CONSULTANCY SERVICES FOR THE DEVELOPMENT OF A FRAMEWORK FOR THE ESTABLISHMENT OF A SOLID WASTE MANAGEMENT AUTHORITY IN KAJIADO COUNTY

WASTE MANAGEMENT IN KAJIADO

SITUATIONAL ANALYSIS

AUGUST 2024

CONSULTANT

CHARLES & BARKER LTD
Environment • Natural Resources • Consulting

Charles and Barker Ltd,

Devan Plaza 4th Floor Suite No 4,

Crossway Road off Chiromo Road, Westlands,

P.O Box 1784 00606,

Nairobi, Kenya.

Email: info@charlesandbarker.co.ke

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Charles & Barker Ltd,

Devan Plaza, 4th Floor Suite No. 4,

Crossway Road (off Chiromo Road),

Westlands, Nairobi.

info@charlesandbarker.co.ke

www.charlesandbarker.co.ke

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CBO:	Community Based Organisation
CIDP:	County Integrated Development Plan
EIA :	Environmental Impact Assessment
EMCA:	Environmental Management and Coordination Ac
GoK	Government of Kenya
IEBC :	Independent Electoral and Boundaries Commission
KRA :	Kenya Revenue Authority
MCA:	Member of County Assembly
MTEF:	Medium Term Expenditure Framework
NaMSIP:	Nairobi Metropolitan Services Improvement Project
NEC:	National Environment Council
NEMA:	National Environment Management Authority
NEP:	National Environment Policy
NGO:	Non-Governmental Organisation
NMR:	Nairobi Metropolitan Region
NSP:	National Spatial Plan
NSWMS:	National Solid Waste Management Strategy
SWMA:	Solid Waste Management Authority
SWM:	Solid Waste Management

1. INTRODUCTION

1.1 Background Information

The Kenyan Government decided in 2013 to establish a new institution that will assist the Nairobi Metropolitan Area in improved waste management. The initiative covers 5 counties, among which is Kajiado County.

The Kenya Vision 2030 is the country's development blueprint covering the period 2008 to 2030. It aims to transform Kenya into a newly industrializing, 'middle-income country providing a high quality life to all its citizens by the year 2030'. The Vision predicts that Kenya will be a predominantly urban country by 2030. Based on the current population trends, it is likely that more than half of country's population will be residing in urban areas at that time.

Part of the national agenda (e.g. Kenya Vision 2030), was a new strategy for Nairobi's urban growth: 'Nairobi Metro 2030: A World Class African Metropolis'. The Nairobi growth strategy was designed as a document that can be revised and modified over time. One of the first actions under the Nairobi growth strategy was the design of a spatial planning concept for the Nairobi Metropolitan Region (NMR). The objective of Nairobi Metro 2030 and the subsequent Nairobi Spatial Planning Concept is to address issues of 'rapid economic growth, employment and balanced wealth creation, poverty alleviation, meaningful youth engagement, and a vigorous pursuit of regional equity' in the NMR.

The Nairobi Metropolitan Region continues to expand and is stressed by rapid growth and urbanization. Socio-economic development is seriously hampered by lacking infrastructure and public services. In order to improve the situation, the Government of Kenya is investing substantially in the Nairobi Metropolitan Services Improvement Project (NaMSIP).

The NaMSIP project is largely funded by the World Bank and focusses on the improvement of key services including sewerage and waste water treatment, solid waste collection and safe disposal, urban roads and drainage, public spaces, markets and other infrastructure. The NaMSIP project is in line with the Government's Vision 2030 that recommends a strategy of investing in urban services that will remove the constraints to economic growth and job creation. The Government hopes to meet Nairobi's enormous needs for infrastructure and services, in order to keep it a liveable and business- friendly city as well as an engine of future economic growth.

1.2 Development of a Solid Waste Management Authority

The current project, Consultancy Services for Development of a Solid Waste Management Authority in Selected Counties within the Nairobi Metropolitan Region, is one of the initiatives being implemented under the overarching NaMSIP project. The decision to establish the Waste Authority was presented in 2013, followed by inviting experts in early 2014 to define de framework of the new authority. The new authority should have a clear focus on the improvement of solid waste management infrastructure and related public services for the Nairobi Metropolitan Region (NMR).

The main objective of the project is to develop the structure of a new waste management authority that will support Counties involved in improving the cost effectiveness and efficiency, as well as service level, of the region's solid waste management system through improvements to the selected counties' institutional and financial arrangements for solid waste management, including private sector involvement and other procurement-related activities.

1.3 Kajiado County

Kajiado County had a total population of 1,117,840, where female population accounted for 50.1 percent while the male population was 49.8 respectively (The Kenya Population and Housing Census of 2019). The total intersex population was only 38 persons. This represents 62.6 percent population increase in the last ten (10) years. Rural-Urban migration is a major factor contributing to rapid urbanization and urban growth experienced in the county. This has contributed to the rise in multiethnic representation in the major urban centers, with the Maasai community being dominant in the rural areas.

The county has five (5) sub-counties and twenty-five wards with the headquarters at Kajiado Town. It is primarily semi-arid with livestock rearing and crop growing as the main economic activities. Livestock rearing is mainly practiced through nomadic pastoralism in the rural areas. The agriculture and livestock sector employs about 75 percent of the total population and provides nearly 40 percent of the county's food requirements. According to the ASDSP Baseline report of 2014 (GoK, 2014), at least 78 percent of households were employed and derived their income from on-farm (crop, livestock sales and fishing activities). Approximately 1,055ha of land is cultivated with food crops such as maize, sorghum, finger millet, beans, cowpeas, green grams, tomatoes, bulb onions amongst others.

The county is a member of Narok - Kajiado Economic Block (NaKaEB) consisting of Narok and Kajiado Counties. The objective of the bloc is to develop joint county programmes to provide an enabling environment attract investments and allow the private sector to play a leading role in its socio-economic development. It was also formed to aid in transforming lives and reduce poverty in the region through infrastructural development and quality service delivery.

1.3.1 Position and Size

Kajiado County is located in the Southern part of Kenya and it borders the Republic of Tanzania to the Southwest, Taita Taveta County to the Southeast, Machakos and Makueni Counties to the East, Nairobi County to the Northeast, Kiambu to the North and Narok County to the West. The county covers an area of 21,872 Sq. Km

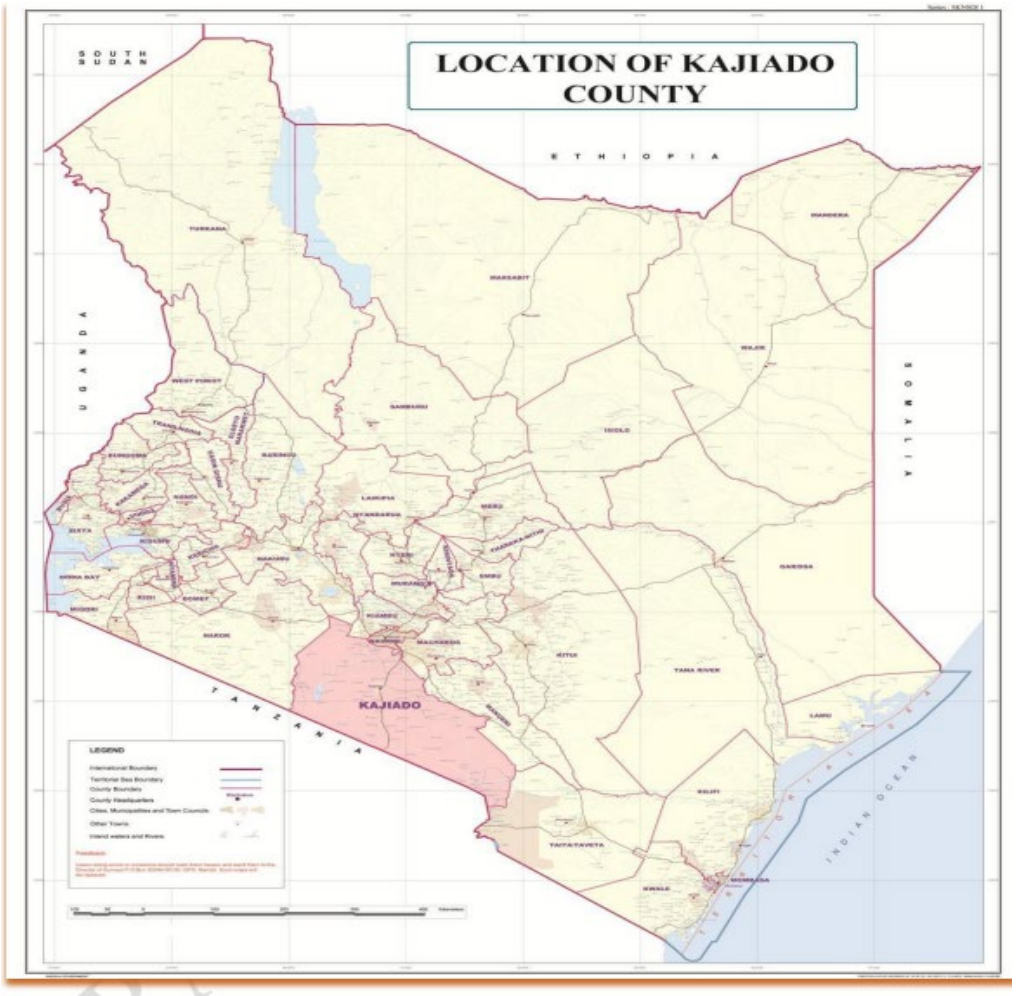

Figure 1: Location of Kajiado County in Kenya

Source: Survey of Kenya, 2023

1.3.2 Administrative and Political Units

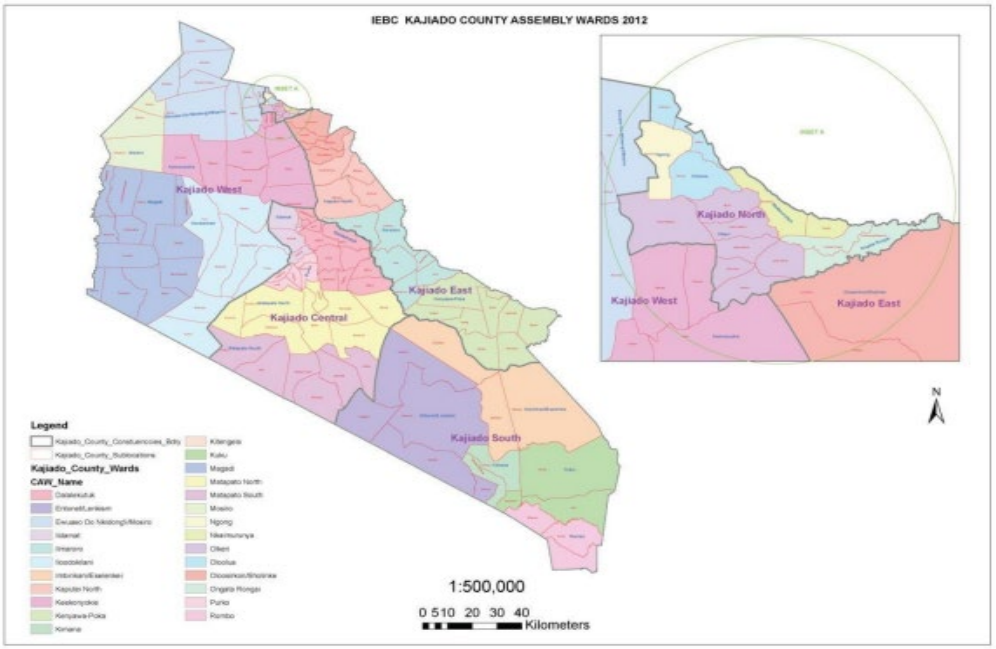

Figure 2: County's Administrative and Political Units

Source: IEBC

The table below shows the number of divisions, locations, sub-locations and area per Sq. Kms by sub-counties. Kajiado West occupies the largest area with the highest No. of locations and sub locations closely followed by Kajiado South. The smallest sub-county by area remains to be Kajiado North with the least number. of locations and sub-locations. Each division in Kenya is divided into locations and are headed by a chief. Locations are further subdivided into sub-locations. Each sub-location is headed by an assistant chief. Locations are further subdivided into sub-locations. Each sub-location is headed by an assistant chief, appointed by the state. The state also introduced 'Nyumba Kumi Initiative' a community mobilization strategy within villages and headed by village elders.

Table 1: Area (Km2) by Sub-County

Sub-County	No. of Divisions	No. of Locations	No. of Sub-locations	Area (Km2)
Kajiado Central	4	31	55	4,240
Kajiado West	3	26	63	7,862
Kajiado East	6	20	36	3,322
Kajiado South	4	18	38	6,337
Kajiado North	2	10	23	111
TOTAL	19	105	215	21,872

There are twenty- five (25) wards and 135 villages across the county. It is worth noting that Kajiado North with the highest population has the least villages against the expectations.

Table 2: County Government Administrative Wards

Sub County	No. of Wards	No. of Villages
Kajiado Central	5	40
Kajiado West	5	33
Kajiado East	5	30
Kajiado South	5	19
Kajiado North	5	13
Total	25	135

Kajiado County is divided into five (5) sub-counties and 25 wards. Every ward is represented by a Member of County Assembly (MCA). The role of an MCA is Representation, Legislation and Oversight.

Table 3: County's Electoral Wards by Constituency

Constituency	Ward
Kajiado Central	Dalalekutuk
	Ildamat
	Purko
	Matapato North
	Matapato South
Kajiado West	Keekonyoike
	Mosiro
	Ewuaso Nkidong'
	Iloodokilani
	Magadi
Kajiado East	Kaputiei North
	Kitengela
	Oloorsirkon/Sholinke
	Kenyawa Poka
	Imaroro
Kajiado South	Rombo
	Kimana
	Kuku
	Imbirikani/ Eselenkei
	Entonet/ Lenkism
Kajiado North	Ngong
	Oloolua
	Olkeri
	Ongata Rongai
	Nkaimurunya

Source: IEBC

1.3.3 Physical and Topographic Features

Kajiado County main physical features includes plains, valleys as well as sporadic volcanic ridges and hills. Lake Magadi has the lowest altitude of 595metres above sea level while Ngong Hills in Kajiado

North has the highest altitude of 2357 meters above sea level. The landscape within the county is divided into Rift Valley, Athi Kapiti Plains and Central Broken Ground.

The Rift Valley is a lengthened depression on the western side of the county running from North to South. The floor is broken by volcanoes, the steep walls forms plateaus and plains structurally forms features such as Mount Suswa and Lake Magadi.

Lake Magadi is saline formed of solid and semi-solid soda-ash deposits and is approximately 100 square kilometers in size laying in an endorheic basin formed by a graben. The lake precipitates massive quantities of trona (sodium sesquicarbonate) formed by a dense sodium carbonate brine. Tata Chemicals Magadi Limited, the Africa's largest soda-ash manufacturer and a leading chemical company commercially produces soda-ash from trona. Approximately 720,000 tons of soda ash are harvested per year in Magadi and this makes it the largest producer both in the country and in Africa.

Mount Suswa is an active volcano which contains an unusual island-block and caldera structure which is also seen at Poseidonius and Gassendi craters on the moon.

Athi Kapiti Plains comprise of an expansive dispersal area – 14,646Ha lying to the South and Southeast of Nairobi National Park (NNP) with 1,777 Households and 10 conservancies. The Athi- Kapiti ecosystem's dispersal areas enable the seasonal movement of wildlife from the NNP to the equally fauna-rich ecosystems of Amboseli, Ol Donyo Sabuk, Tsavo and Serengeti national parks.

The Athi-Kapiti ecosystem is home to the Big Five, (lion, leopard, buffalo, rhino and elephant). The landscape also has one of the highest densities of cheetahs in East Africa and attracts other predators such as the hyena. The shorter and more nutritious grass coupled with the open vast plains makes Athi-Kapiti plains a popular feeding ground during the calving season and the wet season for a range of herbivores, including zebras, wildebeests, waterbucks, elands, impalas and the endangered Maasai giraffe. Likes of the lesser kudu, wild dogs and gerenuk enjoy the wooded habitats at the central part of the ecosystem. The plains are home to about 500 bird species, including the ostrich, helmeted Guinea fowl, yellow-necked spur fowl, yellow-billed egret, martial eagle and Africa's heaviest flying bird, the Kori bustard. Originally home to the Maasai, the region has evolved into a more cosmopolitan area occupied by diverse communities.

The Central Broken Ground is an area stretching 20-70 Kilometers wide from the North Eastern boarder across the county to the southwest where altitude ranges from 1220 to 2073 meters above sea level.

1.3.4 Climatic Conditions

Kajiado County experiences long rains between March and May every year with short rains falling between October and December. The rainfall patterns vary from place to place depending on the 4 "A transformed and Sustainable Kajiado" converging – ascending air flow, air temperature, moisture bearing winds and mountain ranges. As at the year 2022, the average highest rainfall recorded was 389.9mm around Ngong hills and the slopes of Mt. Kilimanjaro. The lowest was 2.3mm recorded around Amboseli basin and the western parts of the county. This shows a negative trend in the average yearly rainfall received owing to the effects of climate change.

Kajiado County has a cool dry climate with mean annual temperatures. Over the last seven (7) years, the mean annual temperature was 38.2°C with the years 2021,2020,2019 and 2017 receiving 29.2°C, 28.6°C, 28.4°C and 28.4°C, consecutively. This shows an increasing trend of temperatures recorded over the past years. The highest temperatures of about 340C have previously been recorded around Lake Magadi while the lowest of 100C in Loitokitok on the eastern slopes of Mt. Kilimanjaro.

1.3.4 Ecological Conditions

The county's soils include well drained, shallow to moderately deep, brown to dark brown, firm and slightly smeary, strongly calcareous, stony to gravelly clay loam; in many places saline and/or sodic soils and with inclusions of lava fields. (National Accelerated Agricultural Inputs Access Program Report, 2014).

The three (3) geological regions in the county are Quaternary volcanic, Pleistocene and basement rock soils. They are mainly found in Rift Valley especially the Quaternary volcanic. In the Amboseli lake drainage system are the Pleistocene soils and the basement system rocks are found mainly along the river valleys and some parts of the plains. Basement rocks mostly comprise of various gneisses, cists, quartzite and crystalline limestone.

Most rivers in the eastern part of the Rift Valley drain toward the east while those within the floor of the valley are restricted to the small depressions and lakes that have no major outlets. It is within this region that Lake Magadi is found.

The amount of surface water varies from area to area. Vegetation type in the county is determined by altitude, soil type and rainfall. In many instances it has been modified by animal and human activity. Grazing, browsing, charcoal burning, extraction of fuel wood and cultivation are the major causes of vegetation reduction. In the lower parts of Mt. Kilimanjaro, indigenous trees have been cleared to create room for agriculture. Vegetation is scarce in low altitude areas and increases with altitude. Ground cover throughout the county varies seasonally with rainfall and grazing intensity. Canopy cover ranges from less than 1 percentage on heavily settled areas to about 30 percentage on steep hills.

2. EXISTING WASTE POLICY IN KENYA

Solid waste management in Kenya is dealt with under several laws, by-laws, regulations and Acts of Parliament, as well as policy documents on national and regional level. This Chapter provides an insight in the relevant waste related legislation, existing policies and institutional arrangements in Kenya. Although the counties are the lead agencies coordinating solid waste management, the Kenyan parliament has established institutional and enacted legislative instruments to address solid waste management through other various institutions.

2.1 Constitution of Kenya 2010

The functions of the County Government are laid out in the fourth schedule of the Constitution. In part 2 of the fourth schedule section 2. (g) gives the functions of refuse removal, refuse dump, and refuse disposal to the County Governments. These functions are to be exercised against the laid-out principles in the overall constitution. The key principles relevant to solid waste management are found under chapter 4 and 5 of the constitution.

In chapter 4- "The Bill of Rights"- article 42 states that:

Every person has the right to a clean and healthy environment, which includes the right (d) to have the environment protected for the benefit of present and future generations through legislative and other measures. Under article 43. (1) Every person has the right to:

a) to the highest attainable standard of health, which includes the right to health care services, including reproductive health care;
b) to accessible and adequate housing, and to reasonable standards of sanitation;

In Chapter 5 – "Land and Environment"- the state (National and County Government) under article 69 is required to:

c) encourage public participation in the management, protection and conservation of the environment;
d) establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
e) eliminate processes and activities that are likely to endanger the environment

2.2 National Environment Policy

Kenya has a National Environment Policy (NEP), which was published in 2013 by the Ministry of Environment, Water and Natural Resources. On waste management, the policy notes that 'Despite efforts to encourage reuse, recycling and recovery, the amount of solid waste generated remains high and appears to be on the increase'.

Below are the policy statements on solid waste as stipulated by the NEP:

1. Develop an integrated national waste management strategy.
2. Promote the use of economic incentives to manage waste.
3. Promote establishment of facilities and incentives for cleaner production, waste recovery, recycling and re-use.

Although the policy does not explicitly guide the counties on solid waste management, it nonetheless provides a clear indication of the national government's prioritization of SWM in the country.

It should be noted that the NEP document looks at solid waste management from an integrated perspective, hence its reference to an integrated national waste management strategy (ISWM). The proposed solid waste authority should therefore consider adopting the term 'integrated' so as to be in line with the NEP.

Whereas voluntary compliance is the most ideal scenario, the NEP states that compliance strategies should include legal requirements since enforcement is crucial in ensuring the success of a national environment policy. To enforce compliance, the government will:

- Design and implement a National Environmental Compliance and Enforcement Programme.
- Enhance public private partnerships in environmental management.
- Provide economic incentives for establishments that adopt environmental- friendly technologies.
- Establish indigenous conflict resolution mechanisms.
- Strengthen the Public Complaints Committee and devolve its functions to the counties.
- Strengthen the environmental courts.

In an article on solid waste management policies in Kenya, Tilahun Haregu and others (2016) identify six categories of solid waste management policies in Kenya. These are:

1. External policies (global and regional) endorsed by Kenya.
2. National laws that provide broad provisions such as the constitution of Kenya.
3. Integrated policies that address many environmental issues, e.g. EMCA and NEP.
4. Sector-specific Acts such as the Public Health Act, Factories Act, etc.
5. Issue-specific regulations such as water quality and waste management regulations.
6. Stand-alone solid waste management policies such as the National SWM strategy.

The lack of clear coherent solid waste management policies at the county level has resulted in uncoordinated un-integrated attempts to manage solid waste in the counties. This is not to say that attempts at solid waste management do not exist at the various counties as evidenced on the ground show a certain level of appreciation of SWM as indicated below.

2.2.1 The National Solid Waste Management Strategy (2015)

The National Solid Waste Management Strategy (NSWMS, NEMA, 2015) is based on an assessment of waste management practices in five Kenyan municipalities to form a basis on which the national strategy was developed. The main guiding principle on the National Strategy is the ZERO WASTE PRINCIPLE. All waste related initiatives should be implemented in line with the National Solid Waste Management Strategy (NEMA, 2015). The NSWMS identifies the following procedures for the counties with regards to solid waste management:

Minimum requirements for Solid Waste Management

The County Governments are expected to implement the minimum requirements across the waste management cycle.

Waste collection

- Ensure that the waste collection areas are zoned;

- Ensure timely and regular collection of all solid wastes either through door to door collection or from centralized collection points;
- Ensure waste collection facilities such as skips, bulk containers and waste cubicles are regularly emptied and do not become eye-sores;

Waste transportation

- Ensure that all the collected waste is transported using NEMA licensed vehicles to designated disposal sites.

Waste disposal site

- Ensure there is a designated site(s) for waste disposal
- Ensure that the disposal site is secured with a fence and a gate manned by a county government official to control dumping and spread of waste outside the disposal site.
- Ensure all incoming waste is weighed or estimated and the quantities recorded in tones
- Develop and maintain motorable roads inside the site to ensure ease of access during disposal;
- Ensure the waste is spread, covered and compacted at regular intervals
- Put in place appropriate control measures for the management of dumpsite fires
- Enhance security and control of the disposal sites so that illegal activities are contained.

Requirement for licensing

- Ensure waste transportation vehicles have NEMA licenses;
- Obtain licenses to operate waste disposal sites.

The County Governments will strive to ensure continuous improvement of collection methods, transportation and disposal facilities. Effective waste management systems will deliver a clean and healthy environment for all as granted by the Constitution of Kenya, 2010.

2.2.2 The National Spatial Plan (2015)

The National Spatial Plan (2015) has been prepared by the National Department of Physical Planning, in the Ministry of Lands and Physical Planning within its mandate of preparing national policies on physical planning. The Plan details the national spatial vision that will guide the long term spatial development of the country for a period of 30 years.

Relevant specific objectives of the National Spatial Plan (NSP) with regards to waste and waste management include:

- To optimize utilization of land and natural resources for economic development
- To create liveable and functional human settlements for high quality of life in both urban and rural areas
- To secure the natural environment for sustainable development

As part of Urbanization the NSP recognizes the key challenges of waste management. The poor Solid Waste Management (SWM) in Kenya is attributable to many factors namely but not limited to the expansion of urban areas and population increase, increased agricultural and industrial activities, lack of appropriate planning, inadequate political will and governance, poor technology, weak enforcement of existing legislation, as well as the absence of economic and fiscal incentives to promote good practice, and lack of analytical data concerning volumes and compositions of waste substances is also lacking. Effective, efficient and economical waste management facilities are crucial if industrial and enterprise

activity is to flourish and develop in a balanced way across various regions of Kenya. Solid wastes in the major urban areas are a by-product of a broad spectrum of domestic, industrial, service and manufacturing processes.

Most of the urban areas lack proper disposal sites and where they exist they are poorly sited or the capacity is exceeded. Solid waste management is a major challenge in the urban areas particularly Nairobi and Mombasa which are the major gateways to the country. To improve the liveability of these urban areas a lasting solution to the solid waste issue must be developed. The NSP proposes that an environmentally sustainable solution be developed. The Plan proposes proper planning, construction and upgrading of integrated solid waste facilities to enable the proper collection, sorting, treatment and disposal of solid waste. The Plan also promotes the reduce, reuse and recycle guidelines.

2.2.3 Nairobi Metro 2030 strategy of 2013

The Nairobi Metro 2030 strategy of 2013 highlights pollution and waste management as growing problems in Nairobi, the main drivers being population growth, shrinking capacity to handle daily challenges, rural–urban migration and rapid development associated with population needs. It proposes that an Integrated Waste Management Program aimed at sustainable solid, liquid, and electronic waste management be implemented as part of the environmental management strategy. Metro strategy recognizes that the growing Nairobi Metropolitan Region will generate significant infrastructure demands which will need to be met.

Critical infrastructure considered in the strategy includes housing, water, and solid waste. Investment in meeting this gap will focus on ensuring jobs are created and the environment is protected. It also notes that the main environmental challenges facing the region are air pollution, climate change, water pollution and solid waste management. Solid waste generation will present a key challenge as well as a significant opportunity for the metropolitan region. If various shares of waste generated remain roughly the same, solid waste presents possibilities for energy gen eration if the right investment is in place.

Under identified key result areas [KRA Two] Articulates deployment of world class infrastructure and utilities for the region by:

- Establishing world class infrastructure and utilities supportive of world-class living, working and business environment
- Prioritizing and accelerating infrastructure related investments supportive of the metropolitan vision
- Integrating information and communication technologies in the development and management of infrastructure and utilities

For policy intervention areas, the concept proposes a Solid Waste Management [SWM] plan that will implement a service level mapping and benchmark nationally, regionally and globally infrastructure and Public Private Partnership. The plan will also implement solid waste management project for domestic, industrial, chemical, toxic and clinical waste built on the reduce, recycle, reuse principle infra- structure.

2.2.4 Spatial planning concept Nairobi Metropolitan Region (2013)

Spatial Planning Concept for Nairobi Metropolitan Region proposes an Integrated Planning Process to provide optimal solution. The concept recognizes the fact that Waste is a complex issue that influences all sectors of the society with significant implications on environment, community's well-being and economy, if not well managed. The process is not static and a step by step approach is required to monitor, make an assessment and proceed to adjust the system. The following issues were recognized in the concept as key issues in waste management

- Improper zoning of SWM services
- Lack of organization structure and management
- Inadequate budgetary allocations
- Inadequate monitoring and enforcement of legal framework
- Private participation in all sectors not regulated
- Insufficiency of trained people

The concept plan for improved waste management in the NMR is required to be achieved through a series of technical intervention and capacity building program. The objective is to improve the existing components of waste management system followed in the country and to introduce new technology and capability in critical areas. Source segregation of waste and subsequent management of waste streams in a scientific method can have significant positive impact on several critical issues. It can help to finance operation system, and develop sustainability both from environmental and economic perspective. Successful planned development of component wise waste management, spread over a period would help in understanding of the acceptability, suitability along with development of an integrated facility to meet the treatment and disposal requirement of waste in an environmentally sound and economically viable manner. The concept offers various recommendations to improve the solid waste management systems in the region.

2.3 Relevant County Policies related to Waste Management

Several reports have been published, presenting the responsibilities of Counties with regards to waste management.

2.3.1 County Solid Waste Management Policies

Kajiado County solid waste management policy

Kajiado County is one of those counties that have taken solid waste management issues very seriously. In 2015, the Kajiado County Assembly declared solid and sewerage waste management in the county towns a county disaster.

According to the Kajiado County Integrated Development Plan, the county has four waste disposal sites. The CIDP notes that the “major emerging environmental problem affecting human settlement in the county, especially in urban centers, is inadequate liquid and solid waste disposal facilities”. To improve SWM in the county, the current Kajiado CIDP has among its flagship projects planned to establish modern solid waste management facilities.

The County is currently working on an environment bill that is expected to address solid waste management issues in the County.

In an update published in the Ministry of Environment and Natural Resources website, an eight-member committee was set up to attempt “to resolve the persistent poor solid waste management” in the County. The team was also challenged to develop a framework for proper management of waste in Kajiado County.

By and large, Kajiado County appears to understand the direction the county should take in terms of solid waste management. Attempts at sponsoring an environment bill are a pointer to this fact; and so is the establishment of a committee to resolve SWM issues in the county. However, as of now, there is no clear policy direction in the county on SWM.

2.3.2 County Integrated Development Plans

Kajiado County Integrated Development Plan 2023-2027

The CIDP articulates the medium term policies and objectives which are further translated into short term strategies, programmes and projects to be implemented under the Medium Term Expenditure Framework (MTEF). In terms of solid waste management, the county has five waste disposal sites, with one that is not operational. One of the key emerging concerns as per the CIDP in relation to human settlement is solid waste management in the urban centers. The CIDP sets for an objective for efficient and effective solid waste management system development. The strategies for achieving this include the allocation of funds; Planning; and procure trucks and equipment.

Among the county flagship projects for the county is the establishment of two modern solid waste management facilities.

2.4 National waste legislation and regulations

2.4.1 The Environmental Management and Co-ordination Act (EMCA)

The Environmental Management and Co-ordination Act (EMCA) 1999, amended in 2015, is the frame-work law on environmental management and conservation. The Act provides for environmental protection through:

- Environmental impact assessment
- Environmental audit and monitoring
- Environmental restoration orders, conservation orders, and easements.

The Act aims to improve the legal and administrative co-ordination of the diverse sectoral initiatives in the field of environment so as to enhance the national capacity for its effective management. The Act harmonizes the sector specific legislations touching on the environment in a manner designed to ensure greater protection of the environment in line with national objectives and the sustainable development goals enunciated in Agenda 21 of the Earth Summit held in Rio de Janeiro in 1992. The ultimate objective is to provide a framework for integrating environmental considerations into the country's overall economic and social development.

The Act, through Part V, recognizes the importance of protection and conservation of the environment. This includes the following relevant sections to municipal solid waste management covered un- der Part VIII as follows:

- Section 86 (3) empowers the Standards and Enforcement Committee to prescribe standards for waste, their classification and analysis and formulate and advise on standards of disposal meth ods and means for such wastes; or issue regulations for the handling, storage, transportation, segregation and destruction of any waste.
- Section 87 deals with prohibition against dangerous handling and disposal of wastes, licensing of waste transporters and disposal sites.
- Section 90 allows the National Environment Management Authority to apply to a competent court for orders compelling any person to immediately stop the generation, handling, transporta tion, storage or disposal of wastes where such generation, handling, transportation, storage or disposal presents an imminent and substantial danger to public health, the environment or natural resources.
- Sections 92 and 147 grants powers to the Minister for Environment to make regulations on the advice of NEMA and the Standards and Enforcement Committee for waste management in Kenya.

Under this Act, the Counties can develop municipal solid waste management by-laws to request for their adoption by NEMA under section 147 of the Environmental Management and Coordination Act, 2015.

To administer the above Act, two major institutions have been established for the purpose of the administration of the above Act. They are the National Environmental Council and the National Environmental Management Authority. The National Environment Management Authority (NEMA) was established as the principal instrument of government charged with the implementation of all policies relation to the environment, and to exercise general supervision and coordination over all matters relating to the environment. In consultation with the lead agencies, NEMA is empowered to develop regulations, prescribe measures and standards and issue guidelines for the management and conservation of natural resources and the environment.

Legal Notice No.121: Kenya Gazette Supplement No. 69-Environmental Management and Coordination (Waste Management) Regulations, 2006

In pursuit of the provisions of the Environmental Management and Coordination Act, 1999, NEMA, in 2006 gazetted the waste management regulations focusing on management of solid wastes, industrial wastes, hazardous wastes, pesticides and toxic substances and radioactive substances (legal Notice no. 121). The regulations are aimed at addressing the following concerns:

- Reduction of solid wastes at source through adoption of cleaner methods of production;
- Responsibilities for waste generators and obligations for disposal: This places the burden of minimizing waste volumes within streams as well reclamation and recycling;
- Proper transportation and disposal of wastes: Section 7 states that no person shall be granted a license to transport unless such person operates a transportation vehicle approved by the Authority upon the recommendation of the relevant lead agency. Under section 8 any person who is granted a license shall ensure that the collection and transportation of such waste is conducted in a manner that will not cause scattering of the waste, emissions and that waste transportation vehicles follow routes that are designated by the Authority;
- Management of waste disposal sites: All designated solid waste disposal sites shall apply to NEMA for a license to operate a disposal site (Schedule II of the regulations);
- Waste treatment requirements: Under section 11, any operator of a disposal site or plant shall apply the relevant provisions on waste treatment under the County Government Act and Regulations to ensure that such waste does not present any imminent and substantial danger to the public health, the environment and natural resources;
- The regulations apply to plants and sites established for re-use and recycling of wastes;
- Procedures for licensing of waste handlers and disposal sites, fees, penalties and other requirements are set out in 10 schedules covering 13 regulations of the legal notice; and
- Licensing fees and procedures for waste handlers and pollution penalties.

Environmental Management and Coordination (Water Quality) Regulations, 2006

Water quality regulations were gazetted in 2006 as legislative supplement to mainly address the challenges of pollution of water resources as well as their conservation. It consists of VI parts and eleven schedules dealing with protection of sources of water to miscellaneous provision.

Solid waste has a bearing on degradation of water sources if not well disposed. Part II section 4 (1) states that every person shall refrain from any act which directly or indirectly causes or may cause immediate or subsequent water pollution and it shall be immaterial whether or not the water resource was polluted before the commencement of the regulations.

Under section 6, solid wastes should not be disposed or held in close proximity (30-meter riparian reserve) to lakes, rivers, streams, springs and wells as they are likely to have an impact on the quantity and quality of the water. In any case the designation of disposal sites close to riparian zones should be preceded by Environmental Impact Assessments (EIA) commissioned by the waste manager.

The Environment Impact (Assessment and Audit) Regulations, 2003

The EIA/EA regulations came into force in 2003 through a legal notice No. 101. EIA is utilized as decision making tool by the National Environment Management Authority to determine the issuance of EIA licenses to new projects. On the other hand, environmental audits are used a tool for compliance monitoring and evaluation to determine how on-going projects conform to environmental protection and conservation measures. The regulations require that on-going projects with a potential to impact negatively on the environment to undertake an initial environmental audit and thereafter annual self-audits for the lifetime of the project.

The regulations stipulate the ways in which environmental experts should conduct the environmental impact assessment study reports and content reporting in conformity to the requirement stated.

After NEMA receives an environmental impact assessment report, it will generally review it and subsequently issue an EIA license or reject the application with the necessary rationale for such rejection. In case a license is issued; environmental inspectors are required to liaise with relevant lead agencies in ensuring compliance with requisite conditions for approval of the project by NEMA. The regulations are concise in their reporting, content requirements, processes of public participation, licensing procedures, and inspections and any possible offences and penalties under the Act.

Under the waste management regulations (regulation 12) all existing solid waste disposal sites are required to undergo environmental audits in to ensure compliance with the set conditions thereof in terms of the provisions under Part V which states that the report compiled under the regulations shall include among others:

- The past and present impacts of the disposal site;
- The responsibility and proficiency of the operators of the disposal;
- Existing strategies to mitigate environmental impacts of solid waste disposal activities;
- Health and safety concerns of the disposal site;
- Legislative and policy frameworks relevant to the waste stream and disposal site management;
- Existing environmental awareness and sensitization measures including environmental standards and regulations, law and policy for the managerial personnel;
- Identification, documentation and analysis of all negative environmental impacts associated with the existing solid waste and disposal site management;
- An analysis of environmental performance of the disposal site in the light of environmental impacts;
- Development of an environmental management plan and action plan for the streams and sites;
- Public consultations on the impact of the continued existence of the disposal site within the area; and
- Preparation of an environmental audit report.

The existing waste disposal sites are subject to environmental monitoring and control audits by NEMA inspectors (Section 117 of EMCA, 1999) in conjunction with the Counties and in the manner prescribed under regulation 35 (3a-f).

The designation of waste disposal sites shall similarly require carrying out an environmental impact assessment and issuance of a license by NEMA. A typical environmental impact assessment study report prepared under the regulations shall include among things the following:

- A proposed location of the project;
- Description of the legislative and regulatory framework;
- Baseline information of the project site;
- Technology, procedures and processes to be used in the management of solid waste collection, transportation and disposal at the site;
- Materials used in the establishment of the disposal sites;
- Description of the products, by-products of the site and disposal processes;
- A description of the potentially affected environment by the waste management activities;
- Environmental effects of the waste disposal sites including socio-economic, cultural and the direct, indirect, cumulative, irreversible, short and long-term effects anticipated;
- Consideration and analysis of alternatives for the proposed disposal site and strategies;
- Development of an environmental management plan (EMP) proposing the measures for eliminating, minimizing, or mitigating adverse impacts on the environment; including the cost, timeframe and responsibility to implement the measures;
- Provision of an action plan for the prevention and management of foreseeable hazardous activities (health and safety);
- Public consultative process on the impacts of the waste management strategies, economic and cultural analysis;
- Analysis of alternatives as a mitigation measure; and
- Any other measures or guidelines proposed by NEMA or in consultation with the lead agency.

2.4.2 Environment and Land Court Act, 2011

This Act of Parliament gives effect to Article 162(2)(b) of the Constitution, which requires the establishment of a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes.

Under article 13(1), the act gives the Environment and Land Court the jurisdiction to hear and determine all disputes in accordance with Article 162(2)(b) in relations to environment and land.

Under sub-section (2) the powers to hear and determine disputes in (a) relating to environmental planning and protection, climate issues, land use planning, title, tenure, boundaries, rates, rents, valuations, mining, minerals and other natural resources; (b) relating to compulsory acquisition of land;

(c) relating to land administration and management; (d) relating to public, private and community land and contracts; and (e) any other dispute relating to environment and land.

Under the guiding principles (section18), the Court shall be guided by the following principles:

1. the principles of sustainable development, including:

- the principle of public participation in the development of policies, plans and processes for the management of the environment and land;
- the cultural and social principles traditionally applied by any community in Kenya for the management of the environment or natural resources in so far as the same are relevant and not inconsistent with any written law;

- the principle of international co-operation in the management of environmental resources shared by two or more states;
- the principles of intergenerational and intergenerational equity;
- the polluter-pays principle; and (vi) the pre-cautionary principle;

2. the principles of land policy under Article 60(1) of the Constitution; (c) the principles of judicial authority under Article 159 of the Constitution;
3. the national values and principles of governance under Article 10(2) of the Constitution; and
4. the values and principles of public service under Article 232(1) of the Constitution.

2.4.3 The County Government Act, 2012

Section 6 of the County Government Act [26has given the County Governments the powers necessary for the discharge of their functions. These functions and power include among others the power to enter into partnerships with any public or private organization in accordance with the provisions of any law relating to public or private partnerships for any work, service or function for which it is responsible within its area of jurisdiction.

To ensure efficiency in the delivery of service or carrying out of a function for which the county government is responsible,

The county government may:

a) *establish a company, firm or other body for the delivery of a particular service or carrying on of a particular function; or*
b) *contract any person, company, firm or other body for the delivery of a particular service or carrying on a particular function.*

In exercising its powers or performing any of its functions a county government shall ensure efficiency, effectiveness, inclusivity and participation of the people.

2.4.4 Physical Planning Act

The Counties are empowered under section 29 of the Act to reserve and maintain all land planned for open spaces, parks, urban forests and green belts. The same section, therefore allows for the prohibition or control of the use and development of land and buildings in the interest of proper and orderly development of an area. Section 30 states that any person who carries out development without development permission will be required to restore the land to its original condition. It also states that no other licensing authority shall grant license for commercial or industrial use or occupation of any building without a development permission granted by the respective County Authority. This Act is important in setting out the land requirements for solid waste management areas such as household solid waste collection sites, transfer stations and landfills.

2.4.5 The Land Registration Act, 2012

This ACT of Parliament was enacted to revise, consolidate and rationalize the registration of titles to land and to give effect to the principles and objects of devolved government in land registration.

Under section 3 of the Act defines. This would apply to solid waste related land uses such as landfills, collection points. The Act under section 20(1) gives guidance on maintenance of boundaries Maintenance, which states that “every proprietor of land shall maintain in good order the fences, hedges, stones, pillars, beacons, walls and other features that demarcate the boundaries, pursuant to the

requirements of any written law". The National Solid Waste Management Strategy 2013 requires that the County Government build and maintain the landfills boundaries as a way of maintaining clean environment.

2.4.6 Government of Kenya Land Act, 2012

This Act gives effect to Article 68 of the Constitution, for purpose of revising, consolidating and rationalizing land laws. It also provides for the sustainable administration and management of land and land- based resources, and for connected purposes. The National Land Commission which under article 67 of the constitution is mandated with management of public land on behalf of the national and County Government is expected under section 15 of the act to identify and require land to be used for specified public purposes and subject to such conditions, covenants, encumbrances or reservations.

2.4.7 Public Health Act (Cap. 242)

This Act is concerned with human health issues and the contribution to health problems due to neglect of the environment. Under section 115 it is stated that no person or institution shall cause nuisances or conditions which could cause injuries or be dangerous to human health and further under section 116 that Counties shall take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to be injuries or dangerous to human health. Such nuisance or conditions include refuse pits, accumulation of materials or refuse which are likely to harbor pests and vermin. The Act also requires Counties to develop by laws for controlling and regulating sanitary services.

2.4.8 Occupational Safety and Health Act, 2007

This is an Act of Parliament that provides for the safety, health and welfare of workers and all persons lawfully present at work places to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes. Section 3 (1) states "that the Act shall apply to all workplaces where any person is at work, whether temporarily or permanently".

Under this Act, the duties of the Occupier are provided thus in Section 6:

- Every occupier shall ensure the safety, health and welfare at work of all persons working in his workplace.
- Without prejudice to the generality of an occupier's duty under subsection (1), the duty of the occupier includes:

    a) *the provision and maintenance of plant and systems and procedures of work that are safe and without risks to health;*
    b) *arrangements for ensuring safety and absence of risks to health in connection with the use, handling, storage and transport of articles and substances;*
    c) *the provision of such information, instruction, training and supervision as is necessary to ensure the safety and health at work of every person employed;*
    d) *the maintenance of any workplace under the occupier's control, in a condition that is safe and without risks to health and the provision and maintenance of means of access to and egress from it that are safe and without such risks to health;*
    e) *the provision and maintenance of a working environment for every person employed that is, safe, without risks to health, and adequate as regards facilities and arrangements for the employees' welfare at work;*
    f) *informing all persons employed of*

i. any risks from new technologies; and
ii. imminent danger; and

g) ensuring that every person employed participates in the application and review of safety and health measures.

- Every occupier shall carry out appropriate risk assessments in relation to the safety and health of persons employed and, on the basis of these results, adopt preventive and protective measures to ensure that under all conditions of their intended use, all chemicals, machinery, equipment, tools and process under the control of the occupier are safe and without risk to health and comply with the requirements of safety and health provisions in this Act.
- Every occupier shall send a copy of a report of risk assessment carried out under this section to the area occupational safety and health officer;
- Every occupier shall take immediate steps to stop any operation or activity where there is an imminent and serious danger to safety and health and to evacuate all persons employed as appropriate;
- It is the duty of every occupier to register his workplace unless such workplace is exempted from registration under this Act;
- An occupier who fails to comply with a duty imposed on him under this section commits an off-fence and shall on conviction be liable to a fine not exceeding five hundred thousand shillings or to imprisonment for a term not exceeding six months or to both.

2.4.9 Other Relevant laws and regulations

While the Environmental Management and Co-ordination Act, 1999 supersede all other environmental legislation, a number of other laws and regulations influence the various aspects and activities to be undertaken, which include the following among others;

- Water Act (2002);
- Food, Drugs and Chemical Substances Act (rev. 1992);
- Pest Control Products Act (1985);
- Building Code (1997); and
- Penal Code (rev. 1985).
- The Building Code of 1987
- The Radiation Protection Act (Cap 243 of the Laws of Kenya)
- The Traffic Act (cap 403 of the Laws of Kenya)
- The Transport Licensing Act (Cap 404 of the Laws of Kenya)
- The Scrap Metal Act (Cap 503 of the Laws of Kenya)

2.5 Regional waste legislation and regulations

2.5.1 The Kajiado County Environmental Management Bill, 2015

Kajiado County has the County Government of Kajiado environmental management Bill 2015, which is currently at the assembly. The bill provides various provisions regarding the improvement of solid waste management in the county.

Examples of provisions included in the bill:

- The object and purpose of this Act is to provide for environmental Management through provisions on environmental protection.

- Every person within the jurisdiction of the County is entitled to a clean and healthy environment and has the duty to safe guard and enhances the environment.
- The County shall allow private sector involvement in solid waste management on terms and conditions which the county shall deem appropriate from time to time.
- Any person, firm or group licensed to carry out garbage collection and transportation, or disposal of any waste and which flouts any clause or clauses of part thereof of solid waste management agreement or policy guidelines in private sector involvement in solid waste management shall be guilty of an offence.
- Any person who operates or engages in waste disposal, waste treatment, waste recycling, waste sorting, waste transportation or any other waste handling activity without a license or written authority or approval issued by county shall be guilty of an offence.
- Every person whose activities generate waste shall employ measures essential to minimize waste generation, treatment, reclamation or recycling.
- Every person, firm, institution, factory, commercial enterprise that engages in activity that generates waste shall if so directed by the Director, separate or cause to be separated various types of wastes and shall ensure collection or disposal of the different wastes separated takes place as per the Director's direction. Failure to fulfil all or any part of the Director's requirement shall be an offence.
- It shall be the duty of every tenant and/or landlord to ensure a safe and sanitary disposal of his or her refuse and show proof of disposal thereof, failure to which it shall be an offence.
- Any owner or occupier of any premises receiving garbage/waste collection services shall pay or ensure payment to county or the private firm, or group that may have rendered service on monthly basis the approved garbage/ waste collection fee. Failure to pay or ensure payment of the prescribed garbage waste collection fees shall be an offence.
- It shall be the duty of the county to ensure that the arrangements made by the producer or the disposal of toxic and hazardous waste are adequate for the purpose of disposing off all such waste produced within its jurisdiction.
- Any person before undertaking sand harvesting, quarrying, mining, waste disposal and other business or activity that may have negative impact on environmental, shall before commencement of the works obtain an environmental license from the county failure to which it is an off- fence.
- Projects to undergo environmental impact assessment, i.e.:

    - *Waste disposal including:*
    - *Sites for solid waste disposal*
    - *Sites for hazardous waste disposal*

2.6 Institutional framework

There are several organizations involved in solid waste and environment management in the country. These organizations include the Ministry of Environment and Natural Resources, Ministry of Water and Irrigation, National Environment and Management Authority, Water Resources Management Authority and the Counties etc. The overall entity involved in the environmental management in Kenya is the National Environment Management Authority which has been founded and mandated under the Environmental Management and Coordination Authority.

2.6.1 Ministry of Environment and Natural Resources

The Ministry of Environment and Natural Resources has its fundamental goal and purpose as ensuring a clean, secure and sustainably managed environment and mineral resources conducive for national prosperity. The ministry's mission is to promote, monitor, conserve, protect and sustainably manage the environment and mineral resources for national development. The Ministry was created in 2003.

2.6.2 National Environment Management Authority (NEMA)

The objective and purpose for which NEMA was established is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment.

NEMA's core functions include the following:

- Coordinating the various environmental management activities being undertaken by the lead agencies;
- Promote the integration of environmental considerations into development policies, plans, programmes and projects, with a view to ensuring the proper management and rational utilization of environmental resources, on sustainable yield basis, for the improvement of the quality of human life in Kenya;
- Take stock of the natural resources in Kenya and their utilization and conservation.
- Establish and review land use guidelines;
- Examine land use patterns to determine their impact on the quality and quantity of natural re-sources;
- Carry out surveys, which will assist in the proper management and conservation of the environment.;
- Advise the Government on legislative and other measures for the management of the environment or the implementation of relevant international conventions, treaties and agreements;
- Advise the Government on regional and international conventions, treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements;
- Undertake and coordinate research, investigation and surveys, collect, collate and disseminate information on the findings of such research, investigations or surveys;
- Mobilize and monitor the use of financial and human resources for environmental management;
- Identify projects and programmes for which environmental audit or environmental monitoring must be conducted under this Act;
- Initiate and evolve procedures and safeguards for the prevention of accidents, which may cause environmental degradation and evolve remedial measures where accidents occur e.g. floods, landslides and oil spills;
- Monitor and assess activities, including activities being carried out by relevant lead agencies, in order to ensure that the environment is not degraded by such activities. Management objectives must be adhered to and adequate early warning on impending environmental emergencies is given;
- Undertake, in cooperation with relevant lead agencies, programmes intended to enhance environmental education and public awareness, about the need for sound environmental management, as well as for enlisting public support and encouraging the effort made by other entities in that regard;
- Publish and disseminate manual codes or guidelines relating to environmental management and prevention or abatement of environmental degradation.
- Render advice and technical support, where possible, to entities engaged in natural resources management and environmental protection, so as to enable them to carry out their responsibilities satisfactorily;
- Prepare and issue an annual report on the State of Environment in Kenya and in this regard, may direct any lead agency to prepare and submit to it a report on the state of the sector of the environment under the administration of that lead agency.

NEMA's mandate is designated to the following committees:

County Environment Committees

According to EMCA, 1999 No. 8, the Minister by notice in the gazette appoints Provincial and District Environment Committees of the Authority in respect of every province and district respectively. The Provincial and District Environment Committees are responsible for the proper management of the environment within the Province and District in respect of which they are appointed. They are also to perform such additional functions as are prescribed by the Act or as may, from time to time be as- signed by the Minister by notice in the gazette. The decisions of these committees are legal and it is an offence not to implement them.

Public Complaints Committee

The Committee performs the following functions:

- Investigate any allegations or complaints against any person or against the authority in relation to the condition of the environment in Kenya and on its own motion, any suspected case of environmental degradation and to make a report of its findings together with its recommendations thereon to the Council;
- Prepare and submit to the Council periodic reports of its activities which shall form part of the annual report on the state of the environment under Section 9 (3); and
- To perform such other functions and excise such powers as may be assigned to it by the Council.

National Environment Action Plan Committee

This Committee is responsible for the development of a 5-year Environment Action Plan among other things. The National Environment Action Plan shall:

- Contain an analysis of the Natural Resources of Kenya with an indication as to any pattern of change in their distribution and quantity over time;
- Contain an analytical profile of the various uses and value of the natural resources incorporating considerations of intergenerational and intra-generational equity;
- Recommend appropriate legal and fiscal incentives that may be used to encourage the business community to incorporate environmental requirements into their planning and operational processes;
- Recommend methods for building national awareness through environmental education on the importance of sustainable use of the environment and natural resources for national development;
- Set out operational guidelines for the planning and management of the environment and natural resources;
- Identify actual or likely problems as may affect the natural resources and the broader environment context in which they exist;
- Identify and appraise trends in the development of urban and rural settlements, their impact on the environment, and strategies for the amelioration of their negative impacts;
- Propose guidelines for the integration of standards of environmental protection into development planning and management;
- Identify and recommend policy and legislative approaches for preventing, controlling or mitigating specific as well as general diverse impacts on the environment;
- Prioritize areas of environmental research and outline methods of using such research findings;
- Without prejudice to the foregoing, be reviewed and modified from time to time to incorporate emerging knowledge and realities; and
- Be binding on all persons and all government departments, agencies, States Corporation or other organ of government upon adoption by the national assembly.

Standards and Enforcement Review Committee

This is a technical Committee responsible for environmental standards formulation methods of analysis, inspection, monitoring and technical advice on necessary mitigation measures.

National Environmental Tribunal

This tribunal guides the handling of cases related to environmental offences in the Republic of Kenya.

2.6.3 National Environment Council (NEC)

EMCA 1999 No. 8 Part iii Section 4 outlines the establishment of the National Environment Council (NEC). NEC is responsible for policy formulation and directions for purposes of EMCA; set national goals and objectives and determines policies and priorities for the protection of the environment and promote co-operation among public departments, Counties, private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes.

2.6.4 Ministry of Transport, Infrastructure, Housing & Urban Development

National Level

Solid Waste Management (SWM) falls under the Ministry of Environment and Natural Resources whose mandate is to protect, conserve and manage the environment and natural resources for socio- economic development. Through restructuring, some roles within the NMR have been handled by the MoTIH&RD. At the helm of the Ministry of Environment and Natural Resources sits the Cabinet Secretary. Within this Ministry is the National Environment Council (NEC) which was established by Section 4(1) of the Environmental Management and Coordination Act no. 8 of 1999. Key Functions of NEC are:

- Policy formulation and direction for the purposes of this act
- Set national goals and objectives and determine policies and priorities for the protection of the environment;
- Promote cooperation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes;
- Perform such other functions as are assigned under the Act.

The National Environment Management Authority (NEMA) was established under the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, as the principal instrument of government in the implementation of all policies relating to the environment. One of the core functions of the authority is to mobilize and monitor the use of financial and human resources for environmental management.

County Level

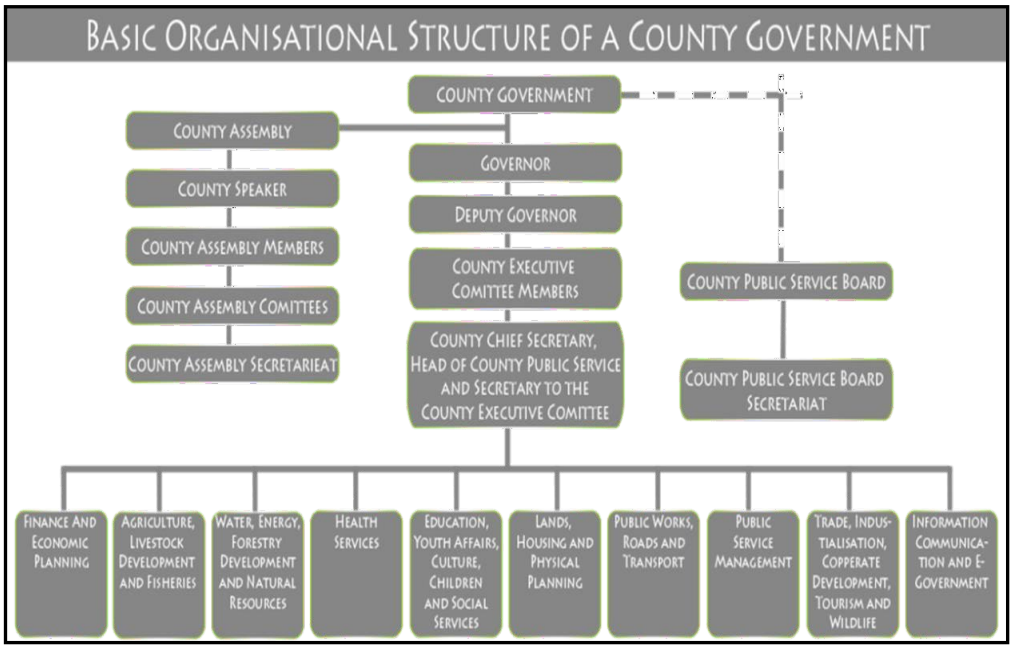

Figure 3: County level organizational structure

2.6.5 Summary of the Institutional framework for solid waste management

The responsibility of solid waste management in Kenya's urban centers lies with the Counties as a devolved function. However due to limited infrastructure, capacity, rapid population growth and resources, counties have failed to respond adequately to the challenges posed by solid waste management thereby inviting other players to compliment effort. The relevant institutional arrangements are summarized below.

Table 4: Institutional arrangements

Institution	Role in Solid Waste Management within Counties	Legal status	Factors limiting effective SWM
County governments	County health services, including, in particular refuse removal, refuse dumps and solid waste disposal. Control of air pollution, noise pollution, other public nuisances and outdoor advertising.	County Governments Act	TBD
National Environment Management Authority (NEMA)	Custodian of environmental legislation, supposed to supervise and implement solid waste management strategies at County, regional and national levels.	Environmental Management and Coordination Act, 1999 Waste Management Regulations, 2006 Water Quality Regulations, 2006	TBD
Ministry of Lands & Physical planning /National Land Commission	Securing of land for collection centers, transfer stations and disposal sites.	Land Titles Act, Cap 282	Compensation for land from County communities
Department of Physical Planning	Spatial organization and location of collection points, transfer stations and dumpsites.	Physical Planning Act, Cap. 286	Land availability Planning capacity
Ministry of Public Health and Sanitation	Ensuring generation, transportation and disposal of solid wastes do not impact on public health.	Public Health Act, Cap. 242	Infrastructure and capacity
Department of Occupational Health and Safety	Ensuring health and safety of personnel handling solid wastes.	Occupational Safety and Health Act, 2007	Lack of clear monitoring policies on use of PPE
Private solid waste handlers	Provision of solid waste management services for house- holds Complementing the Services rendered by the Counties.	Municipal Council by laws and EMCA, 1999 and waste management regulations.	County coverage and infrastructure
Community Based Organizations	Grassroots mobilization and services in solid waste management. Waste based enterprises.	No clear frameworks as most are informal in nature.	Lack of organizational structures and capacities

		CBO's under the Ministry of Gender, Sports and Cultural Heritage.	
Waste recycling firms	Recycling of wastes, waste based enterprises. Reducing wastes reaching the dumpsites.	Industrial laws and business licensing	Sizes and capacity to handle the wastes
NGOs	Funding, lobbying advocacy and awareness activities.	NGO's Act	Enabling framework and trust between them and the government
International Non-Governmental Organizations	Funding, lobbying advocacy and awareness activities.	Multilateral and bilateral agreements	Enabling framework and trust between them and the government

3. CURRENT WASTE SITUATION

As presented in the previous chapter, Kajiado has a quite extensive institutional framework in place regarding solid waste management. However, the current implementation is weak and poor practices have led to a negative influence on the environment and public health. Solid waste management is the responsibility of the county, and although Kajiado is motivated to improve the difficult waste situation, capacity and knowledge are lacking and the establishment of proper solid waste management systems is politically not high ranking. This chapter presents the current waste situation in Kajiado County.

3.1 General information

As mentioned in the Kajiado County Integrated Development plan the county has not been spared from effects of environment degradation and climate change. In 2015 Kajiado County Assembly passed a motion to declare the issue of solid and sewerage waste management in towns a county disaster. The county lacks sufficient solid waste management, sewerage system and public toilets in major towns. Currently the county has four waste disposal sites and aims to ensure acquisition of land for waste management. The establishment of 2 Modern Solid Waste Management facilities is identified as one the county flagship projects.

3.1.1 Community distribution by type of waste/garbage disposal (%):

Table 5: Type of waste disposal

Collected by local Authority	2.4
Collected by Private firm	1.4
Garbage pit	28.9
Burning	56.5
Public garbage heap	9.4
Farm Garden	0.8
Neighborhood Community group	0.8

3.1.2 Statements of representatives from Kajiado County:

There is a need to have an integrated solid waste management governance system. Also ensure that the infrastructure (collection, transportation and disposal) for solid waste management is already in place. Currently the infrastructure is lacking.

One of the challenges likely to face the new SWMA in Kajiado is the county's sensitivity to interventions from 'outside' the county. As such the new Authority should clearly demonstrate how the county stands to benefit from such an intervention.

The Kajiado County draft bill contains proposals on zoning and waste bins, to be located in designated areas. Kitengela, one of the fastest growing towns in Kenya, has minimal reserve areas for public installations. This is because it is designated as a market. This situation has meant that this rapidly expanding, highly populated town does not attract government projects that come with upgrading, i.e. a sewer system.

In Nonkopir dumpsite in Kitengela, due to difficulty in accessing the dumpsite, a lot of waste is indiscriminately dumped on vacant plots in the vicinity.

Ngong dumpsite had an organized group (Nuru Youth Group) that is sorting the waste and selling it. This dumpsite was however closed.

Enforce bylaws on solid waste management - this could be integrated into the licensing regimes such that one cannot be issued with a business license if they violate SWM bylaws.

Kajiado County has about 40 private NEMA licensed waste transporters, both companies and individuals. Kajiado has two metal recyclers. A plastic recycling plant is also being set up in the county. On the basis of NEMA minimum points, Kajiado County's compliance is low. But the county is very much aware of these requirements.

An interesting survey has been done in Kajiado County. The main results are summarized below, and can be considered as relevant for the other counties as well (Kajiado survey Ongata Rongai):

- *Littering is the result of individual choice to be careless in the handling of personal waste. Many-people believe that littering is wrong. People choose to dispose their garbage inappropriately with the belief that someone else will pick up after them. Once litter is on the ground it attracts more litter, whereas a clean community discourages littering.*
- *Residents should be educated on the benefits of recycling and how they can recycle items at home. Recycling in Kenya is predominately in the hands of informal sector entrepreneurs, who at the lowest levels live in squatter settlements at refuse dumping grounds.*
- *There is little recognition of the trickle-up economic benefits derived from direct, informal sector recycling, whereby municipal costs for refuse disposal are reduced, private sector jobs are created and energy in manufacturing is saved through the use of recycled versus raw materials;*
- *The government should be more actively involved in the practice of recycling and give it wider recognition in the country.*
- *Also, there should be wider acceptance of local recyclables and more use of recycled products in the society.*
- *Youth groups and Community Based Organizations (CBOs) should be encouraged to come up in order to convert garbage collection ventures into livelihood strengthening commercial enterprises; for example, by composting municipal waste into organic fertilizer encouraging organic farming and recycling plastics and old tires.*

The Ngong dumpsite was closed unilaterally without offering an alternative in a clear breach of the law. This has led to a waste management crisis in the towns of Ngong, Embulbul, Kiserian, Matasia and Rongai, among others who depend on the dumpsite.

While closing the dumpsite, the waste management practitioners were advised to take the waste to dumpsite which is located in Kajiado County, around 40 kilometers away. This is also a breach of the constitution since waste management is a devolved function as Part 2 of the Fourth Schedule of the Constitution of Kenya clearly states that County Governments are responsible for refuse removal, refuse dumps and solid waste disposal.

There have already been unconfirmed reports that waste practitioners from Ngong have been arrested for this transboundary of waste offence and are facing fines of over 50,000 Kenya Shillings. This closure of the dumpsite is also likely to triple the cost of waste management in the affected areas and also encourage illegal dumping. The closure also affects adversely the community of waste pickers who depend on the dumpsite for survival.

There is absolutely no doubt that the Ngong dumpsite required closure as it is located in the middle of Ngong town and is a major health and environmental concern. However, its unilateral closure without offering an alternative is however a bigger problem and shows a lack of forward planning by the county of Kajiado.

4. PUBLIC AWARENESS CURRENT SITUATION

The aim of designing a public awareness campaign for Kajiado County is to provide a framework for engaging with the public to ensure ownership and acceptance of solid waste management practices.

It is envisaged that by implementing a public awareness strategy, the residents will better understand the role of the local body in SWM and also their role as individuals in ensuring that waste is minimized, sorted and appropriately stored awaiting collection by the relevant local body or contracted private solid waste vendors.

The campaign will also seek to draw the public's attention to solid waste issues, including the role of the county government in ensuring that all live in a safe, clean, and beautiful environment. This is expected to bring about behavior and social change on how the communities view and respond to waste in their neighborhoods.

The campaign design also aims at stressing to the policy setting bodies such as the Ministry of Environment on the need to prioritize environmental issues during budgetary setting exercises.

The design will also propose that a form of social marketing exercise be conducted in order to understand the needs and desires, and perceptions, of the residents in the identified counties. Towards this end, the implementers of the campaign strategy should devise and implement communication pro- grams that seek to educate and explain the benefits of an improved SWM system in their respective counties.

By responding to the public needs and concerns about SWM, the adopted communication messages will likely result in eliciting new sets of values and attitudes among the residents and consequently help influence their behaviors and habits when engaging with solid waste.

4.1 Purpose of Public Awareness Campaigns

Public awareness and communication interventions are aimed at influencing the public's behavior in a way that supports a new policy and helps guide both the public discourse and behavior.

The main goal of public awareness campaigns is to draw the attention of the public to certain issues of concern, with the overriding objective of changing people's behavior and bringing about desired change. For a public awareness campaign to be deemed effective, it is expected that the targeted audience will accept the messages contained in such a campaign.

For the proposed Solid Waste Management Authority (SWMA) to be effective, it will be important to design and implement a PA campaign that ropes in all the stakeholders, especially the public, with the desired impact of changing their perception and behavior towards solid waste in their respective counties.

4.2 Current State of Public Awareness on SWM in Kajiado

Kajiado County has a population of 1,117,840 and occupies 21,292.7 km². The County does not have a public awareness department. Issues to do with SWM have been relegated to the back banner, especially when it comes to planning and budgetary provisions.

The residents of the county look at SWM as the exclusive role of the county government and therefore do not take personal responsibility towards SWM.

Awareness is however improving in the county, but it's largely driven by NEMA, civil society organizations, religious organizations, etc. The county government has however started raising awareness by collaborating with institutions to conduct clean up days.

5. WASTE: PRIVATE SECTOR INVOLVEMENT

This chapter aims at understanding the connectivity of solid waste services in the Metropolitan region between County Government, NGOs/CBOs institutions and private sector. This is to guide in the development of an effective and Integrated Solid Waste Management [ISWM] system that considers how to prevent, recycle, and manage solid waste in ways that most effectively protect human health and the environment. The major ISWM activities are waste prevention, recycling and composting, and combustion and disposal in properly designed, constructed, and managed landfills. The field surveys carried out by the project team in all the counties revealed major challenges experienced by all the five County Governments with regard to effective and sustainable management of solid waste. These challenges can be attributed to: that low funding for solid waste services, insufficient public awareness and lack of adequate capacity for enforcement of for solid waste. Introduction of various incentives and economic instruments that will spur the involvement of the private sector; including the service payment mode that are innovative and acceptable to the service providers will make waste management sustainable.

It should be noted that a sustainable waste management system should be centered on empowerment, waste segregation at source, traceability, recycling and waste diversion from landfills through waste value chain. In this value chain the business approach to solid waste management provides the best solution since it is capable of incorporating private sector involvement. This project seeks to find out how private sector can be involved in the four components or functional elements of waste collection, waste transportation, recycling/ processing, compositing and land filling

Waste collection – the survey carried out by the team found out that at the collection point there is a lot of activities undertaken by waste pickers through separation of valuable materials for recycling. This activity supports the one of the fundamental element of sustainable waste management of source reduction in order to lessen waste handling, transportation, and disposal costs and eventually reduces methane generation.

Waste Transportation is another activity that must be integrated systematically with other waste management activities to ensure smooth and efficient solid waste management. Typically, this includes the collection of waste from collection points, where waste may be concentrated and reloaded onto other vehicles for delivery to the landfill.

Waste Recycling/processing - Separating materials from the waste stream, either at the source or by recovering materials from mixed waste prior to disposal, and turning those products materials into commodities. Recycling has a number of economic benefits such creation of job opportunities in addition to diverting materials from waste streams to generate cost effective sources of materials for further economic use. Economic sustainability of recycling can be achieved through effective and efficient markets for waste and recovered resources through technology and innovation

Waste Composting - Composting, a component of organics recycling, involves the accumulation of organic waste and converting it into soil additives. Like recycling, composting wastes have a number of economic benefits. Composting also significantly contribute to the reduction of greenhouse gas emissions.

Waste Combustion- Using municipal solid waste as a fuel source to create renewable energy, while significantly reducing the volume of waste that needs to be landfilled

Waste Disposal- Use of landfills and combustion, are the activities undertaken to manage waste materials that are not recycled. The most common way of waste disposal is through landfills, which must be properly designed, well-constructed and systematically managed.

6. CURRENT COSTS AND INCOMES SWM SERVICES

6.1 Financial mechanism – current situation

The inefficient and inadequate waste management system in Kajiado County is largely due to a number of factors among them inadequate funding of SWM services. The sustainability of land filling sys- tem and obtaining sites for new landfill for SWM is becoming increasingly expensive. SWM has been given low priority and very limited funds are allocated to SWM sector by the government. This has been primarily because of more urgent funding needs for health care and education. Kajiado County government has not adequately developed revenue collection capabilities resulting in an inadequate financial framework for the development of a sufficient financial mechanism for the delivery of SWM services. The county pays a fee to private firm to provide specific operational services including garbage collection and maintenance of infrastructure. Whilst specific tasks are contracted to the private sector, the overall utility management remains with the public sector. Collection costs account for between 50 and 70%of SWM costs with the remaining amount used for sorting and treatment. For the purposes of determining the actual cost, an average of 60% has been used. The relatively higher pro- portion of collection costs is due to the time it takes to collect the solid waste and the number of vehicles required for collection.

6.2 Financial mechanism – cost recovery

Kajiado County charges a standard fee for SWM ranging between Kshs 100 and 200 per household per month irrespective of the amount of waste generated. The user fee charged does not cover the costs of investing in SWM but only garbage collection.

7. WASTE AUTHORITY: OBSERVATIONS

During the phase of analyzing the current waste management situation in the project region, the team received relevant information from the organizations visited with regards to the future institutional embedding of the SWMA. This chapter summarizes observations, partly based on information received, partly on the experiences of the experts with similar initiatives in other countries. It is suggested by our team to incorporate the observations presented in this chapter in the next phases of this project, in order to avoid misunderstandings and achieve maximum support from the stakeholders involved in the process of establishing the new waste authority.

7.1 Added value and institutional structure of the SWMA

Kajiado County is faced with difficult and expensive waste problems, growing social unrest related to increasing waste volumes, limited waste landfill capacity and limited professional experience in waste management practices. Based on the investigations done so far, and the meetings organized by the contracted expert team, the main conclusion is that the added value of an independent waste institute is unanimously considered as relevant and needed. There is however a great need to sensitize the Stakeholders about this Institution given that most of them have no immediate understanding of the structure of such an organization.

After in-depth discussions, the added value of an advisory body was recognized in consensus, but the main message from NEMA was clear and fully recognized: information transfer during the initial phase, between 2013 and 2017, to the relevant stakeholders, was lacking.

7.2 Relevance for the new SWMA

It is of utmost importance for the funding and contracting organizations to realize that this initiative is not known by counties and by expert organizations.

Observations & recommendations summarized:

- Ministry of Environment and NEMA should have a more important role within the project.
- Important stakeholders are not aware of the initiative to set up a Solid Waste Management Authority. Project team presented the project to various organizations. Initial response is positive, but further discussions on High level, and subsequently implementation level, are needed to establish common ground for the project team to work on preparing an advice for the establishment of the SWMA.
- Additional workshops should be organized to discuss the establishment of the SWMA. During the next phase a similar workshop should be organized to discuss the content of the de tailed action plan.

It is strongly suggested Kajiado to organize an informative meeting for the inner circle stakeholders soonest possible. Main objective of the meeting would be to present the initiative, to discuss the added value and the institutional embedding of the new Waste Authority.

In order to create motivation and ‘ownership’, it would be good to discuss the initiative with the original plan developers, and present it during the meeting mentioned under the first bullet.

Some of the County representatives, as well as NEMA, indicated that the name of the new organization is confusing for County officials: a waste *Authority* could be interpreted as a legally decisive body that will take the lead in waste policy development and implementation in the field of waste management.

The proposed institutional structure of the future SWMA should be communicated soonest possible. In order to avoid misunderstandings, it is recommended to change the name of SWMA: instead of 'Solid Waste Management Authority' the name 'Solid Waste Management Agency' could be considered.

- During the meetings with counties the team received information that it would be advisable to (1) officially inform County Governors and CEC members on the new waste initiative and (2) confirm in written the Counties intention to improve co-operation in waste management.

The expert team suggests the contracting organization to organize an informative meeting with County Governors and CEC members on the added value of the proposed institute and to confirm the proposed co-operation between the five counties in a '*Memorandum of Association*' to be signed by representatives of Kajiado county.

7.3 Kajiado waste policy: main objectives and remaining challenges

The recently published National Waste Management Strategy clearly presents the waste challenges Kenyan government is faced with on the national, regional and local level. The amount of solid waste generated in the country remains high and is even growing, and officials confirmed that improved waste management is still not high-ranking in the list of urgent needs to improve living conditions.

The future SWMA should assist County waste experts in convincing authorities on County and National level about the relevance of prioritizing waste management. It is suggested to organize an expert meeting in the framework of this assignment.

- The main guiding principles on the National Waste Strategy are (1) the ZERO WASTE PRINCIPLE, and (2) the obligation to counties that all waste initiatives should be implemented in line with the National Solid Waste Strategy.

In reaction to this, Counties stated that principles as published in the National Waste Strategy are not compulsory for Counties. In addition, the feeling of 'ownership' is lacking as Counties were not involved in defining objectives and strategies.

It is suggested to organize an expert meeting on Kenyan waste policy objectives with participation of county government representatives and the management level of the responsible waste departments. The outcomes of the meeting are of relevance for the formulation of main objectives and tasks, as well as the institutional embedding of the new authority.

The lack of clear and coherent solid waste management policies at the county level has resulted in uncoordinated attempts to improve the waste situation in counties. The motivation to change the waste situation is high, but due to several reasons it is difficult for counties to change things.

Reasons shared with our team are mentioned in this report, and mainly relate to:

- lack of structured co-operation and coordination between national institutes and regional organizations, resulting in poorly managed initiatives.
- the ongoing process at the county as a result of solid waste management becoming a devolved function is not yet complete.
- strategies and implementation plans focusing on solid waste management are still lacking.
- Budgetary constraints
- Capacity/knowledge constraints

In order to raise motivation and to communicate the future independent advisory position of the SWMA, it is suggested to communicate the added value of the SWMA with regards to the problems defined

already in this phase of the project. Motivating subjects, raised and answered by the future SWMA could be:

- How to combine efforts in solid waste management?
    - County cross border more efficient use of equipment
    - County cross border disposal of solid waste
    - County cross border incineration of specific types of waste (e.g. medical waste)
- How to formalize the informal sector involved i.e. in recycling?
- How to combine efforts to raise public awareness?

For Kajiado county, the process of preparing a County Waste Management Plan is considered as an important but complex and time demanding process.

In order to raise motivation and stimulate participation it is recommended to prepare a 'guideline on County Waste Management' in the next project phase. This is not a defined task for the consultant team in the framework of this project, but preparing a 'detailed blueprint' on County Waste Management will certainly facilitate in the process of recognizing the future SWMA as an institute with added value.

Improvements of the solid waste management facilities including plant and equipment, transfer stations, improved operation of the dumpsites and identification and construction of regional landfills is considered by all counties as of utmost importance.

The investment in existing facilities to achieve the ten-point mark as established by NEMA is critical and a first step towards improved solid waste management in Kajiado.

A detailed asset evaluation survey should be undertaken to cover the status of the facilities and develop action plans for compliance to the ten-point requirement by NEMA. Actions such as landfill rehabilitation, access control, adequate fencing, waste separation on site, weighbridges and waste covering should be undertaken on the short term and identification of needs for regional landfill established to facilitate site identification. Activities like these could be implemented by the contracted expert team soon after officially finalizing the 'situational analysis' phase of this project.

8. APPROACHES TO RESOLVE SWM SITUATION IN KAJIADO

8.1 Technical description of new scheme

Some new scheme is proposed through the upgrading of some entities and the introduction of a transfer station.

8.1.1 Households

The new SWM will still start from the households that will remain the most important stakeholder of the activity. They will especially determine the first orientation to give to their waste according to the materials, taking into account some sorting at source for the most valuable materials.

8.1.2 Collection centers

The second step will be constituted by a network of collections centers that will partly be upgraded from current collection points. They will especially have to be better spread over the territory of Kajiado.

8.1.3 Transfer station

The third step will be the transfer station that must be properly implemented around Kajiado to be accessible by the two types of trucks. It should be designed to allow the transfer from one transport system to another.

8.1.4 Option of composting facility

A composting facility could also be implemented, ideally next to the transfer station. The necessary organic waste would therefore be diverted from final treatment upstream through a separation either at source or at the collection centers and the capacity of the transfer station would be lower.

Composting is encouraged by a few factors:

- the local agriculture activities that represent easy markets and also a possible demonstration for compost;
- the quite large fraction of organic waste in households and markets.

Such a way, it is really interesting to perform composting in order to:

- reduce the quantity of waste going to landfill;
- create local jobs;
- develop better agriculture.

8.1.5 Final treatment

The last step of the supply chain will still be the final treatment planned by CGoK, to a landfill.

8.2 Financial aspects of new scheme

8.2.1 Pre-collection payment

In order to ease the step of household payment for the pre-collection service, it is advised to make it through the use of 50-liter bags (about 20 kg) that will be sold at its value added by the fee usually requested for the service (20 KES for 20 kg or 1 KES per kg).

This possible change in the pre-collection system seems to be feasible through the coordination of the Committee registered as a cooperative that should play the main role: it would design and buy the mentioned bags and then sell them to the registered CBOs. The sales of the pre-collection bags should be slightly higher than the actual price proposed to the households on behalf of its coordination and the right to perform the pre-collection, so that the Committee will drive some little budget.

8.2.2 Fees to be paid to CGK

The Committee might possibly pay some fees to CGK on behalf of the collection performed from the Collection Centers though the use of pre-collection bags. Considering the possible amount of 5 KES per bag (or 0.25 KES per kg), it could therefore be paid to CGK about 6 million per year with a collection rate at 60%.

8.2.3 Business plans

Full business plans will be produced in the next stage for the whole new scheme. Based on the chosen arrangement and designed facilities and under the form of adaptable patterns, they will focus on:

- The CBO level;
- The Committee level;
- The CGK level.

It will also be an opportunity to start doing some capacity building at the Committee. The Committee will then be able to start doing it at the CBOs level.

8.3 Proposed reinforcement measures

8.3.1 Capacity building

8.3.1.1 Committee

The Committee will also have to be trained before CBOs. Indeed, it will have to have a higher level of skills in order to frame the CBOs.

8.3.1.2 CBOs

Some assessment of the CBOs had been done during the diagnostic. It revealed some gaps to be filled at three levels:

- Training: record keeping, managing solid waste business, hygiene related to waste handling, first aid, conflict management, self-empowerment of the youth.
- Ownership: wheelbarrows, rakes, gum boots, gloves, plastic bags, spades, fork jembes, carts, trucks, masks, gully scope.
- Banking: bank account opening.

The training gaps will partially be covered by the project during its second phase. The ownership and banking gaps should be covered by the Committee and maybe also by some basic training about finances.

All the other gaps should be faced by the settling of the new SWM system. Therefore, the Committee will manage them with the support of the project team.

8.3.2 Coordinated pre-collection system

8.3.2.1 Territory dispatch to CBOs

Currently, no coordination exists for CBOs to operate on the slum territory. A major role of the Committee under support of the project team will be to get this territory well covered by the pre-collection of CBOs, considering their location and their capacity.

The CBOs mapping done during the diagnostic will have to be improved with a better geographical distribution on the territory and a precise deserving area for each CBO according to villages. CBOs will therefore have rights to operate in a limited number of villages but not necessarily with exclusivity to enhance competition.

8.3.2.2 Use of common pre-collection bag

The advantage of the pre-collection bag system is the way households pay based on the volume produced which is determined by the bag and also its flexibility because every household may use the service without being engaged per month. This is consistent with the low income and irregular revenues of Kajiado's households and should allow a higher collection rate.

However, this system has to be well communicated and coordinated. The bags should be identified and actually pre-collected on a systematic basis, otherwise it will not work because people will not trust it enough to give money in advance.

A presentation of this system will have to be done shortly to the Committee. It should accept it further to a conversation with the Chairman.

8.3.3 Recycling optimization

8.3.3.1 Connecting and training people

Some local recyclable pickers and a former recycling workshop (Taka Ni Pato) have been visited. They showed that the plastic recycling is not easy in Kajiado because of a lack of training but also low rates of purchase for the secondary raw materials.

Indeed, the rates of secondary plastic materials are very dependent on the crude oil rate which is currently still quite low. However, the trend should be at growing in the following years.

This recycling activity, along with the metal recovery, is actually important for the whole SWM system because it is an additional source of revenue and could encourage CBOs in being more active in the pre-collection which is necessary to increase the collection rate. Thus, it really should be supported by the project at the same time of the pre-collection.

At least, the project could help recyclable pickers get more connected straight to the local plastic industry. The consultant will especially be able to orient them to the right activities and help them in the commercial process.

8.3.3.2 Fostering investment possibilities

An interesting plastic recycling project has also been conducted by a local NGOs with youth groups in. It went up to the transformation of plastics into pellets and the sales to several companies in the neighbor industrial area back in 2012.

The project had to face some governance problem because the youth groups wanted to get more profit out of it by running the processes by themselves. One of the lessons it teaches so far is than it should be bear by an umbrella NGO.

Such a way, the Committee could have such a project in order to further facilitate the transformation and the sales of recycled plastics. The project could also help it design and possibly acquire the equipment.

8.3.4 Insertion of a composting facility

8.3.4.1 Market analysis

About composting, market for compost is undoubtedly the main issue to make it sustainable. It means that it was first quite important to get some information about the possibilities to sell compost around Kajiado environs to know if the idea of implementing a composting facility should be confirmed.

The background situation in Kenya is not very favorable to the development of compost, because the chemical fertilizers are mostly used in agriculture and still granted by the government.

However, some organization like SANERGY started to sensitize the agriculture to the assets of using compost instead chemicals and even demonstrated them. They now produce compost at quite a large scale from human waste and actually sell it to the agriculture with some lack of delivery, which is very encouraging for a potential facility to be sustained.

The idea of using its sales network for compost produced according to its specifications has also been discussed.

Some encouraging element of the background is the recent implementation (March 2017) of a recent law banning the manufacture and import of all plastic bags used for commercial and household packaging in the country. Indeed, it will allow a higher quality of compost that is usually polluted by fine particles of plastic film that is not easy to recycle.

8.3.4.2 Integration of the facility

Based on the information gathered, it was decided that it would be worth to implement a composting facility in Kajiado. Ideally, the capacity of this facility should be increased progressively.

Knowing that all costs have to be minimized for in order to financially balance the activity, it seems quite important that the composting facility shall be next to the transfer station. Such a way, the organic waste could arrive by the same transportation especially if there is a separation at collection centers.

For a quality matter, it is always good to have the organics separated at source. Thus, it will encourage experimenting separation of organics in specific areas at source and maybe also specializing one collection center located near a market.

9. CONCLUSION

Solid Waste Management (SWM) is one of the key devolved functions that are handled within the docket of the Department of Environmental and Natural Resources in the County Government of Kajiado. It is no doubt one of the major development challenges confronting the County Government. This was collaborated be a detailed contextual assessment that was conducted in Kajiado County to determine the status of the problem, its root causes, major stakeholders and what has already been done in response to the issue.

The results indicate that the problem of SWM is a consequence of multiple factors which include: rapid urbanization; limited human and financial resources; weak organizational structures; ineffective laws on waste management; failure of garbage storage, collection, transportation, recovery and disposal systems; low public awareness; lack of a framework for Public Private Partnerships (PPP) for the sector; and emergence of new streams of waste (e.g. e-waste, End- of Life-Vehicles, sanitary waste) which pose new environmental management challenges.

Due to these factors, most of the solid wastes in the county remain uncollected. Resultant effects include spread of infectious diseases, blocked sewers, litter in the streets and pollution of Lakes and rivers through crude dumping. With both direct and indirect linkages to economic development, waste materials represent wasted money, in terms of the original cost of the materials, the disposal and in its potential value as a recyclable and reusable resource.

In the past, several initiatives have been put in place by the County Management to address these challenges, including development of this strategy, promotion of community involvement and participation in Solid Waste Management (SWM), promotion of the 3Rs, introducing of women empowerment through ‘Taka ni Mali’ initiative inter-alia to try and mitigate the impact it has on the environment. These initiatives still have limited impact due the magnitude of the present problem.

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