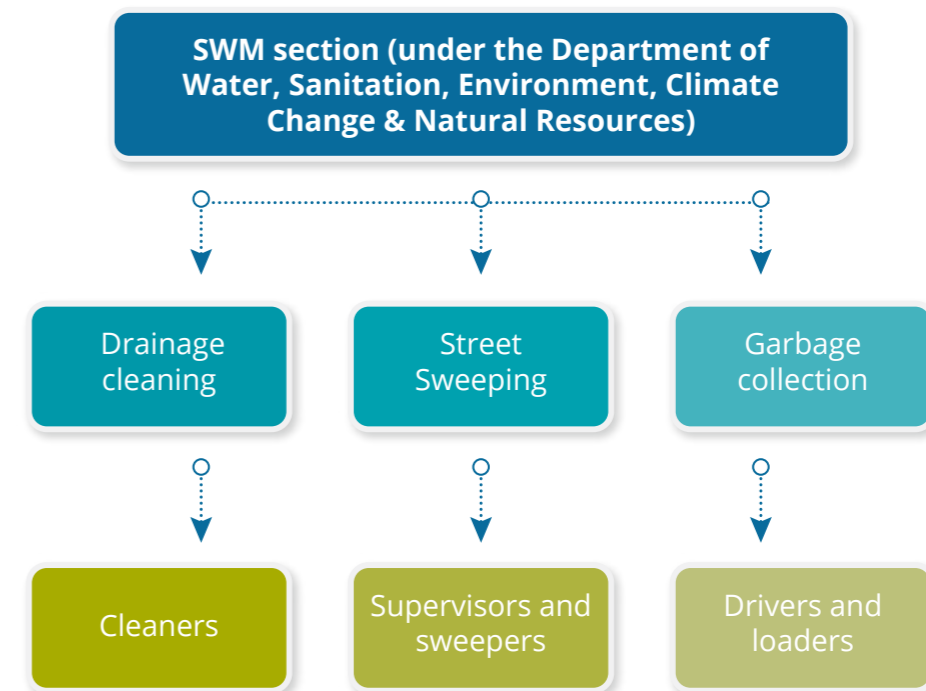

Figure 9: Responsible body for SWM and their Roles and responsibilities

Waste collection and transfer

Taita Taveta county government is the only formal entity providing waste collection services in the county. There are no registered private waste collection companies or Community Based Organizations (CBOs). However, a few individuals operate informally by doing door to door collection for households.

The lack of involvement of the private sector and CBOs in collection means that there is no primary or door to door collection services. All municipal solid waste generators-households, premises and institutions are required to bring their waste to designated collection points or receptacles for secondary collection by the county. This operation model is inefficient and results in a collection coverage of only 32% as presented in section 3.3.1.

There are **18** receptacles in Voi, **11** in Mwatate, **10** in Wundanyi and 7 in Taveta sub-counties. These are located in strategic locations in the entire county but are not sufficient as majority of waste generators, approximately 65%, have to walk more than 500 meters to access them resulting in illegal dumping. It is important to note that this is not the only reason for illegal dumping. In fact, the audit revealed that some individuals, who are within 100 meters from the receptacles, still dump illegally, hence the need for increased public awareness. It was further noted that the ability of the receptacles to contain waste in a manner that does not result in environmental pollution was limited. Waste often overflowed from the receptacles to the nearby surroundings, causing public and environmental health concerns (See Figure 10)

The county owns four waste collection vehicles and collects from the receptacles at specified intervals in a week. Additionally, there are 2 tractor trailers and some dicycles also used for waste collection though the tractor trailers are currently broken down. Table 3 shows the capacity of vehicles, type, and collection frequency in each sub-county.

Table 3: Waste collection infrastructure in Taita Taveta County

Sub-county	Type of truck	Quantity	Functionality	Capacity	Frequency of collection
Voi	Tipper trucks	2	Functional	7 tonnes each	2 trips/day/truck for 6 days in a week
Mwatate & Wundanyi[8]	Manual rear loader	1	Functional	10 tonnes	Mwatate: 3 days per week; 2 trips/day Wundanyi: 2 days per week;2 trips per day
Taveta	Manual rear loader	1	70% functional[9]	7 tonnes	3 trips/day for 6 days in a week
	Tractor Trailer	2	Non-functional	4 tonnes each	N/A
	Pushing[10] dicycles/trotoli (for wheeling bins)	25	8 functional	10 kgs each	Only used temporarily to wheel SW to a temporary holding location when the truck is broken down or when it rains and the road to the dumpsite is muddy.

Figure 10: A waste collection receptacle at a market (left) and a waste collection vehicle

The capacity of the county to efficiently collect waste is limited because generators do not pay for collection services and the only budget line available for collection services is for fuel but even this is unreliable. This means that there are no funds available for repairs and maintenance and when a vehicle breaks down, it takes more than a month to repair. In order to sustainably provide collection services, cost recovery, especially through the payment of collection services, is paramount.

An audit on willingness to pay was conducted, during WaCT application, in 108 households across Taita Taveta County to determine their opinion on paying for collection services. As shown in Figure 11 there is a small fraction of the households, 6% of high income and 5% of middle and low-income, paying between Ksh. 300-1,000 per month for waste collection services. This payment is being made to informal collectors, who collect the waste from households and either takes it to the receptacles, where the county collects it, or dumps it illegally.
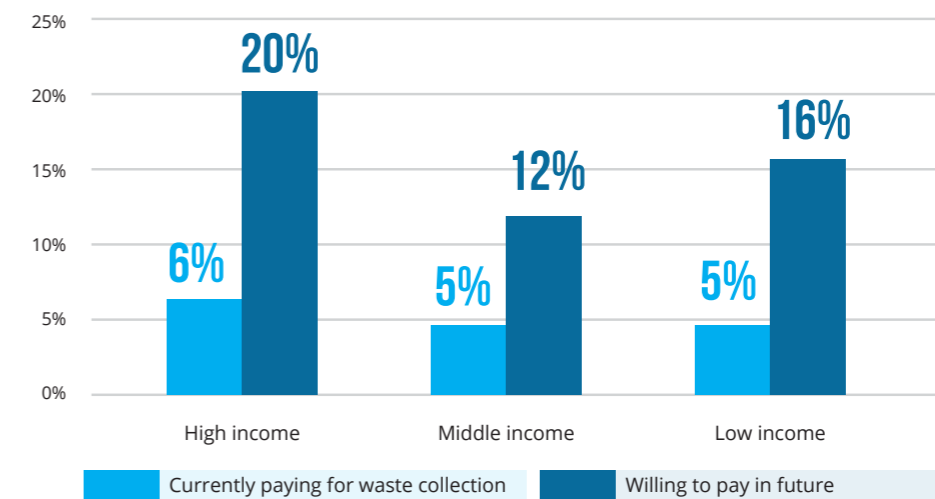
Figure 11: Results of the audit of willingness to pay conducted in sampled households in Taita Taveta County

Furthermore, when asked if they would pay for a collection service in the future, only 20%, 12% and 16% of high, middle and low-income respectively responded in the affirmative. Reasons given for not willing to pay include: lack of money, preference for burning taking to receptacles or drains on their own, it is the county or landlord's responsibility, and uncertainty of the reliability of collection services.

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[8]Wundanyi and Mwatate share one waste collection truck.

[9]The collection truck in Taveta sub-county is very old, has not been serviced for over 3 years and is haphazardly functional.

[10]These receptacles ? were provided by the Norwegian Embassy about 10 years ago.

The key challenges related to waste collection and transfer in Taita Taveta county are as follows:

- Lack of cost recovery mechanism for sustainable waste collection services because waste generators are not adequately charged for collection services, i.e., households do not pay while businesses are only charged 300 Kenyan shillings (about 3 USD) for business registration which is supposed to cater for waste collection but this money never gets to be used in any SWM operation.

- Waste collection vehicles are inadequate and in run-down condition especially the one serving Taveta due to lack of repairs and maintenance. In addition, the tipper trucks are not covered resulting in leakages during transportation.

- Lack of a regular and reliable budget for vehicle maintenance results in a halt of collection services whenever there is a breakdown. Furthermore, the funds allocated for fuelling the vehicles are unreliable and this results in delays in collection services.

- Public attitude and awareness toward safe disposal of waste is a challenge. In certain areas, even is either dumping in drains or open burning. In addition, occasional delays in collection by the county results in open burning of waste at the receptacles

- There is not sufficient equipment and PPE for workers -street sweepers, drain cleaners and manual loaders of collection vehicles.

Waste collection and transfer

The main objective of the analysis of the waste recovery sector within the WaCT tool is to assess the quantities of material recovered by the different recovery value chains together with the level of control of the facilities performing this recovery. A typical structure of waste recovery value chain in low- and middle-income countries is presented in Figure 12.

Considering that there are only two formal and a very small number of informal stakeholders involved in the waste recovery sector in Taita Taveta, the Audit aimed to visit and interview all of them but this was not possible because some of the informal ones were in fear of being investigated and refused to grant interviews. Nonetheless, over 70% were interviewed.
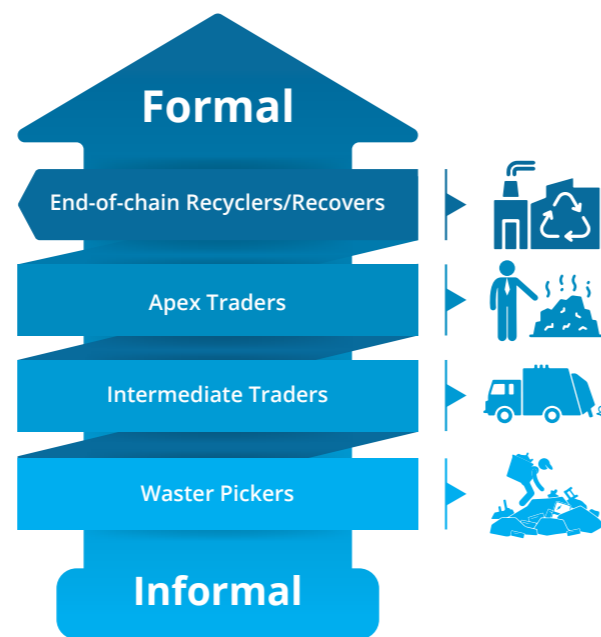
Figure 12: *Typical structure of waste recovery value chain in low and middle-income countries (UN-Habitat, 2020)*

The waste recovery value chain operations in Taita Taveta is clustered into two:

- For sub-counties of Voi, Mwatate and Wundanyi there is one formal end of chain recycler who aggregates approximately 91% of all the waste recovered in the three sub-counties. The remaining 9% is taken by an informal end of chain recycler who deals only in glass bottles. Since the three sub-counties share one dumpsite, the waste pickers who work there also directly supply the formal end of chain recycler without middlemen. Despite having the capacity to collect large quantities of materials, this formal end of chain recycler does not have financial and equipment resources to process and convert the materials into new products locally. He is only able to crush and bale, and then transport to Nairobi and Mombasa.

- For Taveta sub-county there is no formally registered recycler. There are no waste pickers at the dumpsite and individuals just scavenge valuable recyclables from receptacles and collect from households and supply to aggregators and middlemen. The middlemen then supply an informal end of chain recycler who transports the materials to Northern Kenya.

Figure 13 below shows the types of recovered materials in Taita Taveta County.

- The highest fraction recovered is glass at 38% followed by paper & cardboard at 26%, plastic 23.6% (HDPE 14.2%, PET 5.2%, LDPE 4.2%), organic waste 9.4% and the least is metals at 3.1%.

- Glass is particularly on high demand, whether crushed or whole, because there is a readily available market for it in Mombasa (Milly Glass recycling company). During the audit, it was observed that many individuals are engaged in the recovery of glass and even illegally transporting it out of Taita Taveta to Mombasa by disguising it as other types of goods since the law would require them to have a waste transportation license. The rest of the recovered materials have markets in Nairobi and Northern Kenya.
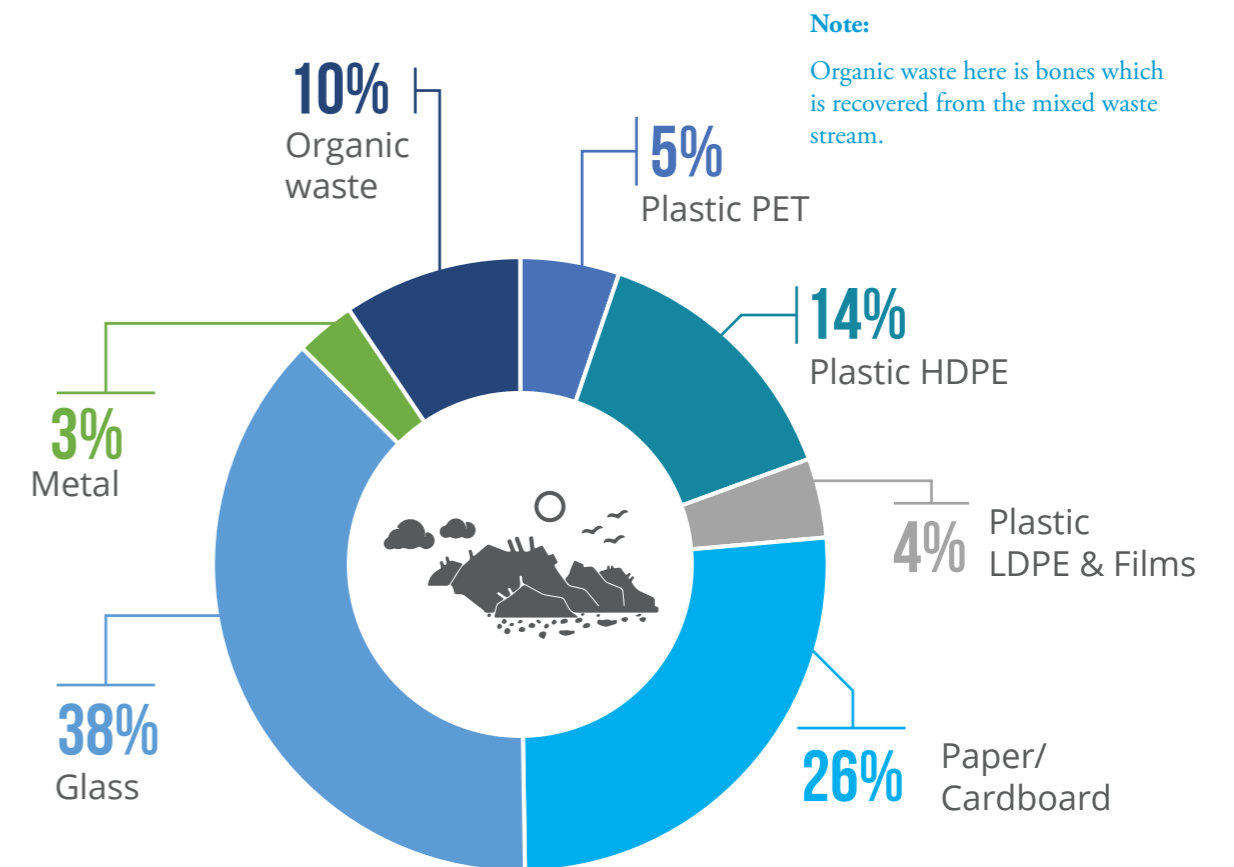
Note:
Organic waste here is bones which is recovered from the mixed waste stream.

Figure 13: *Breakdown of recovered materials in Taita Taveta County*

Figure 14: *Recovered glass (left) and paper and cardboard (right)*

Table 4 below summarises the potential amount of recoverable waste in Taita Taveta County:

- In order to harness those recyclables, clean Material Recovery Facilities with the total capacity of 20t/day can be established.

- Organic waste treatment facility (e.g. composting, biogas, black-soldier flies, etc.) in total capacity of 130t/day is needed to recover the organic waste generated in Taita Taveta County.

- It can be estimated that 69% of all the waste generated in Taita

Taveta County can be realistically recovered if investment in collection, transportation and recovery systems are put in place together with proper source separation execution.

Table 4 *Potential opportunities for waste recovery in Taita Taveta*

Waste category	Quantity collected for recovery (t/d)	Potential by expanding waste collection services (t/d)
Paper and cardboard	0.83	6.6
Plastics	0.75	8.8
Glass	1.2	2.7
Metals	0.1	1.1
Organics	0.3	107.6
Total	3.2	126.8 (69% of all the waste generated)

Numerous challenges were identified in the recovery sector in Taita Taveta County as follows:

- Waste pickers at Chakaleri dumpsite play a critical role in the recovery sector but they are facing numerous challenges hindering them from achieving their full potential. These include: exposure to harsh weather conditions (sun, heat, rain, etc.), hazardous pollutants and smokes from the spontaneous fires regularly happening at the dumpsites, lack of personal protective equipment (PPE), low and unstable market price of recyclables, expensive transportation of recyclables to market, and lack of water to wash recyclable materials as demanded by their customers, which would allow for higher market price; the lack of machineries to process the recyclables e.g. baler, crusher, pelletizer, etc..

- There are very few players engaged in recovery activities, particularly at the end of value chain. This means that there is a quasi-monopoly in market prices, where the end of chain recycler has the final say on pricing and those in lower in value chain are forced to oblige because they lack alternatives. Many recyclers lower in the value chain, including waste pickers, reported that these prices were always unfair and their share in the value chain small compared to the end of chain recycler.

- There is no capacity to process valuable materials locally and all of it has to be transported out of county resulting in low returns/income for many recyclers.

- Lack of data recording and monitoring: all recovery facilities interviewed did not have records of quantities they handle and everything had to be estimated.

Waste disposal

There are two designated disposal sites/dumpsites in the county: Chakaleri and Riata. These are discussed below:

01 **Chakaleri dumpsite:** This is the main dumpsite in Mwatate. It is approximately 10 acres in size and receives about 38 tonnes of MSW per day from three urban areas of Voi, Mwatate and Wundanyi. It is also the site that hosts a planned recovery facility currently under construction by the County government. It is an open dumpsite, and its boundary is less than 100 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 concerns. There is a group of 15 waste pickers, 11 women and 4 men who scavenge several materials for recovery including plastics, glass, paper and cardboard, metals, and organics (bones only) and who depend on this dumpsite for their daily livelihood.

02 **Riata dumpsite:** This dumpsite serves Taveta town, and it receives approximately 18 tonnes of MSW per day, though its size is unknown but estimated to be 20 acres. Similar to Chakaleri, the dumpsite at Riata is an open dumpsite without access control, but the difference is that it is located more than 500 meters from the main road and hence not easily accessible by the public. In addition, the road leading to the site is not only inaccessible during the rainy season, but risky during the dry season as collection trucks have had accidents falling into the excavated pits on the sides of the road. Because the site is isolated and out of reach, there are illegal excavation activities in search of soil and stones by individuals and companies in construction businesses resulting in deep dangerous trenches by the sides of the road and narrow access routes. Further, the site is in a low-lying area and susceptible to flooding. Unlike Chakaleri, there are no waste pickers at this disposal site.

The level of environmental control was assessed for both dumpsites following the ladder of control for disposal facilities as defined by the WaCT. The results indicate that both have characteristics of Level 1/5: No control. These criteria are outlines in Table 5 below and photos depicting the status of the two dumpsites is presented in Figure 15.

Table 5: *Basic level of control area met by the disposal sites in Taita Taveta County*

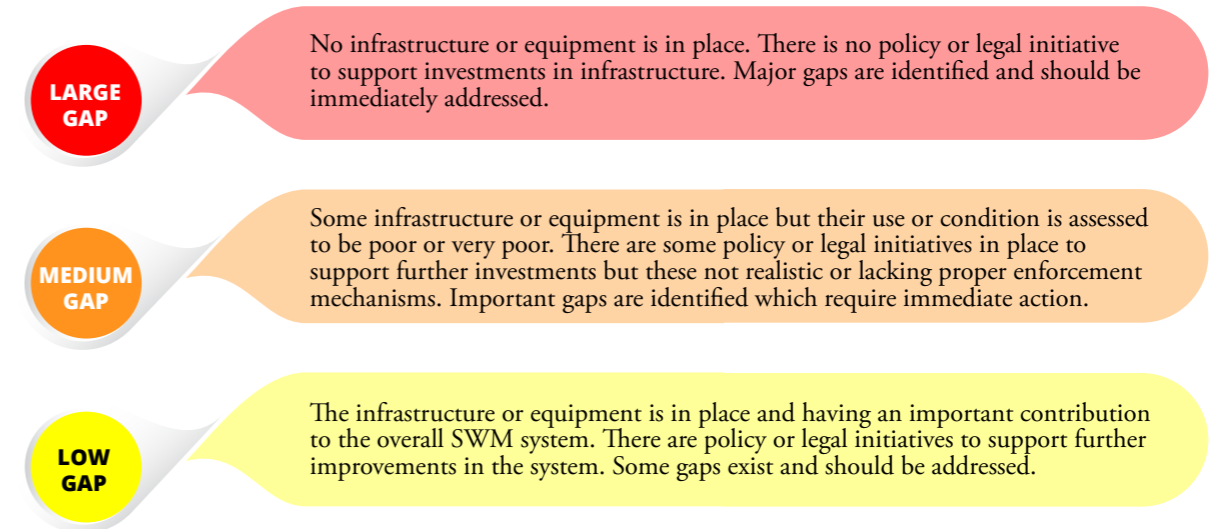| Assessment areas	Questions	Taita Taveta
Security	Is there boundary and access control allowing single point of supervised access	No
Water control	Is there any perimeter drainage maintained around the site	No
Slope stabilisation	Are the slopes stabilised, mitigating risk of landslide	No
Waste handling, compaction and cover	Are waste trucks directed to a specific operational area of disposal	No
	Is there heavy mechanical equipment reliably available	No
	Is waste layered and compacted within the specific operational area	No
	Is there some use of cover material	No
Fire control	Is their zero evidence of burning of waste on the surface of the landfill	No
Staffing	Are staff on site during operational hours	Yes/No [11]
Records	Is there a functional weighbridge in use	No
EHS	Are there toilets and hand washing stations	No
	Are basic personal protective equipment in use	No
Other	Is there a site drawing showing the landfill boundary and filling area	No

Figure 15: *Chakaleri dumpsite in Mwatate (left) and Riata dumpsite in Taveta (right)*

[11]Although there is one staff in Chakaleri, he is not always present on site. In Riata there is none.

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Summary of infrastructure gaps

Table 6[12] presents definitions used to classify and summarize the gaps identified at city level.

Table 6: *Definitions used to classify and summarize the gaps identified at city level*

LARGE GAP — No infrastructure or equipment is in place. There is no policy or legal initiative to support investments in infrastructure. Major gaps are identified and should be immediately addressed.

MEDIUM GAP — Some infrastructure or equipment is in place but their use or condition is assessed to be poor or very poor. There are some policy or legal initiatives in place to support further investments but these not realistic or lacking proper enforcement mechanisms. Important gaps are identified which require immediate action.

LOW GAP — The infrastructure or equipment is in place and having an important contribution to the overall SWM system. There are policy or legal initiatives to support further improvements in the system. Some gaps exist and should be addressed.

The major gaps identified in Taita Taveta County which would require an immediate action include improvement of collection coverage, integration of the informal sector, improvement of Chakaleri and Riata dumpsites and development of a SWM strategy. Table 7 presents the summary, classification, and prioritization of gaps in Taita Taveta County.

Table 7: *Summary, classification and prioritization of gaps in Taita Taveta County*

City,Country SWM Stage	Taita Taveta County,Kenya Policy/Legal Framework	Infrastructure	Prioritization (1-high, 3 -low)
Separation at source			2
Waste collection coverage (incl.waste collection fees)			1
Waste transfer stations			2
Material recovery and recycling			2
Biological treatment (incl. waste to energy)			3
Waste disposal			1
Informal sector intergration			1
EPR			3
Local SWM plan/strategy			1

Priority	
High	1
Medium	2
Low	3

Gaps	
Large	
Medium	
Low	

- With the current collection coverage at 32% and over 900 tonnes of plastic entering water systems yearly as a result, there is an urgent need to prioritise collection coverage, particularly in the context of the Go Blue project as one of its key objectives is to preserve and prevent pollution of the marine and coastal environment. This can be achieved by integrating informal CBOs/youth groups to be responsible for primary collection and training other youths interested in working in the solid waste sector, since the county government is only doing secondary collection.

- Although material recovery is an important component of waste management, it is not prioritised in this case mainly because of the location of the proposed recovery facility, located at Chakaleri dumpsite. Rather, improving the dumpsite to a basic level of environmental pollution control to minimise public health and environmental hazards it poses, is paramount.

- Underscoring the fact that Taita Taveta county lacks any legal framework and plans (policy, strategy, regulations, bill, guidelines) for SWM at the local level, a SWM strategy would provide a framework for sustainable SWM and a starting point to developing other regulatory documents.

Note:

The prioritization is made considering the complexity of the intervention, the capacity of the county government to implement it and the urgency of the problem considering public health and environmental impacts.

[12]Table developed by UN-Habitat to guide SWM practitioners on classification of policy and infrastructural gaps.

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3.3.5   Recommendations

Based on the WaCT results and current understanding of the situation at the local level, the recommendations for Taita Taveta County include:

- Increasing waste collection coverage through integration of CBOs and youth groups
- Improving operations at disposal sites starting with the main one - Chakaleri.
- Boosting waste recovery (after the successful improvement of Chakaleri)
- Having a locally tailored regulatory framework for SWM starting with a strategy
- Sensitization and awareness on MSW issues and solutions e.g. segregation at source, waste fee payment, etc.

A summary of the proposed future waste flow options is presented in Figure 16.
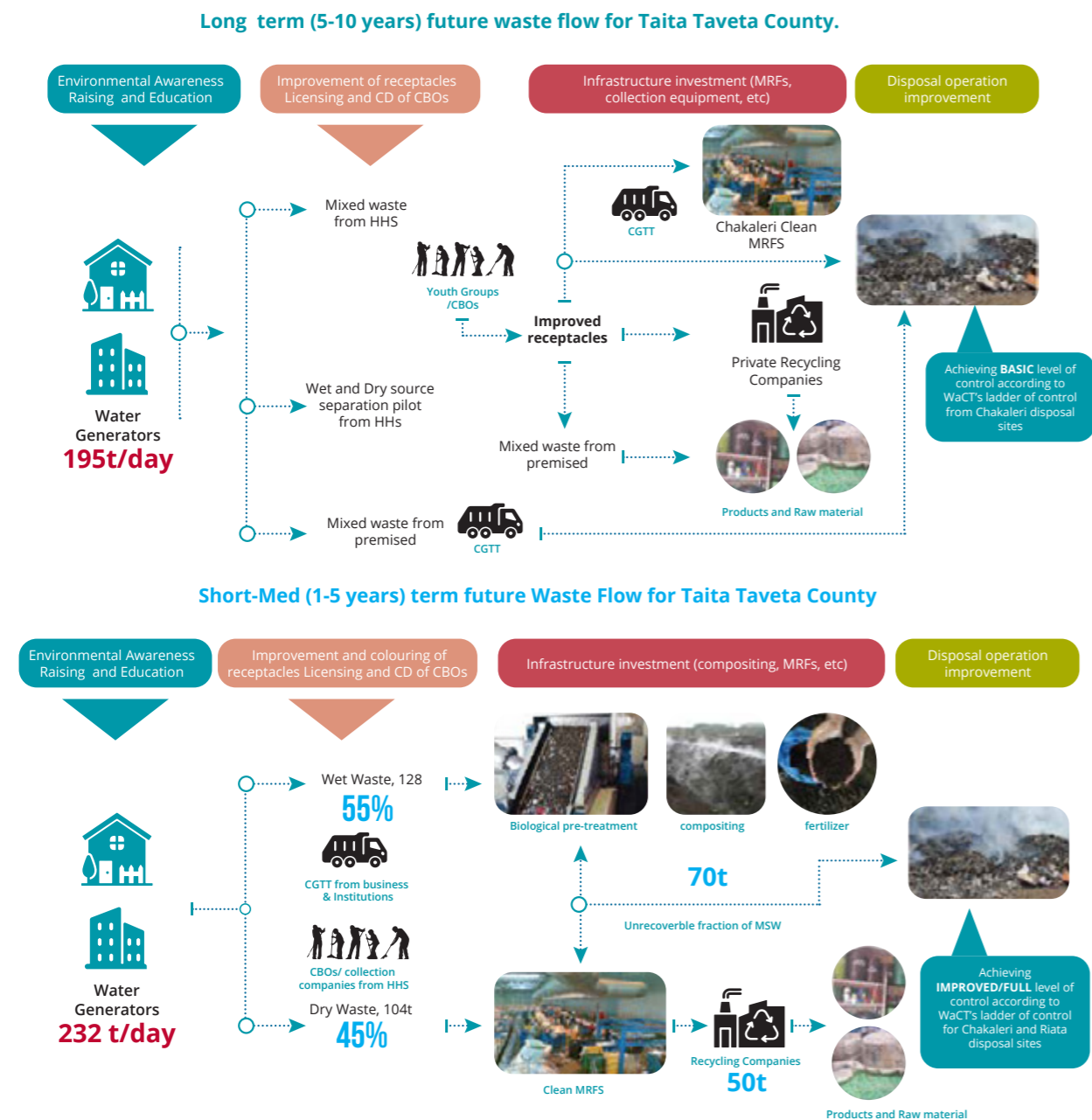

Figure 16: *Future waste flow options for Taita Taveta County, short-medium and long term*

Waste collection

In order to improve the waste collection services, interventions should focus on waste collection vehicles, the informal sector, cost recovery mechanisms and policy and regulatory framework.

Primary collection enhancement can be achieved through:

- Having an enforceable legal framework on SWM to compel generators to pay for collection and minimise illegal dumping. This can be accompanied by public awareness.

- Formalising informal youth groups and CBOs engaged or interested in waste management activities to conduct door to door collection especially in low-income areas. These can be equipped with locally fabricated waste collection equipment and PPE. Their role would be to collect and transport the waste to the receptacles where the county collects from for final disposal.

- Establishing subsidized payment model for the low-income households in accordance with the laws and policies to ensure cost recovery for CBOs or youth groups doing collection.

- Since the funds currently collected by the finance department from business licenses is not benefitting any SWM activities, County Finance Act 2017 should be amended to state that the money is purely meant for business registration and does not include waste collection. Either way, the amount stated in this County Finance Act (3 USD/per year) is way too low to cover collection services and must be adjusted upwards should the clause 'waste collection' be maintained after the amendment. Detailed way forward regarding the Finance Act will be presented in the strategy as per the discussions with stakeholders.

- Building new waste receptacles throughout the sub-counties for waste collection groups and CBOs to have sufficient drop-off points.

- In the long term, if private companies emerge and show interest in providing waste collection services, they should be incorporated in the system.

Secondary collection enhancement can be achieved through:

- The county must ensure that adequate budget is allocated for collection, and this should not only cover fuel but also for regular vehicle servicing and maintenance and tools and PPE for workers.

- Additional waste collection vehicles and an increase in waste collection frequency to minimise the time waste is retained at the receptacles.

- Street and drain cleaning activities currently only targeting the central business districts (CBDs) of each sub-county should be expanded to cover hotspots of pollution in the outskirts of the CBD. These hotspots are mainly drains, open fields, vicinity of receptacles and areas covered by vegetation and indigenous trees near residential and commercial areas (See Figure 17).

- To ensure waste is properly contained in the receptacles as it awaits secondary collection, there should be a barrier or gate at each receptacle. Considering that theft of valuable materials such as metals is very high in Taita Taveta, these barriers could be made using locally available material without recyclable value and - the type of material would be determined in consultation with the county officials/locals. The aim here is to ensure all waste stays behind the barrier and loaders can easily access it during collection. In addition, some of the receptacles are not in good working condition and should be refurbished.

- For sustainability, youth groups and CBOs using the receptacles to contain waste from their primary collection activities should be made responsible for ensuring that the receptacles are in good working condition at all times by being the eye of the county on the ground and reporting any gaps at regular intervals.

- Open tipper trucks used for waste transportation should be covered using either tarpaulins or makeshift nets to minimise waste leakages into the environment during transportation.

Figure 17: *Scatered waste in the vicinity of a receptacle in Voi (left) and waste in an open field and vegetation in Taveta (right)*

Waste disposal

The disposal facilities need to be improved to at least a basic level of environmental control (3/5) according to the WaCT guide. To achieve this, the following actions should be taken:

- There should be a boundary wall to control access to the disposal site. This can be effectively achieved using various types of low-cost infrastructure to be decided by the County.

- To minimise environmental pollution and public health concerns, the implementation of 3Cs (Confining, Compacting and Covering) is highly recommended. This will involve the dumpsite being divided into cells and waste trucks directed to one cell at a time. Waste will then be layered, compacted and covered within the cell. However, this is only possible if there are readily available heavy mechanical equipment-bulldozers and compactors. Since the county government of Taita Taveta only has one excavator which is owned by the public works department and considering the cost implication of purchasing additional equipment and machinery, it is advised that as a short-term solution, these can be hired at regular intervals to continuously improve the status of landfill. In the long term, the county would have to own such machineries and allocate budget for their maintenance and operation.

- A functional weighbridge for recording incoming and outgoing loads should be installed at the disposal sites or a day staff who is counting and keeping consistent track of the trucks coming to the site. A trucks' recording system should be set up.

- It is also recommended that there be a staff stationed at the disposal sites during operation hours not only to record in and out loads but also to guide the truck drivers and waste pickers in using the correct cells. In addition, 1-2-night guards should be deployed to the site to minimise vandalism during non-working hours.

- This means that that an office with changing rooms, toilets and hand washing stations must be installed in addition to having personal protective equipment for personal health and safety.

Waste recovery

The infrastructure investments required to enhance the recycling capacities in Taita Taveta county include construction of clean Material Recovery Facilities (MRFs) and organic waste treatment facility (e.g. composting, biogas, etc.), together with source separation execution to increase the waste recovery. However, these would be long-term interventions. Practical short to mid-term recommendations include:

- Urgent completion of the construction of the Material Recovery Facility at Chakaleri dumpsite. This facility would be crucial in increasing waste recovery rate in the county, improving the working conditions of waste pickers as well as promoting economic well-being of waste pickers.

- The informal sector is playing a critical role in recycling in Taita Taveta. The county should strive to formalise their activities starting by registering the well organised group of waste pickers at Chakaleri dumpsite. In addition, in collaboration with two existing formal recycling companies, the county should map out the existing informal recycling groups, especially the ones dealing with significant quantities of waste and formally recognise their activities through registration.

- One of the reasons why informal recyclers fear being formalized is the payment of taxes. Tax incentives could be introduced to micro small medium enterprises (MSMEs) dealing in waste recovery.

- There is need to capitalise on the popular waste fractions currently being recovered in Taita-Taveta. These include glass, plastics, paper and cardboard. Waste pickers expressed concerns of regularly getting hurt from manually crushing glass and high transportation costs due to the bulkiness of plastics and paper as well cardboards. Investing in glass and plastic crushers and paper ballers would help in improving the recovery of these fractions especially at the disposal site. Organic waste, being the highest fraction of waste would require the implementation of a source separation to be effectively recovered hence this would be a long-term intervention.

- Regulations on the market prices of recyclables is essential to keep recyclers at the bottom of the value chain incentivised and at the same time keep the ones at the top (end of chain recyclers) in check. Local by-laws that can be revised from time to time depending on the market demand of materials can be developed and micro-managed at sub-county level.

– ANNEX 1 —

The Inception Workshop on Municipal Waste Management Audit in Taita Taveta.

In May 2022, UN-Habitat concluded an audit on municipal solid waste management (MSWM) in Taita Taveta county. The audit is part of the Go Blue Project, which aims to improve the protection and preservation of marine and coastal areas in Kenya's Jumuiya Ya Makaunti (JKP) region, among other objectives. The project is financed by European Union and implemented by UN-Habitat and UNEP in line with Kenya's priorities for a Sustainable Blue Economy.

A MSWM audit of Taita Taveta County was conducted and the audit measured the Sustainable Development Goal (SDG) indicator 11.6.1 *"Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal solid waste generated by Taita Taveta County, focusing on the four sub-counties; Voi, Mwatate, Wundanyi and Taveta."*

An inception workshop was held on the 10th of May, 2022, in Voi, Taita Taveta county. The Workshop was attended by high-level county official representatives/leaders from the four sub-counties of Taita Taveta. In addition, 18 youths and 9 environment officers from the different sub-counties of Taita Taveta were in attendance. The complete list of attendees is attached in at the end of this report.

The workshop kicked off with opening remarks from the County Chief Officer of Environment, Rev. Sylvanus Mwakoma, who acknowledged that Taita Taveta county lacks proper waste management practices and infrastructure. He informed that the County Government of Taita Taveta highly welcomes the collaboration with UN-Habitat to conduct a waste audit and baseline audit and develop a long-term strategy for MSWM. The Chief Officer further emphasized the importance of the waste audit and the provision of significant data points that the county currently lacks for strategic planning and intervention implementation. Go Blue Project Manager for UNEP And UN-Habitat, Florian Lux, delivered opening remarks which focused on the global nature of the Go Blue project and how the Project aims at providing coastal cities with opportunities to benefit from the Blue Economy. Thereafter, a detailed presentation focusing on Taita Taveta county under the Go Blue framework was made by Francesca Calisesi on behalf of UN-Habitat and the Urban Basic Services Team.

To capture the attention of the high-level county officials present and to ensure their support and ownership of the outcomes of the waste audit, UN-Habitat's solid waste management expert , Joyce Klu, further provided a detailed presentation on the tools and methodology to be used for data collection based on SDG indicator 11.6.1, as well as a work plan of the data collection exercise. The tools presented by the expert included the following:

01

Waste Wise Cities Tool (WaCT), assessing the performance of the county MSWM performance, collecting data on MSW generated, collected, recovered and environmental level of control of recovery and disposal facilities

02

Waste Flow Diagram (WFD), of GIZ,evaluating plastic leakages from the MSWM system and their fates e. g. burnt, retained on land, drainages, reaching waster bodies; and

03

WasteAware Bench Mark Indicators (WABIs), an indicator set that assesses waste management performance within cities considering governance factors and physical components of a city MSWM system

The officials acknowledged and embraced the aforementioned tools to be used in conducting the waste audit for Taita Taveta County.

In addition, the 18 youths and 9 environment officers underwent intensive technical training on the WaCT methodology during the afternoon. This is the team that was then contracted and that supported the data collection activities to successful completion.

At the end of the workshop, there was a mutual understanding and alignment of expectations with local/sub-county representatives, who also assured their participation in developing the MSMW long-term strategy.

Figure 18: Inception Workshop

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