COUNTY GOVERNMENT OF KIRINYAGA

KERUGOYA-KUTUS MUNICIPALITY SOLID WASTE MANAGEMENT PLAN

November, 2024

EXECUTIVE SUMMARY

Solid waste management is one of the major development challenges globally, nationally and at the County level. In the year 2010, the new constitution rationalized the portfolio responsibilities and functions of all the county government ministries. Consequently, the County Government of Kirinyaga formed the Department of Water, Environment, Natural Resources and Sanitation which is responsible for solid waste management in the County. In 2018, solid waste management for the Municipality was delegated to the Kerugoya-Kutus Municipal Board after being chartered.

The purpose of the Solid Waste Management Plan is to guide Kerugoya-Kutus Municipality on sustainable solid waste management by ensuring a healthy, safe and secure environment for all. The Strategy is a deliberate and visionary commitment for the municipal board in the management of solid waste. It is proposed that this Strategy will cover a period of five (5) years with a midterm review at every three (3) years. With the full implementation of the Strategy, it is expected that the municipality will have embraced environmentally sound waste management technologies and best practices.

The Solid waste management policy consists of five chapters as follows;
Chapter one highlights the background information on solid waste management, challenges and what the strategy aims to achieve. It also gives the strategy guiding principles, scope of the strategy, vision and mission of solid waste management for Kerugoya-Kutus municipality and legal framework guiding the formulation of the strategy.

Chapter two demonstrates the current situation of solid waste management in Kerugoya-Kutus municipality. This entails; waste generation, collection and transportation, human resource management, user charges, current guiding regulations on solid waste management, stakeholders in solid waste management and the way forward.

Chapter three discusses the ideal state of waste management in the municipality. It has illustrated the guiding principles such as governance, social, technical and environmental aspects; integrated solid waste management, waste cycle, and ideal approaches.

Chapter four, illustrates the waste management strategy, objectives, goals and role of the collaborating agencies. The Strategy has been developed to enable the municipality support the county in implementing the Kerugoya-Kutus Municipality Integrated Development Plan 2023-2027, Medium term Plans and short term and the goals for solid waste management.

Chapter five outlines the implementation framework to be followed in implementing Municipal Integrated Development Plan, these includes, Institutions responsible for the actualization of the plan, resource requirement and mobilization. It also outlines monitoring and evaluation mechanism for the strategy to ensure accountability, transparency and feedback to customers.

Prepared by;

The Municipal Environment Officer;

Name; …**ANTONIO GIKONYO. K**…… Sign …… Date……

Verified by:

The Municipal Manager;

Name …… Sign …… Date……

Adopted by the Municipal Board on ……

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CHAPTER ONE

1.1 Introduction

Solid waste management remains as one of the major development challenges globally, Nationally, Municipal and County level. In the year 2010, the new constitution rationalized the portfolio responsibilities and functions of all the county government ministries. Consequently, the County Government of Kirinyaga formed the Department of Water, Environment, Natural Resources and Sanitation which is responsible for solid waste management in the County. In 2018, solid waste management for the Municipality was delegated to the Kerugoya-Kutus Municipal Board.

All human activities generate waste which requires to be properly managed for the protection human health and environment while enhancing aesthetics. This scenario is particularly evident in urban settlements which generate large quantities of solid waste due to high human population. The impacts of poor solid waste management within the Counties urban settlements are disastrous. As such there is need for proper and efficient waste management.

Kenya Vision 2030 recognizes the need for efficient and sustainable waste management systems to be established as the country develops into a newly industrialized state by 2030. Guided by the Environmental Management and Coordination (Waste Management) regulations of 2006, and other relevant legislative frameworks, this strategy provides for the guiding framework for solid waste management within Kerugoya-Kutus Municipality. The strategy shall guide the municipality solid waste management actors by providing effective, efficient and sustainable services while utilizing solid waste as an economic resource.

1.2 Purpose of the Strategy

Solid Waste Management Plan has been formulated to guide Kerugoya-Kutus Municipality on sustainable solid waste management by ensuring a healthy, safe and secure environment for all. The Strategy is a deliberate and visionary commitment for the municipal board in the management of solid waste.

The guiding principle of this Strategy is to address the following:

i. The Current situation
ii. The Preferred state, and
iii. Implementation of the Strategy.

1.3 Scope of the Strategy

Solid waste management remains a major challenge in the county. Over the years, the defunct local authorities did not establish proper waste management systems and hence the County Government inherited this state of affairs. This has led to the current poor waste management situation across the county.

It is proposed that this Strategy will cover a period of five (5) years with a midterm review after three (3) years. With the full implementation of the Strategy, it is expected that the municipality will have embraced environmentally sound waste management technologies and best practices.

1.4 Vision and Mission of the Strategy

a) Vision

A healthy, safe, secure and sustainable solid waste management system fit for a municipality, in a time of increasing resource scarcity; that seeks to minimize waste generation and promote re-use, recovery and recycling of waste materials and sustainable waste disposal.

b) Mission

To improve and protect the public health of Kerugoya-Kutus Municipality, to protect ecological health, diversity and productivity, and to maximize resource recovery through a participatory approach.

1.5 Legal Framework Anchoring Solid Waste Management in Kenya

Constitution of Kenya: In the Constitution of Kenya, Article 42 on the Environment provides that- ―Every person has the right to a clean and healthy environment, which includes the right

(a) to have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and

to have obligations relating to the environment fulfilled under Article 70.

Part 2 of the fourth **Schedule in the Constitution of Kenya** explicitly provides that the County Governments shall be responsible for; refuse removal, refuse dumps and solid waste disposal.

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The Environmental Management and Coordination Act (EMCA), 1999 (Revised 2015)

Section 3of EMCA, stipulates that, "Every person in Kenya is entitled to a clean and healthy environment and has a duty to safeguard and enhance the environment".

The act in Section 9, Section 86 and Section 87also provides for-

a) The standards of waste including such as handling, storage transportation, segregation and destruction of any waste.
b) Prohibition of handling dangerous waste
c) Classification and management of hazardous and toxic waste
d) Transportation, licensing of waste transporters and waste disposal sites

Environmental Management and Coordination (Waste Management) Regulations of 2006

In the Responsibility of the Generator, Regulation 2 states that, "Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed of such waste in the manner provided for under these Regulations".

Regulation 5 on the Segregation of waste by a generator states that, "(1) Any person whose activities generate waste, shall segregate such waste by separating hazardous waste from nonhazardous waste and shall dispose of such wastes in such facility as is provided for by the relevant Local Authority".

The Environmental (Impact Assessment and Audit) Regulations, 2003

This regulation defines "waste" includes any matter prescribed to waste and any matter whether liquid, solid, gaseous or radioactive, which is discharged, emitted or deposited in the environment in such volume composition or manner likely to cause an alteration of the environment.

Part IV - The Environmental Impact Assessment Study Report, 18. (1)A proponent shall submit to the Authority, an environmental contents of impact assessment study report incorporating but not limited to the environmental following information - (f) the products, byproducts and waste generated project;

Part V - Environmental Audit and Monitoring 36, (2) an environmental audit report compiled under these Regulations shall contain - (b) an indication of the various materials, including non-manufactured materials, the final products, and by products, and waste generated.

The Occupational Safety and Health Act, 2007

The Occupational Safety and Health Act, 2007 Part IX, Chemical Safety, Section 83 Subsection IV states that at every workplace where chemicals or other toxic substances are manipulated, the employer shall develop a suitable system for the safe collection, recycling and disposal of chemical wastes, obsolete chemicals and empty containers of chemicals to avoid the risks to safety, health of employees and to the environment.

The Public Health Act, 2012

The Public Health Act Revised Edition 2012, Part 126. Rules under Part, The Minister, on the

advice of the board, may make rules and may confer powers and impose duties in connation with the carrying out and enforcement thereof on local authorities, magistrates, owners and others as to—(d) the drainage of land, streets or premises, the disposal of offensive liquids and the removal and disposal of rubbish, refuse, manure and waste matters.

Section 118 - What constitutes nuisance-1. The following shall be deemed to be nuisances liable to be dealt with in the manner provided in this;

Part—(c) any street, road or any part thereof, any stream, pool, ditch, gutter, watercourse, sink, water-tank, cistern, water-closet, earth-closet, privy, urinal, cesspool, soak-away pit, septic tank, cesspit, soil-pipe, waste-pipe, drain, sewer, garbage receptacle, dust-bin, dung pit, refuse- pit, slop-tank, ash-pit or manure heap so foul or in such a state or so situated or constructed as in the opinion of the medical officer of health to be offensive or to be injurious or dangerous to health.

Part (e) states that any noxious matter, or waste water, flowing or discharged from any premises, wherever situated, into any public street, or into the gutter or side channel of any street, or into any or watercourse, irrigation channel or bed thereof not approved for the reception of such discharge constitutes to be a nuisance.

Section 126 - Rules under Part, The Minister, on the advice of the board, may make rules and may confer powers and impose duties in connection with the carrying out and enforcement thereof on local authorities, magistrates, owners and others as to—**part (d)** the drainage of land, streets or premises, the disposal of offensive liquids and the removal and disposal of rubbish, refuse, manure and waste matters.

The County Governments Act, 2012

Section 120, Tariffs and pricing of public services, subsection (3) A tariff policy adopted under subsection (1) shall reflect following guidelines — part (h) promotion of the economic, efficient, effective and sustainable use of resources, the recycling of waste, and other appropriate environmental objectives.

CHAPTER TWO: SITUATION ANALYSIS

2.1 Waste Generation in Kerugoya/Kutus Municipality.

Waste generation in Kerugoya-Kutus municipality is mostly from the urban areas. Kerugoya and Kutus Towns as well as Kiamiciri, Karia (along Kutus-Karatina road and Thiba areas), Kiamwenja and Ithare-ini centres and major residential estates generate most of the solid waste due to high population density. Kerugoya-Kutus municipality majors in agriculture; most of the waste in rural areas is used as compost manure. The waste in urban set up is collected and mixed up at the disposal areas without sorting. However, below is a breakdown of the major categories of solid waste generators: -

1. Households: Residential areas
2. Commercial establishments: Markets, shops and Restaurants
3. Agricultural activities: Organic waste and residues
4. Construction and Demolition
5. Manufacturing
6. Financial, educational institutions
7. Other offices
8. Informal waste disposal practices: open burning

Waste Streams	
▪ Food, kitchen and garden waste ▪ Agricultural waste ▪ Automotive waste (oil, tyres, end of life vehicles (or vehicle parts) ▪ Paper and cardboard ▪ E – waste	▪ Scrap metals ▪ Construction and demolition debris ▪ Medical waste ▪ Sewage sludge ▪ Batteries, expired chemicals and pharmaceuticals

The most common forms of solid waste generated in the municipality is the organic waste which is mainly generated at household level and plastics then agricultural produce/food markets, hotels and restaurants. Inorganic waste such as e-waste, plastics, glass bottles, construction waste and junk are also produced but in low quantities. Public and private health facilities generate biomedical waste. The waste characteristic is estimated to be as enumerated in the table below:

Table 1: solid waste characterization

Type of waste	**Percentage**
Organic	57%

Plastics	13%
Paper, wood and paper products	6%
Glass	8%
Metals	2%
Inerts such as sand, rubble, dirt etc.	3%
Textile	3%
Others (totally mixed waste at collection)	8%

2.2 Collection and Transportation.

Collection and transportation of solid waste generated at household, commercial and institution level in the municipality is mainly undertaken by the government which provides the services. Some areas are served by private waste collectors who are by law required to be registered and licensed. Health waste is handled separately with major process being incineration.

As of August 2024, the Kirinyaga County Government has adopted a new waste management system aimed at mitigating climate change. This system involves the use of waste bins labeled "organic" and "inorganic" to facilitate waste separation at the source. The municipality has adopted a Kerbside waste collection system. The same is affected in estates surrounding Kerugoya-Kutus town though not so effectively due to system challenges such as inconsistency in scheduled collection due to breakdowns. In rural areas as well as some estates, there waste collection receptacles/retention chambers positioned at strategic points for communal collection. The vastness of some areas also pose a challenge of ineffective waste collection given the inadequate resource.

There are some areas that are not efficiently reached/fully covered currently by the collection trucks, e.g. Githioro/Waigiri, due to the insufficiency in trucks as well as the rural setting of the area.

There is limited awareness and knowledge on the importance of a clean and healthy environment in Kerugoya-Kutus municipality, which has translated to poor handling of waste at the household level including lack of segregation, reuse, reduce and recycling of waste produced. A negative attitude towards waste management and failure to take individual responsibility has also contributed to practices such as littering, illegal dumping and open burning, which has led to environmental pollution.

Waste transportation in the municipality is largely basic – open trucks, tractors and side loaders. The inadequacy in transportation modes has led to littering and open dumping, making waste an eyesore, particularly plastics in the environment. The municipality also faces the challenge of lack of enough skips and waste collection trucks whereby one truck serves more the whole

municipality. Frequent breakdown of trucks has led to inconsistency in collection as per schedule leading to accumulation of waste in the designated areas. This greatly inhibits efficient and effective waste service delivery.

Poor infrastructure in the informal settlements has led to improper waste disposal due to lack of waste collection points and inaccessibility of the areas. These places lack designated areas where waste can be disposed awaiting collection and transportation. The indiscriminate waste disposal has led to blocking of drainages which eventually causes water pollution and poses health risks to the people and causes environmental degradation. Furthermore, access with the waste collection trucks is a challenge due to lack of structured road networks within the settlements which then leads to improper waste disposal due to long term accumulation of waste. This leads to environmental pollution, loss of natural aesthetic value and reduced environmental quality.

In total, an average of 575 tons is collected weekly and 630 tons of waste is collected monthly in the municipality with only three Tipper Trucks, one skip truck, two front loaders and one dozer.

Plate 1: photo of a dozer

Plate 2: photo of a skip truck waste collector

2.3 Fleet of Vehicles in the Municipality

The status of waste collection vehicles is as tabulated below. These figures keep changing as breakdown of vehicles is unpredictable. They are working and in good condition.

STATUS	NO	Remarks
ON ROAD	5	Two Trucks, one skip loader truck, two front loaders and one dozer.

Currently, for daily collection, Kerugoya-Kutus municipality has access to the above vehicles.

2.4 Waste disposal

Disposal of waste in Kerugoya-Kutus Municipality, is done in Kabatero dumpsite in Kutus which

also services the entire county as the main disposal area. Otherwise, there is a dumpsite set for closure but currently still being used behind Kerugoya Referral Hospital. There exists no sanitary land fill but the Kirinyaga county Integrated Development Plan 2023-2027 has Future plans on the same while enhancing public awareness campaigns and infrastructure development in the municipality. Currently, the Kerugoya-Kutus Municipality is relying on those two dumpsites within the county. They should however, be developed.

2.5 Recycling

Waste recycling takes place minimally and informally. This takes place at two of the existing dumpsites within the county, in collaboration with youth groups and also by scavengers. This is at a very small scale and mostly on paper, plastics and tyres.

Due to a lack of waste segregation at source, recycling then can only be to a certain level due to contamination of materials to be recycled.

2.6 Human Resource Management

The municipality is currently operating with a workforce of one hundred and five (105) people as tabulated below: -

1. Casual workers - 97
    - Kerugoya (37)
    - Karia (3)
    - Kutus (36)
    - Mukinduri (16)
    - Kibingo (5)
2. Permanent staff - 8

- Kerugoya (3)
- Karia (1)
- Kutus (2)
- Mukinduri (1)
- Kibingo (1)

There are no Public Health officers nor enforcement & compliance officer in the municipality offering technical support in the solid waste management.

2.7 User Charges

Dumping at the county dumpsites is charged Ksh. 5,000 annually and only 2 private collectors

operate in the Municipality. The people ferrying with donkey carts and tuktuks have not been charged which should be looked at. A license for private collectors is set at Ksh. 50,000 annually which none has ever paid and garbage trucks are approved by NEMA.

2.8 Other Steps Taken

The county is proposing to build a waste recycling facility at the Kabatero dumpsite alongside donors and investors which will greatly assist the Municipality and County at large in waste management.

2.9 Way Forward

- Identify and acquire appropriate site
- Purchase of machinery for waste segregation, treatment and recycling.
- Fencing of the ground for the treatment plant
- Training of staff to operate/maintain the plant
- Sensitization and creation of awareness to the community on sorting of waste at household level.
- Increase area covered on collection through privatization of sections as well as spread in user charge collection
- Increase the collection trucks and proper maintenance of the same to allow efficiency in Kerbside system of waste collection.

2.10 Current Guiding Regulations on Solid Waste Management

Currently there is a draft solid waste Management Policy which will be used to ensure that stated procedures are fully implemented and periodically reviewed by operational services to ensure compliance.

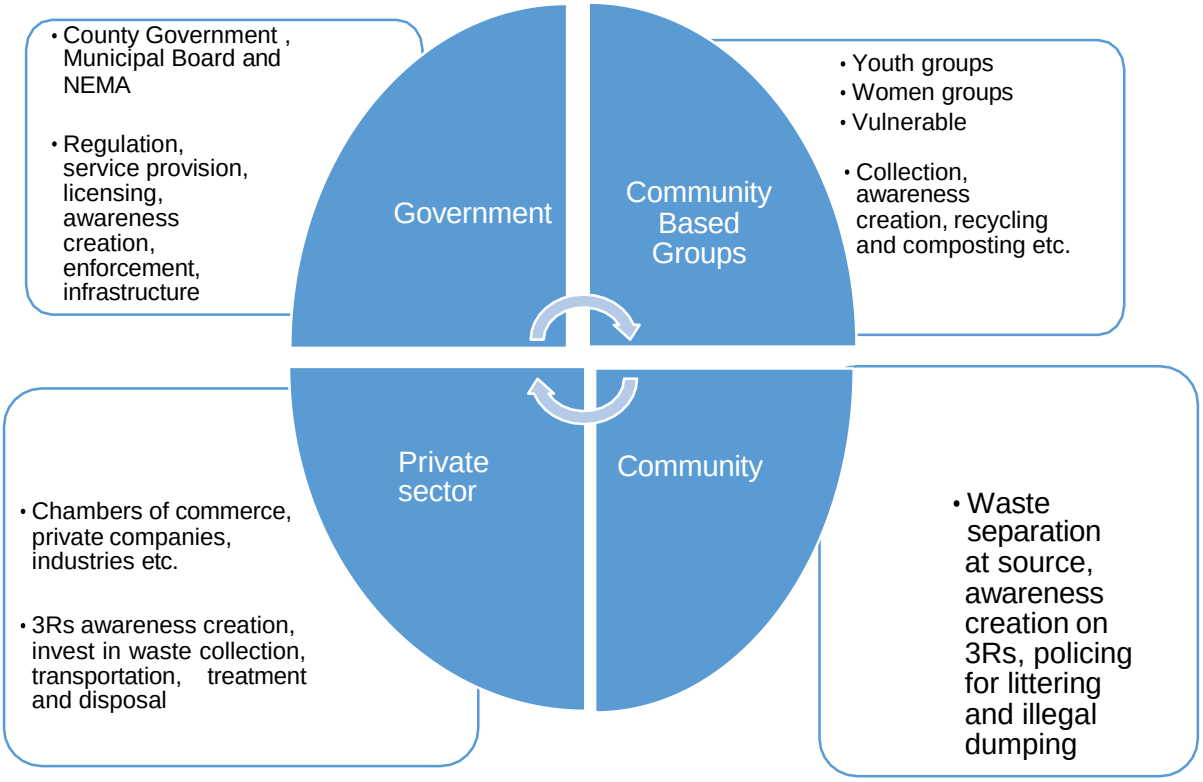
2.11 Stakeholders in Solid Waste Management

The involvement and participation of all the stakeholders such as the Youth Waste Recyclers, PLWDs, farmer's groups/societies, business communities/organizations/traders/estates, housing agencies, distributors, learning institutions (e.g. Kirinyaga University), churches/mosques and Waste producers among others, play a key factor for the sustainable solid waste management. The Kerugoya-Kutus Municipal board will partner with stakeholders as service providers to address the problem of solid waste by coordinating their participation and involvement in various solid waste management activities which include creation of public awareness to enhance source reduction, handling, collection and disposal of solid waste.

They are critical partners in local solid waste management since the activities deal with the subject concerning the environment protection, health of the society, education and community

service.

Stakeholders in solid waste management



CHAPTER THREE: THE DESIRED STATE

3.1 Introduction

Sanitation is one of the most important aspects of individual and community well-being because it protects human health, environment, and water sources and provides enormous benefits to the economy. The Constitution of Kenya 2010 under the Bill of Rights, Article 42 (a) and Article 43 (d) guarantees every person the right to a clean and healthy environment, reasonable standards of sanitation and safe water. The Constitution under the Fourth Schedule, vests in the County Government the power and function of providing water and sanitation services, control of pollution and other public nuisances, refuse and solid waste management and ensuring the widest possible enjoyment of the water and sanitation rights guaranteed under Article 43.

3.2 Guiding Principles

Guiding principles dictate how the sanitation sub-sector in Kerugoya-Kutus Municipality will do things in the future. They define a method of grappling with the situation and of ruling out a vast array of possible actions, they help tackle obstacles identified in the diagnosis of the current situation and are built on strengths and opportunities identified for the Municipality. Guiding principles will ensure future actions are coherent with the strategy and will help reach the vision for 2030. The principles are directed by:

3.3 Governance

Transparency and Accountability

Spending on sanitation shall be earmarked and ring-fenced in a unified agreed upon countywide sanitation budget. An evaluation framework shall be in place to ensure regular monitoring of sanitation investments. All service charges and levies must be redirected back to the line departments.

i. Institutional Strengthening

Resources shall be allocated to capacity building, training and continual professional development and institutional strengthening. Responsibilities of different departments for sanitation shall be clearly defined.

ii. Public Private Partnerships

Existing capacities shall be taken advantage of through public-private partnerships and Corporate Social Responsibility principles applied.

iii. Social Aspects

Social Inclusion and Human Rights

Available resources for sanitation shall be allocated on a per-capita basis to serve all. No person shall be excluded from services on the basis of tenure security. Cross-subsidy principles shall be adopted to ensure equitable access to services and social inclusion.

Public Participation

The opinions of the users shall be taken into account in making decisions concerning the provision of sanitation services.

Service approach

Instead of the classic project-oriented approach that limits itself to the implementation of sanitation structures, a service-oriented approach sensitive to the needs of the low- income segments of the population shall be adopted. This approach is long term, focuses on the user and takes life cycle costs of sanitation solutions into account.

Community awareness, social marketing and behavioral change

Health promotion services and good household hygiene practices are essential components of sanitation services. Awareness campaigns and behavioral change strategies that are sensitive to cultural aspects shall be adopted and implemented in urban and rural contexts alike.

iv. Environmental Aspects

Water Source Protection

Water sources shall be properly mapped, inventoried and protected in strict adherence to the environmental laws. International conventions regarding environmental protection shall inform county level guidelines.

Reduce, Re-Use, Recycle (3R)

Application of 3R (Reduce, re-use and recycle) shall be prioritized to ensure waste minimization and resource efficiency where recyclables shall be re-channeled into new processes as raw materials.

v. Technical Aspects

Choice of Technologies

Technology choices shall include a variety of alternatives including sewered and on-site, centralized and decentralized. When evaluating sanitation technologies, preference shall be given to those alternatives which:

• Are appropriate to local conditions, i.e. materials available and available capacity for operation and maintenance

• Are demanded or accepted by the users

• Minimize the environmental impact

• Have the lowest total costs. The total cost for a sanitation alternative includes investment costs, capital maintenance costs and operations and management costs along the whole sanitation chain: user interface, collection and transport, treatment and final disposal/re-use.

Knowledge Management

A proportion of the sanitation budget for the county shall be allocated towards research and development for validation, innovation and continuous improvement of sanitation solutions. Technical as well as social staff shall be constantly trained and professionalized.

3.4 Integrated Solid Waste Management

The modern approach to effective and sustainable waste management is what has come to be commonly referred to as the Integrated Solid Waste Management (ISWM). This integrated approach has been advanced by United Nations Environment Programme (UNEP) and the UN-Habitat. The approach may be viewed from different analytical frameworks. The UNEP and UN-Habitat have developed 2 complementary analytical frameworks on ISWM. The analytical frameworks are the "two-triangle" ISWM analytical framework advanced by UN-Habitat and the Waste Management Hierarchy advanced by UNEP.

a. Two-triangle" ISWM analytical framework

The "Two triangles" analytical framework categorizes solid waste management system into two pillars (triangles) i.e. the physical elements and governance features. Table 4 below outlines the "Two-triangle" analytical framework.

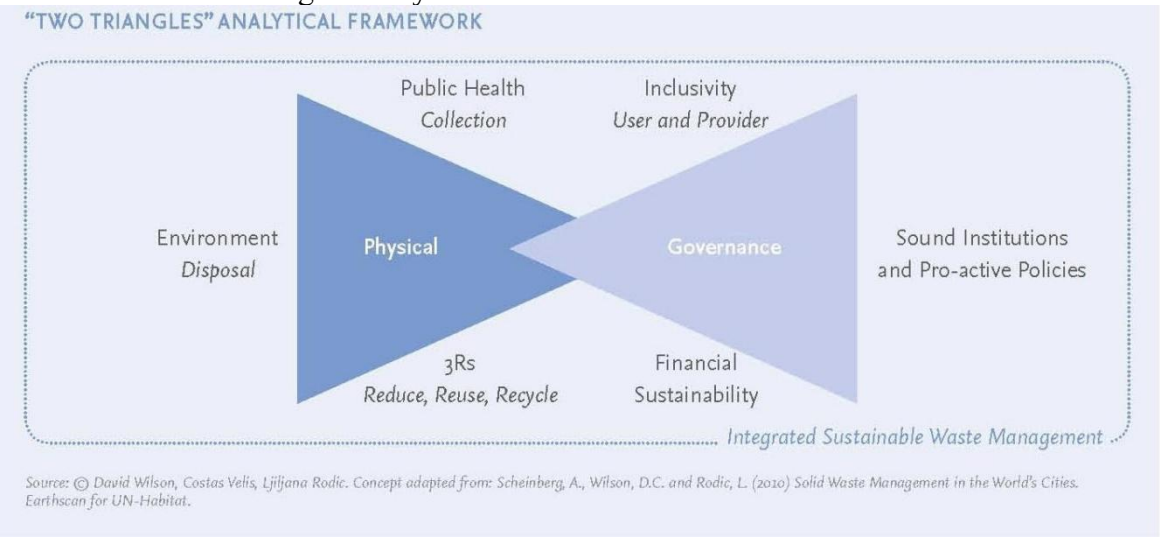


Figure 1: "Two triangles" Analytical Framework

The first triangle comprises the three key physical elements of the ISWM system, which are–

i. **Public health** which entails maintaining healthy conditions in cities and urban areas through a good waste collection service.

ii. **Environment** which entails protection of environment throughout the waste chain, especially during treatment and disposal.

iii. **Resource management** which may be described as 'closing the loop' since it entails returning both materials and nutrients to beneficial use, through preventing waste and striving for high rates of organics recovery, reuse and recycling.

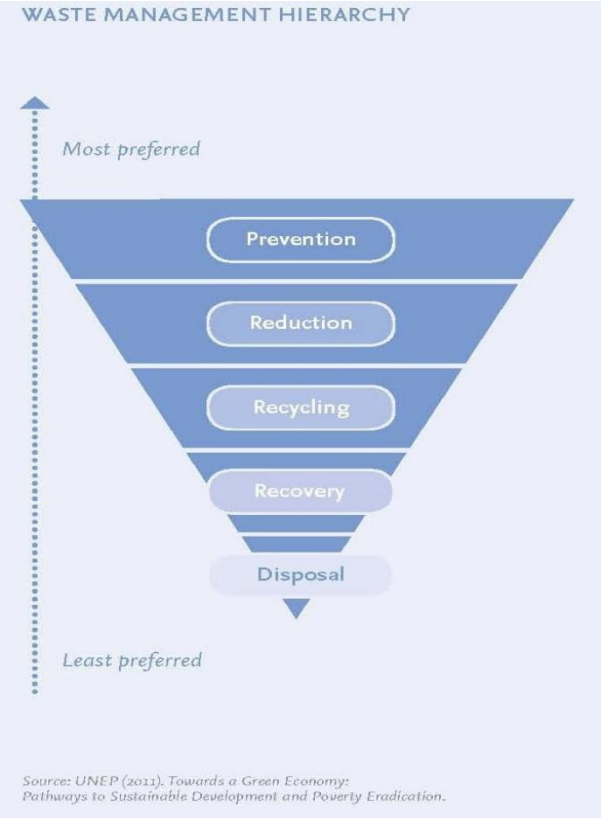
The second triangle comprises of the governance features of the ISWM system, which supports sustenance of the first triangle. The governance features entail a system that–

i. Are inclusive, providing transparent spaces for stakeholders to contribute as users, providers and enablers?

ii. Financial sustainable, which implies cost-effective and affordable waste management system.

iii. Rest on a base of sound institutions and pro-active policies which implies working policies and relevant institutions.

a) Waste Management Hierarchy ISWM analytical framework



The waste management hierarchy indicates an order of preference for action to reduce and manage waste. The waste hierarchy is presented as an inverted pyramid with the most preferred action being prevention of waste generation followed by reduction of waste generation (e.g. through re-use), followed by recycling (including composting or anaerobic digestion), followed by material recovery and waste-energy processes such as combustion and pyrolysis and the final action being disposal either in landfills or through incineration without energy recovery for waste that was not prevented, diverted or recovered. The ISWM system forms a good foundation for solid waste management policy framework and strategy development.

Figure 2: Waste Management

b) Waste avoidance and reduction

Waste avoidance and reduction is the foundation of the waste hierarchy and is the preferred choice for waste management measures. The aim of waste avoidance and reduction is to achieve waste minimization and therefore reduce the amount of waste entering the waste stream.

c) Recovery, re-use and recycling

Recovery, re-use and recycling comprise the second step in the waste hierarchy. Recovery, reuse and recycling are very different physical processes, but have the same aim of reclaiming material from the waste stream and reducing the volume of waste generated that moves down the waste hierarchy.

d) Disposal

Disposal is any operation that involves the dumping and incineration of waste without energy recovery. Before final disposal, a considerable amount of pretreatment may be necessary to change the characteristics of the waste in order to reduce the quantity or harmfulness of the waste. Landfills are the most common form of waste disposal but the least preferred option in the waste hierarchy.

3.5 The Waste Management Cycle and The Ideal Approaches

The waste management cycle comprises;

- Waste generation
- Waste collection
- Waste transportation
- Waste treatment
- Waste disposal

3.5.1 Waste generation

Most of the waste is generated at household, market places, cities, towns, institutions and Industrial zones. Ideally;

- The waste generator should endeavor to minimize waste by reducing, reusing, refusing, returning waste or by adopting cleaner production technologies;
- All waste generated should be segregated at source;
- The Municipal Board, County Governments and the licensed service providers should provide color coded bags or bins as per the NEMA guidance for the segregated waste;

- Waste collection is the main point of interface between the public and waste service providers who are either the Municipal Board or the private sector.
- Collection centers/transfer stations should be established at strategic areas within a town. They should be fully equipped with waste receptacles/skips which should either be color coded or labeled with the specific waste stream to promote waste segregation.
- All waste collection centers should be zoned/ designated by the Kerugoya-Kutus Municipal Board.
- These collection areas should be properly managed and maintained with frequent and timely collection of waste to avoid scattering into undesignated areas.

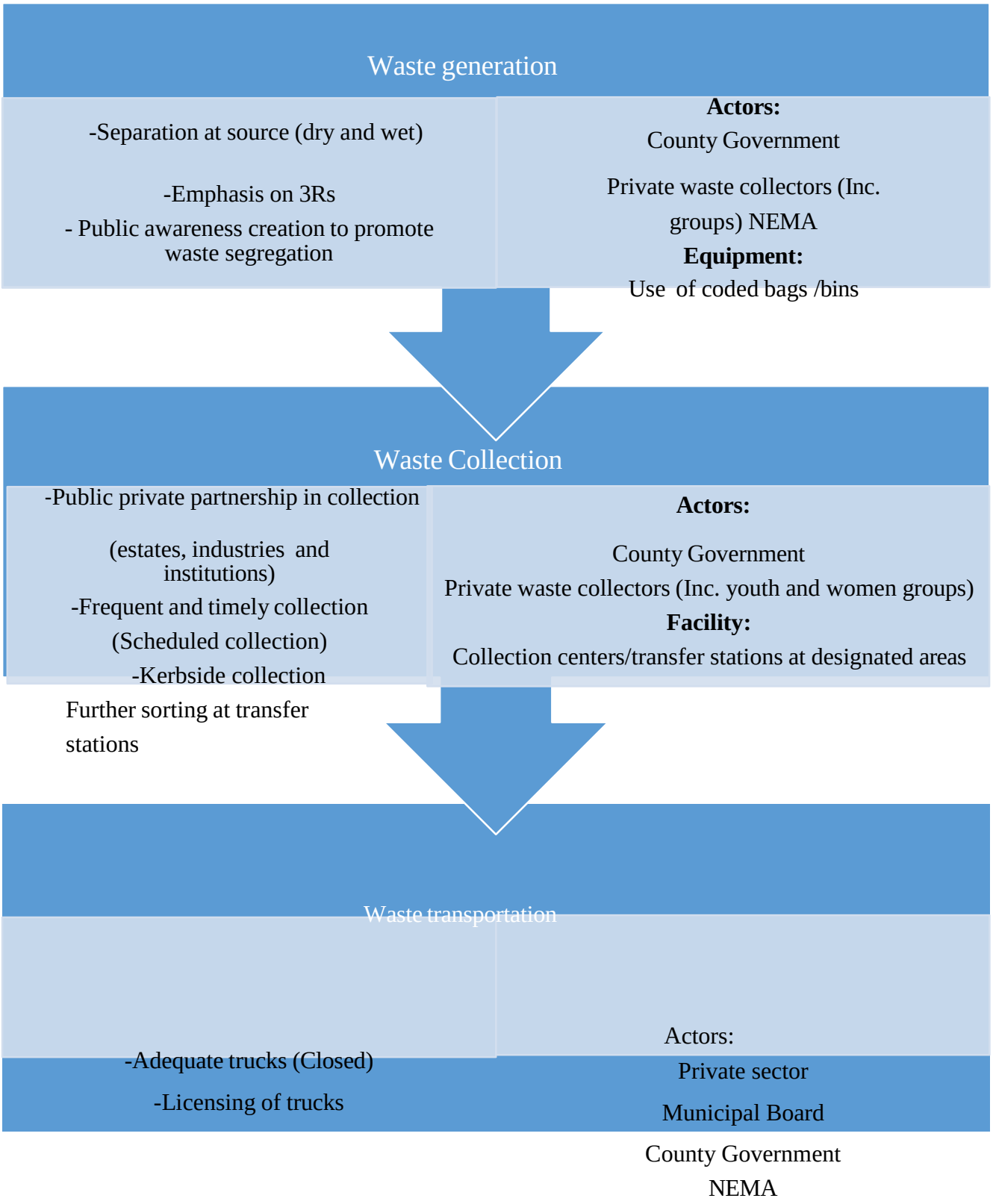
3.5.2 Waste transportation

- The Municipal Board should provide adequate transport for the various segregated waste streams;
- The waste transportation trucks should be closed and suitable for the transportation of the various waste streams to the waste treatment facilities and landfills;
- The trucks waste trucks should be regularly serviced and maintained to avoid littering of waste;
- All waste transportation vehicles should be licensed to operate by NEMA.

3.5.3 Waste disposal

- Disposal refers to the depositing or burial of waste on land.
- The Sanitary landfills should be lined with systems to collect leachate and methane gas.
- There should be frequent spreading, compacting and covering of waste with soil or any other appropriate covering material so as to avoid environmental pollution and scavenging birds.

Ideal State and Roadmap



Sorting	• Transfer Station • Waste sorting machine
Composting	• Windrow composting - (Windrow composting machine; composting station) • Site composting for Institutions - (Composting chambers)
Recycling	• Plastic recycling - PET crushing machine • Glass recycling -Glass crushing machine • Carbonizing machine (briquettes)
Pyrolysis	• Pyrolysis machine • For other plastics, tires
Incineration	• Incinerator • For non-recyclables and medical waste
Landfilling	• Sanitary landfill • For remaining waste

CHAPTER FOUR: THE WASTE MANAGEMENT STRATEGY

4.1 Introduction

The Kerugoya-Kutus Municipality Solid Waste Management Strategy has been formulated with an aim of leading the municipality towards achieving sustainable solid waste management to a state of Zero Waste generation as a guiding principle which states that Waste is a resource that can be harnessed to create wealth, employment and reduce pollution of the environment.

The Strategy has been developed to enable the municipality meet the;

1. Kerugoya-Kutus Municipality Integrated Development Plan 2023-2027
2. Medium term and short term Plans.
3. The goals for solid waste management

4.2 Objectives of the Strategy

4. To formulate policies and legislations to reduce high quantities of waste generation.
5. To inculcate responsible public behavior on waste management.
6. To promote waste segregation at source.
7. To establish environmentally sound infrastructure and systems for waste management.

4.3 Goals of the Strategy

8. Protection of public Health.
9. Reduction of poverty.
10. Reduction of Waste Management.
11. Protection of the environment.
12. To promote circular economy

Key approaches to implementing the strategy

The strategy will be implemented using the following approaches:

- Strategic alignment and recognition of partners through a public private partnership
- Introduction of incentives in the waste management cycle (generation, segregation, collection, transportation, treatment and disposal)
- Introduction of extended producer responsibility and public awareness campaigns and education;
- Establishment of efficiency and value addition in the waste management cycle
- Compliment the input from Community Based Organizations (CBO's) and other private public activities.
- Phase out waste burning
- Establish waste operational zones
- Upscale the activities of the informal sector to link up with the existing formal recycling industries.

- Establishment of infrastructure and systems for residual waste through a stepwise phasing out of illegal dumpsites to establishment of sanitary landfills.

4.4 Roles of Collaborating Agencies

Implementation of this strategy requires the involvement of several actors whose roles are outlined below.

NEMA:

a) Formulate policies, legislations and economic instruments relevant to achieving sustainable waste management;

b) Develop and disseminate public information on the regulatory requirements for waste management in Kenya;

c) Undertake benchmarking regionally and internationally on appropriate waste management technologies;

d) Enhance the capacity of the county governments on waste management systems and approaches applicable in their respective counties;

e) Employ social media to attract wider stakeholder participation and change attitudes towards waste management at a national level;

f) Hold public awareness sessions (for example, school workshops, public consultation exhibitions and public events) on waste management initiatives;

g) Support the dissemination of waste management research and development findings

h) Involve mass media dissemination techniques, such as the publication of news articles and press releases, in addition to ensure coverage in both print and media outlets.

i) Undertake enforcement activities of the laws developed on solid waste management and surveillance exercises on illegal waste related activities.

j) Monitoring and evaluation of the strategy.

The National Treasury:

(a) Channel funding to the respective government agencies and institutions for development of waste management initiatives and facilities

Civil Society Organizations (CSOs) and NGOs:

a. Promote and /or undertake income generating ventures in waste management initiatives.

b. Represent the public's interest in the solid waste management agenda, nationwide and in support in identification of illegal waste related activities.

c. Advocate for change in the public's knowledge, attitude and practice towards sustainable waste management.

Private Sector:

(a) Through PPP, Involvement in the development of effective and efficient solid waste management facilities.

(b) Prioritize on corporate social responsibility (CSR) on waste management

(c) Empower communities and other stakeholders in understanding waste management related issues and in finding solutions for the same.

The Citizens/Public:

(a) Change in attitude and practice to embrace the concept of a waste generator's responsibility by ensuring waste is appropriately managed at source and/or in all phases of the waste management cycle.

(b) Adopt the 7R (Reuse, Recycle, Reduce, Rethink, Refuse, Refill, Repairing) and/or an integrated solid waste management approach in the management of all waste streams.

(c) Collaborate with other government entities, CSOs, NGOs and other informal groups in waste management through the PPP approach.

CHAPTER FIVE: IMPLEMENTATION OF THE PLAN

5.1 Implementation Matrix

Objective	Strategy	Activities	Actors	Timeline	Approx. Budget	Status
1.Formulate appropriate legislation and instruments	-Develop and implement legislation and economic instruments	-Legislation and instruments development and harmonization -ensure implementation of regulations and instruments set	-County executive -Municipal Board -County assembly	2 years	6,000,000 6,000,000	
	-Ensure enforcement of waste management legislation and standards	- Sensitization of stakeholders for compliance and enforcement of waste management standards and legislations	-County executive -Municipal Board -NEMA -County assembly	Continuous	11,000,000	
	-Uptake of appropriate technologies	-Benchmarking on and best practices of appropriate technologies	County Executive Municipal Board NEMA	1 year	3,000,000	
3. Capacity Building.	-Recruitment of skilled and unskilled personnel	Advertisement of vacancies	County Executive Municipal Board	1 year	1,500,000	

			County public service board			
	-Conduct in service training of personnel on waste management	Workshop Short courses	County executive Municipal Board	1 year	2,000,000	
	Sensitize the public on integrated waste management	Hold civic education through media and barazas Publish educational materials Monthly clean ups	County executive Municipal Board Community groups Private companies	Continuous	6,000,000	
3.Mobilize resources	Lobby for Increased budgetary allocation.	Procurement plan preparation	County executive Municipal Board County assembly	1 year	600,000	
	Promote public private partnerships in waste management	Marketing and advertisement Organizing stakeholders forums	Private companies and corporations Municipal Board Community groups	1 year	600,000	
	Promote and activate waste as a revenue stream	Civic education, campaigns and trainings Marketing of recycled and reusables	County executive Municipal Board Community groups	1 year	600,000	

			Private companies			
4. Promote and establish waste segregation and recycling systems.	Provision of equipment's and transport system	-Procure bins and waste bags labeled according to the type of waste -Plan and organize collection	County Executive Municipal Board NGOs Private companies	1 year 1 year	11,000,000	
	-Develop waste segregation and recycling plans	-conduct benchmarking for practices on segregation and recycling -conduct training of both staff and other stakeholders -conduct an estate pilot	County executive Municipal Board NGOs	3 years	11,000,000 2,000,000 4,000,000	
	Develop promotion programs on use of recycled and recovered materials	conduct civic education -publish educational material	County executive Municipal Board NGOs		2,000,000	
	-Enhance stakeholders collaboration on waste segregation and recycling	-campaigns and advertisement -stakeholder workshops			600,000	
5. Establish sustainable infrastructure and systems for waste collection and transportation	-Designate, build and operate collection points, transfer stations and disposal sites	Identification of strategic areas Construction and management of	-County Executive - Municipal board -NEMA	2 years	16,000,000	

		transfer stations				
	Provision of adequate and appropriate waste collection and transportation systems	Buy additional and relevant waste trucks to meet the needs Maintenance of roads to enable easy access use of GIS to map and truck waste transportation	County executive Municipal board	3 years	11,000,000	
	Improvement and maintenance of existing facilities and machinery	-Upgrade existing waste management facilities -Repair of grounded vehicles and machinery	County executive Municipal board NEMA	continuous	5,000,000	
6. Establish environmentally sound infrastructure and systems for waste disposal and treatment	-Acquiring land for waste management purposes.	-Survey and Acquisition of a suitable land according to set regulation. -Acquiring title deeds for the disposal sites and transfer stations	County Executive Municipal board NEMA NLC	3year	21,000,000	
	-Conduct public participation and sensitization on waste	-Call for public participation before acquiring sites	County Executive County Environment Committee	1 year	2,500,000	

	disposal as a land use activity	-Hold civic education forums -Hold baraza meetings with the communities	Municipal Board NEMA County Assembly NLC			
	-Conduct environmental Assessments and audits on the disposal and transfer sites	To procure services of a lead expert licensed by NEMA for a) EIA on proposed disposal site b)Audit on existing sites c)EIA on proposed transfer stations	NEMA, County Executive Municipal Board	3 years	2,500,000	
	Establishment of waste treatment and disposal facilities	-Develop a sanitary landfill -Put up an incinerator -Put up pyrolysis machinery -Set up recycling plant	County executive Municipal Board Public private partnerships Private investors NEMA	3 years		

	-Increase security and surveillance in waste disposal sites	-Monitoring of activities at sites by enforcement and security officers -Fencing of the existing and proposed sites	-County Executive -Municipal board -NEMA -Ministry of interior and coordination -County Legal Unit	3years	11,000,000	

5.2 Funding Mechanism

The sources of funding for the implementation plan will be from the County Government of Kirinyaga and Kerugoya-Kutus Municipal Board, NEMA, Public Private Partnerships, waste generators and the development partners. The funding must be self-sustaining in the long run and strategically integrated in all phases of the waste management system. These phases include initiatives to minimize generation of waste at source, improve collection and transportation systems as well as managing the disposal of waste that cannot be recycled or reused**.**

5.3 Monitoring and Evaluation

Poor solid waste management has direct and indirect effects to the public health and the environment and therefore monitoring and evaluation is an integral component. The Monitoring and Evaluation system adopted for this strategy will be designed to provide feedback to stakeholders to ensure accountability, transparency, facilitate appropriate decisions on future implementation and review of the strategy to ensure that the input delivery, work schedules and target outputs are progressing according to the plan.

5.4 Conclusion

The implementation of a comprehensive solid waste management plan for Kerugoya-Kutus Municipality is essential for fostering a cleaner, healthier, and more sustainable urban environment. By prioritizing efficient waste collection, recycling initiatives, and community engagement, the municipality can reduce pollution, promote resource conservation, and improve public health. The success of this plan depends on the collaboration between municipal authorities, NEMA, private sector players, and residents, ensuring a well-coordinated and sustainable waste management system. Continued monitoring and evaluation will be crucial in adapting strategies and improving waste management practices over time.