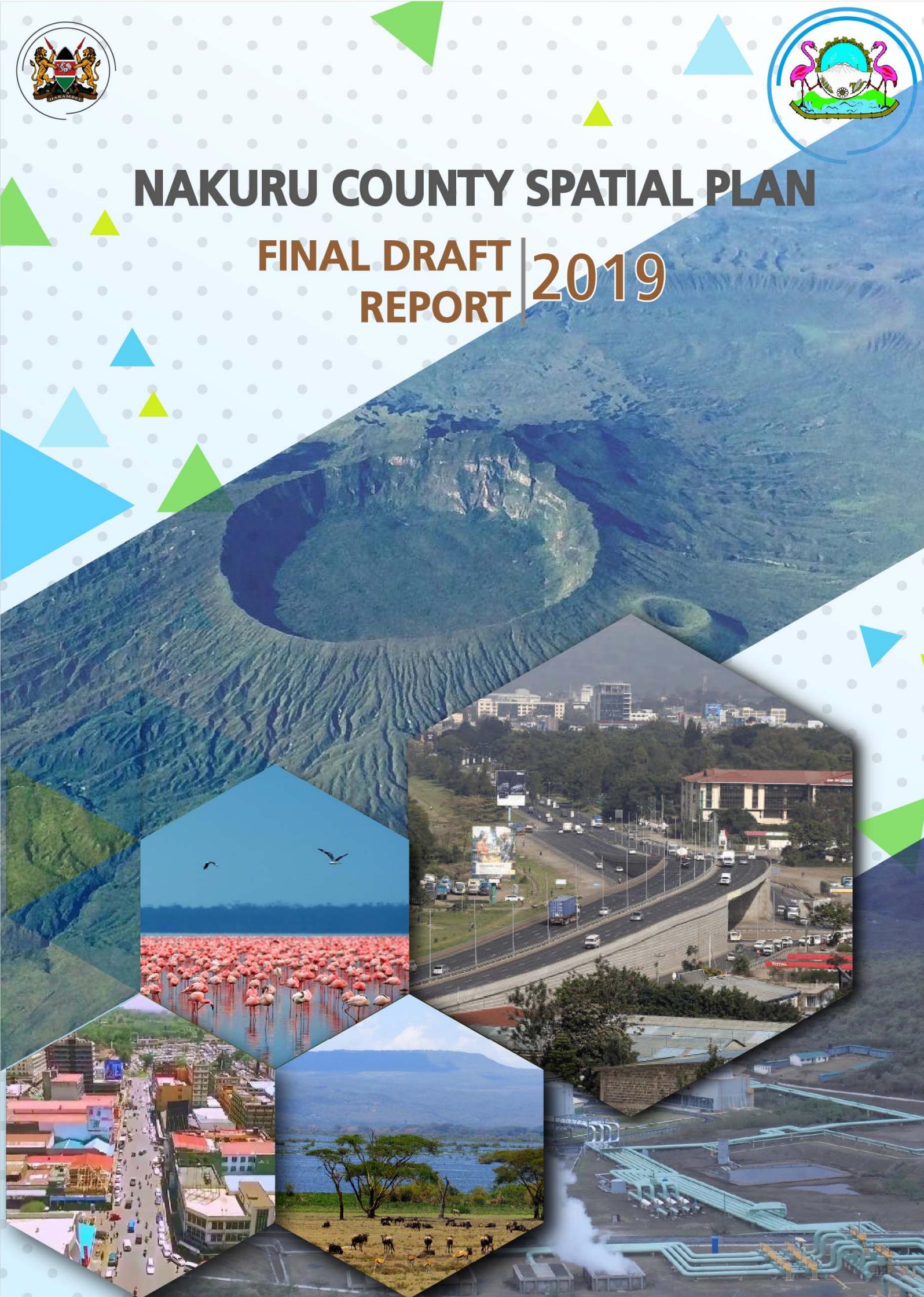




NAKURU COUNTY SPATIAL PLAN

FINAL DRAFT | 2019
REPORT



PREFACE

Nakuru County lies within the Great Rift Valley and covers an area of approximately 7,495 Km². Due to its location in the Great Rift Valley it has various physiographic features such as the Ol Doinyo Eburru Volcano, Akira Plains, the Menengai Crater etc. These features form a unique topography in the county and also a unique ecosystem.

The preparation of the County Spatial Plan is a legal requirement under the County Government Act, 2012. Section 110 (1) which states that there shall be a ten-year GIS based database 'Spatial Plan' for the County which serves as a framework for organizing and distributing activities in order to achieve development objectives. In the past, absence of effective planning has resulted in urban centres that are overcrowded, poor road infrastructure, incessant traffic jams, inadequate public amenities, conflicting land uses etc. This ineffective planning has resulted in mushrooming of informal settlements which have negative social and economic implications to the county. Thus, appropriate measures must be put in place to avert these negative impacts of urbanization so as to retain urban centres as the prime movers of socio-economic development not only for the county but also for the nation as a whole and also maintaining balanced rural development.

The Kenya Vision 2030 development blueprint recognizes that there cannot be sustainable development without well planned urban centres. It is anticipated that by 2030, over half of Kenya's population will be residing in urban areas. The migration of rural population to towns is expected to increase. The County Government of Nakuru has therefore prioritized the planning of the entire County as a basis for achieving sustainable development.

The Nakuru County Spatial Plan (CSP) provides a structured framework for coordinating and integrating sectoral plans and activities and support the systematic implementation of County development programmes. In addition, it is going to provide a platform for mobilization of public participation in development initiatives while seeking to optimize resource allocation and utilization. The plan intends to promote individual initiatives and investments while safeguarding the public interest. Above all, it is going to be an instrument for initiating, guiding, monitoring and appraising County development activities.

APPROVAL

Certified

I certify that the plan has been prepared as per section 110 of the County Governments Act (2012), Planning standards and guidelines.

Signature: _____

Date: _____

County Director Lands and Physical Planning

Recommended

Signature: _____

Date: _____

CEC Member in Charge of Lands and Physical Planning

Approved

Hansard No: _____

Date: _____

County Assembly

Endorsed

Signature: _____

Date: _____

**H.E Lee Kinyanjui
Governor.**

EXECUTIVE SUMMARY

Nakuru County Government is mandated through the County Government Act of 2012 to prepare a GIS-based County Spatial Development Plan covering a period of 10 years (2015 to 2025), which will serve as a broad framework for organizing and distributing activities in the County in order to achieve both national and county development objectives. The preparation process of that plan is informed by past plans and sectoral documents that lack clear spatial details. Most of these past plans, documents and policies are lacking in implementation framework, and are not in line with the current Constitution – The Kenya Constitution (2010).

This document comprises the county spatial plan that identifies programs and projects on land use and development. It designates urban areas, delineates sensitive areas that require conservation, and at the same time integrates those sectors that have special natural resource and environmental characteristics. It stipulates the direction for the county economy, agriculture, human settlements, transport and infrastructure.

This County Spatial Development Plan (CSDP) is an output of a lengthy planning process, incorporating comprehensive field surveys, detailed secondary literature review, inclusive local stakeholder's consultative meetings (through sub-county-specific discussions), meetings with the broad-based stakeholders, ranging from the household level; meetings with key informants that comprised stratified groups, political leadership, county executives and Members of the County Assembly the County of Nakuru. It is prepared under provisions of the Kenya Constitution (2010) that sets the policies, the legal and institutional framework for this work. The Kenya Constitution (2010) created devolved planning and development units that are anchored on public participation in all their activities.

The preparation of this plan involved review of other policies and legislation that provided guidelines for spatial development: such as the Kenya's Vision 2030, National Spatial Plan, National Land Policy (2009), the Industrialization Master Plan, Integrated National Transport Policy, Information and Communication Technology (ICT) Policy, Agricultural Sector Development Strategy, National Tourism Strategy (2013-2018), National Climate Change Response Strategy and the County Integrated Development Plan (2013 -2017).

Various Acts within whose provisions this plan has been prepared were also reviewed. These include the Kenya Constitution (2010); County Government Act, (2012); the National Land Commission Act (2012); Public Health Act, (Cap 242 of the Laws of Kenya); Survey Act, (Cap 299 of the Laws of Kenya); The Physical Planning Act (Cap 286 of the Laws of Kenya); Urban Areas and Cities Act; Environment Management and Coordination Act (EMCA) (1999); The Water Act; National Land Commission Act; Land

Registration Act (No. 3 of 2012); Agriculture, Fisheries and Food Authority Act, (2013); the Forest Act No. 7 of 2005; Nakuru County Finance Act of 2016 and Nakuru County Solid Waste Management Fund Act, 2014).

Nakuru County has several institutions that will play key roles in the successful implementation of this County Spatial Development Plan. Various departments/ministries that the County Government will have to work closely with other respective agents of the central government, private and non-governmental organizations within the County.

The planning area which is Nakuru County lies within Kenya's Great Rift Valley. It is one of the 47 counties within the republic of Kenya and covers 1.29% of the total land mass of Kenya. The County is bordered by other counties namely; Kericho and Bomet to the west, Baringo and Laikipia to the North, Nyandarua to the east, Narok to the south-west and Kajiado and Kiambu to the south. The county covers an area of 7,495.1 Km², with an arable area of 5,274 km². Geographically, the county is located between Latitude 0 ° 13 and 1° 10' South and Longitude 35 ° 28' and 35° 36' east. Its headquarters is Nakuru Municipality, one of the fastest growing urban centres in East Africa region.

According to the 2009 Housing and Population Census of Kenya, Nakuru had a population of 1,603,325. This comprised 4.15% of the Kenyan population. Most of the citizens of the county were aged between 15-64 years. The population growth rate in the county now stands at 3.05%. Based on this growth rate, the population projection for 2017 is 2,038,945 inhabitants.

The physiographic features of Nakuru County include the Great Rift Valley (floor), the Mau Hills, Ol Doinyo Eburru Volcano, Akira plains and the Menengai Crater. These topographic features have developed and have influenced the courses of an elaborate drainage system, which and various inland lakes that lie on the floor of the Rift Valley. Nearly all the permanent rivers and streams in the county drain into these lakes.

The county economy is mainly agricultural driven. This economic sector faces numerous challenges including little modernization, infrastructural bottlenecks; such as inadequate markets for agricultural produce and inappropriate value addition processes. The sector requires modern educational systems-skills that are innovation-oriented, to strengthen trade, commerce and business activities, and facilitate environmental sustainability. The potential for agriculture can be improved through crop diversification, efficient value addition, and marketing.

Transport network in the County is multimodal; and comprises roads, railways and private airstrips. The county has approximately 912 km of roads with bitumen surface; 1,111 km with gravel surface, and 2,327 km of

earth surface. The Nairobi–Kampala highway cuts along Nakuru County. This is the highway that promotes cross-border interconnections within the three East African countries. While the county road network is fairly well developed, there are several rural roads that are impassable, especially during the rainy season. This hinders transport and accessibility of the far-flung areas of the county. In the urban areas of the county, there are transportation challenges that include poor traffic segregation, inadequate parking spaces, encroachment on road reserves and traffic congestion. The county rail and air transportation networks are largely inadequate and under-utilized.

The sources of water for the county are rivers, wells, springs, boreholes and dams. The main water service providers are NAWASCO, NARUWASCO, and NAIWAWASS. The county has limited coverage of sewer networks. Due to the inadequate urban sewerage coverage, most residents use septic tanks and pit latrines. The rural population relies on pit latrines and bush for human waste disposal. This contributes to the pollution of the ground and surface water sources. Solid waste is poorly managed - especially in the urban areas - due to the existence of the undesignated dumping sites that result in urban environmental pollution.

The *Kenya Power Company* national power grid that comprises hydroelectricity which generated in various places in Kenya, together with geothermal energy that is obtained from underground hot springs in OlKaria area near Mount Longonot, are the major sources of energy that is distributed by the company throughout the county. Most rural areas within the County of Nakuru do not have any supply point due to the limitations of the current distribution network. Access to power in the rural areas of Nakuru County has been increased recently by the Rural Electrification Authority using the Constituency Development Funds.

Nakuru County has 166 public health facilities, 14 are non-governmental health facilities, 55 are faith-based health facilities and 189 are private health facilities. The health sector in the county is characterized by inadequate and uneven distribution of medical facilities and personnel, poor access to due to the bad road conditions, lack of facilities and medical drugs among others.

As of 2014, the County had a total 1,077 primary schools (681 public primary schools and 396 private). There were 294 public secondary schools and 101 private secondary schools, one public university and one private university. In addition, there are 17 youth polytechnics and 31 technical training institutions. The challenges facing the education sector of the

county include inadequate number of teaching personnel, poorly equipped learning institutions and unmotivated teaching staff.

The county has various recreational facilities that range from stadia and playing fields, and include accommodation facilities like hotels, lodges and some tourist-class hotels.

Most of Nakuru county urban settlements are located along the transport network. They contain retail and business activities and exist in the usual hierarchical order; from the smallest town to the largest. Those having a few business outlets provide the most basic retail services and; then there are the second order urban centres with a few clusters of shops and services, the third order, which bigger clusters of services, and so on; until the biggest urban order is represented by Nakuru Municipality.

Various challenges and opportunities that face the County inform the spatial development vision, goal and objectives and implementation strategies. Some key problems in the county include; deforestation; soil degradation; flooding and landslides; population pressure; decreasing land productivity; lack of value addition on agricultural products; inadequate marketing facilities; land fragmentation into uneconomical units; unplanned urban areas; urban sprawl into agricultural productive areas; informal settlements; and inadequate infrastructural facilities. Opportunities are presented through the county's strategic location and the major international transit road corridor. The county is rich in cultural heritage, abundance of human resources, arable agricultural land, and has great potential for green energy production.

The preparation of the County Spatial Development Plan (CSDP) is informed by a synthesis of the county potentials, opportunities, strengths and constraints. The county's spatial structure is influenced by factors such as physical features, administrative units, rural – urban interface, land tenure, transport network, settlement structure and land use patterns. Overall, the spirit of the County Spatial Plan is environmental conservation, driving growth into compacted urban areas and along key transportation corridors and prime agricultural land protection. Detailed standards for each proposed land use category have also been detailed within this report.

To operationalize this *County Spatial Development Plan*, thematic strategies have been detailed; which include an environmental strategy, integrated transportation and infrastructure strategy, economic development strategy, agricultural and spatial development strategy, each with a capital investment framework.

ABBREVIATIONS

AIDs	Acquired Immune Deficiency Syndrome
ARVs	Anti-retroviral
AS	Arterial Street
ASAL	Arid and Semi-Arid Land
BOT	Build, Operate. Transfer
CBD	Central Business District
CBO	Community Based Organization
CBO	Community Based Organization
CBPP	Contagious Bovine Pleuro Pneumonia
CDF	Constituency Development Funds
CIDP	County Integrated Development Plan
CIP	Capital Investment Plan
CSP	County Spatial Plan
DMA	Drought Management Authority
DTM	Digital Terrain Model
EA	Environmental Audit
ECD	Early Childhood Development
ECF	East Coast Fever
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
FGD	Focused Group Discussion
GIS	Geographic Information System
GoK	Government of Kenya
GPS	Global Positioning System
HH	Household
HIV	Human Immunodeficiency Virus
ISUDP	Integrated Strategic Urban Development Plan
KCPE	Kenya Certificate of Primary Education
KEFRI	Kenya Forest Research Institute
KeNHA	Kenya National Highway Authority
KFS	Kenya Forest Services
KI	Key Informant
Kms	Kilometers
KPHC	Kenya Population and Housing Census
KPHC	Kenya Population & Housing Census
KSH	Kenya Shillings
LAPPSET	Lamu Port Southern Sudan-Ethiopia Transport
LIMS	Land Information Management System
LPG	Liquefied Petroleum Gas
LS	Local Street

MENR	Ministry of Environment and Natural Resources
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NHC	National Housing Cooperation
NMT	Non-Motorized Transport
P.A	Per Annum
PHE	Public Health & Environment
PPP	Public Private Partnership
SA	Sub- Arterial Streets
SEA	Strategic Environmental Assessments
SEP	Strategic Economic Plan
SIA	Social Impact Assessment
SLF	Sustainable Livelihoods Framework
SME	Small and Medium Enterprise
SSP	Spatial Strategic Plan
TB	Tuberculosis
ToR	Terms of Reference
UHT	Ultra-Heat Treated
UN	United Nation
UNEP	United Nations Environment Program
UNHCR	United Nations High Commissioner for Refugees
VCT	Voluntary Counseling and Testing
VIP	Ventilated Improved Pit latrine.
WHO	World Health Organization
WSPs	Water Service Providers

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**PART I: INTRODUCTION &
PLANNING CONTEXT**

Chapter One : Introduction

1.1 Overview

Throughout Kenya, county infrastructure development efforts and the provision of services are currently hampered by lack of clear and consistent investment framework. There is an unclear process of sectoral coordination of development efforts by various government entities. This has resulted in duplication of development efforts. It is for this reason that the *County Government Act* of 2012 was passed by the national parliament. This legislation requires that all county governments should prepare and implement the *County Spatial Plans* (CSP). These are ten-year development blue prints that must be implemented by using annual budgetary allocation of county governments.

In preparing the county spatial development plans, county governments are required to involve all the stakeholders who are expected to benefit from the development programs of the county. The purpose of the County Spatial Development Plan is to improve the utilization of the land resource base, and to guide the organization of physical and human development. This plan is also aimed at promoting the objectives of devolution - as stipulated in the *Kenya Constitution* (2010); and as provided by the *County Government Act* (No. 17 of 2012).

Nakuru County is experiencing a high population growth rate which currently stands at 3.05 percent per annum. This is caused by the natural population growth and the immigration of people from the rural areas; together with the general rural-urban migration from the same rural areas and from all other parts of Kenya into the County urban areas. The fast growth of the population has led to uneconomical subdivision of agricultural land in order to facilitate settlement and the accommodation of the existing population (with its offspring) and the new immigrants. The result of such subdivision is continually diminishing agricultural produce; which, if it persists, threatens to make the district food insecure.

Nakuru County is one of the first among the 47 counties in Kenya to make the first bold step in harmonizing physical and economic development using the vital instrument of a *County Spatial Plan* (CSP): as provided by the *County Government Act* (No. 17 of 2012). This document will serve as a tool to be used by Nakuru County government to acquire and coordinate all development efforts for the coming 10 years from the year 2015 to 2025.

The County of Nakuru is endowed with many natural resources. Most of these are underutilized, unexploited, or poorly managed. The urban areas of different hierarchical orders display some stress due to the high population growth that is not commensurate with the existing elements of

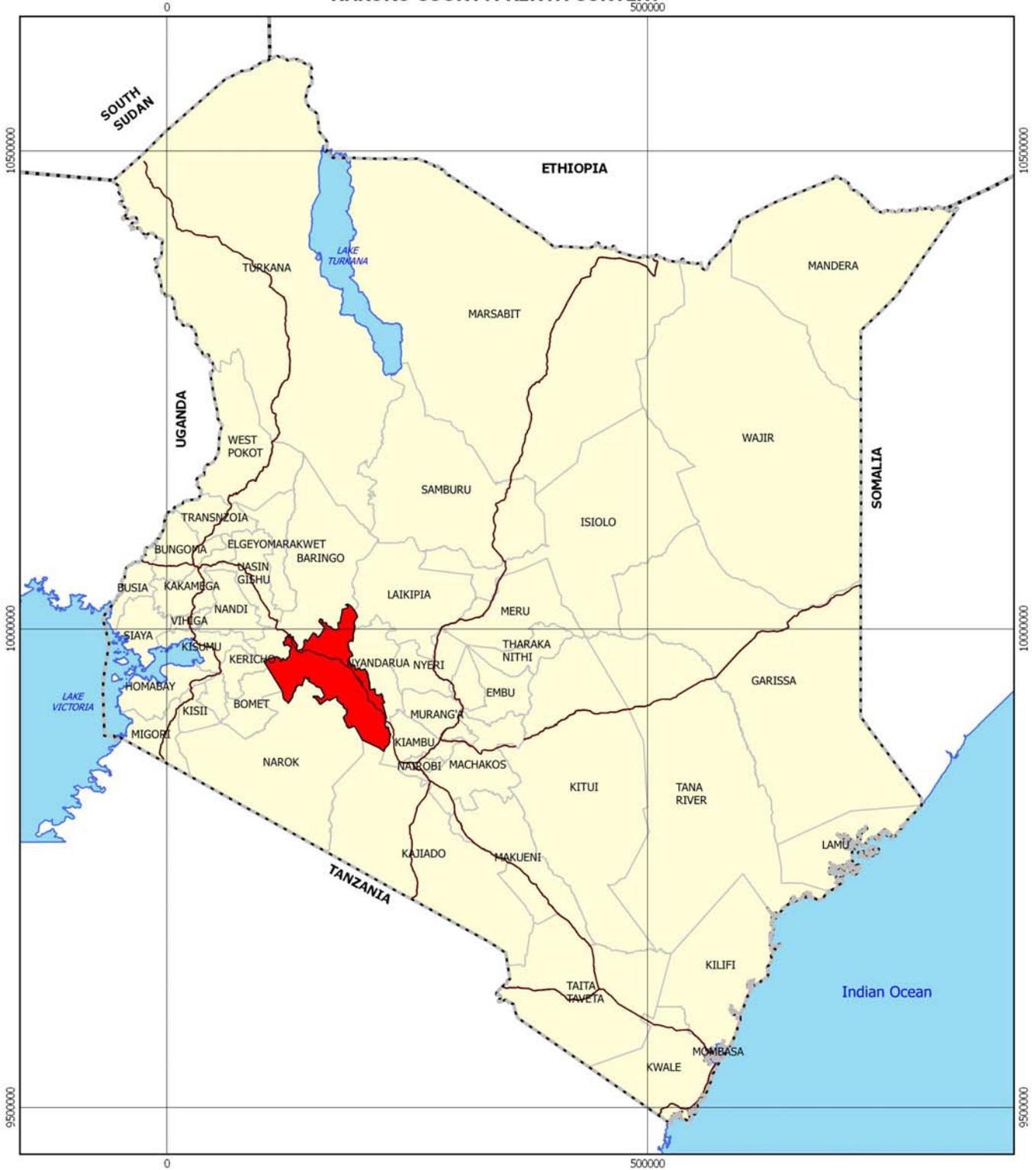
infrastructure, service-delivery and employment-creation. Most urban areas are characterized by urban sprawl, abject poverty, and poorly structured human settlements; informal trade, and environmental deterioration; among other negative attributes of development. The involvement of all stakeholders in the County of Nakuru County Government in the preparation of this CSDP is a welcome effort. Hereunder is the CSDP comprehensive documentation of the present and the proposed activities by the county government and all the stakeholders that are required to ensure coordinated development within the county of Nakuru.

1.2 Historical Background

Pastoral communities used the area which today constitutes Nakuru Town as grazing land until the arrival of the railway in the beginning of the 20th century. The Maasai community named the place *Nakurro*, using the Maasai word meaning 'a dusty place' to reflect the volcanic dust on the Rift Valley floor that is easily raised by cattle hooves. Just like Nairobi and Kisumu, Nakuru Town, which is the headquarters of Nakuru County, originated as a railway station on the great East African Railway that was built between the port of Mombasa on the Indian Ocean coast and the town of *Port Florence* on the shores of Lake Victoria that is presently known as Kisumu. Being centrally located on the so-called 'White Highlands', Nakuru developed into an important regional trading and market centre; and became the capital of the former district with the same name, and one of Kenya's largest provinces, Rift Valley Province. As headquarters of the colonial farming region, Nakuru Municipality was a well-planned settlement during the colonial period; with a rectangular-grid street pattern that was truncated into two by the Mombasa-Kisumu railway. (Maps 1.1, 1.2, 1.3)

Socially, Nakuru County can be said to represent Kenya - in a nutshell. The percentage of all ethnic groups in Nakuru is almost the same as that of the entire country. All 42 ethnic groups within Kenya are represented in Nakuru, with the Gikuyu people forming the majority and the largest tribe in Kenya. In Nakuru, people with diverse ethnic backgrounds, languages, religions and customs, both Kenyan and foreign, co-exist in one way or another.

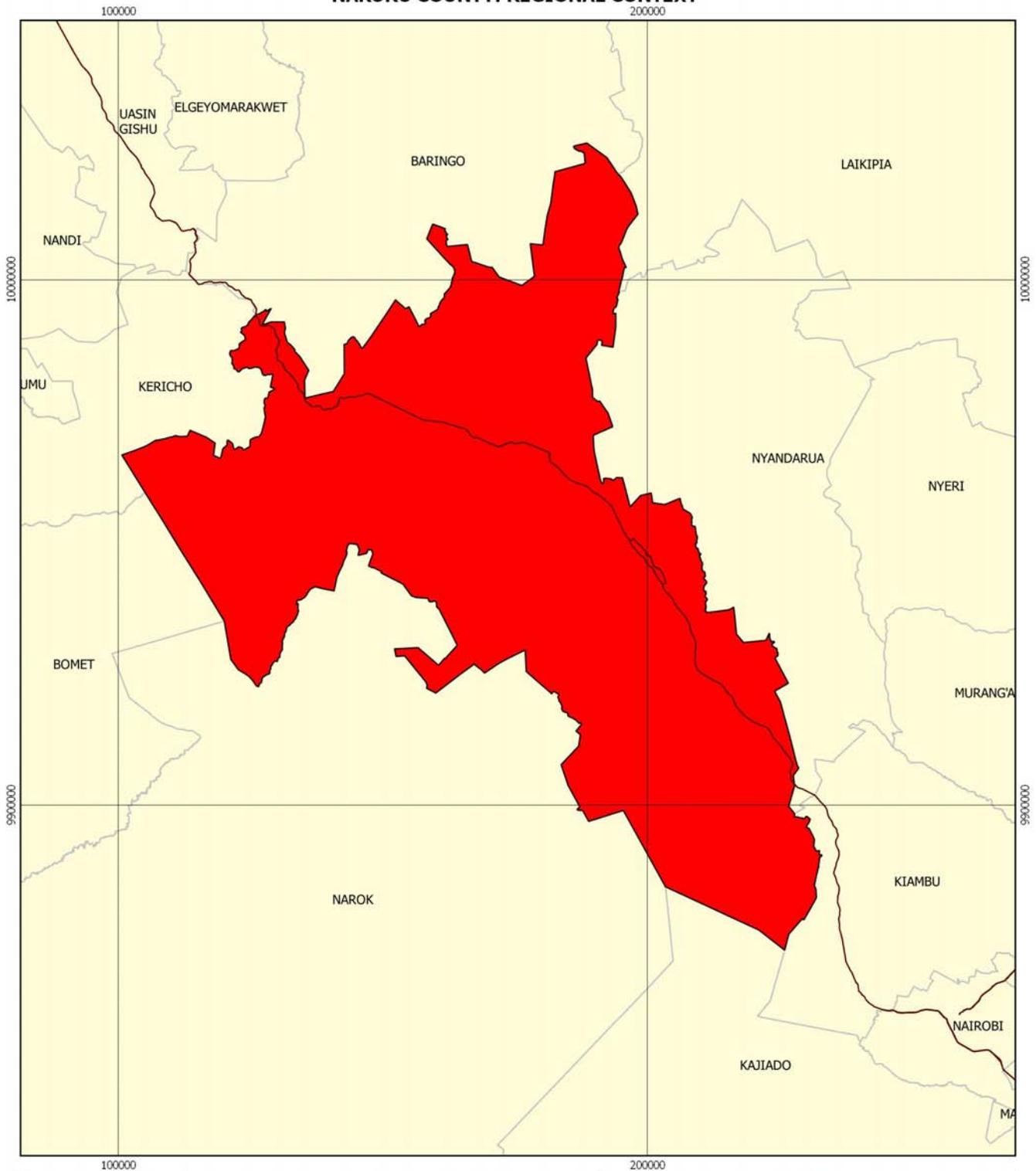
NAKURU COUNTY: KENYA CONTEXT



 <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> — Trunk Road ■ Ocean/Lake ■ Nakuru County ■ Other Counties --- International Boundary 	 <p>Scale 1:5,500,000</p> <p>Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 1.1: The County of Nakuru: National Context
(SOURCE: Geomaps and Habitat Planners)

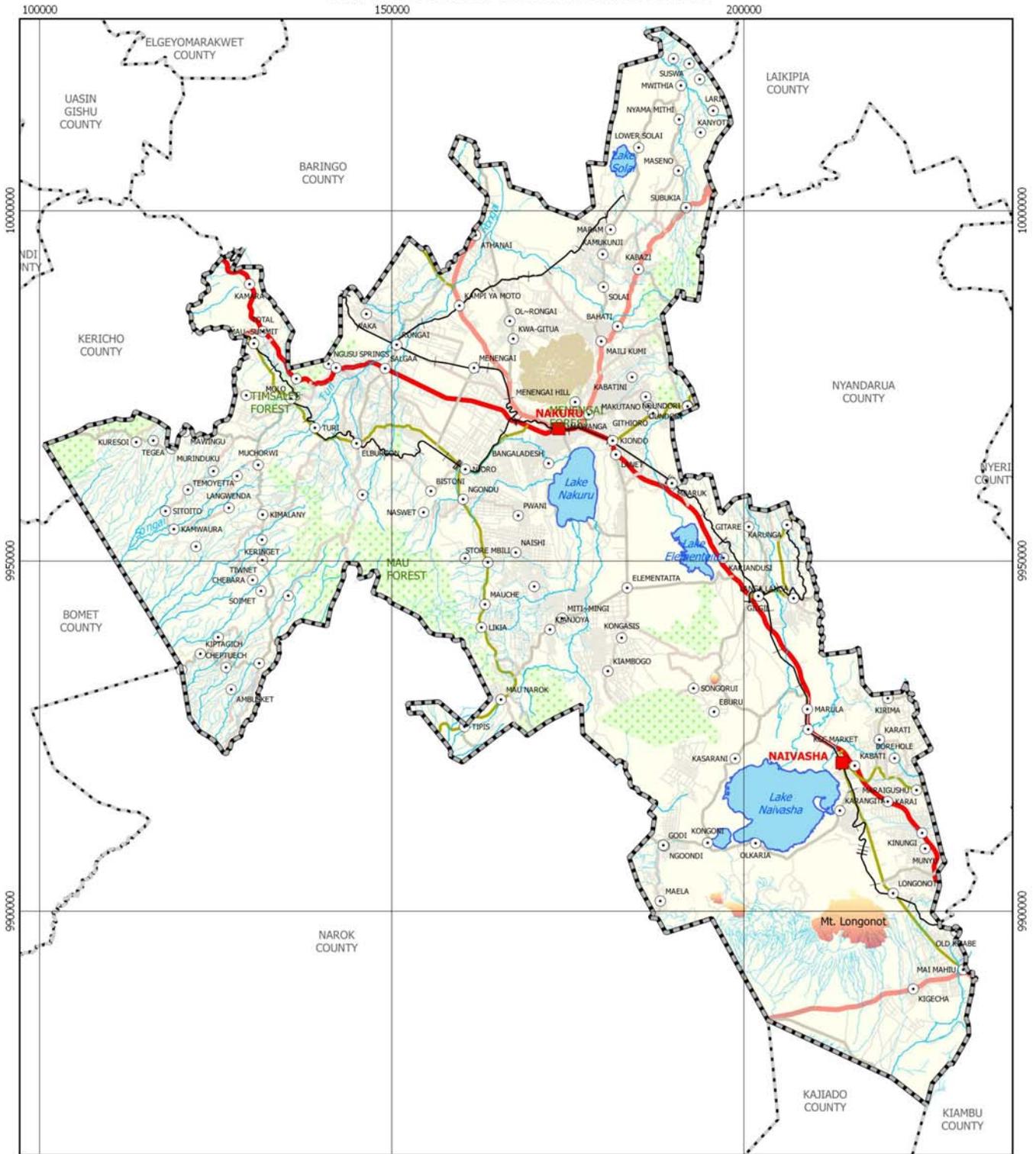
NAKURU COUNTY: REGIONAL CONTEXT



 <p>Nakuru County Government Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> — Trunk Road ■ Ocean/Lake ■ Nakuru County ■ Other Counties — International Boundary 	 <p>Scale 1:1,000,000 Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><small>This map is not an authority on boundaries</small></p>
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Map 1.2: The County of Nakuru: The Regional Scope of the Study
(SOURCE: Geomaps and Habitat Planners)

NAKURU COUNTY LOCAL CONTEXT



<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town ● Other Town — Road Class A — Road Class B — Road Class C — Main River — Tributary River — Railwayline ■ Lake ■ Forest ■ Hill ■ Lava 	<p>Scale 1:750,000</p>	<p>LOCATION MAP</p> <p>Date: October 2019</p>	<p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 1.3: The County of Nakuru: The Geographical Scope of the Study
(SOURCE: Geomaps and Habitat Planners)

1.3 The Purpose of C.S.P

The purpose of this county spatial development plan is to improve utilization of land-based resources and to guide the organization and development of physical development of the human settlements within the County of Nakuru. The plan also aims at promoting the objectives of devolution as provided in the *County Government Act* (No 17 of 2012). The objective of the county spatial development plan is to provide an important part of framework within which the national social and economic development plan – the **Vision 2030** will be implemented. In that regard, the purpose of this County spatial development plan is to: -

- Define a vision for future growth and development of the area over the next 10 years, and to:
- Provide an overall integrated physical framework for growth of the county.

A realistic implementation of this plan is to be prepared for all the projects and the capital investment plan that are identified by the county inhabitants and the County Government of Nakuru.

1.4 Vision

The development vision for the CSP is to:

“Promote properly integrated spatial modern infrastructure network towards achievement of maximum sustainable development in agricultural production, agribusiness industries and tourism for economic prosperity and environmental conservation”.

The detailed visioning process is presented in chapter 2 showing the vision for each sub-county and the process of harmonizing the overall vision.

1.5 Objective

The key objective of the plan is to identify all the vital natural resources within the county, analyze the level of utilization and to propose innovative strategies for enhancing their utilization and sustainable management. The specific objectives of this CSDP are as follows: -

1. Conducting socio economic survey in the eleven sub counties and doing situational analysis of the region
2. Identifying/map key resources and other development potentials of the area
3. Identifying challenges and constraints to development of the county
4. To analyze existing institutional structures and their role in county development

5. Provision a framework for detailed policies and proposals while embracing the principles of sustainable development.
6. Preparation of Strategic Plans, showing current and proposed land use and infrastructure (e.g. transport, water, drainage, power, etc.), housing settlements and environmental assets (10 years)
7. Generation of relevant short and medium-term plans including Action Area Plans, Subject plan, Advisory plans& regulations and other reference materials to guide county development.
8. Preparation of financially feasible Capital Infrastructure Plans (CIP's 2015 -25) based on local priorities and proposed Structure Plans.
9. To propose plans of action on how the region comprising the Nakuru County can be developed

1.6 Scope of the Plan

The scope of (CSDP) work includes the Preparation of County Spatial Development Plan for Nakuru County, which covers the entire jurisdictional area of Nakuru County. This area is depicted in Map 1.1; and consists of eleven sub counties, namely: Naivasha, Gilgil, Nakuru East, Nakuru West, Rongai, Bahati, Subukia, Njoro, Molo, Kuresoi North and Kuresoi South. The county has an approximate area of 7,495.1 square kilometres.

The main scope of the CSDP preparation assignment includes: -

- Digital Topographical Mapping:
- Preparation of an up-to-date accurate digital topographical map,
- Placing of acceptable permanent (monumental) and accurate ground control,
- Ground control survey data,
- Digitization of all cadastral maps of all registered parcels, and
- Digital Terrain Model (DTM).
- A situational analysis of the current socio-economic, physical, environmental and cultural characteristics of the county,
- Formulation of a Vision,
- County spatial development framework for Nakuru County
- County Transportation Strategy
- County Infrastructure and Services Development Strategy
- County Environment and Resource Management and protection Strategy
- County Human Settlement Strategy
- County Economic Development Strategy
- County Agricultural Development strategy
- Environmental Management Plan

- Disaster Management Plan
- Conservation Plan
- Development of planning policies and zoning regulations
- Capital Investment Plan

1.7 Planning Horizon

The planning horizon for the plan is set at 10 years to allow for predictability of key variables and trends over the foreseeable future and also pegged to Kenya's Vision 2030 and as required by the County Governemnt Act, 2012. The plan period is 2015-2025.

1.8 Organizaton of the Plan Report

This CSP is presented in seven parts namely:

a) Part 1: Introduction

- Chapter 1- This section details the background and scope of the CSP, as well as the objectives and purpose of the Plan.
- Chapter 2- This section presents the contextual information about Nakuru County in terms of its location and administrative units. The chapter also details the methodology used in developing the CSP, as well as the supporting policy and legal framework.

b) Part 2: Situational Analysis

- Chapter 3- This chapter details the population size, structure, culture, religion, among other demographic characteristics.
- Chapter 4-. This chapter analyses the environment and natural resources found within the County.
- Chapter 5- This chapter discusses livestock and agriculture in the county.
- Chapter 6- This chapter analyses transportation, water and sanitation, solid waste management, energy, ICT
- Chapter 7- This section looks at the social infrastructural facilities found in the County.
- Chapter 8- This chapter describes the human settlements, both urban and rural, within the County.
- Chapter 9- This chapter describes the economic activities within Nakuru County, such as agriculture, mining, tourism, industry, trade, commerce and farm forestry.
- Chapter 10- This chapter discusses land as a resource, looking at elements such as the uses of land, sizes of land and the suitability of land.

c) Part 3: Plan Formulation

- Chapter 11- This section provides various possible spatial development scenarios and development models.

d) Part 4: Plan Proposals

- Chapter 12- This section details the policies and strategies proposed for the CSP, responding to the challenges identified in the previous sections.
- Chapter 13- This section presents the structure plan that forms the proposed spatial development framework (proposed spatial form) for Nakuru County.
- Chapter 14- This section presents urban design strategies to complement the planning
- Chapter 15- This section gives the implementation and costing for major projects.

e) Annex- This section contains copies evidence of public participation in the process of formulation of this CSP.

Chapter Two : Planning Context

This chapter gives the geographical setting of the planning area, the administrative units, the planning methodology employed and the legal framework guiding the plan preparation. Further, the chapter highlights the institutional framework in the county and the linkage of the CSP to other plans. This section, therefore, provides a foundation for the preparation of the CSP.

2.1 Geographical Perspective

This section gives the national, regional and local locational context of Nakuru County.

2.1.1 National Context

Nakuru County lies within the central parts of Kenya's Great Rift Valley; and is one of the 47 counties within the Republic of Kenya and covers 1.29% of the total landmass in Kenya making it count amongst some of the largest counties in Kenya. The County is bordered by eight other counties namely; Kericho and Bomet to the west, Baringo and Laikipia to the north, Nyandarua to the east, Narok to the south-west and Kajiado and Kiambu to the South East. The county covers an area of 7,495.1 Km², with an arable area of 5,274 km² and is located between Latitude 0 ° 13 and 1° 10` South and Longitude 35 ° 28` and 35° 36` East.

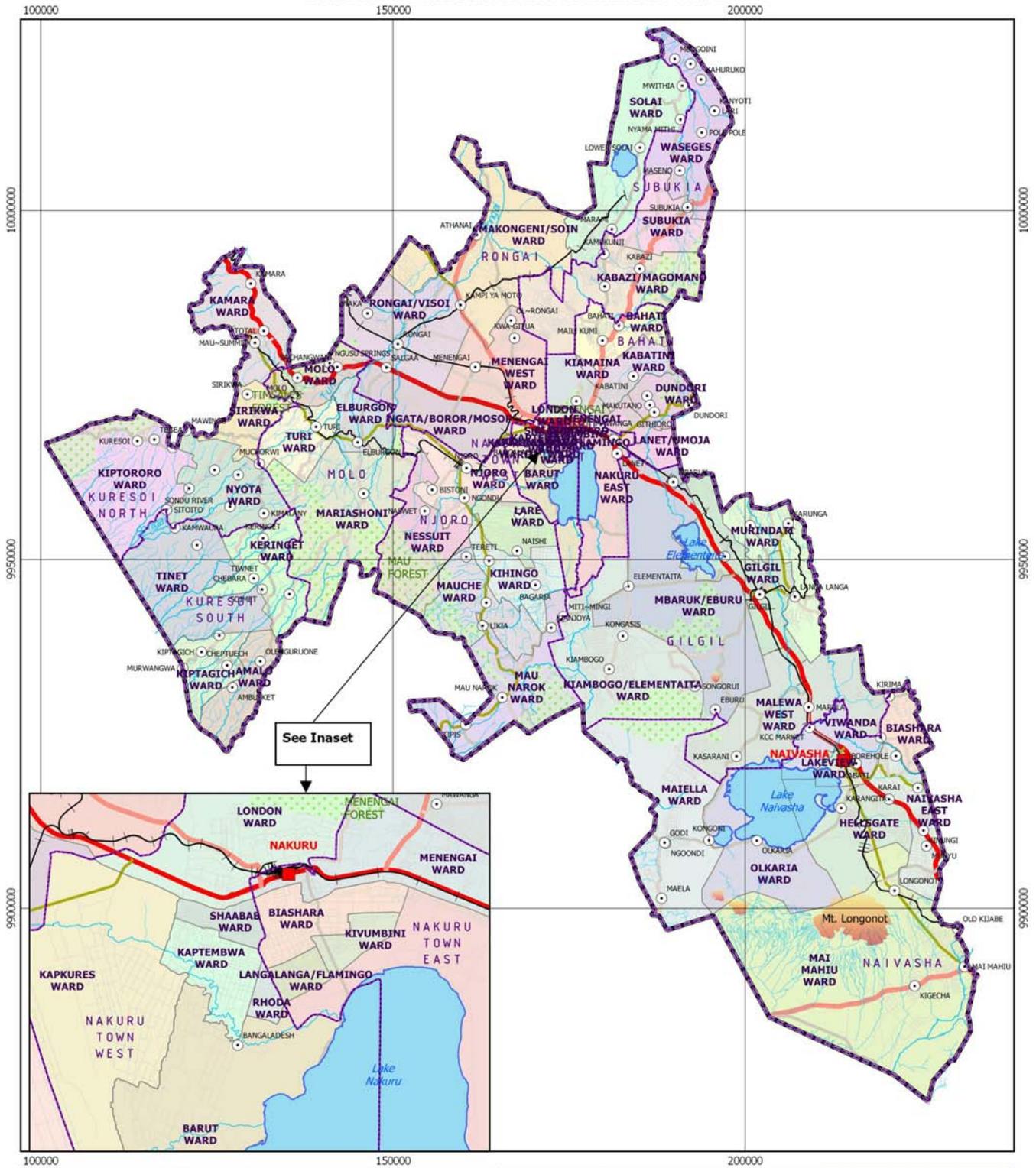
The county headquarters is Nakuru town, one of the fastest-growing urban centres within the East African region according to UN-Habitat, 2011. Map 2.1 shows the county, with surrounding counties and major urban centres.

2.1.2 County Context

The county is divided into eleven administrative sub-counties namely; Molo Njoro, Naivasha Gilgil, Kuresoi South, Kuresoi North, Subukia, Rongai, Bahati, Nakuru West, and Nakuru East. In terms of political units, the county has 11 constituencies and 55 Wards. The county has thirteen main urban centres in the different sub-counties. The county headquarters which is Nakuru Town is one of the most urbanised centres in Kenya today. The county has a total of 31 divisions, 106 divisions, and 219 sub-locations.

Naivasha Sub County is the largest in terms of area size, followed by Gilgil and Bahati is the smallest as indicated in table 2.1 and Map 2.1. Table 2.2 shows the wards per Sub County.

NAKURU COUNTY ADMINISTRATIVE BOUNDARIES



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Major Town Other Town Road Class A Road Class B Road Class C Main River Tributary River Railwayline Lake Forest Hill Sub-County 	<p>LOCATION MAP</p>  <p>Scale 1:750,000</p> <p>Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 2.1: Administrative Units
SOURCE: Geomaps/ Habitat Planners

2.2 Administrative Units

Table 2.1: Administrative and Political Units

Sub-County	Area in Km ²	No. of Divisions	No. of Locations	No. of Sublocation
Nakuru East Nakuru West	297.2	3	7	21
Naivasha	1960.2	3	12	20
Molo	478.7	4	14	28
Njoro	702.0	5	13	27
Kuresoi North Kuresoi South	1,191.0	4	22	51
Rongai	993.1	4	18	27
Bahati	374.3	2	6	17
Subukia	424.2	3	6	16
Gilgil	1074.4	3	8	12
Total	7,495.1	31	106	219

SOURCE: Kenya National Bureau of Statistics, 2013

Table 2.2: Sub County Wards

Sub county	Wards
Molo	Mariashoni, Elburgon, Turi And Molo Central
Njoro	Mau-Narok, Mauche, Kihingo, Nessuit, Lare & Njoro Central
Naivasha	Biashara, Hells Gate, Lake view, Mai-Mahiu, Naivasha East, Maela, Olkaria & Viwanda
Gilgil	Gilgil Central, Mbaruk/Eburu, Elementaita, Maela West & Morendati
Kuresoi South	Amalo, Keringet, Kiptagich & Tinet
Kuresoi North	Kiptororo, Nyota, Sirikwa & Kamara
Subukia	Subukia Central, Wesege & Kabazi
Rongai	Menengai west, Soin, Mosop, Visoi and Solai
Bahati	Dundori, Kabatini, Kiamana, Lanet/Umoja & Bahati Central
Nakuru East	Biashara, Kivumbini, Flamingo, Menengai & Nakuru East
Nakuru West	Baruti, London, Kaptembwa, Kapkures, Ronda & Shabaab

SOURCE: Kenya National Bureau of Statistics, 2013

2.3 Plan Preparation Methodology

2.3.1 Pre-planning

This was the first stage of the CSP work and it involved the definition of the scope of the activity, the formulation of the Terms of Reference (ToRs) and

the preparation of resource mobilization strategies. The step involved the following activities: -

Scoping and Profiling: This stage captured the key features of the physical, administrative, and social-economic, and environmental factors in the county. It involved the identification of all the stakeholders of Nakuru County, the drafting of the work-plan and the designing of the framework for stakeholder participation.

Reconnaissance Survey: This stage involved a reconnaissance visit of Nakuru County, (all the eleven sub-counties); and the identification of the planning issues within all the sub-counties. This stage set the platform for the design of the data collection instruments that needed to be prepared for gathering the pertinent information to be used for the composition of this CSP. After this survey, an inception report was handed over to the county government at the launch of the project.

First Stakeholders' Consultation: During the preparation of this CSP, a public participatory method was used. The purpose of adopting this method is to ensure that the critical stakeholders own and support the plan during its preparation and its implementation. In the process of participation, the citizens of Nakuru County (who comprised all the local communities living in every sub-county) acquired those skills that enabled them to articulate the development issues of their areas; and to assist the planning group in visioning and the drawing up proposals that will assist in providing the solutions to the challenges of development that confront them during the use of resources within their sub-county and the planning area in general. The consultative meetings involved the following key stakeholders: Community representatives; Representatives of key line ministries, institutions relevant to the planning process, and the relevant county government officials. The purpose of the consultation with all these actors is to draw from their long-term specialized knowledge, experience and expertise that assisted the planning group in focusing and interpreting the key development issues relevant to the study in a holistic manner.

1.5.2 Visioning and Objectives Setting

This stage involved the setting up of general and specific objectives associated with each thematic area of the CSP and the development of a research framework that assisted the planning team in data collection.

Visioning: A vision is a statement of where county/region/planning area aspires to go, in terms of development within a given time-frame. The vision for this CSP was developed by considering the physical and socio-economic characteristics of the planning area: its strengths, potential, issues, future focus areas and preferences of the residents of the county.

1.5.3 Research

This activity involved identifying primary and secondary spatial data, identifying sources of that data, preparing data checklist, and identifying the appropriate data collection methods.

1.5.4 Situation Analysis and Socio-Economic Survey:

The preparation of any CSP involves the collection of both primary and secondary data from the area of the study. This is specifically the stage where the enumerators and census-takers of the planning group interacted with all the communities living within the planning area; and also surveyed the physical environment: in order to capture the relevant data existing in the planning area that was used to assist in the preparation of this CSP. Relevant survey instruments and research methods were used in capturing the necessary information.

Apart from these, the Consultants also consulted the previous plans, other reports that had been prepared previously and were relevant to the ongoing exercise. Therefore, data collection and analysis involved the processing of all the collected information and the identification of any gaps that exist in the current development trends.

Data Analysis and Interpretation: Once the fieldwork was completed, the data that was collected was subjected to analysis and interpretation. This process involved addressing the key objectives of the study. At this stage, those findings presented in this report emerged from data analysis. This output provided useful information that is related to the opportunities and challenges that are inherent in the planning area that is shown in Map 1.1.

1.5.5 Developing Scenarios

On the basis of the data analysis, the challenges and opportunities associated with each thematic group were collated. These formed the basis of a conceptual framework of the CSP. This framework was used to generate alternative development scenarios and strategies to be used as pathways for the development of the planning area. The alternative development scenarios indicated the strategies that will steer Nakuru County to high and sustained levels of economic growth and development. Economic development models and strategies adopted during this exercise were integrated in formulating a spatial framework for sustainable development within the spatial planning area: in what is referred to as the **County Spatial Plan** (2015 – 2025) of the County of Nakuru.

The Consultant team discussed all the alternative planning concepts with the Client (County Government of Nakuru) and all the other

stakeholders and obtained their comments and suggestions. The best suitable development scenarios were selected for further inclusion in the proposed County Spatial Plan.

1.5.6 Formulation of Plan Proposals

Once the alternate planning concept/development scenario was finalized, the Consultant formulated sectoral strategies and proposals to realize the aims of the Kenyan government, Nakuru County, and also the proposed planning concept. Sectoral policies were framed within the existing regional development policies-framework and were interpreted in the context that was appropriate to the Nakuru County.

The County Spatial Plan included sector-wise proposals for all sectors: including economic development, land and housing, the urban poor and slums, physical infrastructure (water supply, sewerage and sewage disposal, stormwater drainage), social infrastructure (health, education, community services, recreational facilities etc.), environment, disaster management, heritage conservation and tourism, traffic and transportation, institutional framework, etc. At the end of this planning stage, the first draft plan was presented to stakeholders.

1.5.7 Presentation and Publishing

The comments from the stakeholders will be incorporated in the plan, and then presented to them for validation. At this stage, public will be notified of the completion of the plan through two local dailies for submission of comments and views. The period allocated for submission of views and comments will be clearly indicated. With these comments from the public, the final draft plan will be prepared.

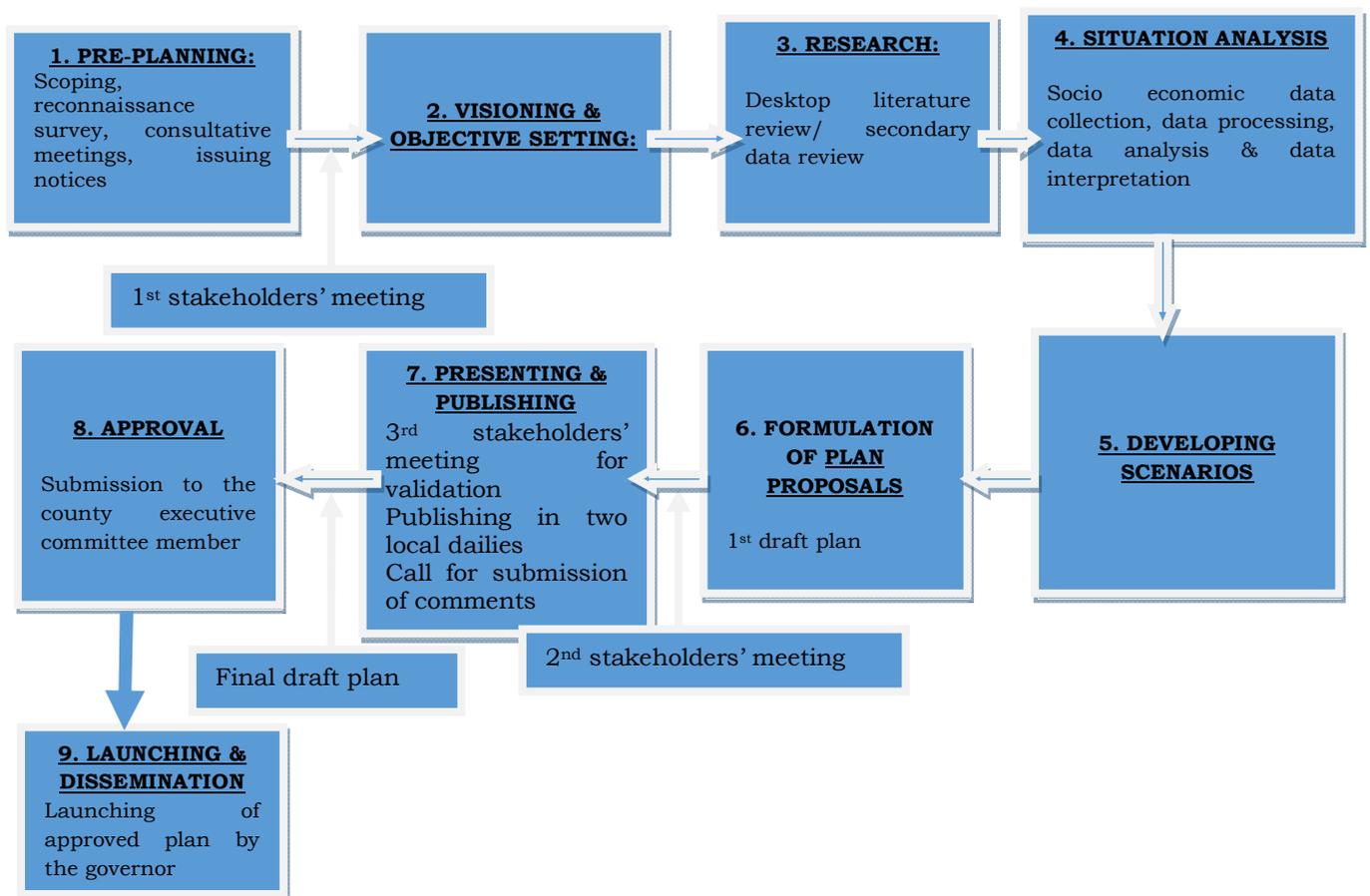


Figure 2.1: Plan Preparation Methodology

SOURCE: *Geomaps and Habitat Planners, 2016*

1.5.8 CSP Approval

The final draft plan shall be presented to the Lands, Housing and Physical planning CECM for forwarding to the County Assembly for approval. The Clerk of the County Assembly will then present the approved plan to the governor for signing on behalf of the county government.

1.5.9 Launching and Dissemination

The approved C.S.P shall be launched by the County Governor upon approval by the county assembly. Figure 1.1 summarizes the plan preparation methodology.

2.4 Visioning

The development of this plan's vision was a highly consultative and participatory. Stakeholder meetings were held per Sub County and from these discussions, the following visions emerged.

Several sessions were held with the stakeholders and they were asked to give their vision of Nakuru County by the year 2025. The following are the views from the various eleven sub-counties.

Gilgil

- To be a sub-county with a reasonable land allocation of ranches
- To be a university sub-county
- To be a sub-county with health and prosperous people
- To be sub-county with an international airport
- To be a sub-county with clean water free from fluoride
- To be a food secure sub-county
- To be a sub-county with markets for agricultural products
- To be a sub-county with improved roads and infrastructure

Naivasha

- To be a sub-county with an adequate clean supply of water for human consumption (free from fluoride)
- To be clean and habitable sub-county
- To be a green tourist destination and conferencing hub
- To be a flourishing multi-ethnic/cultural sub-county
- To be a city sub-county

Nakuru East

- To be a sub-county with better infrastructure
- To be a commercial hub for various urban nodes
- To be environmentally sound sub-county
- Secure sub-county for sustainable economic activities
- To be a sub-county with a modern urban centre with modern infrastructure and well-planned buildings
- To be a modern compact city

Nakuru West

- To be an economical and agri-business sub-county
- To be an industrial hub
- To be a commercial hub and investment destination
- To be a food secure sub-county
- To be educational sub-county

- To be good and green sub-county
- To be a well-lit with good infrastructure sub-county
- To be a prosperous sub-county with good standards of living
- To be a sub-county with sporting and recreational facilities
- To be a sub-county well interlinked
- To be a sub-county with well-planned human settlement
- To be a secure sub-county
- To be a sub-county with modern health facilities
- To be a sub-county with strong culture and heritage

Rongai

- To be an industrial sub-county
- To be a sub-county with modern and planned trading centres
- To be a technology sub-county
- To be a sub-county with sufficient and clean water
- To be a sub-county with good drainage
- To be a sub-county with informal business parks
- To be a healthy sporty sub-county
- To be a sub-county with a modernised agriculture
- To be a sub-county with maintained buildings and infrastructure

Kuresoi south

- A leading Sub County in potato production, processing, and marketing
- A leading area in milk production and processing.

Kuresoi North

- A Sub County with a safe 24hour economy
- A knowledge hub
- All households to have water
- Well planned Sub County to facilitate balanced urban and rural land use for economic development

Molo

- Well planned and clean urban centers in Molo
- A sub-county with access roads in the rural areas
- A Sub-County that is socially and economically developed, living in harmony with the environment.

Njoro

- Prosperous sub-county through agribusiness
- Healthy and disease-free sub-county
- Sub County with good infrastructure and access roads

Bahati

- Good and friendly environment to live in
- The leading producer of value-added agricultural products
- A model Sub- County with enough, adequate facilities and sustainable both economically, politically and socially

Subukia

- Good and friendly environment to live in
- The leading producer of value-added agricultural products
- A model Sub- County with enough, adequate facilities and sustainable both economically, politically and socially

Key Words

Arising from the discussion on the various visions envisaged by stakeholders for Nakuru County. The following key words arose that help in the formulation of the overall vision as well as supporting pillars.

- Secure - Cohesive
- Environment – Protection, clean
- Infrastructure – Transport, water, sewer, airport
- Economic Prosperity- industry,
- Education- Universities, schools, polytechnics

The Vision:

“The CSP seeks to promote properly integrated spatial modern infrastructure network towards the achievement of maximum sustainable development in agricultural production, agribusiness industries and tourism for economic prosperity and environmental conservation”.

2.5. Constitutional, Policy and Legal Framework

The National Government of the Republic of Kenya and County Government of Nakuru have put in place laws and regulations that govern physical planning and development in Kenya and in Nakuru County respectively. A well-planned physical development is critical for social-economic growth. A review of the existing laws, policies, and institutions mentioned below has been carried out to appreciate the legal framework for the planning and implementation of the County Spatial Plan. The Kenya Constitution (2010), Physical Planning Act (Cap 286), County Government Act of 2012, Land Act of 2012, Land Acquisition Act (Cap 295), Housing Act (Cap 117), Water Act, (Cap 2002), Wildlife (Conservation and Management) Act (Cap 376), Forests Act (Cap) 2005), the Environment Management and Co-ordination Act (1999), the Kenya Roads Board Act 1999, (Cap 408), the Kenya Roads Act of 2007, the Kenya Railways Corporation Act (Cap 397) Kenya Airports Authority Act (Cap 395), National Constituency Development Fund Act, Nakuru County Government Acts and Bills amongst many others as discussed below.

2.4.1 Policy Framework

The policy framework context describes the key national and sectoral policies that must be put into consideration in the preparation of any CSP with a view to interpret, translate and ground them for implementation going forward.

The Vision 2030

Kenya Vision 2030 is the country's economic policy blueprint. The *Vision* has three key pillars; economic, social and political, aimed at making Kenya a globally competitive and prosperous nation with a high quality of life, as explained below:

The economic pillar recognizes the importance of tourism, agriculture, retail and wholesale trade, and financial services as among the sectors that have great potential in spurring economic growth. Nakuru County has all sectors that play an important role. The plan will ensure that these sectors are well planned for and given adequate space for expansion. The government will also ensure that infrastructural services are available to support these sectors.

The Social Pillar recognizes the importance of education in creating a skilled workforce. Several flagship projects were identified under land reforms. Key among them and related to sustainable land use planning is the preparation of the first National Spatial Plan (NSP).

National Spatial Plan (NSP):

The NSP forms the foundation for the implementation of national projects by providing a spatial illustration of the projects and identifying a strategy for land development. The Vision is very clear that the Plan will form the basis on which development activities in support of its proposals will take place.

Closely related to NSP and also prioritized in the MTP, 2013 are the County Spatial Plans which are guidelines to ensure that all counties follow the same standards in implementing development projects in the country. The C.S.P is therefore prepared against a backdrop of the implementation of the Vision 2030 MTP, 2013.

National Housing Policy 2004

The goal of the housing policy is to facilitate the provision of adequate shelter and a healthy living environment, at an affordable cost to all socio-economic groups in Kenya in order to foster sustainable human settlements. The policy recognizes comprehensive land-use planning as a major component of housing. The policy aims at promoting planning of human settlements, which includes re-planning, and re-development of areas with inadequate infrastructure and services. Nakuru C.S.D.P also takes into account those aspirations especially in the planning of the neighbourhoods and informal settlements by ensuring the provision of basic services.

Integrated National Transport Policy Sessional Paper No. 2 of 2012

The Integrated National Transport Policy aims to develop a world-class integrated transport system that is responsive to the needs of people and industry. The Government recognizes the transport sector as one of the critical enablers in achieving Vision 2030. The Policy identifies challenges besetting the transport sector in Kenya. In relation to this policy vision, the project seeks to incorporate it within the county's vision when preparing the transportation strategy for Nakuru County. The national transportation master plan is aimed at addressing existing local challenges and opportunities and to provide vital regional linkage with neighbouring countries.

National Land Policy (NLP)

The NLP served largely as the precursor to Chapter Five of the Constitution on land matters. Besides coming up with land policy principles and guiding values, the policy sets out the goals and direction for the administration and management of land and sets out measures and guidelines to be adopted to achieve optimal utilization and management of land.

Agricultural Sector Development Strategy 2009-2020

This strategy recognizes that the agricultural sector is not only the driver of Kenya's economy but also the means of livelihood for the majority of the Kenyan people. The Strategy aims to position the agricultural sector strategically as a key driver for delivering the 10 percent annual economic growth rate envisaged under the economic pillar of Vision 2030.

ICT Policy:

The National Information & Communications Technology (ICT) policy seeks to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services. It envisions a prosperous ICT-driven Kenyan society. The policy seeks to facilitate sustained economic growth and poverty reduction; promote social justice and equity; mainstream gender in national development; empower the youth and disadvantaged groups; stimulate investment and innovation in ICT, and achieve universal access.

2.2.8 Industrial Master Plan

The Industrial Master Plan is aimed at providing a mechanism by which the government will leverage and catalyze the implementation of strategic actions to accelerate industrial development, and enhance industrial growth and competitiveness. Its overall goal is to promote the industrial development of Kenya with emphasis on the target sub-sectors namely agro-processing, agro-machinery and electric, electronics/ICT.

National Tourism Strategy 2013-2018

The Strategy seeks to make Kenya the preferred destination of choice by developing, managing and marketing sustainable tourism in Kenya. This is due to the important role played by the sector in economic development. The Government, therefore, earmarked tourism as one of the six key growth sectors of the economic pillar of Vision 2030 and charged the sector with the task of making Kenya one of the top ten long-haul tourist destinations globally.

National Climate Change Response Strategy, 2010

In response to climate change, the government of Kenya has developed the *National Climate Change Response Strategy*. The vision of the strategy is for a prosperous and climate-change resilient Kenya. The mission is to strengthen and focus nationwide actions towards climate change adaptation and to mitigate the emission of greenhouse gases (GHG).

Nakuru County Integrated Development Plan, 2013-2017

The Nakuru County Integrated Development Plan is a blueprint that guides the National, County Government and development partners' engagement in Nakuru County in the realization of social-economic transformation of the residents. The plan gives details of the plans and projects as suggested by the residents of the County. These projects seek at promoting economic, social and physical development of the County. Currently, with the preparation of this CSP, the County Government of Nakuru is in the process of developing a new CIDP but meanwhile, the 2013-2017 CIDP is still functional until this CSP is given final approval.

Sustainable Development Goals

The preparation of this C.S.D.P is similarly guided by the Sustainable Development Goals (SDGs). These goals embody a universally shared common global vision of progress towards a safe, just and sustainable space for all human beings to thrive on the planet. The goals reflect the moral principles that no-one and no country should be left behind. These goals are:

- Goal 1. End poverty in all its forms everywhere
- Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- Goal 3. Ensure healthy lives and promote well-being for all at all ages
- Goal 4. Ensure inclusive and equitable quality education and promote life-long learning opportunities for all
- Goal 5. Achieve gender equality and empower all women and girls
- Goal 6. Ensure availability and sustainable management of water and sanitation for all
- Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all
- Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- Goal 10. Reduce inequality within and among countries

- Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 12. Ensure sustainable consumption and production patterns
- Goal 13. Take urgent action to combat climate change and its impacts
- Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

The implementation of this plan will aid in achieving these goals

2.4.2 Legal Framework

Kenya Constitution 2010

The Constitution outlines national values and principles of governance (Article 10) that guide all activities including making and implementing public policy decisions. Key among the values and principles that impact on the C.S.P are social justice, inclusiveness, protection of marginalized and attainment of sustainable development. The Constitution also outlines the principles of land policy (Article 60) implementable through the National Land Policy. Key among these principles is the sustainable and productive management of land resources which is a pointer to the optimization of land. The State is given powers to regulate use of any land and property (Article 66) in the interest of land use planning among others. This gives preparation of the CSP Constitutional grounding.

The Physical Planning Act: Cap 286:

This Act provides the guidelines for land use planning. It entrenches stakeholder participation and institutional linkages within the spatial disciplines. Essentially, it provides for the preparation and implementation of Physical development plans. Further, it empowers the *Director of Physical Planning* to prepare various types of Physical Development plans. The Director of Physical Planning performs functions such as the formulation of development policies, guidelines and strategies

for preparation of national, regional and local physical development plans. Section 29 empowers the Nakuru County Government to prohibit or control the use and development of land and buildings. The Development control stipulated in the Act is in the interests of proper and orderly development of the specific planning area. In so doing any county government may consider and approve all development applications and grant all development Permissions.

County Government Act, 2012:

The County Government Act of 2012 gives power to county governments to determine how the counties are run. The key elements in the Act in regard to the regions management are summarized, and include;

- 104. (1) A County Government shall plan for the County and no public funds shall be appropriated outside a planning framework developed by the County Executive Committee and approved by the County Assembly.
- 107. (1) To guide, harmonize and facilitate development within each County there shall be the following plans;
 - County Integrated Development Plan;
 - County sectoral plans;
 - County Spatial Plan; and
 - Cities and Urban area plans as provided for under the Urban Areas and Cities Act

As summarized above the Act provides for preparation of the County Spatial Plan by the county governments. It also details out the composition of the same.

The National Land Commission Act 2012

This is an Act of Parliament that makes further provision to the functions and powers of the National Land Commission, qualifications and procedures for appointments to the Commission; gives effect to the objects and principles of devolved government in land management and administration, and for connected purposes. The Act provides for the roles of Lands Commission and those that are related to regional development and management are:

- To manage public land on behalf of the national and county governments; to conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities;
- To monitor and have oversight responsibilities over land use planning throughout the country.

- Ensure that public land and land under the management of designated state agencies are sustainably managed for their intended purpose and for future generations;
- Develop and maintain an effective land information management system at national and county levels;
- Manage and administer all unregistered trust land and unregistered community land on behalf of the county government;

Nakuru County is endowed with a number of natural resources starting from both public and private land, lakes to minerals amongst others. The implementation of this plan requires use of these resources and especially land. This will call for constant coordination of the county government with Lands Commission.

Urban Areas and Cities Act, 2011

The Urban Areas and Cities Act of 2011 was enacted precisely to guide the development process and governance of urban areas and Cities. Among the objectives of the Act is to establish a legislative framework for Governance and management of urban areas and cities. Participation by the residents in the governance of urban areas and cities are included in the Act. In accordance with this Act, every city, county and town is expected to operate within the framework of an integrated development planning.

Environmental Management and Coordination Act (EMCA): 1999

This Act gives guidance to the constitution on the right to access clean and healthy environment. It provides legal and Institutional framework of Environment Management. The general principles of the Act are that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. The entitlement to a clean and healthy environment includes the access by any person in Kenya to the various public elements or segments of the environment for recreational, educational, health, spiritual and cultural purposes. It also provides for environmental assessments, auditing and conducting of social environmental impacts.

Water Act, 2002

This Act of Parliament provides for the management, conservation, use and control of water resources and the acquisition and regulation of rights to use water. Further, it provides for the regulation and management of water supply and sewerage services. It also provides guidelines for the establishment and running of institutions involved in the management and provision of water services.

Public Health Act, Cap 242

This Act of Parliament makes provision for securing and maintaining the health of the public. It provides standards and guidelines to clean environment, effective ventilations and liveable developments in an area. Occupational licences are given under these provisions.

Survey Act, Cap 299

The Survey Act is an Act of Parliament that makes provision in relation to surveys, geographical names and the licensing of land surveyors, and for connected purposes. The Department of Surveys, under the Director, provides and maintains plans for property boundaries in support of the Land Registration throughout the country. In preparation of this plan, existing survey data was used to prepare the plans.

The surveying and mapping work done under this CSP project does not override the role of the Director of Surveys. The maps produced during the preparation of this CSP are not an authority on boundaries.

Land Registration Act (No. 3 of 2012)

This Act gives the process of land registration for the different land categories. It gives the process for establishment of land registration units and for the establishment of land registries. Though the survey output of this project will not be regarded as an authority on boundaries, it will yield important data.

Agriculture, Fisheries and Food Authority Act, (2013)

This Act provides the confines within which to make proposals on agriculture promotion and conservation of soils and fertility for sustainable agriculture and optimization of land use.

Forests Act, No. 7 of 2005

An Act of Parliament that provides for the establishment, development and sustainable management, including conservation and rational utilization of forest resources for the socioeconomic development of the country. It recognizes that forests play a vital role in the stabilization of soils and ground water, thereby supporting the conduct of reliable agricultural activity, and that they play a crucial role in protecting water catchments in Kenya and moderating climate by absorbing greenhouse gases. It further recognizes that forests provide the main locus of Kenya's biological diversity and a major habitat for wildlife.

Nakuru County Finance Act of 2016

This Act provides for revenue-raising measures relating to County taxes, licenses, fees and charges for the County Government of Nakuru.

Nakuru County Solid Waste Management Fund Act, 2014

This Act of Nakuru County Assembly provides for the establishment of the County Solid Waste Management Fund, establishment of the necessary institutional and regulatory mechanisms. The County Solid Waste Management Fund Board shall be responsible for the preparation of the County Solid Waste Management Framework; implementation of the Local Waste Management Plan; ensure that the waste is collected, stored, transported, recycled, re-used or disposed of in an environmentally sound manner; promote safety standards in relation to solid waste; promote public awareness on the importance of efficient solid waste management; and foster understanding of the importance of efficient solid waste management to the conservation, protection and proper use of the environment as provided in the Act.

2.4.3 Linkages to Other Plans & Strategies

Vision 2030

Vision 2030 is the blueprint for Kenya's long-term national development. It is anchored on three main pillars: Economic, Social and Political. The Nakuru CSP should be linked to the Vision 2030 so as to be part of Kenya's transformation into "a newly industrializing, middle income Country providing a high quality of life to all its citizens in a clean and secure environment" through improvement of key thematic sectors such as Infrastructure; Energy; Security; Tourism; Agriculture; Wholesale/Retail Trade; Manufacturing; Financial Services; and Business Process Outsourcing.

The National Spatial Plan

The National Spatial Plan (NSP) defines the general trend and direction of spatial development for the country by providing a framework for better national organization and linkages between different activities within the national space hence informing the future use and distribution of activities.

The national spatial plan seeks to provide a framework for functional human settlements, enhanced agricultural productivity, planning and managing natural resources and the environment, providing a framework for infrastructure provision, promoting industrial and commercial development and the enhancement of good governance.

Big Four Agenda

From December 2017, the national government announced the Big 4 Agenda that would be prioritized in resource allocation. The four sectoral areas mentioned included:

- a) Affordable Housing.
- b) Food Security

- c) Manufacturing, and
- d) Universal Healthcare

2.6 Institutional Arrangement

Nakuru County has several institutions that will play key roles in the successful implementation of the County Spatial Plan. Various departments/ ministries at the county government will have to work closely with other respective agents of the central government, private and non-governmental organizations within the County.

2.3.1 National Government

The national government has several ministries that are involved in regional development across the country. These ministries will have roles to play in the successful implementation of the spatial plan as discussed below.

2.3.2 Ministry of Devolution and Planning:

This Ministry's Mandate broadly covers issues of economic planning and development, devolution, public service management, youth, gender and special programs. Amongst the Ministry's functions are strengthening capacities for county governments to perform their functions effectively, ensuring sustainable development and proper resource utilization within counties and improving coordination of development planning, policy formulation, and budgeting.

2.3.3 Ministry of Land, Housing and Urban Development:

This ministry has three directorates under it. The Directorate of Land is charged with the responsibility of ensuring the efficient administration and sustainable management of the land resource in the country. Its mandate is to formulate and implement land policy, undertake physical planning, register land transactions, undertake land surveys and mapping, land adjudication and settlement, land valuation and administration of public and community land.

The Directorate of Physical Planning aims at achieving a balanced regional development over the national geographic space for the benefit and welfare of all. Key activities include; preparation of regional and local physical development plans, feasibility studies into matters concerning physical planning and advising on matters concerning the alienation of land and the most appropriate use of land such as change of user, extension of user, extension of leases, subdivision of land and amalgamation of land. The

directorates of Housing is charged with the responsibility of facilitating and coordinating the housing sector in Kenya. Its overall objective is to facilitate Kenyans to access quality housing.

2.3.4 Ministry of Water and Natural Resources

The Ministry's mission commits it to facilitate good governance in the protection, restoration, conservation, development, and management of the environment and natural resources for equitable and sustainable development.

2.3.5 The County Government of Nakuru

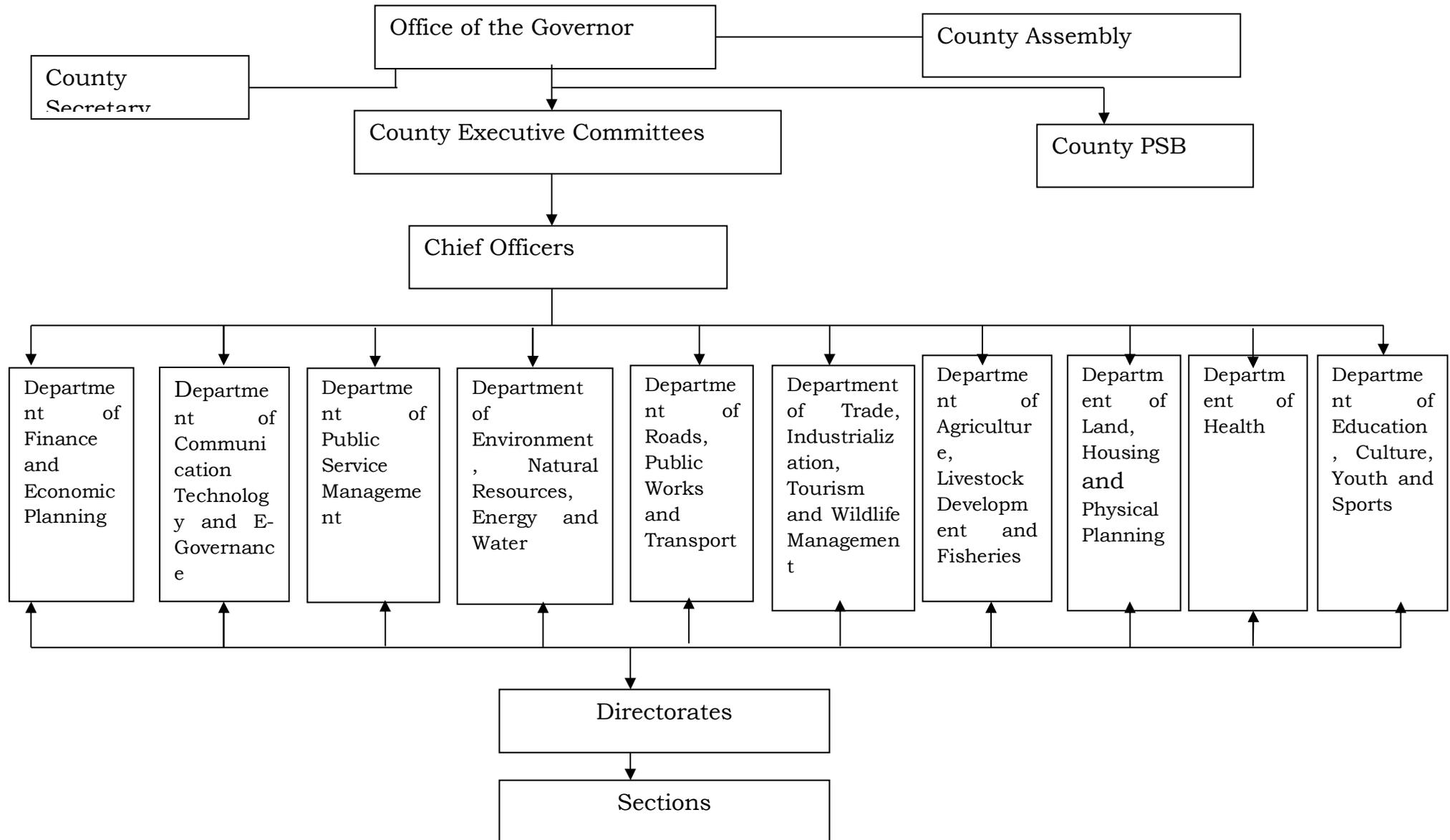
Nakuru county government has the responsibility to plan for the county and no public funds can be appropriated outside a planning framework developed by the county executive committee and approved by the county assembly. The county government designates county departments, cities and urban areas, sub-counties, and Wards as planning authorities of the county. The County planning units are responsible for: -

- a) Coordinating integrated development planning within the county;
- b) Ensuring integrated planning within the county;
- c) Ensuring linkages between county plans and the national planning framework; and
- d) Ensuring meaningful engagement of citizens in the planning process;

Amongst the objectives of Nakuru county planning are to facilitate the development of a well-balanced system of settlements and ensure productive use of scarce land, water and other resources for economic, social, ecological and other functions across a county; to develop urban and rural areas as integrated areas of economic and social activity; and provide the preconditions for integrating underdeveloped and marginalized areas: bringing them to the level generally enjoyed by the rest of the county. The administrative structure of Nakuru County government is as shown in figure 2.2:

Figure 2.2: Nakuru County Government Structure

SOURCE: *Geomaps and Habitatplanners Field Survey 2017*



County Assembly

The important roles of the county assembly in preparation and implementation of the C.S.D.P are:

- approve the budget and expenditure of the county government
- approve the borrowing by the county government
- approve county development plans;

County Executive Committee

These are the ten ministries/ also termed as departments by the County government:

- Lands, housing and physical planning
- Finance and economic planning
- Health
- Agriculture, Livestock Development and Fisheries
- Education, Culture, Youth, and Sports
- Communication Technology and E-Governance
- Public Service Management
- Trade, Industrialization, Tourism and Wildlife Management
- Roads, Public Works, and Transport
- Environment, Natural Resources, Energy and Water

All these departments have important roles to play in the success of this CSP; but with much more responsibilities is the ministry of land, housing, and physical planning.

The County of Nakuru has a total of thirteen (13) professionally trained physical planners. Two of them are under the *development control* section, seven (7) work at the sub-county level, and one of them works in the directorate for the physical planning department. The other two are assistant county planners posted at the county headquarters. The Land Section has four surveyors, four (4) building inspectors and one cartographer who serve the entire county.

The structure of this department is as shown in Figure 2.3.

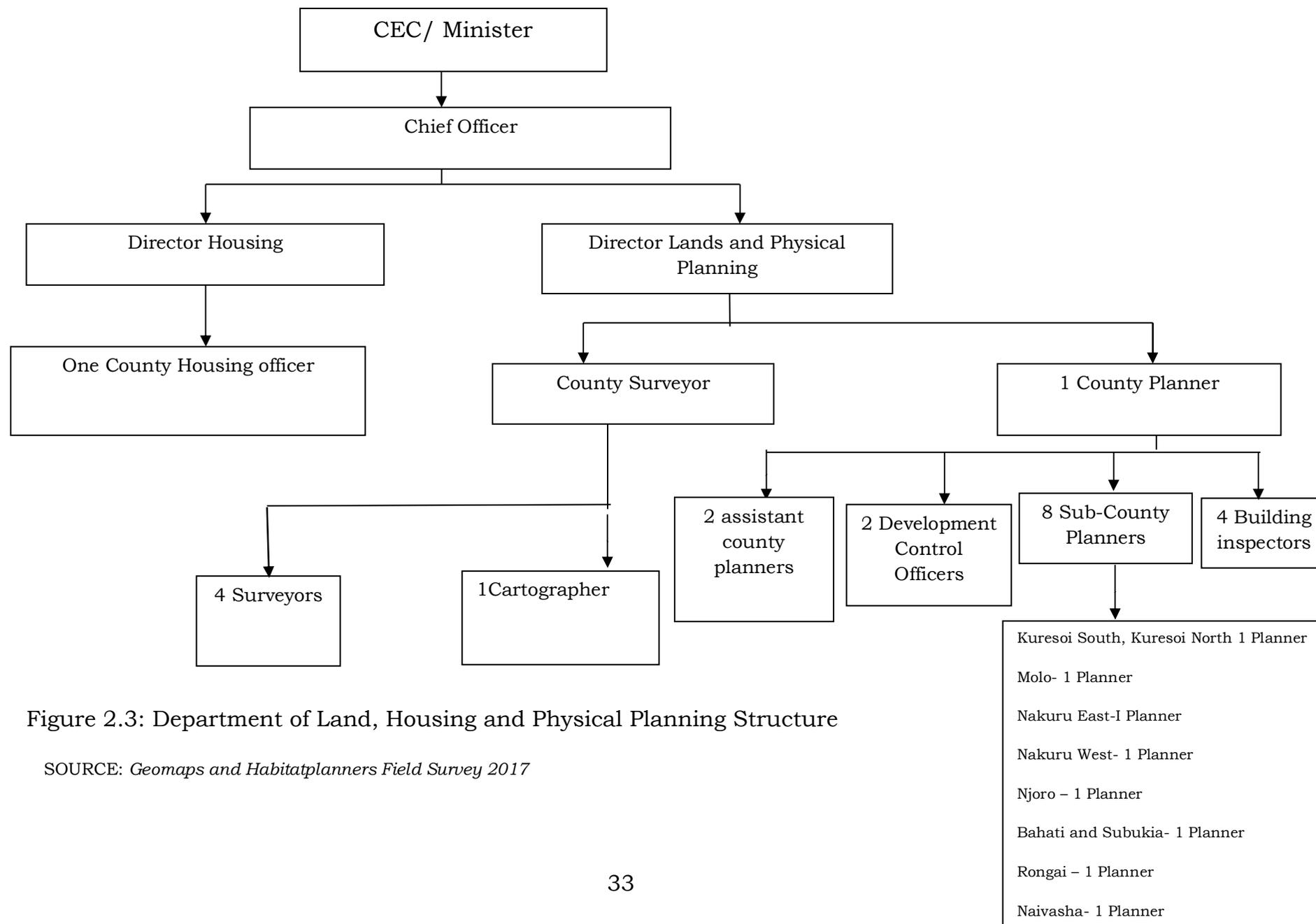


Figure 2.3: Department of Land, Housing and Physical Planning Structure

SOURCE: *Geomaps and Habitatplanners Field Survey 2017*

2.4 Community Institutions

The subsections below discuss the community institutions in the county.

2.4.1 Cooperative Societies

There are over 1,804 registered cooperative societies in Nakuru County which include Housing and Farmers Co-operative societies. The membership is over 149,373 with an annual turnover of over Kshs. 513.76 million. A significant number of county residents draw their livelihood either directly or indirectly from cooperative-based enterprises. The cooperatives promote the use of modern technology and contribute to development through production, procurement, marketing and expansion services, credit services, sale of consumer goods and members' education and loans. The cooperatives have made remarkable progress in agriculture, banking, credit, agro-processing, storage, marketing, dairy, fishing, and housing. However, cooperatives organizations are facing serious management problems and low cooperative education absorption.

2.4.2 Self Help, Women and Youth Groups

The county has a high number of Civil Society Organisations (CSOs) which partners with the Government on many development issues. The county has approximately 3,500 active women groups and 2,768 youth groups. Through these groups, women and youths are able to access loans through the Women Enterprise Fund and Youth Enterprise Fund, Uwezo Fund among others, which enable them to engage in income generating activities. Many women and youth groups have benefited from these funds since inception.

Self-help groups, women and youth groups have become the entry points for both government and donor interventions on poverty, HIV/AIDS and environment. The Ministry of Youth Affairs and Sports has continued to promote youth development by designing programmes that build young people's capacity. The youth engage in activities such as; Jua kali sector, Micro-Finance (Revolving Loan Fund), HIV/AIDS & drug abuse campaign, Home Based Care, Environmental Conservation activities like tree planting, training and advocacy, entertainment, drama and theatre and other Income generating activities.

Despite these activities, women and youth groups continue to experience several incidences of unemployment as well as challenges in getting access to affordable loans from the major financial institutions due to lack of collaterals. These groups of people also represent the poorest in

the county and are also poorly represented in top decision-making levels in the county.

2.4.3 Non-Governmental Organizations

According to the Non- Governmental Organisation Coordinating Board, there are about 1,254 NGOs registered to operate in Nakuru County. This is based on the information that the respective NGOs provided at the point of registration. Though registered to operate in the county, some NGOs may not have a physical address in the county but would have their operations coordinated from their head offices located outside the county. NGOs contribute significantly to national development through various projects and programme's addressing cross-cutting issues with a view to uplift the standards of living of the local communities. The NGOs mainly focuses on community capacity building, HIV/AIDS interventions, environment protection, and health services among others. Some of the notable one's include the USAID sponsored APHIA Plus, and Kenya Red Cross working in health promotion activities and disaster response. Danish Refugee Council is involved in the resettlement programme of the Internally Displaced Person (IDPs).

2.5 Emerging Issues

Department of Land, Housing and Physical Planning emerging issues

So far, the Land, Housing and Physical Planning Department gets training on senior management, strategic leadership and supervisory at KIM. There is no planning, architectural or survey training that the staff receive. The training needed by the two directorates is as discussed below.

Directorate of Housing

- Management courses
- The professionals under housing department don't get sponsorships on training programs from either County or National governments.

Directorate of Land and physical planning

- GIS
- Project management
- Environmental management and planning
- Use of survey equipment like GPS
- Remote sensing and photogrammetry

2.5.1 SWOT Analysis:

Based on the analysis of the policies, legal and the institutional framework of the county, strengths, weaknesses, opportunities and threats

analysis has been done as indicated in Table 2.3 Proposed Strategy: Improve coordination and cooperation among development institutions

Table 2.3: SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Presence of many NGOs and governmental institutions (potential development partners) • New constitution (devolution; services closer to the people) • Increase in public know how hence improved participation in development agendas • Skilled County workforce • Presence of Cooperative societies • Existence of guiding legal framework • Key government departments are available for service provision • Development of control and zoning regulations/physical development plan. 	<ul style="list-style-type: none"> • Lack of a County Cooperative Development Committee to increase effective Governance of the cooperative sector. • Low adoption of up to date technologies important for the varous county departments. • Inadequate human resource • Poor coordination of agencies within the county. • Cooperatives organizations are facing management problems • Lack of coordination in implementation of legislation • Limited community participation in development projects • Inadequate capacity (technical/financial) to both prepare and implement plans. • Weak enforcement of legislation
Opportunities	Threats
<ul style="list-style-type: none"> • Public private partnerships • Presence of donor agencies and development partners. • Participatory development approaches. • Proximity to the metropolitan area. • Existence of county government and sub county structures. 	<ul style="list-style-type: none"> • Duplication of roles • Incompletion projects due to change in county government officers • Risk of political interference

Actions

- Formulate development policies, guidelines, strategies and plans to increase efficiency in service delivery and workflow.
- Develop joint forums for sharing and team building
- Disseminate and conduct awareness campaigns on new policies and legislations
- Develop sector-wide working groups for implementation

PART II: SITUATIONAL ANALYSIS

Chapter Three : Population and Demography

3.0 Overview

This chapter looks into the population and demographic aspects of Nakuru County. Analyzing the population is important in guiding future courses of action for the plan in the next ten years.

3.1 Population Size

Nakuru by population is ranked as the 5th most populous county of all the 47 Counties of Kenya (National Population and Housing Census, 2009). Having a total of 1,603,325 people living there, it constitutes 4.15% of the total population in Kenya. Of this county population according to the 2009 Kenya population census, 804,582 were male and 798,743 are female (National Population and Housing Census, 2009). By 2015 the population was projected to grow to 1,925,296 (966, 1547 male; 959,142 female), and to 2046,395 (1,026,924 males; 1,019,471 female) by 2017. The working-age population in 2012 (15-64 years) in the county was 968,745 accounting for 55.1 percent of the total population of whom 484,378 are male while 484,366 are female. The rural population is estimated to be 62 percent while 38 percent was urban. The county population growth rate was estimated at 3.05 percent close to the national average of 3.14, which is ranked 19th nationally.

Naivasha Sub County is the most populated with 224,141 inhabitants as of 2009, followed by Njoro, while Subukia is the least populated with 94,478 inhabitants as shown in Tables 3.1 and 3.2.

The County had 409836 households as per the 2009 population census. The average household size is 4.7, higher than the national household size of 4.4 and this is a clear indication of high fertility rates in the county. The distribution of households per Sub County is Nakuru Town East & Nakuru Town West 91,110 households; Naivasha 73,457 households; Molo 30,783 households; Njoro 41,585 households; Kuresoi North & Kuresoi South 51,085 households; Rongai 34,021 households; Bahati 37,525 households; Subukia 18,409 households; and Gilgil 31,861 households.

$$P_1 = p_0 (1 + \text{growth rate})^n \text{ (projection intervals)}$$

P₁ is the projected population

P₀ is the base population of the 2009 census.

n is the number of years

Table 3.1: Sub Counties Population

No.	Name	Population (2009 National Census)
1	Gilgil	152,102
2	Molo	124,438
3	Njoro	184,859
4	Naivasha	224,141
5	Kuresoi South	115,435
6	Kuresoi North	124,050
7	Subukia	94,478
8	Rongai	130,132
9	Bahati	144,266
10	Nakuru Town West	152,257
11	Nakuru Town East	157,167

SOURCE: Kenya National Bureau of Statistics, 2009

Table 3.2: Population Projection by 2025

No.	Name	Population (2009 National Census)	Projected Population		
			2015	2020	2025
1	Gilgil	152,102	182147	211672	245982
2	Molo	124,438	149019	173173	201243
3	Njoro	184,859	221375	257258	298957
4	Naivasha	224,141	268417	311924	362484
5	Kuresoi South	115,435	138237	160644	186683
6	Kuresoi North	124,050	148554	172633	200616
7	Subukia	94,478	113141	131480	152791
8	Rongai	130,132	155838	181097	210452
9	Bahati	144,266	172763	200767	233309
10	Nakuru Town West	152,257	182333	211887	246232
11	Nakuru Town East	157,167	188213	218720	254173
	Total	1,603,325	1920037	2231255	2592922

ADAPTED FROM: Kenya National Bureau of Statistics, 2009

3.2 Population Density

The population density of the county is 214 people per kilometer square, this density is lower than the national population density which is 401.1Km². This is ranked 21st nationally. Nakuru East Sub County has the highest population density followed by Nakuru West Sub County because they host Nakuru town which is one of the most urbanised towns in Kenya. The

population density per Sub County is as tabulated in Table 3.3 below and illustrated in Map 3.1.

Table 3.3: Population Density per Sub County

No.	Name	Pop. Density
1	Gilgil	112.80
2	Molo	259.90
3	Njoro	259.16
4	Naivasha	132.96
5	Kuresoi South	198.00
6	Kuresoi North	221.64
7	Subukia	241.81
8	Rongai	124.04
9	Bahati	384.30
10	Nakuru Town West	606.60
11	Nakuru Town East	2115.30

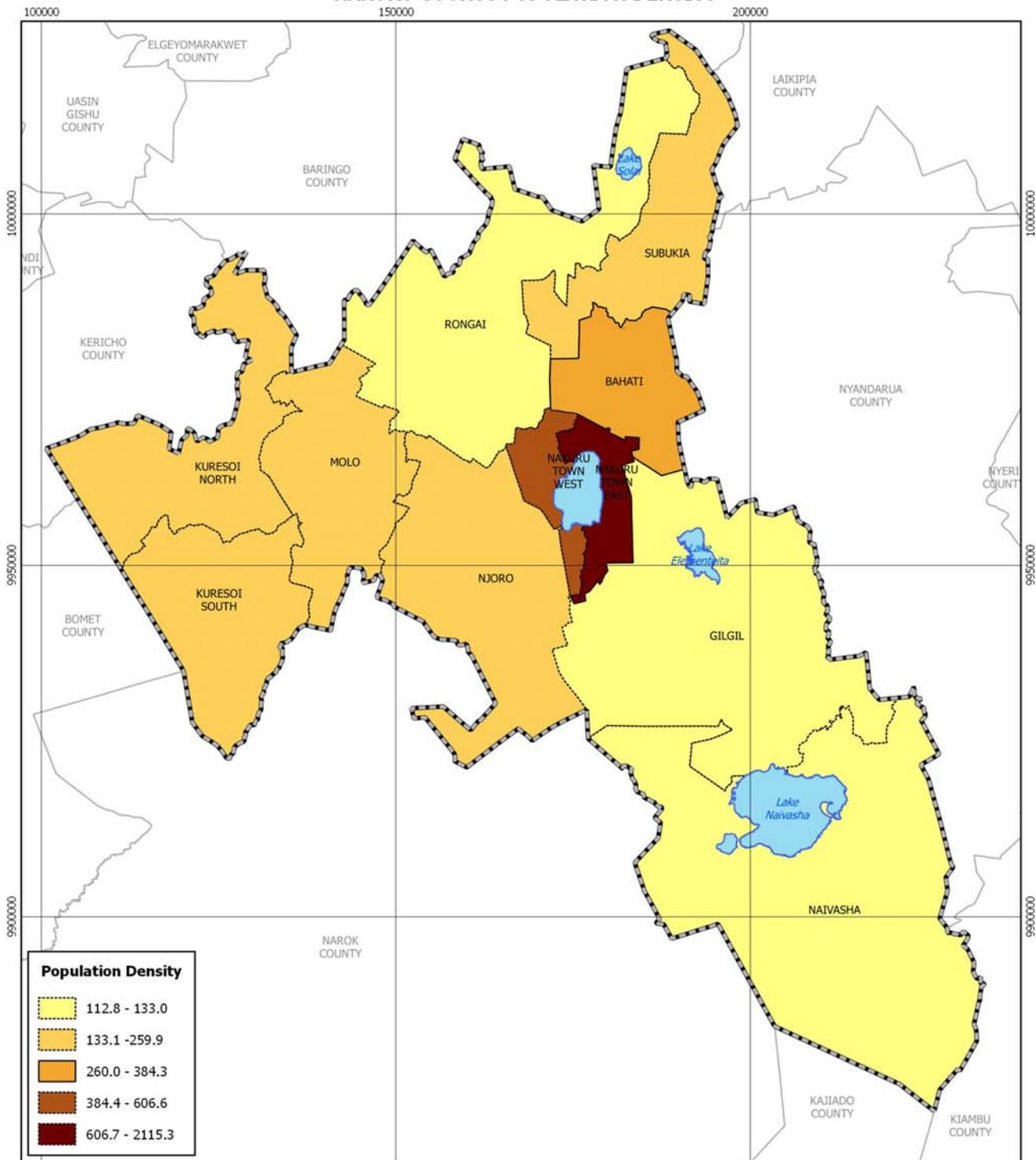
SOURCE: Kenya National Bureau of Statistics, 2009

3.3 Nakuru Population Pyramid

The county has an expansive population pyramid that has a wider base and concave sides and this indicates high fertility hence high birth rate and high death rate. Female to male ratio is almost 1:1 with the number of male being slightly higher than that of female. Figure 3.1 shows the population pyramid.

The age cohort of 0-4 years makes up the highest percentage of the population (constitute 43% of the total population) and this means that the birth rates are high and mortality rate within this age group is low this can be explained by improved health services within the region and improved nutrition.

NAKURU COUNTY POPULATION DENSITY



<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Lake Nakuru County 	<p>LOCATION MAP</p> <p>Scale 1:750,000 Date: October 2019</p>	<p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829, 2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 3.1: Population Density
SOURCE: Geomaps /Habitat Planners

The subsequent cohorts have decreasing population as you move up the pyramid but the population of the age group of 65 years and above combined is larger compared to the 3 prior cohorts. This means that the region has a huge population of aging and this increases the dependency ratio. This also indicates that most of the younger population has moved out of the region in search of greener pasture.

Table 3.4: 2009 Population per Age Cohort

Age	Male	Female	Total
0-4	34391	33752	68143
5-9	30177	29250	59427
10-14	26117	25825	51942
15-19	23447	24852	48299
20-24	26714	31411	58125
25-29	25644	25824	51468
30-34	20193	17557	37750
35-39	15412	13322	28734
40-44	10557	8977	19534
45-49	8850	7321	16171
50-54	5803	4856	10659
55-59	4048	3294	7342
60-64	2805	2398	5203
65-69	1654	1620	3274
70-74	1299	1209	2508
75-79	727	794	1521
80+	1253	1708	2961

SOURCE: 2009 Kenya Population Census

The county also has some labour migration from other parts of the country in search for jobs hence a larger proportion of 20-24-year olds and a high working-age population in Nakuru Town East (63%) and Nakuru Town West (62%) constituencies

5.4 Urban Population

According to the 2009 Population and Housing Census data, the County has thirteen (13) towns enumerated as Urban Centres and they include Nakuru Town, Naivasha, Mai Mahiu, Molo, Mau Narok, Olenguruoni, Njoro, Rongai, Salgaa, Dundori, Bahati, Subukia, and Gilgil. The population of these urban areas is as tabulated in table 3.5 below.

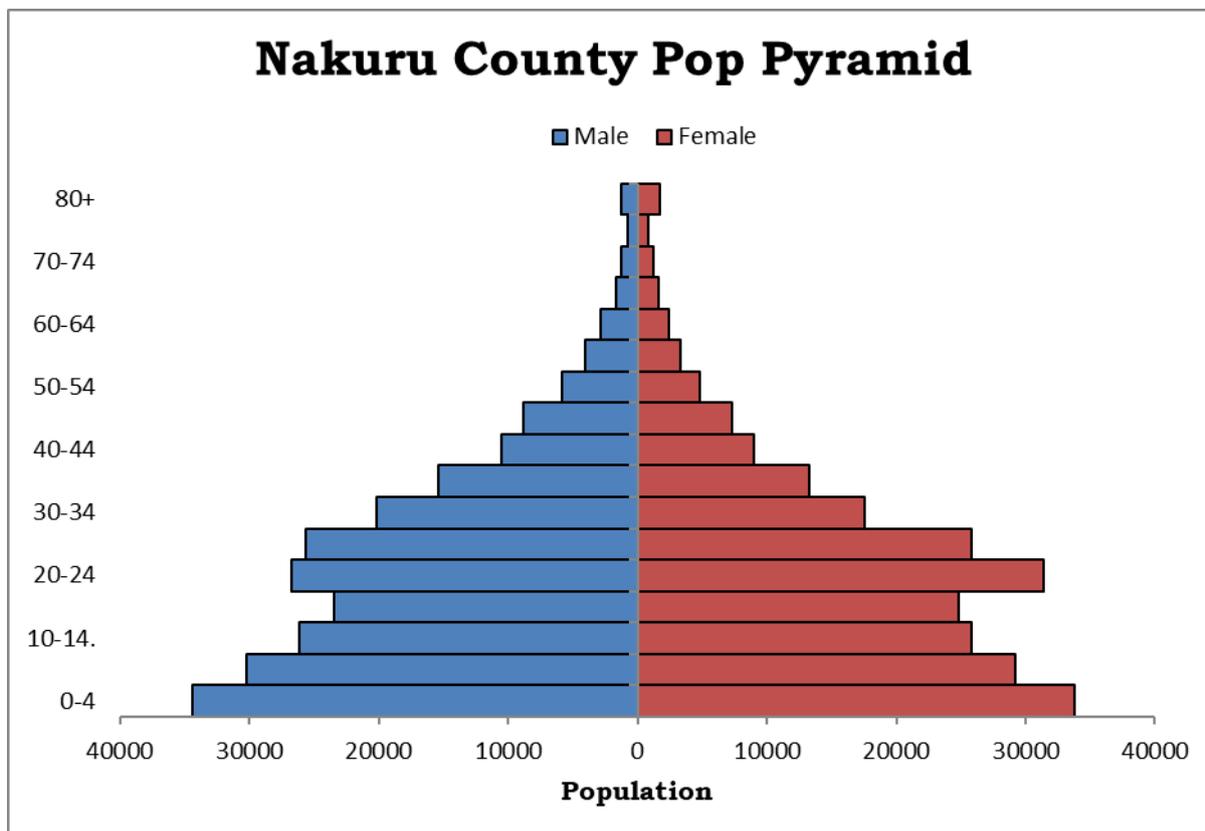


Figure 3.1: County Population Pyramid

SOURCE: 2009 Kenya Population Census

One of the important human development indicators is life expectancy; it is the average number of years a human is expected to live and according to region and era. Currently, a standard of 85 years is viewed as an achievement of this indicator. In Nakuru County, life expectancy at birth is 56 years (2009 census) and is one of the counties with the lowest life expectancy.

Table 3.5: Urban Population in the Largest Towns within the County

Urban centre	Population, 2009	2015	2020	2025	Ranks
Nakuru	307990	368829	428612	498086	4
Naivasha	169142	202553	235385	273539	9
Molo	40651	48681	56572	65741	60
Gilgil	35293	42265	49115	57076	69
Njoro	23551	28203	32775	38087	82
Mai Mahiu	11230	13448	15628	18161	112
Subukia	7309	8753	10172	11820	139
Dundori	5221	6252	7266	8443	166

Urban centre	Population, 2009	2015	2020	2025	Ranks
Salgaa	4740	5676	6596	7666	174
Mau Narok	4357	5218	6063	7046	178
Bahati	3833	4590	5334	6199	184
Rongai	2215	2653	3082	3582	213
Olenguruoni	2119	2538	2949	3427	214

Adapted: 2009 Kenya Population Census

3.5 Demographic Trends

3.5.1 Life Expectancy

The county's crude birth rate stands at 47/1000 as per the year 2009 population census. This translates to approximately 6,735 births in County every year based on the 2009 Kenya Population Census data.

The county's crude death rate stood at 12/1000 as per the 2009 population census. This translates to approximately 1,720 deaths per year in the County as per the 2009 Kenya Population Census data.

3.5.2 Fertility and Crude Death Rates

The crude birth rate of Nakuru County is 40.9 per 1000 population and the total fertility rate is 4.7 children per woman. Teenage pregnancy is still high in the county and nearly a quarter of women aged 15-19 have had children. The total fertility rate is 6.4 children per woman. This implies that on average, a woman who survives from age 15 to 49 is expected to give birth to about six children in the County. This observed total fertility rate is higher than the current national average.

3.5.3 Poverty Distribution

The poverty line is a threshold below which people are deemed poor. In 2005/06, the poverty line was estimated at Ksh 1,562 and Ksh 2,913 per adult equivalent¹ per month for rural and urban households respectively. Nationally, 45.2 percent of the population lives below the poverty line according to 2009 estimates.

3.6 SWOT Analysis

Based on the analysis of the demographic characteristics of the county, several strengths, weaknesses, opportunities, and threats were identified as discussed in Table 3.6.

Table 3.6: SWOT Analysis

Strength	Weaknesses
<ul style="list-style-type: none"> • Concentration of population in urban areas hence more agricultural land in the rural areas. 	<ul style="list-style-type: none"> • High dependency ratio as shown by the high number of people below 15 years of age. • Rapid urbanization: upcoming projects have resulted in speculation on land and employment opportunities attracting people to County.
Opportunities	Threats
<ul style="list-style-type: none"> • The population of age cohorts between 20-45 years is expected to increase more than the other age groups. • More labour due to a youthful population 	<ul style="list-style-type: none"> • High population growth rates due to high fertility rate and high in-migration have resulted in an increase in population which results in a high dependency ratio and pressure on available resources.

Chapter Four : Environment and Natural Resources

4.0 Overview

This section analyzes the natural features and physical characteristics of Nakuru County. The chapter outlines the natural features and resources, climate and environment of the county. The chapter ends with a SWOT analysis of the section.

4.1 Relief, Drainage, and Climate

4.1.1 Topography

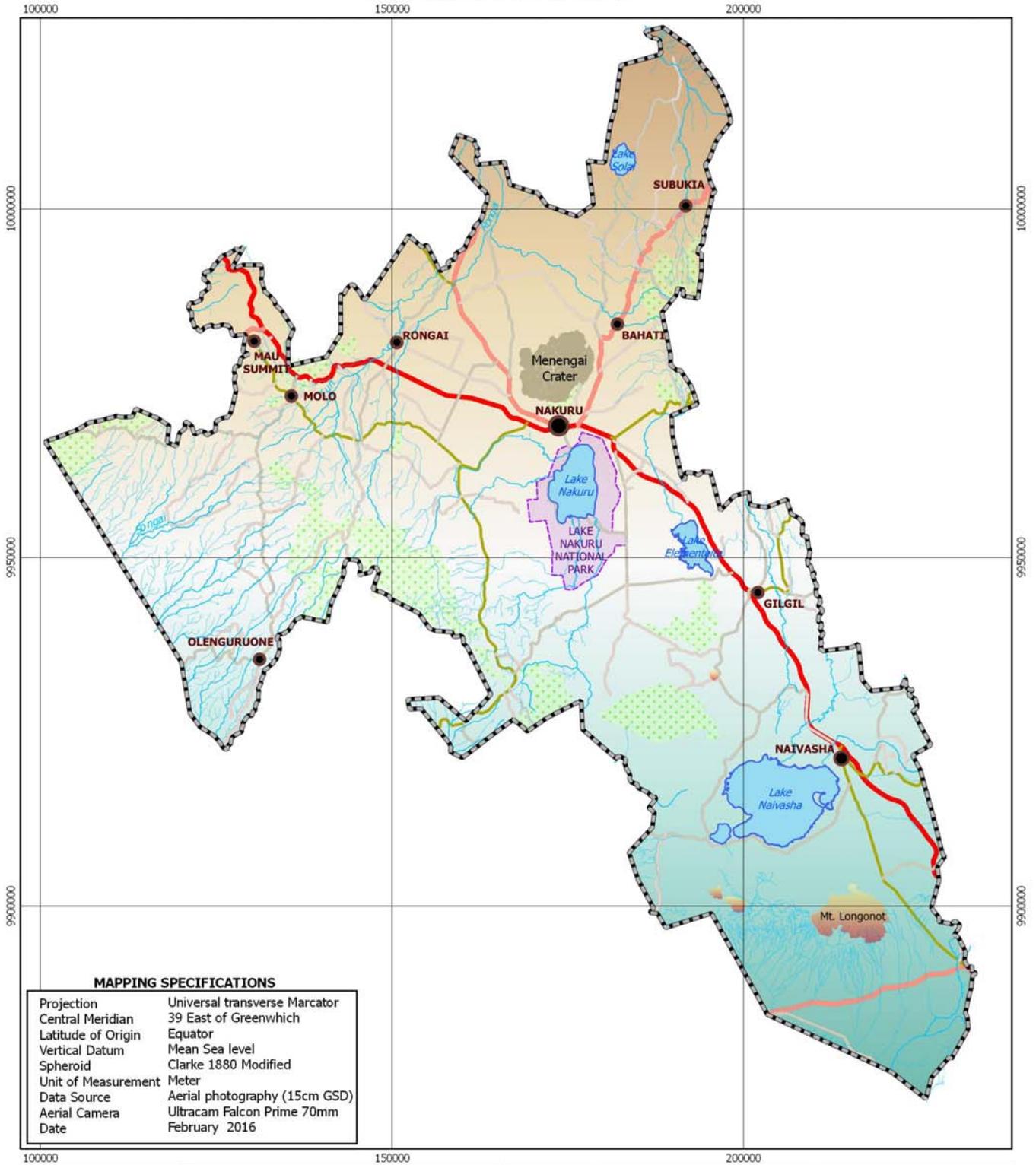
The dominant topographic features in Nakuru County are the Great Rift Valley and its two escarpments. The western escarpment comprises the Mau Hills (3,000 metres above the mean sea level) covering the western part of the county. The Ol Doinyo Eburru Volcano, Akira plains, Menengai Crater are located on the valley floor. The topographic features have developed and influenced an elaborate drainage system comprising a few rivers and various inland lakes on the floor of the Rift Valley (Map 4.1). Nearly all the permanent rivers and streams in the county drain into the valley lakes. The Rift Valley floor slopes gently down towards Nakuru Town in the North West, and towards Mogotio in the North East. The Menengai Crater area lies on the Rift Valley floor that gently slopes northwards; while the southern portion of this mountain slopes southwards.

On the eastern flanks of the county are the Bahati and Marmanet escarpments that form the boundary of the eastern inner rift trough, and are relatively higher and wetter grounds than the rest of the county. The topographic features form an interesting niche for a variety of fauna and flora that provide opportunities for biodiversity conservation as well as great aesthetics for tourist attraction sites. The drainage system divides the Mau Narok on the west and the Nyandarua Range-Kinangop plateau on the east. The rivers running down these escarpments follow terrestrial fractures and fault lines and drain into the valley-floor lakes. The main permanent rivers from the eastern valley escarpments are the Little Gilgil and Melawa. Little Gilgil and Melawa flow into Lake Naivasha; entering at its northern and northeastern shores respectively.

The Karati River near Naivasha town is intermittent; and largely carries floodwater after the onset of heavy rains on the Kinangop plateau. Near Nakuru town on the rift floor from Menengai Caldera, the drainage from the northern rim of this crater flows mainly northwards. The drainage from the southern rim of the crater flows southwards into Lake Nakuru. The permanent rivers in the area are Molo and Rongai in the NW area and the Crater and Olbanita streams in the eastern parts. The N-S, NE-SW, and NW-

SW trending fault/fracture systems provide underground channels resulting to stream water disappearing underground at some places interrupting the Albanita stream at several places.

TOPOGRAPHICAL FEATURES



MAPPING SPECIFICATIONS

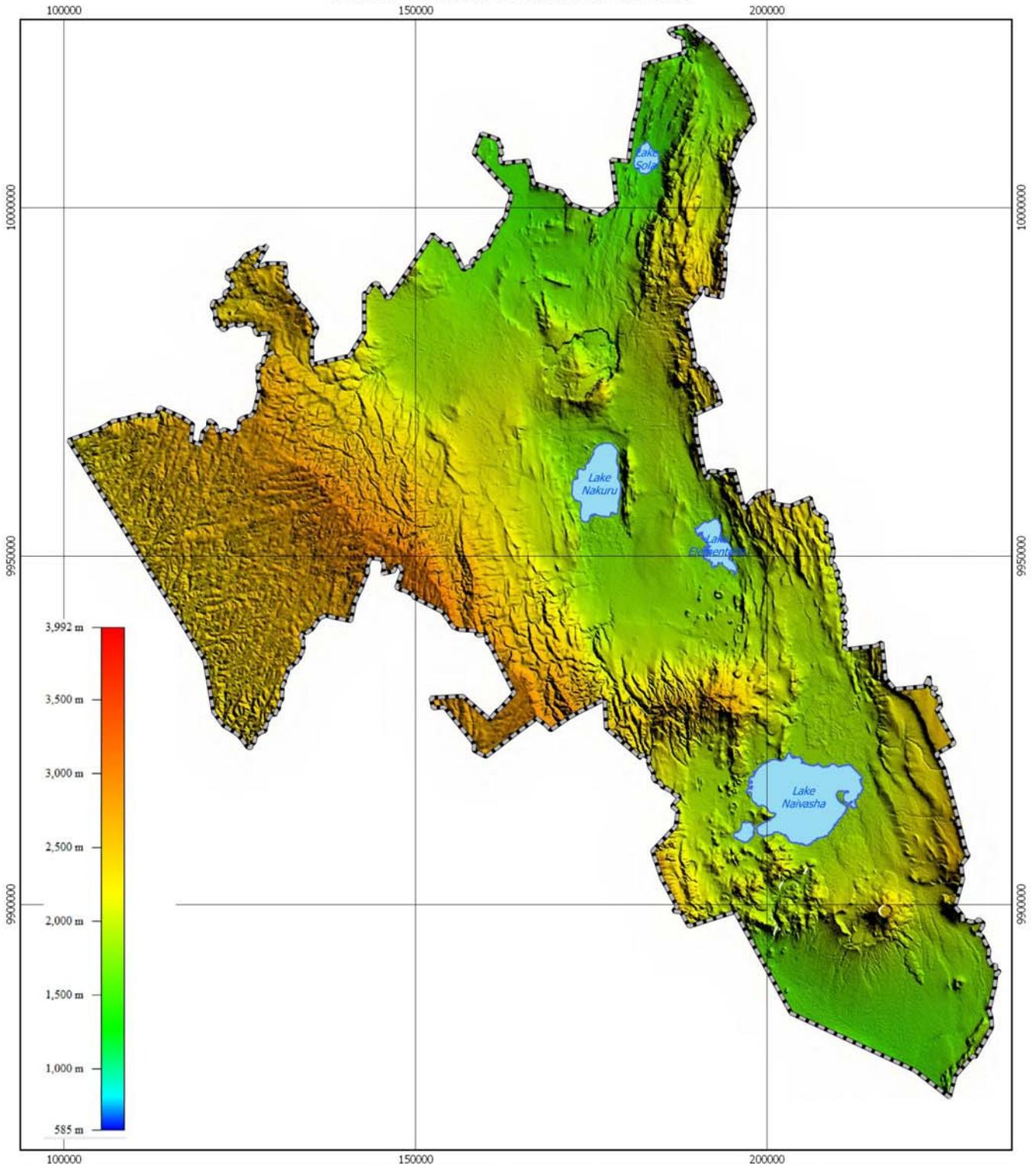
Projection	Universal transverse Mercator
Central Meridian	39 East of Greenwich
Latitude of Origin	Equator
Vertical Datum	Mean Sea level
Spheroid	Clarke 1880 Modified
Unit of Measurement	Meter
Data Source	Aerial photography (15cm GSD)
Aerial Camera	Ultracam Falcon Prime 70mm
Date	February 2016

 Nakuru County Government	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> County HQ Municipality Sub-County HQ Road Class A Road Class B Road Class C Main River Tributary River Lake Forest Hill Park Crater 	<p>LOCATION MAP</p>  <p>Scale 1:750,000 Date: October 2019</p>	 GEOMAPS Geoinformation Services <hr/> INTERNATIONAL GEOMATICS CONSULTANCY Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com. <small><i>This map is not an authority on boundaries</i></small>
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Map 4.1 : Physical and Topographic Features

SOURCE: Geomaps and Habitat Planners

NAKURU COUNTY DIGITAL ELEVATION



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Lake Nakuru County 	<p>Scale 1:750,000</p> 	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.2: Digital Elevation of Nakuru County showing Major Relief Features

SOURCE: Geomaps and Habitat Planners

4.1.2 Climate

The climate of Nakuru County is strongly influenced by altitude and physical features. The county has a bimodal rainfall pattern mainly influenced by the Inter-Tropical Convergence Zone (ITCZ). The short rains falling between October and December forms about 30% of the annual amount while the long rains fall between March and May forming 70% of the annual amount. Mean annual rainfall is highest (over 1600 mm) on the Mau forest zone and Mau summit and decreases towards the central part of the county ranging between 1200 mm and 1600 mm. The area around Lake Elmentaita southwards receives between 600mm to 800mm per annum while the drier parts are within Akiira ranch and parts of Naivasha which receive between 400 mm to 600 mm per annum.

As may be noted in the case for Naivasha station, the classical bimodal mean annual rainfall distribution does not occur as one approaches the southern sub-humid portion of the county. The temperatures in the county are influenced by relief ranging from a high of 29.3°C between the months of December, January, February, and part of early March to low temperatures of up to 12°C during the month of June and July. Molo and Kuresoi Sub-Counties are relatively cold while Naivasha, Gilgil, and parts of Rongai Sub-Counties experience extremely hot weather. The direction of the wind is predominantly from east to west, although the western parts of Mau are influenced by warm moist air originating over the Congo which may occasionally blow eastwards as far as parts of the Rift Valley. Figure 4.1, 4.2 and Map 4.3 below shows the annual distribution of rainfall with Nakuru County.

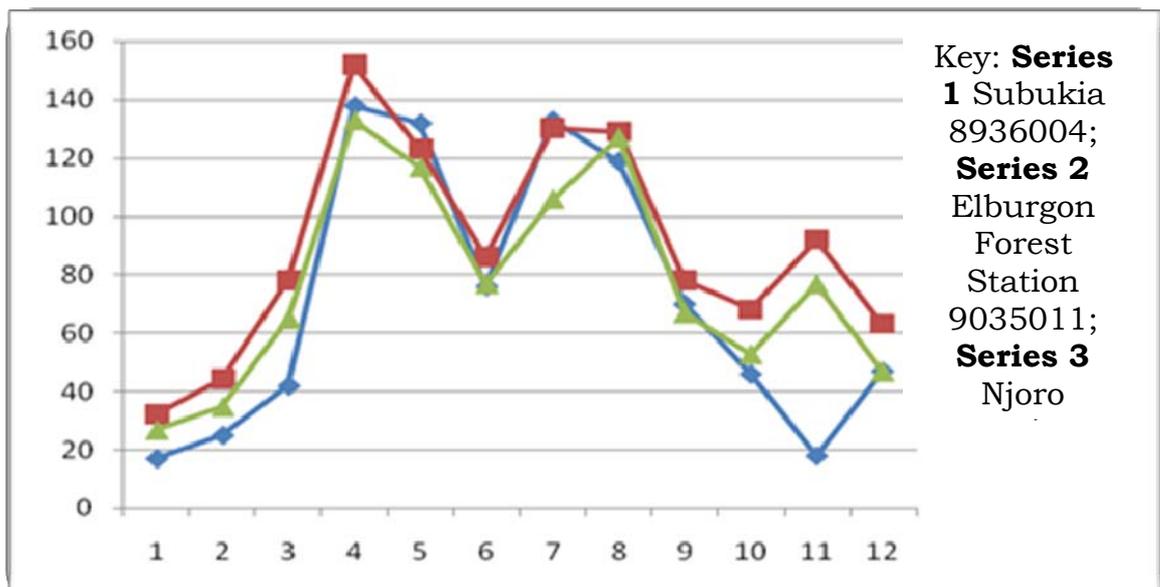


Figure 4.1: Mean monthly rainfall for Subukia, Elburgon Forest Station, and Njoro Stations

The bimodal distribution of mean annual rainfall is markedly strong: the cases are shown in figure 4.2

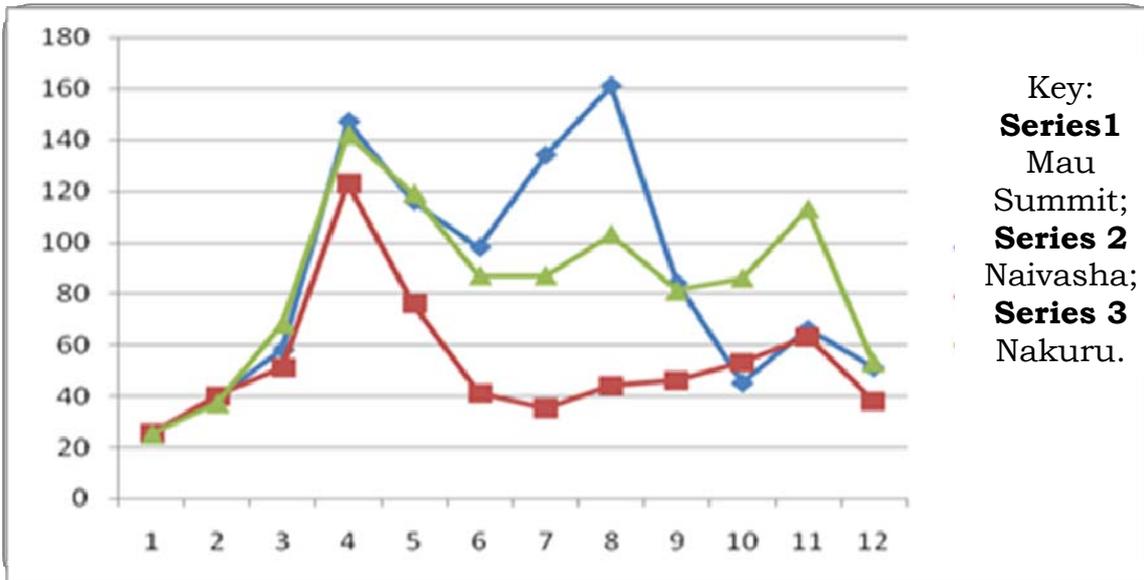
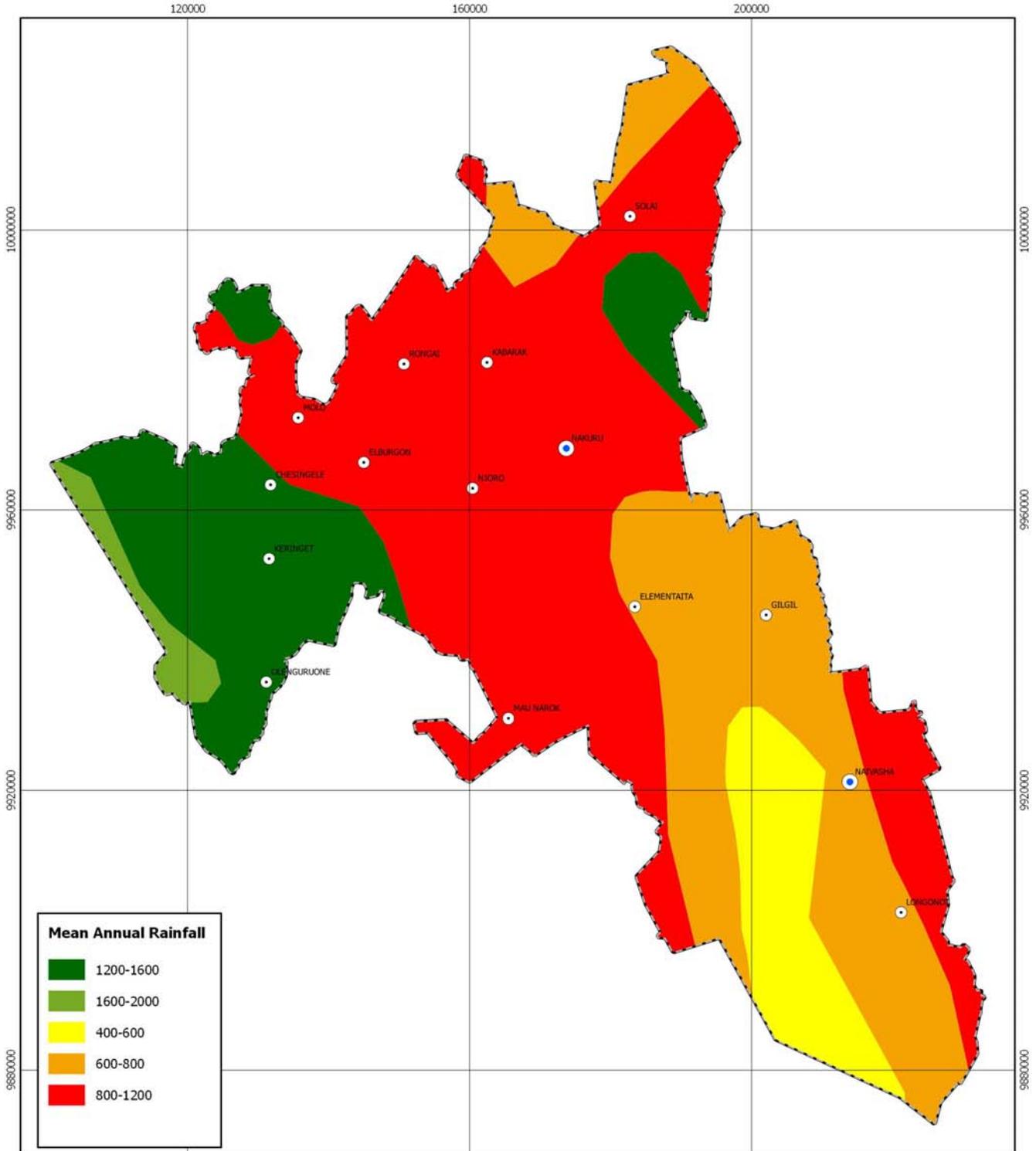


Figure 4.2: Mean monthly rainfall for Mau Summit; Naivasha, Nakuru Stations

NAKURU COUNTY MEAN ANNUAL RAINFALL DISTRIBUTION



<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Major Town Other Town 	<p>LOCATION MAP</p> <p>Date: October 2019</p>	<p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829, 2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
	<p>Scale 1:750,000</p>			

Map 4.3: Mean Annual Rainfall Distribution
 Source: Adapted from International Livestock Research Institute

4.1.3 Agro-Ecological Zones

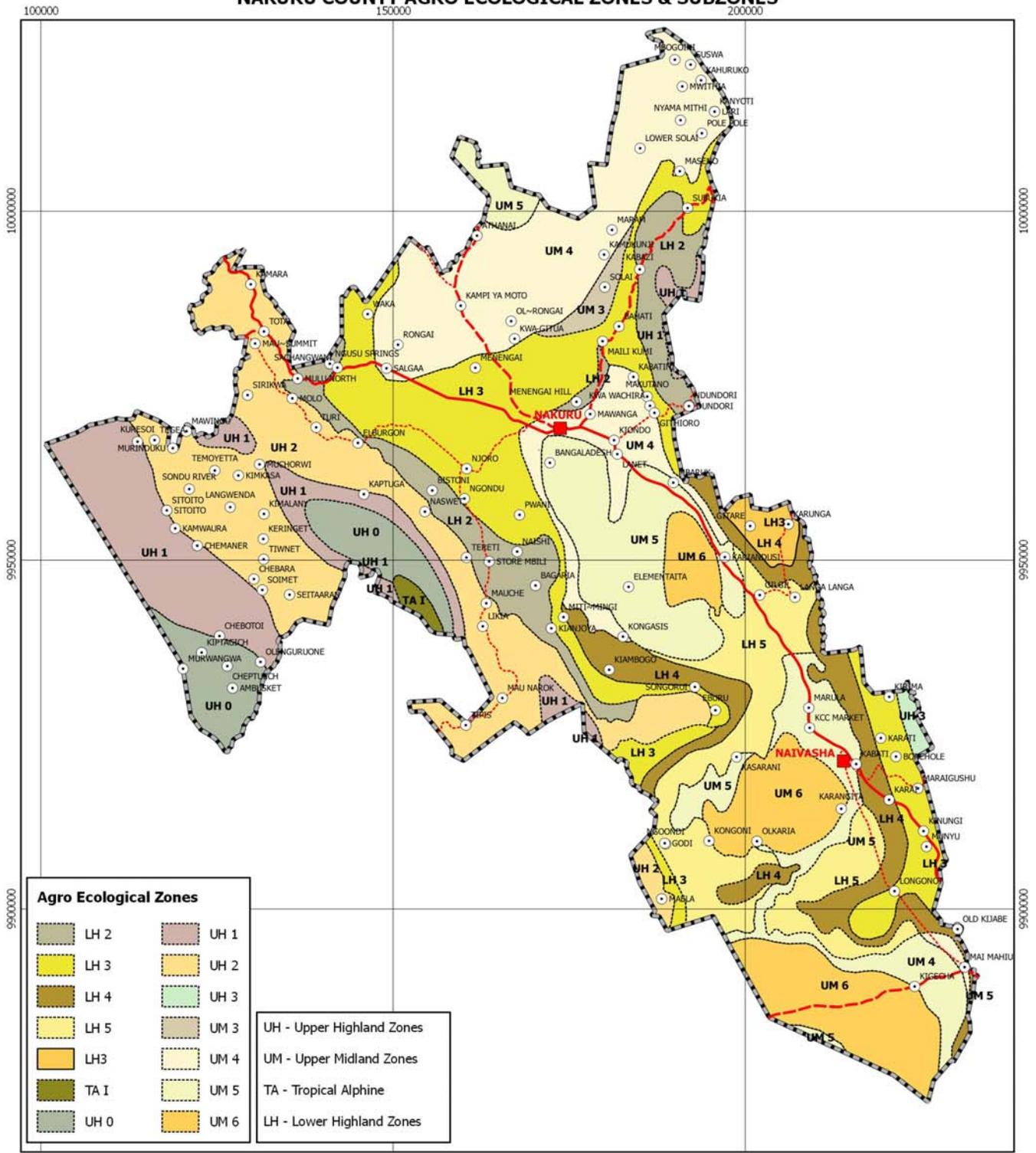
There are three broad climatic zones (II, III and IV). Zone II which cover areas with an altitude between 1980 and 2700 m above the sea level and receives minimum rainfall of 1000mm per annum. This zone covers Upper Subukia, Rongai and Mau Escarpment.

Zone III receives rainfall of between 950 and 1500 mm per annum and covers areas with an altitude of between 900-1800m above sea level. This zone covers most parts of the county and is the most significant for agricultural cultivation. Zone IV occupies more or less the same elevation (900-1800m) as Zone III. However, it has a lower rainfall of about 500-1000mm per annum. This zone dominates Solai and Naivasha areas.

The land use pattern in the county follows the spatial distribution of agro-ecological zones. The climate of Nakuru County is strongly influenced by the altitude, physical features and Inter-Tropical Convergence Zone (ITCZ). The climate ranges from cold and humid, to arid and semi-arid typical characteristics of the Rift Valley floor. The Mau Escarpment with an average altitude of 2,400m above sea level is very important because most of the forests are located on it. Map 4.4 provides a detailed classification of the Agroecological zones adopted from *Farm Management Handbook of Kenya*, (1978). Table 4.1 summarises the broad characteristics of each Agro-ecological zones (AEZ). The AEZ Tropical Alpine (TA) forms the Highlands zone where forests and swamps dominate, Upper Highland Zones (UH) sheep and dairy keeping predominates, AEZ lower Highlands Zone (LH) includes a wide range of agro-economic activities that include the wheat-maize-pyrethrum crop regimes to ranching may be undertaken here. The AEZ IV comprises the Upper Midland Zones (UM) with the mean annual rainfall of 300mm to 1200mm. There are three broad agro-climatic zones marked in Table 4.1.

Table 4.1 shows a considerable gradient in rainfall depending on altitude and topography. The mean annual rainfall of Nakuru County is 750 mm, with short rains occurring during the months of October to December, and the long rains occurring between March and May. During the long runs, the county experiences convectional rainfall. These rains occur mainly in the afternoon and are characterized by heavy storms that may last between ten minutes to one hour. These storms have high erosive energy which is rated as among the highest in Kenya. This is a significant fact to consider when regulating the forest cover in mitigation of deforestation. The mean annual evaporation is 1,800 mm, which is three times the mean annual rainfall. The general decrease in rainfall from the crest of Mau Range towards the floor of the Rift Valley is steep but predictable. (Odada, et al. nd)

NAKURU COUNTY AGRO ECOLOGICAL ZONES & SUBZONES



Agro Ecological Zones			
	LH 2		UH 1
	LH 3		UH 2
	LH 4		UH 3
	LH 5		UH 4
	LH 6		UH 5
	TA I		UH 6
	UH 0		

UH - Upper Highland Zones
UM - Upper Midland Zones
TA - Tropical Alpine
LH - Lower Highland Zones

<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Major Town Other Town Road Class A Road Class B Road Class C 	<p>LOCATION MAP</p>	<p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p>
	<p>Scale 1:750,000</p> <p>Date: October 2019</p>		<p>This map is not an authority on boundaries</p>	

Map 4.4: Agro-Ecological Zones

SOURCE: Modified from Farm Management Hand Book of Kenya, 1978

Table 4.1: Characteristics of the AEZ

	AEZ	Altitude (m)	Rainfall (mm)	Mean annual temperature (°C)	County coverage	Area (km²)
1.	Tropical Alpine (TA)	2980-3050	1200-1900	10.5 - 9.9	Molo, Olengurueni, Njoro	31
2.	Upper Highland Zone (UH)1	2400-2970	1200-1950	14.5-10.6	Mau Narok, Mau, Bahati Forest, Olengurueni	282
3.	Upper Highland Zone (UH) 2	2310-2500	1000-1400	13.7-12.0	Molo South, Mau Summit, Keringet, Olengurueni	756
4.	Upper Highland Zone (UH) 3	2310-2400	950-1200	14.9-13.7	Mau Narok, Olengurueni	111
5.	Lower Highland (LH) 2	2070-2400	850-1100	16.7-14.5	Kabazi. Ndundori, Mau Narok	255
6.	Lower Highland (LH) 3	1890-2490	800-900	17.5-15.7	Njoro, Ngatia, Menengai, Naivasha, Subukia	834
7.	Lower Highland (LH) 4	1890-2110	650-800	17.5-16.6	Rongai, Naivasha, Upper Gilgil	555
8.	Lower Highland (LH) 5	1840-2000	100-1200	17.8-16.6	Gilgil, Naivasha, Karati	582
9.	Upper Midland (UM) 3	1830-1950	300-1100	18.5-17.5	Bongoine, Bahati	46
10.	Upper Midland (UM) 4	1500-1950	700-900	21.0-18.6	Weseges, Lower Solai, Kampi Ya Moto	662
11.	Upper Midland (UM) 5 & UM6	1650-1820	550-700	19.6-18.3	Lake Naivasha, Mbaruk, Longonot	1064
12.	Upper Midland (UM) 5 &6	1480-1550	650-900	19.8-18.5	Mbogoini	9

SOURCE: GoK. 2009. *Farm Management Handbook of Kenya, Vol.II/B Central Kenya (Rift Valley and Central Province)*. Government of Kenya, Nairobi.

4.1.4 Climate Change

Extreme events and variability of weather are now common in Nakuru County. Recently, the seasonal rainfall over Nakuru County has become irregular and unpredictable; some areas experience frequent droughts during what is expected to be the long rainy season, others have severe floods during what used to be the short rains (MoALF. 2016). During the period 2021-2065, prolonged moisture stress is projected to occur across the county. Floods that occurred in 2011 nearly doubled Lake Nakuru's

total area (Onywere, et al 2012). In 2015, other floods brought about catastrophic effects on the urban and rural communities in the county, when more than 200 homes were destroyed and hundreds of acres of crops were uprooted due to flooding (Daily Nation, 2015). The cycle of floods is matched by serious droughts that affect more than 90% of the County, leading to water rationing and other coping mechanisms when these dry spells occur.

Climate change has already been observed in the County. Since 1981, the first wet season has experienced a moderate (1°C) increase in mean temperature. This causes a change in the crop cycle, a significant increase in heat stress days, and lack of increased precipitation. The second wet season experienced a mild increase in temperature (~0.5°C), and there was no change in precipitation. Temperature is projected to increase by 0.3°C, while rainfall is projected to increase by 0.3% in the first wet season, and 6% in the second wet season (MoALF. 2016).

4.1.5 Soils

Nakuru soils are dependent on the geology of the Rift Valley. This geological configuration includes several Lakes like Nakuru, Elementeita, and Naivasha. Lithology, and topography comprises mountain, hills, uplands, plains, escarpments, and footbridges. The predominant underlying rock is volcanic; but varies according to its age and chemistry between basicity, ultra-basicity, pyroclastic, undifferentiated, etc. This is as shown in Table 4.2 and spatial illustration further given in map 4.5.

A variety of soils occur on the hills and minor scarps. The most extensive areas are those of unit HV1. In addition, unit HPC with humid topsoil occurs. Associated with the escarpment are a number of plateaus on either side of the Rift Valley. Unit LP1, of high fertility, occurs frequently. Unit LuP1, of high fertility too, is found in large areas, and also unit LsB1 of moderate to high or variable fertility. Northeast of Nakuru, unit LPC with a very thick humid topsoil occurs.

In the uplands, such as the Molo area, the northeast, and west of Nakuru, units UP2, LvP1, PvP2, PvP3 and RPA of high fertility are common. Unit UV2 of variable fertility is associated with the hills. Smaller areas are composed of soils of units UBP1 with humid topsoil and BP1 of low to moderate fertility. Lacustrine plains are common around the lakes. Here, the soils of unit P1U1 have low fertility. Associated with this unit are soils of unit P1PC, of moderate to high fertility. They may have humic topsoil. Smaller areas of the volcanic plains, south of Longonot and Suswa are composed of unit PvP4.

Table 4.2: Soils Types and Soil Fertility

No	Geological basis	Relief (Topography)	Soil characteristics	Soil types	Fertility classification
1.	Volcanic Lava	Mountains and major scarps	MV4, MV2, and MV5	Regosols, Andesols	Moderate to high fertility (apart of the rocky land).
		Hills and minor scarps	HV1, HPC	Andesols, Cambisols, Regosols	-
		Plateaus	LuP1, LsB1	Phaeozems, Planosols, Cambisols, Andesols	High to moderately high
		Uplands, volcanic plains	UP2, LvP1, PvP2, PvP3, and RPA	Andesols, Regosols	High
			UV2		Moderate fertility with hills
	UBP1, BP1	Low to moderate			
2.	Lacustrine	Plains	P1U1	Solonetz	Low
			P1PC	Phaeozems, Cambisols	moderate to high fertility
3.	Volcanic	Plains	PvP4		
		Bottomlands	BP1	Planosols	Low to moderate
			BV1	Vertisols	moderate to high fertility

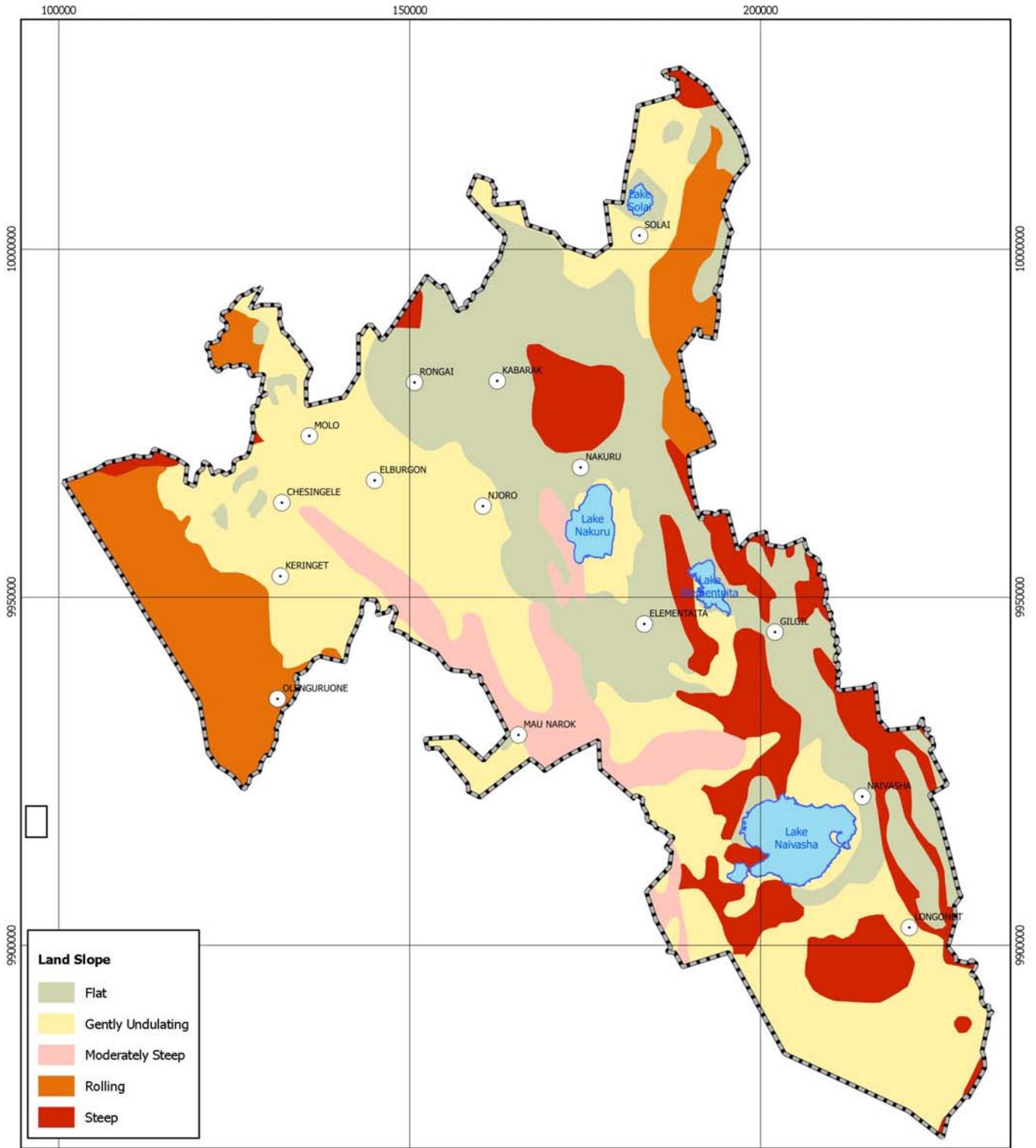
Bottomlands occur within some of the plateaus, e.g. unit BP1 of low to moderate fertility. In the extreme north of Nakuru District, some areas with unit BV1 of moderate to high fertility are found.

The soil pattern in the county presents a complex distribution influenced by climate, age of rocks, volcanic activities and underlying rock type. These main soil classifications include Andosloic which are well-drained, very deep, dark reddish-brown to dark brown, and very friable and smeary, clay loam to clay, with a thick acid humic topsoil; in places shallow to moderately deep and rocky. Some are a partly lithic phase. Latosolic soils are the well-drained red volcanic soils commonly found in upper Subukia valley and imperfectly drained loam with dark brown subsoil covers commonly in Njoro, Nakuru Central Elementaita, and Maai Mahiu in Naivasha areas with fertility ranging from moderate to high. Infiltration rates are reasonably high. Planosolic soils comprise of poorly drained dark brown clay soils with highly developed textured topsoils as well as well-drained humic lawns with dark brown subsoils. These soils are classified as fertile. Areas covered under these soils range from Olenguruoni in Kuresoi, Molo, Rongai and parts of Njoro.

Alluvial and Lacustrine deposits are shallow soils resulting from volcanic ash sediments as well as other sources. They occupy the Rift Valley bed in Lake Nakuru, Lake Naivasha, Lake Elementaita, Solai, and the Menengai Crater as well as the adjacent areas to these features. Their fertility ranges from low to moderate. Regosolic soils that are excessively drained to well-drained, very deep, dark greyish brown to olive-grey, stratified, calcareous, loose fine sand to very friable sandy loam or silt. Phaeozems are well-drained, very deep, dark reddish-brown to very dark greyish brown, friable and slightly smeary clay, with humic topsoil. Soil depth is a balance between land forming processes and erosion over time.

Soils on mountains and hills are excessively drained, shallow to moderately deep while those from uplands and plateaus are well-drained, deep to very deep. Soil susceptibility to erosion is dependent on the gradient and rainfall amount. The mountains and major scarps, hills and minor scarps, plateau and the uplands experience high to very high susceptibility to erosion once natural vegetation is cleared for cultivation. Map 4.6 and 4.7 gives spatial dimension on soil erodability within the county. Infiltration, runoff, and soil loss are largely linked to watershed land use, management conditions, slope steepness and length. Land under forested cover (indigenous and plantation forest) will register high infiltration, low runoff, and low soil loss.

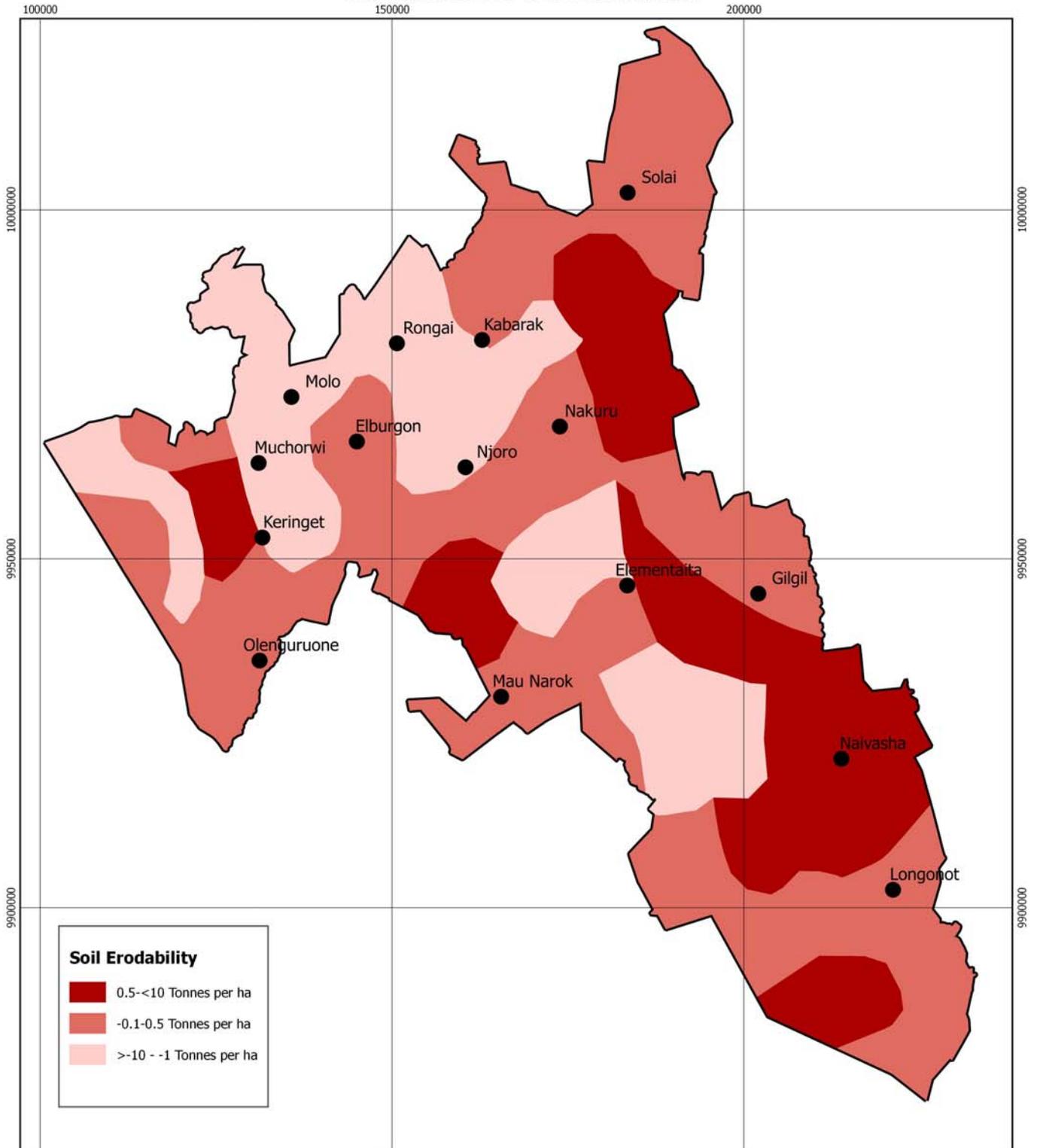
NAKURU COUNTY LAND SLOPE AND ESTIMATION OF SOIL



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ● Major Town ■ County 	<p>Scale 1:750,000</p> 	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geofafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.6: Land Slope and the Estimation of Soil Erodibility
Adapted from Various sources

DISTRIBUTION OF SOIL ERODABILITY



Soil Erodability

- 0.5-<10 Tonnes per ha
- 0.1-0.5 Tonnes per ha
- >-10 - -1 Tonnes per ha

<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ● Town □ County Boundary 	<p>Scale 1:750,000</p>	<p>LOCATION MAP</p> <p>Date: October 2019</p>	<p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><small>This map is not an authority on boundaries</small></p>
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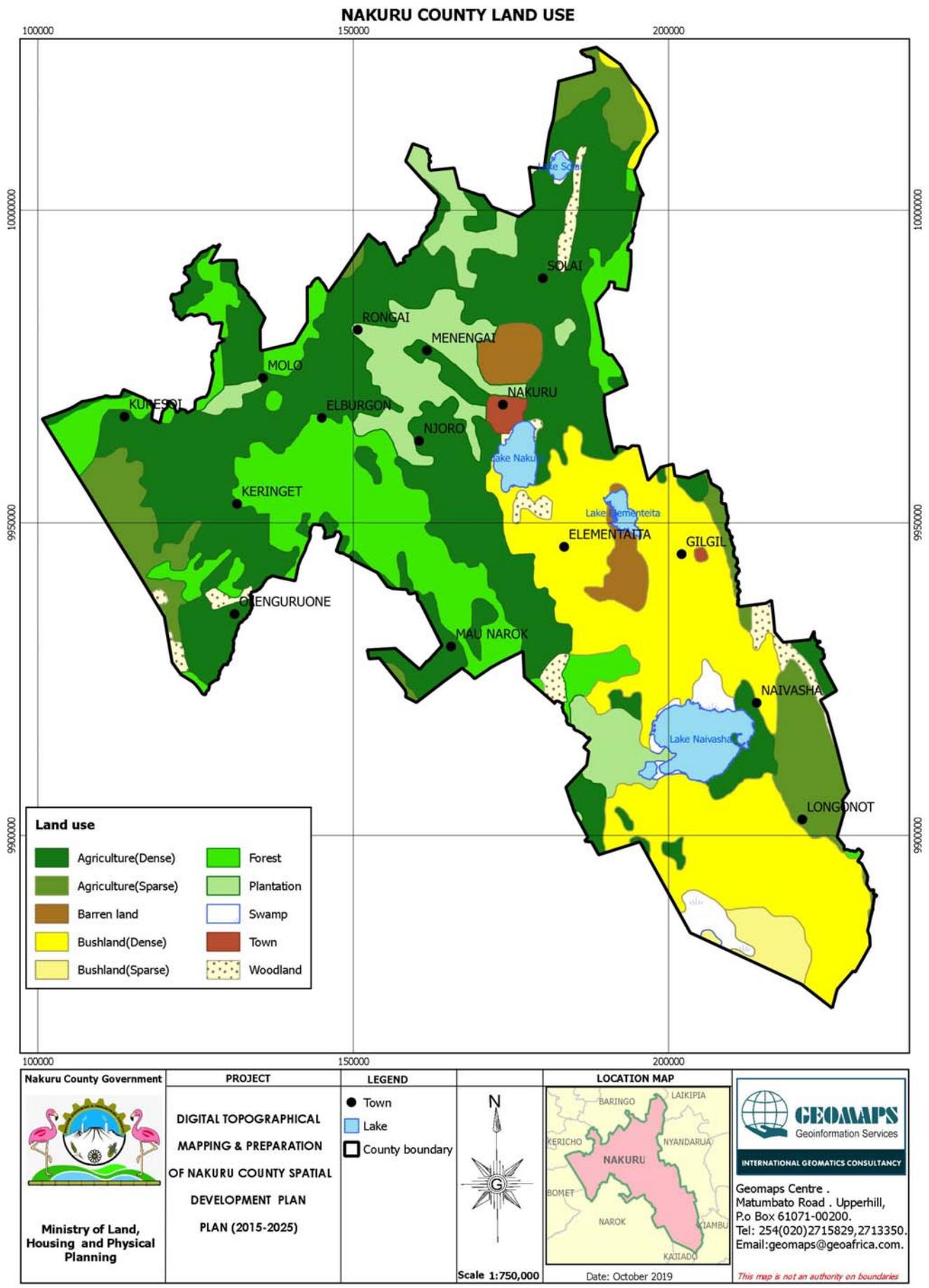
Map 4.7: Distribution of Soil Erodability
Adapted from Various sources

While areas, where the catchments had land use characterized by loss of land cover and disturbed soil surface conditions, experienced high runoff, low infiltration and high rates of soil loss. Soils on plains fell on two extremes, namely, those that were well-drained and deep to very deep and those that are imperfectly drained to poorly drained, moderately deep to very deep. Physical, chemical and biological land degradation likely takes place in the different physiographic units and landforms at varying degrees. Soil erosion, nutrient depletion, and vegetation depletion are the most important forms of degradation. The terrain map was developed so that the relationship between land gradient and soil erodability could be identified. Maps 4.1 and 4.2 show the configuration of the terrain map of Nakuru County

4.1.6 Land Use

The land topography in Naivasha and Gilgil Sub-Counties is characterised by mountain ranges and savannah vegetation cover that support various species of wildlife. Limited information on the best agricultural practices yielding high harvests, controlling loss of soil fertility and polluting the environment. Conservation tillage which involves leaving at least 30% of the crop waste in the land surface is one of the best practices that soil experts and agriculturalists in the country advise farmers to adopt to boost their harvests. The practice of burning crop waste is still practiced and yet it destroys soil productivity. Map 4.8 illustrates further environmental land uses.

Stakeholder's complaints about air pollution could not be confirmed. Soil pollution has not been examined. However, sulphur oxides in the air react with atmospheric gases and may cause acid rain. Environmental impact assessments may need to be done in view of the increased number of well and power plants to mitigate the environmental effects associated with geothermal exploration gases. The present report has not come up with any mitigation measures.



Map 4.8: Land Use

Source: Adapted from, Ralph Jaetzold and Helmut Schmidt: Farm Management Handbook of Kenya
 It should be noted that the area covered by Bush land around Gilgil and Longonot is where we have seen the expansion of wildlife ranches.

4.2 Regional Geology

4.2.1 Structural Features

The natural resource of Nakuru Country is closely associated with the geological history of the Great Rift Valley. The Great Rift Valley (GRV) whose formation dates from the late Oligocene period dating 30-35 million years ago (MacDonald, 2003) was a result of an initial domal uplift of about 300 m (Baker and Wohlenberg, 1971), and may have been as a result of the magmatic bulge in central Kenya thus forming a dome (Figure 4.3). This geographical upwelling was created by the interactions of three major tectonics along which the Nubian and Somalian plates are pulling away from the Arabian plate. The domal bulge was followed by rifting along the divergent tectonic plate boundary, at an average rate of about 2.0 to 3.0 mm annually, involving vertical displacement of series of faults currently observed as dissected scarps some as high as 1370m around Lake Bogoria (Smith, 1994). The Achaean and Proterozoic basement terrenes were responsible for the structural character of the rift (Simiyu and Keller, 2001).

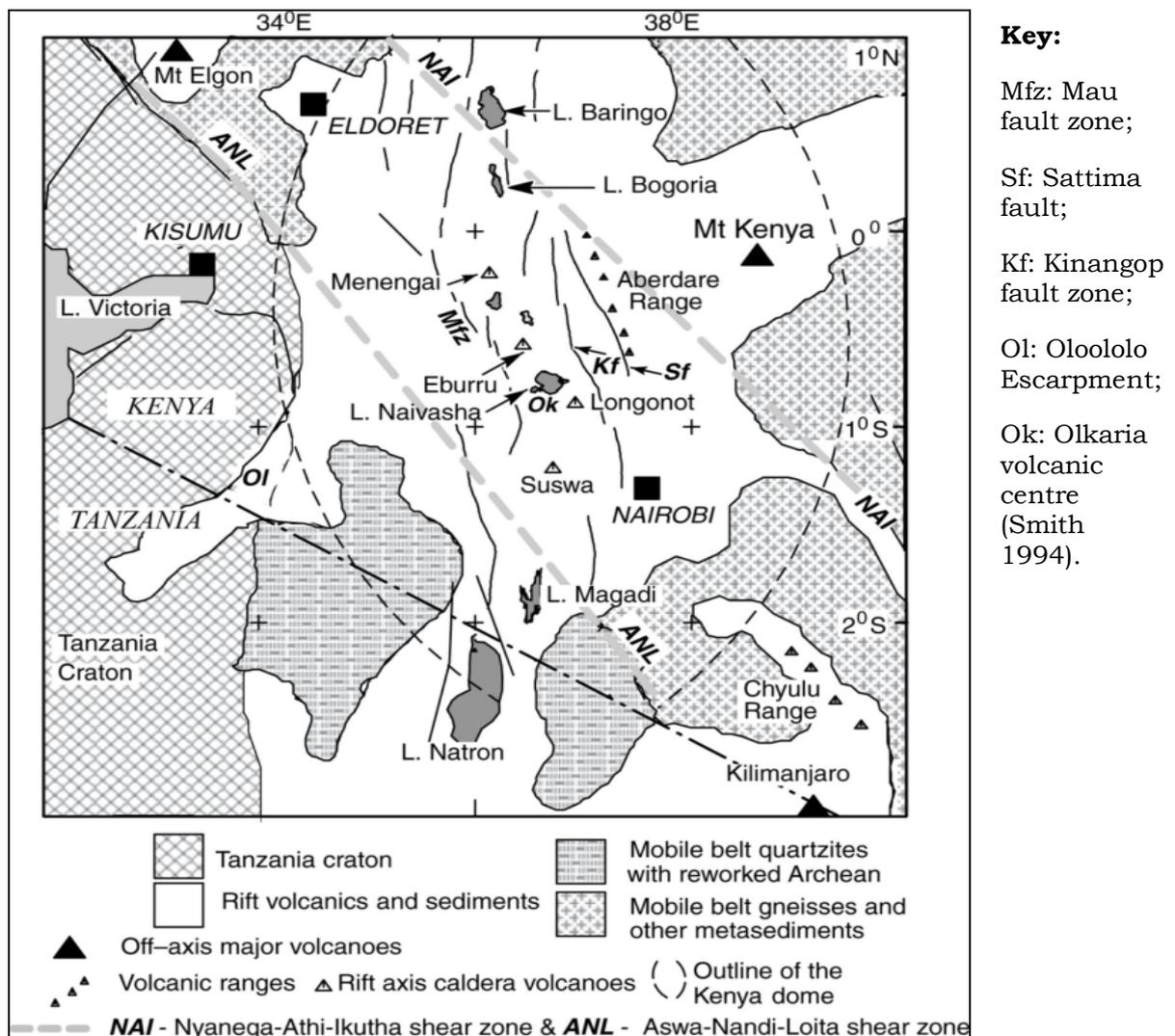


Figure 4.3: Tectonic Figure of the southern Kenya rift showing the surface distribution of the major lithologic units

Table 4.3: Geological and Structural Succession

Period	Volcanic Rocks & Sediments	Igneous Intrusive	Tectonic Episodes
Recent	Superficial deposits, soils and alluvium. Upper Menengai Volcanic: Trachyte (lava flow and scoria cones) -----Weak unconformity ----- -- Gamblian sediments of Nderit and Makalia		
Pleistocene	Tuffs and sediments - Nakuru Basin, Tuffs and fluvial sediments- Mugurini, Pumice showers from Menengai. Pumice Tuffs, welded tuff 'Ignimbrite' and sediments forming unconformable outliers on the Kinangop and Bahati tuffs.	Syenite boulders on Menengai slopes	Minor Faulting - Solai, Marigat, and West of Nakuru Major Faulting. Unconformity
Tertiary	Pliocene: Kwaibus basalt, Kisanana sediments, Mau Tuffs, Bahati Tuffs, Kinangop Tuffs, Lower Menengai Volcanic Series. Miocene: Rumuruti phonolite, Samburu Series, Simbara Series.		Major Faulting Major Faulting Warping Unconformity
Precambrian	Basement System		Precambrian Orogenic movements

SOURCE: (extracted from McCall, 1967)

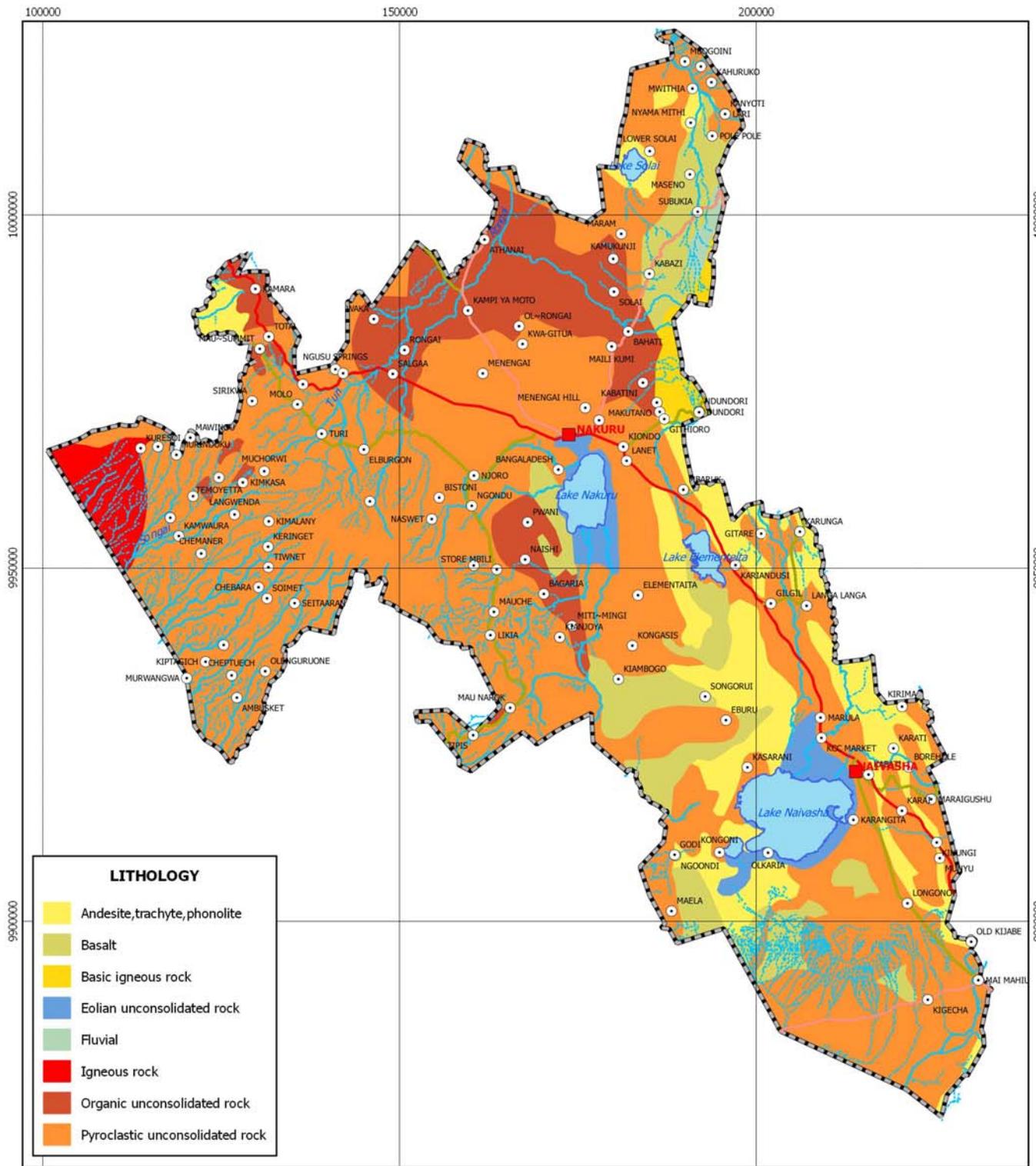
Volcanism was followed by faulting during the Miocene period (Baker and Wohlenberg, 1971). Later eruptions during Pliocene period was followed in four principal phases of which the first phase was during 3.7-3.4 million years ago forming the Mau-Kinangop tuff ash flows (Baker et al., 1988). The first round of vulcanicity and rifting created grabens, fault scarps and hollows that are presently occupied by lakes (Thompson and Dodson, 1963). Much of the volcanic rocks that occur on the eastern highlands areas are composed of varied assortment of tuffs, phonolites, basalts and trachyte (McCall, 1967). The third phase was along the western Mau highlands are composed of Tertiary lava dating from mid-Miocene period. These are overlain by recent (quaternary) volcanic that occurred during the fourth and last phase of vulcanicity triggered by a possible convecting mantle, opening up fractures which served as conduits in the southern portion (McCall, 1967). Late quaternary volcanic activity was concentrated in the axial region of the rift valley and resulted in the formation of many large shield volcanic episodes of decreasing magnitude occurring between Miocene, Recent period and includes Menengai (2278 m), Eburru (2840 m), Suswa (2356 m) and Longonot (2776 m), and smaller rhyolitic domes and basaltic lava flows such

as at Olkaria (2440 m). The Rift Valley Mountains have high geothermal energy and conservation values.

4.2.2 Lithology

Lithology is important for characterisation of rocks mainly for the identification of mineral resources. Three rock types that are described here includes sediments, consolidated or unconsolidated, volcanic and igneous rocks that are products of a series of faulting, vulcanicity and erosion and sedimentation. Map 4.9 shows the spatial distribution of rocks within the county.

NAKURU COUNTY LITHOLOGY



 <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town ○ Other Town — Main River - - - Tributary River — Road Class A — Road Class B — Road Class C ■ Lake 	 <p>Scale 1:750,000</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geofafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.9: Lithology: Spatial Distribution of Rock types
SOURCE: Geomaps/Habitat

Structurally, the major faulting episodes occurred after the Miocene, Pliocene and after the Lower Pleistocene vulcanicity (Table 1) in which north-south, east-west and northeast-southwest trending faults and lineaments swarm the area and the earliest eruptions were the most extensive. Minor renewals of movement occurred later than the middle Pleistocene while the recent eruptions were of very small magnitude. The zone of vulcanicity and movement activities also became progressively narrower southwards. Throughout the long history of repeated Cainozoic eruptivity, two suites of lava erupted—a weakly alkaline basic suite with ultra-basic associates and an alkaline intermediate suite of strongly sodic character (McCall, 1967). The position of these fault lines and vulcanicity has a significant impact on groundwater resources, human settlement and vulnerability to earthquakes. Nakuru town is located south of the Menengai crater and its associated faultscapes with frequent local seismic activity on the western zone of the town, the western side of the Central Commercial District (CBD) around Ngata, Kiamunyi, and Rift Valley Institute of Science and Technology.

The Menengai Crater consists almost exclusively of trachytes (Clarke and Woodhall 1987) followed by fault movements, and an erosion period in which the sediment accumulated unconformably between volcanic rocks. A major faulting episode succeeded, forming Menengai caldera with a summit elevation 2278 m. The volcano was formed about 200,000 years ago with the growth of a 30 km³ volume lava shield was followed by the eruption of two voluminous ash-flow tuffs, each preceded by major pumice falls. The 12 x 8 km caldera formed 7,350 years ago. More than 70 post-caldera lava flows cover the caldera floor. The sequence of tectonic activities started with minor vulcanicity in the Menengai shield, followed by the eruption of trachyte cinder cones and lava flows. Some of these minor faults have been eroded thus opening new fractures whenever it rains.

Mount Longonot, another dormant strato_volcano, also called a composite volcano, is characterized by a steep profile and associated with past periodic and explosive eruptions. The acidic or high in silica to intermediate (rhyolite, dacite, or andesite) lava flow was viscous and cooled and hardened before spreading very far. Longonot is estimated to have last erupted in the 1860s. On the other hand, Mount Suswa is a double-cratered shield volcano made up of two calderas; the inner (younger or smaller) caldera and the outer (older or major) caldera. The outer caldera measures about 10 km in diameter and has a general ENE-WSW orientation. The inner caldera has a diameter of about 4 km and a central resurgent block that measures about 3 km in diameter. The mountain erupted within the last 10,000 years and is 2,356 m high. Through monitoring of volcanoes in the Rift Valley in Kenya, subsidence of 2–5 cm occurred at Suswa and Menengai over the period 1997–2000, while about 9.0 cm of uplift was recorded at Longonot in 2004–2006 (Briggs et al, 2009).

Ol Karia Domes are the best researched group of mountains in the county. Their last known eruption is dated about 1770± 50 years. The Olkaria volcanic complex comprises up to 80 individual commenditic and other peralkaline rhyolitic centers. A thick, geochemically diverse basal complex is overlain by a dominantly silicic lava-dome and lava-flow complex active from about 20,000 years ago to the present. The youngest known eruption originated from the Ololbutot fissure on the south east side of the complex produced lava flows and a pumice flow and has a radiocarbon age of about 180 years.

El Donyo Eburru volcano is complex formed in the Holocene period (11,500 years) at an elevation of 2,856m (980 m. above the floor of the rift). The volcanic complex has an area of 470 km². Eburru is dominated on the surface by pantellerites, and pantelleritic trachytes, but trachytes are more abundant with depth and syenite intrusives at the bottom of the volcanic complex (Thompson and Dodson, 1963). The western margin is covered by trachytic and pantelleritic pumice as well as deposits of ash falls ejected from Eburru. It developed in three stages, of which the products of the first stage, in the west, are now mostly buried except the lava outcrops. The second stage consisted of a series of pyroclastic eruptions originating in a fault zone forming the 19.5 km Waterloo Ridge on the eastern side of the massif. The third stage created craters, small cones, domes and lava flows. The summit has more than fifty craters with diameters ranging from 200 m. to 1.25 km. The pumice lapilli and ash beds from these centers cover most of the massif as well as the western shoulder of the rift. The youngest formations are no more than a few hundred years old. The Eburru massif today is ridge-shaped and eroded, with an east-west orientation. There are widespread fumaroles in cinder cones and craters along the faults in the massif. Between Eburru and Elmenteita are basaltic cones and very recent lava flows which form a "pock-marked", rocky wilderness known as the Elmenteita "badlands". The land is punctuated by pyroclastic cones of Holocene age the highest cone peak has an elevation of 2126 m. Sedimentation occurred in lake basins throughout the Cainozoic history of the central Rift Valley from Miocene times onwards, and diatomitic fauna flourished in the soda lakes throughout.

4.3 Hydrogeology

4.3.1 Groundwater Resources

Population and economic growth in the county has put a lot of pressure on the search for new sources of water. NAWASSCO abstracts 80% of its water from 24 boreholes while the remaining 20% or about 11,000 m³ is drawn from River Turasha upstream of Malewa. While production levels (max. 35,000 m³/day) against a demand of 70,000m³, exploitation of distant surface water sources (requiring inter-basin transfer) will be required to meet future demands. The groundwater distribution is determined by

faulting, vulcanicity, topography and climate. There are three main groundwater zones, namely the Rift Floor, the Midlands such as the Kinangop Plateau, and the Mau Complex. The groundwater in the county is considered strategic and requires continuous monitoring. As shown earlier, the mean annual rainfall distribution is higher in the upland areas of Mau and Bahati, which are the main sources of groundwater recharge for the lowland and Rift Valley floor aquifers.

The Rift Valley floor is an area of medium groundwater potential and yields generally vary with depth (Alamirew et al., 2007). The recharge of the aquifers is mainly from local sources in which rainfall infiltrates through permeable volcanic soils, then by percolation downward through fissures until porous stratum is reached. Some rivers and springs in the area are aligned along faults (McCall, 1967) and therefore may be losing water through trough-like depressions in which water table along its length is lowered. The prevailing geological and climatological conditions in the Nakuru area, therefore, favour groundwater occurrence in lacustrine sediments, weathered and /or fractured zones in the volcanic rocks, and sediments interbedded between volcanic rocks. The evidence is those boreholes drilled in the Rift floor belonging to the drainage system of the Naivasha basin, Lake Nakuru and those of the Elmentaita basin. Around Nakuru town, there is ample recharge along with the high relief areas of Bahati Forest and Kiplombe Hill respectively having a maximum mean annual rainfall of approximately 1200 mm. The majority of the boreholes in the prospect area were drilled to between 100-200 m depths with yield ranging from 6-20 m³/hr. (McCall, 1967).

The Kabitini aquifer, on the other hand, is confined with the upper confining layer being a thick layer of dark almost black basalt rock composed of a layer dominated by mafic minerals and subordinate quartz and the lower confining layer being a tough phonolitic trachyte (Sosi et al, 2013). The aquiferous zone ranges between 62 m and 121m. Most boreholes typically drilled to a depth of about 150m to 165m with an average yield of 4.4m³/hr. for which some of the boreholes have elevated fluoride concentrations (United Nations, 1989).

Table 4.4: Characteristics of Boreholes in Nakuru County

	RIFT FLOOR			KINANGOP	MAU
	Naivasha basin	Element aita basin	Others		
Number of boreholes drilled	62	15	11	7	4
Number of unsuccessful boreholes	2	2	9	1	3

Percentage of success	97	87	18	86	75
Aggregate tested yield of boreholes (m ³)	30,276.6	4,220.9	788	1,632	1,209.60
Average yield of successful boreholes (m ³ per day)	504.6	324.6	394	272	400

Adapted from: Walsh, J. 1969. *Geology of Eldama Ravine-Kabarnet Area*; Jenninngs, D.J. 1971 *Geology of the Molo Area*.

The Menegai Cater groundwater flow occurs towards the North, groundwater elevations adjacent to the Menengai Crater are high, indicating significant groundwater flow towards the Olobanita area. Groundwater elevations vary between 1901m to 1623 m a.m.s.l indicating significant flow in a northwest direction. Around Menengai Crater, the hydrogeological system comprises of four classes, namely, high yielding boreholes mainly hosted in fractured fresh lavas; moderately high yield boreholes hosted in lacustrine beds; reworked volcanoclastic and fractured lavas (Lagat et al, 2010). Along the *Bahati Escarpment*, the groundwater elevations show a fairly even gradient from east to west down the escarpment. The groundwater elevations in the *Solai area* range between 2143-1509 m. towards Lake Solai and further west of the region. From the Crater the groundwater flows in towards the northwest direction, augmenting the flow from the Bahati Forest, and then proceeds towards Olobanita swamp. In the central part of the zone, Crater and Solai groundwater flow occur in an east-west direction towards Kisanana. The groundwater elevations range between 2143 -1496 m. at Solai and Legisianan respectively.

Lomolo-Mogotio area has groundwater elevation low ranging between 1425-1417m indicating that the groundwater inflow from other areas. The inflow is probably from Rongai to the southwest, Olobanita to the southeast, Solai to the west and Kiplombe to the east. In the northern part of Chemogoch area, the flow occurs in a northwest direction. From the groundwater results, it's possible that the groundwater of the Lomolo-Mogotio area escapes through the fault systems forming a part of the flow towards Lake Baringo. The confining pressures are high indicating confined conditions resulting in high yields for the boreholes in the area (Sosi et al, 2013).

Lomolo-Olobanita aquifer is very extensive covering about 90 km² and as such is one of the most productive well fields. The aquifer is composed of weathered volcanic rocks (tuffs), fractured volcanic rocks, fractured and weathered volcanic rocks, and lacustrine sediments. The recharge is local by rainwater and also by Molo and Rongai Rivers flowing along fault zones and other ephemeral streams to the west of the area, and

Olobanita River to the east. From the western side, this zone is further recharged by high rainfall occurring in the area of Kiplombe hill. The groundwater is confined, occurring at an average depth of 150 m. and 180 m below ground level. The Olobanita well field currently has 8 boreholes, a pumping station and a 20 km bulk transfer main to Nakuru town with a production capacity for Nakuru Town by 15,000m³/day. The average water rest level is 118 m. bgl., the average tested yield is 15.7 m³/hr, and the average specific capacity is 378 m²/day, which indicates that the zone has high groundwater potential.

The North Solai regional aquifer system is composed of weathered and or fractured volcanic rock or both, sediments. However, the aquifers are localised. The recharge is local along the fault and fissure zones by both rainwater and several streams that flow off the Solai escarpment and disappear underground in the area. Some recharged also come from the south in the Bahati forest. The average depth of boreholes is 105 m. bgl. while the average depth to groundwater is 88 m. bgl. The average water rest level is 52 m. bgl, the average tested yield is 10 m³/hr. and average specific capacity is 103.3 m²/day, indicating that the zone is of medium groundwater potential.

The Rongai regional aquifer system is composed of weathered volcanic rocks, fractured volcanic rocks, fractured and weathered volcanic rocks, and old land surfaces. The groundwater level conditions are not clearly defined because boreholes drilled in this area are either dry or produce steam. The groundwater elevations range between 1919-1739 m. above mean sea level an indication of flow in NNE direction towards Mogotio and Lomolo area. The Rongai system is recharged locally and from the south in the areas of Njoro. The groundwater is confined and the average depth of boreholes is 225 m. bgl. The average depth to groundwater is 159 m. bgl. The average water rest level is 166 m BGL and the average tested yield is 5.0 m³/hr. the average specific capacity is 4.4 m²/day, indicating that this area is of low groundwater potential (Sosi 2013).

There are 156 registered boreholes in the catchment and a few unregistered without monitoring. The Njoro River watershed has over 41 boreholes in its upper reaches. Nakuru Town has over 55 registered boreholes, of these 35 are located in Kabatini aquifer, which recharges the Baharini Springs 4 smaller, individually-owned parcels of land. It is becoming obvious that lack of water in Kiambogo is due to sinking of water tables.

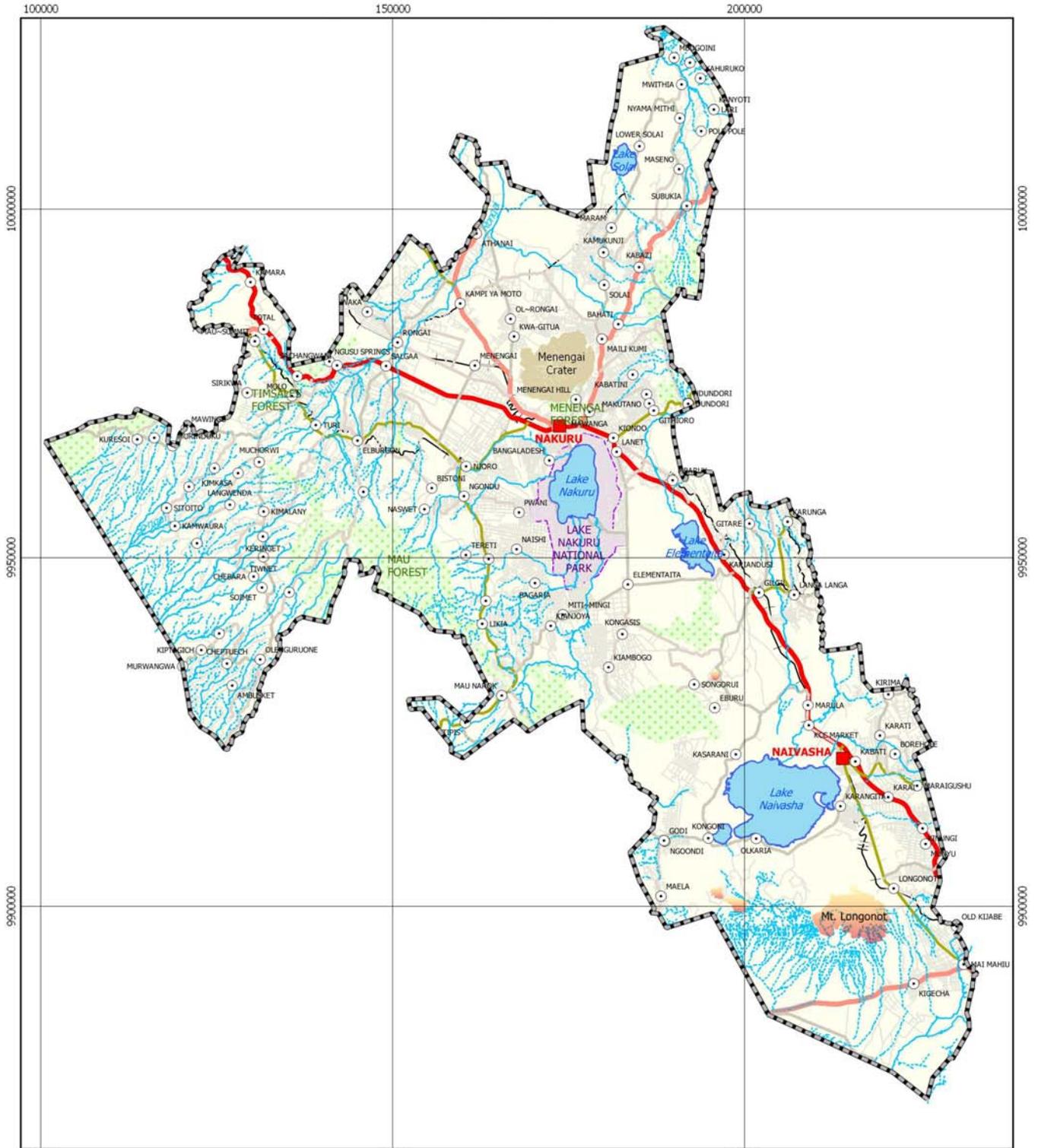
4.3.2 Surface Water Resources

Rivers

There are rivers, shallow wells, springs, dams, pans spread all over the county especially in drier parts of Naivasha, Gilgil, Molo, Njoro and

Rongai. However, on account of the very porous nature of many of the rocks—particularly the lacustrine sediments and the pyroclastics—extensive water-tables exist in the area, one about Lake Naivasha, the lake itself forming a hydrographie window, and another about Lake Elementaita which is to the north and beyond the limits of the present area. Perched water-tables exist on the flanks of the Rift Valley, and sometimes issue as spring on the down-stepped fault blocks that replenish stream flow. There are 27 rivers in Nakuru County as listed Table 4.5 and illustrated in Map 4.10.

NAKURU COUNTY SURFACE WATER RESOURCES



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town ○ Other Town — Road Class A — Road Class B — Road Class C — Main River — Tributary River — Railwayline Lake Forest Hill Lava 	<p style="text-align: center;">N</p>  <p style="text-align: center;">Scale 1:750,000</p>	<p>LOCATION MAP</p>  <p style="text-align: center;">Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><small>This map is not an authority on boundaries</small></p>
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Map 4.10: Surface Water Resources

SOURCE: Geomaps/Habitat planners, 2016

Table 4.5 : Rivers in Nakuru County

Item No	River Name	Seasonal/Perennial	Status Decline/Increasing
1.	Malewa	Perennial	Decline
2.	Turasha	Perennial	Decline
3.	Nyairoko	Perennial	Decline
4.	Karati	Seasonal	Decline
5.	Gilgil	Seasonal	Decline
6.	Little Gilgil	Seasonal	Decline
7.	Kiriundu	Perennial	Decline
8.	Mereroni	Seasonal	Decline
9.	Njoro	Perennial	Decline
10.	Little Shuru	Perennial	Decline
11.	Makalia	Seasonal	Decline
12.	Nderit	Seasonal	Decline
13.	Lamudiac	Seasonal	Decline
14.	Naishi	Seasonal	Decline
15.	Ngosur	Seasonal	Decline
16.	West Acre	Seasonal	Decline
17.	Rongai	Seasonal	Decline
18.	Swamp Canal	Seasonal	Decline
19.	Molo	Seasonal	Decline
20.	Chania	Perennial	Decline
21.	Ruiru	Perennial	Decline
22.	Subukia	Seasonal	Decline
23.	Olbanita	Seasonal	Decline
24.	Maji Matamu	Seasonal	Decline
25.	Kipsonoi	Perennial	Decline
26.	Ndoinet	Perennial	Decline
27.	Songon	Perennial	Decline

SOURCE: Geomap/ Habitat Planners Field Survey, 2016

The Malewa River contributes approximately 80%, the Gilgil River 10% and the remainder of the surface inflow flows into the lake through the Karati and other seasonal streams (Abiya, 1996). The Malewa and Gilgil rivers are perennial which may suggest rainfall percolating into groundwater

tables in the higher regions. These groundwater tables can provide the river with water during dry periods, the base flow. The average streamflow volumes of the Malewa and Gilgil rivers are 153 million m³/year (4.84 m³/s) and 24 million m³/year (0.76 m³/s) respectively (Everard et al. 2002). Gaudet and Melack (1981) qualified water that flows into the lake (surface flow) equal to 80% while 20% is subsurface flow into and out of the lake.

The River Malewa basin is under serious threat from unsustainable land-use practices, deforestation, siltation, the increased abstraction of water and pollution by agrochemicals used by farmers along its course. There are some improvements in water use. This has serious implications for the social, economic and environmental health of the river basin and Lake Naivasha. Nakuru town withdraws approximately 2,036.3 m³/day from the Melawa River.

Turasha River is a major tributary of the Malewa River, which feeds Lake Naivasha. Rising from Kinangop Plateau, Kipipiri Mountain, and Aberdares Ranges. The river has been dammed at an elevation of about 3,000 m. to supply 17,500 m³/day of water to the town of Nakuru and Gilgil communities.

Gilgil River runs to the east of the town of Gilgil, which is on the height of land above 2,500 m located between the Lake Naivasha and Lake Elmenteita basins. Gilgil River has three main tributaries namely, Morindati rises at 2,700 m, the Kiriundu at 2,710 m. and the Little Gilgil at 2,400 m. The channel is 60 km. long, and gradient of 0.0145. Much of sediment destined to Lake Naivasha is trapped by Papyrus, other sedges, and Typha at the river delta.

Molo River rises from the Mau Complex and runs over the approximately 100 km length to Lake Baringo through Kuresoi, Molo, Rongai, Mogotio, and Baringo Central. The basin suffered massive deforestation in the upper reaches thus causing soil erosion and the general decrease in water quality. Individuals have encroached into forest land, clearing the trees and destroying the local environment, poor farming methods on steep slopes, riverbanks, and runoff of farm chemicals, urban waste, and industrial effluents. Passing through the towns of Rongai, Kabimoi, and Mogotio, the river becomes extremely

Dams There were many small dams in the count that currently have silted up and are on private land. Only a few are community-owned dams still exist. Those that have been acquired for private use such as Kamanya and Chebara dams cannot be accessed. The status of these dams is not known by the Water Resources Management Authority (WRMA) Rift Valley

Gitare dam in Gilgil constituency is a community dam whose water is currently used for livestock watering and is proposed to be used to provide water for irrigation. The construction of earth dams has, on the whole,

proved fairly successful in the area; some natural shallow ponds are even known to exist on the southern slopes of Mount Longonot in the pumiceous ashes which abound in that region.

On the Kinangop there are numerous dams but, in all cases, a successful impervious layer of clayey materials must be found which will effectively seal the porous and often pumiceous soils that commonly occur where dams are most needed. There are a number of dams proposed to be constructed in the county under the Kenya Vision 2030. Itare Dam, comprises a 57m high dam, 100,000m³/day water Treatment Works, 1.2m diameter 113 km pipeline, 14.5 km bulk Transfer tunnel, water distribution improvement works, sewerage network and treatment works. It rises from within the Mau complex. The project will cost about KES 30 billion and serve over 800,000 people in Kuresoi, Molo, Njoro, Rongai and Nakuru Town.

The planned construction of Chemususu Dam Phase II is expected to increase water supply to both Nakuru and Baringo. The current dam located on the Chemususu River, a tributary of the Tigiri River is among the largest dams in Kenya. The dam stores approximately 10.94 million m³ and enhances uninterrupted water supply of about 35,000 m³/day to Nakuru Town and parts of Baringo and Koibatek District including Eldama-Ravine Town

Springs

The county is also endowed with springs found in Subukia, Nakuru North, Molo, and Kuresoi areas. Many of these springs are either on private land that is not demarcated or in forest areas. The springs that form the source for Njoro River are not demarcated and hence encroached and overgrazed especially during the dry season. Other springs like the Bahari springs near Lake Nakuru have been submerged when the lake levels rose. The status of the springs needs to be known, plans made for their conservation and sustainable conservation measures taken with the participation of the Water Resources Users' Associations (WRUAs). The county should take advantage of the WRUAs in the catchment to guide on how to undertake the spring's conservation.

Rainwater Harvesting and Storage

Nakuru is a water-scarce county. Rainwater is another major source of water in the county with about 80 percent of households harvesting rainwater. Rainwater harvesting and drip irrigation are compatible technologies that can enhance agricultural production in sub-humid areas of the county. One of the flagship projects and initiatives under vision 2030 is to increase water storage and harvesting. Limited financial support and lack of skills in the management of Rainwater harvesting and drip irrigation are the main

challenges. The county government needs to put in place policies regarding technical, financial and supportive incentives focusing on the farmers' preferences. The county government has also been encouraging farmers to invest in rainwater harvesting structures such as water pans which will help store water when the rain season starts thus averting water shortage.

Water Quality

The main sources of pollutants into our freshwater systems are from agricultural activities mainly from flower farming is on the increase. The farmers have not acquired effluent discharge permits since most of them have not provided WRMA with the design plans of the effluent treatment works. Washing of carrots especially in Mutukanio community is becoming a threat to the water resources. There is concern over the mushrooming of hotel industries in certain areas especially around Lake Elementaita is a threat to the water resource by investors. The slums (Kaptebwa and Rhoda) are a threat to the water resources due to brewing of chang'aa, direct washing of clothes and bathing in the rivers as well as washing of vehicles including motorbikes directly in the rivers.

The main sources of pollutants into lakes, rivers, and dams are from agricultural activities. The farmers have not acquired effluent discharge permits since most of them have not provided WRMA with the design plans of the effluent treatment works. Washing of carrots especially in Mutukanio community is becoming a threat to the water resources. The other concern is the mushrooming of urban and roadside trading centres, hotel industries in certain areas, especially around Lake Elementaita. An increase in the number of slums such as Kaptebwa and Rhoda is a threat to the water resources due to brewing of chang'aa, direct washing of clothes and bathing in the rivers as well as washing of vehicles including motorbikes directly in the rivers.

Quarrying along the rivers is contributing to an increase in sediment load. Improper handling of solid waste could be polluting the groundwater and clogging of storm drains

Water Storage

Itare Dam is one of the major flagship projects identified as the most viable long-term source of water storage in Nakuru County. Comprising of a 75 m. high dam, 100,000m³/day water treatment works, 1.2m diameter 113 km bulk transfer tunnel, water distribution improvement works, sewerage network and treatment works, the project will cost KES. 30 billion and will serve over 800,000 people in Kuresoi, Molo, Njoro, Rongai, Nakuru town, Kiptagich, Keringet, Olengeuone and other parts of South and North Kuresoi. The executing agency is the Rift Valley Water Services Board.

The dam captures the headwater of Sondu, Songol, Kipsonoi, Itare, Ndoinet, Sose, Kiptiget, Chemosoit, and Timbilil. These are also the

headwater for Sondu, Gucha - Nyando, and Migori rivers. The dam will cover 634 acres displacing 14,000 people. The dam was planned in 1992 but construction was delayed and will be completed by 2020.

Chemususu Dam is located on the Chemususu River, a tributary of Tigiri River, some 80 km. northwest of Nakuru Town and approximately 15 km west of Eldama Ravine town. The proposed dam will cost KES. 5.5 billion, has a storage of 10.94 million m³ and supplies about 35,000m³/day to Nakuru town and parts of Baringo, and Koibatek. Upper Chemususu Community Water Project at a cost of KES 5.5 billion is functional.

One of the greatest challenges of water management in the county is the presence of fluoride in groundwater. The presence of fluoride in water is often associated with volcanic activity and fumarolic gases (Marieta, 2007). Rock minerals that have significantly high fluoride include fluorspar, rock phosphate, cryolite, apatite, mica, hornblende many of which are found in Naivasha and Nakuru sub-counties. The highest fluoride concentration reported was 2,800 mg/l in Lake Nakuru in Kenya. The geographical distribution of Fluoride in water Up to 96% of the boreholes in Nakuru County including the Dundori springs and L. Elementaita water have elevated fluoride levels in their groundwater (Naslund, 2005) mean Fluoride levels of about 7.69 ppm in borehole water around Elementaita area.

The level of water F appeared to increase with the proximity of the source to the lakes in the region. There was also an apparent increase in the level of F in piped water compared to the original borehole water, which is ascribed to extensive evaporation during treatment and storage of piped water. With one exception, the river water had the lowest mean F concentrations. The second challenge is the absence of Aquifer Management and Monitoring Programme, including the establishment of a system for observation and monitoring of boreholes. Equipping and reinforcement of the capacity of laboratory for monitoring of the water quality in the catchment. The development of aquifer management tools such as a database system for storage, retrieval, and monitoring of hydrological and environmental data for the Lake Nakuru catchment. The third challenge is the need for an integrated surface and groundwater model of the aquifer to manage water in the county in a conjunctive manner.

Finally, the need for reforestation and conservation of the aquifer recharge zones focusing on the recharge areas of Bahati and Dandori forests

4.4 Biodiversity Resource

4.4.1 Forestry and Agro-Forestry

The forests in the county are classified into gazetted, non- gazetted and individual forestlands. There are two gazetted forests namely Mau

Forest and Dondori Forests and six non-gazetted forests. The gazetted forests in the county cover 679.643 km². The individual forest land is estimated to be less than one percent. There is a great need to promote afforestation and reforestation in the Mau Escarpment to improve tree cover and conserve the environment. The main forest products in the county include timber, poles, charcoal, firewood, and bamboos.

Table 4.6: Forests of Nakuru County

No.	Forest Name	Area (ha)
1.	Menengai Crater Forest	About 7000 ha. but actual forest only about 2000 ha
2.	Mbogoini forest	
3.	Solai	
4.	Mau East	65,000 ha
5.	Bahati	
6.	Subukia	
7.	Eburru	8,736 ha
8.	Dundori	6,956 ha.

SOURCE: Geomap/ Habitat Planners Field Survey, 2016

The forests are a major source of timber and firewood as well as providing employment, generate income and influence climate conditions in the county. These products are important in generating revenue for the government and for income-earning for saw millers and households.

Mau East forest is also home to the indigenous Ogiek community. Additionally, the forests allow the infiltration of water that replenishes underground hot springs in OlKaria for geothermal power as well as provides water supply.

The gazetted forests in the county cover 679.6 km² (420,000 ha). The Eburru forest, composed of indigenous tree species, covers an area of 8,736 ha, while the Dondori forest covers an area of 6,956 ha. The Eastern Mau forest forms part of a national watershed (the Mau Complex), being the largest of these forest blocks and covering an area of 65,000 ha. It is mainly composed of plantation and indigenous forests that have been progressively excised over the last 10 years to make way for human settlement. What forest remains now is restricted to the crest of the escarpment, and consists of thickets of bamboo interspersed with stands of *Olea capensis*, *Prunus africana*, *Albizia gummifera* and *Podocarpus latifolius*.

4.4.2 Mau Complex

The county enjoys favorable climatic conditions with a large forest cover which is part of the Mau complex, the country's most important water catchment area and a source of streams and rivers draining to Lake Nakuru, Lake Naivasha and Lake Elementaita. River Ngosur which is a permanent

water source originates from Bahati forest. More than 4,000 farmers have been mobilised to assist the Forestry Department to plant trees in Dundori forest, Nakuru. At least 7,410 acres of forest has been cleared over the past 10 years.

The Mau forest contains a rich bird fauna, having been accorded Important Birds Area (IBA) status. Forty-nine of Kenya's 67 Afrotropical Highland bird species are known to occur in the Mau Forest Complex, including the grey-throated barbet 300 Lake Nakuru. Catchment maps show a progressive decline in the area of land under forest from 47% of the catchment area in 1970 to less than 10% of the catchments area in 2000, leaving behind only the barest protection for its watersheds. The individual forest land is estimated to be less than one percent.

4.4.3 Menengai Forest Biodiversity

The Menengai Crater forest, gazetted in the 1930s, covers an area of about 7000 ha although the actual forested area is only about 2000 ha. The forest altitude ranges from 1900m to 2300m above sea level. The biodiversity of the forest includes tree species such as eucalyptus and acacia, over 169 species of flowering plants and 17 species of grasses. The flowering plants include Leleshwa (*Tarchonanthus camphoratus*), *Euphorbia* species and *Acacia* species while the common grasses include geothermal grass (*Fimbristylis exilis*) and Boma Rhodes grass. The forest is habitat to many mammals including the tree hyrax, rock hyrax, olive baboon, black-faced vervet monkey, mountain reedbuck, Kirk's dik-dik and slender mongoose. Birds species include the Verreaux's eagle (only found in Menengai Forest in Nakuru), Abyssinian ground hornbill, lesser spotted eagle, African marsh harrier, Horus swift, turn-tailed ravens, red-winged sterling, and others. Other animals include spiders, molluscs and butterflies.

4.4.4 Hell's Gate National Park

Hell's Gate National Park covers an area of 68.2 km² and is situated in the environs of Lake Naivasha. It is characterized by diverse topography and geological scenery including the Fischer's Tower and Central Tower columns and Hell's Gate Gorge and home for the rare lammergeyer.

4.4.5 Eburru Forest

Eburru forest is a gazetted forest. Gazetted in 1936, Eburru Forest Reserve has an area of about 8,736.3 ha. With its highest point at 2,706 m. above sea level, the Eburru forest area forms part of the water catchment for Lakes Naivasha and Elementaita with several ground springs and is the source of Ndabibi River and other small streams and steam jets for geothermal power. The forest is habitat to wildlife such as Bongo, Sykes,

white and black *Colubus monkey*, giant forest hog, bush pig, and buffalo. It is the home to perhaps 12 of the fewer than 100 surviving wild population of critically endangered Eastern Mountain Bongo antelope worldwide.

4.4.6 National Parks and Conservancies

The Nakuru Wildlife Conservancy (NWC) represents a unique area covering up to 400,000 acres of wildlife habitat with its 23 members ranging from large group ranches such as Kedong with 80,000 acres to 20-acre plots on the shores of Lake Naivasha. The conservancy area stretches from the south as far as Suswa in Narok to the border with Nakuru National Park to the North West.

There are three national parks within Nakuru County namely, Mt. Longonot National Park, Hells Gate National Park and Lake Nakuru National Park. Others tourist attraction sites include:

- Menengai Crater
- Subukia Shrines
- Lord Egerton Castle
- Lake Naivasha
- Lake Elementaita
- Hyrax Hill Prehistoric Site
- Ol Doinyo Eburru volcano
- Mau Forest among others.

Table 4.7: Conservancies in Nakuru County

Conservancy	Area (km ²)	Major wildlife attractions	Sub-County
Marura			Naivasha
Oserian (Kongoni Game Sanctuary established mid 1990s)	20,000 acres	White Rhino, Leopard, Buffalo, Giraffe, Cheetah, Grevy Zebra, Oryx and a large number of plains game.	Naivasha
Kedong	80,000 acres		Gilgil
Malewa – Kigio (alone 3,500 acres)	1,416.40 ha	approximately 3,500 heads of wildlife including the endangered Rothschild Giraffe, a 200 strong herd of Buffalo, Impala, Grant's and Thomson's gazelle, Eland among others and over 250 bird species (www.kigio.com, 2009).	Gilgil
Soysambu (2008)	19424.9 Ha (190 Km ²).	flora, fauna and scenery' wooded savannah and grasslands; 11,697 of wild animals	Gilgil

SOURCE: Geomap/ Habitat Planners Field Survey, 2016

In addition, there are private wildlife conservancies which include Marura, Oserian and Kedong in Naivasha Sub-County and Kigio and Soysambu in Gilgil Sub-County. The crater is a tourist attraction, provides

medicinal plants, and endangered tree species like *Prunus africana*, and *Jumperus procera*. The forest is threatened by the dependent population of about 53,000 people of which 95% are subsistence small scale while 5% are large-scale farmers. In small scale, maize and beans are the main crops while in large.

Lake Nakuru National Park has two major species of flamingos, about 422,341 lesser flamingos, and 78 greater flamingos while Longonot National Park is home to various species of wildlife including zebra and giraffe. A forest of small trees covers the Longonot crater floor, and small steam vents are found spaced around the walls of the crater. In the 15 years up to 2009, however, 100,000 ha; a quarter of the protected forest reserve- was cleared and settled on. The area lost its ability to retain water, the seasonal rivers dried up, and it triggered one of the worst droughts on record. However, an estimated 40,000 ha of forest have been rehabilitated by the Kenyan government, and according to the director of the Kenya Water Tower Agency, 10,000 of the forest's inhabitants have voluntarily surrendered their title deeds to aid this rehabilitation highly alkaline and shallow with a maximum depth of 3 m.

Challenges in Forestry Resources

One of the greatest challenges is Forest degradation in the county. Over the last 30 years, Lake Nakuru catchment basin has transformed from a sparsely settled and heavily forested area to one that is heavily settled, extensively cultivated and urbanised. Catchment maps show a progressive decline in the area of land under forest from 47% of the catchment area in 1970 to less than 10% of the catchments area in 2000, leaving behind only the barest protection for its watersheds. An extensive industrial area is rapidly growing around Nakuru Town.

Biodiversity Strategy

- The County's fast-growing population, mushrooming of urban centres and large horticultural developments coupled with high poverty levels, high levels of unemployment and over-reliance on dwindling land resources are increasingly threatening biodiversity conservation through destruction and segmentation of wildlife habitat.
- There is a great need to promote afforestation and re-forestation in the Mau Escarpment to improve tree cover and conserve the environment. The main forest products in the county include: timber, poles, charcoal, firewood, and bamboos.
- Human-wildlife conflicts
- Support local initiatives such as the established Eburu Committee Forest Association.

Lake Naivasha

Lake Naivasha is a freshwater lake of economic importance in Kenya. The lake has a surface area of 139 km² and is surrounded by a swamp that covers an area of 64 km², but this can vary largely depending on rainfall. It is situated at an altitude of 1,884 m. The lake has an average depth of 6 m., with the deepest area being at Crescent Island, at a maximum depth of 30 m. Lake Naivasha level average is 1886 m.asl. Currently 1888.4 m asl demonstrating an increase of depth over the last few years. Rivers supplying are Malewa and Gilgil. Apart from being a vital source of water in a seemingly semi-arid environment, the lake supports a flourishing business in horticulture and floriculture, nature-based tourism, sport fishing, and recreation. The lake is home to a variety of wildlife; over 400 different species of birds have been reported and a sizeable population of hippos. The lake's hydrology is dependent on catchment supply through rivers.

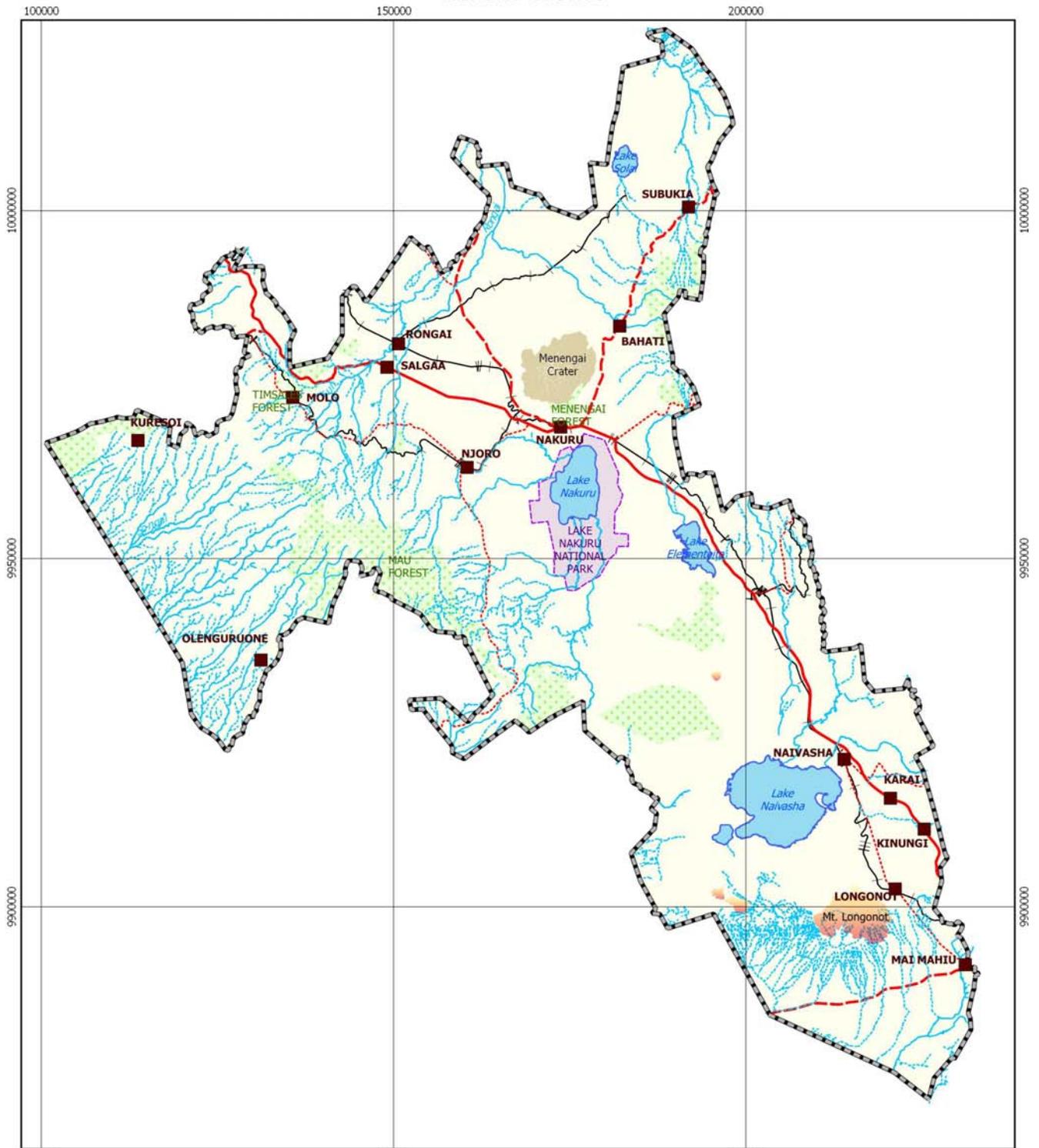
Table 4.8: Lake Naivasha Level Fluctuation

Period	Lake level trend	Remarks
1890s	Almost dried up entirely	<i>After this it refilled</i>
1945	Reached a low level of 0.6 m depth	<i>The water level rose, minor drops in between</i>
1968	Maximum depth nearly 6 m	
1987	major decline of the water level, depth reached 225 cm	

Lake Nakuru

Lake Nakuru has a mean depth of 2.5 m, a maximum depth of 4.5 m, and a water volume of about $92 \times 10^6 \text{ m}^3$ (Vareschi, 1982). The shallow depth, high evaporation rates, and seasonal rivers make the lake a hydrologically-impacted ecosystem since it does not have any buffering capacity to withstand hydrological impacts driven by catchment processes.

NAKURU COUNTY



<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town — Road Class A - - - Road Class B · · · Road Class C — Main River - - - Tributary River — Railwayline ■ Lake ■ Forest ■ Hill ■ Mba 	<p>Scale 1:750,000</p>	<p>LOCATION MAP</p> <p>Date: October 2019</p>	<p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><small>This map is not an authority on boundaries</small></p>
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Map 4.11: Biodiversity Resources
SOURCE: Geomaps/Habitat planners

The rainfall in the Mau Forest and on the Aberdare Range are the most important influence on the lake levels than the rainfall in Nakuru itself. Greater and Lesser Flamingos flock to the lake. The lake was dry 74 years ago, similarly in 2009, but today it is overflowing (East African, November 5th, 2013). This increased recharge of Lake Nakuru is from Njoro, Makalia, Larmidiak, and Enderit rivers and has led to the dilution of the lake water thus decreasing its salinity (alkalinity). Rivers Njoro, Ngosur and Naishi become influent, disappearing along the fault lines to recharge deep aquifers. The low salinity and siltation have led to the loss of algae on which the flamingos feed causing them to migrate. The lake has abundant algae that attract the vast quantity of flamingos. Other birds also flourish in the area, as do warthogs, baboons and other large mammals. Black and White rhinos have also been introduced.

Lake Nakuru lies at the lowest point of a basin and fed by five seasonal rivers, Njoro, Makalia, Nderit, Naishi and Larmudiak, which flow from either the Mau Escarpment or the Aberdares and as well as treated wastewater from Nakuru town. Unlike Lake Naivasha, Lake Nakuru is an enclosed lake, with only evaporation accounting for water loss from the lake. The lake levels were affected by the long drought experienced in 1993 to mid-1997 resulting in particularly poor hydrological conditions, as evidenced by the excessive lake level decline (Onywere, et al). The salinity is balanced by the ratio of inflow (rivers, springs and groundwater inflow) and evaporation. The Baharini springs and other springs along the eastern shoreline are probably the most important contributors to fresh water during the dry period.

Lake Elementaita

Lake Elementaita has been a Ramsar site since 2005 and has over 400 bird species have been recorded in the Elementaita basin. The lake's shores are grazed by zebra, gazelle, eland, and families of warthog. Lake Elementaita lies on the floor of the rift valley at 1,776 m above sea level. Lake Elementaita is an 18 km² but recently has declined to less than 14.3 km²

Runoff is contributed from its catchment of 630 km² bounded to the south by the Eburru (2,820 m above sea level) and at the southern end, it is fed by the Kariandusi hot springs and two small streams, the Mereroni and Kariandusi, flowing from the eastern plateau. Land-use changes in the watershed especially the dramatic increase in farmland and settlements will cause rapid changes in lake water levels. The lake is normally very shallow (less than 1 m deep) and bordered by trona-encrusted mudflats during the dry seasons.

Lake Solai

Lake Solai is a 9 km² shallow (< 1.5 m) playa lake situated in a small rift basin and fed by groundwater emerging as springs and seeps on the

flanks of the Solai escarpment and two groundwater-fed perennial rivers that drain the highlands to the east and south. It is located near the town of Solai, at an elevation of 1667m. The lake has dried on several occasions in the last 40 years, possibly due to a combination of irrigation pressure and ENSO climate events. The lake which is home to more than 200 bird species with one of them being the rare African *Jacana* is one of those affected by the swelling of the Rift valley lakes.

The Main Challenges in Biodiversity Conservation

The long-term lake water balance is calculated as the long-term average storage volume, precipitation, surface inflow, and groundwater inflow or lake seepage-in). The long-term average fluxes out of the lake are evaporation, lake water abstraction, and groundwater outflow. The groundwater inflow and outflow from the lakes are tectonically controlled by morphological and volcanic barriers, faults, and local water-table variations. The lakes may be connected through groundwater flow connections. From a peak in 1961, the Rift Valley lakes have fallen and risen in response to drought and heavy rainfall for the last 50 years.

Table 4.9: Fluctuations in Lake Levels in the Rift Valley

No.	Lake	Regular area (km ²)	Recent area (km ²)	Remarks
1.	Bogoria	32	41(2014)	26.3% increase in water level
2.	Baringo	143 (2010)	231 (2014)	61.3% increase
3.	Nakuru	31.8(2010)	54.7 (2013)	71.9% increase
4.	Naivasha	107 (2010)	169.9 (2013)	57.8 % increase

SOURCE: *Onywere, S. M. Shisanya, C. A. Obando, J. A. Ndubi, A. O. Masiga, D. Irura, Mariita, Z. N. and Maragia, H. O. Geospatial Extent of 2011-2013 Flooding from the Eastern African Rift Valley Lakes in Kenya and its Implication on the Ecosystems.*

Current lake levels are the highest, they have been since the 60's, but now, something very interesting is going on. Although weather conditions have not changed to the degree that would predict such an extreme rise in the lake water, there seems to be no single explanation. Little is known about the highly complex groundwater systems; lacking monitoring data, an assessment is developed on the basis of regional geological, hydrogeological and hydrochemical analyses (Olago et al, 2009). The reasons for the risen waters, since 2011, whether due to increases in rainfall, seismic shifts that may have caused the lake floor to rise, or prevent the outflow of water, causing the lake levels to swell to unprecedented heights is unknown.

Other lakes such as Lake Baringo's water level rise has been suggested to be partly due to the floods in northern Kenya in recent years or a result of the large deposits of sediment brought in as a result of catchment degradation. There is no convincing explanation for rising water

levels, but a number of possibilities may be cited, such as tectonic movement, deforestation, and heavy rains and run-off, previous siltation of the lakes due to deforestation.

The main factor of change is the human population increase and the associated increased pressure on the land, in particular, riparian zones, and hence dramatic change in the runoff response change to rainfall, and also sedimentation. Activities such as tree felling, house building, cultivation, and increased grazing pressure have caused more runoff thus feeding the lakes. Flash floods may also have increased carrying with it increased sediment loads.

The Lake has been expanding, displacing hundreds of families. He said over 30 acres of his farm has been flooded. Geological conditions at the lake during the Little Ice Age have been the object of a scientific study. In 2014 there was a major contamination event at the lake.

Recent the levels of these lakes have increased disproportionately to the current rainfall amounts. There are three reasons that could plausibly explain this:

- a) Increased rainfall, other factors remaining unchanged (Onywere et al (no date);
- b) The reduced storage capacity of lakes due to siltation of the lakes after a long period of deforestation and land-use change; and
- c) The East African Rift System is a narrow zone that runs from afar in the north to Mozambique in the south in which the African “Plate” is in the process of splitting into two new tectonic “plates” – Increased geophysical activity along with the Indian Ocean Plate and the Nubian Plate and Somali Plate. The rift valley in Kenya is opening at an average rate of 2-3mm per year but with a periodicity that varies from periods of fast extension and those of low extension.

On the other hand, tectonics have been used as an explanation that as plates compress closing fractures the water levels will rise. Ecological changes due to flooding:

- riparian trees drown and die;
- riparian vegetation and habitat change means migration of wildlife, especially shoreline grazers;
- Migration of birdlife as the lake water becomes less alkaline and less productive in green algae.

4.5 Renewable Energy Potential

4.5.1 Overview

Nakuru County has promising potential for power generation from renewable energy sources. There are abundant geothermal resources solar, wind, biomass, and limited hydropower. Following a least-cost approach, the government has prioritised the development of geothermal and wind energy plants as well as solar-fed mini-grids for rural electrification. Assessment of the enabling environment of renewable energy in Kenya suggests that there are a number of policy frameworks, which have been put in place by the Kenyan Government. These include the Energy Act 2006, the Kenya Vision 2030, the FiT policy and Updated Least Cost Power Development Plan (LCPDP).

4.5.2 Geothermal Energy

Currently, the electrical power generation in Kenya stands at around 1597MW and is expected to peak demand of 15,000MW in the year 2030. Approximately 7000MW will come from geothermal resources. Conservative estimates suggest geothermal potential in the Kenyan Rift at 2,000 MW, whereas the total national potential is put at between 7,000 and 10,000 MW. Kenya's installed steam power capacity now stands at 579MW. Suswa, Longonot, Olkaria, Eburru, Menengai, state-funded Geothermal Development Company (GDC) has signed a deal with three independent power producers (IPPs). Other uses heating greenhouses, refrigeration of cut flowers storage and processing stores, injection of CO₂ to accelerate photosynthesis, fumigation of soils and sterilization. Value chain not completely explored.

4.5.3 Solar Energy

According to the Energy Regularity Commission (ERC) of Kenya, the national total installed capacity is likely to be over 20MWp as of January 2015. This is projected to grow at 15% annually.

Nakuru County lies astride the equator and extending 35 °- 28 degrees on either side and receives a considerable amount of solar radiation and thus possesses an increased solar power potential. With this potential, several projects have been initiated to harness this potential. The daily average solar insolation is estimated to be about 4-6 kw/hrs/m², which is considered one of the best for solar electric energy production in sub-Saharan Africa. Depending on the conversion efficiency of solar modules, 10-14% of this energy can be converted to electric power. However, there are regional and seasonal differences in the solar resources of the country. TRINE a financial institution provided the investors in a rural solar electrification project with 100% of their original investment to finance solar energy in Nakuru.

The progress for the county includes The Kenyan government's conducive policy and regulatory frameworks for the promotion of clean and renewable energy alternatives in general.

A recent drive of electrifying rural public institutions through the government's Solar Energy Development project, which targets installing PV systems at 500 institutions. The national energy policy targets that PV systems will be installed at 50% of rural institutions by 2016, which do not have access to the national grid.

- The government has also set up Green Energy Fund Facility within the National Taskforce on Accelerated Development of Green Energy with the aim of lending to private investors in renewable energy projects including solar PV
- Over 40 solar PV distributing private companies that exist in the country, including Solarnet, BP Solar, Chloride Exide, Sollatek Electronics, Solagen, and Electric Link.
- Establishment of a solar panel factory in Naivasha financed by the Dutch Government through the Private Sector Investing Programme (PSI).
- Nakuru 50MW solar power project (in the plan as of 2013) by the Nakuru County government to be funded by a Chinese State corporation, Dongfang Electric International Corporation (<http://www.businessdailyafrica.com/Nakuru-eyes-50MW-solar-power-in-deal-with-Chinese/>)

The Nakuru county government has acquired 200 hectares of land in Gilgil for the construction of a solar power plant. He said the project will generate over 100MW once completed. It will be funded by the East Africa Solar Company

4.5.4 Wind Energy

There is significant potential to use wind energy for wind farms connected to the grid, as well as for isolated grids and off-grid community electricity and water pumping. Researchers estimate that Kenya has a total physical potential of approximately 9 terawatts (TW) of wind energy. Others have estimated Kenya's wind potential to be as 1604GW in wind speed of Class III, 642GW in Class II and 4.6GW in Class I 87. Despite this potential, wind contributes to only 3% of the country's installed electric power capacity in 2012. Recent wind energy installations for electricity generation the 300 MW wind farm under construction in the Turkana, 5.1 MW installed at Ngong hills. The challenge has been inadequate feasibility assessment, poor planning and lack of funding, lack of sound data on wind power potential spots of the country, large initial capital requirement of wind projects for investors, poor infrastructure and lack of stable grid and disconnects among potential stakeholders.

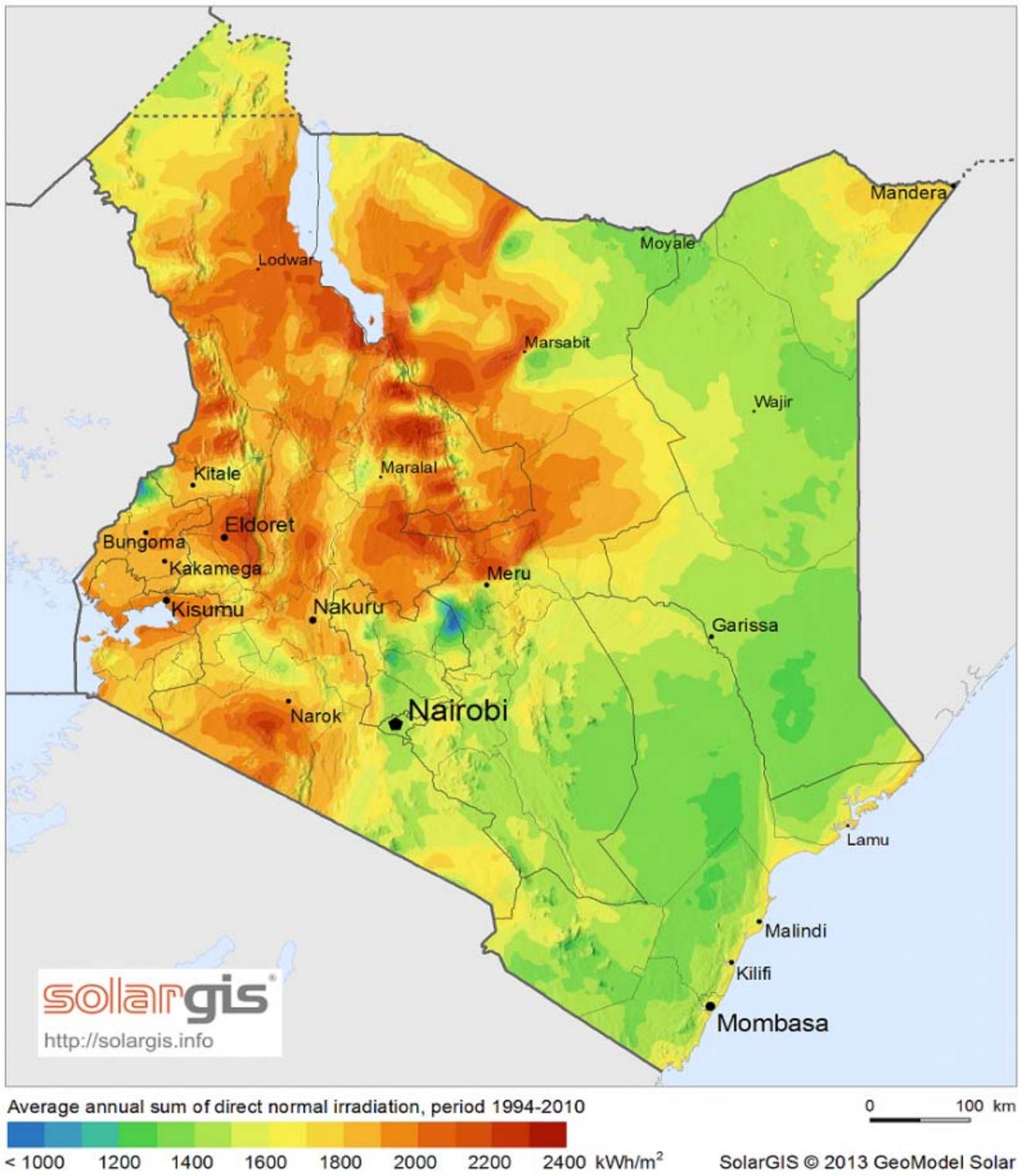
Estimates indicate that there is significant wind power along the rift valley, especially along the escarpments.

The advantages of wind energy growth are:

- The liberalised Kenyan power sector that allows for the participation of independent power producers (IPPs) and private investment.
- Kenya's Wind Atlas was developed in 2003 by the Ministry of Energy that provides wind energy data for potential investors.
- Wind energy data Development Program set within the Energy Sector Recovery project for installed 95 wind speed measuring masts (data loggers)⁹⁶ across different regions funded by the World Bank to supplement information in the Wind Atlas.
- The hiring of Wind Force Management Services Private Limited Company to carry out a wind resource assessment with funding from the World Bank. Rapid growth of annual electricity demand at the rate of 13.5% per year.
- The Nakuru County government acquisition of 200 ha. of land in Gilgil for the construction of a solar power plant to generate over 100MW.

4.5.5 Hydropower

The potential for large-scale hydroelectric power development is estimated to be 1,500 MW, of which 1,310 MW is feasible for projects with a capacity of at least 30 MW. Of these, 434 MW has been identified in the Lake Victoria basin, 264 MW in the Rift Valley basin, 109 MW in the Athi River basin, 604 MW on Tana River basin and 146 MW on Ewaso Ng'iro North River basin. Small, mini and micro hydroelectric systems (with capacities of less than 10 MW) are thought to have higher potential for future development because of their overall costs and low environmental impacts.



Map 4.12: Direct Normal Radiation in Kenya

Source: *GeoModel Solar*

4.5.6 Biogas Power Generation

The county's agricultural activity produces large amounts of agricultural waste. These can be used to produce electricity by implementing biogas and biomass technologies. There are plans to harness garbage collected from the major towns for biogas energy production. The 2014 National Energy Policy Draft also sets out biogas expansion targets of 10,000 small and medium-sized digesters by 2030. Biogas is considered a viable energy solution by a number of agricultural producers.

4.6 Minerals

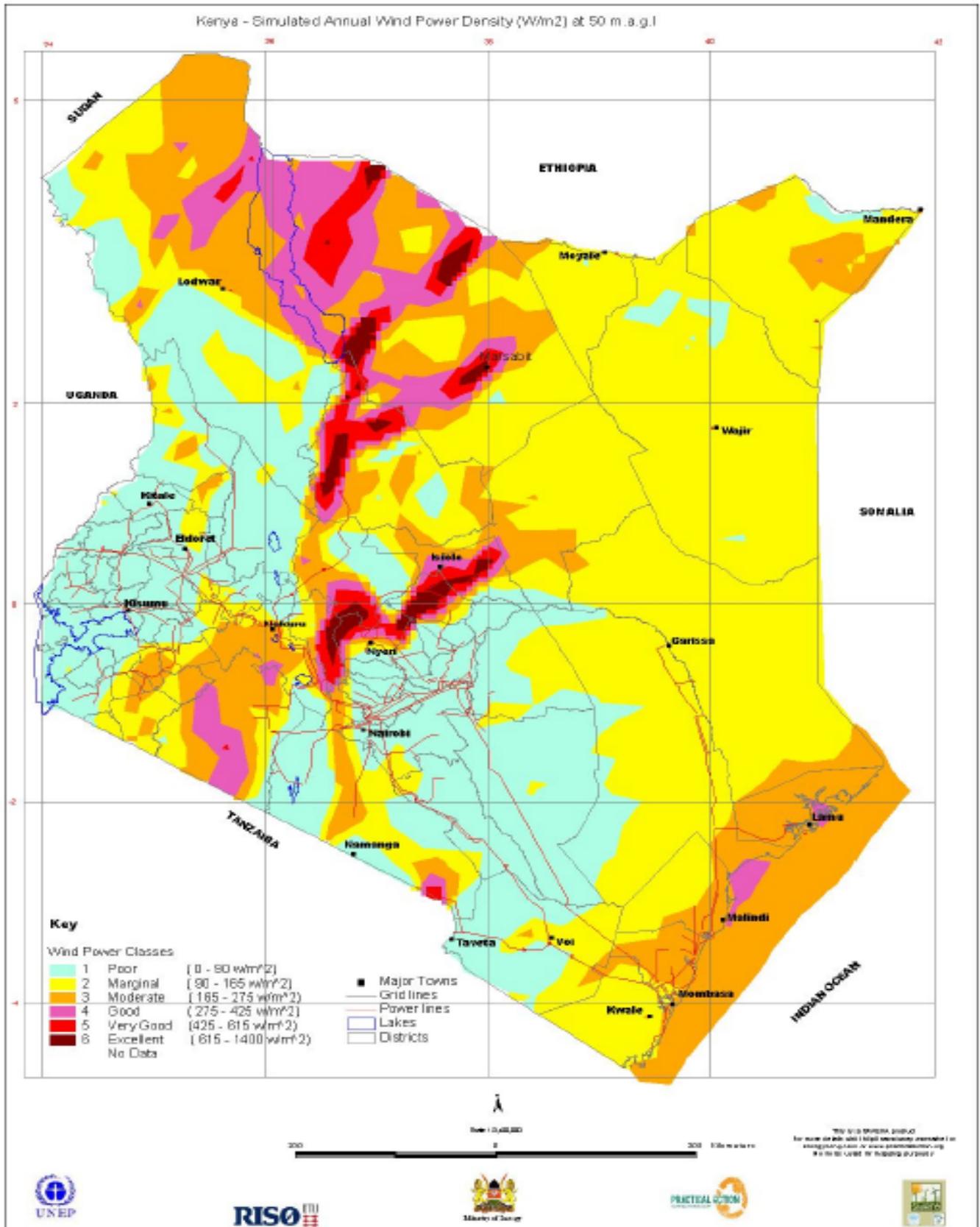
The county mineral resources include kaolin, diatomite, sand and building stone, trona (soda ash), and natural carbon dioxide.

4.6.1 Diatomite

Diatomite occurs as discontinuous horizons intercalated with the Pleistocene lake beds around Lakes Naivasha and Elementaita. The diatomite crops out sporadically, the best exposures being at Kariandusi in the south-western shores of the Lake Elementaita. The diatomite varies from poor quality to reasonably good material, the quality often varying within a given horizon.

Kaolin

Kaolin deposits at Eburru sites and in a small area about five miles south-west of Lake Naivasha, near Ol Karia for pottery manufacture. The reserves of white clay present at Eburru, exceed 69,000 tonnes. (Thompson and Dodson, 1963) formed by the action of steam-jets or geothermal fluids on acid lavas.



Map 4.13: Wind Power Density
 SOURCE: UNEP: Kenya Country Report

4.6.2 Building Stones

A number of volcanic rock types in the Naivasha area have been used for building purposes successfully. By far the most commonly exploited suitable rock is the grey tuff or building-stone tuff. It is sufficiently soft to be easily quarried and shaped, while it is tough enough for most building requirements. Weathered it is buff-colored and while not as compact as the fresh material it can still be used for less exacting purposes. The grey tuff outcrops as distinctive horizons in the Kinangop volcanic and is also exposed in the valley floor below the eastern scarp. Other successful building-stones are the agglomerates and basaltic ashes which form craters on the south-western and western banks of Lake Naivasha. The agglomerates are fairly compact and can be readily shaped into building blocks while they are probably not sufficiently tough for large buildings they have proved suitable for some houses and farm buildings. The lavas are of little value for building purposes although lava boulders have been used on a limited scale for the building of roofless stock-pens. See Plate 4.2.

4.6.3 Sand Mining

Sand mining along Ndarugu River, which flows into Lake Nakuru National Park, is the main site of sand harvesting. Rhonda is the leading source of sand. (Plate 4.3) The sand quarries in Rhonda are privately owned and provides employment to close to 3,000 people. The charges are Ksh. 5,000 per seven-tonne truck of sand, with 20 percent of that sum being shared among sand miners, loaders and truck drivers as wages. The worst incident occur when weak sand walls collapse, pushing the diggers and the truck driver into the Ndarugu River. The diggers earns a minimum of Ksh. 300 on a normal day. Besides employing under age children that quit school to earn money for their parents, the sand harvesting causes environmental degradation especially siltation in River Ndarugu. National Environmental Management Authority (NEMA) in 2007 established the National Sand Harvesting Guideline that restricting sand harvesting or scooping to river beds with no harvesting allowed on riverbanks to avoid widening of rivers. However this has not been enforced.

4.6.4 Road Metals

Most of the lavas occurring in the Naivasha-Gilgil Sun counties can be used as road-metal, railway-line ballast and as aggregate in concrete. The trachyte are probably the most suitable of the lavas as they are usually compact, medium-grained rocks. The phonolites are usually fine-grained and are sometimes considered excessively hard and brittle. The banding, typical of most of the comendites, tends to give them undesirable cleavage, while the basalts such as the Badlands lavas are too hard. Several quarries are being worked in the vicinity of Gilgil township and should the demand arise there are a number of outcrops of medium-grained trachyte suitable

for quarrying near Naivasha and Morendat station. Plate 4.1 shows an active quarry.

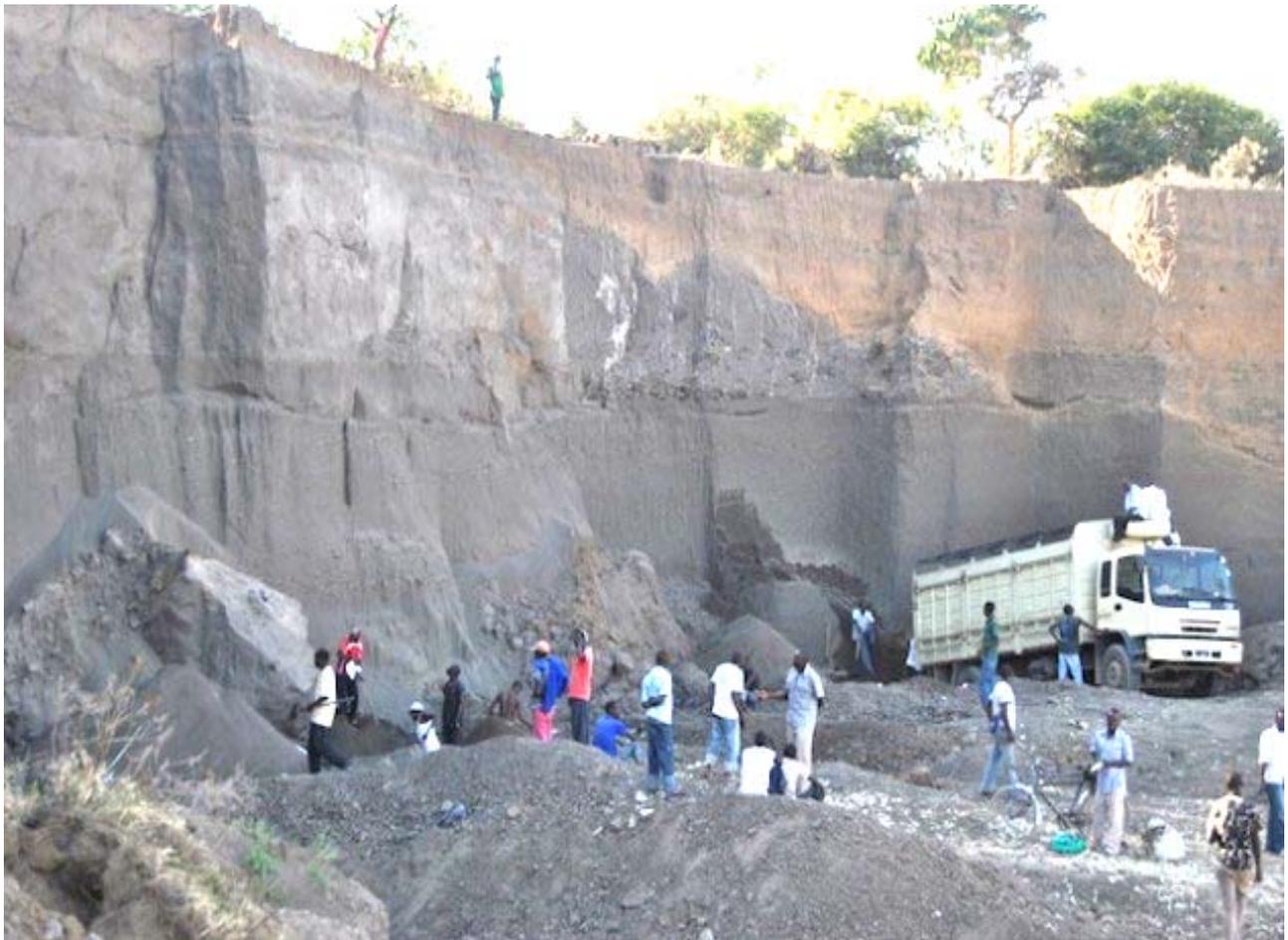


Plate 4.1: A sand quarry Rhonda, Nakuru County, Kenya

Courtesy: Robert Kibet/IPS

Radio-Active Minerals

During the past few years there have been reports of slight radio-activity by means of portable rate meters. The radio-active lava around Maasai Gorge area has been recognized as emanating from comendite which is rich in potassium. The slight radioactivity is caused by the relatively high potassium content of the acid and intermediate lavas abundant in the Naivasha area. The possibility of the discovery of exploitable radio-active mineral occurrences in the Naivasha area is considered as exceedingly remote.



Plate 4.2: Building Stone Quarry

4.6.5 Other Minerals

Pumiceous material occurs extensively both as terrestrially laid bands and as lacustrine beds. The best deposits occur north-east of Longonot, south-west of Gilgil town and as valley infilling in the Njorowa Gorge, near Gamble's Cave and south-south-west of Ol Karia. Pumice is used mainly in the production of concrete blocks, and to a lesser extent as abrasive, water cement, as insecticide filler, for insulation purposes, for paint fillers and as an absorbant.



Plate 4.3: Sand harvesting

Courtesy: *Robert Kibet/IPS*

For some years there have been local rumours of the presence of valuable minerals, particularly gold, cassiterite and diamonds in the Naivasha area. As the area is occupied almost entirely by fairly young volcanic, and sediments derived from them, of types not normally associated with mineralization of value, the presence of such minerals is considered as exceedingly unlikely. However, further exploration might reveal the presence of other large mineral deposits especially fluorite given the history of presence of fluoride in waters found in Nakuru and Naivasha areas.

4.7 Natural Disasters

4.7.1 Earthquakes Risks

The geological instabilities and the associated faulting in Nakuru area and the Rift Valley region as a whole means that the area is highly vulnerable to earthquakes and related geological disasters such as land subsidence and land sliding. The area west of Nakuru has already experienced frequent land subsidence. Similar hazards could be expected in areas of the central part of the town where there is evidence of ground depressions; disappearance of surface water into fissures, and cracks and

settlement of building. Walls and buildings are known to vibrate when heavy commercial vehicles pass nearby, indicating the presence of underground cavities (Mulwa et al, 2014).



Plate 4.4: Rift Valley

Table 4.10: Record of Earthquakes Since 1926

No.	Date	Magnitude (Ritcher scale)	Location	Depth (km)	Comments
1.	Jan. 6, 1928	6.9	Subukia Valley	-	na
2.	20th July 2007 (Mwangi, 2007).	Eruption of Ol Donyo Lengai	Ol Donyo Lengai	-	na
3.	17th July 2007	6.1	Ol Donyo Lengai Mountain south of Lake Natron in north eastern Tanzania.	-	na
4.	15th July 2007	3.4	na	na	na
5.	12th July		Nakuru, Nairobi, Nyeri,		epicentre

No.	Date	Magnitude (Richter scale)	Location	Depth (km)	Comments
	2007		Kiambu, Embu and Mombasa and parts of central and eastern parts of Kenya		at 145 km SSW of Nairobi
6.	? 2005	6.8	Lake Tanganyika in Tanzania, Rwanda, Uganda and Burundi		
7.	September 10, 2005	5.7	Epicentre in Nsunga, Kagera, Tanzania, in the Lake Victoria Basin region	10.0	
8.	October 4	6.6	SNNPR, Ethiopia	35.0	
9.	January 10,	6.2	Uasin Gishu County	10.0	
10.	January 6, 1928	7.0	Baringo County, Kenya	15.0	Fairly strong, damage unknown.
11.	March 9, 1928	7.7	South Indian Ocean	15.0	
12.	1913	6.2	Turkana region	-	

Source: USGS, Various sources

Kenya has had a seismic station since 1963 as part of the World Wide Standardized Seismograph Network (WWSSN) (United States Geological Survey (USGS). Earthquakes of local magnitude (Ml) in the order of ≤ 2.0 –5.0 have been recorded, such as the January 6, 1928 Subukia earthquake (Ml 7.1) and an aftershock (Ml 6.2) four days later, as well as the 1913 Turkana region earthquake (Ml 6.2). It is reported that a concrete wall for a dam constructed on the south-western slopes of Eburru on Ndabibi estate was wrecked by an earthquake several years ago (1928), but it is unknown if earth dams have been similarly affected.

The Subukia crack was 38km and maximum throw of 240cm and average long rupture less than 100 cm. (Ambraseys, 1991). The earthquake triggered rockfalls and minor landslides and exhibited long period effects at large distances but the damage was minimal because of the sparsity of dwellings and the inherent resistance to earthquake shaking of the local type of huts.

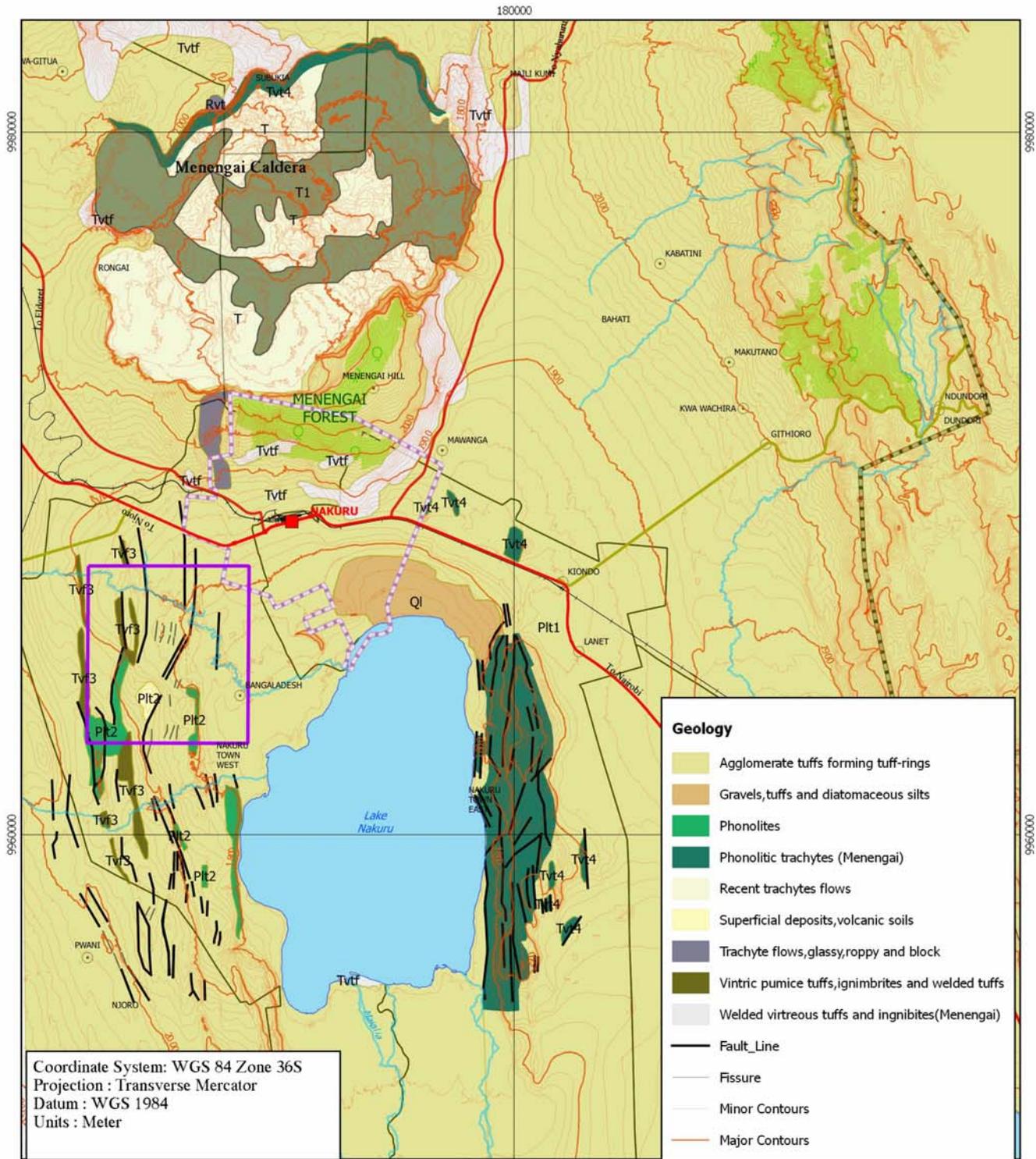
4.7.2 Drought and Floods

The occurrence of drought situations caused by the natural causes in the County has been made worse by the change in climate conditions in the region. Climate change scenarios may contribute to increase in flooding. Mbaruk estate in the outskirts of Nakuru town, Kwa Rhonda estate, Kaptwemba, Gilanis, and Mwariki witnessed frequent flooding whenever there is a heavy downpour. The floods have been enhanced by degraded Dunduri forest. On the other hand, the droughts are common during the dry spells especially in parts of Rongai, Njoro, Naivasha, Gilgil, and lower Subukia. The dry spells are accompanied by strong winds that cause wind erosion, especially on farmlands.

4.7.3 Landslides and Mudflows

The geology of Lake Nakuru and its catchment area comprises lava flows and pyroclastics which have been affected by a series of faulting. The soils, therefore, have high porosity, permeability, and loose structure and highly susceptible to erosion, land subsidence and fractures during or after heavy rain. The rainfall causing mudflows can range from soupy floods to thick flows that have the consistency of wet cement. In Olongiraine Sub County there are occasional landslides in Ghorofani affecting many people.

ILLUSTRATION OF FAULT LINES IN NAKURU COUNTY



<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Major Town Other Town Road Class A Road Class B Road Class C River lake Railwayline Nakuru_CBD Area of Study 	<p>Scale 1:150,000</p>	<p>LOCATION MAP</p> <p>Date: October 2019</p>	<p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.14: Illustration of Fault Lines in Nakuru
 SOURCE: Adopted from Dindi, 2014.

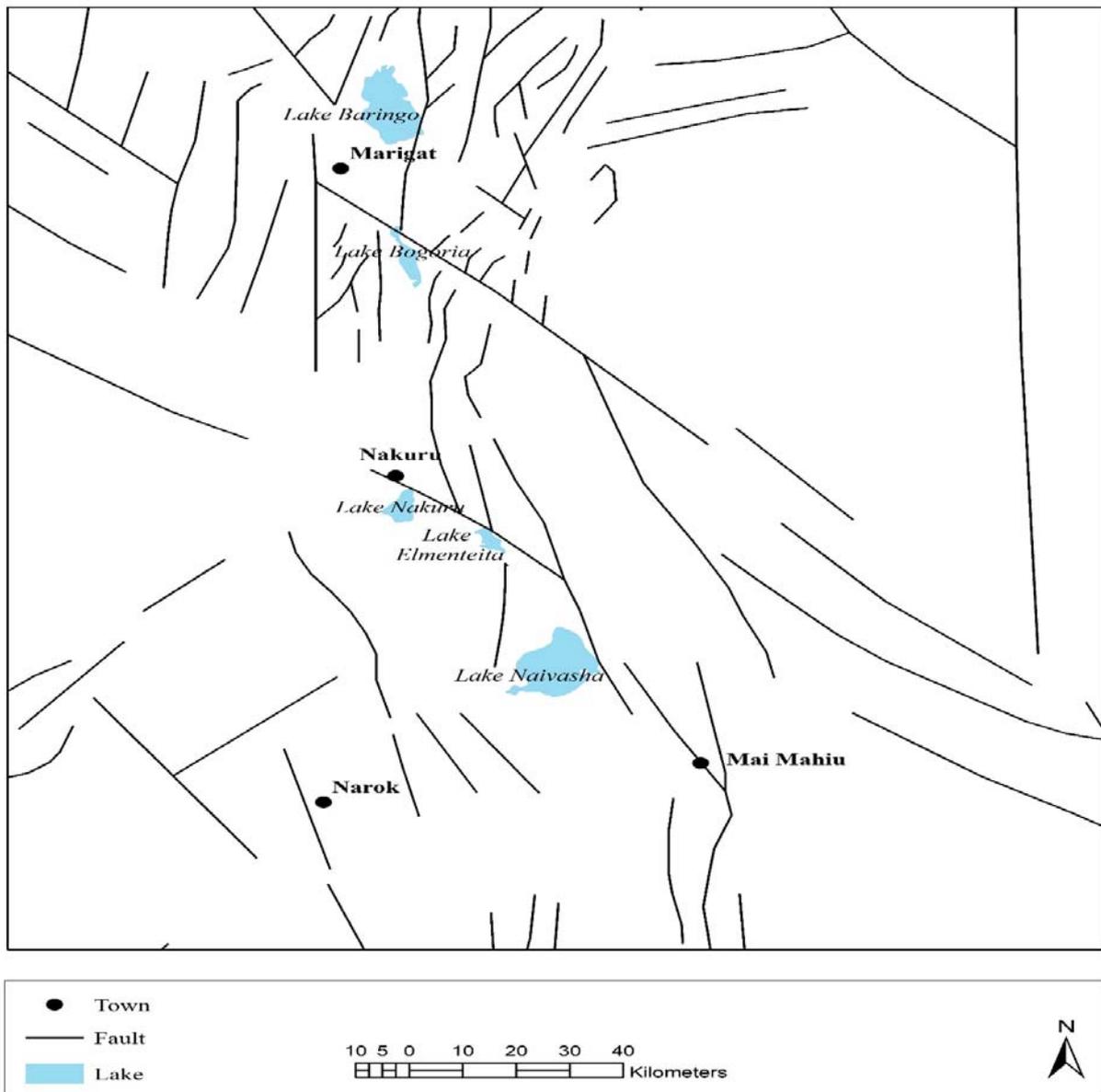


Figure 4.4: The Heavily Faulted Areas in Nakuru County
 Adopted from: McCall, 1967: *Geology of Nakuru area*.

4.7.4 Land Subsidence

Land subsidence risk is associated with the geology of an area including faults and fractures, soil type, rainfall intensity, and slope. Several areas of Nakuru County such as Mai Mahiu, Nakuru town often undergo subsidence along the parallel fault zones during and after heavy rainfall. During the rainy season, when most of the subsidence occurs, the overlying unconsolidated volcanoclastic sediments become oversaturated with water. The water reduces the shear strength of the sediments and also introduces extra loading through saturation leading to subterranean erosion along faults (Otieno. 2014). The unconsolidated sediments then collapse into the subsurface water channels which closely follow the fault zones, leading to

the formation of sinkholes. The frequent incidences of ground subsidence in Nakuru County, have caused several fatalities, destroyed settlements, and physical infrastructure. Furthermore, persistent subsidence has increased the cost of construction and the repair of the destroyed properties. Apart from being hazardous, ground subsidence degrades environment when sewage water, refuse and garbage enter into the groundwater systems through

4.8 Environmental Management

4.8.1 Solid Waste Management

Nakuru town generates approximated 250 tonnes of solid waste daily (Mwanzia et al, 2013). Before changes were introduced in 2006, the average daily collection rate was less than 30%. To resolve this challenge on domestic solid waste handling, the then Municipal Council of Nakuru (MCN) enacted 2006 Nakuru Environmental Management by-laws that paved the way for decentralized service delivery of domestic solid waste management. The solid waste is sent to a dumpsite at Giotto dumpsite located 3.2 km. to the northwest of Nakuru town along Nakuru-Kabarak road. See Plate 4.5.

The dumpsite is about 50 ha. at a place known as Kiamunyi and it is an open dumping site. It was started in 1972 to help with the dumping of collected waste from the town. In common with many cities in the developing world, a high proportion of the waste generated is organic material (46%) (MCN 2010).

Currently finalizing arrangements with an international solid waste management company in Finland that will see the County acquire an energy production/waste management plant that will improve the management of the solid waste sector. In collaboration with the Finnish company, the County government planned to invest in managing the waste to produce energy as a long-term management strategy. The plant will generate electricity, biodiesel, produce tissue paper and create hundreds of employment opportunities. The unique technology will see the production of high-quality green electricity for all needs including a modern environment-friendly landfill and waste recycling plant. Research has indicated that over 250 tonnes/day of garbage produced in Nakuru town could support the establishment of a power generation plant. The effluent and solid waste flow to Lake Nakuru National Park and have a negative impact on the ecosystem at the Park (Kenya Wildlife Service). The pollution includes odor, polythene papers, and weeds blooming at the Park.



Plate 4.5: Decaying Solid Waste Thrown on an Empty Field

SOURCE: *ms willems daily nation*, june 10th 2013.

Challenges in Solid Waste Management

- Few access roads in the low-income settlements thus limiting waste collection.
- Lack of community participation and some households argue, and rightly so that refuse collection is Council job for free.
- Unwilling to pay for solid waste collection, especially amongst the low-income settlements. However, licensed waste enterprises counter this by striking agreement with plot owners who pay for tenants.
- Lack of sustainable financing is required for investments in waste enterprises.
- Limited hands-on experience, skills and efficient transportation logistics.
- Filled up refuse disposal site which sometimes the waste at the disposal site spreads to the road and it is difficult to drive up the heaps of waste especially during the rainy season.

4.8.2 Sanitation and Sewerage system

The Nakuru Water and Sanitation Services Company (NAWASCO) is responsible for both water supply and sanitation in Nakuru town. The water supply and delivery services suffer from a host of problems including i) Inadequate water production; ii) weak institutional capacity to operate and maintain the water supply and sanitation facilities, and iii) poor billing and revenue collection performance. Nakuru town, rehabilitation of the existing water supply and sanitation facilities to restore production capacity to the installed capacity of 40,000 m³/day; development of a new well field to augment capacity by 15,000 m³/day; and institutional capacity building to establish the Rift Valley Water Services Board (RVWSB) and support the NAWASSCO, improve billing and revenue collection performance, and to reduce unaccounted-for water (UfW) from the current level estimated at 70%. For the other Rift Valley towns (Naivasha, Gilgil, Narok, Kabernet, Elderma Ravine, Mogotio, Iten, Lodwar, and Kapenguria), the project will fund studies on the immediate works that are required, and an institutional options study for the management of the water supply and sanitation in these towns.

Sanitation is poor in the towns and urban areas. The access to improved sanitation facilities is low, with 46% for Nakuru Town and 53%, for Nakuru County (Maji Data, 2012). Out of the existing toilets, 51% are unimproved pit latrines. Due to the sandy soils in Nakuru town, pit latrines contaminate groundwater by faecal sludge (FS) and urine that percolates to the groundwater table. In Nakuru, five human waste collection centres are operational and would later be spread to other peri-urban centres in towns such as Gilgil, Njoro, Molo, and Subukia. Planning for a commercial sanitation project that will convert waste from toilets to produce biogas and fertilizers will boost agriculture in the region. Sanitation campaign to sensitize residents in the low-income areas on the need to embrace modern toilets and washing facilities in schools in low-income areas in a bid to improve hygiene standards

4.8.3 Land Degradation

Environmental degradation is mainly as a result of inappropriate farming methods, effects of climate change, poor solid waste, and liquid waste disposal, soil erosion, inadequate sanitary facilities, massive felling of trees for firewood, timber and clearing land for agricultural use. In addition, poor physical planning in urban areas, quarrying activities, pollution and toxic from agro-chemicals contributes to environmental degradation. Widespread deforestation has been experienced in the county. In Kuresoi

North, deforestation and encroachment of forest reserve has occurred because of over-reliance on wood fuel; overgrazing; poor drainage system

Summary of Challenges associated with the use of natural resources to the environment

- Environmental degradation around Menengai slopes and deforestation in Bahati by human settlements
- Widespread deforestation
- Overreliance on wood fuel
- Overgrazing
- Over-abstraction of water from various sources
- Geological and climatic hazards
- Unprotected rivers and water catchment areas
- Replacement of indigenous vegetation with exotic invasive species
- Poor solid waste management
- Unplanned settlement
- Poor drainage system
- The environmental and natural resources management plan will therefore come up with proposal for:
 - Watershed modeling, water resources management;
 - Estimates of mineral potential of the county
 - Hazards assessment - fractures, landslides, floodplains, sensitive areas, etc.
 - Flood estimates for land use planning;
 - Accusation of corruption by foresters.
 - Widespread deforestation;
 - Over reliance on wood fuel;
 - Overgrazing;
 - Poor drainage system
 - Unplanned urban settlements;
 - Poor solid waste management;
 - Unprotected rivers and water catchments areas

4.9 SWOT Analysis

Based on the above analysis of the existing situation, several strengths and weaknesses can be identified. Besides, they are numerous opportunities for improvement that can be harnessed for improved environmental management and sustainability. However, several negative externalities threaten the achievements of these improvements. Table 4.11 shows the identified strengths, weaknesses, opportunities and threats.

Table 4.11: SWOT Analysis

STRENGTH	WEAKNESS
<ul style="list-style-type: none"> • Central location in the heartland of resources base • Proximity to Nairobi (capital city) • Abundant energy sources • Diversity of weather conditions for different production systems (agroecosystems) • Presence of abundant natural resources (minerals, topographical features, pre-historic sites like gabbos caves) • Adequate land supply • Global heritage sites and nature reserves (National Museum in Kikopey) • Land use planning and zoning • Quarries for sand and stone for building and construction materials 	<ul style="list-style-type: none"> • Environmental degradation • Limited investment funding. • Deforestation and encroachment of forest reserve; • Human-wildlife conflict • Forest reserves • Degradation of Ramsar sites, Lakes Naivasha, Nakuru and Elementaita • Land disputes • Poor/inadequate solid waste management
OPPORTUNITY	THREATS
<ul style="list-style-type: none"> • Land for infrastructure expansion • Abundant renewable energy like Biogas generation from sewerage • Industrial growth • Plenty of untapped water resources • Rainwater harvesting 	<ul style="list-style-type: none"> • political interference • Lack of investment • Land subsidence • Impact of climate change • Natural disasters like; Earthquakes, subsidence, floods and droughts and fire. • Air pollution from plants.

Chapter Five : Agriculture and Livestock

5.1. Overview

Agriculture is the mainstay of Nakuru County. The Agriculture sector comprises of the following sub-sectors; livestock keeping, fish farming and food and cash crops farming, including horticulture and floriculture. The agriculture sector plays a critical role in provision of food and creation of employment. Nakuru County has more arable land than any other county in the Kenya and has a conducive climate for agricultural activities. The County is known for its vast agricultural potential with numerous small holder farms and also vast agricultural enterprises.

Nakuru County has two agricultural production systems: rain-fed and irrigated agriculture. Agriculture in Nakuru County is mainly rain-fed and is dependent on the bimodal rainfall. Irrigation agriculture is carried out mainly in irrigation schemes and in large-scale farms. Agriculture is predominantly small-scale farming mainly in the high-potential areas. Subsistence farming carried out in Nakuru County accounted for 47.6% of all responses. Commercial accounted for 8.6% while combined commercial and subsistence accounted for 25.9%. This trend is becoming a popular mode of farming in ensuring that households grow the staple food crops so as to be food secure.

Livestock herd sizes are considerably large because of communal grazing with low use of purchased inputs like feed, drugs and artificial insemination. Large-scale farming is practised on farms averaging about 50 ha for crops and 30,000 ha for livestock ranches. Out of the 1,899 respondents, 936 (49.2%) reported they keep livestock in their farms. Cattle accounted for (67.2%), poultry (43.9%), sheep (30.1%), goats (14.8%), and sheep (16.4%). Kuresoi south and Subukia have the highest percentage of livestock keepers. Fish farming is mainly found in Njoro and Nakuru East subcounties. A total of 130 (6.8%) respondents reported they keep unconventional livestock/new animals in their farms. These include bees (79.7%), ornamental animals (7.5%), guinea fowl (5.3%), and chameleon (0.8%) among others. The main livestock reared are dairy cattle, poultry, sheep, goats, beekeeping and rabbits. Aquaculture is also gaining a foothold in the county.

Crop production is in two categories based on the use of the harvested produce: food crops and cash/ industrial crops. The types of crops on the farms include cash crops (7.1%), food crops (52.5%) both types of crops (23.4%) while 16.9% were not sure of their responses. Size of land under

crop production was lowest in Kuresoi North. In Subukia, Njoro and Kuresoi South, residents have bigger areas under crop production. The primary sources of seeds include purchasing from seed companies (46%), previous harvests (23%) and from agricultural societies (12%).

Out of the 1,899 respondents, 158 (8.3%) reported they practiced unconventional farming in their parcel of land. The unconventional farming methods include organic farming (59.2%), conservation/evergreen agriculture (16.3%), green house farming (11.4%), and api-culture & sunflower growing (8.2%).

A total of 816 respondents (63.7%) reported they have crop storage facilities at their homesteads. For those who do not have storage facilities, the greatest post-harvest losses are incurred in charges associated with commercial storage (45.0%), transport (14.7%), and stores found in the market places (33.4%). Seventy-four percent (74.2%) stated that extension workers do not reach their farms. Alternative sources of agricultural-related information include getting information from other farmers (63.5%), media outlet (27.8%), and stakeholders (6.2%).

Farmers training centres are not readily available in Nakuru County. Out of the 1,899 respondents, 23.7% reported they knew of a farmers training centre within their locality, while 75.0% reported no knowledge of the same. Market centres (41.4%) and selling to brokers (36.2%) were the primary destination for farm products. The least mentioned sources are cooperatives which accounted for 2.7% of all responses.

Agricultural research comprises of institutions both in the public and private sector. In addition, academic institutions have faculties of agriculture that carry out agricultural research independently or in collaboration with other agricultural research institutions.

a. List of the Agricultural Activities and their Locations

Various agricultural activities are taking place in Nakuru County. Table 5.1 shows the location of the activities in the County.

Table 4.12: List of Agricultural Activities

AGRICULTURAL ACTIVITY	DETAILS OF ACTIVITY	LOCATION
Commercial farming	Dairy farming	This typically occurs in the higher altitude areas of the county. Known areas are Egerton, Njoro as well as some parts of Kuresoi.
	Ranching	This usually occurs in the low lying areas of Naivasha sub county
	Plantation Agriculture	Molo
	Horticulture	Mostly grown around Naivasha and Gilgil
	Apiculture	Kuresoi and Mau Summit
Subsistence farming	Pulses (beans, pigeon pea, cowpea, chickpea, green grams);	By small scale farmers in the county.
	Roots and tubers (sweet potato, Irish potato, cassava, arrow root and	By small scale farmers in the county.
	Food crops such as; maize, wheat, sorghum,	By small scale farmers in the county.
	Fruit trees e.g. Avocado, pawpaw	By small scale farmers in the county.
Intensive farming	Green house farmers	Small land owners in the county
	Organic farmers	Small land owners in the county
	Farmers e.g. dairy, poultry, crops, aqua culture	Small scale farmers
Extensive farming	Large scale farmers	Large land owners in Naivasha, Molo, Bahati, Subukia and Rongai sub counties
	Dry Land farming	Gilgil, Naivasha, Mai Mahiu areas

5.2. Crop Production

Crop production is in two categories based on the use of the harvested produce: food crops and cash/industrial crops. The main food crops produced in the county include maize, beans, Irish potatoes and wheat. The types of fruits and vegetables grown are tomatoes, peas, carrots, onions, French beans, citrus fruits, peaches, apples, cabbages, kales, strawberries, asparagus and leeks. Most of these are grown in Bahati, Njoro, Molo, Rongai, Olenguruone, Nakuru Municipality, Gilgil and Mbogo-ini Divisions.

There are two canning factories; Kokoto and Njoro Canners that are involved in canning of tomatoes, beans and water bottling among other

processing. Kabazi Cannery in Subukia Sub County is no longer in operation. Tea production is carried out in Olenguruone, Keringet, Kabazi and Bahati Divisions. Other cash crops grown include flowers, wheat, barley and pyrethrum. Most of the barley used for beer production is grown around Molo and Mau Narok. This barley is processed in Molo Town, where Kenya Malting Ltd has a factory and depots. One of the fastest growing and most economically viable activity is horticulture, especially flower farming. Major flower farms include the Home grown and Oserian flower farms in Naivasha and Subati flower farm in Subukia, CIDP, 2013. The types of crops on the farms include cash crops (7.1%), food crops (52.5%) both types of crops (23.4%) while 16.9% were not sure of their responses.

5.2.1 Food Crops

These are classified into cereals (maize, wheat, sorghum, rice, millet); pulses (beans, pigeon pea, cowpea, chickpea, green grams); and, roots and tubers (sweet potato, Irish potato, cassava, arrow root and yam). The main food crops are maize, rice, wheat, sorghum, potato, cassava, vegetables and beans. Production costs for most of these crops are still high due to high costs of inputs especially fertilizer, poor and long marketing chains, low level of mechanization and high transport costs.

5.2.2 Industrial Crops

The main industrial crops in Nakuru County are tea, coffee and barley. These crops contribute 55% of agricultural exports. Other commercial crops whose production has remained low despite large unexploited potential are cotton, pyrethrum, and sisal.

5.2.3 Horticulture

Nakuru County is the home of the horticultural industry in Kenya. This industry plays an important role in the national economy. Products in this industry include cut flowers, vegetables, fruits, nuts, herbs and spices.

Agricultural practices and agricultural land usage in Nakuru County has been illustrated in Figure 5.1 and Table 5.2.

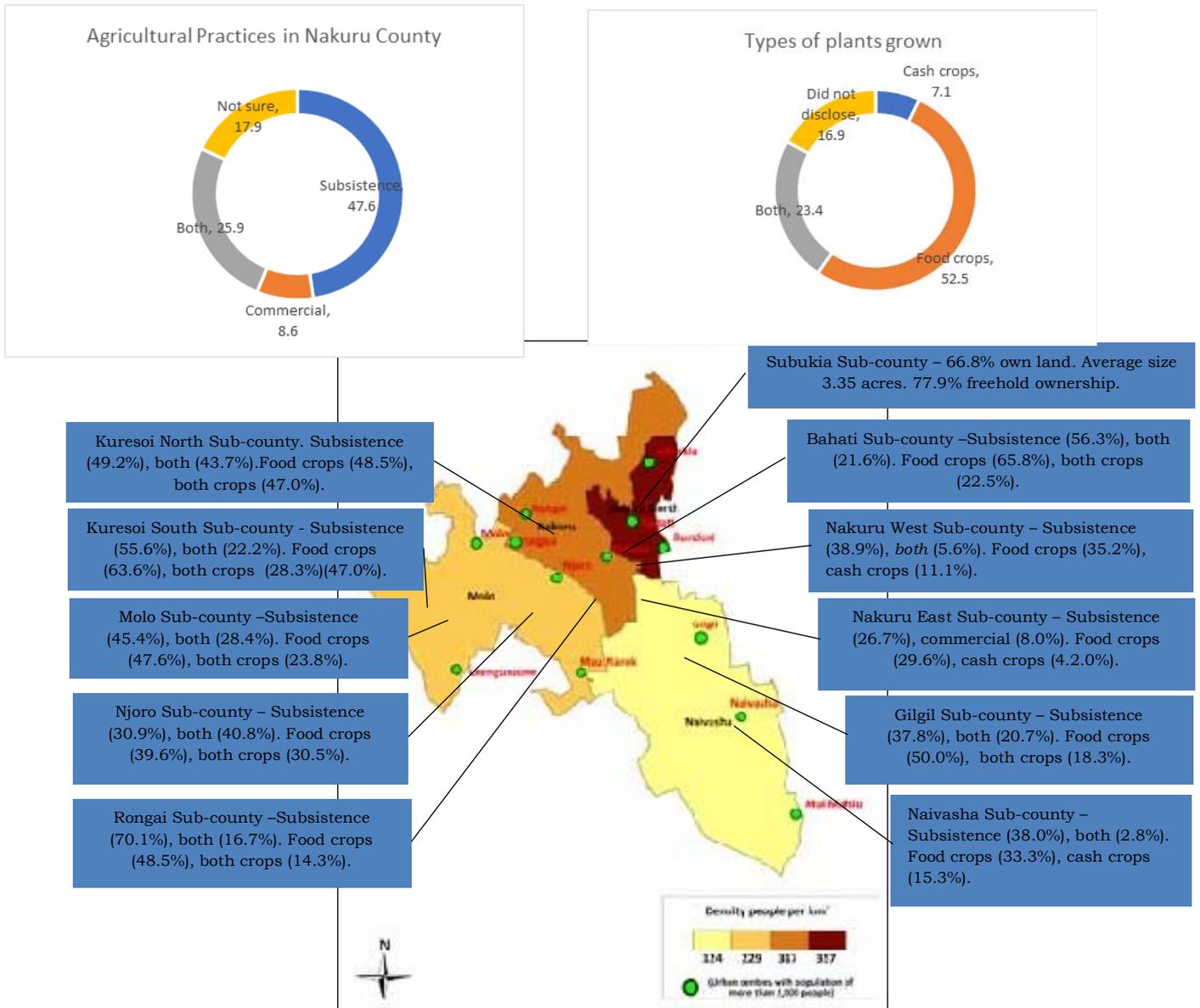


Figure 4.5: A profile of Agriculture Practices, and Types of Crops Grown

Table 4.13: Agricultural Production per Sub-County

Sub-county	No. of respondents	Acreage under crop		Production (based on a 90 kgs bag)	
		Size	Percentage (%)	Output	Percentage (%)
Bahati	110	<1 acre	47.3%	<5 bags	28.6%
		1-2 acre	32.7%	5-10 bags	29.5%
		3+ acres	16.3%	>10 bags	41.9%
		N/A	3.6%		
Gilgil	82.0%	<1 acre	45.1%	<5 bags	42.4%
		1-2 acre	22.0%	5-10 bags	28.8%
		3+ acres	6.1%	>10 bags	28.8%
		N/A	26.8%		
Kuresoi North	195	<1 acre	53.3%	<5 bags	35.1%
		1-2 acre	31.8%	5-10 bags	34.6%
		3+ acres	11.3%	>10 bags	30.3%
		N/A	3.6%		
Kuresoi South	195	<1 acre	48.2%	<5 bags	34.1%
		1-2 acre	25.1%	5-10 bags	36.3%
		3+ acres	18.0%	>10 bags	29.6%
		N/A	8.7%		
Molo	188	<1 acre	38.3%	<5 bags	22.1%
		1-2 acre	33.5%	5-10 bags	29.0%
		3+ acres	11.2%	>10 bags	49.0%
		N/A	17.0%		
Naivasha	72	<1 acre	25.0%	<5 bags	41.2%
		1-2 acre	9.7%	5-10 bags	23.5%
		3+ acres	12.5%	>10 bags	35.3%
		N/A	52.8%		
Nakuru East	73	<1 acre	24.7%	<5 bags	46.2%
		1-2 acre	8.2%	5-10 bags	15.4%
		3+ acres	2.8%	>10 bags	38.5%
		N/A	64.4%		
Nakuru West	54	<1 acre	35.2%	<5 bags	50.0%
		1-2 acre	13.0%	5-10 bags	23.1%
		3+ acres	5.6%	>10 bags	26.9%
		N/A	46.3%		

Njoro	151	<1 acre	24.5%	<5 bags	18.6%
		1-2 acre	33.1%	5-10 bags	25.7%
		3+ acres	18.5%	>10 bags	55.8%
		N/A	23.8%		
Rongai	76	<1 acre	46.1%	<5 bags	27.9%
		1-2 acre	23.7%	5-10 bags	30.9%
		3+ acres	17.1%	>10 bags	41.2%
		N/A	13.2%		
Subukia	158	<1 acre	30.4%	<5 bags	16.7%
		1-2 acre	43.6%	5-10 bags	41.3%
		3+ acres	23.5%	>10 bags	41.9%
		N/A	2.5%		

Source: Geomaps/Habitat Planners Nakuru Household Survey Data 2016

Primary Source of Seeds

The primary sources of seeds include purchasing from seed companies (46%), previous harvests (23%) and from agricultural societies (12%) (See figure 5.2). This is suggestive that farmers seek for quality seeds.

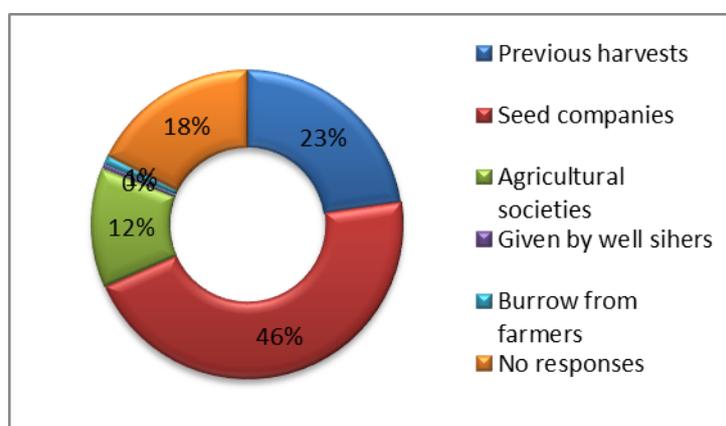


Figure 4.6: Sources of Seeds

SOURCE: Geomaps/Habitat Planners Nakuru Household Survey Data 2016

Practice of Un-Conventional Agriculture

Out of the 1,899 respondents, 158 (8.3%) reported they practiced unconventional farming in their parcel of land. The unconventional farming methods include organic farming (59.2%), conservations / evergreen agriculture (16.3%), green house farming (11.4%), others (api-culture & sunflower growing) 8.2%.



Greenhouse in one of the respondents farm located in Malewa Ward, Gilgil Sub-County



Organic farming located in Njoro Ward, Njoro Sub-county



Sunflower growing in Elburgon Ward, Molo Sub-county



Apiculture farm located in Tinet Ward, Kuresoi South Sub-county

Plate 4.6: Some of the unconventional farming practiced in the Nakuru County

Table 4.14: Crop Production Trends, Nakuru County 2012-2015
1. FOOD CROPS

	2012		2013		2014		2015
	AREA(Ha)	TONS	AREA(Ha)	TONS	AREA(Ha)	TONS	TONS
MAIZE	89,649	302299	90,690.00	233,985.40	86,504.00	160,681.80	159,049
WHEAT	31657	101179	31,292.00	99,808.90	32,057.00	90,542.20	84,427
SORGHUM	730	924	1,665.10	2,234.90	1,330.00	1,623.40	822
FINGER MILLET	0	0	318	366.9	414	456.4	546
GRAIN AMARANTH	0	0	23	23.4	27.4	29.3	
BARLEY	4,868	16669	4,522.00	14,552.40	3,456.00	11,973.50	7,122
LEGUMES							
BEANS	47266	28058	51,467.00	29,699.30	43,946.00	20,941.70	45,739
SOYA BEANS	0	0	49	12.8	44	10.8	25
PIGEON PEAS	167.5	123	87	168.1	76.8	166.7	52
DOLICHOS BEAN	0	0	100	108.1	91.3	116.4	191
COW PEA	278	187	59.6	39.5	59.2	51.2	21
GREEN GRAMS	0	0	50	17	22	7	
ROOTS AND TUBERS							
SWEET POTATOES	0	5669	278.6	1,947.40	217.4	1,786.40	2,966
CASSAVA	109	1381	99.4	840.2	111.1	827.2	1,626
COCOYAMS	17.5	211	17.8	129	14.7	128	144

2. HORTICULTURAL CROPS

CROP	2012		2013		2014		2015
	Area(Ha)	Quantity (MT)	Area(Ha)	Quantity (MT)	Area(Ha)	Quantity (MT)	Quantity MT
VEGETABLES							
Potatoes	13,675	252,751	20,373	263,401	29,940	301,686	386,847
Tomatoes	509	6,745	495	8668	742.3	19,690	8,445
Spinach	231	2,056	238	2,140	420	5,592	10,650
Kales	596	9,576	869	9,976	1,055	10,195	48,800
Cabbage	789.3	29,253	1,154	31,681	1,202	37,575	60,715
Carrots	205.1	3,537	541.5	4936.5	501	7,559	7,695
Garden peas	2,384	11,464	2,642	13,018	1,676.5	8,645	7,965
French beans	242.7	2,838.5	237.3	2,698.3	54.7	1298	758.4
Pumpkin fruit	22.9	231	17.6	218.4	22.2	207	300
Butter nut	25.7	383.6	37	414.2	44.8	429.1	675
African Nightshade	26.2	168.2	78.4	253.2	56.9	480.9	435
Spider plant	49.1	237.7	51.7	487.5	11.7	8.0	120
Cowpeas	11.2	64.1	9.7	49.2	10.6	101.1	21
Bulb Onion	40.3	359.6	111.4	628.2	58.7	490.1	455
Spring Onion	118.0	1266.8	238.7	1,411.5	159.3	1695.216	3,638
Bananas	116.2	1,945	120	2,270	121	2751.8	3,175
Mango	88.3	765.6	110.8	1637.4	83	730.1	753
Avocado	67.0	1005.1	68.1	1173.1	89.8	1497.4	1,441.6

Paw paw	34.6	420.2	51.3	345	30.4	358	431.6
Oranges	40.5	657	53.3	853.8	35	354	323.2
Lemons	21.2	209.5	19	195.9	14.7	117.5	127.9
Passion Fruits	21.3	300.6	43.1	308.1	53.3	418.6	333
Water melon	10.3	336.0	14.6	396	17.2	370.6	317.3
Tree tomato	124	941	135	957	89	632.9	459.4
Pears	27	306	26	252	24.4	453.2	488
Apples	6	64	6	72	12	219.6	219.8
Plums	24	222	24	286	28.1	476.8	436.5
Loquats	6	26	11	55	13.2	89.4	92.4

5.2.4 Agricultural Produce Storage Facilities

A total of 816 (63.7%) respondents reported they have crop storage facilities at their homesteads. For those who do not have storage facilities, the greatest post-harvest losses are incurred in charges associated with commercial storage (45.0%), transport (14.7%), stores found in the market places (33.4%), others (6.3%), none response (0.6%). See Figure 5.3.

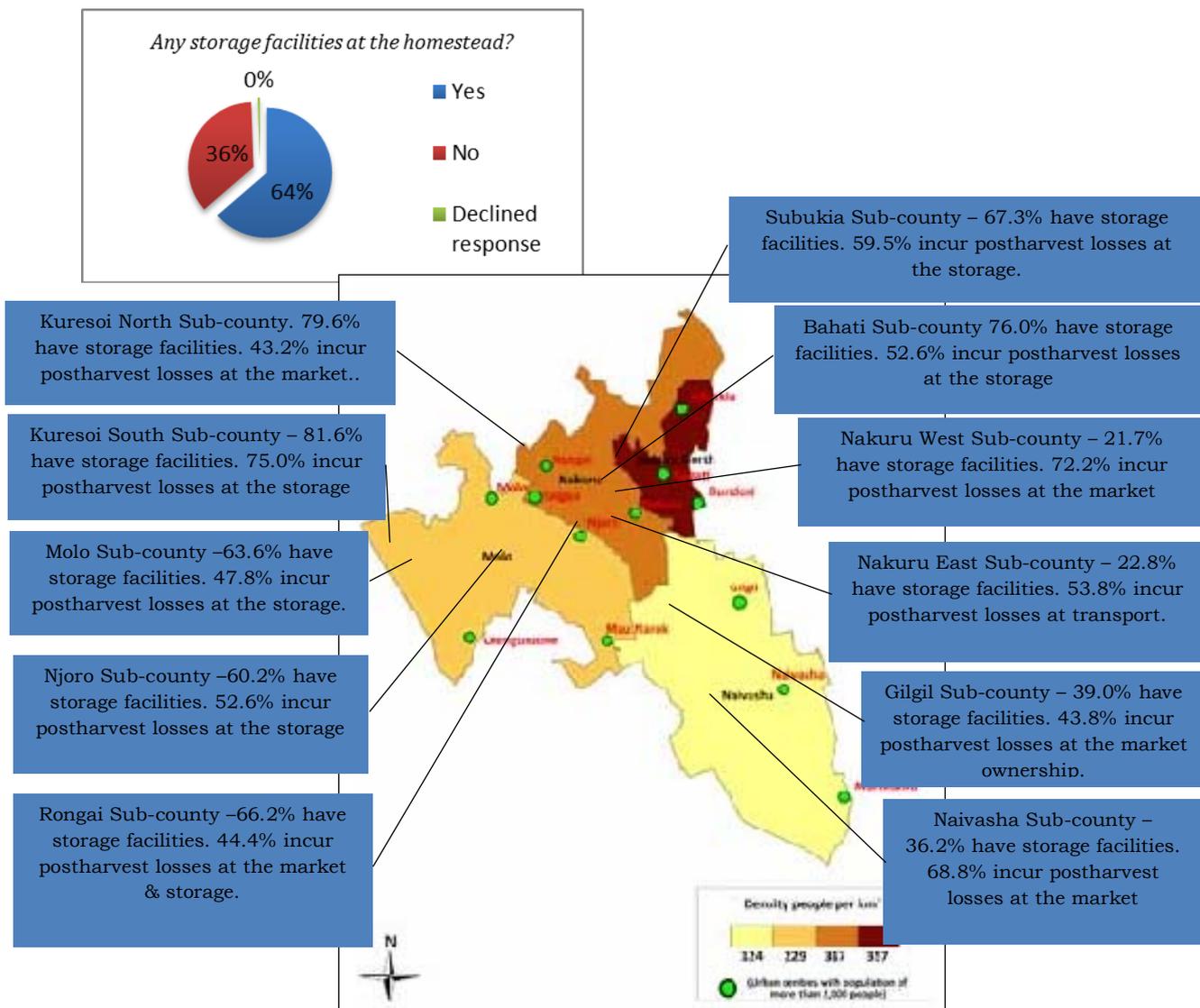


Figure 4.7: Availability of Storage Facilities by Sub-County, and Profile of Post-Harvest Losses

SOURCE: Geomaps/Habitat Planners Nakuru Household Survey Data 2016

5.3 Livestock Production

Livestock production is one of the major economic and social activities undertaken by communities living within Nakuru County. The main livestock reared, in order of economic significance, include dairy cattle, poultry, sheep, goats, beekeeping and rabbits. Among them, dairy production is a major livestock income earner. Others include the emerging livestock species such as Quails, Pigeon and Ostrich. The main livestock breeds include Dairy-Ayrshire, Friesian, Guernsey and Jersey and several crosses. Beef animals include Boran, Sahiwal and their crosses. Goat breeds are East African goat, Saanen, Torgenburg, German Alpine, Galla, Boer and Angora. Sheep breeds include Merinos, Blackhead Dorper, Corriedale, Romney Mash and Hampshire down. Pig breeds include Landrace, Large white, Duroc and their crosses. For poultry there are commercial breeds

such as White Leghorn, Rhode Island, Light Sussex, Black Australorp and the hybrids. For indigenous poultry they include Normal, crested, naked neck, dwarf and frizzle.

The County has an estimated 165,854 beef cattle, 310,448 dairy cattle, 179,300 wool sheep and 294,350 hair sheep, 269,240 meat goats, and 21,380 dairy goats. There are 19,488 pigs, 91900 Rabbits and an estimated 1,779,216 poultry.

In 2015, the County produced 290,187,525 Kgs of milk valued at Kshs 9.64 billion. It is also estimated that 6,952 tons of beef meat was realized valued at Kshs. 2.5 billion. On the other hand, chevon production in the same year was 372,744Kgs valued at Kshs. 147,691,200 whereas 701,542 Kgs of mutton was realized valued at Kshs. 454,680,000. Honey production realized 365,662 Kgs valued at Kshs. 139.0 million while Wax gave 13,439 Kgs valued at Kshs. 2,526,532. In the wool industry 89,662 Kgs valued at Kshs 4,034,835. For eggs, an estimated 106,010,842 eggs were realized valued at Kshs. 1.852 billion while poultry meat was 1,320,979 Kgs valued at Kshs. 436.0 million. Pigs produced 54,032 kgs of pork valued at Kshs 18,566,850. The total income realized from all livestock and their products in the County was Kshs.12, 748,849,620.

The County has a potential of 5 billion kilograms of milk and 42 million Kgs of beef, Wool 1.5 million Kgs, over 11 million pieces of hides and skins. About 30 million Kgs of honey and 500,000Kgs of wax can be realized and over 2 billion eggs in number can be achieved if farmers undertook recommended animal husbandry practices.

Out of the 1,899 respondents, 936 (49.2%) reported they keep livestock in their farms. Cattle accounted for (67.2%), poultry 43.9%, sheep 30.1 %< goats (14.8%), sheep (16.4%) (See Table 5.4). Kuresoi south and Subukia have the highest percentage of livestock keepers. Fish farming is found in Njoro and Nakuru east.

Table 4.15: Types of Livestock Kept by Respondents by Sub-County Profile

Region	No. of respondents	Types of livestock						
		Cattles	Goats	Sheep	Poultry	Pigs	Donkeys	Fish
Nakuru County	936	67.2%	27.1%	30.1%	43.9%	3.5%	7.7%	1.0%
Sub-counties Livestock Keeping Profile								
Bahati	85	54.1%	25.9%	32.9%	45.9%	11.8%	1.2%	-
Gilgil	56	62.5%	44.6%	46.4%	57.1%	3.6%	1.8%	-
Kuresoi North	165	81.2%	15.8%	36.4%	47.3%	-	12.1%	0.6%
Kuresoi South	179	93.3%	24.0%	22.3%	44.1%	2.2%	14.0%	-
Molo	119	60.5%	18.5%	19.3%	42.0%	1.7%	.8%	.0%
Naivasha	34	50.0%	47.1%	32.4%	11.8%	2.9%	20.6%	.0%
Nakuru East	21	42.9%	47.6%	19.0%	33.3%	-	.0%	4.8%
Nakuru West	21	66.7%	19.0%	9.5%	47.6%	4.8%	.0%	.0%
Njoro	74	45.9%	29.7%	33.8%	52.7%	8.1%	5.4%	4.1%
Rongai	53	67.9%	26.4%	26.4%	37.7%	1.9%	1.9%	-
Subukia	129	71.3%	38.8%	38.0%	41.1%	4.7%	9.3%	3.1%

SOURCE: Geomaps/Habitat Planners Nakuru Household Survey Data 2016

A total of 130 (6.8%) respondents reported they keep unconventional livestock / new animals in their farms. These include bees (79.7%), ornamental animals (7.5%), Guinea fowl (5.3%), and Chameleon (0.8%) others (6.9%).

The livestock subsector contributes to the food and cash needs of the farmers, and provides employment to a significant population in the county. Both crop farmers and pastoralists keep livestock for food and income generation.

The livestock industry has a high degree of vertical links with upstream and down-stream industries. It is a significant user of products from feeds, drugs, vaccines and equipment manufacturing industries and is a major provider of raw materials for agro-processing industries.

The most common livestock kept in the large-scale commercial farms are dairy and beef cattle, goat and sheep, with milk, meat, hide and skin, wool and mutton as their main products. The population pressure on the

wildlife due to the expansion of land under cultivation and poaching activities has led to the conversion of some beef ranches to animal conservancy areas.

Dairy Population in the County

The dairy cattle population over the years has been increasing as result of value of the dairy animals. Exportation of dairy cattle to other Counties and outside the Country has also enhanced their prices. The Table 5.5 indicates the populations of 2015 and 2014, however note the 2015 dairy population is only inclusive of January to September. The population is expected to increase when the other three months are captured.

A huge potential for dairy production exists especially for small scale farmers. However, over the years, the dairy herd population has been decreasing due to reduction in agricultural land. Intensive dairy campaigns and extension service delivery has greatly increase dairy animal productivity.

The Table 5.6 indicates the estimated milk production from different sub counties. The estimated production of milk is as from January to September 2015. The average farm gate price is Ksh.25 – 30 per kilogram of milk while the market price is ranging between Ksh. 50 – 60 per kilogram. The directorate of livestock and other stakeholders have been encouraging the growth and development of the dairy sector in the County through field days, farm visit, exhibition/trade show and other stakeholder for a and platforms.

Table 4.16: Dairy Population

Sub County	2015	2014
Gilgil	10,724	9,748
Njoro	16,937	36,915
Nakuru East	8,025	7,925
Bahati	35,500	36,149
Subukia	3,700	3,960
Kuresoi North	9,700	40,300
Kuresoi South	61,210	39,040
Naivasha	35,130	59,100
Molo	9,200	16,850
Rongai	28,224	28,216
Nakuru West	3,242	7,847
Total	221,592	286,050

SOURCE: Geomaps/Habitat Planners Nakuru Household Survey Data 2016

Table 4.17: Milk Production

Sub-County	Milk (kg)
Gilgil	813,417
Njoro	12,608,961
Nakuru East	11,772,216
Bahati	38,807,662
Subukia	1,619,000
Rongai	2,259,869
Molo	14,987,613
Nakuru West	1,841,079
Naivasha	19,858,163
Kuresoi North	55,318,884
Kuresoi South	21,662,104
Total	181,548,968

SOURCE: *Geomaps/Habitat Planners Nakuru Household Survey Data 2016*

Support of various programs such as Smallholder Dairy Commercialization Program (SDCP), Kenya Agricultural and Agribusiness Project (KAPAP) and Agricultural Sector Development Support Program (ASDSP) have been keen on dairy value chain development.

5.4 Fisheries

Fisheries activities in Nakuru county ranges from fishing in lakes; Lake Naivasha with the main target species of economic value; Common carp, Tilapia and Black bass and in both private and community owned dams.

Fishing in Lake Naivasha is one of the main economic activities for the community living around supporting 50 fishing boats each with 10 fishing gears as the current sustainable fishing effort. Capture fisheries; mainly carried out in dams and Lake Naivasha has been nationally recognized due to its economic importance. It supports about 100 boats, 1,000 fishing nets of 4 inches mesh size, with over 500 fishermen directly and more than 3000 people indirectly. Fish produced in the lake is not only consumed locally but also exported out of the county. The lake production has increased over the years as shown below.

Table 4.18: Capture Fisheries

YEAR	TOTAL CATCH (Kgs)	VALUE (Kshs)
2010	209,084.5	13,052,911
2011	288,076	18,118,821
2012	143,315	14,609,922

2013	206,876.5	15,446,240
2014	691,837.4	59,831,954
2015	1,080,579.6	131,678,247.50

SOURCE: *Geomaps/Habitat Planners Nakuru Household Survey Data 2016*

There are three landing sites on Lake Naivasha, Kamere, Central landing and Tarambeta each with fish market centres/bandas. Also one landing site on every dam that is being exploited. There has been a notable increase in fish production both from the capture fisheries and culture in ponds which has greatly increased the consumption of fish within the county. This calls for an organized market with proper fish handling facilities constructed in other parts of the county like Nakuru and Subukia to reduce post-harvest losses.

Fish rearing farming is also highly practiced in fish ponds and water reservoirs owned by individuals and registered groups with the support of the state department and linkages from other stakeholders. The fish value chain has been able to form a county common interest group to tap the business potentials available in the fisheries sub sector. Many of the fish ponds were introduced through Economic Stimulus Programme (ESP) by the Government of Kenya in 2009 against a backdrop of the global economic and financial crisis in 2008. It is estimated that there are approximately 1500 operational fish ponds across the County. The main types of fish reared are tilapia, cat fish and tout though at low level.

The intervention of County government by funding FFEPP (fish farming enterprise project) and provision of 50 pond liners by the County government has tremendously increased the number of farmers over the years as shown in Table 5.8.

Table 4.19: Fish Ponds Production

Year	Farmers	Ponds	Area (Sqms)	Production (Kgs)	Value (Kshs)
2010	1,000	1,000	300,000	257,180	18,407,861
2011	1,500	1,500	450,000	632,689	53,444,717
2012	1,550	1,575	472,500	648,935	54,259,933
2013	1,550	1,600	480,000	522,276	43,669,490
2014	1,590	1,650	495,000	137,891	19,249,792
2015	1,631	1,660	502,500	100,487	19,586,350

SOURCE: *Geomaps/Habitat Planners Nakuru Household Survey Data 2016*

Aquaculture is the only sustainable source of fish and has great potential for growth in Nakuru County mainly due to the presence of a wide variety of water sources such as rivers, springs and lakes. In addition, most

of the land that is suitable for other agricultural activities is also suitable for aquaculture. Aquaculture can also be integrated with other production activities such as poultry and dairy production to increase production efficiency per unit area. Commercial aquaculture enterprises are increasing. This is a paradigm shift from subsistence aquaculture, which has been practised over the years.

The Fish inspection, quality assurance (FIQA) and marketing unit is responsible for the overall technical supervision of fish quality assurance in the county, in particular implementation and coordination of fish safety activities to ensure compliance with County, National and International market requirements. During the year 2015 a total of **290MT** of mixed fish species valued at **66.9 million** was marketed.

Table 4.20: Marketed Fish

YEAR	FISH MARKETED (Kgs)	VALUE (Kshs)
2013	291,000	18,700,000
2014	335,000	63,400,000
2015	290,397	66,904,044

This data reflects what was sold locally within the county and the surplus was exported out of the County.

The aquaculture subsector has the potential of significantly contributing to the livelihoods of the county residents by creating employment, earning foreign exchange, reducing poverty and supporting food security. Demand for fish is rising owing to the growing population and their changing eating habits as they move towards healthy living. With its cholesterol-free white meat, fish offers the best nutrition profile for humans.

5.5 Beekeeping

In addition to contributing directly to household incomes, bees play an important role in plant pollination. Due to the low investment and variable costs involved, beekeeping is becoming increasingly popular in rural areas. Many farmers are however yet to fully embrace apiculture.

5.6 Forestry

Forests and related forestry activities contribute to improved agricultural productivity through conserving soil and water and enhancing soil fertility. Although there is a significant forest cover in Nakuru County due to the Mau Forest, there are also large areas which have little tree cover. In addition, the Mau forest was previously seriously threatened by planned excision of land for settlement and excessive harvesting of trees without

replanting. Water catchment areas in the county are being rehabilitated. Farmers are also being encouraged to adopt agro forestry.

5.7 Wildlife

While most wildlife is concentrated in game parks and reserves, a considerable population is on farmlands and ranches. Wild animals in parks and reserves are well managed and play a key role in the economy, mainly through tourism. However, wildlife on farmland and ranches is seen as a menace. Human-wildlife conflict remains a serious threat to other forms of crop production including establishing industrial forests. Electric fencing has proved effective in reducing wildlife-related damage and should be enhanced, especially where land-use types are incompatible.

Returns from tourism can exceed returns from competing land uses such as pastoralism and ranching, especially in the arid areas of the county. The challenge is to identify the best types of land use (or combination of them) for specific areas in terms of their long- and short-term benefits to the people.

5.8 Cooperatives

Agricultural cooperatives have helped in procurement of inputs, production, value addition and marketing. In the financial sector the cooperative movement through savings and credit cooperatives (SACCOs) has helped mobilize savings and provide credit to producers.

5.9 Agriculture Development Institutions

5.9.1 Agricultural Research

Currently, the agricultural research system comprises public and private agricultural research institutions established under different legal and institutional frameworks. The Kenya Agricultural Livestock Research Organisation (KALRO) is the leading public agricultural research institution.

The National Irrigation Board established under the State Corporations Act (Cap 446) has a research division that undertakes research on irrigation technologies and practices.

Academic institutions such as the Egerton University found in the County have faculties of agriculture that carry out agricultural research independently or in collaboration with other agricultural research institutions.

In addition, some agricultural research is undertaken by private sector institutions as well as individual farmers. This research is geared at

enhancing productivity, product quality and safety, and competitiveness in domestic and global markets.

5.9.2 Agricultural Extension and Training

Agricultural extension service is provided by the county government under the Agriculture department. It plays a key role in disseminating knowledge, technologies and agricultural information, and in linking farmers with other actors in the economy.

Other extension service providers include NGOs, community-based and faith-based organizations. The entry of these new players has helped fill the gap created by the reduced presence of public sector extension service.

There are two key agricultural institutions in the county that offer services to the agricultural sector. These institutions are the Agricultural Machinery Services (AMS) and Agricultural Training Centre (ATC). Others include universities, middle-level colleges and institutes, and farmer and pastoral training centres. Agricultural training institutions run by the private sector also offer general and specialized courses.

Farmers training centres are not readily available in Nakuru County. Out of the 1,899 respondents, 23.7% reported they knew of a farmers training centre within their locality, while 75.0% reported no knowledge of the same. Out of the 450 respondents, over 62.3% reported that farmers either meet annually or never meet at all. See Table 5.10.

Table 4.21: Availability of Extension Workers and Alternative Sources of Agricultural Related Information

County / sub-county	Total number of respondents	Availability of a farmers training centre		Frequency of meetings				
		Yes	No	Quarterly	Semi-annual	Annually	Never	N/A
Nakuru County (Overall)	1,899	23.7%	76.3%	16.9%	20.0%	12.3%	50.0%	0.8%
Sub-County Analysis								
Bahati	140	33.3%	62.4%	2.9%	70.6%	14.7%	8.8%	2.9%
Gilgil	175	12.3%	83.6%	10.7%	25.0%	3.6%	60.7%	-
Kuresoi North	200	16.2%	83.2%	2.4%	9.8%	8.9%	78.9%	-
Kuresoi South	178	21.2%	78.3%	18.1%	12.8%	10.6%	57.4%	-
Molo	248	21.8%	77.7%	20.6%	6.3%	6.3%	65.1%	1.6%
Naivasha	69	6.2%	92.3%	-	15.0%	10.0%	75.0%	-
Nakuru East	144	22.4%	77.6%	-	16.7%	33.3%	50.0%	-
Nakuru West	77	23.4%	72.3%	15.4%	23.1%	46.2%	7.7%	7.7%
Njoro	190	36.0%	64.0%	66.7%	11.1%	14.8%	7.4%	-

Rongai	147	25.0%	75.0%	8.7%	26.1%	43.5%	21.7%	-
Subukia	220	36.4%	61.7%	40.7%	39.0%	6.8%	11.9%	1.7%

SOURCE: *Geomaps/Habitat Planners Nakuru Household Survey Data 2016*

Extension services

In Nakuru County, 74.2% stated that extension workers do not reach their farms. Extension services are one of the key inputs towards increased agricultural outputs. The lack or unavailability of these services means that farmers continue to rely on the traditional agricultural practices. Alternative sources of agricultural related information include getting information from other farmers (63.5%), media outlet (27.8%), stakeholders (6.2%) and others (2.5%). See Table 5.11

Table 4.22: Availability of Extension Workers and Alternative Sources of Agricultural Related Information.

County / sub-county	Total number of respondents	Availability of extension workers		Sources of agriculture related information			
		Yes	No	Other farmers	Media	Other Stakeholders	Other sources
Nakuru County (Overall)	1,899	24.6%	74.2%	63.5%	27.8%	6.2%	2.5%
Sub-County Analysis							
Bahati	140	50.5%	49.5%	73.3%	24.4%	-	2.2%
Gilgil	175	11.5%	83.5%	36.5%	48.1%	9.6%	5.8%
Kuresoi North	200	10.8%	89.2%	71.5%	25.9%	2.5%	-
Kuresoi South	178	18.30%	81.7%	80.1%	15.8%	2.1%	2.1%
Molo	248	29.2%	70.8%	62.0%	31.8%	5.4%	0.8%
Naivasha	69	10.3%	89.7%	55.3%	6.4%	36.2%	2.1%
Nakuru East	144	20.8%	79.2%	31.6%	68.4%	-	-
Nakuru West	77	27.5%	72.5%	26.7%	20.2%	6.7%	46.7%
Njoro	190	30.4%	69.6%	62.7%	35.3%	2.0%	-
Rongai	147	20.5%	78.1%	76.0%	14.0%	6.0%	4.0%
Subukia	220	28.9%	71.1%	43.0%	44.3%	10.1%	2.6%

SOURCE: *Geomaps/Habitat Planners Nakuru Household Survey Data 2016*

5.9.3 Markets for Produce

Marketing for the different commodities are characterized by long, not transparent and consist of many players making them inefficient and unresponsive to producer needs. Market centres (41.4%) and selling to brokers (36.2%) were the primary destination for farm products (see Table 5.12). The least mentioned sources are cooperatives which accounted for 2.7% of all responses. For planning purposes, there is need to encourage formation of marketing cooperatives in the county.

Table 4.23: Places where Most Farm Produce are Sold by Sub-County

Region	Number of respondents	Places where most farm produce are sold						Total
		Market centre	Neighbourhood	Cooperatives	Companies / institution	Brokers	N/A	
Nakuru County (Overall)	1,899	41.40%	14.00%	2.70%	5.50%	36.20%	0.20%	100.0%
Sub-County Analysis								
Bahati	140	29.9%	11.7%	3.9%	5.2%	49.4%	-	100.0%
Gilgil	175	70.3%	8.1%	-	8.1%	13.5%	-	100.0%
Kuresoi North	200	42.7%	7.9%	3.9%	2.8%	42.70%	-	100.0%
Kuresoi South	178	28.5%	26.6%	0.6%	5.1%	39.2%	-	100.0%
Molo	248	46.1%	12.5%	-	10.5%	30.9%	-	100.0%
Naivasha	69	69.1%	12.7%	-	7.3%	9.1%	1.8%	100.0%
Nakuru East	144	57.9%	26.3%	-	10.5%	5.3%	-	100.0%
Nakuru West	77	40.0%	55.0%	-	5.0%	-	-	100.0%
Njoro	190	37.9%	10.3%	8.0%	5.7%	36.8%	1.1%	100.0%
Rongai	147	53.6%	5.4%	3.6%	7.1%	30.4%	-	100.0%
Subukia	220	31.9%	10.4%	4.4%	1.5%	51.9%	-	100.0%

Source: Geomaps/Habitat Planners Nakuru Household Survey Data 2016

Over the years, cooperatives have played a key role in marketing, dairy products, pyrethrum, livestock and fish. County and regional markets have great potential to expand with better marketing infrastructure and quality assurance.

5.9.4 Credit Institutions

At the national level, there is the Agricultural Finance Corporation whose mandate is to provide long-term credit to individuals and groups to purchase farms and to finance farm improvement, as well as seasonal credit for production. By providing suppliers with credit, cooperative societies also supported farmers. These organizations have been mismanaged and run down and are no longer important sources of finance for agriculture. Indeed, a large number almost collapsed. Today, farmers get credit mainly from cooperatives, NGOs and community-based lending institutions.

5.9.5 Value Addition and Agro-Processing

There are three categories of agro processing going on in the County.

- Industries involved in processing of industrial crops e.g. Pyrethrum, Tea, Maize, Sunflower, Soya beans etc.
- Medium Scale, dealers with vegetables and fruits processing .eg. canning factories cotton ginneries etc
- Cottage produce processing at the farm level eg. Mala and yoghurt making and drying of local vegetables etc.

The main agro processing activities include grading of agricultural produce and milling especially for maize. Milling is done by individual traders. Grading is prevalent in maize, garden peas and barley. Barley processing is carried out by East African malting Ltd. Njoro canners contract farmers in the county and also outside the county. Soypro is a local production of soya beverage in Lare division where they add value to soya beans.

Table 4.24: Agro processing Facilities

Sub County	S/No	Processing plant	Produce	Capacity	Remarks
Molo	1	East African malting	Barley seed	6000 T/year	Mechanized system
	2	Molo Peas Marketers	peas	3 T/month	
Bahati	1	Milling corporation	Dairy meal, poultry feeds, sunflower and soya bean meal, maize germ, maize flour		Packaging is in gunny bags.
	2	Kamiruri Agro processors	Honey		Done at the farm level. Scale very low.
	3	Twajenga Holdings Co.	Wheat, sunflower,		Uses a stone mill for wheat

Sub County	S/No	Processing plant	Produce	Capacity	Remarks
		Ltd	soya beans		processing and a cold press for sunflower oil.
	4	Wanyororo Dairy Cooperative	Milk		Plant is still young. Acquired the milk processing equipment through KAPAP.
Njoro	1.	Njoro Cannery (large scale)	Canned assorted Vegetables for export	-	Contract farmers in and outside the Subcounty
	2.	Amani flour mills (large scale)	Maize flour	-	-
	3.	Soypro (small scale)	Soya beverage Soya flour	160kg/month 340kg/month	Local production of soya beans & soya beverage in Lare division
	4.	Dehydrates East Africa-Assorted vegetables	Assorted vegetables	-	Not in production due to low production of vegetables
Rongai	1.	Tushibemtama group.	Value addition of wheat into buns and wheat flour Sweet potato cakes, cookies and mandazi	Licensed with mini bakery at Mangu trading centre with turnover of 10,000 profit per day.	KEBS mark of Quality Expansion of sweet potato value addition products underway.
Kuresoi South	1	Kiptagich Tea factory	Tea	581 T per day	Privately owned
	2	KTDA Tea Factory	Tea		
	3	Kuresoi Women Regional Assembly (KUWORA)	Potato cold storage and Chips making		Funded by the CDTF (Community Development Trust Fund) Ksh. 2M

Sub County	S/No	Processing plant	Produce	Capacity	Remarks
	4	Gorta			Starting a potato value addition industry in Keringet ward

SOURCE: Nakuru County Agriculture Annual Report 2015.

Farmers are being trained on value addition in their groups on the following;

- Value addition of sweet potatoes
- Value addition of sorghum
- Processing of tomatoes into paste and sauce
- Cake baking
- Drying of vegetables
- Juice making

It has not been possible to ascertain the traded volumes because traders do not keep records and some of them do not want to disclose the information. The agro processing going on in the County is mainly done on a small scale at cottage level. Many farmer groups involved with value addition lack adequate knowledge on proper packaging. Farmers require assistance in identification of equipment's to assist them carry out processing of their produce e.g. fabricated juice extractors e.t.c. There is also inadequate skills on agro-processing amongst extension staff and farmer entrepreneurs. Inadequate entrepreneurial skills in standardization and rates governing food & nutrition.

The challenges encountered in agro-processing include;

- Processing machinery is quite expensive and prohibitive to most farmers/farmer groups.
- Packaging materials has become very expensive especially polybags.
- Technical know-how and market outlets also pose a great challenge.
- High levels of competitive products from local and international markets also affect the capability and capacity of agro-processors.
- High energy prices.
- Unstable supply of raw materials.

5.10. County Agriculture Development Policies

The county has identified the following as key agriculture intervention plans:

- a) To improve agriculture, livestock and fisheries

- b) To promote food security for people so that food AID is not needed
- c) Improve agriculture to bring income to farmers and create employment for all
- d) Demystify farming for the youth to participate

Target: Make farming a business enterprise by encouraging young people to do value addition in Agriculture, livestock and fisheries

Objective: To encourage investors, both local and international to invest in agricultural inputs such as fertilizers, farm machinery and equipment for value addition.

The county government through the Department of agriculture has also identified key projects. These include:

- a) Rehabilitate pyrethrum-putting around 18 million in the nurseries in collaboration with Kenya Pyrethrum Board
- b) Support co-operatives and farmers so they can add value to the ministry
- c) Encouraging people to have fish ponds besides the lake Naivasha
- d) Looking for investors who can process fish from Naivasha
- e) Looking for investors who can process end product of beef by constructing a class A abattoir /company which can export the beef, beef sausages, hides & skins, animal feeds, create industries for dairy meal/food stuff for our own animals.
- f) Civic Education on irrigation
- g) Encourage the construction of an airport in Nakuru to enhance mass production and export of agricultural produce to improve revenues and job creation.

5.11 Challenges Facing Agricultural Production

The challenges facing agricultural production in Nakuru County include:

- a) Inadequate budgetary allocation: Insufficient budgetary allocation to the agricultural sector is a key constraint. This insufficient allocation has reduced human resources and service delivery by County Government institutions.
- b) Mobility: The effectiveness of extension services has declined with the new devolved system of government. Extension officers often lack the means to move within the county to offer their services to farmers. When farmers want advice, the extension officers use their own means of transport which is then later levied on the farmer. This can also be attributed to a sharp reduction in operational budgets for the agriculture department.

- c) Recruitment: Quite a significant number of staff members are due to retire in 1-2 years and thus the county needs to recruit staff to learn from the retiring staff members.
- d) High cost and increased adulteration of key inputs: The cost of key inputs such as seed, pesticides, fertilizer, drugs and vaccines is high for resource-poor farmers. Such high costs lead to low application and adulteration of inputs.
- e) Pre and post-harvest crop losses: There have been high levels of waste due to pre and post-harvest losses occasioned by pests and diseases, and lack of proper handling and storage facilities. Smallholder farmers are unable to control pests and diseases due mainly to lack of information. The situation is exacerbated by a lack of storage facilities for farm produce.
- f) Land use changes: The rising population density has contributed to the subdivision of land to uneconomically small units. Inappropriate land-use practices and environmental policies that have encouraged land fragmentation, extension of urban development into agricultural land, retention of idle land, cultivation of river banks, deforestation and encroachment into catchment areas and wetlands
- g) Inadequate infrastructure: Poor rural roads and other key physical infrastructure have led to high transportation costs for agricultural inputs and products. This has reduced farmers' ability to compete.
- h) Climate change: climate change is impacting heavily on agriculture in Nakuru County. For instance, the emergence of new pests and diseases that are affecting crops in the county as well as livestock is a key indicator of a changing climate. Erratic and unpredictable weather conditions also affect agricultural production.
- i) Poor marketing structure: lack of market regulation makes farmers at times to incur losses due to low market prices. Extension officers felt a need to have concrete market regulations to avoid post-harvest losses. Also, presence of so many brokers for agricultural produce ultimately decreases earnings for the local farmers through exploitation.

Table 4.25: SWOT Analysis

Strength	Weakness	Opportunity	Threats
<ul style="list-style-type: none"> • Favorable weather conditions • Presence of agriculture institutions • Community's passion for crop 	<ul style="list-style-type: none"> • Ineffectiveness of agricultural extension workers • Low level of expertise. • Overreliance on maize, beans, and other crops leading 	<ul style="list-style-type: none"> • Formation of farmers Sacco's to provide capital • Showcasing alternative agricultural technologies 	<ul style="list-style-type: none"> • Environmental degradation/ Global Warming • Preference of white collar jobs by youth. • Diminishing agricultural land

Strength	Weakness	Opportunity	Threats
& livestock production <ul style="list-style-type: none"> • Diversification of livelihoods; • Ready market for farm outputs • High population especially the youths • Availability of arable land • Embracing of I.C.T 	to poor harvests. <ul style="list-style-type: none"> • Poor road network • Preference of white collar jobs • The land not fully utilized for maximum benefits • Few residents are computer literate. 	<ul style="list-style-type: none"> • Water projects funded by the county and CDF • Rain water harvesting • Community interest in new farming ideas/technologies • Ongoing construction of major roads and upgrading of feeder roads. • Vocational training on farming methods and agri enterprises • Rural livelihoods diversification eg beekeeping, ecotourism • Introduction of I.T in all schools; • Farmer trainings on ICT 	due urbanization <ul style="list-style-type: none"> • Lack of entrepreneurial skills and vocational skills; • Deforestation and encroachment of forest reserve; • Drug and substance abuse, HIV/AIDS • Increased subdivision of land into small plots, land use changes • High cost of I.T equipment;

5.12 Summary and Emerging Issues

In spite of the many challenges and constraints limiting agricultural growth in Nakuru County, there are some emerging issues that can be exploited to build a robust, dynamic and business oriented agricultural sector;

- a) **New and expanding markets:** With the devolved system of governance, Nakuru County is uniquely placed to take advantage of expanding domestic markets in other counties as well as be able to go for regional and international markets. Due to the diverse agro-ecology, the county can produce a wide range of temperate, tropical and subtropical

products. Large and expanding markets for traditional products like maize and other cereals, beef and dairy products, tea, coffee and pyrethrum exist. Global demand for horticultural products, and emerging livestock such as ostrich, guinea fowl, crocodile, frogs and butterflies as well as emerging crops such as assorted resins and essential oils, and aloe remain under-exploited. Vast opportunities are opening up in the production of biofuels from sugar cane, maize, millet, sorghum, jatropha and other oil-bearing seeds.

- b) **Potential for increasing production:** Not much effort has been put to increasing production of traditional commodities in Nakuru County. Agricultural productivity can be increased in multiples through better use of unused land in traditional farming areas, and through irrigated agriculture. The vast livestock potential in the arid and semi-arid areas that cover 30 per cent of the county remains untapped as does the fisheries potential in Lake Naivasha as well as from individual and group fish ponds located in the county.
- c) **Vast irrigation potential:** Nakuru County has vast stretches of land that can be used for irrigation purposes. This can significantly increase production of commodities as well as creating employment for the residents of the county not forgetting the massive revenues that can be generated from irrigation.
- d) **Value addition:** Value addition includes processing, branding, quality certification and accreditation, as well as farm-level quality improvements that the market values. It is estimated that 91 per cent of total agricultural exports are in raw or semi-processed form. Thus, the county loses billions in earnings by not adding value to its produce. Potential for adding value to products such as tea, coffee, pyrethrum, hides and skins, milk and beef, fruits and vegetables remains largely untapped.

e) Community Priority Projects

Following community participation forums held throughout the 11 sub counties, the following priority projects were identified by community members:

- a) Storage centers: there's a need to have farm produce storage centers in the county to avoid post-harvest losses. These also include potato and milk cooling centers.
- b) Establish farmers wholesale markets and agricultural information centers

- c) Establishment of agriculture and livestock produce value chains and value addition industries to increase and diversify incomes for farmers.
- d) Improvement of feeder roads so as to ease transport of farm produce to the markets as a means of avoiding post-harvest losses.
- e) Enhance ICT connectivity so that farmers can get access to market information in a timely manner as well as get informed on agriculture matters.
- f) Revive and diversify the cash crops and industrial crops sector.

5.13 Conclusions and Recommendations

The rich volcanic soils of Nakuru County give great potential for crops, reliable rainfall in most parts of the county, readily available labor force and the availability of ready market for crop produce both in the urban centers and the proximity to other major urban centers such as Nairobi, Nakuru, Eldoret Naivasha, Gilgil and Narok offers incentives for the sector to flourish.

Revitalize agriculture and Livestock Keeping- Agriculture and livestock development remains one of the major pillars of economic development of the county; however, there is a casual approach to the stability of these two sectors, there is need to support major actors i.e. seed production, farm inputs supply, Vet services so as to strengthen the sectors and make them more profitable to the residents.

Plan for livestock corridors- Livestock corridors do not exist or they are not known by the residents, therefore the need to identify them and provide all the required facilities that will be required along the corridor i.e. water and sanitation facilities.

List of the Challenges Mentioned by Stakeholders

- Lack of good grade roads that can substantially bear the heavy trucks carrying agricultural goods and loggers ferrying timber
- Lack of facilities for potatoes and milk storage
- Do not have slaughter house
- Lack of markets for trading
- Break out livestock diseases and crop diseases
- Lack of slaughter slabs
- Lack of fertilizer
- Lack of produce collection centres
- Livestock diseases
- Lack of slaughter house for small animals

- Inadequate storage facilities
- Limited growth towards the ranches
- Lack of pyrethrums seedlings
- Poor prices for agricultural produce
- No public facilities in tea factory
- Broken for agricultural products (potatoes)
- Marketing of agricultural produce
- Fluctuations of agricultural produce prices
- Lack of storage facilities/preservation facilities
- No credit facilities for youth/women
- Lack of value addition for agricultural products
- Lack of access to extension services
- Lack of factual information from agricultural offices
- Lack of certified potatoes seeds
- Un-conducive weather between August and March for farming
- Youth unemployment
- Existing markets in deplorable conditions
- No value addition facility for dairy farmers
- Dependency on rain-fed agriculture
- Rampant sub division agricultural land
- Poor marketing structures for agricultural produce
- Inadequate value addition for farm produce
- Inadequate water for irrigation
- Low agricultural yields
- Lack of demarcation of riparian reserve
- Lack of demarcation of riparian reserve
- Poor land management that is the shamba system causing environmental degradation
- Inadequate funding/support to agricultural related departments for instance to the extension officers
- Inadequate markets, low utilization and its accessibility
- Lack of adequate agricultural extension officers
- Reliance on rain fed agriculture
- Lack of marketing systems for agricultural products
- Lack of storage facilities
- The Sub County incubators were procured in a shoddy manner
- Pollution of water sources by agriculture

Cross-cutting challenges in all the sub counties

- Poor road networks,

- Poor solid waste management
- Poor drainage
- Lack of title deeds

List of Opportunities

- Availability of agricultural demonstration farm that needs to be improved to pave way for farmers farming centre
- Good climate
- Fishing
- A lot of milk
- Plenty of agricultural produce
- Existing timber and canning industries
- Many dams for agriculture and fish farming
- Existing fish ponds under economic stimulus
- River Njoro for domestic/ agriculture water
- Existing cattle dips
- Fertilizer factory to boost agriculture
- Licensing of animal orphanages
- Agriculture potential (floriculture and horticulture)
- Underground water for irrigation
- Available human resource
- Good soils for agriculture (farming)
- Conducive climatic conditions for agricultural production
- A hard working population
- Plenty of water (dams and boreholes) that is Itara dam
- Availability of labour force
- Plenty of agricultural produce
- Ready market for agricultural produce
- Fertile agriculture land and favourable climate
- Provide a pasteurizer for milk value addition
- Establishment of a farmer's market
- Favourable climate
- Good soils
- Existing underutilized cereal board storage facility
- High potato production
- Conducive climatic conditions for agricultural production
- Waste recovery e.g. waste for fertilizer
- Biogas production

Suggestions on Agriculture Vision 2025

- A leading Sub County in potato production, processing and marketing
- Leading area in milk production and processing.

- The leading producer of value added agricultural products
- To be a sub-county with modernised agriculture
- To be an economical and agri-business sub-county
- To be a food secure sub-county
- Prosperous sub- county through agribusiness
- To be a sub –county with reasonable land allocation of ranches
- To be a food secure sub-county
- To be a sub-county with markets for agricultural products
- County where agricultural land is safeguarded
- County with policy on protection of agricultural land
- Fair trading platforms for farmers

Chapter Six : Transport and Infrastructure

This chapter outlines the transportation and infrastructure characteristics of the county. It details the conditions/status of the infrastructural facilities; the challenges affecting this sector and concludes with a SWOT analysis.

6.1 Transportation

According to the socio-economic conducted in 2016, the main mode of transportation in the county is walking which accounts for (63.8%). Other modes of transport include matatu (13.2%) and boda boda (15.4%) which are categorized as public service vehicles (PSVs). Private vehicle ownership constitutes 6.2%. Table 6.1 profiles the various mode of transport by sub-county.

Table 4.26: Mode of Transport per Sub-County

Region	No. of respondents	Mode of Transport*								
		Walk	Boda boda	Motor cycle (rider)	Motor cycle (Passenger)	Private car (self-drive)	Private car (Passenger)	Matatu	Bus	Others, (Specify)
Nakuru County (overall)	1,891	63.8%	15.4%	5.9%	8.4%	4.8%	1.4%	13.2%	0.7%	0.4%
Sub-county Analysis										
Bahati	145	57.2%	11.0%	8.3%	9.0%	10.3%	2.1%	22.1%	-	-
Gilgil	170	65.3%	18.8%	3.5%	2.9%	2.9%	1.8%	5.3%	0.6%	1.2%
Kuresoi North	208	85.6%	20.7%	3.4%	4.8%	2.4%	1.0%	2.9%	1.0%	-
Kuresoi South	194	87.6%	23.7%	4.6%	9.3%	0.5%	-	1.5%	-	-
Molo	258	68.2%	12.4%	6.6%	19.0%	2.7%	0.8%	7.8%	-	0.4%
Naivasha	78	60.3%	5.1%	3.8%	2.6%	7.7%	-	12.8%	10.3%	-
Nakuru East	162	42.6%	14.2%	3.7%	4.3%	13.0%	1.9%	32.7%	-	0.6%
Nakuru West	69	42.0%	10.1%	8.7%	11.6%	8.7%	1.4%	27.5%	-	-
Njoro	182	50.5%	15.9%	7.7%	8.2%	2.2%	4.4%	29.7%	-	1.1%
Rongai	141	51.1%	12.1%	12.1%	1.4%	5.7%	1.4%	19.1%	.7%	0.7%
Subukia	176	63.1%	14.2%	5.1%	11.4%	4.5%	0.6%	1.7%	-	0.6%

6.1.1 Existing Transport System

The major transport infrastructure in the county comprises the roads network. International road A104 and other principal transportation corridors in Kenya passes through Nakuru County.

Apart from the international road, other road networks such as rural, urban, both classified and unclassified are also housed within the county. These road networks assist in functional mobility and/or accessibility within the county.

6.1.2 Road Transportation

The road infrastructure can be described as 20% good, 35% fair and 45% poor. Currently, only 20% of the road network in the county can be said to be fair (*source: Household Survey 2016*). Most bridges in the county are old and dilapidated due to lack of regular rehabilitation and maintenance. Due to the scarce resources required to support capital intensive programmes the road network in the county is sparsely interconnected, particularly in the expansive rural areas. This poor state of roads and bridges particularly during rainy seasons has been a major challenge to agriculture and health sectors with regards to transportation of farm produce and accessibility to health services. The poor road network also hinders effective and efficient patrol by security agencies.

This shows the need for more robust strategies in improving road network and the associated infrastructure in the county to promote agriculture and improve connectivity between regions. In order to improve the road network conditions in the county, there is need to open-up new roads, regularly rehabilitate and maintain the existing roads. The rehabilitation and maintenance of roads should adhere to quality standards.

6.1.3 Motor Vehicle Growth

Kenya's Motor Vehicles Sales Growth rate stood at 4.4 % in Dec 2015, compared with 3.8 % in the previous year. Kenya's Motor Vehicles Sales Growth rate is updated yearly, available from Dec 2006 to Dec 2015, with an average of 4.1 %. The data reached an all-time high of 58.3 % in Dec 2012 and recorded low of -20.0 % in Dec 2010 this automatically shows that there is an increase in the rate of motor vehicle ownership. Expenditure on the purchase of cars, motorcycles and other vehicles accounted for 1.5% of total consumer expenditure in 2015 and is expected to remain relatively stable to 2025 as incomes rise.

6.1.4 Public Transport

Public transport in developing countries such as Kenya comes in a variety of physical forms. Due to the privatized nature of the sector in Kenya, public transport vehicle sizes vary from the large buses to the commonly operated paratransit vehicles known as Matatus. Matatu transport is an important means of paratransit public transport in the county of Nakuru. It is mainly composed of the 14-seater type vehicles that ply many routes not only within the county but also through the entire country. Matatu means of transport grew in numbers in the period after independence due to the influx of migrants into Nakuru County in search of business and employment opportunities as well as settlement. As the county began to expand demand for public transport began to increase, matatus became the most important form of paratransit.

Nakuru Town has many matatu Saccos. These Saccos would wish to adopt a cash-less system for easier accountability and smoother running of operations.

These Sacco's commonly ply routes to Nairobi, Nakuru, Naivasha, and Lanet, as well as within Nakuru County itself. The matatus are mostly preferred by the locals due to their frequency in travel and their high response to demand compared to other means of transport such as tuk-tuks and boda-boda within the county. However, the matatu system has some shortcoming on the notion that their number increases gridlock in the county, they are mostly driven by unruly operators who constantly violate traffic regulations, they have recorded an increase on road crashes and they do not promote environmental sustainability due to the emission of toxic gases that results to greenhouse effect.

6.1.5 Intermediate Public Transport System

Other modes of public transport in the county include tuk-tuks, motorbikes, bicycles, donkey carts. Tuk-tuks are the second major transit mode within the county especially in some parts of Nakuru and Gilgil constituency. Currently there are no tuk-tuks operating in Naivasha. Motorbikes (boda-bodas) are the third transit mode in the county region and it is becoming extremely reliable for quick and short distances. The bicycle is uncommon, but are slowly picking up in the urban areas, however in the rural areas the bicycles, boda-bodas and donkey carts are becoming more visible in the county as they are used in water and luggage transport especially in parts of Nakuru, Gilgil and Naivasha. However, the most frequently mode of transport used in the county is walking as shown in Table 6.2. Table 6.3 indicates the challenges associated with the intermediate modes of transport.

Table 4.27: Various Modes of Transportation

Region	Mode of Transport								
Nakuru County	Walk	Boda boda	Motor cycle (rider)	Motor cycle (Passenger)	Private car (self-drive)	Private car (Passenger)	Matatu	Bus	Others, (Specify)
	63.8 %	15.4 %	5.9%	8.4%	4.8%	1.4%	13.2%	0.7%	0.4%

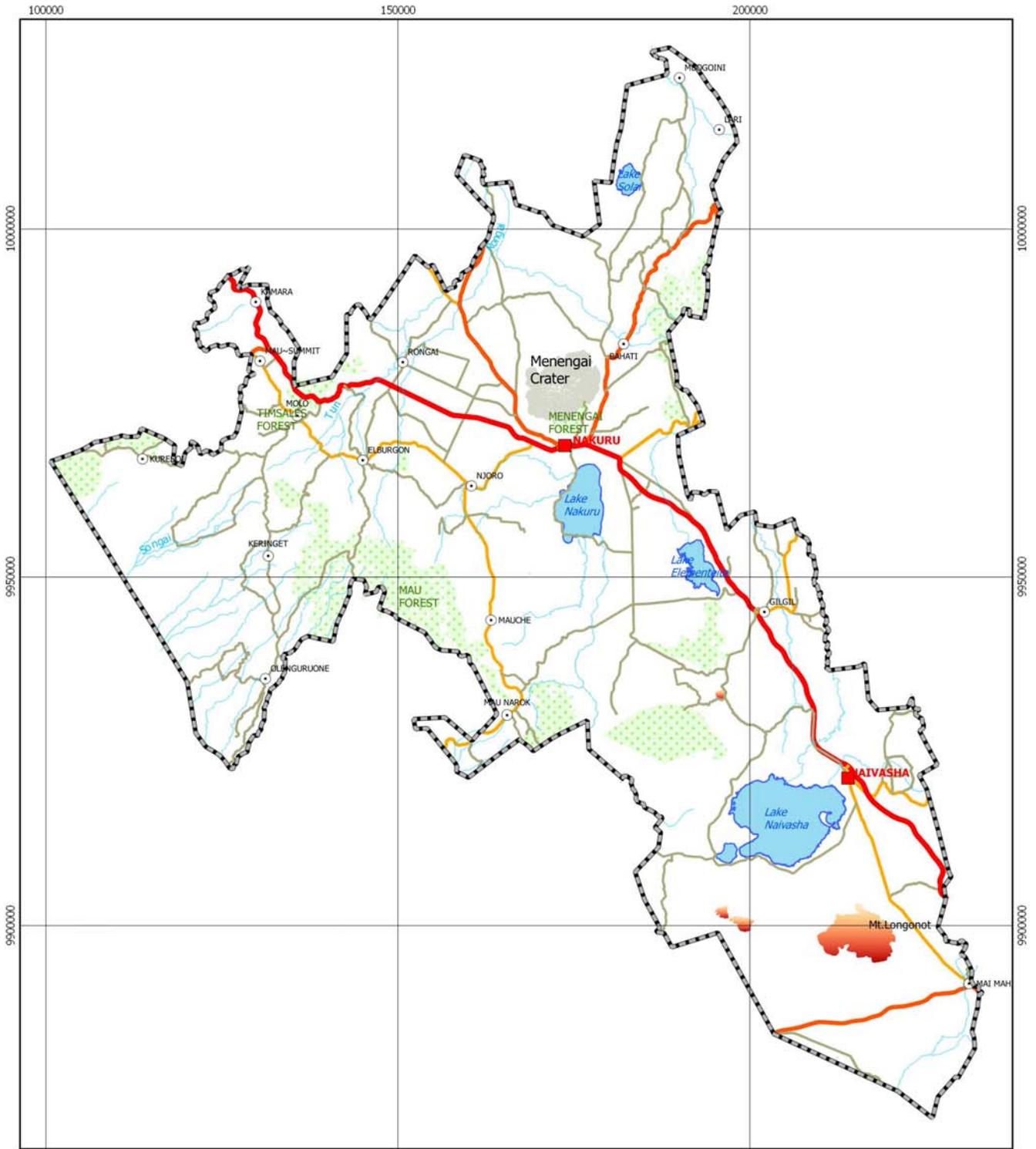
SOURCE: GeoMaps & Habitat Planners Field Survey, 2017

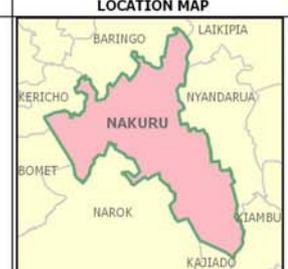
Table 4.28: Intermediate Public Transport Challenges Transport

Transportation Mode	Advantages	Challenges	Disadvantages
Bodaboda	-Convenient for poorly constructed. Roads	-Recklessness and overspeeding. - High fare charged during the peak periods.	Prone to accidents. -No comfort as passenger is affected by Strong winds, uneven terrain and potholes
Motorcycle	-Quickest mode of transport. - Reliable especially during rainy conditions.	-Recklessness and overspeeding. -Lack of mechanics and spare parts. - High fare charged during the peak periods.	-Prone to accidents. - No comfort as passenger is affected by Strong winds, uneven terrain and potholes
Donkey		-Animal is prone to theft.	-Not suitable for long distance movement. -Unreliable as it is dependent on the donkey's wellbeing and health
Walking		-Insecure at night as wildlife and other dangerous animals may be found along the way.	-Time consuming -Not suitable for long distance as it may lead to fatigue

SOURCE: Geomaps & Habitat Planners, 2017

MAJOR ROADS NAKURU COUNTY



 Ministry of Land, Housing and Physical Planning	PROJECT DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN PLAN (2015-2025)	LEGEND <ul style="list-style-type: none"> ■ Major Town ○ Other Town — Road Class A — Road Class B — Road Class C — Road Class D — Road Class E Forest lake Hill 	 Scale 1:750,000	LOCATION MAP  Date: October 2019	 Geoinformation Services INTERNATIONAL GEOMATICS CONSULTANCY Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com. <i>This map is not an authority on boundaries</i>
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Map 4.15: Road Transport
 SOURCE: Geomaps/Habitat Planners 2017

Table 4.29: Inter-County Connectivity

Neighbouring County	Road Type	Starts	Terminates/ Through	Comments
Kericho	B1	Mau summit	Kisumu	Links Kericho County to Nakuru County.
Baringo	B4	Nakuru Town	Athanai	Links up with A1 at Marich Pass in West Pokot County.
Uasin Gishu	A104	Fly-over center	Kamara Town	Links Nakuru County to Uasin Gishu and Kiambu County.
Elgeyo Marakwet	C55	Kampi ya Moto	Baringo	Links Nakuru County to Elgeyo Marakwet County.
Nyamira	B3	Maai Mahiu	Narok, Bomet	Links Nakuru County to Nyamira County through Narok County and Bomet County.
Kajiado	D523	Suswa Center	Ewaso Kedong	Links Nakuru County to Kajiado County
Nyeri	B5	Nakuru Town	Bahati, Laikipia, Nyandarua	Links Nakuru County to Laikipia and Nyeri County.
Nyandarua	D393/D391	Kirima		Links Nakuru County to Nyandarua County.
	R8			
	C67	Maraigushu		
	D385	Gilgil	Gitare	
	L3751	Mbaruk	Kwa Washira	
	C69	Kiondo	Ndundori	
	C83	Naivasha	Ndundori	
	D386	Karunga		Flows along the railway line.
D383	Kabazi		Near Bahati Forest	

The county has approximately 911.9 km of roads which have bitumen surface; 1,110.8 km are of gravel surface and 2,326.6 km of earth surface.

The Nairobi–Kampala highway runs across the county thus promoting cross-border interconnections within the three East African countries. The county also possesses a large network of unclassified roads that are maintained through funds disbursed from various agencies including County Government, Kenya Urban Roads Authority, Kenya National Highways Authority, Kenya Rural Roads Authority and Constituency Development Fund. The county road network is as outlined by Map 6.1. Nakuru County is connected to various neighbouring counties. This is better illustrated in Table 6.4.

Conditions of Sub-County Connecting Roads

The Nakuru sub county is served by roads in various categories and states of maintenance. Table 6.5 summarizes the state of the roads.

Table 4.30: Summary of Sub-County Road Conditions

Road Class	Approximate Length (Total) (Km)	Approximate Length (Tarmacked) (Km)
Class A	155	155
Class B	116	116
Class C	273	199
Class D	501	1
Class E	555	14
KURA Roads	5616	307

6.1.6 Intra-County Connectivity

i. *Nakuru Town East*

This sub-county is surrounded by three sub-counties, i.e. Bahati, Gilgil and Nakuru town West constituency. The sub counties are linked to Nakuru East as follows Bahati joined by A104 which is joined by B5 and linked by D361, Nakuru town West through D351 and Gilgil by A104 linked by D320, D321 and E450.this is illustrated in map 6.2.

Nakuru Town West

The sub-county is surrounded by Rongai, Njoro, Bahati and Nakuru town East sub counties. Class B4 road links Rongai to Nakuru town West from A104, class B5 through R55A connects to Bahati from A104 and Njoro is connected to the county through C56 as illustrated in Map 6.3.

Molo

Molo is surrounded by Rongai, Njoro Kuresoi North and South sub counties. These constituencies are linked to Molo as follows; Rongai by D317 which originates from Salgaa, Njoro by E263 linked to G25 that starts at Bistoni, Kuresoi North by C56 joining E260 and Kuresoi South by E264 as shown in Map 6.4.

Kuresoi North

Kuresoi North is surrounded by Molo and Kuresoi South constituencies. Kuresoi North is linked to the sub county by R8 which joins E262 as illustrated in Map 6.5.

Kuresoi South

Kuresoi South is surrounded by Molo and Kuresoi North sub counties as shown in Map 6.6.

Subukia

The sub county is surrounded by Bahati Sub County which is linked to it through road B5 and Rongai Sub County through road class B4 as seen in Map 6.7.

Bahati

The constituency is surrounded by the following sub counties; Gilgil through A104, Subukia through D66 that connects to B5, Nakuru town East and West through B5 and Rongai constituency through B4 road which is linked to E454 and D317 as viewed in Map 6.8.

Gilgil

The sub county is surrounded by the following sub counties; Naivasha, Bahati that is connected to it through A104, Nakuru town east that links D321, D351 to A104 and Njoro through D320 that joins C57 as shown in Map 6.9.

Naivasha

The sub county is surrounded by Narok and Nyandarua County connected by B3 and D523 respectively, and Gilgil Sub County connected to it through A104 as illustrated in Map 6.10.

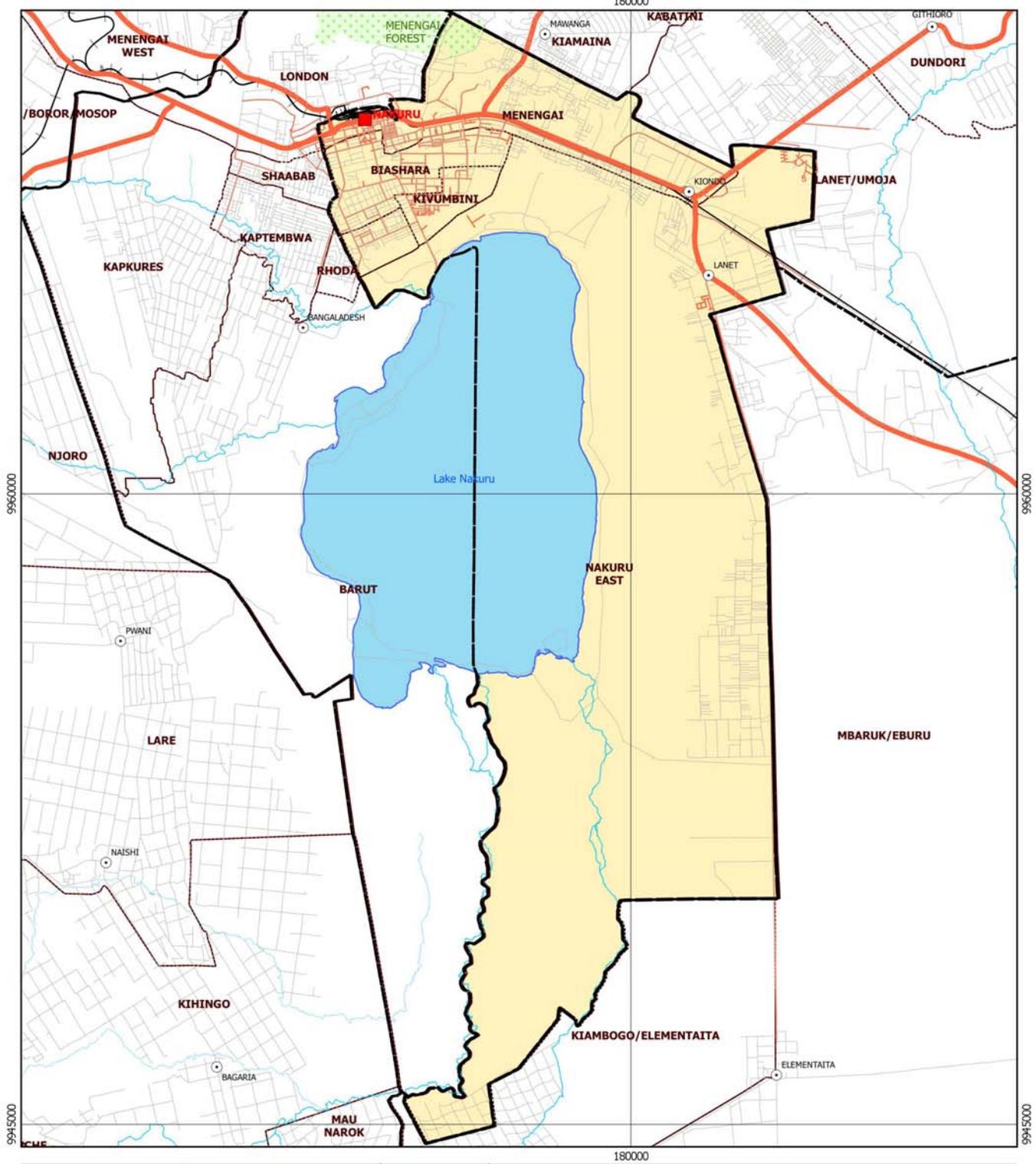
Rongai

The sub county is surrounded by Subukia, Bahati, Njoro, Nakuru town West and Molo sub counties as shown in Map 6.11.

Njoro

This sub county is surrounded by Nakuru West, Gilgil, Molo and Rongai sub counties as depicted in Map 6.12.

ROAD NETWORK: NAKURU EAST

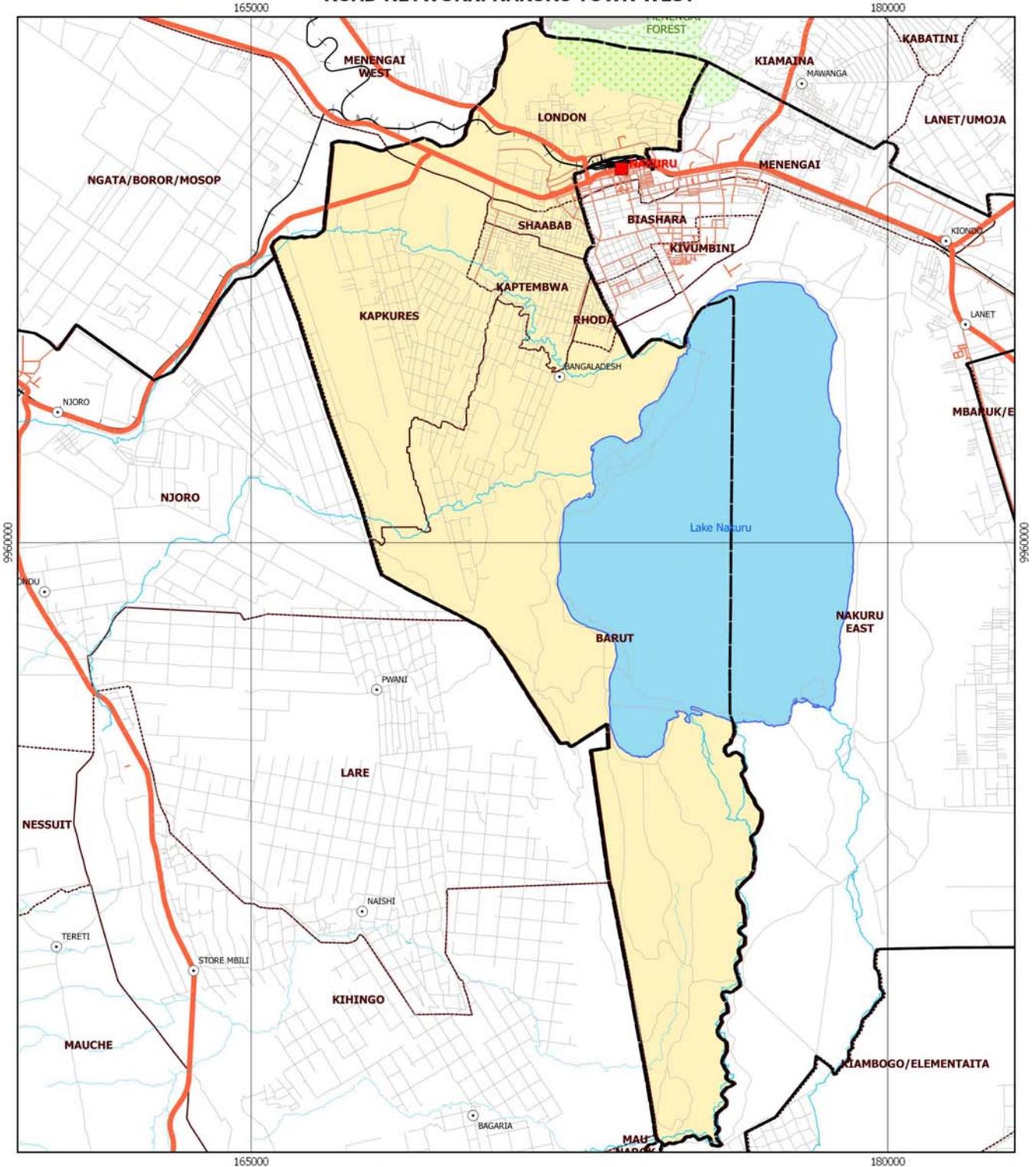


<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major_towns ● Town — Main River — Minor River — Major Road — Minor Road — Tarmac Road — Railwayline ■ Forest Ward ■ Lake 	 <p>Scale 1:125,000</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geofafrica.com.</p> <p><small>This map is not an authority on boundaries</small></p>
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Map 4.16: Road Network Map in Nakuru East Sub-County

SOURCE: Geomaps/Habitat Planners 2017

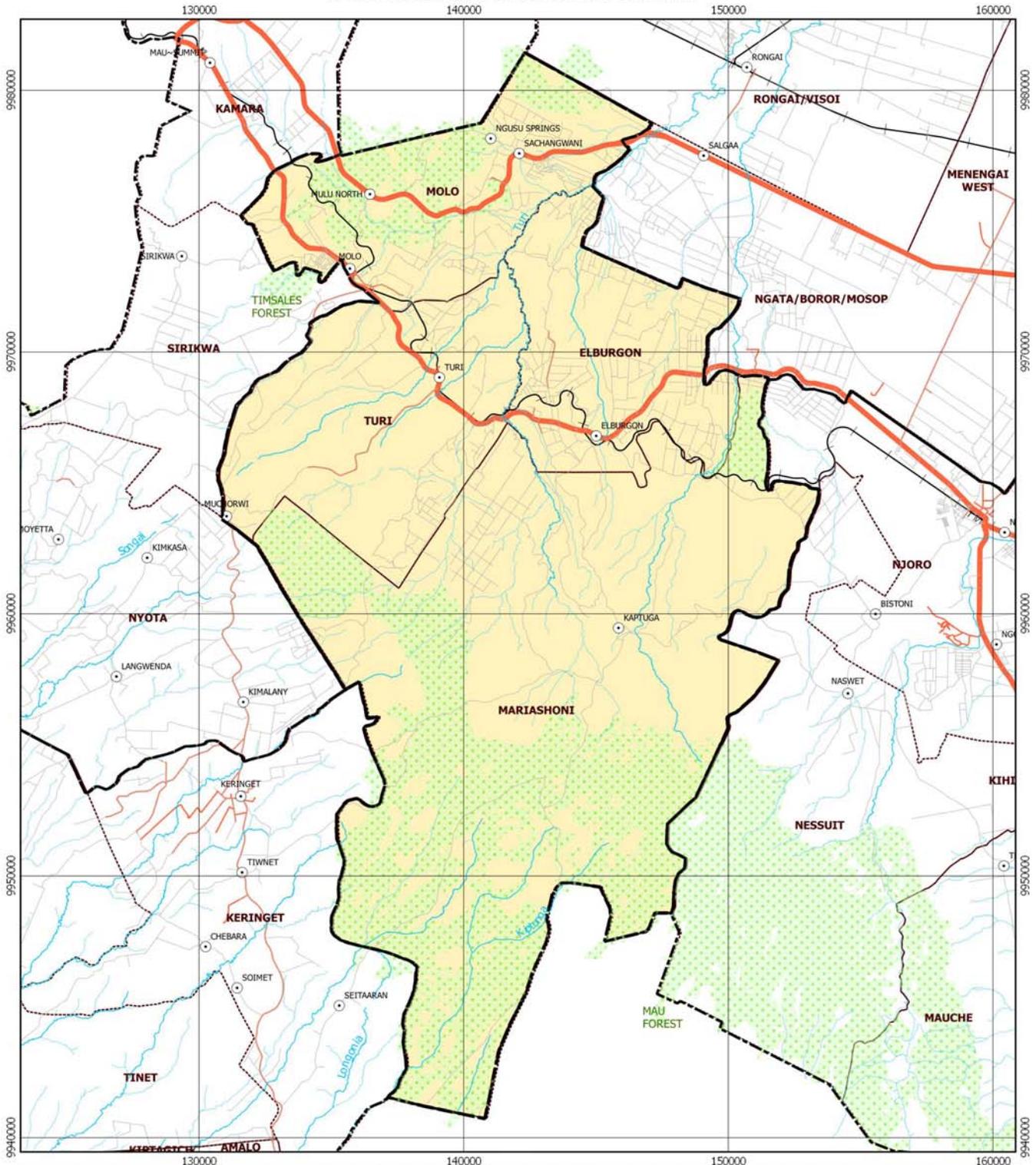
ROAD NETWORK: NAKURU TOWN WEST



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town ○ Other Town — Major Road — Minor Road — Tarmac Road — Railwayline — Main River — Minor River ■ Forest ■ Lava ■ Lake --- Ward 	 <p>Scale 1:125,000</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geofafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.17: Road Network Map in Nakuru West Sub-County
SOURCE: Geomaps/Habitat Planners 2017

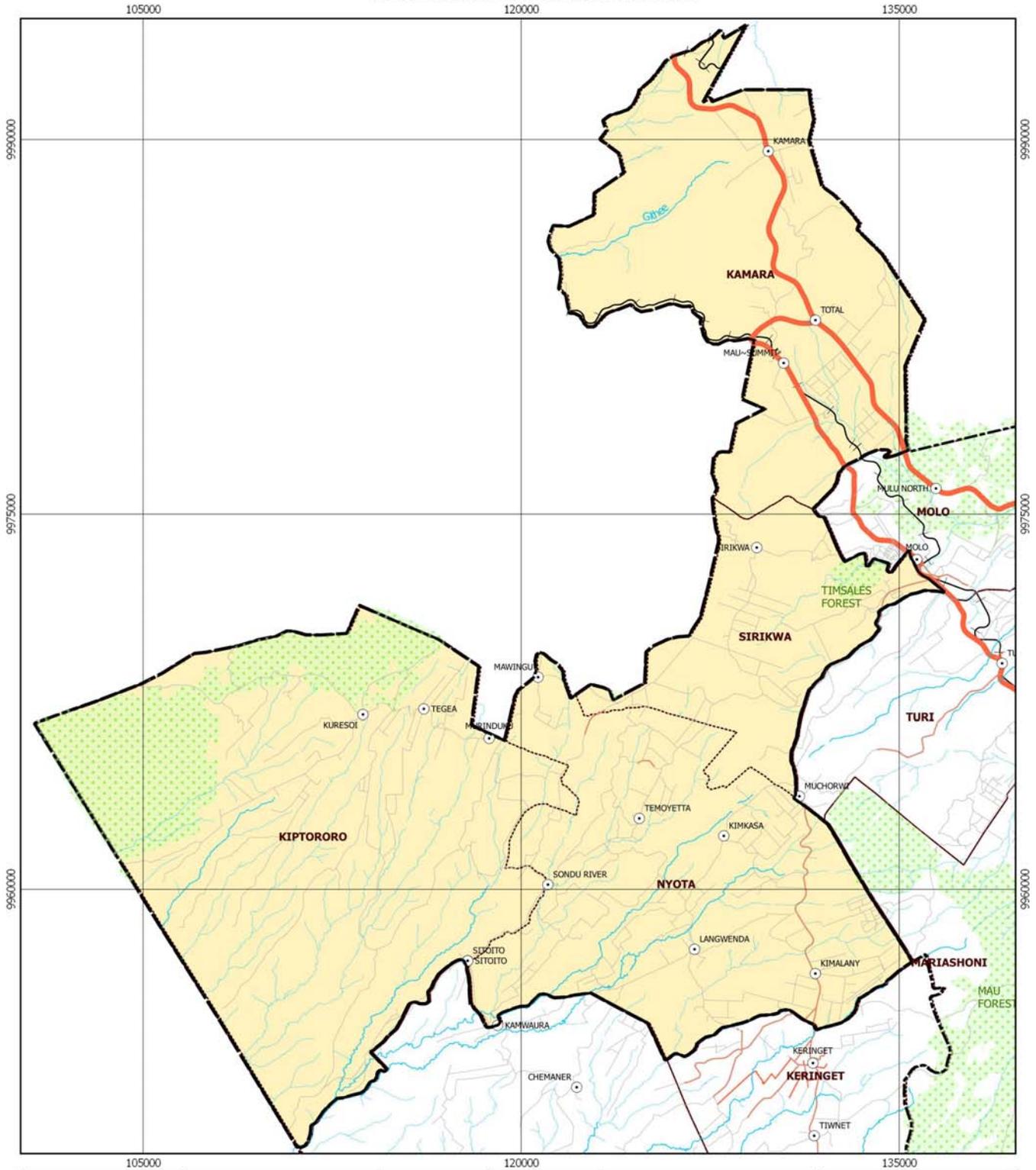
ROAD NETWORK: MOLO CONSTITUENCY



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ○ Other Town — Major Road — Minor Road — Tarmac Road — railwayline — Main River — Minor River ▭ Ward ▭ Forest ▭ Constituency 	<p style="text-align: center;">N</p>  <p style="text-align: center;">Scale 1:200,000</p>	<p>LOCATION MAP</p>  <p style="text-align: center;">Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.18: Road Network Map in Molo Sub-County
SOURCE: Geomaps/Habitat Planners 2017

ROAD NETWORK: KURESOI NORTH

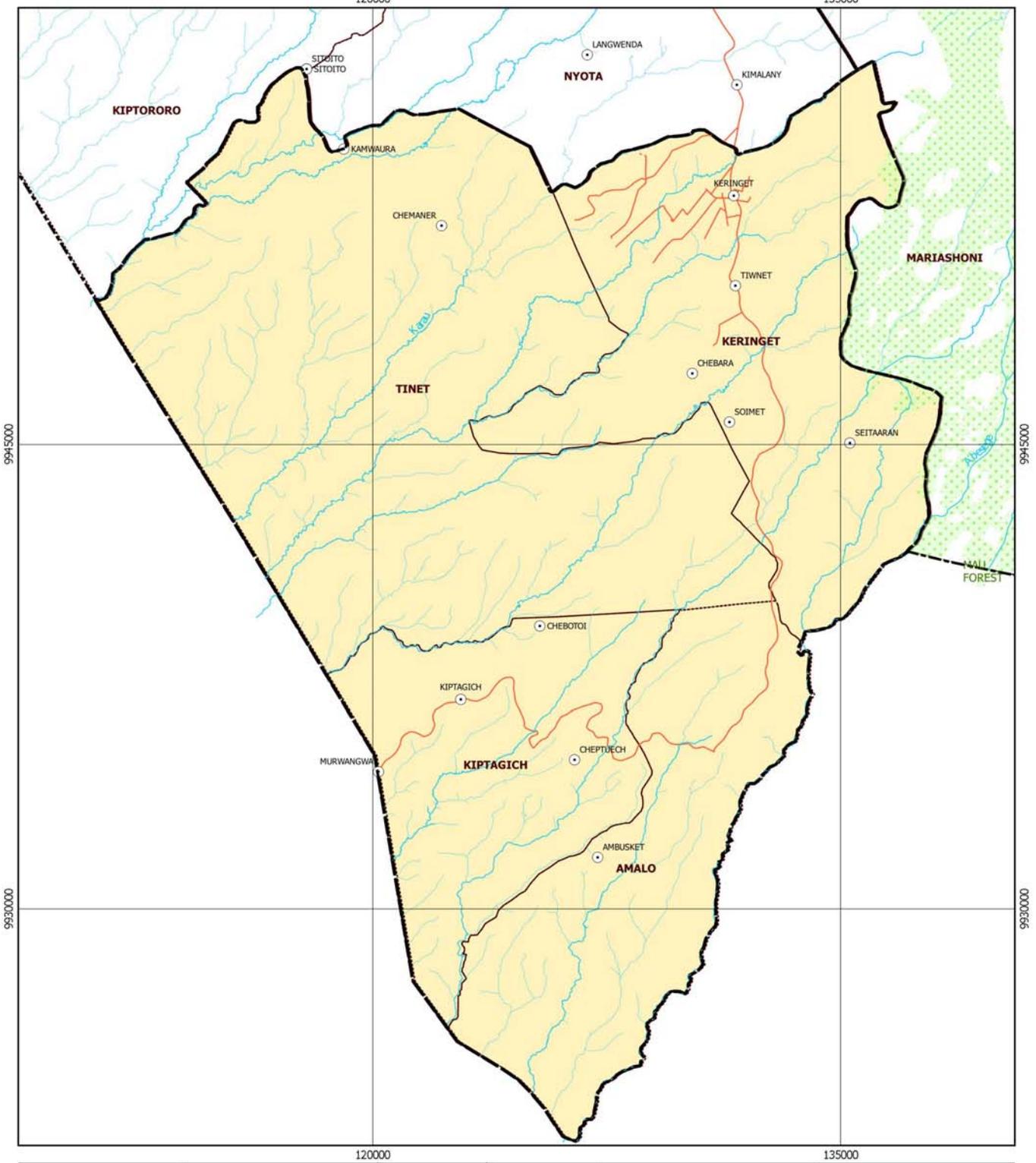


 Nakuru County Government	PROJECT DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN PLAN (2015-2025)	LEGEND <ul style="list-style-type: none"> ■ Major Town ● Other Town — Major Road — Minor Road — Tarmac Road — railwayline — Main River — Minor River Ward Forest 	 Scale 1:210,000	LOCATION MAP  Date: October 2019	 GEOMAPS Geoinformation Services INTERNATIONAL GEOMATICS CONSULTANCY Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829, 2713350. Email: geomaps@geoafrica.com. <i>This map is not an authority on boundaries</i>
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Map 4.19: Road Network Map in Kuresoi North Sub-County

SOURCE: Geomaps/Habitat Planners 2017

ROAD NETWORK: KURESOI SOUTH

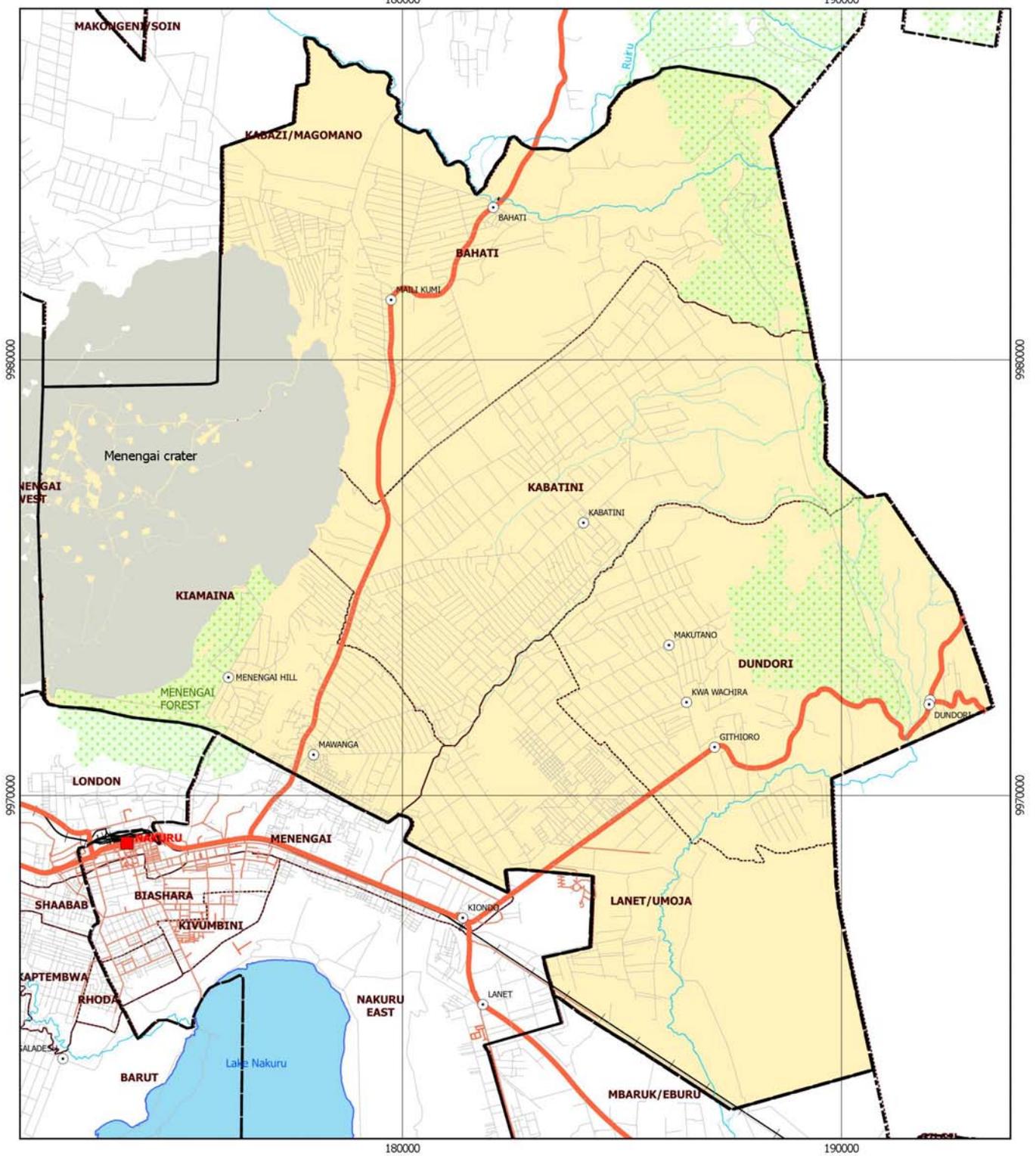


<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ○ Town — Main River — Minor River — Tarmac Road ■ Forest □ Ward ■ Kuresoi South 	 <p>Scale 1:170,000</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.20: Road Network Map in Kuresoi South Sub-County

SOURCE: Geomaps/Habitat Planners 2017

ROAD NETWORK: BAHATI

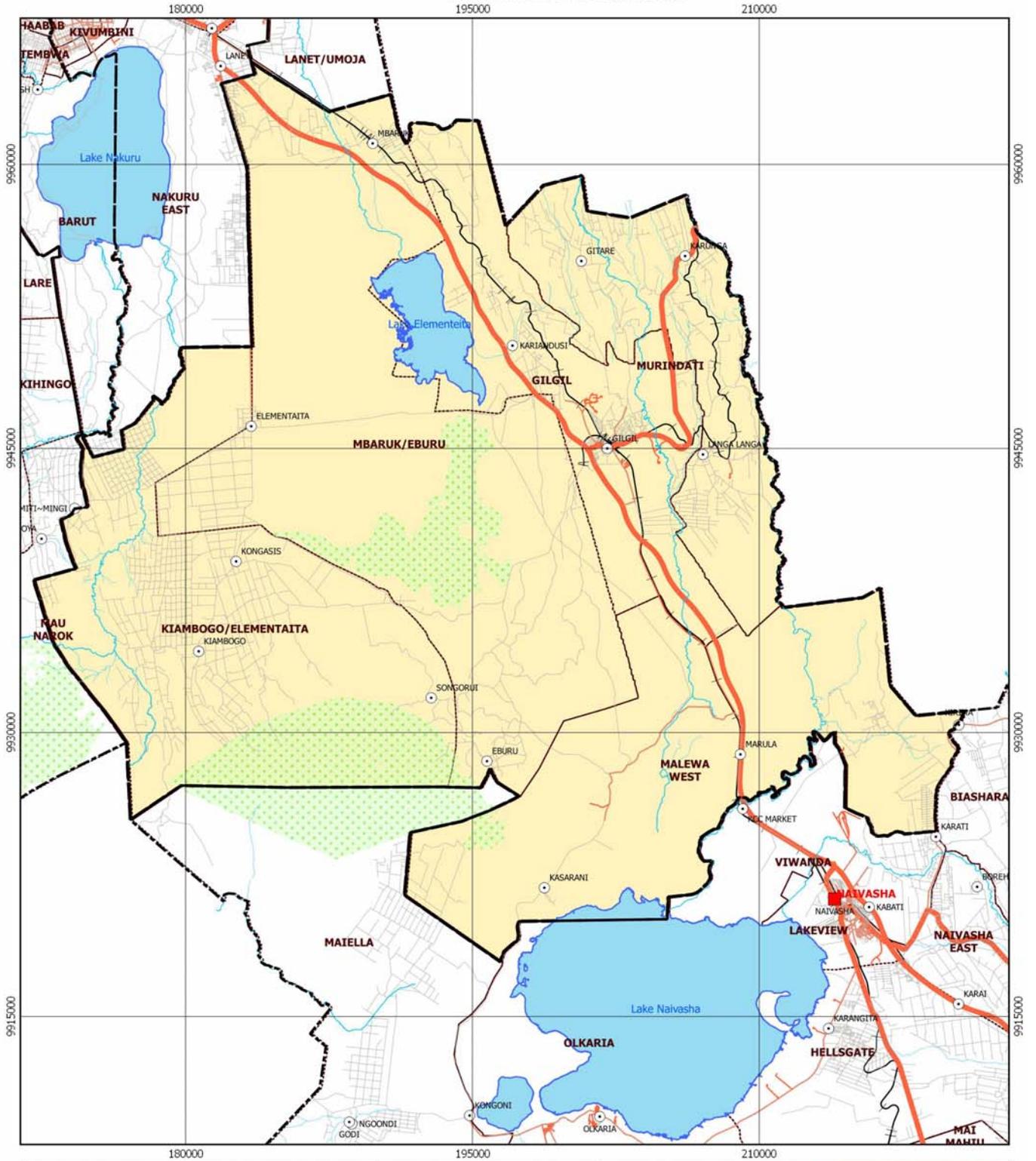


 <p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major town ○ Other town — Major Road — Minor Road — Tarmac Road — railwayline — Main River — Minor River ■ Forest ■ lava ■ lake 	 <p>Scale 1:120,000</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geofafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.22: Road Network Map in Bahati Sub-County

SOURCE: Geomaps/Habitat Planners 2017

ROAD NETWORK: GILGIL

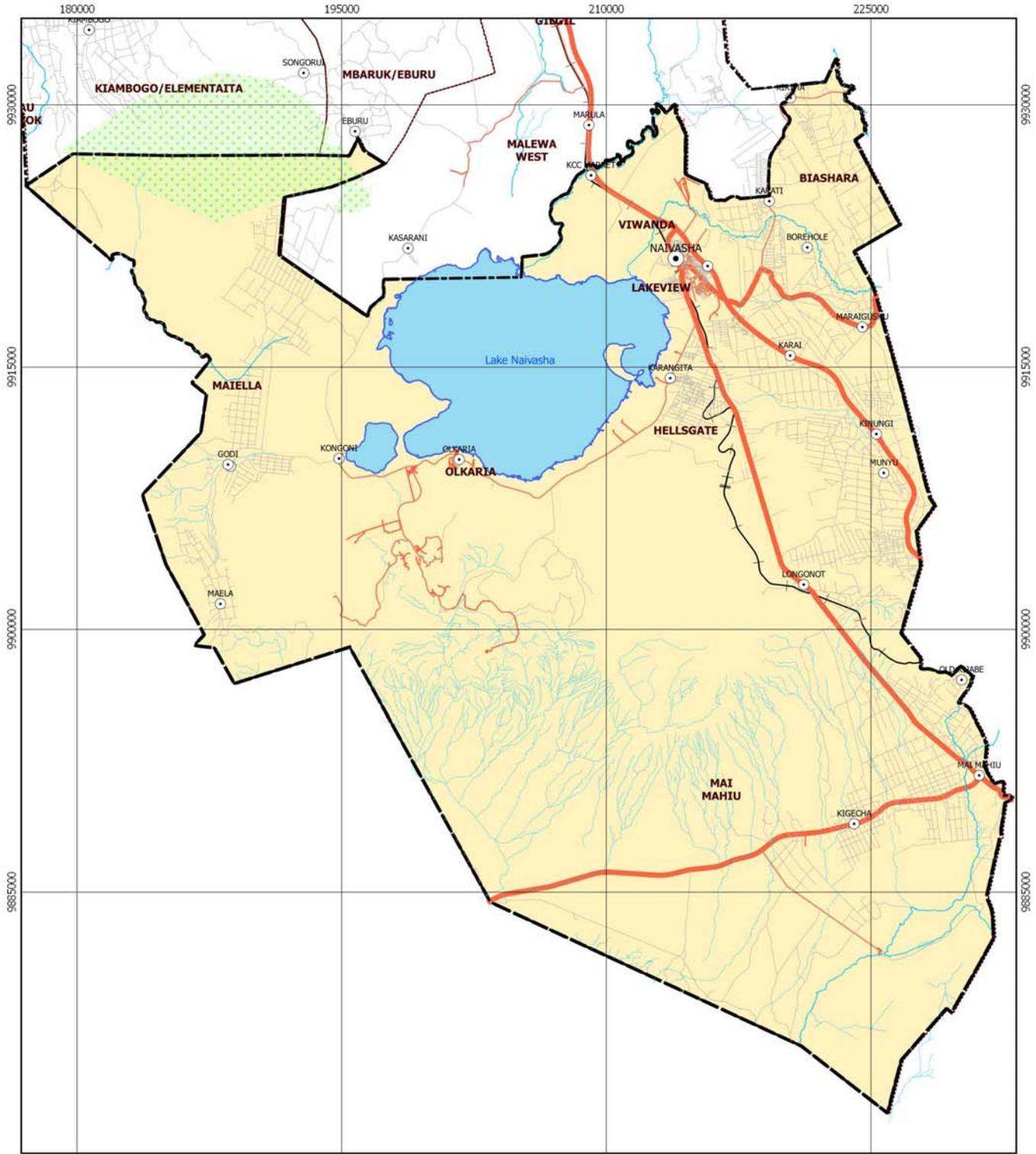


 <p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town ○ Other Town — Major Road — Minor Road — Tarmac Road — railwayline — Main River — Minor River □ Ward ■ Forest ■ lake 	<p>LOCATION MAP</p>  <p>Scale 1:275,000</p> <p>Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.23: Road Network Map in Gilgil Sub-County

SOURCE: Geomaps/Habitat Planners 2017

ROAD NETWORK: NAIVASHA

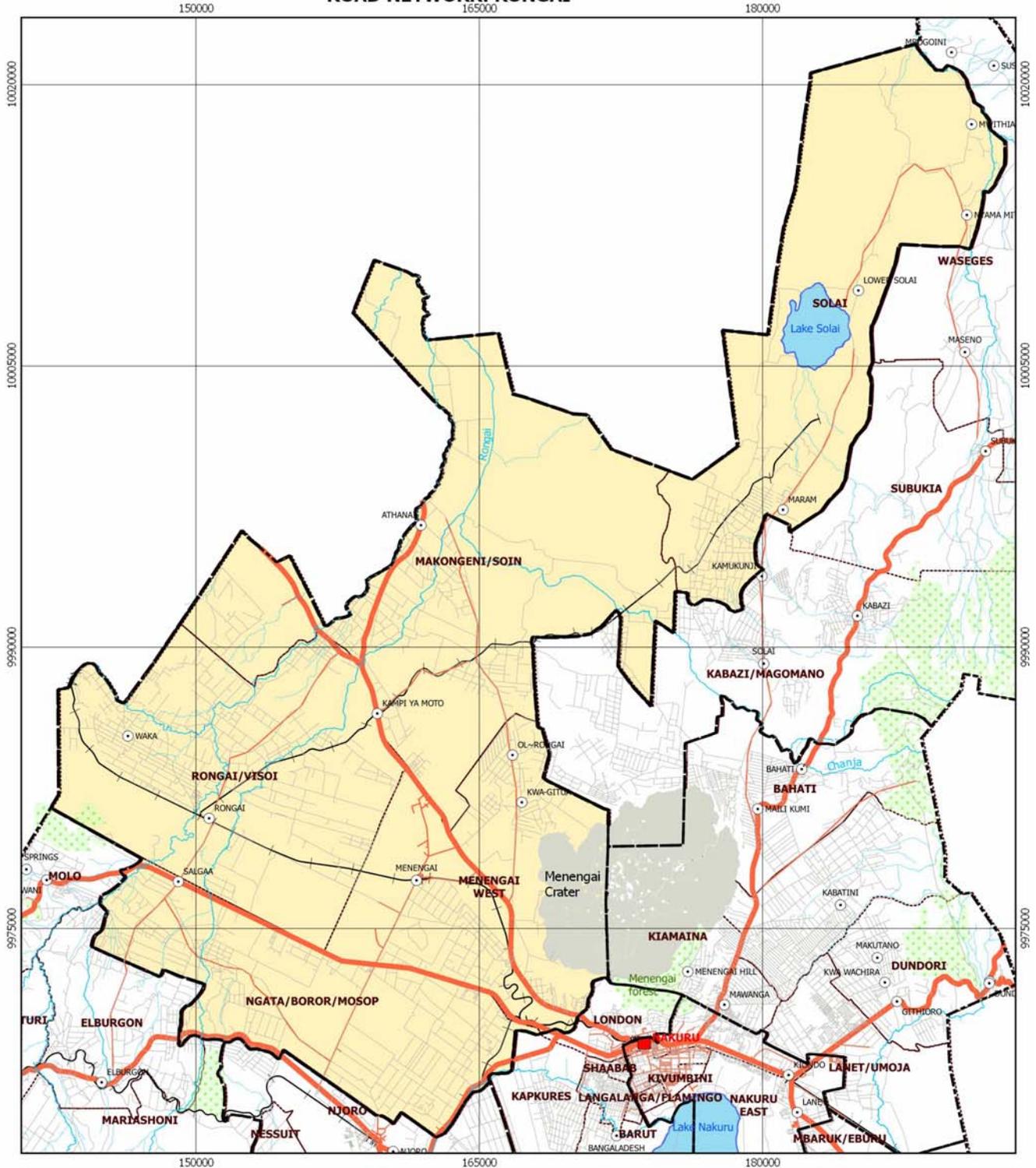


<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town ○ Other Town — Major Road — Minor Road — Tarmac Road — Railwayline — Main River — Minor River ■ Forest ■ Lake □ Ward 	<p>N</p>  <p>Scale 1:300,000</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.24: Road Network Map in Naivasha Sub-County

SOURCE: Geomaps/Habitat Planners 2017

ROAD NETWORK: RONGAI



 <p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ○ Town — Major Road — Minor Road — Main River — Minor River — Railwayline ■ Lava ■ Lake ■ Forest □ Ward 	 <p>Scale 1:280,000</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829, 2713350. Email: geomaps@geofafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 4.25: Road Network Map in Rongai Sub-County

SOURCE: Geomaps/Habitat Planners 2017

Nakuru County is also home to some of the Principal Transport Corridors in Kenya since some of the road sections tend to transverse through it. These include;

- Nairobi - Nakuru - Eldoret - Lodwar - Kakuma – Lokichogio and Sudan (838 km) - This is a Primary paved road with a fairly too bad road condition characterized by severely broken tarmac especially Lodwar and Kakuma areas. The average transit time is 5 days during the dry season without the bottleneck at Ortum Bridge with a total transit time of 3 – 4 days
- Nairobi - Naivasha - Nakuru - Kisumu (346 km) – This is a primary tarmacked road which is in a good condition up to Nakuru due to road reconstruction. From Nakuru to Kisumu the condition is not as good and is quite hilly in a section which reduces travel speed. The average transit time is 1 day.
- Nairobi - Nakuru - Timboroa - Eldoret - Malaba and Uganda (440 km) - This is a primary tarmacked road in good condition with bad sections between Busia and Malaba.

Some of these roads are in poor condition hindering full realization of the county's potential in agriculture, manufacturing and foreign and domestic tourism. The poor condition of roads has resulted in the high cost of transport thereby affecting the performance of various economic activities as well as hindering access to social amenities. The main contributing factor to poor state of road in the county is inadequate funding for construction, rehabilitation and maintenance of both classified and unclassified roads as well as corruption especially in the ministry of infrastructure.

Some of the roads in the county have also registered a very high rate of accidents, thus robbing the county of very productive people through road deaths. Some of accident survivors have also been left disabled and families impoverished due to increased expenditure on treatment as a result of injuries suffered during the accidents. Examples of such roads in the county are the Nairobi-Nakuru-Eldoret highway and Naivasha-Mai-Mahiu highway. These accidents also cause damage to roads in the county thus reducing their design life.

- **Emerging issues**

Some of the issues that the county experiences that concerns road transportation are:

- Poorly ungraded and incomplete road network
- Narrow roads
- High rate of road accidents

- Delay in road construction processes.
- High cost charged on licenses
- Excessive passenger carriage
- Poor road quality characterized by mud, dust, potholes and poor signage
- Careless driving and motorists ignoring traffic rules
- Congested bus stops
- Bus park/stops located at a long distance
- Lack of truck parks especially for heavy commercial vehicles
- Safety and security concerns
- Poor prioritization in funds allocation for road construction

These emerging issues will be addressed; some of these will offer tangible solutions to counter them.

6.1.7 Railway Transport

Nakuru was established by the British as a railway outpost part of the white highlands during the colonial era. The county has a railway line length of 192 km connecting major urban areas of the county namely Naivasha, Gilgil, Nakuru, Njoro, Molo and Rongai. It had ten railway stations serving as drop and collecting points for agricultural and industrial good as well as providing public transport from Nakuru to the Mombasa via Nairobi and Nakuru to Uganda via Eldoret, Kisumu, Busia and Malaba.

The railway line was mainly established to transport farm produce from Nakuru and Eldoret to Nairobi or to Uganda, but has recently embraced coffee and tea consignments for export while receiving imports such as oil, among other raw materials for use in local industries. Most manufacturers prefer the train to transport raw materials and food from various parts of the country because it is cheaper and more convenient thus efficiency and time saving compared to other forms of transport. Railway transportation also offers easy movement of bulky goods as very few cases of accidents are experienced in railway transport. Private firms also use the railway to transport goods from Kenya to Uganda, and vice versa. Nakuru station is also used as a loading point for. Industrial products from the region as well as agricultural products from the county's farms usually from Bahati, Engashura, Kiamunyeki and Mwariki where both large and small-scale farming is practiced.

The railway system however encounters challenges such as the interference from residents and hawkers living and selling along the railway lines thus resulting in service delays.

Similarly, the national government has constructed a standard gauge railway (SGR) that connects Mombasa to Nairobi city. The railway replaces the parallel metre-gauge railway that was originally built in the 19th century. The SGR will be extended from Nairobi to Naivasha. The extension of 120 kilometres will link special industrial zones that would be established at Naivasha, home to the Olkaria geothermal power plants, to Nairobi and Mombasa. This significant impact in Naivasha and Nakuru County as a whole

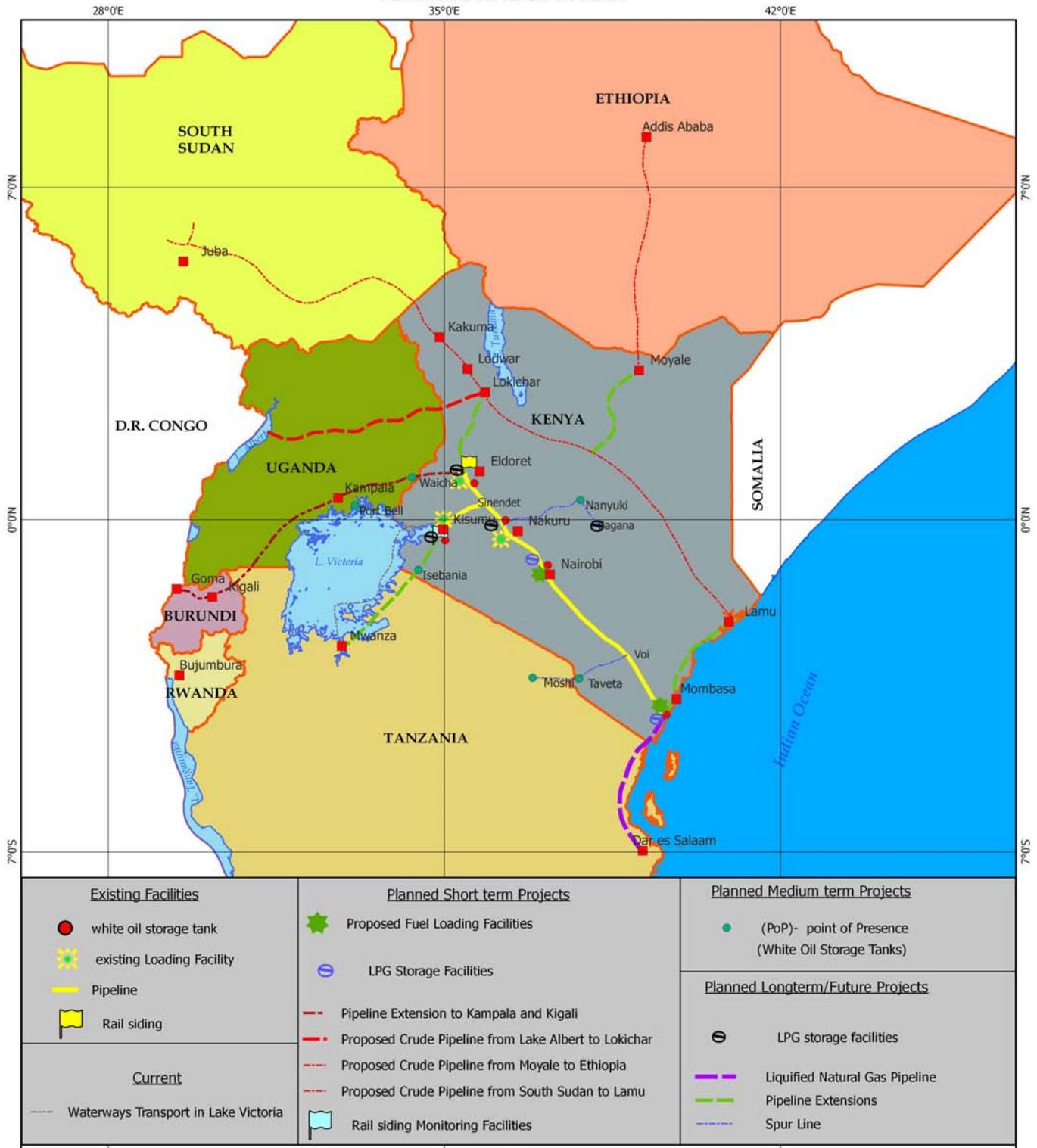
6.1.8 Pipeline Transport

The Kenya Pipeline Company (KPC) Limited is a State Corporation established on 6th September, 1973 under the Companies Act (CAP 486) of the Laws of Kenya and started commercial operations in 1978. The Company is 100% owned by the Government and complies with the provisions of the State Corporations Act (Cap 446) of 1986. The Company has constructed pipeline network, storage and loading facilities for transportation, storage and distribution of petroleum products which provides efficient, reliable, safe and cost-effective means of transporting petroleum products from Mombasa to the other parts of the Kenyan region.

The county of Nakuru houses the Western Kenya Pipeline Extension (WKPE) which runs from Nairobi to Nakuru, Eldoret and Kisumu. The Pipeline Extension (WKPE) consists of 446 kilometres, 8-inch and 6-inch diameter pipelines with an increased combined flow rate from 160m³/hr. (1994) to 220m³/hr. (2004). It consists of four pump stations that aid in enhancing the flow rate; these are located at Nairobi (PS 21), Ngema (PS 22), Morendat (PS23) and Nakuru (PS 24). The capacity of the WKPE is currently being enhanced through construction of a parallel 14-inch diameter multi-product pipeline from Nairobi to Eldoret in order to increase the flow rate to Western Kenya to match the rising demand and to achieve a flow rate of 757M³/hr. through phased installation of additional pumps. On completion, the parallel multi-product pipeline will increase the combined flow rate to Western Kenya by an additional 378M³/h, this will aid in reducing the number of petroleum tankers plying the Kenyan roads and the associated road damage, carnage and maintenance costs as well as in achievement of Kenya's Vision 2030, through ensuring uninterrupted supply of refined petroleum products in the country and the entire east Africa region.

The county also houses one of the depots which acts as a storage facility to the company which had a throughput of 796,601 as of the year 2011, it is expected that this throughput would increase with construction of more pumping stations and depots within the county.

PIPELINE IN EAST AFRICA



 Nakuru County Government Ministry of Land, Housing and Physical Planning	PROJECT DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)	LEGEND ■ Major Town ■ Lake ■ Ocean	 Scale 1:12,000,000	LOCATION MAP Date: October 2019	 Geoinformation Services INTERNATIONAL GEOMATICS CONSULTANCY Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com. <i>This map is not an authority on boundaries</i>
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Figure 4.8: Pipeline in East Africa

6.2 Infrastructure

6.2.1 Water Supply

Residents of Nakuru County receive about 47,500 m³ of water daily through organized water supply systems. This supply is inadequate compared to the daily demand of about 89,000 m³. This therefore means that Nakuru may be classified as “a water deficient county”. There is urgent need to upgrade and enhance the current systems, build new ones and source for more water for the county to meet the basic requirements and to cater for the rapid growing population. Besides the inadequate water supply, the situation is further worsened by the low quality of water due to the presence of high fluoride levels, lack of proper and routinely operation and maintenance of the available water distribution sources, poor management and notable increase with proximity of the water source to the lakes in the region.

The main sources of water for Nakuru County are surface water and ground water. The surface water is mainly sourced from seasonal and permanent rivers. Some water is also sourced from Nguso Springs. Underground water is obtained from boreholes which are done by water service providers or private developers within various areas of the county.

Compared to other counties in the Kenya, Nakuru is doing a commendable job in water supply. The national average of water supply coverage is 56% while that of Nakuru County is 62%. The growth has been brought by consistent and planned development to build and enhance water supply. In the first and second years of devolution, the County of Nakuru invested over Ksh 400 million in water projects which have increased water supply from 42% to 62%. Through these interventions, the distance to access water services has been reduced from an average of one 1000m to 500m, which have been made possible by personnel who work in the water sector. This has been also contributed by a great partnership that exists between the county and national government and other key development partners in addressing critical challenges faced in the efforts to provide people with clean drinking water.

Existing Situation and System Overview

Nakuru county is endowed with natural water resources including four major lakes; lake Nakuru, lake Naivasha, lake Elementaita and Solai. In addition to the lakes, there are rivers, shallow wells, springs dams, pans and boreholes which are spread all over the county especially in the drier parts of Naivasha, Molo, Gilgil, Njoro and Rongai, some of which include river Malewa, Njoro and Ingwamiti which supply a greater portion of water to the

daily amount of water used in the county. Springs found in Subukia, Molo, Nakuru North and Kuresoi have also contributed to the water supply. The boreholes dug in the various locations and homesteads have further boosted water supply in the county.

Apart from natural and ground water, rainwater is also another major water source in the county with about 75% to 80% of the household population harvesting rain water for domestic use.

Nakuru town is presently supplied with water from 4 different schemes, with a total capacity of 40,079 m³/day, but only about 30,000 m³/d is currently produced for a population of about 290,000; 60% of whom live in low income and peri-urban areas. The water infrastructure is old, and defective, and has deteriorated due to poor maintenance and negligence by the relevant authority. These water supply infrastructures are experiencing high levels of unaccounted for water, which is currently estimated at 70% and is largely attributed to the high number of illegal and unmetered connections, faulty meters in the system with low estimates of consumption, (only about 17,300 out of 24,892 connections are metered, most of them faulty), and the poor condition of the transmission mains and reticulation network. Water supply is down to 4 hours a day in some areas with the result that women and children spend long hours collecting water or buying it at very high cost from vendors. The services are also overstaffed, with 101 connections per employee, as against 150 to 250 connections per employee for well-run water utilities.

The schemes are old with little or no recent improvements. Total production capacity for the other 5 towns in the county that is Naivasha, Gilgil, Njoro, Molo and Elburgon has decreased from 11,650 m³/day to 7,500 m³/day for a served population of about 120,000. Unaccounted for water is estimated at 50%, with low metering and high levels of faulty meters, poor billing and collection and unreliable services, with less than 6 hours of supply a day for some consumers.

Generally, the distance to the nearest water point in Nakuru County is roughly from zero to six kilometres. Thus, 35% of the county population takes between 1 to 4 minutes to fetch drinking water. Estimates from KPHC 2009 indicates that about 150,608 households (36.8%) in the county have access to piped water and about 63% have access to portable water and 80% of the households are harvesting rain water.

Most water facilities are between 20 to 40 years old and lack of maintenance and few new investments and urbanization has ensured that the facilities can no longer meet their design capacities or cater for demand from the increased populations. Most urban schemes are characterized by

low water charges, low metering, underestimated consumption for unmetered connections or those with faulty meters, and widespread wastage of the scarce resource. In addition, billing is irregular and revenue collection is inadequate, resulting in poor cost recovery. Rural schemes in many cases do not correspond to the effective demands of the consumers while a high proportion of the schemes are inactive due to lack of spare parts and low capacity for operation and maintenance in communities. Other constraints include inadequate qualified manpower, poor technology choices in water supply and sewerage development, and lack of proper coordination of the various actors.

The three main water providers in Nakuru county include; Nakuru Rural Water and Sanitation Company Limited (NARUWASCO), Nakuru Water and Sanitation Company (NAWASCO) and Naivasha Water Sewerage and Sanitation Company (NAIVAWASS)

a. Nakuru Rural Water and Sanitation Company Limited (NARUWASCO)

This is a wholly owned company of the county government of Nakuru. It is responsible for the provision of water and sanitation services within the larger part of Nakuru County except Nakuru and Naivasha Urban counties.

The service provider has divided its area of operation into five distinct areas as shown in the Table 6.6.

Table 4.31: NARUWASCO Offices and Zones

Area/Region	Areas covered	Area office
Eastern	Gilgil, Turasha, Kikopey, Langalanga	Gilgil
Northern	Bahati, Kabatini, Ndungiri, Subukia	Bahati Town
Central	Njoro, Kiamunyi, Lanet-Mbaruk	Njoro
Western	Salгаа, Sobeа, Sachangwan, Rongai, Kampi Ya Moto	Salгаа
Southern	Molo, Kibunja, Elburgon	Molo

The service provider operates ten (10) water supply schemes within its area of jurisdiction. The scheme can either be conventional gravity scheme or pumping scheme where it may not be economically feasible to use a gravity system due to issues with the topography, high ground water, structurally unstable soils and rocky conditions. Out of the ten schemes available, six of them are purely gravity while the remaining four schemes

are a combination of gravity and pumping scheme as illustrated in Table 6.7;

Table 4.32: Types of Water schemes

Gravity system schemes	Gravity and pumping system schemes
Gilgil, Nguso-Salgaa, Bahati, Kabatini, Subukia, and Rongai	Njoro, Molo, Elburgon and Nguso-Molo

Apart from operating the schemes, the provider also operates two convectional water treatment systems i.e. Turasha and Rongai South water treatment works. Furthermore, partial water treatment (chlorination only can also be operated by the company).

b. Naivasha Water Sewerage and Sanitation Company (NAIVAWASS)

This is the main service provider for Naivasha and its environs. The major source of water supply for Naivasha town is mostly groundwater where water is extracted from boreholes and some water also extracted from Lake Naivasha. Naivasha town basically constitutes 12 boreholes which are scattered all over depending with their zone of operation. The twelve (12) boreholes are located in six (6) sites all which are out of town. However out of the 6 sites only two (2) of them have quality water while the rest has water with very high levels of fluoride that are beyond the stipulated WHO safe levels and hence are not safe for human consumption. The two sites have a total number of 5 boreholes with wholesome water. However, despite of the quality water available from the two sites, it is very difficult for individuals to obtain water directly from the site as they are located far away from homesteads, pumping has to be undertaken to ensure that this water reaches everyone regardless of their geographic location. The tariffs charged are in the range of Ksh 22 per cubic meter (m³) to Ksh 33 per cubic meter (m³). Preparations are also underway to introduce new tariffs of Ksh 50 per cubic meter (m³) especially for the huge consumers, so as to support the low consumers as well as generating income that will be used for operation and maintenance of the borehole systems as well as raising funds to pay the staff involved in the day to day running and operation of the system.

c. Nakuru water and sanitation company limited (NAWASSCO)

In Nakuru, water and sewerage services were for a long time provided by the Municipal Council of Nakuru (MCN). However, the central government revoked MCN's water undertaker ship in February 2001 due to poor performance, and Department of Water Development (DWD) has since managed the operations of Nakuru Water and Sewerage Services (NWSS).

Nakuru Water and Sanitation Services Company Ltd (NAWASSCO) is a corporate entity incorporated in September 2003 under the companies Act

CAP 486 of the Laws of Kenya. It is fully owned by the Nakuru County Government. It has been engaged by Rift Valley Water Services Board through a Service Provision Agreement to provide Water and Sewerage Services within Nakuru Municipality and its environs as well as along Ol-Banita pipeline corridor. Other stakeholders involved are, Water Services Regulatory Board, Development Partners, and Water Resources Management Authority and NAWASSCO suppliers. These Services are provided in an efficient and economical manner in accordance with the Water Act 2002 of the Laws of Kenya. Apart from provision of water services the company is also engaged in Provision of waste water disposal services and sale of its by-products as well as provision of water and waste water quality testing laboratory services; it also has a laboratory located Lake Nakuru National Park next to Educational Centre.

The company also operates customer care desks at head office and zonal offices whose purpose is to attend to customer’s issues and ensure all cases are resolved. These zonal offices are reported as follows.

Table 4.33: Zonal Offices

Zone	1	2	3	4	5
Location	Central	Northern	Eastern	Southern	Western

The company’s water tariff structure for the previous years is as shown in Table 6.9

Table 4.34: NAWASCO Water Tariff Structure

Residential / Governmental Institution	Consumption	Current (Kshs.)	Approved (Kshs.)
	0-6	Flat rate Kshs. 200	Flat rate Kshs. 288
	7-20	50	63
	21-50	65	80
	51-100	80	100
	101-300	100	120
	300 & above	130	140
Commercial / Industrial	Consumption	Current (Kshs.)	Approved (Kshs.)
	0-6	Flat rate Kshs. 200	Flat rate Kshs. 318
	7-20	50	63
	21-50	65	80
	51-100	80	105
	101-300	100	125
	300 & above	130	145
Standpipes / Kiosks		35	35
Public Schools, Universities & Colleges	0-600	40	53
	601-1200	40	80
	1200 & above	40	100

Some of the challenges experienced by the company include; inefficient commercial management, characterized by unreliable customer records and obsolete billing systems. About 70% of the meter connections are either disconnected or malfunctioning, and since the breakdown of the computer system in 1995, billing is done manually based on flat and average rates. This untenable situation is aggravated by the absence of a formal credit control policy, and has resulted in the build up of customer payment arrears. It is estimated that only 60% of billed amounts is collected.

NAWASSCO is amongst the highest Nakuru power consumer outfits and uses most of its electricity in pumping water and running its over 14 boreholes. As a result, NAWASSCO is experiencing some crises due to steep

rise in electricity costs which have more than doubled in the previous years. The Kenya Power tariffs are now costing NAWASSCO over Ksh 26million monthly, way up from the Ksh 12million it has been paying. Some of the possible solutions that can be adopted to meet power costs without raising NAWASSCO's own tariffs are to get subsidized by its owner, the Nakuru County Government or Kenya Power to list NAWASSCO under a special category of paying low tariffs just like street lighting which is heavily subsidized as it's an essential service.

6.2.2 Sewerage & Sanitation

The major sanitation and disposal system available in Nakuru County are sewerage lines and sanitation facilities, pit latrine, septic tank and open defecation. Organized sewerage and sanitation facilities and proper sewerage systems are limited to urban centres only while a majority of the peri-urban and rural areas tends to rely heavily on open defecation, flying toilet, bucket latrine, simple pit latrine, ventilated improved pit (VIP) latrine, pour-flush latrine with pit, aqua privy, water-flush or pour-flush toilet with septic tank and water-flush toilet with holding tanks/cess pits. The sewer lines in the urban centres mainly comprises of sewer pipes made of concrete, asbestos, pitch fibre and PVC.

Table 4.35: Incidences of Water Related Diseases

Diseases	2000	2001	2002	Treatment Cost (2002) KES/incident
Malaria	179,124	163,774	153,195	2,500
Intestinal Worms	18600	16,092	15,609	3,500
Diarrheal Diseases	46,524	33,679	29,981	3,500
Skin Diseases	40,728	46,506	51,421	3,500
Eye Infections	17,928	15,601	16,226	3,500
Typhoid fever	9,036	11,295	9,352	7,000
Bilharzia	828	701	324	

SOURCE: Ministry of Health Nakuru District

The existing sewerage system covers an area of 16.6 km² or 26% of the present municipal area, which is served by 2 sewage treatment plants – the Njoro Sewage Treatment Plant, with a capacity of 9,600 m³/day, and the Town Sewage Treatment Works with a capacity of 6,600 m³/day. There are about 9,608 registered sewer connections and the recorded average daily sewage flow is 8,991 m³/day compared to the design flow of 16,200 m³/day.

With over 70% of the system consisting of 150 mm pipes, the system suffers an average of four blockages per day. The town also has a storm water drainage system, which only serves the central built-up area.

As a result of the poor access to clean water and sanitation services, there is high incidence of water-borne diseases like cholera, dysentery and diarrhoea in the county, which is more pronounced in the poorer communities and among young children.

Table 6.10 shows the incidence of water related diseases in Nakuru County attributed to the use of water from unprotected sources, and low awareness of personal hygiene among the population.

Existing System Overview

The sewerage system in Naivasha constituency was being designed to serve twenty thousand people in the constituency; the population of the town however has rapidly increased up to a current situation of ninety thousand people in the constituency today. This clearly shows there is a deficiency in system provision with very low coverage as the sewerage system only covers 20% of Naivasha constituency while the remaining 80% depends on septic tanks and pit latrines. The sewerage system mostly consists of gravity sewer lines which discharge into a sewage pumping station.

Some of the main type of waste water that is produced in Nakuru County includes effluent from domestic use, institutional and industrial discharge.

A bigger percentage of the sewerage system in the county is overloaded and dilapidated. Hydraulic loading on the pipelines, solid migration to drain fields, root intrusion into sewer lines resulting to frequent blockages, traffic damage to drain field, disposal of garbage and other solid wastes in sewer lines and manholes, and poor operation and maintenance of the sewerage systems are some of the challenges facing the sewerage systems. Some of the sewerage pumping stations in the county is not working efficiently.

1) NJORO SEWAGE TREATMENT PLANT

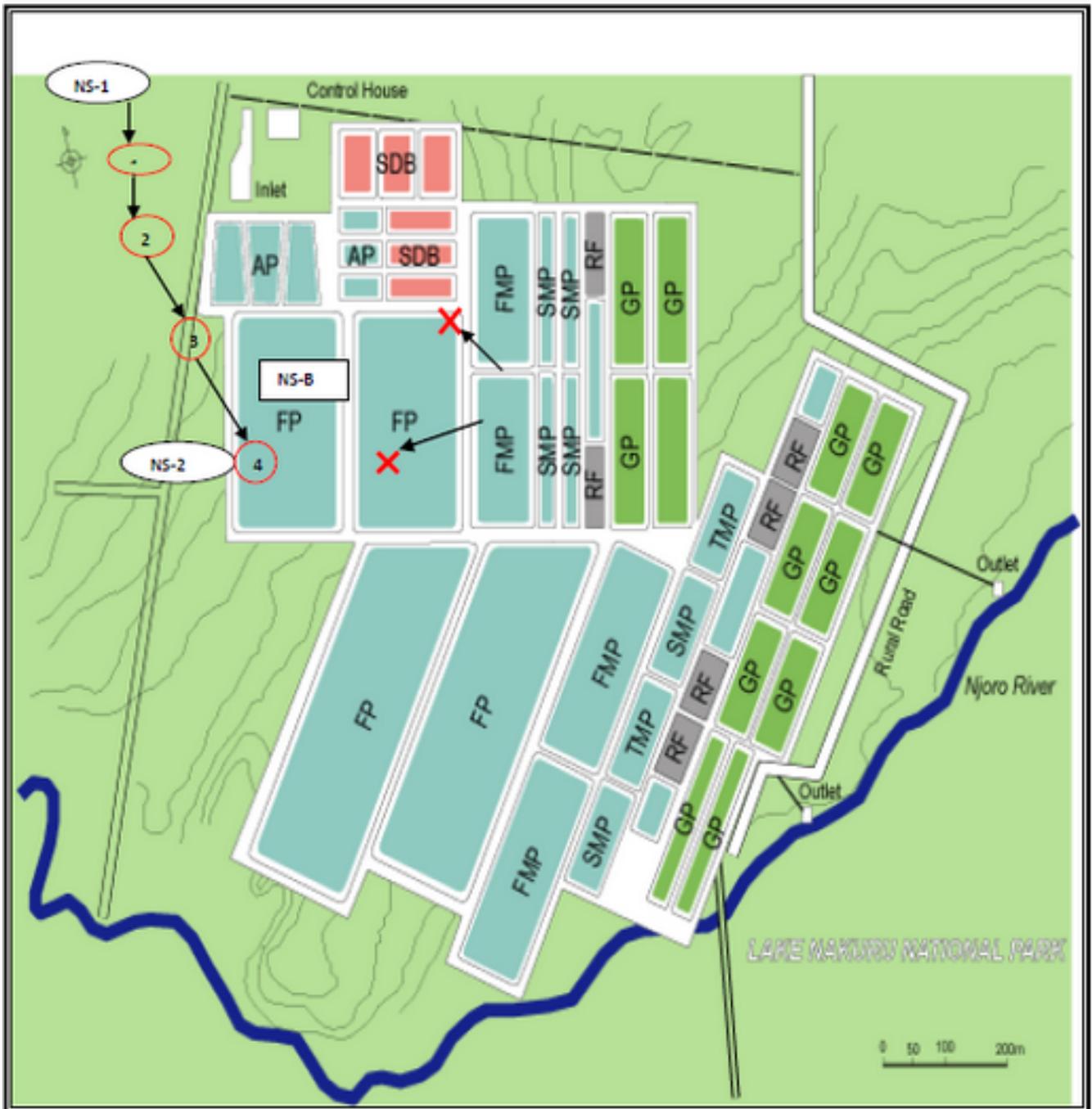


Figure 4.9: Njoro Sewage Treatment Plant
Source: Nakuru County Government

2) OLD TOWN SEWAGE TREATMENT PLANT

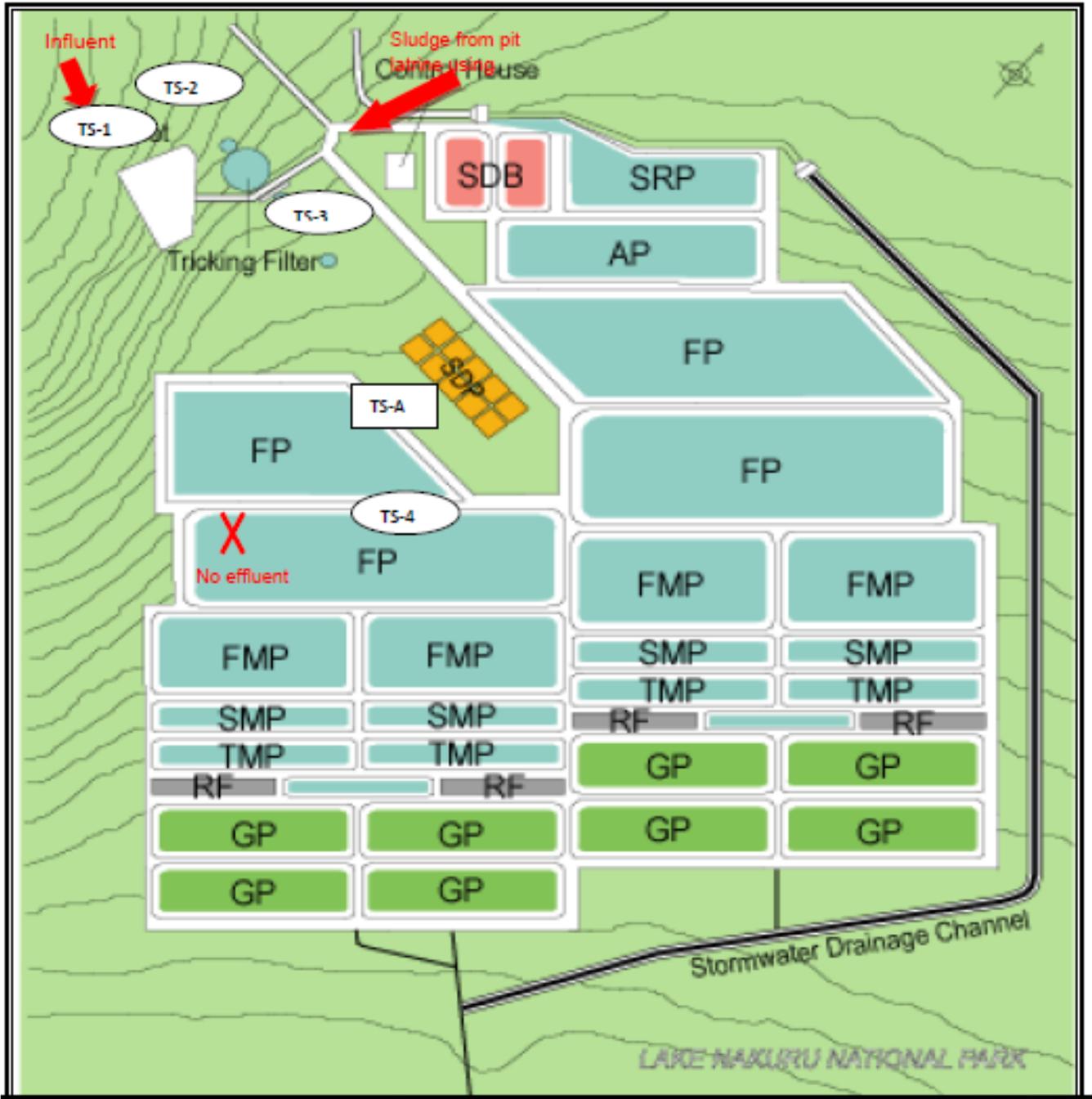


Figure 4.10: Old Town Sewage Plant
Source: Nakuru County Government

Analysis of Existing Systems

As outlined above, the major sewerage systems only cover the semi urban areas such as Naivasha and Nakuru town the two-major treatment plant in the county is the Njoro sewerage treatment plant and old town sewerage treatment plant.

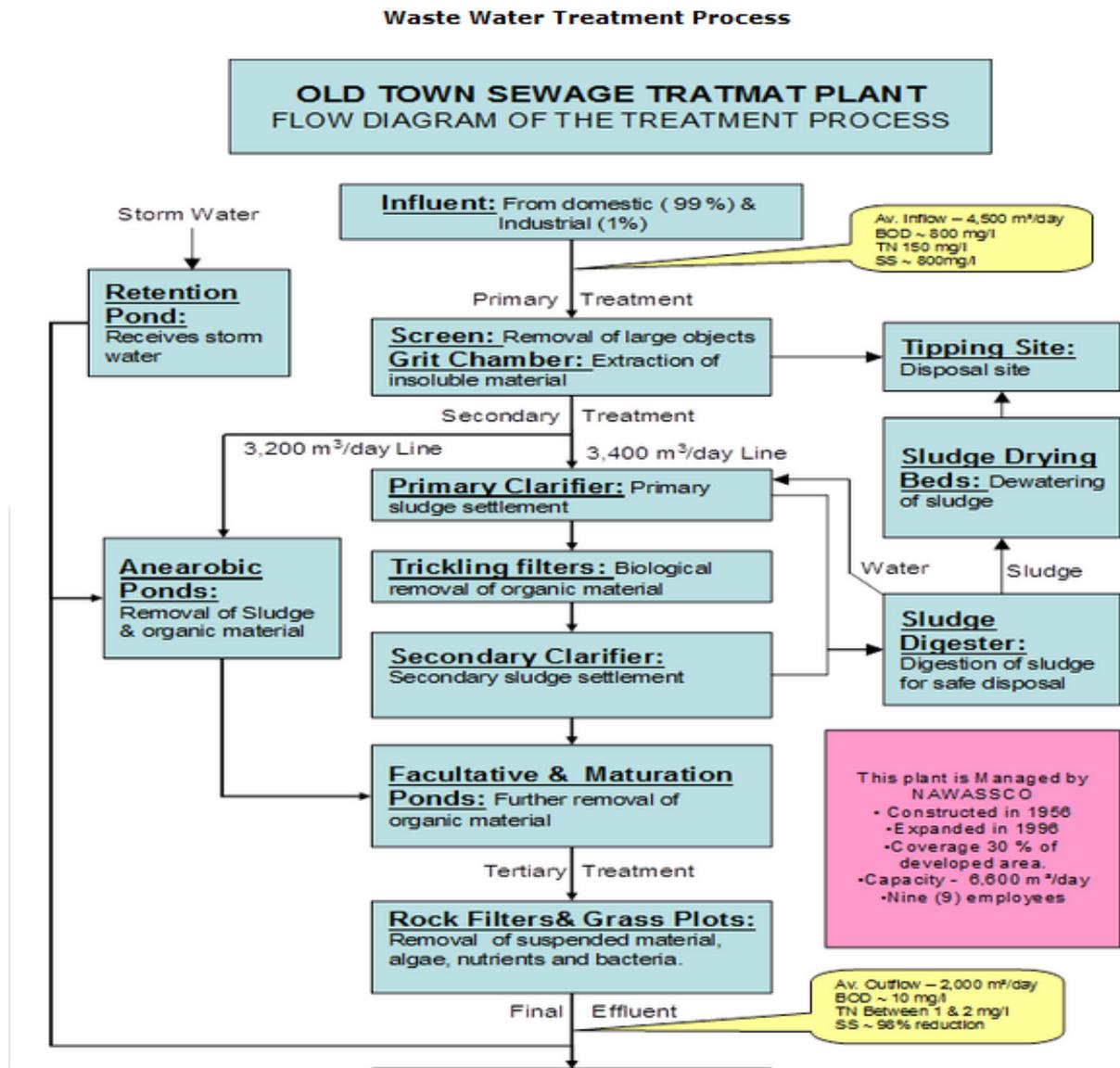


Figure 4.11: Waste Water Treatment Process

However, these systems are associated with a lot of operational problems such as over flooding, overloading, blockages and vandalism of manholes covers, dumping of solid wastes on the manholes, lack of frequent operation and maintenance and lack of accessibility to the facilities so as to enhance its maintenance. These sewerage systems are usually operated and maintained by urban local bodies with limited staff as outlined in the categories below:

- Superintendent-Sewerage
- Foreman/Supervisor- Sewer line
- Foreman/Supervision – Treatment Works
- Labours – Trunk Sewers
- Labours – Treatment Work
- Drivers, watchmen, exhausters and operators, etc.

A lot of the raw water from open trenches, and tampered lines usually find their way into the fresh water bodies thus affecting the quality of drinking water as well as leading to waterborne diseases such as cholera and typhoid among other waterborne diseases. The raw water also results to environmental hazards due to the odor that they produced when they are open freely to the environment. The existing capacities of the treatment plant are not adequate for the present and the fast-growing population in the county. The systems are also poorly maintained thus their efficiency is not reliable.

In rural areas, pit latrine and septic tanks are the common sanitation facilities in practice. Manual cleaning of pit latrine and cleaning with flood water are also in practice, which also are causes of serious health concern.

6.3 Energy/Power

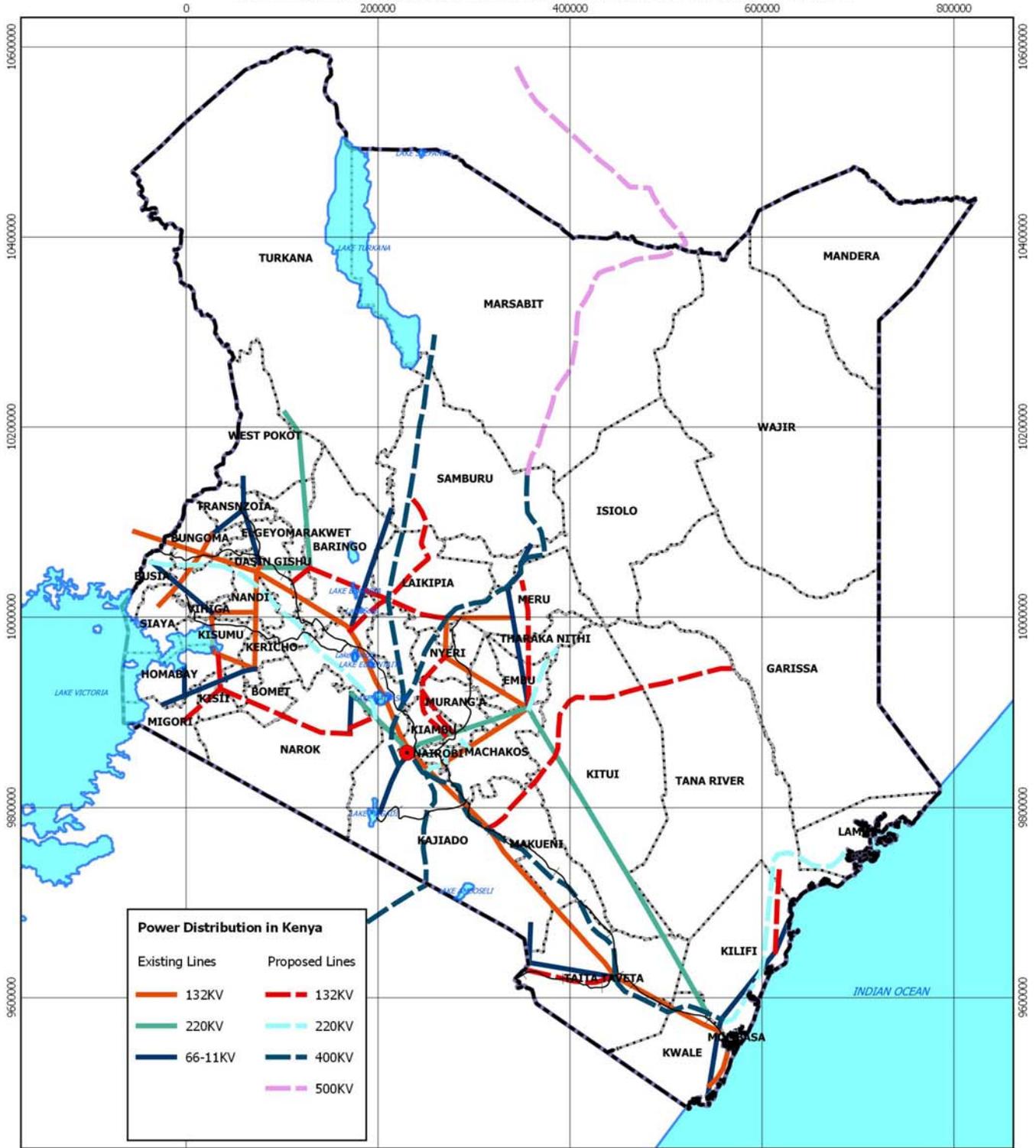
6.3.1 Existing Situation

Kenya's national grid operates in four regions: Nairobi, Coast, Western and Mount Kenya, as shown in the map.

Out of the four regions where the national grid operates, the Nairobi region is the best interconnected, being supplied from the transmission network via several 220/66kV and 132/66kV transmission substations or bulk supply points (BSPs). The distribution network in the regions outside Nairobi including Nakuru is less interconnected, with many radial 33kV and 11kV feeders and generally with long distances between BSPs.

In Nakuru County, the underground hot springs in OlKaria are an important source of geothermal power that serves not only the county but also provides power supply to the national grid. Further explorations are underway at Menengai Crater and Ol Doiyo Eburru with a view to generating more electricity. However, about 34% of households use electricity for lighting, of which 87 per cent of these connections are in the urban areas. Rural areas use lantern which account for (37%) and tin lamp (26%) as a source of lighting. Most rural areas within the region have not got a supply point due to the limitations of the distribution network. Rural communities with a connection to the grid suffer frequent and prolonged outages and poor voltage levels. The dire condition of the distribution network in rural areas, with long and undersized feeders, also causes high losses and long response times. However, power access in the rural areas have been increased by rural electrification through the Rural Electrification Authority and Constituency

POWER TRANSMISSION AND DISTRIBUTION NETWORK IN KENYA



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ● Capital City — Railway ■ Lake ■ Ocean ■ Forest □ County □ International 	<p>Scale 1:5,500,000</p> 	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	<p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Figure 4.12: Power Distribution in Kenya
Source: Kenya Electricity Transmission Company

Development Funds has had a very huge impact on these areas as a lot of rural areas are able to get electricity. The production of geothermal power at Olkaria, Menengai Crater and Ol Doinyo Eburru geothermal projects are as a result of seismic activities from the Rift Valley floor which is located in Nakuru. Thus, exploiting the full potentials of this geothermal energy shall hugely improve the extraction of affordable energy and reduce overreliance on hydro-power which is a susceptible source to climate change. The county has also tried to connect all county public primary school with electricity through talking to locals, subsidizing for power connection and sourcing for more funds from potential donors and investors.

6.3.2 Potential Problems

Due to over-reliance on hydro-electricity, the frequency of power outages in the county is high and more often leads to production losses. Considerably longer time is needed to obtain electricity connection in the county thus slowing the uptake of electricity both at household and firm level.

Some of the challenges that the energy sector is experiencing today include; inadequate power capacity that is as a result of rise in demand for electricity, long delays in development of power infrastructure due to many processes and steps that have to be followed before their commissioning, low investments in power generation by private investors, overdependence on hydropower which may not be adequate, dependence on donor funding which may not always be adequate, shortage of transformers and overstressed distribution network, unrealistic demands by local communities where energy resources such as coal, gas and oil are discovered.

6.4 SWOT Analysis

The Strengths, weaknesses, opportunities and threats analysis of this sector is as outlined in Table 6.11

Table 4.36 : SWOT Analysis for Transportation

Strengths	Weaknesses
<ul style="list-style-type: none"> • A104 Road-inter county linkage • Available fund/budget allocation • Abundant sources of energy • Existence of rail transport system. This will reduce overreliance on roads 	<ul style="list-style-type: none"> • Poor road networks • Inadequate coverage of road network • Narrow pedestrian walkways • Encroachment on road reserves • Poor road surfaces • Lack of designated parking spaces for trucks • Lack of public airport
Opportunities	Threats
<ul style="list-style-type: none"> • Adaptation of new technology in the transportation network Maglev (high speed trains) • Introduction of cashless mode of payment in road transportation • Existence of minerals and other valuables • The expected standard gauge railway 	<ul style="list-style-type: none"> • High and ever-changing transportation costs • Lack of land/space for construction • Unplanned urbanization • High cost of land acquisition

Chapter Seven : Social Infrastructure

Social infrastructure supports the economic and social growth of a region. They consist of recreational facilities, education facilities, health facilities, religious facilities and security facilities. Proper social infrastructure improves the standards of living of people, alleviates poverty and improves environmental conditions within human settlements. This chapter conducts a situational analysis of the social infrastructure status in Nakuru County and recommends strategies to be implemented in this sector within the planning period.

7.1 Education

7.1.1 Overview

Education remains the most critical component for economic development and social progression in any society and is typically seen as a means of improving people's welfare. The Kenya Vision 2030 underscores the importance of education in ensuring relevant human and social capital for sustainable development in the country. Nakuru County government recognizes that education and training is one of the levers that will make the county a vibrant region with high standards of living for its residents. The development concern is for the county to provide adequate school infrastructure such as desks, chairs, classrooms, laboratories and staffing. The County has several learning institutions according to data from the Kenya National Bureau of Statistics (KNBS).

7.1.2 Literacy in Nakuru County

According to KNBS 2014, the literacy level of Nakuru County was 76.7% while the Kenya national literacy level was 87.38 % and 80.59 % in 2010 and 2012, respectively. Nakuru County literacy level is lower than the global average, which was estimated at 83.95% and 86.29% in 2010 and 2012, respectively, and the national average. The literacy rate has improved over the years and this is attributed to FPE and the promotion of adult and continuous education. However, there are disparities between rural and urban areas, with rural areas having lower levels than urban areas.

Based on the socioeconomic survey, majority of the respondents (32%) had completed secondary education while 19% had completed primary education and 3.8% of the respondents had no formal education. Details of the levels of education are profiled in Figure 7.1 below.

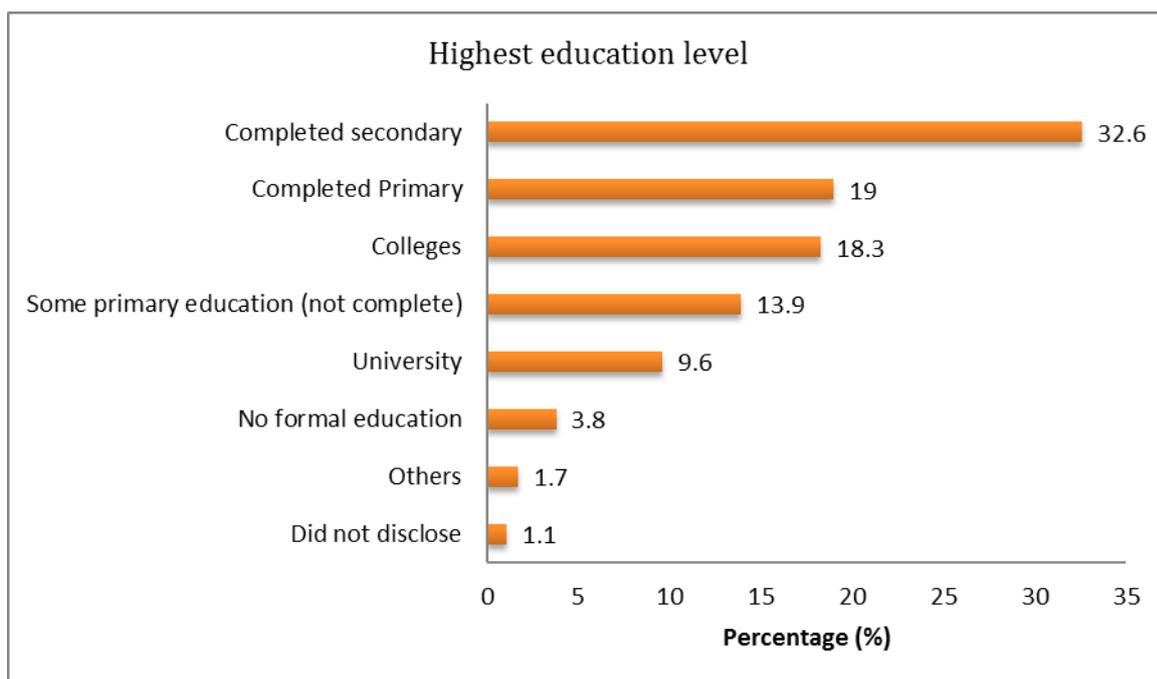


Figure 4.13: Levels of Education of Respondents

SOURCE: Nakuru Household Survey Data 2016

7.1.3 Early Childhood Education

Definitions of early childhood education differ around the world. Kenya considers early childhood education as an education provided to the children aged between 3-6 years old. There are both private and public ECDE centres within the county. There are about 1465 centres as shown in Table 7.1, with a children-teacher ratio of 13:1 in public centres and 20:1 in private centres. This ratio is far above the optimal ratio of 40:1, implying that the county is doing well in terms of number of ECD teachers.

Table 4.37: ECDE Centres, Enrolment and Teachers by Category, 2014

Category	Number		
	2014		
	Centers	Enrolment	Teachers
Private	694	40598	2022
Public	771	70714	5333
Total	1465	111312	7355

SOURCE: KNBS Data, 2014

• Enrolment in Pre-Primary School

The Kenya national gross enrolment rate in pre-primary school was 49.9% in 2005, while at the global rate was 60.85% in 2009. According to the 2009 Population Census, the county had 127,570 children aged between 0-9 years. This is the pre-primary school enrolment age and with enrolment

number at 111,312. This means that early childhood education is taken seriously within the county and at the moment is almost 100 per cent.

7.1.4 Primary Education

In Kenya, primary schools cater for children from 6 years to teenage. The county has both private and public primary schools. According to KNBS data as at 2014, the county had 681 public primary schools and 396 private primary schools serving 358,556 pupils. As shown in Table 7.2, the number of these facilities are on the rise and it can be assumed that the number of these facilities have risen by 2017.

Table 4.38.: Primary Schools by Category and Sub-County, 2013-2014

Sub-Counties	2013			2014		
	Public	Private	Total	Public	Private	Total
Kuresoi South and North	167	48	215	172	63	235
Molo	47	15	62	50	22	72
Njoro	87	28	115	91	38	129
Rongai	73	41	114	82	45	127
Nakuru East and West	104	134	238	105	131	236
Subukia and Bahati	40	12	52	42	16	58
Gilgil	62	29	91	68	29	97
Naivasha	68	52	120	71	52	123
Total	648	359	1007	681	396	1077

SOURCE: KNBS Data, 2014

The county's teacher to pupil ratio is 1:56 for public primary schools according to the 2013-2017 County CIDP.

- **Enrolment in Primary School**

Enrolment from ECD into primary school is nearly 100% according to KNBS 2014 data. Even then, there is a drastic decrease in the number of pupils enrolling into class 8 as illustrated in Table 7.3.

Table 4.39: Primary school Enrolment by Class, Sex and Sub County -2014

Class	Standard 1		Standard 2		Standard 3		Standard 4		Standard 5		Standard 6		Standard 7		Standard 8	
	Boys	Girls														
Gilgil	2370	2217	2349	2245	2427	2336	2382	2492	2349	2222	2345	2309	2242	2387	1920	1868
Kuresoi	5568	5171	5254	5029	5064	5018	5062	5017	4711	4820	4554	4693	4380	4444	3373	3380
N & S																
Molo	2671	2572	2695	2622	2819	2744	2852	2819	2793	2832	2741	2951	2572	2959	2138	2392
Naivasha	3479	3408	3623	3480	3672	3658	3754	3576	3881	3582	3685	3543	3807	3527	3377	3243
Nakuru	6217	6015	6343	6208	6400	6176	6742	6519	6534	6560	6258	6444	6254	6291	5613	5825
E & W																
Njoro	4328	3558	3858	3625	3830	3585	3907	3739	3693	3498	3577	3520	3573	3862	2566	2580
Rongai	2639	2575	2658	2509	2769	2432	2673	2623	2587	2502	2611	2547	2674	2561	2035	2026
Subukia	1671	1511	1742	1568	1569	1478	1634	1574	1567	1476	1620	1627	1685	1700	1364	1449
Total	28943	27027	28522	27286	28550	27427	29006	28359	28115	27492	27391	27634	27187	27731	22386	22763

SOURCE: KNBS Data, 2014

7.1.5 Secondary Education

There are 395 secondary schools in Nakuru County serving 110025 students as shown in Table 7.4 below.

Table 4.40: Secondary Schools by Category, Enrolment and Teachers, 2014

Category	Number		
	2014		
	Centers	Enrolment	Teachers
Private	294	93237	4402
Public	101	16788	1110
Total	395	110025	5512

SOURCE: KNBS Data, 2014

The enrolment for secondary education stands at 71,262 (Boys 36,144, Girls 35,118) according to Nakuru County CIDP with a teacher: student ratio is 1:45 and the main contributing factor to low enrolment in secondary is inadequate number of schools to accommodate the large number of pupils completing the primary school education at a time when secondary education fees have been subsidized.

7.1.6 Tertiary Education

The tertiary education sector of the county has been improving. There has been an establishment of several satellite university campuses and colleges within the county, especially in Nakuru East Sub County. The county had 17 youth polytechnics; 95% of which are public according to KNBS 2014 data; 1 public university – Egerton University; 1 private university – Kabarak University; several public and private university campuses; and a number of tertiary colleges including, Kenya Institute of Management, Rift Valley Institute of Technology, Dairy Training Institute and Kenya Medical Training Institute (KMTC) as shown in Table 7.5 and 7.6.

The enrolment in the institutions of higher learning (universities and colleges) as per the 2009 NHPC was 28,597 (male 15,274 and female 13,323) according to the Nakuru CIDP. This show a higher male to female ratio, and effort will have to be made to improve the female enrolment in the higher education level. The number of people that had graduated through institutions of higher learning as of 2009 was 85,638 (male 46,179, female 39,459), (KNBS2009, NHPC) and the number is expected to grow with the opening of new campus colleges within the county since then. Within this context there will be the need to expand the institutions of high learning

considering the rising enrolment at both secondary and primary education levels. This shows that there is less female transition rate from secondary to university and colleges and this need to be addressed through proactive and specific policies on mainstreaming girl child education at advanced levels.

Table 4.41: Youth Polytechnics by Category and Sub-County, 2013-2014

Sub-Counties	2013			2014		
	Public	Private	Total	Public	Private	Total
Kuresoi South and North	2	-	2	2	-	2
Molo	1	-	1	1	-	1
Njoro	1	-	1	1	-	1
Rongai	3	-	3	3	-	3
Nakuru East and West	5	-	5	5	-	5
Subukia and Bahati	1	1	2	1	1	2
Gilgil	-	-	-	1	-	1
Naivasha	1	-	1	2	-	2
Total	14	1	15	16	1	17

SOURCE: KNBS Data, 2014

Table 4.42: Universities and Technical Institutions by Category, 2013-2014

Category	2013			2014		
	Public	Private	Total	Public	Private	Total
Universities	1	1	2	1	1	2
Universities campuses	6	7	13	6	7	13
Teachers Training Colleges	-	4	4	-	4	4
National Polytechnics	1	-	1	1	-	1
Institutes of Technology	2	13	15	2	13	15
Technical Training Institutes	2	-	2	2	-	2
Total	12	21	33	12	21	33

SOURCE: KNBS Data, 2014

7.2 Health

7.2.1 Overview

More than 50 % of the county's inhabitants live in the rural areas where access to health facilities is not as good as compared to urban areas. As at 2015, the County had 166 public health facilities, 14 non-governmental facilities, 55 faith-based facilities and 189 private facilities. These facilities are in nine classes of health facilities: district/mission hospitals, referral and provincial hospitals, health centers, dispensary, private hospital, private clinics, maternity hospitals and nursing home, and special treatment centers.

The largest hospital in Nakuru County is the Nakuru Level 5 Hospital located in Nakuru Town's Viwanda area in Nakuru East Sub County. It was established in 1906 as a military hospital. It has grown to be the 2nd largest provincial hospital in Kenya with a bed capacity of 620 in 15 general wards. Only Molo and Kuresoi Sub Counties have health facilities built using the Constituency Development Fund (CDF). Four out of the five company medical facilities are in Naivasha Sub County and are owned by respective horticultural farms operating there. Rongai Sub County does not have a Sub-County level hospital.

7.2.2 Health Access

There is low access to health services in the County due to the long distances between them. 66.3% of the population travel for more than 5 kilometres to access the nearest health facility. Furthermore, some patients face insurmountable challenges in accessing health facilities due to poverty and impassable roads. Majority of the health facilities lack adequate infrastructure, drugs, and trained personnel to attend to some of the chronic illnesses. There is therefore need to address poverty, inadequate medical facilities, high cost of medical services and inadequate medical personnel in order to promote healthy living in the county. As shown in Table 7.7, Nakuru County is doing well in terms of health workforce: population ratio compared to the national average, though this number is way below the set minimum threshold by the World Health Organization.

Table 4.43: Number of Health Personnel

	County average	National average	WHO Recommended Minimum Threshold
Nurses (per 100,000 people)	90	55	230 per 100,000 people
Doctors (per 100,000 people)	12	10	1 per 1000 people
Clinical officers (per 100,000 people)	33	21	

SOURCE: *Nakuru County Facts Sheet, 2016 & WHO Report, 2011*

7.2.3 Most Common Diseases in Order of Prevalence

The common diseases in order of prevalence are diseases of the respiratory system (71%), clinical malaria (70%), pneumonia (9%), diarrhoea (8%) and typhoid fever (7%). HIV prevalence rate in the county is estimated at 4.7% and has greatly contributed to the increase in tuberculosis cases (Nakuru CIDP, 2013). Current emphasis in health is on reducing child mortality, promoting maternal health as well as mitigating the vulnerability of HIV/AIDS and other major diseases.

7.2.4 Availability of Medicine in Hospitals

Among one of the key facets of supporting and devolving decision making from central level to decentralized governments is to make services available to local residences which are consistent to their local needs. Using availability of essential medicines as an indicator of availability of responsive health services, a total of 62% of the respondents in the socioeconomic survey reported there were no essential drugs at the nearest health facilities frequently by household members.

In urban areas - especially Nakuru West and part of Rongai Sub-counties - private clinics were the most frequently mentioned as the most reliable health facilities. In rural areas, public health facilities were the most frequently mentioned source of health care as well as the most reliable (see Table 7.8). This pattern is consistent with national health network distributions and trusted sources of health care. Economic status of the population determines the choice of usual/trusted source of health services.

Table 4.8: Most Reliable Health Facility used by People

Sub-county	Names of reliable facility	
	Public Facility	Others (NGOS / FBOs / Private)
Bahati	Bahati District Hospital, Kabatini Health Center, Rift Valley General Hospital, Ndundori Health Centre, Maili Kumi Hospital, Kiamwamu Health Center	Mediheal Medical Clinic, Esther Memorial (Mie Sita), Wesley Mission Hospital, St. Annes Medical Clinic,
Gilgil	Gilgil General Hospital, Gilgil Mathare Hospital, Karati Dispensary, Karura Community Dispensary, Kinangop Hospital, Locco Dispensary, Naivasha General Hospital, Nakuru PGH Hospital,	St. Mary's Mission Hospital, Jasho Clinic, Kabasa Clinic, Ben Clinic,
Kuresoi North	Kamara Dispensary, Kimweson Health Center, Kiptororo Dispensary, Kwanja Ndege Dispensary, Kuresoi Health Center, Korabariet Dispensary, Londiani Dispensary, Molo General Hospital	Mercy Clinic, Morindoko Clinic, Trinity Clinic,
Kuresoi South	Chebaraa Health Center, Chemanar Dispensary, Chepakundi Dispensary, Kamwaura Health Center, Kapkeep Health Center, Kapkeet Health Center, Kario Health center, Kaplamai Dispensary, Kapkeet health Center, Molo Hospital, Ole Ngurruone Health Center, Olengurueno Health Center	Taita Hospital, Royal Clinic
Molo	Arimi Dispensary, Elburgon Nyayo Hospital, GSU Camp, Kamunge Hospital, Molo District Hospital, Sachagwan Dispensary	St. Clares Hospital, Rapha Medical Center, Oasis Medical Hospital, Matuamaini Mission Hospital, Baraka Mission, Home Nursing Clinic, Mungai Dispensary
Naivasha	Kenyatta National Hospital, Lakeview Hospital, Maai Mahiu Hospital, Naivasha Hospital	Kijabe Mission Hospital,
Nakuru East	Free Area Health Center, , PGH Nakuru, KITI Health Centre, Kapkure Health Center, Lana Langa Hospital, Menengai Dispensary, Njoro Dispensary, Pipeline Dispensary	St. Mary's Hospital, Jamii Dispensary, Karen Hospital, Aga Khan Hospital, Evans Sunrise Hospital, Bondeni Maternity Clinic, Al Kadir, Banita Dispensary, Bethsaida Clinic,

Sub-county	Names of reliable facility	
	Public Facility	Others (NGOS / FBOs / Private)
		Mediheal Hospital, Mithonge Hospital, Nairobi Womens Hospital, Nakuru Nursing Hospital
Nakuru West	Annex Valley Dispensary, Forestly Dispensary, Kapkures Health Center, Nakuru PHG Hospital, Prison Health Center	Coolen Health Center, Eveready Health Center, Menengai Hospital, Ngati Home Nursing, Mother Keriri Clinic,
Njoro	Egerton Dispensary, Huruma Dispensary, Kapletech Dispensary, Likia Dispensary, Mau Narok Dispensary, Njoro Health Center, Shome Health Center, Rare Hospital, Taita Dispensary, Tuiyotich Dispensary,	St. Nicholas Njoro Clinic, Aman Clinic, Familycare Clinic, Meta Clinic, PCEA Dispensary,
Rongai	Annex Hospital, Banita Health Center, Celechiest Dispensary, Kabarak University Hospital, Mangu Dispensary, Mema Dispensary, Menengai Hospital, Mogotio Health Center, Negesha Dispensary, Nakuru PGH Hospital, Rongai Dispensary, Salgaa Dispensary	Evans Sunrise Hospital, First Aid Company, Mema Dispensary
Subukia	Maseno Dispensary, Kiporojo Health Center, Kabazi Health Center, Igwamiti Dispensary, Chamasis Health Center, Nakuru PGH Hospital, Nyamathi Dispensary, Olgilgei Dispensary, Salai Health Center, Simboyon Dispensary, Subukia Health Center, Wei Dispensary	Maico Clinic, Symboiyon Dispensary, Tachasis Dispensary, Top Care Medical Center

7.2.5 HIV/AIDS

The impact of the HIV/AIDS pandemic has been felt at all levels of the county's economic and social circles. The county has a significant percentage of HIV and AIDS orphans, majority of who are in the urban centres. There are various children homes to take care of such children while in rural areas they are being taken care by their grandparents or older siblings of school age. This has increased dependency and has a negative impact on the labour force. HIV and AIDS has also affected children's participation in education due to inadequate parentage for the affected and truancy for those infected

A number of sentinel surveillance centres have been set up in the county in order to enhance the capacity of the county to monitor the trends of the pandemic. The county holds joint HIV/AIDS Program Reviews annually which bring together all the stakeholders in the fight against the pandemic. Collaboration between CSOs, CBOs, FBOs, private sector and the government through the County Technical Committee can ensure that there is increased awareness as well as improved uptake of V.C.T services across the county. Currently, all the Sub-Counties in the county enjoy the services of V.C.T sites located in various parts of the County. The National AIDS Control Council (NACC) has continued to carry out its coordination role of

the multi sectoral war against the pandemic through the Constituency AIDS Control Committees (CACC)

7.3 Security and Safety

Adequate and equipped security facilities are important for the development of various sectors of the region. The county has police stations, G.S.U camp, police camps, chief camps, prisons, and police posts as some of the security facilities. Based on the socio-economic survey insecurity came out as one of the major challenges in the entire County.

The county has been experiencing ethnic differences that usually occur during the election cycle. This has sometimes led to several people becoming internally displaced, unwarranted destruction of property and loss of lives. This has been a hindrance to development. To address this, there is need for an inter-ethnic reconciliation programme to foster the peaceful co-existence among the various communities residing in the county. This will also go a long way in boosting investor confidence.

7.4 Recreational Facilities

The County has a number of recreational facilities ranging from stadiums, hotels and accommodation facilities and playing grounds. Even then, there are inadequate user friendly play grounds for children, parks, modern stadiums and the region lacks even a single regional sports complex in the county hence the need to provide modern recreational modern facilities.

7.5 SWOT Analysis

The strengths, weaknesses, opportunities and threats of this sector are as outlined in table 8.10.

Table 4.44: SWOT analysis

Strength	Weaknesses
<ul style="list-style-type: none"> • Several NGOs handling HIV/AIDS prevalence issues • Mapping of educational and health facilities • High literacy levels • Inter-organizational collaboration (government, NGOs, private sector) 	<ul style="list-style-type: none"> • Not fairly distributed social facilities • Not well equipped social infrastructure due to inadequate financial resources • Health centers are understaffed • Poor access roads to the social facilities • Health facilities and education institutions lack adequate water supply • Insufficient education facilities • Walking long distance to access education facilities • Few social halls • Few police officers
Opportunities	Threats
<ul style="list-style-type: none"> • Development of strategies on improving and expanding secondary schools' physical infrastructure. • Investment in education sector by offering ECDE training, agricultural training and more technical colleges. • Devolved funds making response to public crisis better addressed 	<ul style="list-style-type: none"> • Insecurity • Rapid population increase

Chapter Eight : Human Settlement and Housing

The chapter looks at the human settlements in the county. A situational analysis was done where opportunities and challenges in human settlements were identified. Strategies towards sustainable human settlements were formulated with project budgets and implementers.

8.1 Human Settlements

Human settlements mean the totality of the human community with all the social, material, organizational, spiritual and cultural elements that sustain it. The fabric of human settlements consists of physical elements and services to which these elements provide the material support. The physical components comprise:

- Shelter – the superstructures of different shapes, size, type and materials erected by mankind for security, privacy and protection from the elements and for his singularity within a community
- Infrastructure – the complex networks designed to deliver to or remove from the shelter people, goods, energy or information
- Services cover those required by a community for the fulfilment of its functions as a social body, such as education, health, culture, welfare, recreation and nutrition.

It is now contended that human settlements are the spatial dimension, as well as the physical expression of economic and social activity. No creative act takes place without being influenced by settlement conditions. In turn, the creation of workable human settlements inevitably becomes an objective, an indicator and prerequisite for social and economic development.

Settlements are an objective of development in that safe, comfortable, and efficient living, working, and learning places are a fundamental and elementary need. Settlements are also an indicator, in that they are the most visible expression of a society's ability to satisfy some of the fundamental needs of its members. They can mark accomplishments as well as expose destitution, neglect and inequality. Finally, settlements are a prerequisite for social and economic development, in that no social progress for sustainable economic growth can occur without efficient settlements systems and settlement networks. The key concerns in the domain of human settlements are housing, infrastructure and urban services and urbanization.

8.2 Role of Human Settlements

Human settlements perform the following more specific functions:

Service Function – Human settlements facilitate provision of schools, health services, public utilities, banking services, cooperatives, administration, judicial, recreational and other social services.

Economic Function – Human settlements provide employment in agricultural, industrial, commercial and service sectors. They provide markets for both subsistence and cash produce, and allow material advancement out of manufactured goods for persons residing in them.

Residential Function – Human settlements always have a residential function for people working in agricultural or non-agricultural employment. As development progresses, the demand for these activities increases and, in turn, the development has a beneficial effect on the entire region through interdependence between urban and rural settlements.

8.3 Sustainable Human Settlements

“Promoting sustainable human settlements development” is the subject of Chapter 7 of Agenda 21, which calls for 1) providing adequate shelter for all; 2) improving human settlements management; 3) promoting sustainable land-use planning and management; 4) promoting the integrated provision of environmental infrastructure: water, sanitation, drainage and solid waste management; 5) promoting sustainable energy and transport systems in human settlements; 6) promoting human settlements planning and management in disaster-prone areas; 7) promoting sustainable construction industry activities; and 8) promoting human resource development and capacity-building for human settlements development.

8.3.1 Sustainable Development Goals

Sustainable development goals seek to build on millennium development goals and complete those that were not achieved. They are universal goals which balance three dimensions of economic, social and environmental development. They are targeted at stimulating global action for the next 15 years. Some of the sustainable development goals (SDG) that have a direct bearing on the objects of the County Spatial plans include the following:

(a) Sustainable Development Goal 1: by 2030, if not earlier, all the world’s people will have access to safe and sustainable water and sanitation, adequate nutrition, primary health services, and basic infrastructure, including electricity, roads, and connectivity to the global information network.

(b) Sustainable Development Goal 2: from 2015 to 2030, all nations will adopt economic strategies that increasingly build on sustainable best-

practice technologies, appropriate market incentives, and individual responsibility. The world will move together towards low-carbon energy systems, sustainable food systems, sustainable urban areas (including resilience in the face of growing hazards), and stabilization of the world's population through the voluntary fertility choices of families supported by health services and education.

The third broad SDG is social inclusion, the commitment to future economic and technological progress under conditions of fairness and equitable access to public services, and with the government counter acting social discrimination on the basis of gender, ethnic origin, religion, and race.

(c) Sustainable Development Goal 3: every country will promote the wellbeing and capabilities of all their citizens, enabling all citizens to reach their potential, irrespective of class, gender, ethnic origin, religion, or race. Every country will monitor the wellbeing of its citizenry with improved measurements and reporting of life satisfaction. Special attention will be given to early childhood, youth, and elderly people, addressing the vulnerabilities and needs of each age cohort.

(d) Sustainable Development Goal 4: governments at all levels will cooperate to promote sustainable development worldwide. This target includes a commitment to the rule of law, human rights, transparency, participation, inclusion, and sound economic institutions that support the private, public, and civil-society sectors in a productive and balanced manner. Power is held in trust to the people, not as a privilege of the state.

(e) Sustainable Development Goal 11: Sustainable Cities and Communities

This goal aims at making Cities and Human Settlements inclusive, safe, resilient and sustainable. The targets under this goal are:

- ❖ By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums;
- ❖ By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons;
- ❖ By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries;
- ❖ Strengthen efforts to protect and safeguard the world's cultural and natural heritage;

- ❖ By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations;
- ❖ By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management;
- ❖ By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities;
- ❖ Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning;
- ❖ By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels.

8.3.2 Sustainable Urban Areas and Cities

Cities are hubs for ideas, commerce, culture, science, productivity, social development and much more. Cities can promote economically, socially and environmentally sustainable societies if we adopt a holistic approach to urban development that ensure universal access to basic services, housing and mobility. Urban planning, transport systems, water, sanitation, waste management, disaster risk reduction, access to information, education and capacity-building are all relevant issues to be addressed.

8.4 Human Settlement Objective

The overall human settlement objective is to improve the social, economic and environmental quality of human settlements and the living and working environments of all people, in particular the urban and rural poor. Such improvement should be based on technical cooperation activities, partnerships among the public, private and community sectors and participation in the decision making process from community groups and special interest groups such as women, indigenous people, the elderly and the disabled. These approaches should form the core principles of national settlement strategies.

8.5 History of Human Settlements in Nakuru County

In the colonial days, the area attracted white settlers who successfully began to exploit its agricultural potential. Nakuru was linked to the Uganda railway and became a centre of trade and industrial activity. During and after the colonial days the county attracted immigrants from far and wide making it one of the most cosmopolitan counties in Kenya. Currently Nakuru County has an average population growth rate of 3.5%.

8.6 Types of Human Settlements in Nakuru County

Settlement patterns in Nakuru County can be classified into rural and urban;

(i) Rural Settlement (Scattered)

These are rural settlements where agriculture activities are primarily undertaken. The settlement patterns are scattered in the farms. The percentage of rural population in 2009 was 62% with a county average population density of 214 persons per km². The hinterlands are poorly endowed with quality infrastructure (such as good roads, water, electricity, and sewer) and social services (education, health, recreation security).



Plate 4.7: Dispersed Rural Settlement in Kuresoi North

SOURCE: *Geomaps /Habitat Planners Field survey 2016*



Plate 4.8: Rural Roads in Poor Condition
SOURCE: *Geomaps /Habitat Planners Field survey 2016*



Plate 4.9: Rural Houses without Electricity
SOURCE: *Geomaps /Habitat Planners Field survey 2016*

(ii) Urban Settlements

Urban settlements in Nakuru county are either clustered (nucleated) or linear. Urban centres are clustered or nucleated settlements with predominantly non-primary activities. Another form of urban settlement that is predominant is linear settlement which is urban growth along the major roads (See Figures 8.1 and 8.2).



Figure 4.14: Linear/Ribbon Rural Settlement in Subukia
SOURCE: *Geomaps 2016 Aerial Mapping*



Figure 4.15: Nucleated Urban Settlement in Molo Town
SOURCE: *Geomaps 2016 Aerial Mapping*

a) Classification of Urban Centres

The Urban Areas and Cities Act 2011(revised 2015) requires a city to have a population of over 250,000 residents according to the last population census, have an Integrated Sustainable Urban Development Plan and

demonstrate economic viability among other requirements. Accordingly, Nakuru town – which had a population of 307,990 in 2009 – qualifies for city status and the process of its conferment should be initiated by the county government. The same Act defines a municipality as urban centres with a population of 70,000- 249,000 residents as at the time of the last population and housing census and has an integrated development plan among other requirements. Going by these key requirements, Naivasha town which had a population of 169,142 residents in 2009 qualifies for municipal status. The county government should initiate the process of conferring Naivasha town municipal status. The Act further requires a town to have a population of at least 2,000 residents at the time of the last census. Figure 8.2 shows the major towns in Nakuru County.

Accordingly, eleven towns qualify for town's status. They are Mai Mahiu, Molo, Njoro, Gilgil, Subukia, Olenguruoni, Bahati, Rongai, Salgaa, Dundori and Mau Narok as outlined by Table 8.1

Urban Population projections show a significant growth in towns. For instance, Molo and Gilgil will have a population of 53,789 and 58,276 in 2024, respectively. This growth can be attributed to growing social economic activities in the towns, rural-urban migration and tribal violence in the case of Molo town. The county will need to provide more social amenities as well as strengthening peace building efforts in the areas affected by violence.

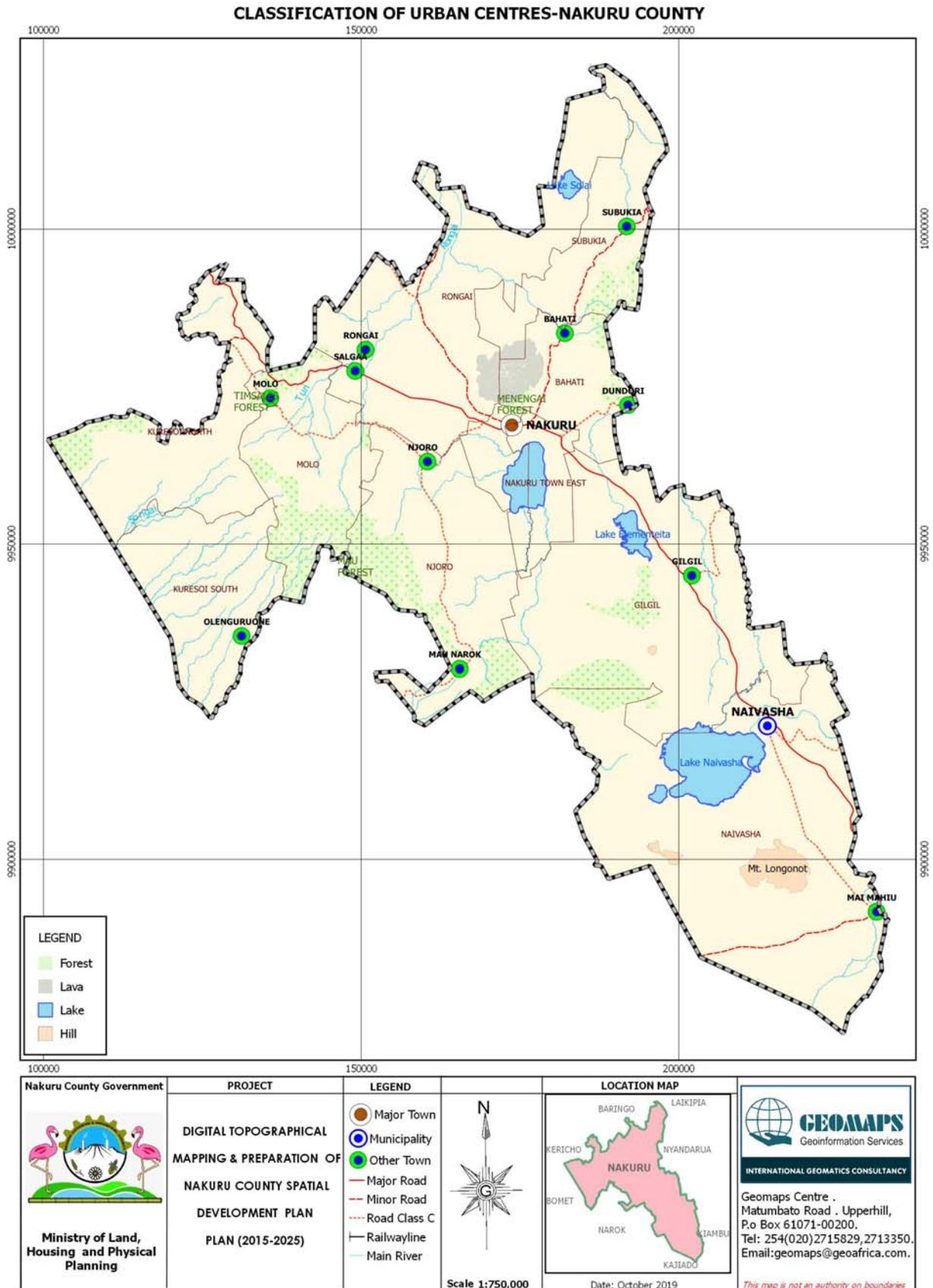


Figure 4.16: Major Urban Centres in Nakuru County

SOURCE: Geomaps /Habitat planners' modification 2016

Table 4.45: Towns with a Population of Over 2,000 in 2009.

Urban Area	2009 (Census)	2012 (Projections)	2015 (Projections)	2018 (Projections)	2021 (Projections)	2024 (Projections)
Nakuru Town	307,990	337,501	369,839	416,108	460,026	508,562
Naivasha	169,142	185,349	203,108	228,518	252,636	418,466
Gilgil	35,293	38,675	42,380	47,683	52,714	58,276
Molo	32,576	35,697	39,118	44,112	48,656	53,789
Njoro	23,551	25,808	28,280	31,818	35,175	38,947
Mai Mahiu	11,230	12,306	13,485	15,171	16,772	18,542
Subukia	7,309	8,009	8,777	9,874	10,917	12,068
Dundori	5,221	5,721	6,269	7,053	7,797	8,620
Mau Narok	4,357	4,774	5,232	5,886	6,507	7,194
Salгаа	4,072	4,462	4,890	5,501	6,011	6,723
Bahati	3,833	4,200	4,603	5,178	5,724	6,329
Rongai	2,215	2,427	2,660	2,991	3,307	3,656
Olenguruo ni	2,119	2,322	2,545	2,862	3,164	3,498
Total	608,908	667,252	731,185	822,755	909,406	1,144,670

SOURCE: *Geomaps / Habitat Planners 2016*

8.7 The Role and Functions of Urban Centers

Urban centres in the county play administrative, service, economic, social and innovative roles in the development of the county. Very important, they provide market for rural agricultural produce and supply inputs to the rural agricultural sector. The roles of the various towns are given in Table 8.2.

Table 4.46: Role of Key Urban Centres

	Sub-county	Role
1	Nakuru East	County(Nakuru town) and Sub County Hq, transport linkage, economic, residential, education services, medical services and farm equipment
2	Nakuru West - Kapkores	Sub County Hq, transport linkage, economic, residential, education services, medical services and farm equipment
3	Gilgil – Gilgil	Administrative Hq, economic, residential, farm equipment provisions
4	Naivasha - Naivasha	Administrative Hq, conference and tourism town, residential, services, economic, farm supply
5	Kuresoi North – Mau Summit	Administrative Hq, food supply
6	Kuresoi South – Olenguruoni	Market (food products)
7	Bahati - Bahati	Administrative Hq, food supply
8	Subukia - Subukia	Administrative Hq, food supply
9	Molo – Molo	Administrative Hq, food supply
10	Njoro – Molo	Administrative Hq, education services
11	Rongai - Salgaa	Market, large scale farming

SOURCE: *Nakuru County Government*

8.8 Urban Infrastructure and Services

Towns in the county lack adequate infrastructures and services requisite for their development. The situation is worse in the unplanned areas and especially in the low-income settlements.

8.9 Towns with Physical Development Plans

Physical development plans guide urban development and are one of the key instruments of urban management. Where there are no physical development plans, towns grow haphazardly without control and finally become economically, socially and environmentally unproductive. Table 8.3 gives the list of towns with approved physical development plans. The planning status of other towns and markets is given in Annex 1. Efforts should be made to get all towns in the county planned.

Table 4.3: Towns with Physical Development Plans

Towns	Status	Towns	Status
Nakuru	Approved	Mau Narok	Approved
Naivasha	Approved	Ngecha	Approved
Maai-Mahiu	Approved	Ngwataniro	Approved
Subukia	Approved	Noiwet	Approved
Bahati	Approved	Nyamamithi	Approved
Gilgil	Approved	Molo	Approved
Rongai	Approved	Ol Rongai	Approved
Olenguruone	Approved	Sitoito	Approved
Kuresoi	Approved	Thuthua	Approved
Kabatini	Approved	Longonot	Approved
Kabazi	Approved	Mukinyai	Approved
Kamwaura	Approved	Turi	Approved
Kampi Ya Moto	Approved	Mau Summit	Approved
Kandutura	Approved	Tipis Maji Mingi	Approved
Kiamunyi	Approved	North Karati	Approved
Old Kijabe	Approved		

SOURCE: Nakuru County Government

8.10 Major Towns with Informal Settlements

Due to rapid urbanization and failure of the formal sector to supply adequate houses especially for the low-income segment of the society, there has been proliferation of informal settlements to meet the housing gap. This is manifested by the slums and squatter settlements and other form of shanty developments. There is need to embrace the national housing policy and planning regulations to enhance housing delivery in the affected towns. The complimentary role of the public and private sector in housing delivery should be tapped into.

Table 4.4: Major Towns with Informal Settlements

	Sub-county	Towns
1	Nakuru East	Bondeni, Manyani, Lake view
2	Nakuru West	Ronda, Kaptembwa, Gituima
3	Gilgil	Kampi Somali, Maina, Makaburi
4	Naivasha	Lake View
5	Kuresoi North	-
6	Kuresoi South	-
7	Bahati	-
8	Subukia	-
9	Molo	Casino, Kasarani
10	Njoro	Industrial area, jua kali, Jewatho, Kondeni
11	Rongai	-

SOURCE: Nakuru County Government

8.11 Factors Influencing Human Settlements

The settlement patterns are influenced by the availability of natural resources, soil fertility and rainfall, pasture, infrastructure, economic opportunities, proximity to urban set-ups and security. Although a large population is in the rural areas, the urban centres have the highest population density due to rural-urban migration, well-developed infrastructures,

employment opportunities and security. The factors affecting human settlements are summarized in Table 8.5

Table 4.5: Factors Influencing Human Settlements in the Region

Sub-county	Historical factors	Improved infrastructure	Resource endowment	Ethnicity	Other specify
Nakuru East	✓	✓	✓ Lake Nakuru, Menengai crater & wildlife	✓	
Nakuru West	✓	✓	✓		
Gilgil	✓	✓		✓ Cosmopolitan	Military town
Naivasha	✓	✓ (Railway & airport -no longer exists)	✓ (land availability)	✓ (Maasai and Kikuyu)	
Kuresoi North	✓		✓ (forest cover)	✓ (Kalenjin, Kikuyu & Kisii)	
Kuresoi South				✓	
Bahati				✓	
Subukia	✓		✓ (land availability)	✓ (Cosmopolitan)	
Molo	✓	✓	✓ (forest)	✓ (Kikuyu)	
Njoro	✓	✓	✓ (forest)	✓ (Kikuyu)	
Rongai	✓			✓	

SOURCE: *Field Survey 2016*

8.12 Settlement Schemes

The status of the settlement schemes in the county is given in Table 8.6.

Table 4.6: Settlement Schemes in the County

S/No	Scheme Name	Scheme No.	Sub-county	Status
1	Bahati	201	Nakuru North	Registered
2	Banita	112	Rongai	Not registered
3	Boron	504	Molo	Registered
4	Ceder Lodge	713	Nakuru North	Registered
5	Ex-jack Evans	540	Rongai	Registered
6	Githiriga	554	Molo	Registered
7	Kamara	614	Kuresoi	Registered
8	Kampi ya moto	539	Rongai	Registered
9	Kenjoketty	551	Kuresoi	Registered
10	Kirengero	529	Nakuru North	Registered
11	Kivulini	851		Registered
12	Kivulini Ext. (Kambala)	878	Molo	Registered
13	Kivulini Highland	865		Registered
14	Langwenda	545	Molo	Registered
15	Lengetia	550	Njoro	Registered
16	Lenginet	501	Rongai	Registered
17	Miti Mirefu (tall tress)	612	Molo	Registered
18	Moyasset	509	Rongai	Registered
19	Muchorwi	505	Molo	Registered
20	Mukei	537	Molo	Registered

S/No	Scheme Name	Scheme No.	Sub-county	Status
21	Njoro	717	Njoro	Registered
22	Nyota Complex	609	Molo	Registered
23	Olongai	552	Rongai	Registered
24	Nyota Complex Ext	866	Molo	Registered
25	Nyota Pendle/Tregana	613	Molo	Registered
26	Piave	751	Njoro	Registered
27	Rongai	538	Rongai	Registered
28	Rotharine	555	Molo	Registered
29	Rwangondu	553	Molo	Registered
30	Sachangwan	610	Molo	Registered
31	San Marco	546	Rongai	Registered
32	Sirikwa	611	Molo	Registered
33	Sitoito	503	Molo	Registered
34	Solai	536	Rongai	Not registered
35	Sondu River	552	Kuresoi	Registered
36	Subukia	528	Nakuru North	Registered
37	Temoyetta	502	Molo	Registered
38	Thigi	544	Molo	Registered
39	Turi	714	Molo	Registered

SOURCE: Nakuru County Government

Only two schemes are unregistered and we recommend the process should commence.

8.13 Urban-Rural Linkages

There exists a severe weakness in urban- rural linkages. The condition of roads linking urban areas to their surrounding rural areas is very bad in the region. This has led to higher transportation costs, affecting human settlements in the hinterland areas.



Plate 4.10: Poor Rural Roads

SOURCE: *Geomaps /Habitat Planners Field survey 2016*

The demand by the rural population of non-food goods, agricultural inputs and services and demand for food and other rural materials by the urban dwellers can only be met if there is a coordinated urban-rural linkage.

8.14 Land Tenure

Land tenure is the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land. Rules of tenure define how property rights to land are to be allocated within societies. They define how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints. In simple terms, land tenure

systems determine who can use what land for how long, and under what conditions.

According to the Kenyan Constitution, 2010, there are three different types of land tenure: private land, public land, and community land. Private land is land owned by an individual under freehold or leasehold tenure. Public land is vested in the government for the benefit of the people in Kenya. It includes roads, all water bodies, forests, national parks, and mineral-endowed land, among others. Community land is held by and managed by communities. It includes land registered under group representatives, shrines, grazing areas and ancestral lands. Land tenure affects access, conservation and utilisation of land, as well as the provision of infrastructure and services. It also has a bearing on the cost of projects.

The Trust and Government lands in these areas have since been adjudicated and government settlement schemes implemented. No consideration was made to set aside adequate public land for urban areas as outlined in Table 4.7. Thus, very few urban centres have public land for expansion. Urban centres and small towns have developed on private land. This has led to land sub-divisions into very small parcels and some illegal settlements to accommodate the expanding demand for land. The end result of this has been uncontrolled development of slums in the areas.

Table 4.7: Public Land for Expansion

	Sub-county	Yes	No	Others
1	Nakuru East		✓	Private land available
2	Nakuru West		✓	Private land available
3	Gilgil		✓	Private land available
4	Naivasha	✓		
5	Kuresoi North	✓		
6	Kuresoi South	✓		
7	Bahati	✓		
8	Subukia	✓		
9	Molo	✓		
10	Njoro	✓		
11	Rongai	✓		

SOURCE: Nakuru county government

8.15 Human settlements issues identified in Nakuru County

8.15.1 Opportunities for Human Settlements in the Region

- Land with high human carrying capacity potential
- High agricultural potential
- High tourism potential
- Ecological and topographical diversity
- Good climate for human settlements
- Locally available building Materials
- Northern corridor traverses the county
- Developed inter and intra road network
- Reasonable level of social amenities (education, health etc.)
- Many urban centres
- Highly literate manpower

8.15.2 Emerging Planning Issues and Proposed Strategies

(a) Fast Population Growth

The county population growth rate is estimated at 3.05%; slightly lower than the national average growth rate of 3.14% as per the 2009 National Population and Housing Census. The high population growth rate has created a predominantly youthful population with 51.87% of the population below 20 years of age and 71.63% of the population below 30 years of age. The implication of a large youthful population is that it will exert pressure on the existing natural resources, infrastructure and social services. Already the county population density is 234 persons per km² and is projected to increase. To contain the fast population growth, various birth control/family planning measures needs to be employed.

(b) Uneven Settlements and Population Distribution.

The settlement patterns are influenced by distribution of natural resources, soil fertility, rainfall, pasture, infrastructure, economic opportunities, proximity to urban set-ups and security. Although a large

population is in the rural areas, the urban centres have the highest population densities (with population growth rate of 3.05%) due to rural-urban migration a well-developed infrastructure, employment opportunities, and security.

Towns are unevenly distributed, developing mainly along the main transport corridors and in the high potential areas. The rural population is estimated to be 62 %, with the remaining 38% living in towns. Although the average county population density is 234 persons per km² is much higher than the national average of 67 persons per square kilometre, there are regional disparities in population densities as shown in Table 8.8.

Table 4.8: Projected Population per Sub-County

Constituency	Area (Km2)	2009		2012		2018		2021		2024	
		Population	Density	Population	Density	Population	Density	Population	Density	Population	Density
Nakuru Town West	251	152,257	607	166,617	665	199,530	795	218,350	870	238,944	952
Nakuru Town East	74.3	157,167	2,115	171,990	2318	205,964	2,783	225,391	3,046	246,650	3,333
Molo	478.79	124,438	260	136,174	285	163,074	340	178,455	373	195,286	408
Njoro	713.3	184,859	259	202,572	284	242,254	340	265,104	372	290,108	407
Kuresoi North	559.7	124,050	222	135,936	243	162,565	290	177,898	318	194,677	348
Kuresoi South	572.3	115,435	202	126,496	221	151,275	264	165,544	289	181,157	317
Rongai	1049.1	130,132	124	142,601	136	170,535	1,312	186,620	1,436	204,222	1,571
Bahati	375.4	144,266	384	158,089	421	189,058	504	206,890	552	226,403	605
Subukia	390.71	94,478	242	103,531	265	123,811	317	135,489	347	148,269	379
Naivasha	1685.8	224,141	133	245,617	146	293,733	174	321,438	191	351,755	209
Gilgil	1348.4	152,102	113	166,676	124	199,327	149	218,127	162	238,701	177
Total	7498.8	1,603,325	4,660	1,756,951	5107	2,101,126	7268	2,299,306	7956	2,516,172	8706

SOURCE: Kenya National Bureau of Statistics and consultant's projection



Plate 4.11: Dense Urban Settlement in Subukia Town

SOURCE: *Geomaps /Habitat Planners Field survey 2016*



Plate 4.12: Sparse Population in Nakuru rural

SOURCE: *Geomaps /Habitat Planners Field survey 2016*

To reduce population distribution disparities, efforts geared towards a more balanced population density are required. These include the development of more infrastructure,

social amenities and government investment in areas with low population densities. Towns should be encouraged to grow in those areas by creating economic opportunities so as to attract more people. The areas of focus should include Gilgil, Rongai, Naivasha, Kuresoi North and South which have relatively low population densities.

(c) Subdivision of Land into Small Parcels

Nakuru County has few large-scale land owners, holding approximately 263 Hectares of land on average. On the other hand, the county is dotted with many small-scale land owners with a mean land holding size of 0.77 Ha. The bulk of the land holdings in the county are small and are found mainly in the high potential agricultural areas. The medium and large farms account for a small per cent of the holdings, but cover the largest area under farming. On the other hand, the mean holding size for land ownership in urban areas is 0.05 ha on average.

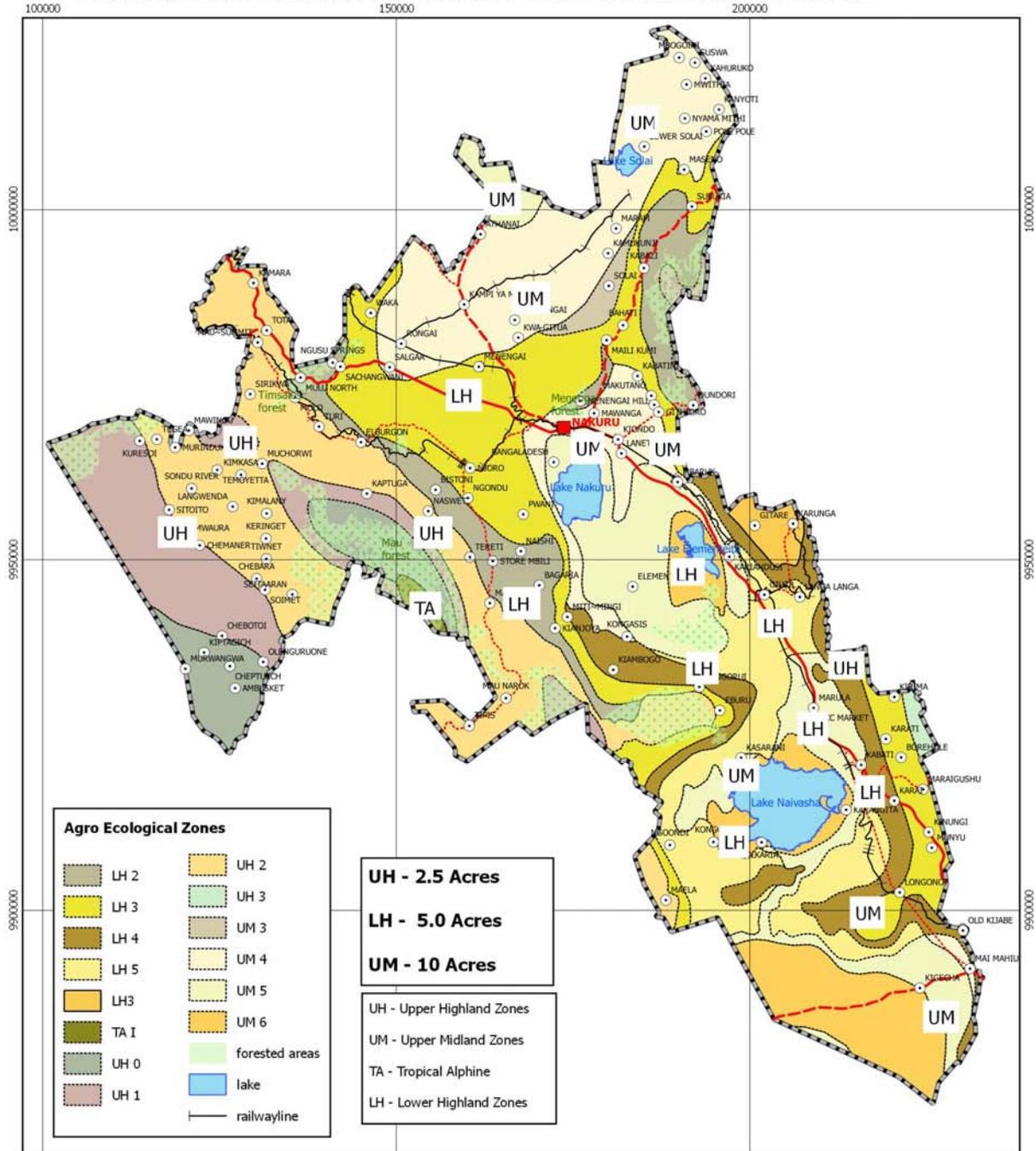
To forestall further land fragmentation, minimum land acreage should be established for both urban and rural areas. When subdividing rural agricultural land, the minimum size of land subdivisions should be based on the agro ecological zone as recommended by the physical planning handbook 2007 (See Table 8.9 and Figure 8.3).

Table 4.9: Recommended Minimum Land Acreage in Rural Areas

Agro-ecological zone	Minimum land size	County coverage
High potential areas (Ecological Zone 2, UH)	2.5 acres	Upper Subukia, Rongai and Mau Escarpment
Medium potential areas (Ecological Zone 3, LH)	5 acres	most parts of the county and is the most significant for agricultural cultivation
Low potential areas (Ecological Zone 4, UM)	10 acres	Solai, Gilgil and Naivasha

SOURCE: *Physical Planning Handbook 2007 and Consultant's Compilation*

AGRO ECOLOGICAL ZONES RECOMMENDED MINIMUM LAND SIZES IN RURAL AREAS



<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Major Town Market Centre Road Class A Road Class B Road Class C 	<p>LOCATION MAP</p> <p>Scale 1:750,000</p> <p>Date: October 2019</p>	<p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
	<p>Nakuru County Government</p>			

Figure 4.17: Recommended Minimum Land Sizes in Rural Areas

Source: Adopted from the Agriculture Handbook

Consideration is given to how much land can support a family before the minimum acreage is determined. It is recommended that the following minimum land sizes be maintained according to the agro ecological zones. It should also be noted that during the process of land subdivision the land owner is required to surrender 4% of the land to be earmarked for public utility purposes exclusive of road reserve. The minimum urban land sizes should be established in the advisory plans.

(d) Lack of Title Deed for Some Land Parcels

About 22.5% of lands in the county have no title deeds. This is both in urban and rural areas. The government agencies responsible for titling should expedite the exercise to increase title deed holding. More capital and human resources should be allocated to the activity. Processing of title deeds for public institution should be prioritized in this regard to avoid land grabbing.

(e) Incidence of Landlessness

Slightly less than 20% of the households in the county are considered landless. Some of these landless persons are the post-election violence victims settled in camps for the internally displaced persons while others are slums dwellers and immigrants either on employment or engaged in business. There are also incidences of landlessness affecting those who were evicted from the Mau forest. The County Government and the Central Government should work collaboratively to identify suitable land for settling the landless



Plate 4.13: Landless Internally Displaced Persons

SOURCE: *Geomaps / Habitat Planners Field survey 2016*

(f) High Levels of Poverty

The Human Poverty Index is a composite measure of poverty that combines several basic factors affecting the quality of life. The major component included in the HPI survey includes longevity of life, knowledge acquisition, economic status and social inclusion. According to the 2009 Kenya Human Development report, Nakuru County's HPI is 24.6% compared to the National average of 29.1%.

Unemployment, low agriculture productivity, and an increasing dependency ratio are some of the major contributing factors to poverty in the county. Other causes of poverty include poor marketing linkages for agricultural products, lack of affordable credit facilities for farmers and high costs of farm inputs.

There is need to initiate programmes that reverse poverty trends with the aim of improving the living standards of the county's residents. The programmes should work towards promoting investments, use of modern technology and practices in agriculture; and acquisition of appropriate skills. More and diversified economic activities especially in the SMEs should be created together with other labour-intensive economic activities.

(g) Poor Quality of Housing

Decent housing is an objective of sustainable human settlements. The nature of dwelling units in terms of roofing, walling and flooring material in the county, demonstrates a significant disparity as one progresses from rural to urban areas. According to the KPHC 2009, 83 % of the households living in rural areas of the county have iron sheets as their roofing material which may be considered decent roofing in conventional standards. However, a significant proportion of 12 per cent of the rural households live in grass thatched dwellings. Comparing rural households and urban dwellings it is observed that 90 per cent had corrugated iron sheets as their roofing material and on the other hand less than one percent have grass thatched houses. This demonstrates a more improved housing for people in the urban dwellings. However, the rising urban population is exerting pressure on the housing units and the inability to afford decent housing has led to mushrooming of informal settlement.

With regards to the type of wall material for houses, 52 per cent of urban dwellers have stone walled houses compared to 12 per cent of the households in the rural areas. On the other hand, more than half of those households

residing in the rural areas (56 per cent) live in mud walled houses compared to 13 per cent of urban households. In urban areas, 77 per cent of the dwellers live on cemented floors. This contrasts heavily with 75 per cent of the rural households which have earthen floor material. The semi-permanent dwelling premises are a common feature in the rural areas and in slum settlements.



Plate 4.14: Low Quality Houses in Nakuru Rural

SOURCE: *Geomaps /Habitat Planners Field survey 2016*



Plate 4.15: Low Income Settlement in Nakuru town

SOURCE: *Geomaps /Habitat Planners Field survey 2016*

This shortcoming needs to be addressed in order to ensure the provision of affordable modern housing that promotes healthy living. Policies and strategies to ensure decent affordable houses should be embraced. These include, appropriate building technologies, use of locally available building materials, slum upgrading and affordable credits. The county government should enhance serviced land for housing development in markets and urban centres

(h) Inadequate Infrastructure and Social Amenities

The road infrastructure can be described as 20% good, 35% fair and 45% poor. This shows the need for robust strategies in improving road network to promote agriculture and improve connectivity between regions. Thirty-four per cent (34%) of households use electricity for lighting. This percentage is expected to rise upon implementation of a major flagship project on geothermal power production at Olkaria, Ol Donyo Eburru and Menengai crater.



Plate 4.16: Poor Condition Roads in Nakuru Rural

SOURCE: *Geomaps /Habitat Planners Field survey 2016*

A large proportion of the population (66.3%), travel for more than five kilometres to access the nearest health facility while 35.5% take between 1-4 minutes to fetch drinking water.

Urban centres in the county lack adequate infrastructure and social amenities such as quality roads, water supply, electricity, health and education facilities, recreation areas, police stations, public cemeteries, among others. The situation is more pathetic in the smaller urban centres.



Plate 4.17: Poor Infrastructure in Nakuru Town Slums
SOURCE: *Geomaps /Habitat Planners Field survey 2016*

More public investment should be channelled to improvement of infrastructure and social amenities. This should be mainly in the rural areas and low-income urban areas which have been neglected hitherto.

(i) Rapid Urbanization

The county continues to experience high rates of immigration whose effect has been a steady increase in population especially in the urban centres estimated at 3.4% per annum. Urban population account for 38% of the county population. The rapid urban growth has resulted to urban problems such as congestion, environmental degradation, regional imbalances and a burgeoning population of under and unemployed workers and sprawling slums and squatter settlements among others.

The ever rising population growth in urban areas calls for better housing, creation of more economic opportunities, enhanced security, improved urban planning, water and sanitation, social amenities like schools and effective health centres. This will prepare them to absorb more population sustainably.



Plate 4.18: Subukia Urban Centre

SOURCE: *Geomaps /Habitat Planners Field survey 2016*

(j) Unplanned Urban Centres

Most urban and market centres in the county lack physical development plans to guide their growth. Uncontrolled urban growth on the other hand may lead to higher incidences of crime and mushrooming of informal settlements. More important is the urgent need for the physical planners to take decisive actions to safeguard public utilities and other physical amenities in the county and avoid uncoordinated settlement patterns.



Plate 4.19: Urban Sprawl in the Outskirts of Nakuru Town

SOURCE: *Geomaps /Habitat Planners Field survey 2016*

Proper planning of all the towns and market centres and enhanced enforcement of the county by-laws is recommended. This should start with the big towns and cascade down to the smallest market centres.

(k) Urban Sprawl

The urban centres in the county are expanding very fast into the rural lands. The expansion involves subdivision of the rural land adjacent to urban areas into small parcels and conversion into urban land uses. The sprawl is low density urban development. The conversion of rural agricultural land to urban land use is compromising food security and increases cost of infrastructure and service provision as the urban area expands.



Plate 4.20: Linear Urban Development along the Roads

SOURCE: *Geomaps /Habitat Planners Field survey 2016*

Urban boundaries of all towns and markets should be demarcated and urban development contained within them. Densification of development can control the need for urban sprawl.

(1) Linear Urban Development

Linear urban development occurs along the main road arteries. This phenomenon was observed along the major roads such as the Northern corridor, Nakuru-Mogotio Road, Nakuru- Nyahururu road and other roads. The resulting linear towns are often difficult to service efficiently. Often, the first problems noticed by residents is traffic congestion as people compete to move along the narrow urban corridor while ever more people join the ribbon further along the corridor

Urban consolidation is often a solution to encourage growth towards a more compact urban form. This can be attained through planning and strict development control.

(m) Growth of Urban and Market Centres at the Road Junctions

Road junctions are very favourable nodes for urban development. This is because they are the interchange of travel routes. Many centres have grown at the road junctions and include Elgeyo Marakwet junction, Maili Kumi, Sobe, Kivunja and total among other road junctions. Planning interventions are required at the junction points to guide and control spatial development.

(n) Development of Settlements on Road Reserves.

Many businesses and residential premises are locating on road reserves. This was observed in areas such as Elgeyo Marakwet junction and Rongai town. This will result to transport-settlements land use conflicts and will create squatting on the road reserves.



Plate 4.21: Eldama Ravine Road Junction
SOURCE: *Geomaps /Habitat Planners Field survey*



Plate 4.22: Settlements on Road Reserves
SOURCE: *Geomaps /Habitat Planners Field survey 2016*

The agencies responsible for the roads together with the county government should work collaboratively to discourage and remove settlements on the road's reserves.

(o) Traffic Congestion in Major Towns

Town authorities should provide adequate parking spaces and bus parks for internal and transit motorists. All towns should designate lorry parking spaces. The authorities should discourage use of private cars in favour of public mass transport, cycling and walking. Strict traffic management strategies should be employed.



Plate 4.23: Traffic Congestion in Urban Centres in Nakuru County
SOURCE: *Geomaps /Habitat Planners Field survey 2016*

(p) Informal businesses on road reserves and open areas

Many informal small-scale business activities are being carried out on road reserves and undesignated open areas. This is a common feature of almost all urban and market centres in the county.

Many informal small-scale business activities are being carried out on the road reserves and undesignated open areas. This is a common feature of almost all urban and market centres in the county.



Plate 4.24: Small Scale Businesses by the Road Side at Total Trading Centre
SOURCE: *Geomaps /Habitat Planners Field survey 2016*



Plate 4.25: Road Side Market at Maili Kumi Market Centre
SOURCE: *Geomaps /Habitat Planners Field survey 2016*

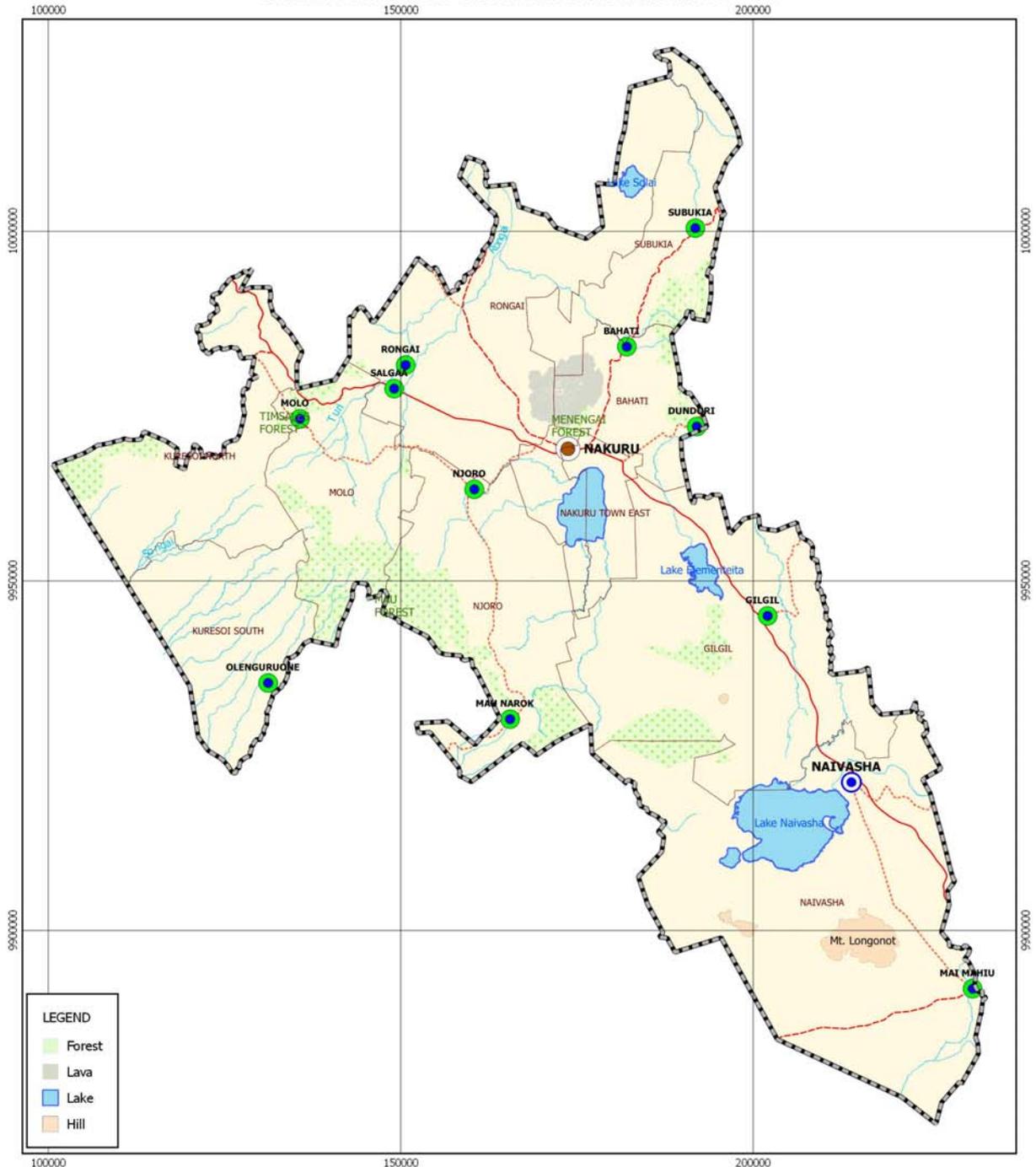
Interventions to create trading and production areas for this category of economic activities will be required in planning those urban centres.

(q) Urban Primacy

Urban Primacy indicates the extent to which urbanization and the resultant urban benefits (population, economic activities, services, etc.) are concentrated in the largest town. The 2 and 4 city index for Nakuru County are 1.8 and 1.3 respectively. This shows a tendency of urban concentration in Nakuru town and the largest 4 towns. This has resulted to unbalanced urban growth.

Regional planning in the county should strive to reduce strong urban primacy by stimulating growth of secondary towns and promote a hierarchical urban pattern with regional distribution of towns across the county. More infrastructure, social services and economic opportunities should be provided in secondary towns to stimulate their growth.

CLASSIFICATION OF URBAN CENTRES-NAKURU COUNTY



LEGEND

- Forest
- Lava
- Lake
- Hill

 Ministry of Land, Housing and Physical Planning	PROJECT DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN PLAN (2015-2025)	LEGEND <ul style="list-style-type: none"> Major Town Municipality Other Town Major Road Minor Road Road Class C Railwayline Main River 	 Scale 1:750,000	LOCATION MAP  Date: October 2019	 Geoinformation Services INTERNATIONAL GEOMATICS CONSULTANCY Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com. <i>This map is not an authority on boundaries</i>
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Map 4.27: Classification of Urban Centres
 SOURCE: Geomaps /Habitat Planners Field survey 2016

(r) Scattered Rural Settlements

Settlement patterns are influenced by availability of natural resources, soil fertility, rainfall, pasture, infrastructure, economic opportunities, proximity to urban set-ups and security among other factors. Although a large population is in the rural areas, urban centres have the highest population densities due to rural-urban migration as a result of well-developed infrastructure, employment opportunities and security. Scattered human settlements are very expensive to provide with infrastructure and social amenities compared to compact high-density settlements such as urban centres.



Plate 4.26: Dispersed Rural Settlements
SOURCE: *Geomaps /Habitat Planners Field survey 2016*

Future county spatial planning should encourage settlements in compact well planned serviced towns and market centres. This will free rural land for agricultural purposes.

(s) Poor Urban-Rural Linkages

The condition of roads linking urban centres to the surrounding rural areas is poor in the region. This has led to high transportation costs between

the two continuums. A symbiotic urban-rural linkage can be achieved by improving conditions of roads linking urban areas to the rural areas.

(t) Low Economic Activities in Some Market/Trading Centres

Many urban centres have low economic activities, as manifested by the closure of many business premises. The centres also lack business diversification as they offer similar goods and services.



Plate 4.27: Closed Shops in Old Mau summit Trading Centre
SOURCE: *Geomaps /Habitat Planners Field survey 2016*

To stimulate economic activities in the “dead market centres” public investment in infrastructure, social amenities and security should be prioritized, while economic diversification potentials should be explored. Roads connecting the “dead market centres” to their hinterlands and neighbouring centres should also be improved to stimulate growth in the market centres.

(u) Increasing Human Settlements around Ecologically Sensitive Areas

There is increased development of urban centres and residential settlements surrounding ecologically sensitive areas such as lakes. This if not

properly managed will compromise the health of these areas through pollution discharge.

This can be managed by spatial planning of the area around ecologically sensitive areas with strong considerations to sustaining the lake. Zoning of the lake riparian for lake compatible activities such as tourism and conservation can enhance lake conservation.

Summary of emerging issues

- Fast population growth
- Uneven distribution of settlements and population
- Subdivision of land into small uneconomical parcels
- Lack of title deeds for some land parcels
- Incidences of landlessness
- High levels of poverty
- Poor quality of housing
- Inadequate infrastructure and social amenities
- Rapid urbanization
- Unplanned urban centres
- Urban sprawl
- Linear urban development
- Growth of urban and market centres at the road junctions
- Development of settlements on road reserves.
- Traffic jams in growing towns
- Informal businesses on road reserves and open areas
- Urban primacy
- Scattered rural settlements
- Poor urban-rural linkages

- Low economic activities in some market/trading centres
- Increasing human settlements around L. Naivasha

8.16 SWOT Analysis

A summary of the strengths, weaknesses, opportunities and threats of the human settlements sector has been tabulated.

Table 4.10: SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Fertile land. • Favourable climate. • Good inter towns' road connectivity. • Many towns. • Low levels of poverty • Cosmopolitan county • Strong economic diversification. • Distribution of towns 	<ul style="list-style-type: none"> • Uneven settlements and Population distribution. • Lack of title deed for some land parcels. Incidences of landlessness. • Poor quality of housing. • Inadequate infrastructure and Social amenities. • Growth of towns without planning • Growth of urban and market centres at the road junctions. • Development of settlements on road reserves. • Informal businesses on the road reserves and open areas. • Strong urban primacy. • Scattered Rural Settlements. • Poor Urban-Rural Linkages. • Low economic activities in some market/trading centres.
Opportunities	Threats
<ul style="list-style-type: none"> • High agricultural potential • High tourism potential • Ecological and topographical diversity • Good climate for human settlements • Locally available building materials • Northern corridor traverses the county • Developed inter and intra road network • Reasonable level of social amenities (education, health, etc) • Many urban centres • Highly literate manpower • Rain harvesting from roof catchment. 	<ul style="list-style-type: none"> • Fast population growth. • High population densities in urban areas • Subdivision of land into small parcels. • High Levels of Poverty. • Rapid Urbanization. • Traffic congestion in growing towns. • Increasing human settlements around ecological fragile areas. • Environmental degradation (forest encroachment, overstocking, poor farming methods such as farming on steep hills and mono-cropping • Tribal tensions and animosities.

SOURCE: Stakeholder and Consultant's Compilation 2016

Chapter Nine : Economics

The successful implementation of the CSP necessitates effective financial planning to determine the current sources of revenues, current expenditures, and potential sources of funds to finance the proposed projects. This is consistent with ensuring that the strategies proposed can be effectively implemented. This section seeks to assess the current state of the economy to propose areas of future development for continuous growth. As such, it seeks to assess the current state of the local economy in Nakuru County to determine the main economic drivers. This section primarily dwells on how the county's collection of revenues and its expenditure capacity with the aim of outlining how different economic sectors can be improved to enhance their economic outlook. The constraint encountered in this sector is also assessed before the opportunities and potentials for economic growth can be proposed.

9.1 Economic Trends

9.1.1 National Scene

At the national level, the blue-print for economic development is the *Kenya Vision 2030*. The national *Ministry of Devolution and Planning* has already issued the first progress report called the *Implementation of the Second Medium-Term Plan 2013 – 2017* (Republic of Kenya: 2015). The overall goal of the *Vision* is to have the economy of Kenya transformed into newly industrialized, middle-income country, providing high-quality life to all its citizens who will be living within the 47 counties of the Republic of Kenya. The current thrust of this blue print is to put the economy on the high path of economic growth. It aims at facilitating the achievement of double-digit growth rate by the year 2017 and beyond. As a result, the assessment of national economic trends has been done within this report with this strict benchmark concept in mind.

Nationally, the GDP growth has been observed to grow between 6.7% and 7.2% per annum during the period 2013 – 2014. This is, however, below the projected target of 12 %. A slight increase in the GDP has been reported during the period covered by the medium term, which a positive growth trend of the nation. Accordingly, the economic development-planning and implementation is targeted on infrastructural development (roads, rail network, seaports, airports, oil pipeline, energy, and ICT connectivity). There is also a huge input into the land reform, public sector reform, and on the strengthening of national values and ethics. This latter goal affects Nakuru County directly; and has to

do with the elimination of negative ethnicity through the development of social harmony and conflict resolution mechanisms. All the other sectors of the economy like the agriculture-livestock development sector, tourism sector, wholesale-and-retail sector, manufacturing, financial services, oil-and-mineral resources have been given some priority within the county. Conflict resolution among communities of the County is the delicate balance that needs to be maintained.

9.1.2 Local Economy

According to the World Bank, Nakuru is the fourth richest county in Kenya based on GDP per capita. In this respect, the GDP per capita of the county as of 2015 was \$1,413 (approx. Ksh. 141,300) given an approximated population of 1,603,325. The only counties that are richer than in terms of GDP per capita are Kiambu (\$1,785), Nyeri (\$1,503), and Kajiado (\$1,466) (David, 2015). Nakuru's high ranking is largely attributed to its rich endowments in natural resources, tourist attraction sites, and booming agriculture. The county is recognized as among the counties in Kenya with the highest potential for growth. In particular, the county enjoys a favourable weather that supports both crop farming and domestic animal rearing. In fact, most of the residents within the county rely on agriculture or agricultural-related activities for their economic upkeep.

Nakuru County is suitably positioned to attract tourists and foreign investments than most counties in the country. In fact, the natural resources found in the county have been a major factor contributing the economic growth of Kenya as a whole. Among the major tourist attraction sites in Nakuru County that distinguishes it from other counties in the country include Lake Nakuru National Park, Menengai Crater, Hells Gate, Hyrax prehistoric hill, and Mt. Longonot. Besides, the country produces green energy through geothermal power generation in Olkaria area. More geothermal energy is expected to be produced from the Menengai Crater, which is endowed with geothermal fossils. All these factors make Nakuru County one of the most economically developed counties in Kenya. Its ability to harness these resources will determine its ability to advance its development path.

The local economy of Nakuru County is supported by several sectors that collectively play a key role in enhancing each other in the development of the county. The county has numerous sectors that are well developed, and which play a critical role to its economic prosperity. Some of these economic sectors have been discussed in this section.

9.2 Status of Nakuru Economy

9.2.1 Agriculture, Livestock and Fisheries

Crop Farming

Agriculture is the main source of employment in Nakuru County. This economic activity forms an important source of income both at the household level and at the government level. The main food crops produced in the county include maize, beans, Irish potatoes and wheat. A wide variety of fruits and vegetables also do well in the county. Most of these are grown in Bahati, Njoro, Molo, Rongai, Olenguruoni, Nakuru Town, Gilgil and Mbogo-ini Divisions. Cash crops grown in Nakuru County include flowers, pyrethrum, barley, wheat, and tea. Barley is mostly grown in Molo and Mau Narok while tea is largely grown in Olenguruoni, Kabazi, Keringet, and Bahati divisions. One of the fastest growing and most economically viable activity is horticulture, especially flower farming. Major flower farms include the Home Grown and Oserian flower farms in Naivasha and Subati flower farm in Subukia.

Most of the farmers (47.6%) practice subsistence farm, 8.9% practice commercial farming while 25.9% practice a mixture of both. There is low adoption of unconventional farming in Nakuru County. Based on the socioeconomic survey, 91.7% of farmers practice conventional farming and only farm traditional crops. The remaining 8.3% of the respondents practice organic farming, evergreen horticulture, greenhouse farming, apiculture, and sunflower farming.

There are certain factories and processing plants in the county that support value addition of the crops farmed for commercial purposes. Kokoto and Njoro Cannery are the two main canning factories involved in the canning of tomatoes and beans, among other processing (Kabazi cannery in Subukia sub-county is no longer in operation). Tea production is carried out in Olenguruoni, Keringet, Kabazi and Bahati Divisions. Barley is processed in Molo Town, where Kenya Malting Ltd has a factory and depots.

Livestock Farming

Livestock production is one of the major economic and social activities undertaken by communities living within Nakuru County. 49.2% of the respondents in the socioeconomic study reported that they kept livestock in their farms. The main livestock reared, in order of economic significance, include: Dairy cattle, poultry, sheep, goats, beekeeping and rabbits. Among them, dairy production is a major livestock income earner. Others include the

emerging livestock species such as Quails, Pigeon and Ostrich. The county residents have invested in good breeds of livestock, which points to a high potential of increased livestock productivity. Although conventional livestock is the most common in Nakuru County, 6.8% of the respondents reported they keep unconventional livestock/new animals in their farms. These include bees (79.7%), ornamental animals (7.5%), Guinea fowl (5.3%), and chameleon (0.8%) others (6.9%).

Fishing Activities

Fisheries' activities in Nakuru county ranges from fishing in lakes; Lake Naivasha, with the main target species of economic value; Common carp, Tilapia and Black bass and in both private and community owned dams. Fishing in Lake Naivasha is one of the main economic activities for the community living around supporting 50 fishing boats each with 10 fishing gears as the current sustainable fishing effort. Fish rearing and farming is also highly practiced in fish ponds and water reservoirs owned by individuals and registered groups with the support of the state department and linkages from other stakeholders. The fish value chain has been able to form a county common interest-group to tap the business potentials available in the fisheries sub sector. Many of the fish ponds were introduced through Economic Stimulus Programme (ESP) by the Government of Kenya in 2009 against a backdrop of the global economic and financial crisis in 2008. It is estimated that there are approximately 1500 operational fish ponds across the County. The main types of fish reared are tilapia, cat fish and tout (though at low level).

There are three landing sites on Lake Naivasha, Kamere, Central landing and Tarambeta each with fish market centres/bandas. Also is one landing site on every dam that is being exploited. There has been a notable increase in fish production both from the capture fisheries and culture in ponds which has greatly increased the consumption of fish within the county.

Revenues Collection from Agriculture, Livestock, and Fisheries

Agriculture is recognized as a major source of revenue for the Nakuru County Government, given its large contribution to the budget. In the 2015/2016 financial year, cess for agricultural produce and flowers accounted for Sh. 46.2 million of the Sh. 2.30 billion collected from local revenue sources. This was a 9.6% growth from the Sh. 42.20 million collected in the 2014/2015 financial year. Despite this growth, the county is yet to attain the Sh. 49.08 million it had collected in the 2013/2014 financial year. The county sets the cess rate at Sh. 0.2 for every kilogram of exported flowers. Also, the cess

amounts collected in 2014/2015 and 2015/2016 financial years account for less than 50% of the targeted amounts. Nakuru County Government had targeted 112.8 million in 2014/2015 and 125.91 million in the 2015/2016 financial years, both of which were not accomplished. Revenues from livestock-related activities also contribute to the county budget. However, the figure has fluctuated significantly over the last three financial years. The revenues collected from stock/slaughter fees in 2013/2014, 2014/2015, and 2015/2016 were Sh. 3.66 million, Sh. 10.52 million, and Sh. 4.72 million respectively.

9.2.2 Commerce

Business in Nakuru County is thriving. A significant number of people rely on business income to support their livelihoods. Most of the businesses in the county fall under the micro, small, or medium level. The prosperity of businesses in Nakuru County is evident in the revenues collected by county officials with relevance to business units. In fact, the issuance of single business permits contributed the second largest share of revenues among all local revenue sources, coming second only to the “other fees and charges” category. In the financial years 2013/14, 2014/15, and 2015/16, revenues from the issuance of single business permits were Sh. 345.19 million (25%), Sh. 327.14 million (20%), and Sh. 384.96 million (21%), respectively. Market fees are also an important contributor of revenues to the county kitty; as noted in the budget estimates. The county government reported market fees of Sh. 69.38 million, Ksh. 77.76 million, and Sh. 63.61 million in 2013/14, 2014/15, and 2015/16 financial years respectively. Liquor licensing contributed lower revenues to the county kitty, although this figure has been fluctuating. In 2013/14, 2014/15, 2015/16 financial years, the revenues attributed to liquor licensing amounted to Sh. 6.63 million, 0.34 million, and 43.33 million. The significant amounts attributed to the issuance of operating licenses in Nakuru County are a clear indication of the significant role played by commerce in economic prosperity. However, the fluctuating amounts of revenues realized by the county point to an unreliable source of revenue for effective economic planning.

9.2.3 Industries

Given the abundance of a wide range of raw materials to support various industrial processes in Nakuru County, the government, local investors, and foreign investors have set up various industries in Nakuru. Most of these industries are agricultural-based, since Nakuru is an agricultural county.

Some of the industries located in the county include milk processing plants, flour milling, and grain ginneries. Manufacturing industries are also a common feature in Nakuru County. Some of the companies and businesses found in the county include textile industries, animal feeds, agricultural implements, printing, dairy products, engineering works & body builders, saw mills, contractors, bitumen products and quarrying, posho mills, canners, edible oils and soap manufacturers and pyrethrum processing plants. These companies are an important source of employment in Nakuru County. Besides, they offer an important market for the farm products, which are used as raw materials.

9.2.4 Tourism

Nakuru County is among the counties with a large inflow of tourists from within and outside Kenya. The county boasts of major tourist attraction sites and wildlife that attract tourists. Besides, the proximity of the county to Nairobi makes it strategically positioned to be visited by people visiting or staying in the capital. Among the major tourist attraction sites include wildlife, sceneries, lakes, crater, anthropological sites, and national parks among others. Besides, the county is recognized as great place to host sporting activities and hang out. Many investors in Nakuru County, especially Nakuru and Naivasha towns have directed their funds at building hotels and lodges to accommodate the many visitors touring the county. This has led to the crop of executive hotels and lodges in recent years. More can still be done to increase the number of visitors touring the county.

Other tourist attraction sites include Subukia Shrines, Lord Egerton Castle, Ol Doinyo Eburru volcano, and Mau Forest among others. In addition to these public tourist attraction sites, there are private wildlife conservancies which include; Marura, Oserian and Kedong in Naivasha Sub-County and Kigio and Soysambu in Gilgil Sub-County.

Table 4.47: Existing Tourism Attraction Areas and Their Locations

Tourist attraction site	Main attraction
Lake Nakuru National Park	Lake Nakuru Flamingos Eastern Black Rhinos Southern White Rhinos Other wildlife
Longonot National Park	Mount Longonot Hiking Camping Safaris

Tourist attraction site	Main attraction
	Wildlife
Hell's Gate National Park	Lake Naivasha Boat Riding Camping Safaris Maasai People Hiking Wildlife Hot Springs Rock Seeing
Lake Elementaita	Flamingos
Menengai Crater	Volcanic caldera Hiking Safaris
Hyrax Hill	Prehistoric remains

Even then, tourism is not a major income-generating income activity. Based on the socioeconomic survey, only 1.9% of the locals derive employment directly from tourism. It is important to note that tourism may be having multiplier effects on other sectors that may not be recognized by the county residents. For instance, the increased inflow of tourists may boost the hotel industry within county. Low awareness of the local tourist sites among locals is the major challenge facing tourism in Nakuru. Despite the numerous and famous tourist attraction sites in Nakuru County, their awareness among locals is only 37%.

9.2.5 Minerals

Mining is an important economic activity in Nakuru County. However, the County Government only realized minimal revenues from this activity prior to the passing of the Nakuru County Finance Act 2013. Prior to this legislation, the county did not have any set rules governing royalties' collection from the mining sector. Consequently, the royalties for the 2013/2014 financial year amounted to 25.64 million only. This figure shot up significantly following the enactment of the Finance Act to Sh. 115.81 million in 2014/15 financial year. In the 2015/16 financial year, royalties were reported at Sh. 163.64 million. There are four main minerals from which royalties are collected by the Nakuru County Government. These include diatomite, lime, kaoline, and brine. These minerals are found in Kariandusi and Soysambu areas. The Finance Act 2013 requires the miners of these minerals to pay a tax 1% of the gross revenues realized from mining activities.

Apart from diatomite, lime, kaoline, and brine, geothermal fossils are also an important mineral in Nakuru County. Although geothermal fossils are not mined, they are an important source of electrical generation. Currently, geothermal power in Nakuru County is produced in Olkaria area. Investors in the energy sector who are involved in exploring geothermal energy are required to pay the levy of 1% on the gross revenues realized from these activities. More royalties can be collected by the County Government if all the geothermal fossil deposits in the county were to be explored. Notably, the geothermal fossil deposits at the Menengai Crater ought to be utilized for power generation. This would increase the revenues collected by the County Government and create employment to the County Residents.

Table 4.48: Location of Mineral Deposits in Nakuru County

Mineral	Location
Diatomite	Soysambu and Kariandusi
Lime	Kariandusi
Kaoline	Kariandusi
Brine	Kariandusi
Geothermal Fossils	Olkaria and Menengai Crater (potential)

9.2.6 Trade

Trade is also a major economic activity in Nakuru County. Trade between the county residents and foreign countries is mainly through agricultural produce. In this respect, CESS payments from agricultural produce and flowers are a clear indication of the high exportation of these products. For instance, CESS payments are charged on the exportation of horticultural products and flowers. In 2013/14, 2014/15, and 2015/16, CESS payments for the two products amounted to Sh. 49.08 million, Sh. 42.20 million, and Sh. 46.26 million, respectively. Also, a donkey abattoir has been opened in Kinamba town. The slaughterhouse focuses on trading in donkey meat, most of which is meant for exportation.

9.2.7 Co-operatives

There are over 1,804 registered cooperative societies in Nakuru County, which include Housing and Farmers Co-operative societies. The membership is over 149,373 with an annual turnover of over Kshs. 513.76 million. A significant number of county residents draw their livelihood either directly or indirectly from cooperative-based enterprises. The cooperatives promote the use of modern technology and contribute to development through production,

procurement, marketing and expansion services, credit services, sale of consumer goods and members' education and loans. The cooperatives have made remarkable progress in agriculture, banking, credit, agro-processing, storage, marketing, dairy, fishing and housing.

9.3 County Revenue and Expenditure

9.3.1 Revenues

Similar to the case in other counties, Nakuru County Government relies on revenues from local sources and exchequer releases. Although the local revenue sources make a major contribution to the revenues collected, they make up a significantly smaller percentage of the budget when compared to the exchequer releases. The "Other Fee and Charges" category is the major source of revenue among the local sources of revenue. Other major local sources of revenue include facility improvement fund, single business permits, parking fees, and land rates among others.

Revenues from exchequer releases are mainly obtained from the equitable share and grants. The two main grants that form major revenue sources are the conditional grant for the Nakuru Level 5 Hospital and grants from donors (DANIDA). Other sources include conditional funds and the Road Maintenance Fuel Levy Fund. In the financial years 2014/15 and 2015/16, revenues from the exchequer were 82.3% and 85.9% of the total

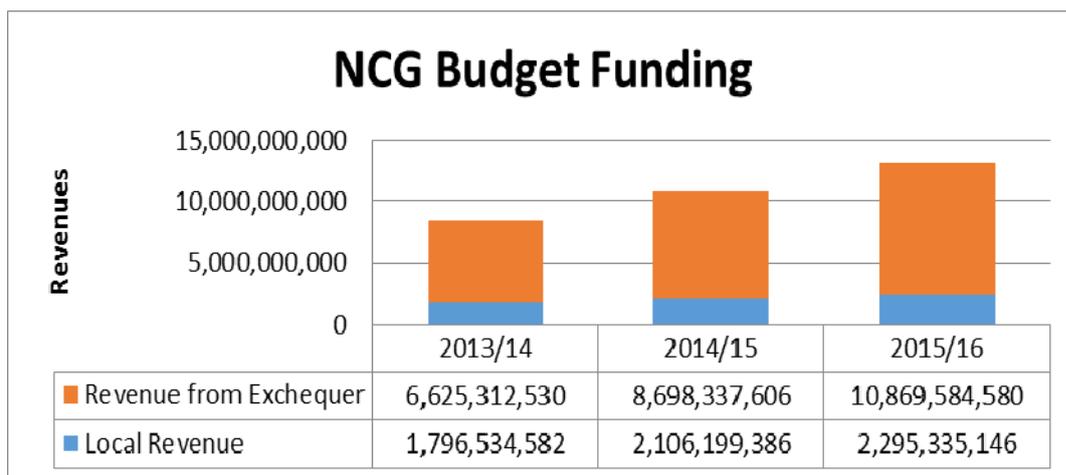


Figure 4.18: NCG Budget Funding
SOURCE: County Budget Review and Outlook Paper (2016)

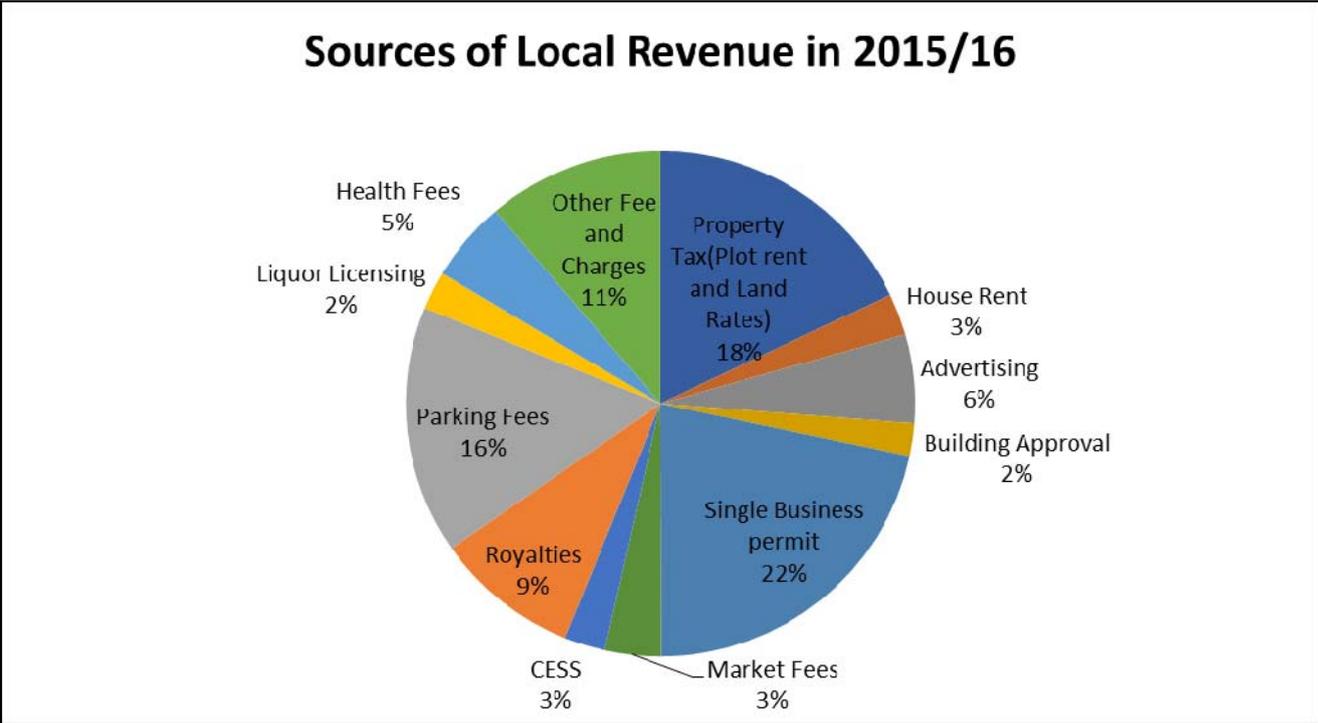


Figure 4.19: Sources of Local Revenue in 2015/2016

SOURCE: *County Budget Review and Outlook Paper (2016)*

Table 4.49: Nakuru County Government Total Revenues.

No	REVENUE SOURCE	2013/2014	2014/2015	2015/2016
1	Property Tax(Plot rent and Land Rates)	230,169,891	324,982,918	319,171,789
2	House Rent	32,136,014	59,373,470	47,475,050
3	Advertising	69,142,288	90,982,257	100,842,351
4	Building Approval	35,258,693	58,127,531	36,928,134
5	Single Business permit	345,189,270	327,139,634	384,962,894
6	Market Fees	69,381,684	77,759,357	63,614,650
7	County Park Fees	-	194,500	58,600
8	CESS	49,077,348	42,196,617	46,262,249
9	Stock/Slaughter Fees	3,660,539	10,518,254	4,716,120
10	Royalties	25,643,131	115,814,409	163,641,687
11	Water and Sewerage	219,280	3,237,055	
12	Parking Fees	233,601,312	271,556,391	282,619,325
13	Liquor Licensing	6,633,000	337,500	43,326,840
14	Health Fees	-	63,634,773	92,098,858
15	Other Fee and Charges	271,937,010	154,565,622	194,936,420
	Sub-Total	1,372,049,460	1,600,420,288	1,780,654,967
16	Facility Improvement Fund (FIF)	424,485,122	505,779,098	514,680,179
	TOTAL LOCAL SOURCES	1,796,534,582	2,106,199,386	2,295,335,146
17	Balance in County Revenue Fund		1,200,000,000	1, 511,280,979
18	Donor Grants (DANIDA)	88,000,000	22,800,000	25,260,000
19	Loans and Grants CRA			
20	Conditional Allocation to compensate Forgone user fees			37,373,449
21	Conditional Fund - Leasing of Medical Equipment			
22	Conditional Fund -Free Maternal Health			184,361,500
23	Road Maintenance Fuel Levy Fund (RMFLF)			103,104,387
24	Conditional Allocation For Level- 5 Hospital	600,436,911	620,000,000	377,193,144
25	C.R.A Equitable Share	5,936,875,619	6,290,337,606	8,116,330,942
	Sub-Total	6,625,312,530	8,698,337,606	10,869,584,580
	Grand Total	8,421,847,112	10,573,928,197	12,650,239,547

SOURCE: County Budget Review and Outlook Paper (2016)

Nakuru East Sub-County is the main source of local revenues by region. Out of the Sh. 1.57 billion and Sh. 1.78 billion collected from local sources in 2014/15 and 2015/16 financial years, Nakuru East sub-county

contributed Sh. 691.23 million and Sh. 723.78 million, respectively. This is equivalent to 43.9% and 40.6% of the total local revenues in the two years. This is followed by Nakuru West, Naivasha, and Bahati sub-counties in that order. This is not surprising given that the leading two sub-counties host Nakuru Town. Naivasha sub-county includes Naivasha town, the second-largest urban centre in Nakuru County. Subukia sub-county records the lowest revenues collected in the county. In the financial years 2014/15 and 2015/16, Subukia sub-county only contributed Sh. 13.42 million (0.8%) and Sh. 19.64 million (1.1%) of the local revenues collected. The breakdown of the revenue collection by sub-county has been presented in Table 9.4.

Table 4.50: Revenue Sources by Sub-County

	SUB COUNTY	BUDGET TARGET 14/15	ACTUAL UP TO JUNE 14/15	% OF COLL. 14/15	BUDGET TARGET 15/16	ACTUAL UPTO JUNE 15/16	%OF COLL. 15/16
1	NAKURU EAST	838,000,000	691,225,871	82%	762,357,409.3	723,780,769	95%
2	RONGAI	52,550,988	36,860,441	70%	78,776,800.5	65,279,006	83%
3	BAHATI	102,532,750	86,440,895	84%	160,718,149.8	117,948,933	73%
4	NAIVASHA	365,539,483	263,703,428	72%	469,714,017.6	337,801,910	72%
5	NAKURU WEST	405,926,241	254,380,373	63%	395,691,024.9	253,488,574	64%
6	KURESOI SOUTH	27,128,295	18,806,208	69%	36,191,392.6	22,960,970	63%
7	GILGIL	86,963,702	73,812,960	85%	147,893,140.4	90,547,789	61%
8	KURESOI NORTH	28,818,341	18,555,506	64%	38,821,805.5	23,708,629	61%
9	NJORO	56,488,788	55,559,507	98%	103,142,017.5	62,199,089	60%
10	MOLO	76,418,624	60,896,695	80%	117,144,590.7	63,427,593	54%
11	SUBUKIA	18,797,137	13,423,872	71%	50,699,340.4	19,639,405	39%
	TOTAL RECEIVED	2,059,164,349	1,573,665,757	76%	2,361,149,689.2	1,780,782,667	75%

Source: County Budget Review and Outlook Paper (2016)

9.3.2 Expenditure

In the financial years 2013/2014, 2014/2015 and 2015/2016, most of the expenditures by the Nakuru County Government have been on recurrent expenditure. The recurrent expenditure as a percentage of total expenditure in these three financial years has been 88.93%, 80.38%, and 72% respectively. Although this is a clear indication of the increasing spending on development, the percentage for recurrent expenditure is very high. The largest part of the expenditure is consumed by the payment of employees. For instance, 45% of the budget was spent in compensating employees in the 2015/2016 financial year. Consumption of goods and services accounted for 27% of the expenditure while development expenditure accounted for the remaining 28%. The expenditure performance by economic classification has been illustrated in Table 9.5. There is need for greater expenditure on development projects.

Even then, there has been underperformance in the utilization of the county budget each year. Most of the county ministries utilize fewer funds than the targeted amount each year. This leads to the excess amount being carried forward to the following financial year. However, some ministries record execution rates that are higher than the targeted expenditure. For instance, the ministry of health had a 103% execution rate in the 2015/2016 financial year. Plans should exist for the virement of unspent funds from low-spending to needy organs of the county government. There is great need for development funds in education, health, and agriculture. Careful allocation mechanisms should be put in place for balancing the budget and expenditure programs.

Percentage of Local Revenues Collected per Sub-County in 2015/16

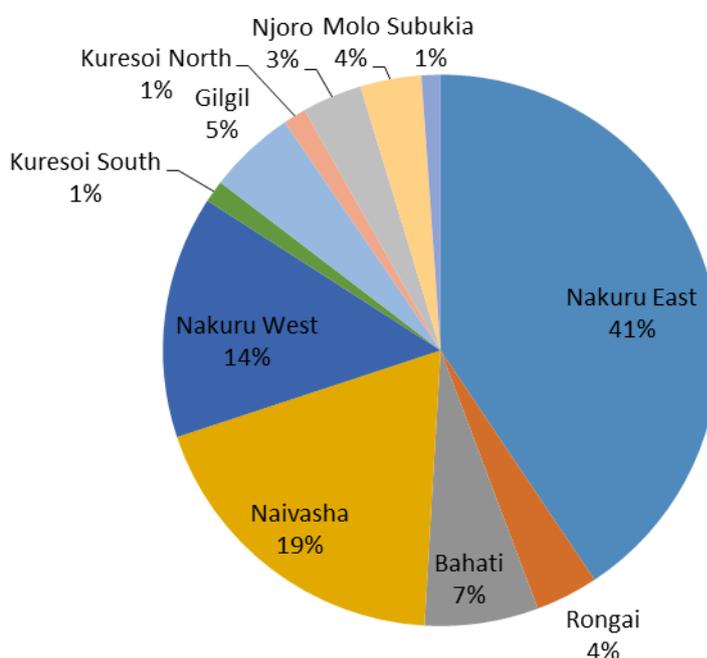


Figure 4.20: Local Revenue Collection at the Sub-County Level in 2015/2016

9.4 Economic Challenges Facing Nakuru County

1. Low seed quality – Based on a socioeconomic study, up to 24% of farmers may be using low quality seeds. These include seeds from previous harvests (23%), borrowing from other farmers (1%), and seeds from well-wishers.

2. High post-harvest costs – The socioeconomic survey revealed that 63.7% of the farmers have crop storage facilities in their homesteads. Those without such facilities incur most of their post-harvest costs in storage and transportation to storage facilities.

Table 4.51: Nakuru County Expenditure Performance by Economic Classification

	ACTUAL (Baseline) 2014/2015	TARGET 2015/2016	ACTUAL 2015/2016	VARIANCE	% GROWTH	BUDGET EXECUTION RATE	PERCENT OF TOTAL BUDGET
Current Expenditure							
Compensation of employees	4,429,938,345	4,919,199,048	4,917,531,516	(1,667,532)		100%	45%
Use of Goods and Services	2,389,518,083	3,382,442,185	2,966,179,329	(416,262,856)		88%	27%
Transfers to other Government entities							
Other Grants and transfers							
Sub Total		8,301,641,233	7,883,710,845	(417,930,388)		95%	72%
Capital Expenditure							
Acquisition of Non-Financial Assets	1,642,008,330	3,581,762,865	3,105,475,236	(476,287,629)		87%	28%
Capital Grants to Governmental Agencies							
Other Development							
Sub Total		3,581,762,865	3,105,475,236	(476,287,629)		87%	28%
Grand Total		11,883,404,098	10,989,186,081	(894,218,017)		92%	

SOURCE: County Budget Review and Outlook Paper (2016)

3. **Low awareness of the local tourist sites among locals** –Despite the numerous and famous tourist attraction sites in Nakuru County, their awareness among locals is only 37%.
4. **There are no current initiatives by the county government to attract investors who wish to establish industries in the county** – Nakuru County Government has not put in place specific infrastructure of policies aimed at attracting investors to establish industries in the County.
5. **The unsustainability of some trading activities** – Some of the trading activities in the county are highly unsustainable. Such activities include the slaughter of donkeys, as well as activities interfering with natural resources such as forests.
6. **Political interference in revenue collection** – Some politicians have been inciting the public not to pay taxes, especially property tax and house rent. This has led to high default rates, especially in Nakuru East sub-county.
7. **Hostilities from the locals** – Council officials often face hostile individuals when collecting different fees and taxes. For instance,

there has been an incidence where an official county vehicle was burnt down by locals.

8. Lack of necessary regulation to govern the collection of revenues in some areas – Currently, only level 4 and level 5 hospitals collect revenue. The collection of the cost sharing fund from other health facilities is hampered by the lack of necessary regulation to govern it.

9. Fluctuations in local revenue collection – The revenue collected from some local revenue sources fluctuate significantly from their previous amounts and the projected values. For instance, the revenues collected from county park fees declined by 69.9% (194,500 to 58,600) between 2014/2015 and 2015/2016. This was against a projected figure of Sh. 5 million. This makes planning for such revenues difficult as reliable information to forecast is missing. It may also be an indication of poor enforcement of revenue collection. This has been illustrated in Figure 9.4.

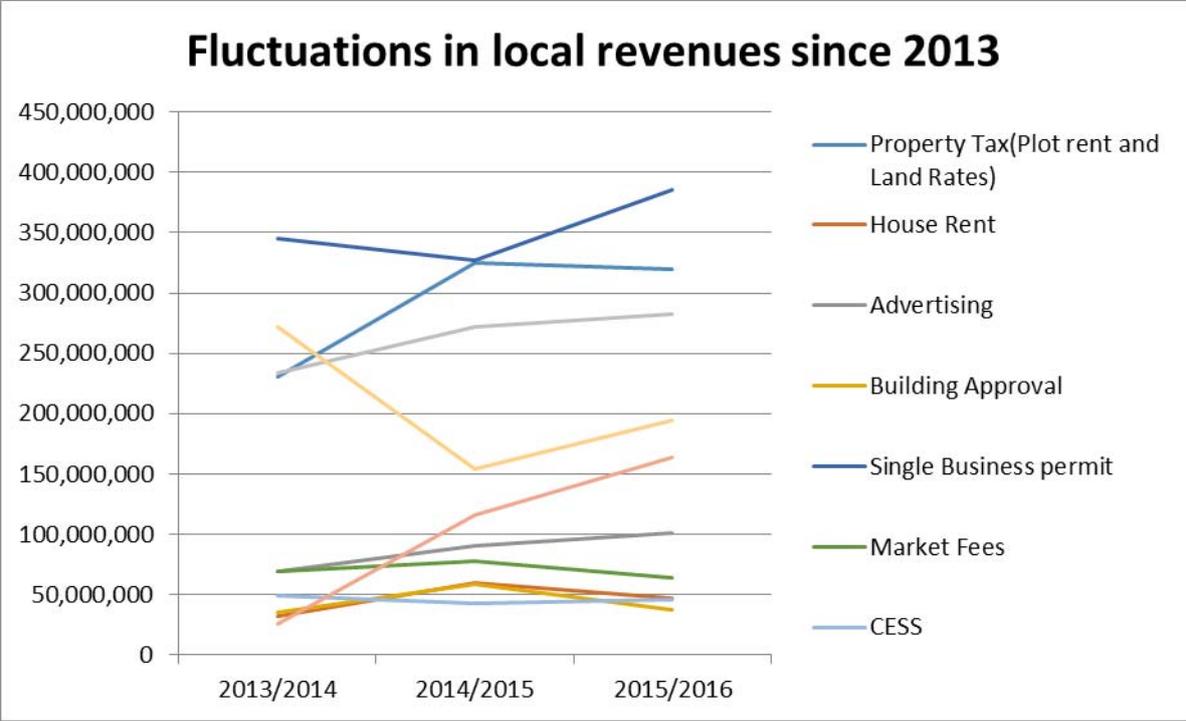


Figure 4.21: Fluctuations in Local Revenues Since 2013

10. High Recurrent Expenditures – Although the percentage of the revenues spent on development has been on the increase over the last three financial years, it is still small. This implies that most of the expenditures in Nakuru County finance non-income-generating activities. Therefore, such expenditures are less likely to advance the economic prosperity of the county.

11. Lengthy Procurement Processes – Lengthy procurement processes was one of the main reasons attributed to the large deviation of the actual development expenditure from the set targets. This delays the commencement of these projects, leading to partial implementation during the financial year.

12. Inadequate Capacity to Execute Projects – All county departments have inadequate capacity to execute the projects that they have budgeted for. This can largely be attributed to the underperformance in utilizing the funds set for each financial year. The inadequate capacity limits the benefits realized by citizens.

13. Cash Flow Constraints as a Result of Delayed Disbursements – The national government is often late at disbursing funds to the county coffers. When this happens, cash-flow constraints are experienced. This inhibits the execution of projects, leading to delays. In some cases, the national government disburses money after a financial year has already ended. This necessitates the huge rollover of projects to the following financial year.

9.5 Ongoing Initiatives/Programs by the NCG to Boost Economic Development

1. Nakuru County Government has come up with a program to support producer business groups by training them and linking them to markets. The program involves crop and livestock farmers.
2. The weights and measures' sector is responsible for ensuring that the weighing equipment used by traders are accurate; to protect producers from faulty equipment that record lower weights than the actual.
3. The County Government has set aside over Sh. 700 million towards the promotion of sustainable fishing activities at Lake Naivasha. This will ensure the long-term viability of the lake as a source of fish and livelihood in the county.
4. The Joint Loans Board issues existing businesses with small loans of between 20,000 and 300,000, charging an interest rate of 8% on a reducing balance.
5. Facilitating producer business groups through advice, training, and marketing.
6. Minimum licensure requirements – Small and micro enterprises are only required to obtain one-year single business permits and monthly receipts for them to operate in the county. Large businesses are required to obtain a single business permit and business registration forms.

7. Decentralization of services to the sub-county level to reduce the costs incurred by traders accessing them and increase the convenience of obtaining them.
8. Business counselling and advisory services for both existing and upcoming businesses.
9. Inspection of weighing equipment to protect business people from faulty equipment that record less weight than the actual.
10. Business training for small traders.
11. The ZIZI system – This is a system that is used to monitor the performance of revenue officers tasked with collecting parking fees. Using the system, the cashiers produce Y reports of the revenues collected while their supervisors produce Z reports. The two reports are then compared for consistency. Clerks are also required to produce bank slips of the same transactions. Using this system ensures high accountability by providing an avenue for monitoring revenue collection and reporting by cashiers. Besides, it offers an avenue for rating the performance of cashiers in their workplace.
12. Monitoring and evaluation – Nakuru County Government conducts periodic monitoring of revenue collection to assess the realization of the set targets for any financial year. Where necessary, steps to improve revenue collection are taken.

9.6 SWOT Analysis

For effective economic planning, there is the need to assess the internal and external situation of the economic sector in the county. This entails identifying the strengths, weaknesses, opportunities and threats of the economic sector in its current state. This is aimed at harnessing the existing strengths while coming up with strategies to address the existing weaknesses in the county. Table 9.6 contains the SWOT analysis of Nakuru's economic sector.

Table 4.52: SWOT Analysis

Strengths	Opportunities
<ul style="list-style-type: none"> • Good transportation/connectivity (Railway and road) to other counties • High GDP per capita • A booming tourism sector • Good climate • Rich in Natural Resources • County government involvement in supporting different economic sectors with regard to funding, 	<ul style="list-style-type: none"> • Potential for geothermal energy in unexplored sites such as the Menengai Crater • Enhancing tourism as an economic sector • Harnessing technology to enhance efficiency • The opportunity of growing the tourism sector

<p>training, counselling and advisory services, and marketing facilitation</p> <ul style="list-style-type: none"> • Near self-sustenance – Agricultural produce in the County has a ready market in industries around the County 	<ul style="list-style-type: none"> • Developing a dry port and industrial park in Naivasha
Weaknesses	Threats
<ul style="list-style-type: none"> • Fluctuations in revenue collection • Poor regulations governing the collection of revenues • High recurrent expenditures • Overreliance on revenue sources from the national coffers and donors. 	<ul style="list-style-type: none"> • Water pollution that threatens economic activities, especially fishing activities. • Poor governance • Climate change • Unstable political climate • Natural disasters

Chapter Ten : Land Use and Planning

10.1 Overview

The physical planning component of the Nakuru County Spatial Plan establishes the framework for future development of land uses to accommodate projected growth and will inform and guide decisions about development. It will be prepared by taking into account the known resources and constraints of the planning area while recognizing the significant role of the key urban centres in Nakuru County as service centres for a vast region. The physical plan has a land use structure that identifies the distribution of land uses to accommodate future growth. The associated objectives and concepts provide further details to guide future development. The structure for future land use is based on optimistic prospects for growth recognizing the benefits of a planned response to such growth. The preparation of detailed concepts and area plans for future development of specific localities will be subject to further investigations and community consultation.

The physical plan has been prepared to establish a strategic framework for future development of the land uses in the county. The aim of the plan is to position the County to respond to opportunities for growth while improving well-being and protecting valued environmental and productive assets in the locality. The strategic location of the County, on a major transport route linking the Nakuru County to the rest of Kenya, strengthens the role of the County as a hub for a wider region. The plan recognizes the increasing importance of the role of Nakuru County as a significant area due to its rich endowment with natural resources.

The plan brings together views of residents and stakeholders following consultations in July and November 2015 and filed survey in October 2016.

10.2 Nakuru County Planning Area

Nakuru town lies 160 Km West of Nairobi along the A104 Nairobi-Eldoret highway. The county has an estimated population of about 2,046,395 inhabitants (CIDP, 2013). The main activities in the key towns include retail business, entertainment, trade in agricultural produce and livestock trading. Nakuru town as the primary centre of the County plays an important role as an administrative centre in the Rift Valley region of Kenya. The planning comprises the entire county covering the sub-counties of; Naivasha, Gilgil, Nakuru Town East, Nakuru Town West, Rongai, Bahati, Subukia, Njoro, Molo, Kuresoi North and Kuresoi South. This is an approximate area of 7,495.1 KM².

The towns and service centres from these sub-counties are key focal points serving the expansive rural areas where they fall. The urban centres within the sub-counties have the potential to evolve into a full commercial centre incorporating a mix of shops, offices and light industrial uses, cultural and recreational services, government and civic institutions, entertainment, restaurants and tourist accommodation, light industrial and a full range of residential housing types. This is because as devolved units, they should be in a position to provide a broad range of services thus reducing the need to commute to the regional centre for services.

The predominantly rural setting has abundant non-built up land that is used for agricultural purposes noting that this sector is the heartbeat of the county. It is therefore important to have a comprehensive plan to guard against sprawled development. The towns will remain focal points for commercial and retail activities in Nakuru County.

10.3 Land Holding

Land is the main source of livelihood for many people in Nakuru County. All socio-economic activities depend largely on land. Thus, rights of land ownership and land use are critical in influencing growth in all sectors.

Mean Holding Size: Nakuru County has few large-scale land owners holding approximately 263 Hectares (Ha) of land on average. On the other hand, the county is dotted with many small-scale land owners with mean landholding size of 0.77 Ha. The bulk of the land holdings in the county are small-scale and are found mainly in the high potential agricultural areas. The medium and large-scale farms account for a small per cent of the holdings, but cover the largest area under farming.

On the other hand, the mean holding size for land ownership in urban areas is 0.05 ha on average. This being the case though, some larger parcel of land adjacent to major towns like Nakuru and Naivasha remains undivided therefore reducing growth of these urban areas.

Percentage of Land with Title Deeds: About 72.5 per cent of lands in the county have title deeds. However, for the parcels of land that not have title deeds, the owners are at different stages in the process of acquiring title deeds. Title deeds are important documents in enabling land transactions and in promoting investment(s).

Incidence of Landlessness: Slightly less than 20 per cent of the households in the county are considered to be landless. Some of these landless persons are Post Election Victims (PEV) settled in camps for Internally Displaced Persons (IDPs), while others are slums dwellers and

immigrants either on employment or engaged in business. There are also incidences of landlessness affecting those who were evicted from the Mau Forest.

Land Issues from Socio-Economic survey

Fifty seven percent of the respondents reported that they own some parcel of land within Nakuru County. The average acre range is 4.67 acres with least holding 100x80 feet while the largest parcel of land was approximately 1000 acres.

For the 958 respondents who own parcels of land, the type of ownership includes freehold (85.4%), lease hold (4.3%) while others accounted for 4.1%. Most of the land is utilized for agricultural purposes. There was significant number of respondents who owned plots measuring approximate 100x80 feet mostly from Gilgil, Nakuru East and Nakuru West sub-counties.

10.4 Structure of Land Tenure

There are three types of land tenure in Kenya as defined in the constitution. These are: private, public and communal. The private land is either on freehold or leasehold tenure. This arrangement obtains in the planning area. Public land is predominantly used for public purposes or leased out to individuals for a specified period with certain conditions. Public land is generally diminishing and thus other options like compulsory acquisition are the ones available. However, compensation is a provided for in the current land laws. This becomes the option for the much-needed future development of public utilities and purposes.

About 72.5% of lands in the County have title deeds. Less than 20% of the households in the county are considered to be landless. The acreage under food crops and cash crops in Nakuru County is 243,711.06 (Ha) and 71,416.35 (Ha) respectively. The average farm size for cash crops and food crops per household is 0.77 ha.

Table 10.1: Land Tenure Categories

Category	Sub-category
Public/Government	Forests Parks Lakes Rivers
Private Freehold/leasehold	- Farms- Small holders and Large holders

10.4 Land Use Disposition in the Planning Area

The general land use in the planning area can be broken into the following categories as calculated from the available mapped data:

Table 10.2: Land Use Disposition in the County

Category	Ha	TOTAL KM ²
Built environment- residential, commercial, industrial, institutional	31379.3	313.8
Arable land-		2437.1
• Food Crops	243,711.06 (Ha)	714.1
• Cash crops	71,416.35 (Ha)	
Forests		
Water resources		217.5012879
Park & Reserves	22881.2	228.8
Recreational	405.9	4.1
Conservation	182615.6	1826.2

SOURCE: *Geomaps / Habitat Planners*

10.4.1: Commercial

The commercial land use is manifested in a variety of forms in the planning area but predominantly in the market and service centres spread across the landscape of the area. In the market centres, there are a lot of trading activities such as retail shops, groceries and wholesale traders forming the bulk of business activities contributing significantly to income for many households. A large proportion of the County population is employed in wholesale and retail trade, hotels and restaurants, manufacturing sector and informal sector including the Jua kali sector. Commercial activities are also vibrant along the roads in some of the towns.

During the 2009 Population and Housing Census thirteen (13) towns in Nakuru County were enumerated as Urban Centres. These include Nakuru Town, Naivasha, Mai Mahiu, Molo, Mau Narok, Olenguruoni, Njoro, Rongai, Salgaa, Dundori, Bahati, Subukia, and Gilgil. The total population in these urban areas is 667,252. According to the Urban Areas and Cities Act 2011, town has a “Population of at least ten thousand residents according to the final gazetted results of the latest population census carried” (CIDP, 2013). In this regard the main towns in the county include Molo, Njoro, Gilgil, Mai Mahiu and Naivasha. Under this classification Nakuru town is the

only Municipal town with a population exceeding two hundred fifty thousand.

There are more urban centres below the classification under the Urban and Cities Act 2011 and they too, constitute the urban population in the county. Cumulatively, these centres had a population of (Male 335,712, Female 331,539) and in 2012 the population is projected to reach 777,176 (Male 391,018, female 386,158) by 2017. As per the 2012 projections, the urban population accounts for 38 per cent of the total population in the County. This is a high percentage considering the significant populations of the urban centres mentioned above. This situation is attributable to rural-urban migration associated with availability of relatively better infrastructure and employment opportunities in the urban areas.

The commercial sector in the numerous service centres has acted as the driver for economic development of the respective areas in which they fall. Proper guidance is therefore vital taking into consideration that the high population in the urban areas has increased the demand for various services such as education, water and sanitation, health and housing. Most of the urban centres in the planning area lack proper urban planning and therefore increases congestion and constraint other vital services like sewerage systems.

10.4.2 Residential

Within the towns of the planning area, residential land use is dominant in the built-up area. It is therefore depicting the general growth pattern of the town. The housing typology depicts different types of houses in the physical form of permanent, semi-permanent or temporary. Generally, all types of houses had a big percentage being semi-permanent. The single dwelling houses are scattered and sprawled and generally is largest consumer of the land and services.

The housing structures were permanent, semi-permanent or temporary. From the survey it was established that permanent houses accounted for 51.0%, semi-permanent 29.1%, temporary 19.8% and other types of houses 0.2%.

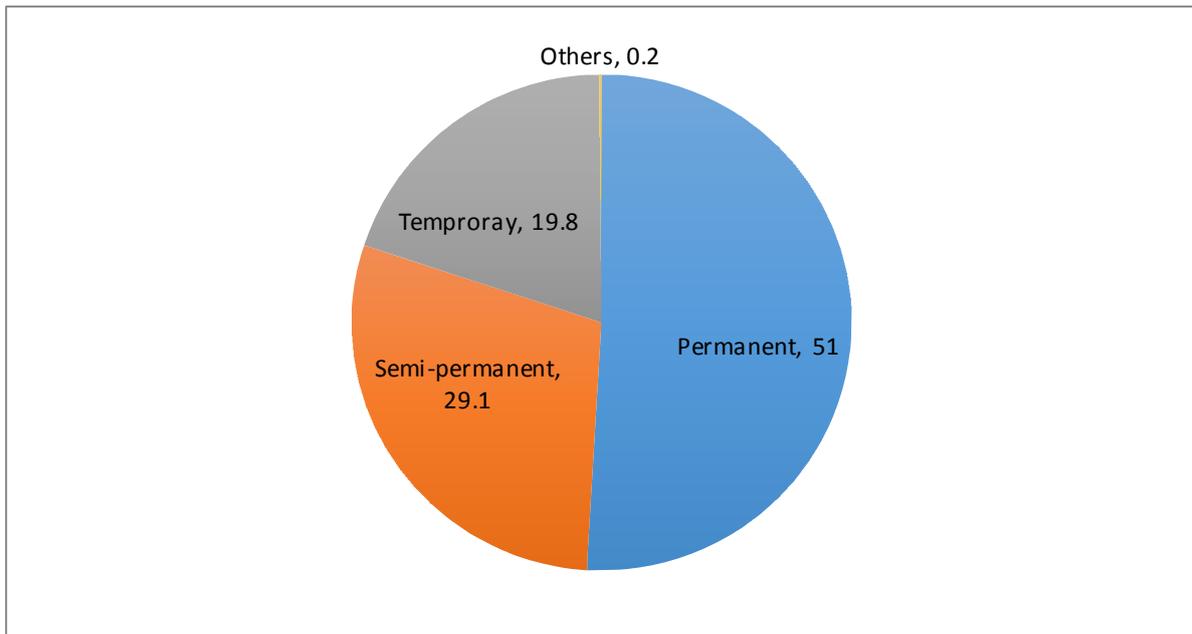


Figure 10.1: Percentage of Housing Categories

SOURCE: Nakuru Household Survey Data 2016

10.4.3 Agriculture

The land area under food crops and cash crops in Nakuru County is 243,711.06 (Ha) and 71,416.35 (Ha) respectively covering approximately 3,151.240 Km² of the total area of the county. A number of factors have contributed to the increase in land under cultivation namely; the rich volcanic soils of Nakuru County that give great potential for crops, reliable rainfall in most parts of the county, readily available labor force and the availability of ready market for crop produce both in the urban centers and the proximity to other major urban centers such as Nairobi, Naivasha, Gilgil and Narok which offers incentives for the sector to flourish. There is however a substantial size of land in the county that is either arid or semi-arid but can be made productive through irrigation.



Plate 10.1: Land under Different Crop Cultivation Regimes

SOURCE: *Geomaps /Habitat Planners Field survey 2016*

10.4.5 Forests

The forests in the county are classified into gazetted, non- gazetted and individual forestlands. There are two gazetted forests namely Mau Forest and Dondori Forests and six non-gazetted forests. The gazetted forests in the county cover 679.643 KM². The individual forest land is estimated to be less than one per cent. There is great need to promote afforestation and reforestation in the Mau Escarpment to improve tree cover and conserve the environment.

10.4.6 Mining

The major on-going mining activity in Nakuru County is that of Diatomite at Kariandusi located along the Nairobi-Nakuru highway about 2Km east of Lake Elementaita. Other activities related to mining include the harvesting of sand for construction, quarrying and the harnessing of underground hot water for geothermal power generation.

10.4.7 Heritage Conservation Areas

There are three national parks within Nakuru County namely, Mt. Longonot National Park, Hells Gate National Park and Lake Nakuru National Park. Other tourist attraction sites include Menengai Crater, Subukia Shrines, Lord Egerton Castle, Lake Naivasha, Lake Elementaita, Hyrax Hill Prehistoric Site, Ol Doinyo Eburru volcano, Mau Forest among others. In addition, there are private wildlife conservancies which include; Marura, Oserian and Kedong in Naivasha Sub-County and Kigio and Soysambu in Gilgil Sub-County.

There is need to conserve these areas as they also happen to be the most iconic features in the county attracting tourists and thus contributing to economic development.

10.4.8 Industry

Some of the industries that are found in the county forming the economic basis include: textile industries, animal feeds, agricultural implements, printing, dairy products, engineering works and body builders, saw mills, contractors, bitumen products and quarrying, posho mills, canners, edible oils and soap manufacturers and pyrethrum processing plants. There are two canning factories; Kokoto and Njoro Canners that are involved in canning of tomatoes beans and water bottling among other processing

A lot of emphasis should be laid on the promotion of medium and Small-Scale businesses (MSEs), the informal sector, Jua-Kali- retail and

wholesale trade and the transport sector. These sectors create a lot of employment to the citizens especially for women and youth.

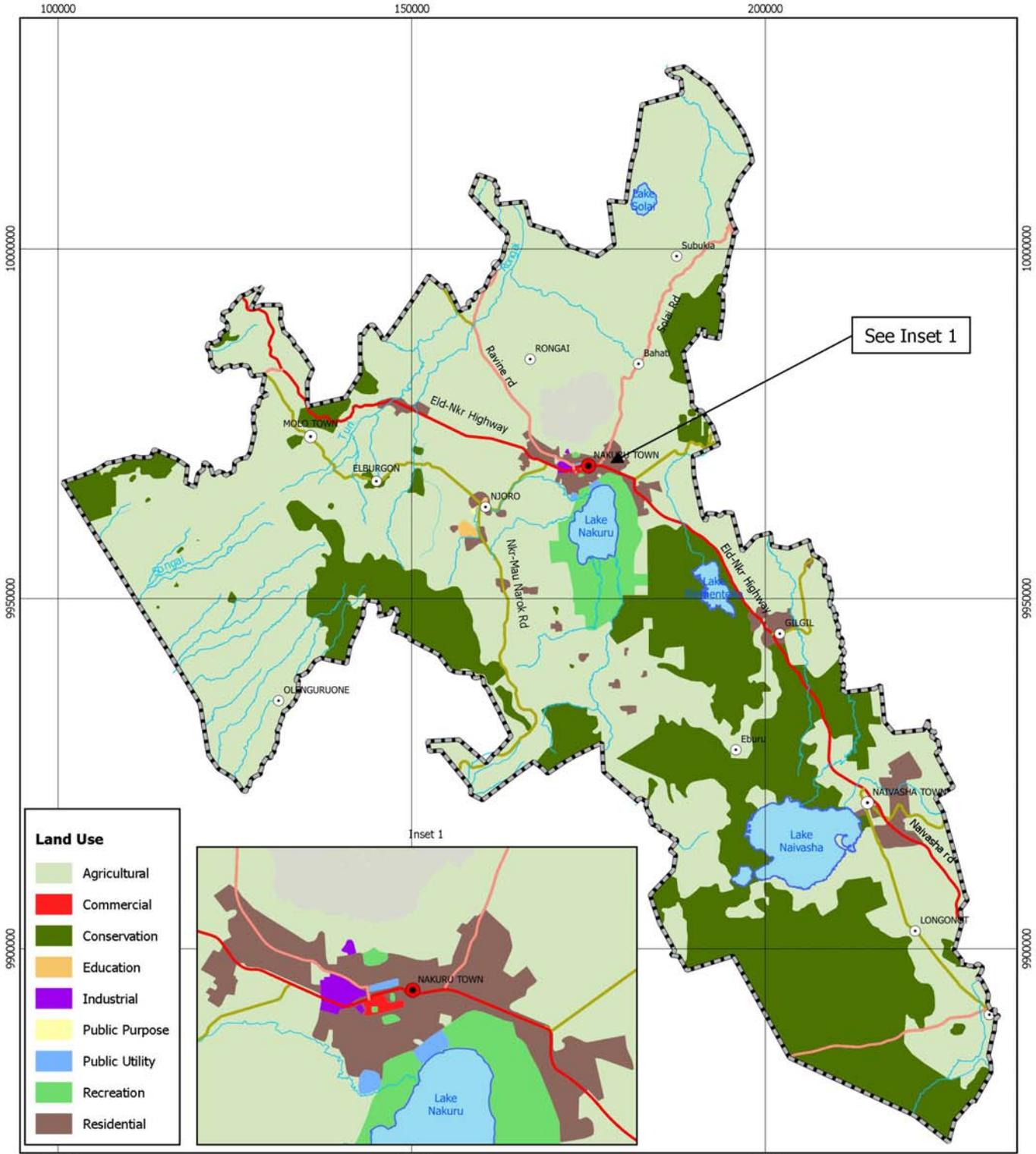
Since under vision 2030 the country is aiming to be industrialised, this sector should be promoted in order to create more jobs.

10.4.9 Water Resources

Nakuru County is endowed with natural water resources including four major lakes, Nakuru, Naivasha, Solai and Elementaita. In addition, there are rivers, shallow wells, springs, dams, pans and boreholes spread all over the county especially in drier parts of Naivasha, Gilgil, Molo, Njoro and Rongai. The boreholes have boosted water supply in the county. Some of the major rivers include, Malewa, Njoro, Molo and Igwamiti. The county is also endowed with springs found in Subukia, Nakuru North, Molo and Kuresoi areas. Rain water is another major source of water in the county with about 80 per cent of households harvesting rain-water.

The land use distribution in the county is as outlined by map 10.1.

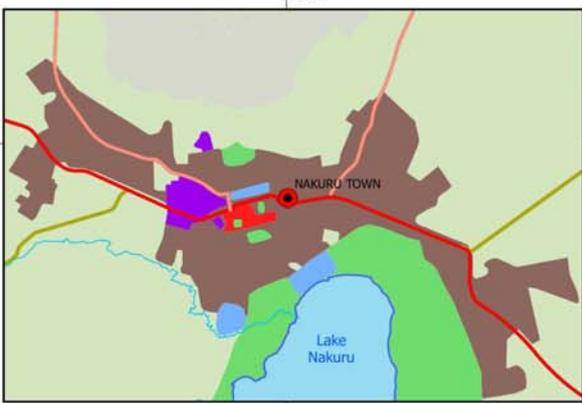
NAKURU COUNTY LAND USE



See Inset 1

Land Use

- Agricultural
- Commercial
- Conservation
- Education
- Industrial
- Public Purpose
- Public Utility
- Recreation
- Residential



 Ministry of Land, Housing and Physical Planning	PROJECT DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)	LEGEND <ul style="list-style-type: none"> County H/Q Major Town Town A B C Lava Lake County 	 Scale 1:750,000	LOCATION MAP  Date: October 2019	 INTERNATIONAL GEOMATICS CONSULTANCY Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com. <i>This map is not an authority on boundaries</i>
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Map 10.1: Existing Land Use
 SOURCE: Geomaps/ Habitat Planners, 2016

10.5 Analysis of Present Land Use

10.5.1 Typology of Developments

The planning area is characterized by predominantly agricultural land interspersed by several urban centres. The urban centres vary in size with some having more functions than others. All the urban centres have the potential to evolve into large commercial enterprises serving multiple functions. The planning area is also endowed with numerous natural features some of which are key tourist attractions. The key features that include Lake Nakuru, Mengengai crater, Lake Elementaita, rivers, the escarpment and a range of other physical features are significant in physical planning as they determine spatial distribution of land uses since they are key structuring elements.

There is a mix of development types that are in the form of informal or semi-permanent in nature made of corrugated iron sheets. Permanent settlements made of stone and corrugated iron sheets dot the core of the town.

The urban footprint is only in a manifested in the urban centres across the county and is relatively small compared to the overall size of the county. Most of the centres have assumed the ribbon pattern and to some extent grid pattern of spatial development. The density of development gets lower towards the fringes of the planning urban centres. The bulk of the outskirts of the urban centres is poorly serviced in terms of roads and transportation. Population and employment opportunities are concentrated in the denser area. The main corridors also happen to be the areas served by public transport.

The nature of dwelling units in terms of roofing, walling material, as well as flooring material as per households in the county, demonstrates a significant disparity as one progress from rural to urban areas. According to the KPHC 2009, 83 % of the households living in rural areas of the county have iron sheets as their roofing material which may be considered decent roofing in conventional standards. However, a significant proportion of 12 per cent of the rural households live in grass thatched dwellings. Comparing rural households and urban dwellings it is observed that 90 per cent had corrugated iron sheet as their roofing material and on the other hand less than one percent have grass thatched houses. This demonstrates a more improved housing for people in the urban dwellings. However, rising urban population is exerting pressure on the growth of housing units and the inability to afford decent housing has led to mushrooming of informal settlement.

With regards to the type of wall material for households, about 52 per cent of the urban dwellers are able to afford stone walled housing compared to only 12 per cent of the household in the rural areas. On the other hand, more than half of those households residing in the rural areas (56 per cent) live in mud walled houses compared to only 13 per cent of the urban households. In urban areas, 77 per cent of the dwellers live on cemented floors. This contrasts heavily with 75 per cent of the rural households which have earthen floor material. The semi-permanent dwelling premises are a common feature in the rural areas and in slums settlement. This shortcoming needs to be addressed in order to ensure the provision of affordable modern housing that promote healthy living.

10.5.2 Typical Pattern of Urban Development in the Towns

The towns basically have a core centre that spreads linearly along the main corridors. Other developments are in the rows behind and are accessible by earth roads. The spatial pattern the takes a grid-lock style with collector roads stemming from the main corridor in the towns. However, the level of infrastructure services in the towns varies with Nakuru town having the highest concentration of services in the County.

10.5.3 Regional Impacts Linkages and Functions

The dominance of Nakuru town within the region in terms of job opportunities and high levels of infrastructure services has continued to act as a pull factor and focal destination for employment seekers from across the county. This in-migration of population has put tremendous pressure on available services and housing within the town limits.

10.6 Land Use in Settlements in the Developed Parts of the Planning Area

10.6.1 Nakuru West Sub-County

Nakuru Town West covers an area of 251 KM² and has a population of 172,013. The wards are: Barut covering an area 195.5 KM² and has a population of 7661 London covering an area 20.9 KM² and has a population of 26,643; Kaptembwa East covering an area 5.1 KM² and has a population of 79,480; Kapkures covering an area 26 KM² and has a population of 10,118; Rhoda covering an area 1.1 KM² and has a population of 27,787 and Shaabab covering an area 2.4 KM² and has a population of 20,323.

As the core settlement, Nakuru town within Nakuru West Sub County is the most extensive of all the urban areas in the plan area. The main settlement areas are London, Kaptembwa, Kwa Rhoda, Shabaab and Kapkures. These settlements vary from planned to unplanned estates. The

settlement pattern portrays a dual spatial outlook with dense settlement development in the area closer to Nakuru town, and settlement sprawl on the northern side of the main corridor towards Kiamunyi.

The South-Eastern part of the area hosts Nakuru national park and Lake Nakuru thus acting as a barrier to settlements in that side of the town. To the west in Kaptembwa area, it is known for the faults that also restrict development towards that side. Slum settlements are in London, Kwa Rhoda, Shabaab and Kaptembwa. In a nutshell, population growth and pressure on land have contributed immensely to the structure of Nakuru West Sub County.

Contemporary settlement planning manifests itself in the old Nakuru county government owned residential estates, further it is manifested in the Kiamunyi area. However, there are no development control guidelines in the town thus exposing it to the risk of unplanned settlements. There is ribbon development along the roads. This area is the core of commercial and industrial development. In the CBD, there are mixed land uses with commercial land uses intermixed with industrial, residential as well as civic and community land uses. The business core is expanding capturing residential land uses on its edge. The proactive intervention of planning is required in order to ensure that growth in this area takes place in a coordinated and controlled manner.

There are several emerging nodes along the road network especially the intersections of roads that appear as isolated land use activities. Such locations are significant to planning as they may have implications for accessibility and traffic circulation along the respective roads to promote coordinated development.



Figure 10.2: A Section of Nakuru West

SOURCE: *Geomaps 2016 Aerial Mapping*

10.6.2 Nakuru Town East

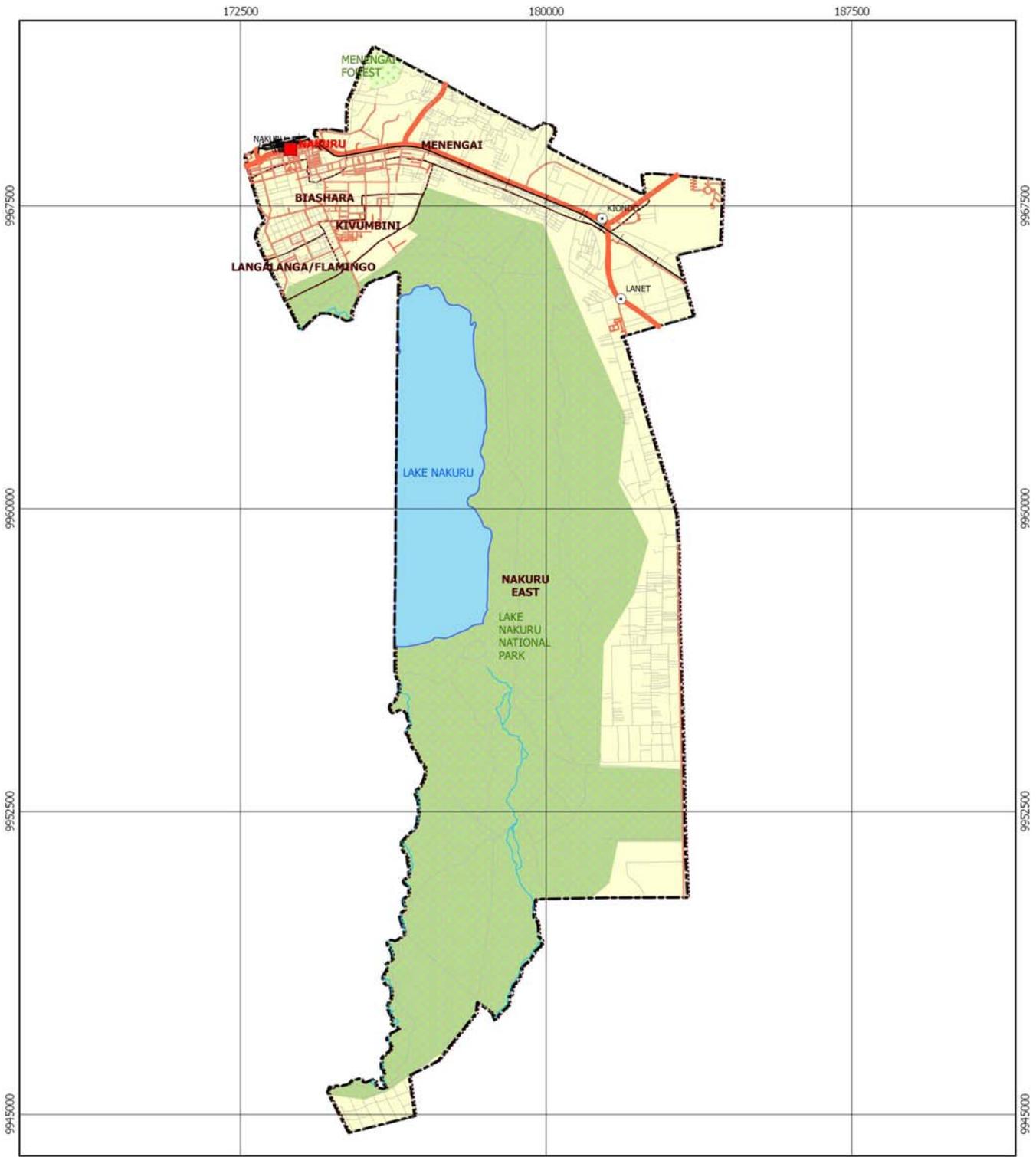
It is the sub county bordering Nakuru Town west and covers an area of 74.3 KM² and an estimated population of 177560 as of 2013. There are five wards: Biashara covers 19.6KM² and population of 40576; Kivumbini covers an area 25.9 KM² and a population of 23,244; Langalanga is the smallest ward in this sub-county covering 2.6 KM²; 36,554 Menengai covers as area of 26.2 KM² and 37,198 Nakuru East covers an area of 23.3 KM² and a population of 39,988.]

The spatial structure of housing in Nakuru has evolved from racially based differentiation to zoning based on socio-economic status. This also corresponds with densities of development. High-income low-density developments are found in Sita centre, Section 58, Mwariki East. Middle income /medium density neighbourhoods are found south of the A104 and include Langalanga and Race track. The public housing areas are generally well planned with provision made for wide roads, open spaces and space for public utilities. Most private housing area especially the low income are poorly planned and development control is not used in the areas hence standards are not followed. The area is poorly served with physical infrastructure and services. Development is constrained on the southern side due to Lake Nakuru and the National Park, while the north is

constrained by Menengai crater. Nakuru town east has the highest population density in the entire county with 2015 densities being 2,540 and projected to be 2,700 in 2017.

The area is poorly served with physical infrastructure and services. Development is constrained on the southern side due to Lake Nakuru and the national park, while the north is constrained by Menengai crater. Nakuru town east has the highest population density in the entire county with 2015 densities being 2,540 and projected to be 2700 in 2017.

NAKURU EAST



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major_Town ○ Other Town — Major Road — Minor Road — Tarmac_Road — Railwayline — Main River — Minor River ■ Forest ■ Lake ■ Park ■ Sub County 	<p>N</p>  <p>Scale 1:130,000</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map10.2: Nakuru East Sub-County

SOURCE: Geomaps/ Habitat Planners, 2016

10.6.3 Rongai

Rongai covers a total area of 1049.1 KM² and a total population of 147,017. It has five wards: Menengai West covers 118.7 KM² and a population of 31499; Soin covers an area of 292.5 KM² and a population of 28,209; Visoi covers an area of 204.9KM² and a population of 35,438; Mosop 197.2 KM² and a population of 30,556 and Solai covers an area of 235.8KM² and a population of 21,315.



Figure 10.3: Sections of Rongai Town
SOURCE: *Geomaps 2016 Aerial Mapping*

The key urban areas are Rongai, Kampi ya Moto, Lower Solai, Nyamamithi and Menengai. Salgaa is also a node that is vibrant as well as Sachangwan and Keringet area. The centres have formed along the road corridors. The discernible commercial centre is Rongai. The rest of the commercial nodes are disjointed ribbon developments along the main roads.

10.6.4 Njoro

Njoro Constituency covers an area of 713.3 KM² and a population of 208359. There are six wards: Mau Narok covers an area 159.3 KM² and a population of 40026; Mauche covers an area 184.5KM² and a population of 38461; Kihingo covers an area 97.64KM² and a population of 30059; Nesuit covers an area of 75.2KM² and a population of 15238; Lare covers an area of 72.2 KM² and a population of 20180 and Njoro covers an area of 124.46KM² and a population of and a population of 64881. Njoro is the dominant commercial centre.

The western side has forest cover thus limiting urban development toward that side as well as the south and south-east side. There are large farms interspersed by commercial nodes mainly forming along the main roads. Some notable developments in the area are Egerton University, Timber factories.

There are several rivers in the central part of the area are getting into Lake Nakuru, therefore activities in the settled area if not checked could lead to environmental pollution particularly the Lake Nakuru. The tributaries of Njoro River traverse the settlements. The river has encouraged linear settlement along its meandering course. The developments are a threat to the fragile ecosystem.



Figure 10.4: Section of Njoro Town

SOURCE: *Geomaps 2016 Aerial Mapping*

10.6.5 Molo

Molo Constituency covers an area of 478.79 KM² and a population of 140,584. It has four wards: Mariashoni covers an area of 345.5 KM² and a population of 14,070; Elburgon covers an area of 97.09 KM² and a population of 49,074; Turi covers an area of 77.08KM² and a population of 28,750 and Molo covers an area of 58.2KM² and a population of 48,690.

Elburgon and Molo urban centres are the dominant commercial areas offering a wide range of service to the hinterland population. Turi, Kaptuga and Mauche are also key centres.



Figure 10.5: Section of Molo Town

SOURCE: *Geomaps 2016 Aerial Mapping*

The southern part of the area is covered by forest land and in the Molo area in the north there is also some forest land. The forest in the southern the forest extends to almost half the plan area.

10.6.6 Subukia

Subukia covers an area of 390.71KM² and a population of 106737. It has three wards: Subukia covers an area of 89.11KM² and a population of 23895 Weseges covers an area of 172.7KM² and a population of 38303 and Kabazi covers an area of 128.9KM² and a population of 44538. Kabazi has the largest population in the sub county. The towns are found along the road network while the bulk of the area is farmland.

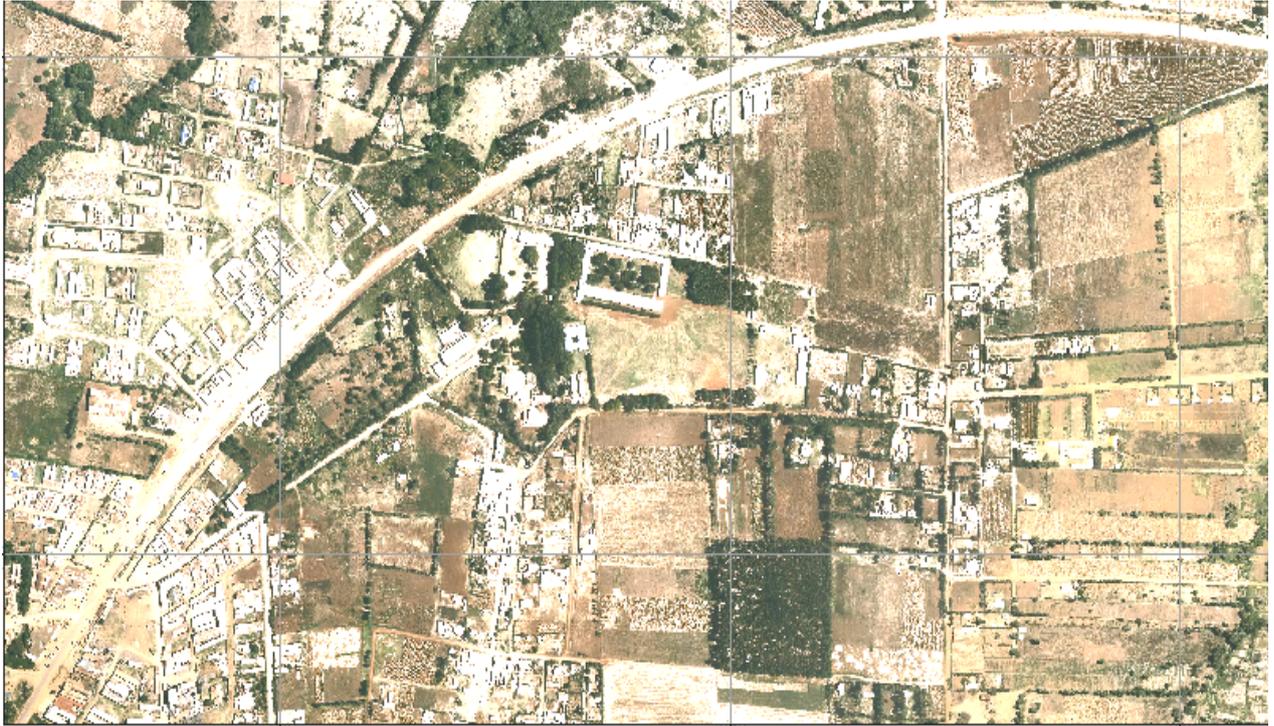


Figure 10.6: A Section of Subukia Town
SOURCE: *Geomaps 2016 Aerial Mapping*

Subukia has the lowest population with 87,526 as at 2012. On the other hand, the lowest population figure in Subukia is due to the rural nature and size of the Sub- County and limited social economic activities.

10.6.7 Bahati

Bahati covers an area of 375.4KM² and a population of 162,985. It has five wards: Dundori covers an area of 54.9 KM² and a population of 27,471; Kabatini covers an area of 62.1KM² and a population of 33,473; Kiamaina covers an area of 52.1KM² and a population of 35,412; Lanet/Umoja covers an area of 50.2KM² and a population of 31,646 and Bahati covers an area of 156.1KM² and a population of 34,983.

Kiamaina, Kabatini and Bahati are the key urban centres in the sub-county. Mawanga, Maili Kumi and Bahati are all along the main Nyeri-Nyahururu road while the rest of the urban centres are along the secondary roads in the area.



Figure 10.7: A Section of Bahati Town
SOURCE: *Geomaps 2016 Aerial Mapping*

10.6.8 Kuresoi South

Kuresoi South covers an area of 583 KM² and a population of 130,413. There are four wards in the sub county: Amalo 87.6 KM² and a population 23,822; Kapsimbweywo covers an area of 63.4 KM² and a population of 32,931; Kiptagich covers an area of 114 KM² and a population 29,592 and Tinet covers an area of 218 KM² and a population 44,068.



Figure 10.8: A Section of Kuresoi South

SOURCE: *Geomaps 2016 Aerial Mapping*

10.6.9 Kuresoi North

Kuresoi North covers an area of 559.7KM² and a population of 140146. It is divided into three wards: Kiptororo covers an area of 241.6KM² and a population of 42467; Nyota covers an area of 174.2KM² and a population of 44574; Sirikwa covers an area of 63.4KM² and a population of 19253 and Kamara covers an area of 80.5 KM² and a population of 33851.



Figure 10.9: A Section of Kuresoi North
SOURCE: *Geomaps 2016 Aerial Mapping*

10.6.10 Gilgil

Gilgil covers an area of 1348.4 KM² and a population of 171,838. It is divided into five wards: Gilgil covers an area of 84.3 KM² and a population of 53,780 Elementaita covers an area of 213.1 KM² and a population of 31,073 Mbaruk/Eburu covers an area of 621 KM² and a population of 37,728 Malewa West covers an area of 274.1 KM² and a population of 24,759 Murindat covers an area of 155.9 KM² and a population of 24,499.



Figure 10.10: A Section of Gilgil Town

SOURCE: *Geomaps 2016 Aerial Mapping*

10.6.11 Naivasha

Naivasha Sub-County occupies the largest land mass at 1,960.2 Km². This can be partly attributed to existence of large uncultivated plains, vast cattle ranches, parks and animal conservancies as well as the lake Naivasha water body. Naivasha had the second highest populations of 269,632 as at 2012 and the same is expected to grow to 314,052 by 2017. The pull factor for high population in Naivasha is mainly because of the employment opportunities in the massive flower and horticultural farms in the constituency. It is divided into seven wards: as shown in Table 10.2.

Table 10.3: Wards in Naivasha Sub-County

Ward	Population	Area in km ²
Biashara	17,728	64
Hells gate	44,297	91.2
Lake view	22688	16.2
Mai Mahiu	33662	544
Maeilla	31100	427.8
Olkaria	28738	345.5
Viwanda	51418	105.8



Map10.3: A Section of Naivasha Town
SOURCE: *Geomaps 2016 Aerial Mapping*

10.7 Review of Previous Plans and Other Planning Related Efforts

Nakuru forms the nucleus from which the county was founded. This was in 1904 as a railway post, 160KM North-West of Nairobi. It is located along the east-west transport route across the country, linking the Kenyan coast with the Lake Victoria region and neighbouring Uganda. Nakuru is the fourth largest growing town in Kenya and is the headquarters of the county (SSP, 1999).

The County has been able to formulate several plans to guide the urban centres over the years. Several planning related efforts have been undertaken in Nakuru County to address various challenges and bring about sustainable and orderly development. These have not been integrated to cover the entire county but isolated efforts covering certain parts of the county. Some are listed below:

10.7.1 Nakuru Strategic Structure Plan 1999

In 1999 a Strategic Structure Plan (SSP) for Nakuru town was undertaken under the Localising Agenda 21 Programme. It was the first plan to be approved by the Minister for Lands and Settlements under the then new Physical Planning Act. The UNHCS (Habitat) selected Nakuru as a secondary city and provided for concentrated capacity building and management support interventions. Rapid population increase led to an increase in demand for basic services and infrastructure such as housing,

water and sanitation, roads and social infrastructure. This put a strain on the available resources and increased challenges to the Municipal Council to meet the needs of the inhabitants. This entailed setting up of a planning unit to implement the proposals in the SSP.

Strategic structure plan approach was developed within the framework of urban development and localizing Agenda 21 as a new approach for settlements planning and development.

A wide range of proposals were recommended to address the challenges that the town was facing. From a recent 2016 survey, the bulk of the challenges identified in 1999 were still being experienced even to a greater magnitude

10.7.2 Local Physical Development Plans and Zoning Plan

The Ministry of Lands, Physical Planning Department prepared Part Development Plans (PDPs) for some towns in Nakuru County over a period of time. These were geared towards guiding the spatial development of the respective towns. The PDPs designated land uses for various activities within the towns. The success of implementation will be established during the survey exercise of this study. However, from the socio-economic survey undertaken in the area in 2016, there were many challenges raised that pointed to non-implementation of the PDPs.

The following PDPs and zoning plan for the towns were available at the time of the survey: Njoro, Mau Summit, Olenguruoni, Bahati and Rongai.

i. Olenguruoni Local Physical Development Plan

This plan was prepared in 2001 by the then Ministry of Urban Development and Housing, Physical Planning Department. It was prepared on government land stating that it would not affect the legal rights of land owners. The plan demarcated the trade centre boundaries and specified a broad range of land uses including commercial, industrial, educational, recreational, transportation public purposes and deferred land for future designation.

ii. Mau Summit Local Physical Development Plan

The Mau Summit Local Physical Development Plan was prepared in 1968 by the then Ministry of Lands and Settlements, Town Planning Department. The plan demarcated the trade centre boundaries and specified a broad range of land uses including commercial, industrial, educational, markets, abattoir, recreational and public purposes.

iii. Njoro Local Physical Development Plan

Njoro Local Physical Development Plan was prepared in 2002 by the then Ministry of Lands and Settlements, Physical Planning Department. It was prepared on government land stating that it would not affect the legal rights of land owners.

iv. Rongai Local Physical Development Plan

Rongai Local Physical Development Plan was prepared in 2001 by the then Ministry of Urban Development and Housing, Physical Planning Department. It was prepared on government land stating that it would not affect the legal rights of land owners. The plan demarcated the trade centre boundaries and specified a broad range of land uses including commercial, industrial, educational, recreational, transportation and public purposes.

v. Bahati Local Physical Development Plan

This plan was prepared in 1994 by the then Ministry of Lands and Settlements, Physical Planning Department. It was prepared on government land stating that it would not affect the legal rights of land owners. The plan demarcated the trade centre boundaries and specified a broad range of land uses including commercial, industrial, educational, agricultural, and public purposes.

vi. Draft Mai Mahiu Zoning Plan

A layout for draft Mai Mahiu Zoning plan was availed indicating the distribution of land uses in Mai Mahiu. However, the report was not available at the time of the study as it was awaiting the approval process. From the available information, it appears the town's land uses have been designated in a comprehensive way as depicted from the layout below. The plan proposals as shown in the Mai Mahiu Plan will be taken into consideration when planning the wider sub-county.

vii. Nakuru Physical Development Plan 2014-2030

The Nakuru Town Integrated Strategic Urban Development Plan 2014-2034 was in the process of being approved in the County Assembly of Nakuru. The Plan was meant to provide a spatial development framework to guide the town's growth for the next 20 years up to the year 2034.

It seeks to address various development concerns that have been afflicting the town's growth in the recent decades. The planning process from validation of the identified planning challenges, data collection and analysis and formulation of proposals was participatory. It involved stakeholders including local residents, business entrepreneurs, civil society organizations, county and local administration. It also detailed the proposed strategies and policies intended to address concerns identified to achieve the overall set vision. While it can be considered as a draft, the proposals having

been arrived at recently will be considered and integrated with the proposals for Nakuru Town East and Nakuru Town West Sub-counties.

viii. Nakuru County Integrated Development Plan 2013-2017

The County Government is required to prepare Integrated Development Plan so as to enable prioritization of local socio-economic development issues. Under the Fourth Schedule of the Constitution the County Government responsibilities and functions are specifically spelt out. The County Government is also obligated by Part XI of the County Government Act 2012, to ensure harmony of the County Integrated Development Plan with national plans such as the Medium-Term Plan, Millennium Development Goals, other county and sub-county plans such as sectoral plans, spatial plans as well as urban and city plans located within the county.

A number of flagship projects were identified and earmarked for implementation under the Kenya Vision 2030. The Nakuru C.I.D.P. has identified also the flagship projects and programmes to be implemented at the county level. This will be carried out in conjunction with the national government so as to ensure they are realized. It is worth noting that the projects and programmes contained in the County Integrated Development Plan were identified through various consultative meetings/forums at the county level, such as the stakeholder consultative meetings on the County Medium Term Expenditure Framework, and the Second Medium Term Plan, and the sub-county consultative forums.

The 2013 – 2017 Nakuru Integrated Development Plan has identified the key priority sectors to include: Infrastructure development - covering rehabilitation of the sewerage system in major towns, tarmacking of the major roads, better power connectivity and water distribution network; Agriculture and food security - food crops, pyrethrum, coffee, tea and dairy farming; Trade and Industries -Revival of collapsed industries and provision of a conducive business environment; Education, Training and ICT - ensure enrolment, retention and transition from primary, secondary to post-secondary and promote the use of I.C.T; Tourism, Wildlife and Forestry - reduce human wildlife conflicts, reforest all the forests in the county.

The projects and programmes in the various sectors are estimated to cost approximately Kshs.102, 318,835,337 for the 2013 – 2017 plan period. The projected funding for projects and other activities over the same period will be sourced from internally generated funds, grants and donor funds, public private partnerships and exchequer grants. It is however noted, that the funding of these projects is inadequate to meet the development needs of the County. The county has therefore identified several strategies to be

applied in achieving sustainability in revenue generations for continued social-economic development.

It is expected that increased participation by a wide cross-section of the people during identification, planning, implementation, monitoring and evaluation of projects and programmers will contribute greatly towards the achievement of the key goal of devolution.

The various studies are a pointer to the fact that various development concerns have been felt in the area and planning was identified as one of the ways of dealing with the problems. Perhaps weak implementation may have led to uncoordinated development over the years.

10.7.3 Development Control Policies

There is no development control policy to guide the development of the various towns and rural areas within the County. These pertain to subdivision and building standards. Formulation of the same to be in line with the growth tempo of the county is needed. Further, enforcement capacity was needed to bring about coordinated development of the area. It therefore means that the regulatory offices have no tools to enforce development making coordinated and orderly development difficult.

10.8 Key Identified Planning Issues

The directions for the growth of Nakuru County will be identified within the context of constraints and opportunities and the needs of existing and future residents. The benefit of the plan will be its ability to inform and guide decisions about development.

During the past two decades, Nakuru County as a whole has witnessed tremendous urbanization trends particularly the key town centres including Nakuru, Naivasha, Gilgil, Njoro, Molo, Elburgon, Olenguruoni, Rongai, Bahati, Subukia and Mai Mahiu. The situation is even more alarming given the fact that settlements in close proximity with Nakuru town have experienced great pressures leading to hitherto low dwelling settlements in areas like Kiamunyi rapidly converting into higher density development in form of apartments. The challenge is that the development control tools are limited and some towns do not have them making it difficult to guide development and the result is uncontrolled and haphazard growth. The development has thus greatly preceded planning. The development pressure is not matching the infrastructure development thus creating a great strain on existing facilities and attendant challenges.

The high population growth has led to mushrooming of informal settlements in urban areas and massive subdivisions of agricultural lands to

accommodate this population growth. This has also led encroachment into natural reserves, forests and water catchment areas and other ecologically fragile ecosystems. Table 10.3 is a summary of key planning challenges in the planning area:

Table 10.4: Challenges in the Planning Area

Planning Issue	Manifestation
Uncontrolled urban development	<ul style="list-style-type: none"> -Unauthorized developments causing haphazard, uncoordinated growth and sprawl into agricultural land. -Encroachment of informal trading activities along road reserves compromising on road safety
Inadequate urban infrastructure	<ul style="list-style-type: none"> - Insufficient access to safe water, -Poor solid waste management -Insufficient and poor quality of public transportation, -Poor road condition
Poor living conditions	<ul style="list-style-type: none"> -Insufficient affordable housing, -Expansion of informal settlements
Inadequate of social facilities	<ul style="list-style-type: none"> -Insufficient social amenities i.e. schools, hospitals, universities, social halls and recreational facilities. -Insufficient public open space, -Poor solid waste management system -Insufficient liquid waste management system -Inadequate markets
Transportation challenges	<ul style="list-style-type: none"> -Poor road condition -Traffic congestion -Poor connectivity -Inadequate public transport -Inadequate parking – private, psv -Narrow roads -Lack of comprehensive transport system within the towns
Environmental degradation	<ul style="list-style-type: none"> -Pollution of water bodies -Encroachment on riparian reserves
No delimitation of extents of urban areas	<ul style="list-style-type: none"> -Rapid expansion of human settlements into rich agricultural land -Encroachment on agricultural land -Encroachment in ecologically fragile areas and road reserves
Subdivision of	<ul style="list-style-type: none"> -Rapid subdivision of agricultural land to pave way for

Planning Issue	Manifestation
agricultural land into small unviable holdings	settlements
Lack of plans for urban area	Lack of localized policies and regulatory frameworks

The above challenges are as a result of lack of clear guidelines to manage the development. Formulation of the guidelines and an implementation framework is therefore key to achievement of improved living conditions in the planning area.

10.9 SWOT Analysis

Strengths

The devolution setup presents a great opportunity for the county to exploit its resources to the full and improve its competitiveness in the country. There are several strengths that the county can leverage on:

- Strategic location along the Mombasa Kisumu Highway
- Scenic physical features with huge touristic potential
- Good weather most of the year
- Multi-ethnic diversity

Weaknesses

The County is also faced by a number of weaknesses:

- Inadequate human resources at the county level to implement various programme
- Inadequate funding to implement the programmes
- Pressure on infrastructure facilities

Opportunities

Devolution has presented a broad range of advantages in terms of how counties can govern their resources and improve on their competitiveness in the country and the region. There are a number of opportunities that can be exploited to enhance the level of development in Nakuru County and aid in achievement of the vision. These include:

- Markets in the region for the county products and services
- Regional cooperation with surrounding counties to have joint plans for trans-boundary areas
- Geothermal power exploitation: This is a good opportunity for growth in the county and enhancing the competitive edge in the country

Threats

The impending threats concerns the global climate change whose effects are already being felt in the county through unreliable weather patterns and shrinking of lakes in the county. The other aspect is instability related to politics. The climate change can be mitigated by employing good practices in urban development and agriculture while the instability due to politics that can be mitigated by promoting inter-ethnic integration.

Emerging Issues

- **Supportive stakeholders:** The people are eager to see their areas change through proper planning. In this they gave a lot of support to the process.
- **Implementation:** The implementation of past projects has been a challenge and hence the proper planning and identification of partnership opportunities is a key area of consideration
- **Rich unexploited potential for Tourism:** The County has a rich historical and cultural heritage which if properly exploited will provide an avenue for growth.

PART III: SCENARIO BUILDING

Chapter Eleven : Scenario Building

This chapter brings out the various planning considerations that have informed the proposed plan. The chapter also brings out various development scenarios that could be adopted as a basis for development in Nakuru County. These scenarios/ models are developed through overlay of various spatial depictions such as population, infrastructure, human settlement, environmentally sensitive areas etc so as to identify the clustering of issues to be addressed and optimal layout for development of the county.

The scenarios are based on the identified development challenges and opportunities in the county as well as the potentials of the county. These scenarios are then evaluated and the one or hybrid of scenarios that covers the best development approach chose. It is then on the basis of the identified preferred model/scenario that the spatial plan is developed.

11.1 Planning Considerations

The following consideration gave guidance to the development of this plan.

11.1.1 Development Visions

Development vision of Nakuru County is formulated with reference to the related plans and inputs from stakeholders. The following are the steps for development vision formulation:

- Reviewing and understanding the development vision of “Kenya Vision 2030” and “Nakuru County Integrated Development Plan”.
- Understanding the position of Nakuru County in the country and the Rift Valley region.
- Stakeholders Development Visions

Kenya Vision 2030

Kenya Vision 2030 was formulated in 2007 and provides the baseline of the economic, social, and political frameworks, and also shows action to be taken to achieve the development goals

Overarching Vision: A globally competitive and prosperous nation with a high quality of life by 2030

Foundation for Kenya Vision 2030 on which Three Pillars (Economic, Social, Political) are based:

- (1) Macroeconomic stability for long-term development
- (2) Continuity in governance reforms

- (3) Enhance equity and wealth-creation opportunities for the poor
- (4) Infrastructure
- (5) Energy
- (6) Science, technology, and innovation (STI)
- (7) Land reform
- (8) Human resources development
- (9) Security
- (10) Public service

Three Pillars of Kenya Vision 2030

Economic: To maintain a sustained economic growth of 10% p.a. over the next 25 years.

- (1) Tourism
- (2) Increase in value in agriculture
- (3) A better and more inclusive wholesale and retail trading sector
- (4) Manufacturing for regional market
- (5) Business process off-shoring (BPO)
- (6) Financial service

Social: A just and cohesive society enjoying equitable social development in a clean and secure environment.

- (1) Education and training
- (2) Health sector
- (3) Water and sanitation
- (4) Environment
- (5) Housing and urbanisation
- (6) Gender, youth, and vulnerable groups
- (7) Equity and poverty elimination

Political: An issue-based, people centred, result oriented, and accountable democratic political.

- (1) Rule of law
- (2) Electoral and political process
- (3) Democracy and public service delivery
- (4) Transparency and accountability
- (5) Security, peace-building, and Conflict management.

Nakuru County Integrated Development Plan 2013-2017

The vision for the county from the CIDP is: A secure, cohesive and industrialized County.

The mission is: To formulate citizen-oriented policies, promote sustainable socio-economic and technological development.

County Spatial Vision

“The CSDP seeks to promote properly integrated spatial modern infrastructure network towards achievement of maximum sustainable development in agricultural production, agribusiness industries and tourism for economic prosperity and environmental conservation”.

11.1.2 Guiding Principles

The land use of the study area has been guided by the following principles aimed at achieving balanced growth for the planning area.

- Economic Sustainability
- Environment Sustainability
- Protection of agricultural zones
- Integration land use with transportation

The principles have guided in determination of future land uses aimed at achieving sustainable development

11.1.3 Structuring Elements

The landscape of Nakuru County is characterized by a combination of unique geographical, natural and geological features. The natural, man-made and historical development factors have influenced the existing spatial structure of Nakuru County. The structuring elements include geographical factors, natural features, land tenure systems and human development activities. All these have influenced the outcome of the physical form of the plan area. The intended structure will define the strategies directed at achieving the desired vision for Nakuru County.

Natural Factors

The natural structure of Nakuru County is characterized by a rich heritage of geological features most of which are tourist attractions. Most of these are as a result of volcanic and tectonic activities giving rise to a variety of landscape features. The Rift valley is rich in natural features of which Nakuru County has a good share. Lake Nakuru and Lake Elementaita both in the floor of the Rift Valley form part of the key natural features in Nakuru that shape the spatial structure of the county.

The main topographic features in Nakuru County are:- the Mau Escarpment covering the Western part of the county; the Rift Valley floor; Ol Doinyo Eburru Volcano, Akira plains; Menengai Crater; elaborate drainage and relief system and the various inland lakes on the floor of the Rift Valley. Nearly all the permanent rivers and streams in the county drain into the inland lakes. Farming within the riparian is responsible for heavy silting as reported during the socio-economic survey in 2016. Other human activities lead to pollution of the lake water. The rivers do define the settlement patterns and at some point, act as boundaries between areas. These rivers include river Njoro, Makalia which drain into Lake Nakuru, Malewa which drains into Lake Naivasha and Molo River which drains into Lake Baringo.

The topographic features are an interesting niche for research as well as great tourist attraction sites. The most predominant is the Hells gate gorges in Naivasha which are an important tourist sites. The land topography in Naivasha and Gilgil Sub-Counties is characterized by mountain ranges and savannah vegetation cover that support various species of wildlife.

Others are Menengai Crater (8060 – 2040 m above the sea level). Bahati escarpment to the North East and Mau escarpment are to the South west. There are hills in Nakuru Town East such as Lion (1780-2040m), Nelan (1870-1920m), Hyrax (1800-1840m) and Honey moon Hill (1800-1840m). The hills are characterized by steep slopes. These are natural barriers to settlements and have contributed to the spatial structure of development in the county.

Transport Corridors

Historically, the introduction of the railway line in the area played a role in shaping the resultant land uses and pattern of development. The railway was introduced to open up the hinterland for European occupation as part of the white highlands. This opened up the area with the railway serving as a major structuring element in the 1920s. In 1930s the road Nairobi-Eldoret was constructed further defining the structure of the area.

Settlement Structure

The pattern of settlements that is discernible in the planning area is attributable to the volume and nature of human activities. The distribution is mainly on housing and attendant facilities like commercial and social amenities.

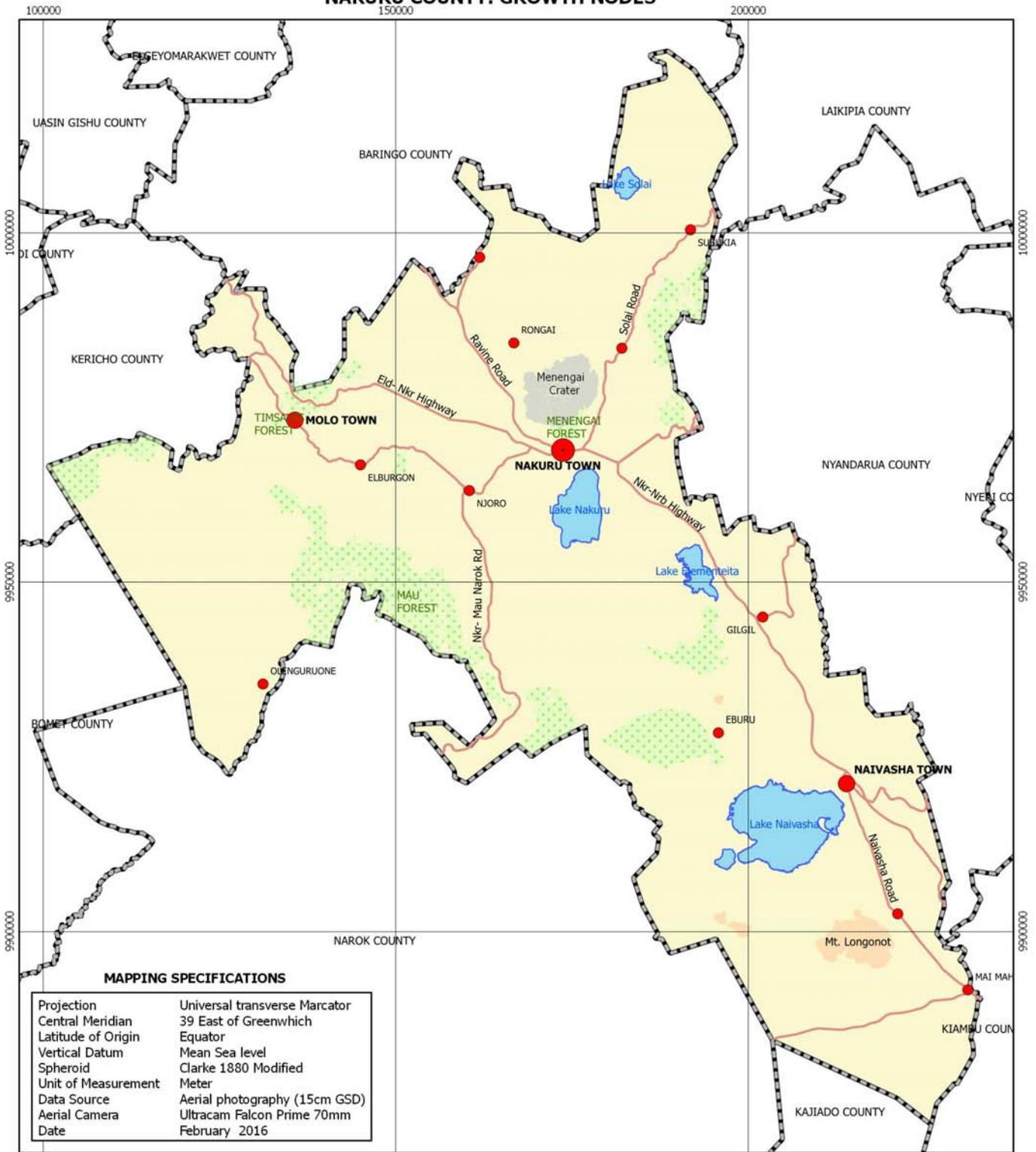
A spatial patterning of settlements in the development area shows existence of nodes spread across the landscape serving the rural areas in which they are based. They are not integrated into a joint system but rather an overview of the area shows leap frogged development with key nodes: Nakuru along the Nairobi-Nakuru highway, Rongai, Molo, Njoro, Total, Kuresoi, Gilgil, Mai Mahiu, Naivasha, Bahati and Subukia. They are along at focal points of key road corridors in the area.

Nakuru town assumes a radial central location with key roads radiating to serve urban centres away from the town. This manifests in a core-periphery spatial interaction in the planning area.

The southern part of the plan area is characterized by hilly topography and also protected forests. The outskirts of built up areas is mainly agricultural/ range land for grazing and cultivation.

The area is traversed by a national road and a railway line; Mombasa-Kisumu Railway Line These transportation corridors have had a huge influence in the spatial structural pattern of the plan area as they provide a framework for the road network and have encouraged linear development along the roads as outlined by map 11.1.

NAKURU COUNTY: GROWTH NODES



MAPPING SPECIFICATIONS

Projection	Universal transverse Mercator
Central Meridian	39 East of Greenwich
Latitude of Origin	Equator
Vertical Datum	Mean Sea level
Spheroid	Clarke 1880 Modified
Unit of Measurement	Meter
Data Source	Aerial photography (15cm GSD)
Aerial Camera	Ultracam Falcon Prime 70mm
Date	February 2016

 <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ● County H/Q ● Urban Centre ● Market Centre — Highway County Boundary Forest Lake Lava Mountain 	 <p>Scale 1:750,000</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.O Box 61071-00200. Tel: 254(020)2715829, 2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 11.1: Growth Nodes
SOURCE: Geomaps / Habitat Planners
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Population Distribution

The population is concentrated in the existing towns where the densities are much higher than the surrounding hinterlands where agricultural activities are dominant. This defines the structure according to where people have settled. Urban Population projections describe a significant growth in towns for instance Molo and Gilgil were projected to have a 20 per cent growth. This density can be attributed to growing social economic activities in the towns, rural-urban migration and tribal violence in the case of Molo town. The county will need to provide more social amenities to ensure balanced growth.

The County continues to experience high rates of immigration. The effect of these movements has been a steady increase in population especially in the urban centres. The ever-rising population growth in urban areas calls for better housing, enhanced security, improved urban planning, water and sanitation, social amenities like schools and effective health centres. Uncontrolled urban growth on the other hand may lead to higher incidences of crime and mushrooming of informal settlements. More important is the urgent need for the physical planners to take decisive actions to safeguard public utilities and other physical amenities in the county and avoid uncoordinated settlement patterns. Proper planning of the towns and enhanced enforcement of the County by-laws is recommended.

Nakuru Town East and Nakuru Town West sub-counties were most densely populated with 2,318 and 665 persons respectively per square kilometre in the year 2012. Gilgil sub-county on the other hand had the least population density of 124 persons per square kilometres in the year 2012. The high population density in both Nakuru Town West and East sub-counties is mainly attributed to the fact that this is the hub of the county and the principal urban centre in the planning area. It is projected that population density will rise to 774 in 2017 for Nakuru Town West and to 2,540 in Nakuru Town East. Naivasha, Gilgil and Rongai have expansive uninhabited land area due to that has semi-arid climatic conditions, Lake Elementaita and large-scale private ranches.

National Parks

There are three national parks within Nakuru County namely, Mt. Longonot National Park, Hells Gate National Park and Lake Nakuru National Park. Tourism is an important sub-sector in the development of the county. However, the county fortunes in tourism might be adversely affected by the widespread changes in climate. Extremities in weather conditions have led to reduction in volume of river flows and caused serious decline in water levels in Lake Nakuru, Elementaita and Naivasha threatening the future of

these sites as major tourist attractions. Changes in climate also has huge ramification in agricultural and rural development sector. (CIDP, 2014).

Forests

Nakuru County has about 10% of the area is under gazetted forest. The forests include Menengai Crater, Mbogoini, Solai, Mau, Bahati, Subukia, Eburru and Dundori. They are a major source of timber and firewood as well as providing employment to high number of the county population. They form an important structuring element in that settlements and provide a carbon sink.

Regional Boundaries

The planning area shares common administrative boundaries with 5 counties. These form important structuring elements. Further, they have great significance to planning administration and service provision on the margins of the boundaries. In the boundary between Nakuru County and Baringo County at Mogotio town, the activities have spread astride both counties and some services are shared, for instance a primary school. This may call for an inter-county approach to planning.

Rivers

The planning area falls within a watershed where several rivers traverses the area. While these are valuable linear natural open space systems, they constrain spatially integrated development. Indeed, in some parts, connectivity is poor as bridges over the rivers are in poor condition.

Transport Network

The transport network is a key defining structuring element of the planning area’s spatial structure. From the County’s road network map, the corridors have created a network that is traversing the entire area. The resultant land uses seem to be influenced by the layout of the road network.

Challenges and Opportunities of the Structuring Elements

Natural Physical Constraints

The natural physical constrains that influence the spatial structure of the planning area is as outlined by table 11.1 below.

Table 11.1: Natural Physical Constrains and Opportunities

Natural Features	Constraint	Opportunity
Hills	Steep slopes	Tourism
Rivers	Environmentally fragile	Water resource/tourism
Escarpment	Steep Slopes	Tourism
Lakes		Tourism
Faults		



Plate 11.1: Example of a Quarry Site as Man Made Constraint

SOURCE: *Geomaps / Habitat Planners Survey*

11.2 Development Models

Having understood the nature of the site and its physical structuring elements, various development models have been considered. The apparent model seems to be polycentric to some extent due to the various urban centers in the region. However, elements of a core center, Nakuru may mean a monocentric model. The choice of development models is informed by visioning of the planning area and the prevailing physical, economic and social trends.

11.2.1 Alternative Development Models for Structure Plan

Having understood the nature of the planning area and its physical structuring elements, various typical development models have been considered for Nakuru County. The models are described below:

Mono Core Model

The model typically is characterized by one strong nucleus from which all corridors emanate. It is a primate centre which dominates all the major functions while the other centre plays no important function.

Advantages

- The urban function is concentrated in the CBD.
- Services are close together and easier to service.
- Effective in early stages of a town growth.

Disadvantages

- Heavy traffic congestion when the urban centre is large.
- Disparity in development as everything is concentrated in the central area.

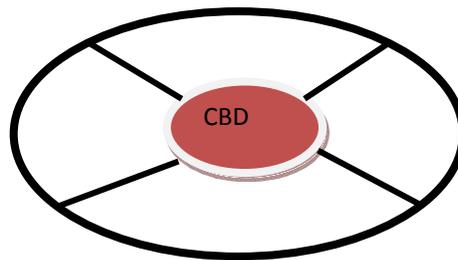


Figure 11.1: Mono Core Illustration

Polycentric Development

The model is characterized by several nodes that mostly have the same importance in spatial participation and as such there is no dominating node.

Advantages

- Traffic congestion is at a minimum as there is no dominating node.
- There is reduced growth imbalance as urban centres are spread across the area.

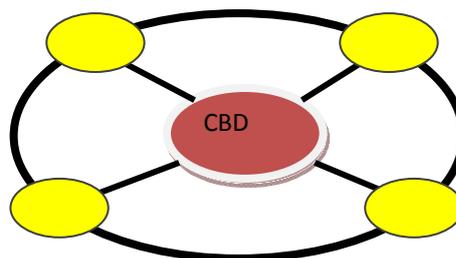


Figure 11.2: Polycentric Model

Ribbon/Linear Development

The development model is characterized by settlements along a transport corridor usually stemming from a major node spreading linearly.

Advantages

- The developments along the transport corridor have easy access.

- Forming of a node is easier if there are other roads nearby.

Disadvantage

- Servicing the developments is difficult due to spread out development along a transport corridor
- Direct access to major roads hence prone to traffic jams

The apparent model seems to be polycentric to some extent due to the various urban centres in the region. However, there is dominance of Nakuru town hence all urban centres do not have the same level of functions.

11.2.2 Preferred Development Model

With regards to a suitable model of future development of Nakuru County, a decentralized model of development is preferable for balanced development as envisaged by the devolution spirit. Further, from the vision of the communities and other stakeholders in the area, there is desire to have their sub-county regions develop into fully fledged urban centres offering a variety of services. This is however subject to development in the County that will hence spur growth across all the market centres, particularly the sub-county headquarters

11.3 Land Use Proposals

The proposals are based on the views from stakeholders that were gathered in the various meetings at the sub-county level. Further, proposals as suggested in the CIDP 2013-2017 were also considered. Some of them will be demonstrated in the structure plans.

11.3.1 Facilities That Are Required at Sub-County Level

Required facilities at sub county level were identified by the stakeholders during the socio-economic survey they also suggested possible locations as shown in Table 11.2.

Table 11.2: Facilities Required at Each Sub-County

Rongai Sub County	
Facility	Place/ Area
Health facility	Chepseon /Salgaa market/ each sub location/Magare /Kampi ya Moto
Play ground	Salgaa
Social halls-	Lelechwet
Drainage /sewerage	In the shopping area
Recreation center	Salgaa market / Rafiki
School(primary	Salgaa /sobe
Market	Sobe /kampi ya moto

Water point area	Kipsarian
Well-equipped nursery school	Kipsarian
Livestock auction	Solai –testai
ECDE center	Kipsyrian
Firefighting equipment	Magotio/ kampi ya moto
Monuments	Between Magotio/ kampi ya moto
Colleges / university	Makonkeni location
Development of boarding sec schools	Between Majani and lamolo
Police stations	Makonkeni, Lomolo, majani mingi
Youth center	Rafiki
Youth polytechnic	Rafiki
Njoro Sub County	
Facility	Place/ Area
Hospitals	Improve/upgrade existing ones
Maternity	Tuiyotich Dispensary
A polytechnic	Siriyat
Teachers college	Chorwet
Medical equipment	Hospital
All level 4 hospitals to be fully equipped	Mau Narok Centre
Dumpsite	Select site
Stadium	-
Market ground	Mau Narok Centre
Polytechnic/ college	Mau Narok ward
Police station	Mwisho Wa Lami
Dispensary	Gatimu Farm
Resource Centre	Mau Narok
Health Centre	Tuitoich
Transport System	Tuitoich
Community Health Workers	Mauche Division
Public toilets	Town centres
Water points	Town centres
Market that is fenced	Bondeni/Njoro
Bus park	Posta/Bondeni & Njoro Ward
Cemetery	Njoro ward
Fire station	Njoro, Bondeni
Health dispensary	Njoro-posta
Water facility	Jewathu
Gilgil Sub County	
Facility	Place/ Area
Stadium-	Kikohey
Airstrip	Kikohey
Super highway linkage	Gilgil town
College facility	Gilgil town
Community hall	Gilgil town
Fire station-	Gilgil town
Social halls	Gilgil town
Tertiary training institute	Gilgil town
Library	Kikohey
Health facility	Kikohey

Industries	Rural areas
Stimulus projects	Rural areas
Vocational training	Rural areas
Public modern toiles	Gilgil town
Waste buster	Gilgil town
Good health facilities	Gilgil town
Good town roads	Small towns
Good sanitation	Gilgil town
More schools	Kcc/Marula
Health centres	Marula/Kcc
Water projects	Centre of county
Health centres	Marula
Learning institutions	Kcc/Marula
Kuresoi South Sub County	
Facility	Place/ Area
Stadium	Olenguruoni centre
Community social hall	Olenguruoni centre
Hospital	Tailei, kapkeet
Bus park	Kapkembu
Health centre	Taita kabongoi
Technical institute	Kabongo
Secondary school	Sangawet
Survey of land	Olenguruoni town
Colleges	Kapkeet
Police station	Kapket & sotik
Hospital	Kapkembu
Warehouse	Amalo ward
Parking stage	Olenguruoni
Subukia Sub County	
Facility	Place/ Area
Electricity	Kagochi
Water	Kagochi
A.ps line	Kagochi
National libraries	Kiborongo
Stadium	Waseges ward
University	Waseges ward
Boarding Secondary school	St.Micheal Gstagati
Polytechnic	Gakingi Primary grounds
Dam construction	Waseges ward
Police station	Mihango
Health centre	Sibion
Maternity	Wei
Stadium	Town centre
Mortuary	Town centre
Social halls	Mbogoini ward
Maternity ward	Wei area
Labs in existing health facilities	Every dispensary
Rehabilitation centres	Near Subukia town
District hospital	Subukia
Molo Sub County	

Facility	Place/ Area
Water	Mutirithia
School	Mutirithia
Dispensaries	Mutirithia
Health centre	Matumaini Tayari
All weather roads	Matumaini sachangwani valley
Social amenities e.g stadium	Molo town
Social halls, Huduma centre	Molo town
Wi-Fi Hub	Elburgon and Molo town
A modern library	Elburgon ,Molo
Agriculture facility	Molo
ECD	Tegat sub location
Market stalls	Elburgon Ward
Public Library	Within town
Stadium	Outside the town
Lights	Salama Centre
Lights	Mealtime
Good roads	In Elburgon Wards
Public Swimming pools	In town
Open ground	In town
University	Around Molo town
Stadium	Around Molo town
Nakuru East Sub County	
Facility	Place/ Area
Talent facility for young people	Nakuru Town
Rehabilitation centre	Nakuru Town
Hospitals	In Kaptembwa, Maili Sita
Schools	Kaptembwa
Airport	Rongai sub county
Fish board	Around lake Nakuru
More schools near residential areas	Blanket
Better equipped hospital	Blanket
Flyovers along the highway	Nakuru town
Youth Polytechnic	
Maternity	Teachers Estate
Counseling facilities	In all public schools
Police post	Kisangi
Modern technical Institutions	Town centre
Renovation of houses Hospitals	County houses Kaloleni C Bondeni
Nakuru West Sub county	
Facility	Place/ Area
• Hospital	• Nakuru west, London
• Secondary schools	• Nkauru west , London
• Cultural Centre	• Nakuru west
• Market	• Mwariki
• Social halls	• London, Kapkures
• Standardizing roads	• All of Nakuru
• Upgrade health facilities	• Prisim Ever ready Health Centre. London, Bangladesh

• Even distribution of water	• Upper hill areas
• Training facilities	• London, Nakuru west
• Stadium	• Barut
• Schools for people with disabilities	• Nakuru West
• Recreational site	• Kapkures ward
• Waste recycling plants	• Industrial area
• Protect Riparian Land	• River Ndarugu/ Njoro
• Farmers training centre	• Kapkures
Kuresoi North Sub-County	
Facility	Place/ Area
• Level 4 hospital	• Kuresoi
• Administration office	• Sirikwa
• Advanced polytechnic	• Total kamara/ Kuresoi centre
• Social hall	• Kuresoi centre
• Active market	• Kuresoi centre /Mau summit centre
• Recreational centre	• Kuresoi centre
• Technical college	• Kuresoi/ndoinet /kamara
• Farmers college	• Kuresoi
• Health facility	• Kuresoi upgraded/ Kiptororo ward/githima
• Research centre –tea pyrethrum	• Kuresoi
• Water reservoirs	• Kuresoi-Itara dam site
• Mortuary	• Kuresoi health centre
• KTDA factory	• Kuresoi centre
• Secondary schools	• Kuresoi centre
• Police stations/post	• Mau summit centre
• Dispensary	• Mau summit centre/ every location
• University	• Gacharage area
• Street lights	• All major centres
• An ambulance	• Kamara
• Fire brigade truck/fire station	• Total town
Naivasha Sub County	
Facility	Place/ Area
Livestock market	Near safe
Drainage for Mai – Mahiu	Maai-Mahiu
Cemetery for Mai-Mahiu	Karima area
Polytechnic	Maai- mahiu
Public library	Maai- Mahiu
Recreational area //arboretum	Maai- Mahiu/ within town
Primary school	Mafuta taa /longonot haraka scheme
Secondary school	Maai Mahiu town /kwa ngima, morugi area
Mortuary	Maai Mahiu health centre
Public toilets spread	Mai Mahiu and Naivasha town
Youth resource centre	Naivasha town
Stadium	Industrial area
Hall	Lake view estate
Police post	Kabati estate
New bumps	Road leading to the reconstructed stage

Parking lots	Basement parking
Schools	Weru sub location
Fire Station	Maai- Mahiu
Health centre	Muniu sub location
Markets	Longonot
Upgrade of health centre	Mai Mahiu
Water supply project	Longonot
Bahati Sub County	
Facility	Place/ Area
Rehabilitation centre	Ndundori, Karunga, Maili kumi
Polytechnics	Ndundori, Mugwathi, Maili kumi
Good market places	Ndundori
Hospital	Karunga, rural areas
Schools	Karunga/ Wanyororo
Vocational/ training schools	Bahati
Proper public service facilities	Maili kumi
Level 4 hospital	Dundori
Stadium	Bahati
Primary and secondary schools	In each ward
Recreational centre	Mariguini centre
Higher education centre	Wanyororo
Widows and widowers support centre	Maili kumi , Bahati
Widen roads	Along the town areas
Drainage system	Bahati, wanyororo
Agricultural facilities	Kimchoch

SOURCE: Nakuru Key Informants Survey Data 2016

Key Informants Suggestions for the Improvement of the Sub County

In general, the stakeholders felt that should also consider the issues listed below.

Rongai
<ul style="list-style-type: none"> • Plan for more funds for developments projects such as roads, health facilities, education. • Completion of projects within the ward e.g. Salгаа drainage and bus parking , Ngecha dispensary • Provide agricultural facilities • Complete the dispensary project in process- • Start a game reserve for tourist attraction • Good open air market at Kipsyerian • Tarmacking of Kampi ya moto • Development and upgrading of Rongai youth polytechnic(Kipsyerian)
Njoro
<ul style="list-style-type: none"> • Better garbage collection system • Upgrade existing hospitals • Equitable distribution of resources • Better road construction • Creation of Recreation facilities in the area- • Need for market in the area

<ul style="list-style-type: none"> • Modern slaughter house
Gilgil
<ul style="list-style-type: none"> • Improve social amenities • Proper maintenance of weather roads • Proper garbage collection • Street lighting • Improvement of infrastructure • County Government to take care of the elderly in the society
Kuresoi South
<ul style="list-style-type: none"> • Bring services near to people • Improve road network • Villages roads should be expanded • Distribution of county centres
Subukia
<ul style="list-style-type: none"> • All IDPs to be resettled • Well maintained roads- • Upgrade health facilities •
Molo
<ul style="list-style-type: none"> • Additional funding to all the social facilities in the sub –county • Lightings and proper roads all in the estates • Proper town planning and numbering of houses
Nakuru East
<ul style="list-style-type: none"> • Invest in security • Infrastructure development for a conducive environment for Growth • Reduced motorbike operators • All matatus should have a Sacco and those that don't should be penalized
Nakuru west
<ul style="list-style-type: none"> • Implementing made laws and policies in order to protect Public lands and open spaces available • Every development in the sub county should consider environmental sustainability
Kuresoi North
<ul style="list-style-type: none"> • Establishment of research institution and science and technology
Naivasha Sub county
<ul style="list-style-type: none"> • Gilgil, Naivasha and Susua should be one county • Develop one cultural heritage in Naivasha • Airstrip to be expanded • SGR railway to be established • Proper coordinated development
Bahati Sub county
<ul style="list-style-type: none"> • Boosters should be established to enhance communications • Establish an industry • Provision of reliable financial institutes and open market site-

SOURCE: Nakuru Key Informants Survey Data 2016

PART IV: PLAN PROPOSALS

Chapter Twelve: Development Strategies

12.1 Sector Plan Proposals

This chapter presents sector strategies detailing specific planning problems and the framework to attain the desired objectives for that sector that collectively led to the Nakuru County Spatial Plan. The strategies cover all sectors of development which include: Environment, Transportation and Infrastructure, Economic Development, agriculture, human settlement, social infrastructure, spatial and the existing land uses as well as CIP (Capital Investment Programme).

12.2 Transportation and Infrastructure Development Plan

Key issues in the transport sector include; poor road drainage /erosion, lack of facilities for Non-Motorized Transport (NMT) users in other areas. Other challenges include inadequate public transport provisions; poor state of roads and limited alternative roads; lack of effective traffic control measures like traffic signals, signs and road markings; poor intersection designs and traffic accidents.

12.2.1 Proposed Road Network Plans

The main existing transportation mode in Nakuru County is by road. For planning to the year 2025 it is anticipated that the county will have reached middle income status with the other country in line with national government vision 2030. It is in this respect that the road transportation network for Nakuru County can be divided into 5 classes as follows:

- i. National Road Network
- ii. Arterial Streets
- iii. Sub-arterial Streets
- iv. Collector Streets
- v. Local Streets

i. National and County Road Network

The major road in Nakuru County is A104, it is anticipated that this road will remain the main access road. This road needs annual routine maintenance, due to the nature of the soils and erosion through rains in the area. The routine maintenance is the obligation of the Kenya National Highways Authority (KeNHA).

It is proposed that these national and provincial trunk roads be reserved for motor traffic with full or partial control access. Sufficient wayleave for this road is to be provided for a full quadruple carriage development during the planning period. It is proposed a 60-metre corridor

be reserved for the A104. The design and construction of this road should be done in consultation with the County Office to incorporate local aspects needed in the design. These local aspects include but are not limited to pedestrian crossing facilities and allowance of animal human conflict on the road corridor.

ii. Arterial Streets

The arterial streets are meant for through traffic within the towns. These roads will be provided highways with fully or partially controlled access. Parking, loading and unloading are carefully regulated. Pedestrian and motor cycle facilities should be incorporated in this category of streets. An allowance for these roads to be improved to dual carriage should be allowed for. It is therefore recommended that a 60meter road reserve be allowed for in the proposed arterial roads.

iii. Sub-Arterial Streets

The town roads which provide lower level of travel mobility than arterial streets are called sub-arterial streets. Loading and unloading are usually restricted. Pedestrians are allowed to cross these highways at intersections. It is therefore recommended that a 45meter road reserve be allowed for the proposed sub-arterial streets.

iv. Livestock Corridors

These will serve as links for livestock due to the pastoralist nature of some of the residents in specific sub-counties like Rongai, Naivasha and Subukia. They will follow the path of the collector roads outlined above in case the pastoralists are not interested in going through town. These corridors shall each be 10m wide on both sides of the collector roads.

12.2.2 Corridors Design Principals

a. Continuous Corridors are better than Fragmented Corridors.

Corridors facilitate movement of animals through landscapes. Gaps in corridors disrupt movement. The ability of an individual to cross corridor gaps is dependent on its tolerance for edge conditions, its movement and dispersal characteristics (i.e., how fast it moves, and how far it moves at one time), the length of the gap, and the amount of contrast between the corridor and the gap.

b. Wider Corridors are better than Narrow Corridors.

Wider corridors reduce area and edge effects within the corridor. Thus, a broader range of animals are more likely to use the corridor.

c. Natural Connectivity should be Maintained or Restored.

Maintaining historical connections is essential and introduced connectivity should be studied carefully. Retaining or planting occasional

clumps of trees, shrubs, or forbs enhance corridor's value by providing a wider variety of cover types and a diversified food supply.

Planning Aspects

The following four planning aspects are to be considered as part of a step-wise decision-making process that will help determine whether an urban livestock passage is warranted on a highway facility.

1. Land-use planning considerations Area Structure Plans and Laws guide current and future land use decisions in urban areas and will influence decision-making when determining whether to incorporate an animal passage as part of the highway infrastructure. The effectiveness of passage structures can be compromised if current land-use within the town is not conducive to protecting livestock movements/corridors through urban areas (e.g. residential housing development including urban parks/playgrounds).
2. Alteration of a livestock corridor by future activity (e.g. commercial/ industrial or residential developments) may negatively affect livestock movement and, hence, the function and performance/usage of livestock passage structures. These passage structures should not be considered in areas where future planned development or increased human activity will negate the benefits of their construction. Additionally, livestock management plans may also exist at the provincial and municipal levels.
3. Existing animal paths should be identified where they exist and thoroughly reviewed to ensure that the livestock movement objectives in these plans are carefully considered.
4. Motorist safety is an important consideration when evaluating the need for a livestock passage structure.

Proposals

- 1) The livestock corridors are proposed along the hinterlands of the town and connected to the town's core through leeway along the major roads. The necessary watering points should be provided for at strategic locations along the corridors
- 2) Under passes should be provided for the livestock to reduce animals/ vehicular accidents along major roads.
- 3) The necessary wayleaves for livestock movement in sale yard and slaughter houses should be integrated with the road networks leading to these facilities.

v. Collector Streets

These are town roads which provide an access to arterial and sub-arterial streets. These are the roads proposed for location in residential, business and industrial areas. These roads are accessible from the buildings along them. It is therefore recommended that a 25-meter road reserve be allowed for the proposed collector streets.

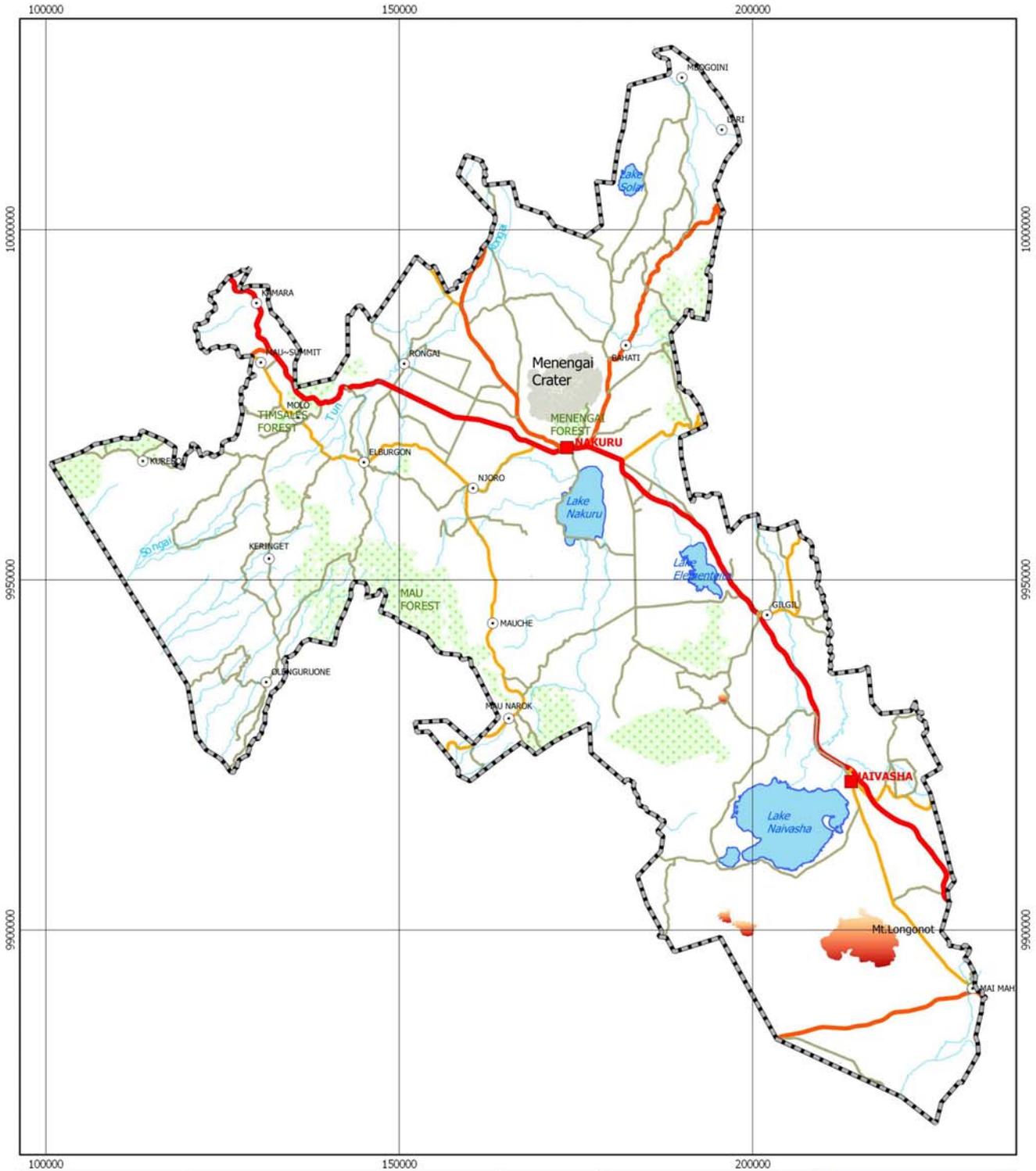
vi. Local Streets

These are town roads which provide an access to residence, business and other buildings are called local streets. The traffic carried either originates or terminates along the local streets. Depending upon the important of the adjoining areas, a local street may be residential, commercial or industrial. Along local streets pedestrians may move freely and parking may be permitted without any restriction. It is therefore recommended that a 15meter road reserve be allowed for the proposed local streets.

Planning Matrix

In order to set out a structured plan, it is important an existing assessment is carried out. This is achieved via juxtaposing two data inputs, one concerning the all roads while another concerning the tarmacked roads in Nakuru County. This can be seen in Map 12.1 and Map 12.2.

MAJOR ROADS NAKURU COUNTY



Nakuru County Government

Ministry of Land, Housing and Physical Planning

PROJECT

DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)

- LEGEND**
- Major Town
 - Other Town
 - Road Class A
 - Road Class B
 - Road Class C
 - Road Class D
 - Road Class E
 - Forest
 - lake
 - Hill

Scale 1:750,000

LOCATION MAP

Date: October 2019

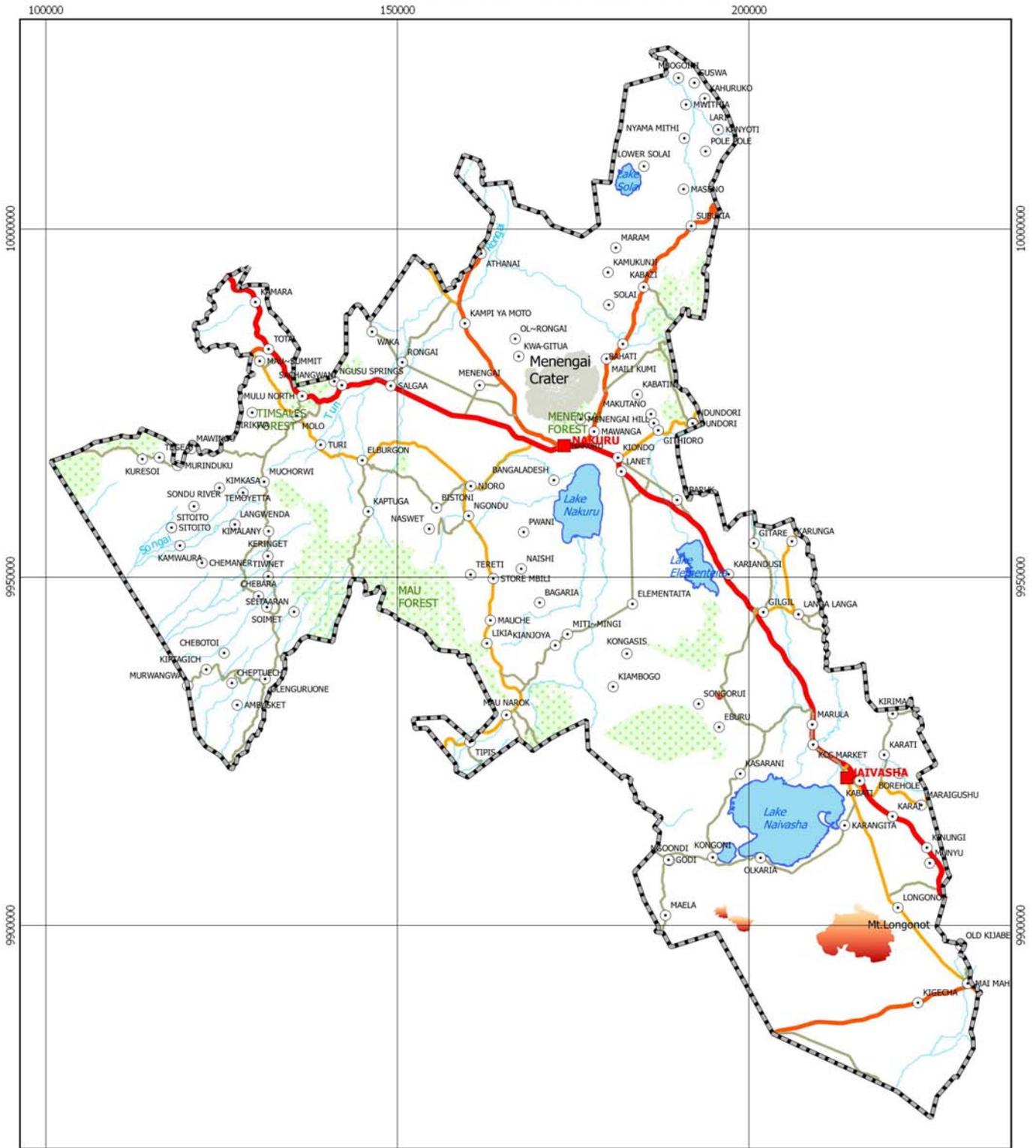
INTERNATIONAL GEOMATICS CONSULTANCY

Geomaps Centre .
Matumbato Road . Upperhill,
P.o Box 61071-00200.
Tel: 254(020)2715829,2713350.
Email:geomaps@geofafrica.com.

This map is not an authority on boundaries

Map 12.1: Major Roads in Nakuru County

TARMACKED ROADS NAKURU COUNTY



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town ● Other Town — Road Class A — Road Class B — Road Class C — Road Class D — Road Class E ■ Forest ■ lake ■ Hill 	<p style="text-align: center;">N</p>  <p style="text-align: center;">Scale 1:750,000</p>	<p>LOCATION MAP</p>  <p style="text-align: right;">Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829, 2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 12.2: Tarmacked Roads in the County

The proposed planning matrix recognizes a three-stage plan namely as short term in the year 2018, medium term in the year 2021 and a long-term plan in 2025. The proposed network for Nakuru County has all the roads in the area paved by the year 2025. The activities required to achieve this are outlined in tables below.

Table 12.1: Proposed Future Transport Network for Nakuru County (Short Term, 2015-2018)

Road Name	Section Length (Km)	Section Length (Km) Tarmacked	Road Reserve (M)	Current road Condition	Required Activities to Achieve Targets (2018)
Class A (A104)	155	155	60	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and expansion via reconstruction of trunk road. Periodic maintenance by KENHA.
Class B	116	116	60	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and expansion via reconstruction of trunk road. Periodic maintenance by KENHA.
Class C	273	199	45	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and expansion via reconstruction of trunk road. Periodic maintenance by KERRA.
				Gravel and earth road on minority of roads	Design and construction to bitumen standards
Class D	501	1	30	Gravel and earth roads on majority of roads.	Design and construction to bitumen standards
					Evaluation of the road condition, design and expansion via reconstruction of trunk road. Periodic maintenance by KERRA & CGN
Class E	555	14	20	Gravel and earth roads on majority of roads.	Evaluation of the road condition, design and expansion via reconstruction of trunk road. Periodic maintenance by KERRA & CGN
Arterial Streets	303	17	45	Gravel and earth roads on majority of roads.	Evaluation of the road condition, design and construction of arterial roads.
Sub-Arterial Streets	760	42	35	Gravel and earth roads on majority of roads.	Design and construction to gravel standards

Collector Streets	1518	83	25	Gravel and earth roads on majority of roads.	Design and construction to gravel standards
Local Streets	3036	166	15	Gravel and earth roads on majority of roads.	Design and construction to gravel standards

Source: Geomaps/ Habitat Planners, 2017

Table 12.2: Proposed Future Transport Network for Nakuru County (Medium Term, 2018-2021)

Road Name	Section Length (Km)	Section Length (Km) Tarmacked	Road Reserve (M)	Current road Condition (2018)	Required Activities to Achieve Targets (2021)
Class A Roads (A104)	155	155	60	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KENHA.
Class B	116	116	60	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KENHA.
Class C	273	273	45	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KERRA.
Class D	501	250	30	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KERRA & CGN.
Class E	555	280	20	Good maintainable tarmac road with camber. Drainage and NMT	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KERRA & CGN.

				facilities required.	
Arterial Streets	303	303	45	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KURA & CGN.
Sub-Arterial Streets	760	42	35	Gravel and earth roads on majority of roads.	Evaluation of the road condition, design and construction of sub-arterial roads.
Collector Streets	1518	83	25	Gravel and earth roads on majority of roads.	Design and construction to gravel standards
Local Streets	3036	166	15	Gravel and earth roads on majority of roads.	Design and construction to bitumen standards

Source: Geomaps/ Habitat Planners, 2017

Table 12.3: Proposed Future Transport Network for Nakuru County (Long Term, 2021-2025)

Road Name	Section Length (Km)	Tarmacked Length (Km)	Road Reserve (M)	Current road Condition	Required Activities to Achieve Targets
Class A Roads (A104)	155	155	60	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KENHA.
Class B	116	116	60	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KENHA.
Class C	273	273	45	Good maintainable tarmac road with camber.	Evaluation of the road condition, design and construction of trunk road and periodic

				Drainage and NMT facilities required.	maintenance by KERRA.
Class D	501	501	30	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KERRA & CGN.
Class E	555	555	20	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KERRA & CGN.
Arterial Streets	303	303	45	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KURA & CGN.
Sub-Arterial Streets	760	760	35	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by KURA & CGN.
Collector Streets	1518	1518	25	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by CGN.
Local Streets	3036	3036	15	Good maintainable tarmac road with camber. Drainage and NMT facilities required.	Evaluation of the road condition, design and construction of trunk road and periodic maintenance by CGN.

SOURCE: *Geomaps/ Habitat Planners, 2017*

Proposed Interventions:

Some of the targeted interventions for public transport are outlined below;

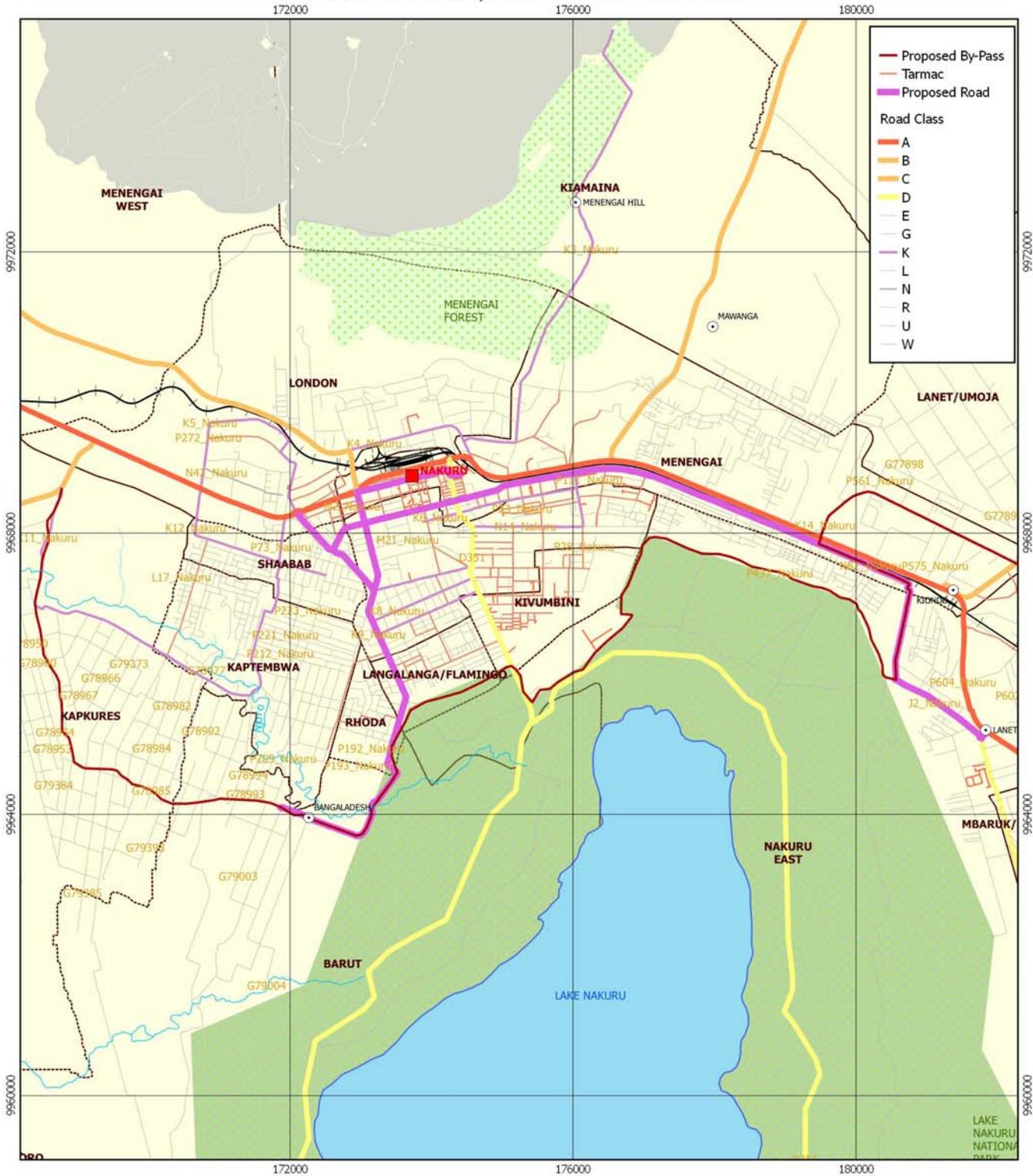
a Proposed Interchanges

The construction of interchanges at Mau Summit, Solai and Kunste in Nakuru County is scheduled to be complete by mid this year (2017). These interchanges will ease traffic along the Northern corridor, facilitate transport of farm inputs, produce and supplies and boost safety along the busy international transit corridor that also extends to Kericho. The interchanges are part of Vision 2030 flagship projects aimed at helping to cut the man-hours wasted in traffic jams on most roads in the country. A pedestrian underpass has also been included at Mau Summit to reduce accidents that is as a result of high commercial activity; this will help eliminate any possible conflict between pedestrian and vehicular traffic. Ramps have also been provided to access the pedestrian facility and hence will provide requisite development stimulus through reduced transport costs and travel times.

b Proposed Bypasses and New Roads

A bypass road is being constructed in the outskirts of Nakuru town. The road branches off Nakuru-Nairobi highway at Pipeline area through Naka and Mwariki estates to link up with the Nakuru-Njoro turn-off (Map 14.3)

NAKURU BY-PASS-K14, FREE AREA AND MWARIKI



<p>Nakuru County Government</p>  <p>Department of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town ○ Other Town — Main River — Minor River — Railwayline ■ Lake ■ Park ■ Forest ■ Lava □ Ward □ County New 	<p>Scale 1:75,000</p> 	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829, 2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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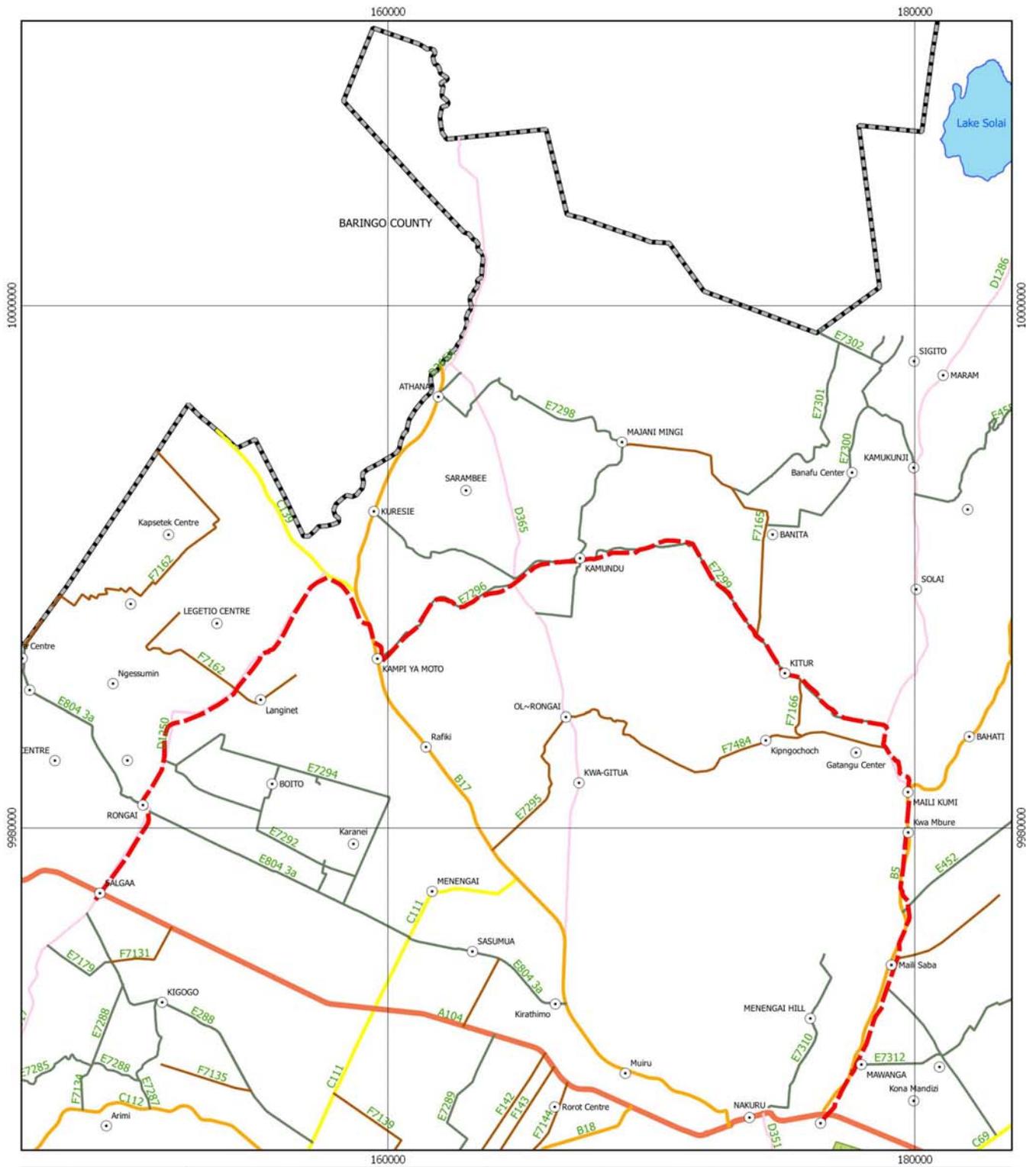
Map 12.3: Nakuru by -Pass-K14, Free Area and Mwariki

SOURCE: KURA South-Rift Urban Roads Revised Maps

The plan was designed by the then Ministry of Roads and Public Works in 1990s. Construction of the bypass was underway at the time of this report and proposed bypass is intended to decongest the town and ease traffic in the town, which is increasingly becoming congested owing to rapid growth.

Another road that was being planned by KURA at the time of this study was the Kunste-mailikumi -Kampi ya moto Salgaa -Nakuru Northern bypass. This road is to support the decongestion of the Nairobi – Nakuru Highway from travellers operating the northern routes through the Class B roads to Subukia and later Nyeri or the B17 towards Athinai. This road will link movement off the A8 spurring growth in the neighbouring localities.

KUNSTE-MAILIKUMI-KAMPI YA MOTO SALGAA-NAKURU NORTHERN BYPASS



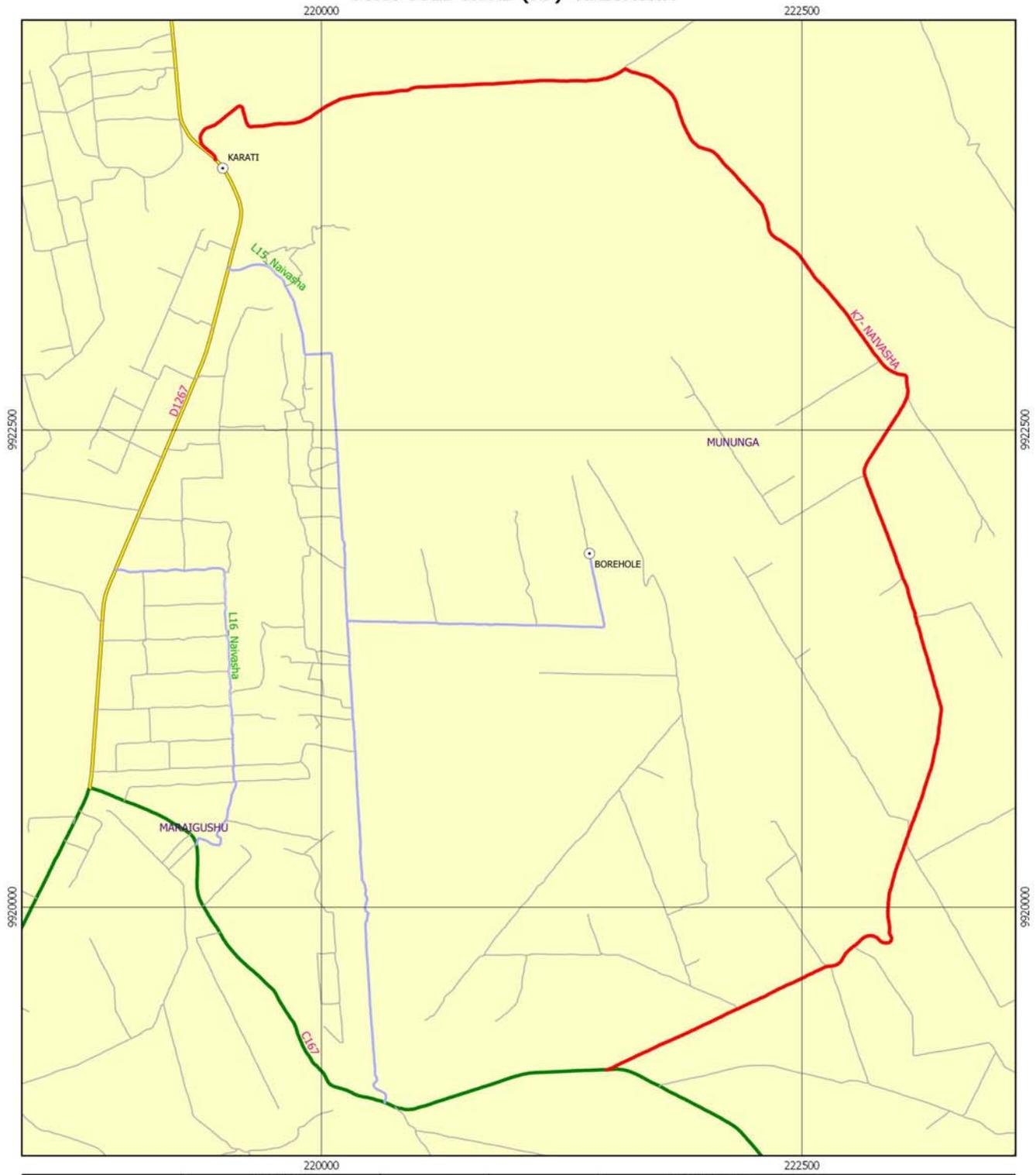
<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ○ Town — Road Class A — Road Class B — Road Class C — Road Class D — Road Class E — Road Class F — Proposed Road ⊞ County Boundary ■ lake ■ Park 	<p>Scale 1:200,000</p> 	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	<p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geofafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 12.4: Kunste-mailikumi -Kampi ya moto Salgaa -Nakuru Northern bypass

SOURCE: KURA South-Rift Urban Roads Revised Maps

A third road that was in the KURA plans was the Nakuru County-Naivasha road (Map 14.5). The road was being proposed to be built in Naivasha town to ease traffic congestion in the sub-county headquarters, reduce accidents and promote economic development in the region. This road will eliminate unnecessary traffic on the Nairobi – Nakuru Highway and allow growth in the adjacent areas.

PROPOSED ROAD (K7)- NAIVASHA



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ○ Market Centre — Proposed Road — Road Class C — Road Class D — Road Class E — Other Road 	<p>N</p>  <p>Scale 1:27,500</p>	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road , Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geofr.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 12.5: K7 - Nakuru County-Naivasha road
SOURCE: KURA South-Rift Urban Roads Revised Maps

A few Naivasha town roads were in the planning of KURA (Map 14.7). These roads included J1 and K3. These new roads are being proposed to be built in Naivasha town to ease traffic congestion in the town, reduce accidents and promote economic development in the region.

Proposed Truck/Bus Parks

Lorry parks have been proposed to be designed and constructed at some locations along the A104. There has been proposals for construction of bus parks at Kinangop Bus Park in Naivasha and rehabilitation and modernizing of bus parks in Nakuru town.

Proposed Interventions

- i. Establish intermodal terminals facility (vehicles, bodabodas, animal carts).
- ii. Provide parking spaces for lorries and other vehicles within the county at intervals of 40 Km (Truck and buses parks)
- iii. Improvement of NMT facilities such as provision of street shades, street seats, segregated walkways.
- iv. Proposed Interchanges.
- v. Proposed bridges and footbridges.
- vi. Upgrade link roads, provide bypasses and ring roads.
- vii. Provision of road side drainage.

12.2.3 Proposed Railway Network

Standard Gauge Railway

The Governments of Kenya and South Sudan have signed and ratified a Protocol for the development of an SGR connecting the port of Mombasa and Juba. Each country will develop the section of the railway line within its borders. Kenya is therefore developing the Mombasa – Naivasha section of the entire proposed network.

The Mombasa – Naivasha section is being developed in two phases:

Phase 1 Mombasa – Nairobi: is already under development having commenced on 12th December 2014, and is due to be operational by July 2017.

Phase 2 (Nairobi – Naivasha) : has been divided into three subphases as follows:

Phase 2A – Nairobi –Naivasha

(Tentative) Phase 2B –Naivasha – Kisumu including the development of a new high capacity port at Kisumu

(Tentative) Phase 2C – Kisumu –Malaba. The railway line will have a uniform design specification which will permit seamless operation across the borders of the two countries and in turn reduce transportation and production costs.

Construction of the second phase of the Standard Gauge Rail (Nairobi to Naivasha) is already underway, which on completion will help in transport of people as well as goods thus reducing congestion on the main roads that transverse the county.

The Governments of Kenya and Southern Sudan are committed to providing high capacity, cost effective railway transport within the Northern corridor. This will be achieved through the construction of a high capacity, high speed Standard Gauge Railway for passenger and freight transportation.

Some of the problems encountered during railway operations are being mitigated by the management. It has tried to solve these previously mentioned problems by deploying officers who carry out daily inspection and patrols along the railway line to ensure smooth running of the system.

12.2.4 Infrastructure development plan

Water supply

Demand and Supply Gap Analysis

Table 12.4 gives the water situation in Nakuru County. The Ministry of Water recommends that the per capita daily requirement of water should be 250 litres per day.

Table 12.4: Water Situation

Population		Water Demand by MoW standards (m³ per day)	Water Supply (m³ per day)	Deficit in Water Supply (m³ per day)	Remarks (m³ per day)
2009	1,600,000	400,000	140,729	~260,000	-Nakuru County: Supplied: 47,500 Demand: 89,000 (Nakuru Town) Capacity: 40,079 Supplied: 30,000 5 other major towns: Supplied: 11,650
2015	1,900,000	475,000	175,729	~300,000	Chemususu Dam in operation:

					35,000 Nakuru Town: Supplied: 20,000 5 other major towns: Supplied: 15,000
2018	2,100,000	520,000	175,729	~344,000	
2021	2,300,000	575,000	275,729	~300,000	Itare Dam: 100,000 Nakuru Town: Supplied: 60,000 5 other major towns: Supplied: 40,000
2025	2,600,000	650,000	650,000	-	By 2025 the water demand is projected to be fully satisfied.

SOURCE: *Geomaps / Habitat Planners Field Survey, 2017*

A water supply of only 140,729m³ per day does not meet the daily requirements of the residents and furthermore there are inadequate water storage tanks within the county. The water is pumped directly from the boreholes into the storage tanks and flows by gravity into the water kiosks and other water outlets.

From tests done on the boreholes by Water Resources Management Authority, the average yields of the boreholes were determined as 8.84m³per day. This translates to a maximum water supply of 8,840 litres per day.

Recommendation

The existing water supply of 140,729 m³ per day does not meet the demand of (400,000m³) living a deficit of ~260,000 m³. To satisfy this daily demand the following are recommended.

- Construction of water storage tanks would significantly reduce the shortage within the county.

However, the company has foreseen the construction and implementation of the following project;

- **London/Manyani Water Project to be completed-** This project involved extension of 29.7km of water pipeline with various sizes of pipes ranging in diameter from 1 1/4" to 4", construction of 40-yard tap fetching bays, installation of 166 customer meters and construction of meter chambers and installation of 15 territory meters.
- **Free Area/Kiratina Water Project to be completed** This project involved extension of 35.0km of water pipeline with various sizes of pipes ranging in diameter from 1 1/4" to 6", construction of 20-yard

tap fetching bays, installation of 190 customer meters and construction of meter chambers and installation of 9 territory meters.

- **Mzee Wa Nyama Water Project to be completed** - This project involved extension of 16.5km of water pipeline with various sizes of pipes ranging in diameter from 2" to 6" and construction of five water kiosks.
- **Manyani Prepaid Water Meter Project completed on June 2013** – This project entailed construction of fetching bays and installation of 15 prepaid water meters.
- **Lakeview, Gilanis, Rhonda, London and Mwariki Prepaid Water Meter Project** - The project involved construction of fetching bays and installation of 80 prepaid water meters. It was completed on September 2013.
- **Githima, Bondeni, Misonge Water-** The project involved extension/improvement of 10.5km of water network with various sizes of pipes ranging in diameter from 1 ½" to 4" and construction of 15-yard tap fetching bays completed on October 2013.
- **Baruti Water Project it involved** - Extension/improvement of 17.6km of water network with various sizes of pipes ranging in diameter from 1" to 2", construction of one water kiosk and 10-yard tap fetching bays. The project was completed on October 2013.
- **Recent Completion of Chemususu Dam:** This was commissioned to supplement the water deficit in Nakuru County, the total capacity is 35,000 m³/day. Nakuru town is to be supplied with 20,000 m³/day, while the intermediate towns will get a supply of 15,000m³/day.
- **Completion of construction of Itare dam.** This will be commissioned in 2022. The total capacity will be 100,000 m³/day. Nakuru town will be supplied with 60,000 m³/day, while the intermediate towns will get a supply of 40,000m³/day.

Sanitation

An average of 80% of the water consumed is converted into waste water. In Nakuru County there is a centralized waste water disposal system, hence sanitation is achievable under considerably less strain in some of the major towns. Currently the figures show the wastewater that is produced in public and private pit latrines, septic tank and openly is disposed in the other urban town into the river systems. This waste water has to be considered and catered for to ensure proper hygiene and prevent outbreak of communicable diseases. Table 12.5 shows the projected situation of sanitation of Nakuru County.

Table 12.5: Projected Situation of Sanitation in the County

Year	2009	2015	2018	2021	2025
Perceived Ideal Supply (m³)	400,000	475,000	525,000	575,000	650,000
Assumed Volume of Waste (m³) 80%	320,000	380,000	420,000	460,000	520,000

Electricity / Energy / Power

Well-functioning, reliable and competitively priced electricity supply is a critical factor for both the wider economic development of a country and the quality of life of ordinary consumers. First, electricity is one of the infrastructural enablers for sustained economic growth by providing the energy needed for the acceleration in industrialization and local production as well as service provision in the tertiary sector. Sufficient installed electricity capacity coupled with affordable electricity tariffs for large scale industrial consumers are expected to generate sustained economic growth, employment opportunities in the respective growing sectors and, therefore, a reduction of poverty in the longer-term. Secondly, the ability to access electricity that is affordable and most importantly reliable is a major determinant for the quality of life of Kenyan citizens. For those consumers that are not connected to the electricity grid in Kenya, such as the majority of rural consumers, the priority of energy policies is to extend access to electricity to those currently excluded

Due to the many activities, such as agricultural, tourism, industrial, trade and commercial activities that are undertaken in the county of Nakuru, there is need for an efficient, reliable and sustainable energy services which provide and cater for the impulse development of these sectors that contribute to the county's economic growth. Nakuru County has great ability and immense opportunity for development of power sector to meet both the present and the future power demand that are as a result of the rapid growing population and the expected high per capita income.

The spatial plan of the county involves coming up with a development programme that will increase the power generation capacity to meet the present and the total future demand as well as decreasing the power shortage during normal and peak load periods. Some of the reforms that maybe undertaken include increasing installed power generation, enhancing access to electricity, improving the operational efficiency of power utilities, facilitation of private sector investment in Kenya's energy sector and the exploration and development of new sources of energy such

as geothermal, coal and renewable energy sources to meet the energy requirements of the country for the medium term .an organized and coordinated plan will be implemented showing how existing regional grids will be upgraded and how new power plants will be set up.

Possible Solutions

As a result of the high and increasing load demand in the county there is need to improve and enhance the existing energy resources as well as adapting new and efficient sources of energy for the county. Other sources of renewable energy sources like solar, biomass and waste energy (recycling) can also be used to meet the demand. Some of the potential energy sources that could be adopted to meet the Kenya Vision 2030 and as per the ministry of energy include, geothermal sources, Hydro Resources, Coal Resources, Wind Resources, Biomass Resources, Solar Energy Resources.

(1) Hydro Resources

Hydroelectric power in Kenya currently accounts for about 49% of installed capacity, which is about 761MW. Kenya has considerable hydropower potential consisting of large hydro's (sites with capacity of more than 10MW) and small hydros. Of the large hydro's, 750MW has been exploited and accounts for about 50% of installed electric power generation capacity as at 2011 while about 1,450MW remains unexploited. Potential for small hydros is about 3,000MW, 45%of which is located in the Lake Victoria Drainage basin; only about 30MW had been developed. The hydroelectric power potential of economic significance available for large scale power development is estimated to be 1,500 MW of which 1,310 MW is for projects of 30 MW or bigger. This high production in located in Lake Victoria basin (434 MW), the Rift Valley basin (264MW), Athi River basin (109 MW), Tana River basin (604 MW) and on Ewaso Ngiro North River basin (146 MW)

With the introduction of the Feed-in-Tariff (FiT) policy in 2008 small-scale candidate were developed for supply of villages, small businesses or farms, as well as grid supply. The Ministry of Energy has carried out feasibility studies for small hydros in tea growing and other agricultural areas covering twelve sites with an estimated combined potential generation capacity of 33MW.

Some of the challenges facing development of hydro resources in the county are;

- Conflicting and competing land and water uses between various sub-sectors of the economy with regard to development and utilization of the same for electricity generation.

- Relocation and resettlement of affected persons.
- Hydropower is vulnerable to variations in hydrology and climate.
- Inadequate and poor-quality hydrological data captured.

(2) Geothermal Resources

Geothermal energy utilizes natural steam from the earth. Geothermal resources in Kenya are mainly located along the Kenyan Rift especially within Nakuru County, which is part of the eastern arm of the African Rift.

Table 12.6: Geothermal Power Plants

Plant	Installed Capacity (MW)	Effective Capacity (MW)	Year of Commissioning
OlKaria I	45	44	1981/1983/1985
OlKaria I AU	150.5	140	2014
OlKaria II	105	105	200/2010
OlKaria IV	149.8	140	2014
Eburru	25	23	2012
Wellhead	71.1	66.5	2015

The primary forms of utilization of geothermal energy in Kenya currently are mainly electric power generation 99 per cent (168 MWe) and direct uses (~18 MWt) to a small extent. Geothermal energy is now the leading energy source in the country and supports the base load energy requirements, the current installed geothermal power by KenGen 150 MW and IPPs generate about 52 MW, the planned geothermal production will generate up to 280 MW of electricity. This only shows that only a small fraction of the estimated resource potential has been developed. KenGen's geothermal power plants built to exploit geothermal energy are listed in Table 12.6.

Other potential areas identified for the production of geothermal power are, Suswa, Longonot, OlKaria, Eburru, Menengai, ArusBogoria, Lake Baringo, Korosi, Paka, Lake Magadi, Badlands, Silali, Emuruangogolak, Namarune and Barrier.

The major challenges for geothermal resources are:

- High upfront investment costs
- Competing and conflicting interests in use of natural resources.
- Relatively long lead time of between conception to production of electricity

(3) Solar Energy Resources

Solar energy can be used for lighting, heating, drying and generating electricity. Kenya's geographical location astride the equator gives it unique opportunity for a vibrant solar energy market. The country receives good solar insolation all year round coupled with moderate to high temperatures estimated at 4-6 kWh/m²/day. Solar energy is widely used for drying coffee, cereals, vegetables, fish, hides and skins; for water heating; and for electricity generation using photovoltaic (PV) systems. As at per now Kenya is well known for a large-scale market-driven penetration of small PV systems with capacity of 12 – 50 watts' power (Wp) consisting of low-cost amorphous silicon modules and both mono- and polycrystalline silicon modules. It is projected that by 2020, the installed capacity of solar photovoltaic systems will reach 10MW generating 22 GWh annually

The country has great potential for the use of solar as a means of energy. Currently solar water heating systems are mainly used in homes, hotels, hospitals and learning institutions. The demand for solar water heating (SWH) is projected to grow to more than 800,000 SWH units by 2020. This represents a growth rate of 20% per annum. This demand will mainly be from domestic, institutional and small commercial consumers spurred by the operationalization of the energy (Solar Water Heating) regulations.

The number of solar home systems installed has grown at an average of 20,000 units per annum for the last three years. Currently over 4 million households in rural Kenya which have solar home system. This may bring down conventional use of non-renewable power demand.

Some of the challenges that might be associated with the use of solar as a means of electric energy include;

- Lack of appropriate credit and financing mechanisms to facilitate acquisition of solar technology
- Rampant theft of solar photovoltaic panels, which discourages their installation
- The percentage of solar energy harnessed for commercial and domestic applications is insignificant relative to the potential.
- The cost of solar home systems has remained beyond the reach of many potential consumers despite favourable tax incentives.
- Lack of awareness on the potential, opportunities and economic benefits offered by solar technologies

Due The high production costs associated with unreliable and expensive energy the county's agricultural exports mainly pyrethrum and horticulture becomes less competitive in global markets. Furthermore, the

high costs weaken the growth and development of potential urban centres in the county to become industrialized. There is therefore need to exploit green energy sources and increase efficiency in energy consumption in the county.

(iv) Other Alternative Sources of Power

Other Alternative Sources of Power such as Automatic Generators have been supplied and installed in the county's office to reduce the rate of power consumption.

The county has developed and constructed street lighting master plan and management plan and policy for the whole county. Other energy saving measures such as the use of renewable energy sources in street lighting by use of solar lighting, use of LED lights and introduction of high masts light timers have also been explored.

12.2.5 Transportation and Infrastructure capital investment Development Plan

Table 12.7, shows a summary of crucial proposed transportation and infrastructure developments and their subsequent capital investment expenditure. It will require both National and County governments for realization of proposed projects.

Table 12.7: Transportation Capital Investment Plan

PROJECT				ESTIMATED COST(KSHS)	TIME FRAME	ACTOR	REMARKS
					-Short (2018)		
					-Medium (2021)		
					-Long (2025)		
TRANSPORTATION							
1.	<i>Total Length</i>	<i>Tarmac ked</i>	<i>Road Name</i>	<i>ROADS</i>			
	155	155	Class A - (A104)	15.5 billion @100million/km	Short	KENHA	To at least 6lanes within CBD & dual carriage within county
	116	116	Class B	10.44 billion @90million/km	Medium & Long	KENHA	To at least 6lanes within CBD & dual carriage within county
	273	199	Class C	21.84 billion @80million/km	Medium & Long	KERRA	To at least 6lanes within CBD & dual carriage within county
	501	1	Class D	35 billion @70 million/km	Long	KERRA / CGN	To at least 6lanes within CBD & dual carriage within county
	555	14	Class E	32.4 billion @60 million/km	Long	KERRA / CGN	To at least 6lanes within CBD & dual carriage within county
	303	17	Arterial Streets	15.73 billion @55million/km	Short	KURA / CGN	
	760	42	Sub-Arterial Streets	32.3 billion @45million/km	Medium & Long	KURA / CGN	

	1518	83	Collector Streets	50.3 billion @35 million/km	Medium & Long	CGN	
	3036	166	Local Streets	57.4 billion @20 million/km	Long	CGN	
<i>ASSOCIATED ROAD AMENITIES</i>							
			Bus-station (6500 sqm)	97.5 million	Medium	CGN / KURA	Requires stalls & drainage
			4 truck parks	400 million @ 100 million each	Medium & Long	CGN / KURA / KENHA	Total, Gilgil, Mahi Mahiu @10acres each.
<i>AIR TRANSPORTATION</i>							
			Nakuru Airport	5 billion	Medium & Long	TCG & KAA	Build and upgrade.

Project		Estimated Cost(Kshs)	Time Frame	Actors	Remarks
Infrastructure					
Water supply	Drilling of more boreholes (15 No. s)	45 million (@Ksh. 3m)	Short & Medium	WRMA & CGN	Should be situated in the drier sub-counties of Nakuru County (Rongai, Gilgil and Naivasha)
	Dams(Itare)	34 billion	Medium & Long	National Government.C GN, WRMA &Relevant construction authorities	Project is ongoing
	Storage tanks provision (rain harvesting) 35 No. (750m3 each)	87.5million @2.5 million	Short, Medium & Long	WRMA, NCG& Sewerage & Water Co.	
Water Treatment Plants	Provision for clean & safe water (11 nos)	660million @60million each	Medium & Long		Centralized; Each subcounty to have water treatment plant.
Sanitation	lagoons	45million	Short & Medium	NCG, Sewerage and water company	More land needed
	Dumpsites/com posting pits	30million	Short & Medium		Manure production, more land needed
	Sewerage Treatment System (10nos) 540,000 m3/ day	4.75 billion @475million	Medium & Long		Can be done in Njoro areas. Can adopt Sequence Batch Reactor (SBR) System, stabilization ponds, extended aeration

12.3 Environmental Strategy

The environmental strategy proposes mitigation measures to the various environmental challenges identified in the county.

12.3.1 Strategy for County Disaster Management for Geologic, Climatic and Human Disasters

The geologic disasters (earthquakes, land subsidence, and landslides and mudflows), climatic disasters (floods and droughts), and human disasters (road accidents, rift valley fever, HIV/AIDS, etc.) will be planned and managed. The tasks will include research, mapping and determining levels of vulnerability amongst the residents.

- Build and maintain IT assisted capacity in EARS countries with the involvement of governments
- Revive and extend the KNSN for a greater coverage and effective seismic monitoring in Kenya.
- undertake public education and make concrete plans on disaster management and prepare for volcanic eruptions, fractures, floodplains, sensitive areas of slopes,
- Disaster mapping of the entire county to guide building standards and land use bylaws.
- Revise the Code of Practice for the Design and Construction of Buildings and other Structures in relation to Earthquake (1973)
- Establish quick response disaster management team at the sub county level. The National Operation Centre of the Office of the President chaired a key stakeholders meeting of emergency stakeholders and agencies.

12.3.2 Strategy for Solid Waste Management (SWM)

The activities will include:

- Identifying and carrying out environmental feasibility of land for solid waste management
- Rehabilitation of Nakuru Town dumpsite
- The county government to provide for litter bins in all the urban nodes and soure areas.
- The county government to acquire and provide waste transfer trucks
- Encourage public private partnerships in waste collection and disposal
- The county government of Nakuru to promote public awareness on methods of sorting waste

- The county government of Nakuru to open up access roads in low income settlements for easy collection of wastes

12.3.3 Strategy for Storm Water Drainage and Sewerage Treatment

- Establishment of storm water drainage channels from Lalwet to Ndaruku
- Expand the existing storm water drainages and provide new drainage channels in areas within the county that is prone to floods.
- Construct water retention facilities like retention ponds, dams and tanks in areas within the county that is prone to flooding
- Nakuru county government to make water harvesting a mandatory requirement in all development approvals.
- The county government of Nakuru to enhance planting of trees in areas prone to flooding to reduce surface runoff

Promotion of Agro-Forestry and Green Economy

The issues include uncontrolled tree cutting, bush clearing, logging and deforestation; high demand for timber, charcoal and wood fuel; forest encroachment for farming; non- adherence to existing policies; Forest and bush fires.

- Enforce the policy on 'Farm Forestry Rules' in 2010 which requires that all farmlands increase their trees species to 10 per cent per land hectare.
- Introduce farm forests as an income generating activity.
- Establish active Women and youth groups in producing seedling and selling the same, such as "Trees for jobs programme" in the Department of Youth Development.
- Sawmills like Timsales be required to replant depleted sites.

12.3.4 Strategy for Wildlife Conservation and Tourism Promotion

In order to resolve human wildlife conflict, the following activities will be implemented:

- Identification and zoning of corridors for wildlife to remove encroachment.
- Establish wildlife conservancies along corridors to maintain the habitat.

12.3.5 Strategy for Water Resources Management, Water Supply and Sanitation

The following activities have been planned for protection of water catchment areas:

- Harvest best practices in catchment management based on great improvement in water resources management in the Lake Naivasha-Malewa river basin as a result of payment of ecosystem services (what are these best practises).
- Control pollution of lakes and rivers by planting trees along the riparian reserves.
- Control encroachment and cultivation on riparian reserves/wayleaves, riparian areas.
- Reduce high siltation levels of Lake Naivasha by preventing water erosion and conservation of the catchment areas of the rivers feeding the lake.
- Formation of Water Resource Users Associations (WRUAs) at the sub county levels.
- The county government of Nakuru to Provide sewerage networks for all urban areas.
- The county government of Nakuru to provide for sewerage plan in Kaptembwa.

12.3.6 Strategy for Sustainable Land Management (SLM)

Soil erosion is dependent on topography, rainfall and soil types. Water erosion is common in the degraded forest areas, mountains and limited vegetation cover. The Highlands such as Mau, slopes of Kinangop, Eburru, Longonot and Menengai. Similarly, gully erosion is rampant in northwestern part of the catchment. Areas undergoing serious erosion include newly opened forest zones zones. The county experiences strong winds that have serious detrimental effects on soil. The winds contribute to the transmission of air borne diseases and therefore are a serious threat to the health of the residents. The strong winds especially in the bare lands of the county (particularly in semi-arid regions which include Rongai and Naivasha sub-counties) accelerate soil erosion and land degradation leaving the land bare and unsuitable for cultivation.

The following activities have been planned for SLM:

- Afforestation programme through the Kenya Forest Service as well as the Kenya Youth Empowerment

- Ministry of Agriculture through its various extension services in collaboration with partners will improve the planned objective of preventing soil erosion.

12.3.7 Strategy for Energy Exploration

- Renewable energy for tea factory to replace wood fuel
- Provide an alternative source of energy including solar, biogas, etc.

Table 12.8: Environmental Plan Implementation Matrix

Issue	Causes	Objectives	Locality	Strategy	Programme(s)	Actor	Costs (Kshs)
Lack of disaster management	Lack of information;	Identify types of disaster, prepare vulnerability assessment and maps; establish disaster management plan	Landslides in Ghorofani, Amalo ward, Olenguruoni	Improve disaster preparedness for the county	<ul style="list-style-type: none"> Enhance community capacity Build strong institutions to carry out research, monitoring and implement rescues. 	Nakuru County Government (NCG), NDMA, MENR	1.3 billion
Poor solid waste management (SWM)	Lack of appropriate waste disposal systems	Improve solid waste management in urban areas and small towns	urban areas and town in Nakuru County	Identification of new and appropriate dumpsite for all towns Waste	Feasibility study on SWM in each urban and rural centres	Nakuru County Government (NCG), MENR, NEMA	2.4 billion
Poor storm water drainage and sewerage treatment			Kaptembwa and Rhond in Nakuru West, Nakuru East, Kikopey in Gilgil, Naivasha, Olenguruoni, Kuresoi South, Lalwet to Ndaruku in Nakuru West		Feasibility study on SWM in each urban and rural centres	Nakuru County Government (NCG), RVWSB, NEMA, MWI	3.5 billion
Water resources management, water supply and sanitation			Survey and planning for Nakuru County, water quality especially fluoride, water supply, feasibility for dams Survey and rehabilitation of springs Water pollution control			Nakuru County Government (NCG), MWI, RVWSB, NWASCO	1.2 billion
Mineral and Energy exploration			Geological and geophysical mineral exploration survey for the county Renewable energy potential			Nakuru County Government (NCG), MEM, MENR,	360 million
Sustainable land management (SLM)			Land degradation survey and planning for climate change Soil and water conservation in Kuresoi, Molo, Bahati			Nakuru County Government (NCG), MoALF, KARLO	2.0 billion

Issue	Causes	Objectives	Locality	Strategy	Programme(s)	Actor	Costs (Kshs)
			Sulphur contamination in soils in Rongai				
Wildlife Conservation and Tourism promotion			Human wildlife conflicts in Naivasha, Gilgil, Nakuru East, Nakuru West; Environmental management plan for L. Elementaita			Nakuru County Government (NCG), KWS, KFS, KTDC	3.7 billion

12.4 Economic Strategy Proposals

An economic strategy has been proposed, integrating development of all economic sub-sectors within the county. At present, there is great need to arrange the priorities for development from the realities on the ground. According to the field survey, the state of rural access roads is despicable; especially within farther reaches of the Mau Escarpment, the Subukia sub-county, the remote parts of Naivasha sub-county and other areas. Since the improvement of the rural accessibility is critical to the economic development of the county, it has been highly prioritised. The proposed strategies for specific areas have been classified below:

12.4.1 Revenue and Expenditures

Nakuru County collects large amounts of revenue every financial year. Even then, the revenue collected can be enhanced to support the capital expenditures proposed in this CSDP. Apart from the proposed improvements in different sectors, several operational and structural changes in the collection of revenues should be affected. These have been discussed below.

Proposed Strategies to Enhance Revenue Collection

1. The Use of Technology in Tax Collection to Reduce the Wage Bill as a Percentage of the Total County Expenditure

The county government of Nakuru spends nearly three quarters of its revenues on paying workers and other expenses. Workers, in particular, are paid around 45% of the total budget allocated to the county. This can largely be attributed to the repetition of tasks in some areas. However, the use of technology should be aimed at enhancing the operating efficiency as opposed to laying off workers or reducing their wages. To achieve this, technology should be harnessed in the following ways:

- a. The use of *e-Nax Pay* in the collection of parking fees
NCG should partner with mobile payment services such as M-Pesa and Airtel Money to come up with a mobile payment system to be used in the payment of parking fees. As noted in the ZIZI System that is currently in place, a cashier, supervisor and clerk are tasked with the collection of parking fees and monitoring to avoid misappropriation. The use of a mobile payment system would reduce the number of the employees involved to only one (cashier) who would be tasked with ensuring that all those parking their vehicles in major towns have paid their taxes.
- b. The use of direct mobile transfer services or direct bank transfers in the payment of different taxes and licensure. This would minimize the need to visit the county offices, thus reducing the need to have many staff members in the county offices.

2. Strict Adherence to the Set Targets

Currently, Nakuru County Government has been unable to realize its revenue targets for the last three financial years. In some cases, the variance between the set targets and the actual amounts collected is very large. Unfortunately, this hampers the effective planning as planning is based on budget forecasts. The county government should seek to come up with strategies at the beginning of each year on how to realize the set revenue targets. Mini-targets (monthly, quarterly, and semi-annually) should be set for effective control and monitoring.

3. SWOT Analysis of the Strategies Being Employed Currently

Based on the revenue collection in the last three financial years, the strategies being employed currently should be improved to ensure higher revenue collection. For instance, the reduction in revenue collection from certain sources, such as parking fees, house rent, and slaughter fees, which ought to have increased, is an indication of inefficient strategies in revenue collection. To avoid such pitfalls, the county government should carry out periodic SWOT analyses of these strategies to point out their weaknesses and opportunities for improvement. Threats that such strategies may be facing, such as user fraud, should also be noted and resolved.

4. Introduction of a Levy on Bed Occupancy

Nakuru County is a major tourist destination in Kenya. This has led to many investors establishing hotels and lounges to accommodate the high number of people visiting the county. Since this move reduces the investment in real estate targeted at commercial and residential purposes, a tax should be introduced to ensure revenue generation from these activities. The tax should be set as a percentage of the gross revenues of hotels and lounges in the county. Extensive stakeholder involvement should be embraced to ensure the setting of a realistic levy and to avoid resistance from the investors and/or a discouragement of investment in this sector.

5. Enacting New Regulation to Monitor the Collection of Cost Sharing Fund from All Health Facilities

Currently, there is no law monitoring the collection of the Facility Improvement Fund (FIF) from public health facilities, other than Level 4 and Level 5 hospitals. This revenue provides an avenue for cost sharing between the government and users of public health facilities in running these facilities. This inhibits revenue collection from such facilities and puts a major financial strain on the county government in financing them. As such, new regulation should be enacted to facilitate the collection of this revenue. The regulation should be consistent with the Public Finance Management Act, 2012. The user fees set should not be very high so as not to discourage the utilization of health services from public health facilities.

Proposed Strategies to Enhance Budget Execution Rates

1. Enhancing Operating Efficiency

Recurrent expenditures account for the largest share of all expenditures in Nakuru County. To reduce this, operating efficiency should be enhanced by minimizing or eliminating some recurrent expenditure. For instance, the county should seek to reduce the number of employees or eliminate the growth in the number to reduce the percentage of the budget paid out in salaries. This can be done through increased use of ICT technologies and mechanization. For instance, the revenue collection officers can be reduced by embracing mobile payment methods and other tech-savvy approaches.

2. Streamlining the Procurement Process

Nakuru County Government should shorten the procurement process to secure the early commencement of development projects. For this to be realized, procurement processes should be started at the earliest point possible, even before the disbursement of funds from the national kitty.

3. Capacity Building at Different Departments

Nakuru County Government should invest in developing the capacity of its different departments to executing projects. This should entail training its staffs and hiring highly qualified professionals from different fields.

12.4.2 Transport and Infrastructure

Nakuru County is served by both rail and road transportation infrastructure. However, the current transportation network is in a bad condition, especially in the rural areas. In other cases, the transportation network does not meet the needs of citizens given its failure to enhance connectivity within the county, as well as with other counties.

Proposed Strategies to Make the Transport Infrastructure Economic-Friendly

1. Link the SGR with Tarmacked Roads

The ongoing Standard Gauge Railway project is expected to increase the accessibility of Nakuru to other regions. In particular, it is expected to link it to the port of Mombasa and the capital, Nairobi. Businesses and industries can benefit from using this railway network in the transportation of raw materials from local and international sources, as well as the exportation of finished goods to local and international markets. Since the SGR will be connected to the dry port in Naivasha, an extensive road network connecting the SGR and dry port with the rest of Nakuru County

should be put in place. The roads should be tar marked and linked to the existing road network.

2. Improve the Conditions of Roads in Rural Areas

One of the major challenges facing Nakuru County is the lack of accessibility to rural areas, especially during the rainy season. This has contributed to losses and increased costs, which are incurred by those conducting economic activities in the remote regions. Notably, farmers incur high post-harvest losses or forced to pay very high costs for the transportation of their commodities. Poor rural accessibility also discourages investments in these areas. To resolve these problems to economic development, NCG should seek to improve the conditions of the roads in rural areas to tarmac or gravel standards. The areas with the poorest accessibility, such as Olunguruoni and other remote parts of Kuresoi North, Kuresoi South, Njoro, Molo, and Subukia sub-counties, should be prioritized.

3. Improve the Conditions of the Roads Connecting Nakuru and Other Counties

Although the road network in Nakuru County is fairly well-established, it does not serve all sections of the county equitably. For instance, beyond Mwisho-wa-Lami it is difficult to proceed farther into Narok efficiently, due to the rough nature of the road connecting the two regions. To increase inter-county connectivity, which could enhance trade and other economic activities, the county government should seek improve the conditions of such roads. This would increase the accessibility of the areas near the county borders, as well as the accessibility of neighboring counties as a market for products emanating from economic activities in Nakuru. Other counties whose connectivity to Nakuru County should be looked into include Laikipia through Nyahururu, as well as Isiolo.

12.4.3 Agriculture and Allied Activities

Nakuru County is primarily an agricultural-based economy. Most of the households in the county rely on agriculture, livestock keeping and fishing, as well as other allied activities, for income generation. However, this sector faces numerous challenges, which curtails the high potential of agriculture as an income-generating economic activity. Among the challenges faced in this sector include low productivity, high post-harvest losses, lack of the necessary support and poor access to the market among others. Several strategies have been suggested to enhance the role played by the sector in the county's economy.

1. Provision of High-Quality Seeds and Raw Materials

Part of the reason why the agriculture in some parts of Nakuru County has low productivity is the poor quality of seeds and other raw material used. A quarter of the farmers may be using low-quality seeds, which may have an adverse impact on the level of productivity. The County Government should take an active role in sensitizing farmers on the need to use high-quality seeds for higher productivity. This should be done by conducting training and sensitization campaigns, especially during the planting seasons. Farmers should be advised on the appropriate seeds to use given the weather projections during different seasons.

2. Enhancing the Reach of Extension Services

Over 74% of farmers in Nakuru County lack access to extension services. This denies them of the necessary support to aid them participate in high-production practices. The county government should invest funds to hire more extension workers. Farmers should be organized into groups and educated on different matters. This would increase the efficacy of the training programs, as opposed to training farmers on an individual basis.

3. Value Addition

Although agriculture is the leading economic activity in Nakuru, the proceeds that residents get from this sector are minimal. Most of the farmers, livestock keepers, and fishermen sell their products with no value addition. As such, such products only fetch a small price. To increase the profitability from agriculture and allied activities, the county government should put in place measures to support value addition. NCG should establish canning industries, tanning industries, milk-processing industries, among other processing industries to support producers in this sector. In particular, products intended for exportation should be exported in their processed forms, as this would increase the revenues obtained by farmers.

4. Training on Post-Harvest Practices

The high post-harvest losses are a major concern in agriculture, livestock keeping and fish-keeping in Nakuru County. The poor knowledge of training centers among the residents has led to the poor utilization of training services. The county government should increase the residents' awareness of training centers and dedicate more funds on training them on how they can manage excess harvests to avoid losses.

12.4.4 Commerce

The commercial sector in Nakuru also plays a key role in economic development, especially in the urban sectors. However, most commercial enterprises engaging in the retail business are small and lack the necessary resources to grow. NCG can enhance the success of such enterprises through various strategies.

1. Promotion of the Private Sector Participation

The County Government relies on the private sector for economic development to a very large extent. For the sector to grow, NCG should increase the participation of private sector players by involving them in formulation of strategies affecting them. Also, the tendering process at the county level should set aside a 20-30% of all tenders for micro and small-scale enterprises.

2. Financial Support

Although NCG offers financial support to businesses through the Joint Loans Board, such loans are only accessible by existing businesses. Besides, there is low awareness among residents of the existence of this facility. It is recommended that the financial service be extended to new businesses to promote the growth of the private sector. The county government should also make more effort in creating more awareness of the existing of this fund, including how to access it.

3. Business Counselling and Training

The Department of Finance and Economic Planning in the NCG should set up business counselling and training programs to equip existing and aspiring businesspeople on the how to start and run their businesses successfully. The training programs should feature aspects regarding business establishment, access to finance, business registration and licensure, and business expansion among others.

4. Minimised Business Requirements for the Jua-Kali Sector

The Jua-kali sector is recognized as one of the key sectors in the economy of Nakuru. However, these businesses are characterized by low operational efficiency given their small scale. The cost of operation of these businesses relative to their capital base is also high. To reduce this cost, NCG should ease the operational requirements for players in the informal sector. In this case, they should only be required to remit a small levy to the county government (either weekly or monthly) as opposed to imposing a large sum of fees to be paid once annually.

12.4.5 The Industrial Sector

Then the Nakuru *County Integrated Development Profile (2013-2017)* mentions that the industrialization sub-sector through the economic stimulus program has equipped the *Constituency Industrial Development Centres* in Kuresoi South, Nakuru Town, Rongai and Subukia Constituencies. It anticipates these centres would give the community an opportunity to channel their creativity, innovation and entrepreneurial competencies in economic activities like Jua-Kali. However, some industries such as the pyrethrum processing plant has not been performing to capacity due to production inefficiencies and the declining sources of raw materials. While there are plans to establish an SME park as indicated in the *County Integrated Development Profile*, there is no significant push to attract industries into Nakuru County. In addition, nothing is mentioned about the effort to attract investors and innovators into the proposed industrial park. Some strategies have been proposed to support the ongoing efforts.

1. Sourcing for Land and Marketing Nakuru as an Investment Destination

There is need to be more aggressive in the provision for areas of investment and attracting investors in Nakuru. NCG should source for other land within the county for industrial purposes and then advertise widely. The county should put a lot of effort to make sure that all investors are aware of the facilities offered in the county for their kinds of investment.

2. Support the Establishment of Industries Whose Raw Materials Can Be Sourced within the County Borders

(a) Hides, Skins and Leather Industries

Nakuru is strategically positioned to establish a booming tanning industry given the large number of livestock farmers. The location of this industry should be in close proximity to the slaughterhouses to reduce the cost incurred in transporting the hides and skins. Once well-organized, this is an industry with the potential of providing considerable employment. This will place the leather products from Nakuru County as a perfect substitute for the high imports of similar products. It is instructive to learn from the processing of leather in the neighbouring Kiambu County by the *Bata Shoe Company*, located in Limuru.

(b) Food and Beverage Canning

There are three food, beverage, and fruit canning factories at Njoro, Kabazi, and Kokoto. Given that Nakuru is largely an agricultural county, there is high potential to establish more food and beverage canning industries, which would source their raw materials from within the county

3. Export Processing Zones and Industrial Parks

There has been a weak attempt of establishing an electronic EPZ at Gilgil with a mixed bag of success. Nakuru County should source for land and plan an efficient industrial park, a science and technology parks and an Export processing zone (EPZ) either of these standing alone or combined in one location. If this is fully implemented, it has the potential of generating considerable employment places – both direct employment or as service industries for the workers in these zones. It is recommended that the first EPZ be located in Naivasha, where it will be serviced by the SGR. To ensure that businesses are attracted to the EPZ, tax breaks and subsidization should be offered to companies establishing in these zones as appropriate.

12.5 Agricultural Strategy

Agriculture is the backbone of Nakuru county economy but is faced by numerous challenges as outlined in the earlier chapters and therefore the agricultural strategy proposes solution to these challenges and its cost estimates.

Vision; A food secure and prosperous county

Mission; Innovative, commercially oriented agriculture through agribusiness

Goal: Agriculture to drive the county economy

Objectives: Increase productivity, reduce post-harvest losses, enhance product value chains and expand markets.

Proposed solutions

Kuresoi South

- Tea tax to be removed
- Extension officers to be employed to help reduce water source pollution from agriculture
- Potato cooling plant
- Iteren dam to enhance and foster development

Njoro

- Establish fertilizer factory
- Establish agricultural products collection centres
- Revive the 18 cattle dips

Gilgil

- Funding to be increased for agriculture and to include; green houses, milk coolers and improvement of livestock breed
- Irrigation for agriculture

Kuresoi South

- Gross turn over cess be waived
- Crop cess to be handed to KTDA factory from the County and used for emergency purposes especially during rains
- Provide storage and processing facilities for milk and potatoes
- Build resource centres for information like Huduma centres within the sub county
- Weighing of potatoes be restricted on 50 Kg packaging
- Seeds to be supplied through cereals board not through brokers
- County government to erect slaughter slabs in various centers

Kuresoi North

- Build warehouses and markets
- Formation of a farmers' association
- Explore methods of value addition for agriculture products and operationalize
- Establish industries for value addition
- Revive the boreholes and dams for utilization during the dry periods

Bahati

- Upgrading existing markets to required standards
- Provide a value addition factory (pasteurizer)
- Construction of dams for irrigation and enhancement of water harvesting

Subukia

- Strengthen the current cooperative movements

- Revive and establish new value addition factories
- Revive/ de-silt/ rehabilitate existing dams and irrigation system
- Strengthen extension service delivery
- Demarcate riparian reserves
- Discourage cultivation on riparian reserves

Table 12.9: Agricultural Strategy

Problem	Causes	Objectives	Locality	Strategy	Programme(s)	Actor	Cost (Kshs) M	Time Frame	Indicators
Low productivity for crops, livestock and fisheries	Poor crop husbandry	Increase crop productivity	Countywide	Improve crop production services	<ul style="list-style-type: none"> • Robust extension services • Farmer training schools • Improve inputs supplies • irrigation projects 	(NCG), Department of Agriculture	160 200 250 500	Immediate and continuous	<ul style="list-style-type: none"> • Number of extension workers per ward • Farmer visitations • Number of trainings • Availability of inputs
	Poor livestock husbandry	Improve Livestock Productivity	Countywide	Enhanced livestock services	<ul style="list-style-type: none"> • Enhanced extension services • Improved fodder production • Disease control and AI • disease free zones • Range management 	NCG Department of livestock	150 300 120 500 300	Immediate and continuous	<ul style="list-style-type: none"> • Farmer visitations • Number of trainings • per capita fodder production • Inseminations per month • decrease in disease incidence
	Low fish production	Enhance fisheries Production	Countywide	Increase fish production	<ul style="list-style-type: none"> • Fisheries extension services • Fingerlings 	NCG Department of fisheries	100 120	Immediate and continuous	<ul style="list-style-type: none"> • Number of fisheries extension workers • Fingerlings

Problem	Causes	Objectives	Locality	Strategy	Programme(s)	Actor	Cost (Kshs) M	Time Frame	Indicators
					<ul style="list-style-type: none"> production Fish ponds expansion 		250		<ul style="list-style-type: none"> production per month Number of fish ponds and kgs of fish produced
	Lack of agricultural credit	Avail credit to farmers	countywide	Create agricultural credit revolving fund	<ul style="list-style-type: none"> loan scheme 	NCG	500	Immediate and continuous	<ul style="list-style-type: none"> number of agribusiness loans
High post harvest Losses	Non existent to inadequate storage facilities	Provide adequate agricultural produce storage facilities	Countywide	Public private partnerships (PPPs) to build storage facilities	<ul style="list-style-type: none"> Crops produce storage facilities Milk Cooling plants Fish cooling plants Slaughter houses 	NCG	500 500 500 250	Short term	Number and capacity of storage / cooling facilities
Lack of Value addition	Inadequate to non existent value addition	<ul style="list-style-type: none"> Establish / enhance agricultural produce value chains Establish agribusin 	countywide	Public private partnerships (PPPs) to build storage facilities	<ul style="list-style-type: none"> Crops value chains Milk Value chain Meats value chains Leather 	NCG	1,000 200 500	Immediate and continuous	<ul style="list-style-type: none"> Number of value chains PPPs in operation jobs created Revenues earned

Problem	Causes	Objectives	Locality	Strategy	Programme(s)	Actor	Cost (Kshs) M	Time Frame	Indicators
		ess industries/ parks			value chain		200		<ul style="list-style-type: none"> Number of agribusiness industries/ parks
Poor marketing systems	inefficient markets	<ul style="list-style-type: none"> To provide new /efficient markets Create new /strengthen cooperatives 	countywide	<ul style="list-style-type: none"> Create and support markets in urban centers Establish Produce cooperatives 	<ul style="list-style-type: none"> Build wholesale farmers markets Agriculture information centers farmers cooperative societies 	NCG	1,100 250 220	Immediate and continuous	<ul style="list-style-type: none"> Number of wholesale markets Number of agriculture information centers New markets created Number of new cooperatives
Poor rural roads networks	Ungraded, Unmaintained rural roads	Provide all weather roads	Countywide	Murrum or tarmac roads	Infrastructure development	NCG	-	continuous	Number of all weather roads
							Total 8,770		

Agriculture is at the centre of sustainable development. Directly and indirectly agriculture contributes to achieving interrelated development outcomes such as poverty alleviation, food and nutritional security, economic and social development, gender equality, energy, water, climate, biodiversity, peace and security, and disaster prevention or mitigation. Agriculture is essential for inclusive development because it produces food as well as economic wealth for improved livelihoods. Small farming businesses are hugely important for sustainable food systems of the future. The priority is to increase production on existing agricultural land by improving efficiency & resilience across the value chains followed by diversification of agricultural enterprises. These farming systems must be undertaken with minimal environmental footprints for sustainability. It is estimated that the county government of Nakuru should invest approximately Kenya shillings 8.8 billion in the next 8 years to implement this agriculture strategy.

12.6 Human Settlement Strategy

The human settlement strategy outlines the solutions to the challenges that are faced by the human settlement sector in the county

Table 12.10: Human settlement Plan Implementation Matrix

Problem	Causes	Objectives	Locality	Strategy	Programme	Actor	Costs (Kshs)	Time Frame	Indicators
Fast population growth	High population fertility & immigration	Reduce the rate of population growth	Countywide	Adopt various family planning methods	Family planning campaigns. Establish family planning clinics. Promote formal education. Empower population economically.	NCG. Ministry of Health. Ministry of education.	10m p.a.	Long term	Reduced population growth rate.
Rapid Urbanization	Rapid urban immigration especially Rural urban migration. High population natural growth rate.	To accommodate the burgeoning urban population sustainably.	Markets, urban centres & towns.	Plan all towns in the county.	Planning all unplanned towns.	NCG	100mpa	Short term	Planned towns.
Uneven distribution	Differential in natural	To attain a sustainable	County	Establish the	Land carrying capacity	NCG, Ministry of	100m	Short	A justifiable

Problem	Causes	Objectives	Locality	Strategy	Programme	Actor	Costs (Kshs)	Time Frame	Indicators
of settlements and Population	resources endowment, infrastructure and social amenities. Land holding patterns	distribution of settlements and population	wide	sustainable settlements and population carrying capacities for the various agro ecological zones.	assessment.	lands, NLC, Ministry of agriculture, Ministry of environment & natural resources.		term	& sustainable human settlements & population spatial distribution
Subdivision of land into small parcels	High population densities. Uncontrolled land subdivision and land use development	To attain sustainable land parcels. To control land subdivision into unsustainable sizes.	County wide	Control land subdivision without a guiding land use plan.	Prepare & enforce land use plans (towns & regional spatial plans) indicating minimum land sizes in different areas/zones.	NCG	100mpa	long term	County & towns spatial plans. Controlled Land subdivision
Lack of title deed for some land parcels	Historical & social reasons. Inadequate human and financial resources.	To increase number of land parcels with title deeds.	County wide	Increase land holding with title deeds.	Improve capacities of government agencies involved in land titling.	NCG, Ministry of lands, NLC	10mpa	Long term	Increased levels of land titling.
Incidence of	Poverty.	To reduce	Countywide	Settle and	Resettlements	NCG,	100mpa	Long	Reduced

Problem	Causes	Objectives	Locality	Strategy	Programme	Actor	Costs (Kshs)	Time Frame	Indicators
Landlessness	Customary practices which deny women land inheritance rights. Politically instigated Population displacement.	levels of landlessness		ensure security of tenure for the landless.	Action Plans. Identify land for settling the landless. Economic empowerment of the landless. Create awareness & include women in land inheritance.	Ministry of lands,		term	incidences of landlessness
High Levels of Poverty	Falling agricultural production. Unemployment.	To reduce levels of poverty.	Rural areas & Urban slums	Economically empower the poor	Employment & economic opportunities creation.	NCG, National Government	200mpa	Long term	Reduced poverty levels
Poor quality of housing	Poverty	To improve housing quantity and quality.	Poor rural and Urban slums	To improve housing quality To encourage urban renewal	Domesticate national housing Policy. Promote low-cost housing projects. Slum upgrading. Research on affordable building materials.	NCG, NGOs, CBOs, NG, NHC, private sector, PPPs, Housing Cooperatives, Organized groups,	500mpa	Long term	Affordable quality houses especially for the low-income population.

Problem	Causes	Objectives	Locality	Strategy	Programme	Actor	Costs (Kshs)	Time Frame	Indicators
						Residents and engaging development partners.			
Unplanned urban centres	Limited planning capacity and resource allocation	To ensure all markets & towns are planned.	Unplanned markets and towns. Annex I	To plan all markets & towns. Define urban boundaries	Planning all unplanned centres	NCG	200mpa	Short term	More planned markets & towns.
Urban sprawl	Undefined urban boundaries & uncontrolled urban growth	To ensure all markets & towns are planned & development control is enforced.	All markets & towns	To contain urban sprawl through spatial planning and development control.	Planning all unplanned centres	NCG	Above	Short term	More planned markets & towns. Compact towns
Linear Urban development	Undefined urban boundaries	“	“	To contain urban linear development through	“	“	Above		More planned markets & towns. Compact

Problem	Causes	Objectives	Locality	Strategy	Programme	Actor	Costs (Kshs)	Time Frame	Indicators
				spatial planning and development control.					towns
Unplanned urban and market centres at the road junctions	“	“	“	To control unplanned development at the road junctions.	Planning all road junction areas and ensuring strict development control.	NCG	50mpa	Short term	Less haphazard development at the road junctions. Well planned road junctions.
Development of settlements on road reserves.	Landlessness. Lack of enforcement. Political influence	To remove illegal developments on road reserves.	Most road reserves	To keep all road reserves free from illegal developments & encroachment	Removing all encroachments on road reserves. Enhance capacity for development control.	NCG, Road agencies (Kenha, Kura, Kerra).	5mpa	Short term, long term.	No illegal developments on road reserves.
Traffic congestion in growing	Unplanned towns. Lack of vehicle parking	To reduce traffic jams in	Major towns	Reduce traffic congestion/	Plan the towns & provide adequate vehicle parking	NCG	Provided for in town	Short term.	Less vehicle congested

Problem	Causes	Objectives	Locality	Strategy	Programme	Actor	Costs (Kshs)	Time Frame	Indicators
towns	spaces. Increase of number of vehicles & overreliance on private vehicles as a mode of transport Encroachment on road reserve	towns.		jams in towns	spaces. Discourage overreliance on motor vehicles & Promote NMT		planning budget		urban centres with more NMT.
Informal businesses on the road reserves and open areas	Lack of markets for trading	To reduce informal businesses on the road reserves.	Total market, & other roads	To provide markets for the traders.	Identify areas for markets for the informal businesses.	NCG	100mpa	Short term	Less trading on the road reserves. More markets.
Urban Primacy	Over investment in the county capital town. Nakuru town historical & age advantage. Lack of alternative attractive	To reduce strong primacy for Nakuru town and plan for a hierarchical urban order in the county.	Nakuru town	Through county spatial planning, propose the desired urban hierarchy and direct investment	County spatial planning & implantation.	NCG	1bpa	Short term	Reduced urban primacy. Growth of secondary towns.

Problem	Causes	Objectives	Locality	Strategy	Programme	Actor	Costs (Kshs)	Time Frame	Indicators
	Urban centres.			accordingly to actualize it.					
Scattered Rural Settlements	Culture. Lack of professional advice on better settlement patterns.	To reduce dispersed human settlements.	Countywide .	To encourage nucleated settlements surrounded by farmlands.	Plan the markets and towns and provide them with adequate infrastructure, social services, affordable houses, employment and economic opportunities.	NCG	2b pa	Long tern	Well planned centres. Reduced rural settlement densities
Poor Urban-Rural Linkages	Low allocation of resources.	Improve Rural-urban Linkages	County wide	Improve roads linking urban to Rural areas	Rural Roads improvement	KURA, KERRA	Refer to infrastructure section	Short term	Improved rural roads.
Low Economic activities in some market/trading centres	Poor road networks, insecurity, population displacement.	Revive economic activities in the “dead” market centres.	Old Mau summit trading centre, other mall market centres	Channel more public investments to the “dead” market centres, improve their road	Intra and inter roads improvements’. Public investment in the centres. Provide security. Create Private sector investment	NCG, NG			

Problem	Causes	Objectives	Locality	Strategy	Programme	Actor	Costs (Kshs)	Time Frame	Indicators
				linkages and stimulate economic activities.	incentives				
Increasing human settlements around ecologically sensitive areas.	Lack of an area action plan. Uncontrolled development.	To ensure development that promotes lake conservation	Around lake Naivasha.	Prepare & enforce an action area plan. Enforce the lake management plan	Area spatial plan. Creating Enforcement capacity.	NCG	50m	Short term	Development that is compatible with lake conservation

SOURCE: *Geomaps/Habitat Planners 2016*

12.7 Social Infrastructure

There is need for balanced social infrastructure throughout the County. The total requirements of education, health and other facilities have been estimated based on projected population till 2025.

Education

Based on the standards adopted from the Nairobi Metropolitan Plan, there should be one pre-school/nursery school for every 2500 persons, a primary school for every 5,000 persons, and one secondary school for every 7500 persons in the population. The projected required facilities are as tabulated in Table 12.11.

Table 12.11:: Projected required facilities

Type of facilities	Required facilities by 2025	Area in Ha
Pre-primary	1037	259
Primary	519	2023
Secondary	346	1210

Existing planning standards recommend 0.15 - 0.25 hectares of land for a nursery school. The standards also prescribe 3.9 hectares and 3.5 hectares as the required land size for (3 stream) primary and one stream secondary schools, respectively.

The education aspects that must be looked into include:

- Free meal to the under-privileged children
- Improving school infrastructure
- There is also requirement of special institutes for physically challenged students. For every population of 45000 there should be one facility for the physically challenged. The county therefore requires 14 facilities.
- College Population served/Unit 100000

Health

There is need for improvement in this this sector. The proposals for the health sector should be guided by the standards indicated below as adopted from the Nairobi Metropolitan plan.

- Health Centre to be provided to all settlements in the County.
- Nursing Home Population served/Unit 80000

- Primary Health Centre Population served/Unit 72500
- Sub County Hospital Population served/Unit 100000
- General Hospital Population served/Unit 25000

Recreational

There should be sufficient areas for passive and active recreation to be provided for all age groups i.e. children, youth and old age in county.

Parks and Playgrounds

The provision of open space/ greens for parks and playgrounds in the County will include:

- Development of large parks for recreation in urban areas and outside urban areas
- Development of green buffer along major roads, water bodies, industries and institutes
- Settlements to have at least 15 - 20% of land use under recreation/ open spaces.
- There should be 10 –12 sq.m. per person for recreation/ open spaces.

Sports Centre

There is total requirement of 3 regional sports centre in the County.
Regional Sports Centre Population served/Unit 1200000

Stadium

There is total requirement of 26 stadiums in the County.

Stadium Population served/Unit 100000

Community hall

There is total requirement of 173 community halls in the County.
Community hall Population served/Unit 1,200,000.

: Spatial Development Framework

Chapter Thirteen : Spatial Development Framework

13.1 Structure Plan

A structure plan is a framework that sets out strategic planning policies on space, broad zoning document, as well as a policy instrument. The structure plan comprises of a physical zoning plan indicating the broad land uses, transportation connectivity proposals, existing and proposed infrastructure facilities and areas of economic and environmental activities. Policies and standards are also assigned to each proposed land use to ensure harmony and equity upon implementation of the plan, through the next ten years.

This structure plan is a result of comprehensive analysis of the county using various tools such as land capability analysis, land availability/suitability analysis, transportation analysis, infrastructure gap analysis, human settlements analysis, and environmental sensitivity analysis. In particular, this section was deeply rooted in inputs collected from rich public participation through sub-county-specific forums of the general public, meetings with both the county executives and county MCAs.

As outlined by the analysis in the previous chapters, Nakuru County is facing a myriad of challenges that if unchecked could have catastrophic consequences into the future. The consequences include increased forest degradation, uneconomic land sizes, and unchecked urban sprawl all of which would have devastating impacts on incomes. This spatial structure plan is therefore important because the various county problems all have an implication on land and therefore require a land-based solution. This structure plan is being prepared with the aim of guiding integrated development of all sectors on space.

The plan describes how land use distribution patterns would best accommodate the various types of development and activities at various stages of the county's growth. This is seen in terms of population growth and the demand for land to accommodate housing, industry, commercial, institutional, public utility and public purpose. This was derived from the analysis of existing development and development needs identified by stakeholders and the commonly agreed on vision for the county. The strategies are based on the possible theoretical regional growth concepts giving rise to various development alternatives.

Evaluation of the Alternatives

To assess the alternatives and identify their advantages and disadvantages in meeting the objectives of the County vision, their performance was measured against the following criteria:

- **Mobility:** Ease of providing functional accessibility in the area
- **Service accessibility:** Ease to access a broad range of services with minimum movement
- **Agricultural protection:** Ability to protect agricultural/rural land from undue sprawl
- **Intensification in built-up areas:** Ability to intensify development without undue land acquisition from agricultural parcels.
- **Rural/urban linkages:** The proximity of farms and urban lands

Strategies

- Concentrated development between Naivasha and Nakuru
- Concentrated development between Naivasha and Total i.e. west-east development
- Development concentrated at sub-county headquarters

The current policy dispensation is inclined to devolution of services to the smallest unit. In this regard, the strategy of concentrating development to the sub-county headquarters seems to be favourable, however, considering the infrastructure outlay needed, concentration of the already established towns seems favourable. Since they also form sub-county headquarters, then the development oriented to injecting more growth in all major urban centres in the county seems favourable and recommended. The already seeming scenario of linear development along the main Nairobi-Eldoret highway will persist.

Thus these strategies will be promoted as they are considered likely to provide the most balanced development for Nakuru County as per the spirit of devolution. It is anticipated that following this strategy, the vision of the county shall be realized.

Residential Land

Residential land use was distributed based on types of residential structures. These were categorized into high density, medium density and low density. The low-density scattered settlements are found in the rural area predominantly. However, there are also low-density dwellings in the town centres.

Commercial

Commercial facilities are provided within a certain population threshold. According to the Urban Areas and Cities Act, 2011 the following are the categories of urban areas.

Table 13.1: Provisions of Commercial Centres as per UACA by 2025

Class	Population Threshold	Urban Centres as per threshold	Services
City	500,000	Nakuru	Infrastructural facilities, including but not limited to roads, street lighting, markets and fire stations, and an adequate capacity for disaster management; and has a capacity for functional and effective waste disposal.
Municipality	250,000	Naivasha	Infrastructural facilities, including but not limited to street lighting, markets and fire stations; and has a capacity for functional and effective waste disposal
Town	10,000	Gilgil, Njoro, Molo, Subukia, Olenguruoni, Kuresoi, Rongai	Capacity to effectively and efficiently deliver essential services to its residents as provided in the First Schedule; and Sufficient space for expansion.

Population Projection

The demand for all land uses is expected to rise sharply considering that the population is expected to rise from the current at a growth rate of 3.05%. Table 13.2 outlines the population projections in the county.

Table 13.2: Population Projections of Urban Areas in the County

No.	Name	Population (2009 National Census)	Projected Population		
			2015	2020	2025
1	Gilgil	152,102	182147	211672	245982
2	Molo	124,438	149019	173173	201243
3	Njoro	184,859	221375	257258	298957
4	Naivasha	224,141	268417	311924	362484
5	Kuresoi South	115,435	138237	160644	186683
6	Kuresoi North	124,050	148554	172633	200616
7	Subukia	94,478	113141	131480	152791
8	Rongai	130,132	155838	181097	210452
9	Bahati	144,266	172763	200767	233309
10	Nakuru Town West	152,257	182333	211887	246232

11	Nakuru Town East	157,167	188213	218720	254173
	Total	1,603,325	1920037	2231255	2592922

ADOPTED FROM: *KNBS Population Census Data, 2009*

Development Proposals

The formulation of proposals for the spatial plan has been informed by:

- Plan vision,
- Plan objectives
- Planning standards
- Projected population
- Rural-urban linkages

Spatial Structure and Growth Direction

Decentralization of Functions: The plan proposes decentralization of functions to the key towns in order to enhance service delivery. The lower level urban centres of Rongai, Molo, Njoro, Mau Summit, Olenguruoni, Subukia, and Gilgil have been identified as towns where broader range of urban services can be provided to enhance balanced growth in the county and strengthen the rural-urban linkages.

Within the towns, the plan proposes integrated development which is predicated on a compact structure through dense settlement development. This will be promoted by encouraging higher density and vertical development in the towns and provision of requisite infrastructure to support such development.

Discouragement of Outward Expansion: The outward expansion of urban centres as Nakuru and Naivasha will be discouraged to protect prime agricultural land. In that case definition of urban boundary to discourage uncoordinated sprawl will be done. The core parts of the key growth nodes identified for decentralization of functions from Nakuru towns will be taken as the limits of urban growth boundaries.

Redevelopment and Renewal: is proposed in urban centres particularly Nakuru town where institutional housing is occupying large area and the houses are old and dilapidated.

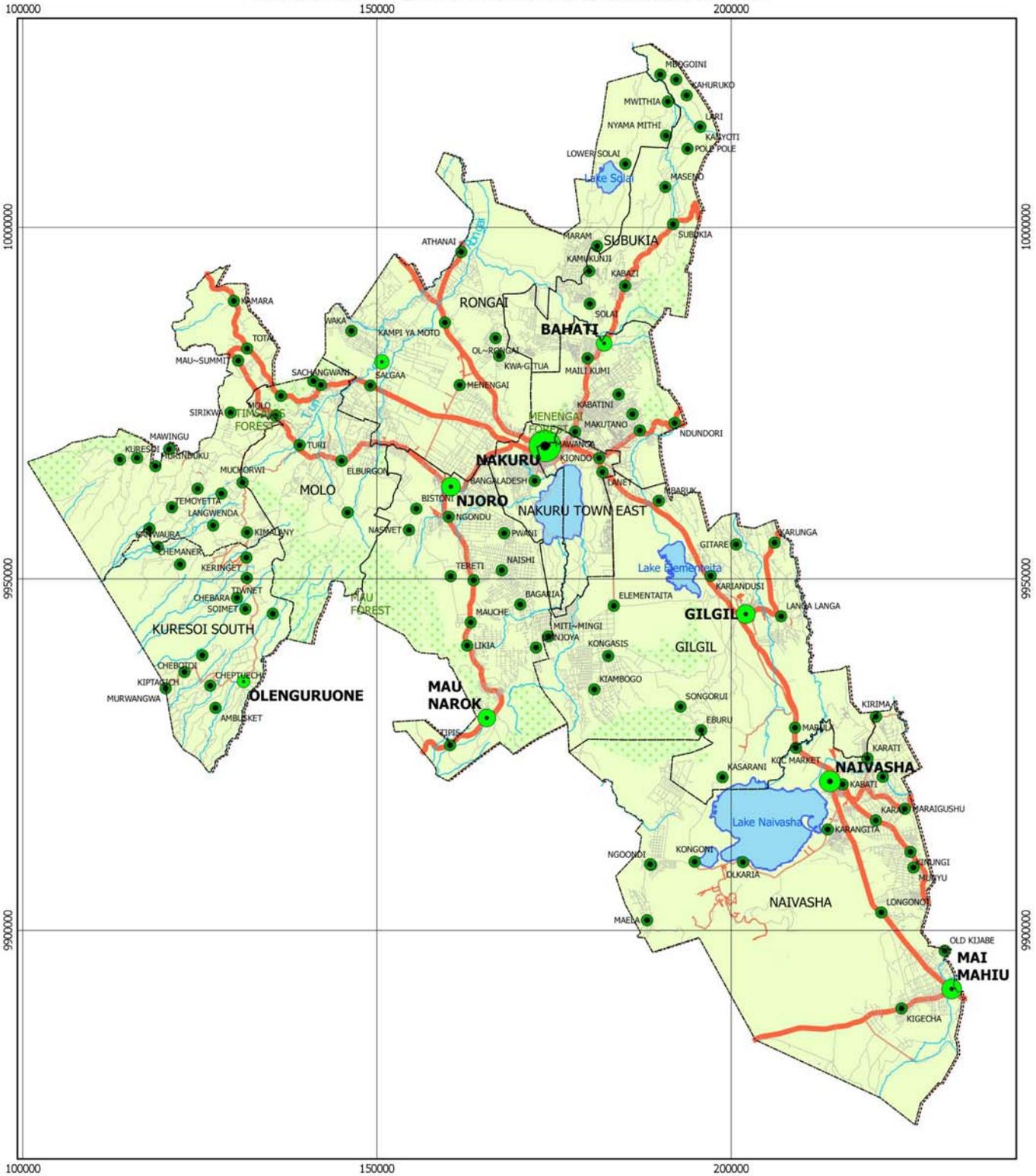
Residential Development

The projected population increase will necessitate demand for residential land. Residential land is thus proposed to add to the existing residential land as tracts for future development. Within the urban centres,

the residential land use has taken the largest percentage and this consideration is important in designating residential land for future development. From the population statistics, the population under 30 years constitutes over three quarters of the total population and hence the demand will be high.

Redevelopment, renewal and infilling in old dilapidated low-density estates is recommended as one way of building to the residential land development. The other approach is to provide additional land to meet expected future demand.

URBAN NODES AND ROAD NETWORK- NAKURU COUNTY



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ● Urban centre ○ Other town Major Road Minor Road Tarmac Road River Forest lake 	<p style="text-align: center;">N</p>  <p style="text-align: center;">Scale 1:750,000</p>	<p>LOCATION MAP</p>  <p style="text-align: center;">Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p style="font-size: small; color: red;">This map is not an authority on boundaries</p>
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Map 13.1: Urban Nodes and Road Networks

Commercial/Growth Centres

The plan proposes a hierarchy of commercial centres distributed across the county. These include the municipality, urban centres and market centres. The commercial areas will improve access to services in the catchment areas as outlined by Map 12.1 above.

Primary Centre

The apex of the commercial hierarchy is Nakuru town based on the population and the level of function it provides. It is expected to continue being the primary business area in the County. This will encompass the central core and sub centres around Nakuru town covering key settlements within Nakuru East and Nakuru West. The plan recommends Nakuru town to remain the capital of the County and the promotion of advanced high urban functions to sustain socio-economic development of the county. Based on the provisions of the Urban Areas and Cities Act, 2011, Nakuru town qualifies for the status of a city by the end of the plan period.

Secondary Centres

The plan recommends vertical intensification of building development be encouraged in shopping centres across the county especially the ones where development has been decentralized. These include Subukia, Bahati, Molo and Naivasha. Provision of adequate facilities to enhance functionality of the towns like parking, bus parks and recreational areas is recommended.

Primary Urban Corridor

The growth of the key towns appears to be along the main Nairobi-Eldoret highway. These include Naivasha, Gilgil, Nakuru, Rongai, Salgaa, and Total. Some of the towns even though not served directly by the primary urban corridor are within its proximity and they include Nakuru-Kabarak-Mogotio, Nakuru-Bahati-Subukia, Naivasha-Longonot-Mai Mahiu and Nakuru-Njoro-Elburgon-Molo transportation corridors. These corridors promote linear developments which at times are difficult to manage. Table 13.3 shows categorization of the urban settlements hierarchy.

Table 13.3: Category of Settlement

Category	Urban Centres	Strategies
Primary - Capital	Nakuru, Naivasha,	Promote high level urban functions as the capital urban centre of the county
Secondary - sub-county headquarters	Gilgil, Subukia, Bahati, Molo, Njoro, Elburgon, Mau	Decentralized urban functions from Nakuru

	Summit, Olenguruoni	Develop the sub-county headquarters which could provide jobs and services for their surrounding rural hinterlands. Promote proper linkages within the individual urban centres and among the urban centres
Tertiary – market centres	Ward headquarters	Promote development of the rural centres
Local centres	Sub-locations centres	Promote the provision of basic services within the rural areas

SOURCE: *Geomaps and Habitat Planners, 2016*

Informal Sector

The plan recognizes the key role played by the informal sector in the economy of the county. From the socio-economic survey, the informal sector activities take a large percentage of enterprises that people are engaged in. Most informal activities take place in areas where there is conflict with other major land uses such on highways, parking, pavements, riparian reserves and wayleaves. The plan recommends that suitable land be identified and set aside in all urban areas to accommodate the informal activities. The spirit of the plan with regards to informal sector should therefore be to facilitate the sector's co-existence with the formal sector by putting into place necessary controls. The controls should guarantee environmental quality, aesthetics, public health and safety.

Industrial Land use

The location of the county headquarters along the Nairobi-Eldoret highway and also the Mombasa-Kisumu railway line provide a key pull factor for industrial development. Further the county is endowed with other resources very conducive for industrial growth such as power (geothermal and hydro), water, variety of agricultural produce, ample land and human resource among others. This plan shall therefore recommend identification of land for industrial development in all urban areas. This will create a significant number of employment opportunities and provide for faster growth of the county.

Agricultural Land Use

The predominant land use in the county is agricultural. The county is also a key in Kenya's food security. The plan will therefore make proposals and recommendations that will protect the agricultural land from uncontrolled urban development.

Civic and Community Facilities

The plan recommends the identification of suitable sites for social infrastructure that will accommodate civic and community land requirements. The decentralization of functions from Nakuru town means there is need for land to site these facilities at sub-county and ward levels.

Road Network

There would be need to rationalize and upgrade the existing road network to accommodate future development. Land acquisition may be necessary in instances where the road reserves are inadequate in terms of the stipulated road hierarchy.

The plan also recommends by-passes in major urban centres which will reduce vehicular traffic and ease congestion. This approach is recommended for the existing towns such as Nakuru and the planned sub-county headquarters.

Physical Environment

In order to protect the fragile environment along river courses, the plan proposes a 50meter development free buffer zone along the main river courses and a 30meter buffer along the smaller rivers and drainage courses. Conservation measures such as tree planting along river courses are recommended.

The plan recommends that development be directed away from the geologically fragile zones especially where faults have been identified. The plan recommends that the natural features such as hills and lakes be protected from adverse human activities as they constitute a vital component of the ecosystem. These features include the Mau ecosystem, Longonot, Menengai Crater, Lakes Naivasha, Elementaita, Nakuru and Solai, rivers and national parks among others. The plan recommends rehabilitation of disused quarries in order to make the land suitable for other land uses.

Rural Development

One of the objectives of the plan is to enhance balanced development in the county considering that most of the population is rural. It is therefore

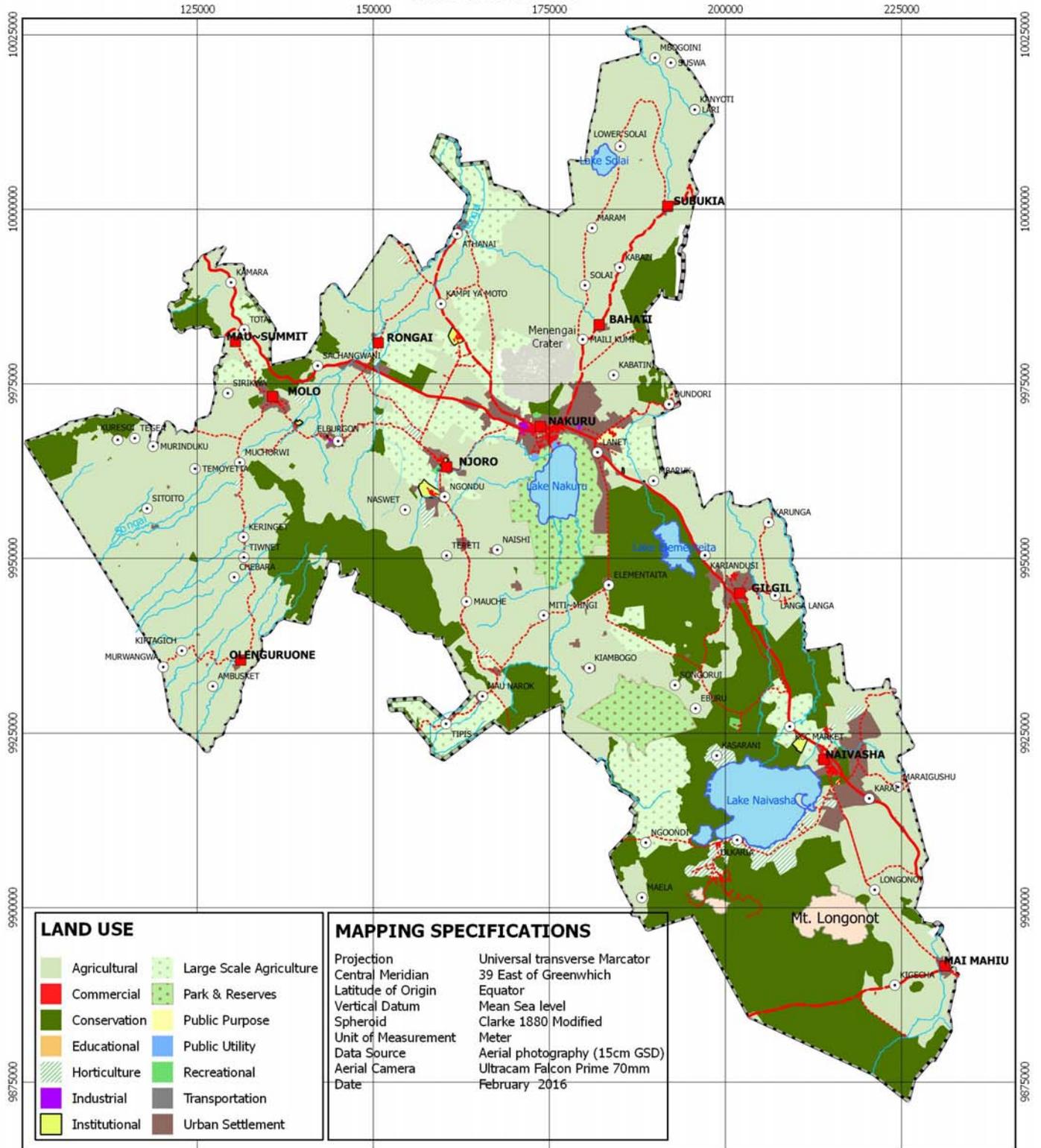
imperative to provide strategies to promote sustainable socio-economic development of the rural areas with a view to minimise migration to the urban areas.

Strategies

- Protection of prime agricultural land from uncontrolled urban development and uncontrolled subdivisions.
- Promotion and development of rural centres as service centres for the hinterlands for providing agricultural inputs and centres for agro-industries.
- Promote rural centres for stronger integration between rural areas and the urban areas for enhancement of rural-urban linkage.
- Promote proper connectivity between the rural towns and the sub-county headquarters.
- Promote investment in agro-processing industries to create employment and enhance the wellbeing.
- Enforce laws and regulations for promoting environmental protection.

Map 13.2 shows the proposed structure plan for Nakuru County.

STRUCTURE PLAN



LAND USE	
	Agricultural
	Conservation
	Educational
	Horticulture
	Industrial
	Institutional
	Large Scale Agriculture
	Park & Reserves
	Public Purpose
	Public Utility
	Recreational
	Transportation
	Urban Settlement

MAPPING SPECIFICATIONS	
Projection	Universal transverse Mercator
Central Meridian	39 East of Greenwich
Latitude of Origin	Equator
Vertical Datum	Mean Sea level
Spheroid	Clarke 1880 Modified
Unit of Measurement	Meter
Data Source	Aerial photography (15cm GSD)
Aerial Camera	Ultracam Falcon Prime 70mm
Date	February 2016

Nakuru County Government

Ministry of Land, Housing and Physical Planning

PROJECT

DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)

LEGEND

	Major Town
	Other Town
	Major Road
	Minor Road
	River
	lake
	hill
	lava

Scale 1:750,000

LOCATION MAP

Date: October 2019

INTERNATIONAL GEOMATICS CONSULTANCY

Geomaps Centre .
Matumbato Road . Upperhill,
P.o Box 61071-00200.
Tel: 254(020)2715829,2713350.
Email:geomaps@geoafrica.com.

This map is not an authority on boundaries

Map 13.2: Structure Plan
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Land Management Policies

Land management policies form an important instrument that guides the general activities over the use of land. The overall land management policies will include:

Table 13.4: Overall Land Management Policies

1.	Environment	<ul style="list-style-type: none"> • Non-approval of development around forests, rivers and wetlands/ swamps • Restriction of development to approved uses only along immediate boundaries of fragile site buffers
2	Transportation	<ul style="list-style-type: none"> • Non-approval of encroachment/ encroaching use on transportation way-leaves
3	Infrastructure	<ul style="list-style-type: none"> • Non-approval of encroachment/ encroaching use on infrastructure way-leaves. • Restriction of development to approved use within the vicinity of social infrastructure facilities
4	Agriculture	<ul style="list-style-type: none"> • Restrictions on uneconomical sub-division of agricultural land. • Non-approval of encroachment/ encroaching urban settlements use of the highly capable agricultural land areas.
5	Commercial /urban land use	<ul style="list-style-type: none"> • Encouraging compacting of urban areas. • Enforcement of urban fringes/ edges. • Encouraging compact market development
6	Industry	<ul style="list-style-type: none"> • Restrictions on location of industries near densely populated zones
	Tourism	<ul style="list-style-type: none"> • Restriction of development around scenic sites to eco-tourism developments only.

13.2 Land Uses

13.2.1 Land Use Standards

The following standards have been proposed to guide each proposed land use development.

Table 13.5: Proposed Land Use Development

Housing Densities	Proposed Minimum Land Sizes	Necessary Facilities
Low Density	½ Acre (0.2 Ha)	<ul style="list-style-type: none"> • Recreational facilities • Community facilities

		<ul style="list-style-type: none"> • Roads and streets • 5% of residential area should be covered by urban agriculture
Medium Density	1/4 Acre (0.1 Ha)	
High Density	Below 1/8 Acre (0.05 Ha)	<ul style="list-style-type: none"> • Commercial water points should be provided for informal settlements (At a distance of 500m from each other, preferably occupying an area of 3m x 3m. • 1 toilet block is required for every 100m.

Residential Use

Residential land use was distributed based on types of residential structures. These were categorized into high density, medium density and low density.

Detailed urban area plans should be formulated to determine appropriate maximum plot coverage's, plot ratios, building lines, street widths for residential areas.

Commercial /CBD

	Standards
Plot size	Minimum plot sizes should be 0.045 Ha.
Construction Standards	<ul style="list-style-type: none"> • Building setbacks should be provided to act as traffic islands. • The concept of corner shops at each corner plot should be discouraged. • Where roads range between 6-18 meters wide the building line shall be 6 m. • For any roads above 18m the building line shall be 18m.
Accessibility	<ul style="list-style-type: none"> • Remove through traffic by constructing a by-pass or relief road. • There shall be no direct access. • A provision of accelerated and deceleration lanes should be made at a 100m stretch. • Beautification of the main highway- green area network along the highway should be done. • Urban road reserves require more generous space provision because of additional street furniture and infrastructural facilities that have to be provided.
Parking	<ul style="list-style-type: none"> • Parking facilities should be related to the level of commercial activities created. • In central commercial and business zones, parking should be considered, particularly by encouraging storeyed parking in town centres (minimum plot size of 0.025 Ha). • For every 100m² of land in the central Business District a minimum of 1½ parking space may be provided except where basement parking is provided. • However, for small centres, car park may be provided for every 500m².
Major Shopping Malls	<ul style="list-style-type: none"> • Need to be located along major outlet corridors from the town. • Minimum plot size to be 4 acres (2 ha). • Allow 25% plot coverage • Minimum parking space of one and half meters car park space per every 100m² plinth.
Informal Economy	<ul style="list-style-type: none"> • Kiosks should only be confined to areas adjacent to markets, bus parks and certain institutions. Minimum size of a kiosk should be 3m x 3m. • Specific areas need to be designated for hawking (e.g. hawking grounds or hawking streets).
Pedestrian Movement	<ul style="list-style-type: none"> • Provide vertical separation of vehicles and pedestrians by constructing roads and pedestrian's ways at different levels. • Interrupt continuity of streets within the centre by bollards or other means. • Remove vehicles from street and provide vehicular access and parking at rear of buildings
Sanitation	Provide 1 public toilet on each street

Transport

		Planning Standards
Road Network		<p>International trunk road (class A road)</p> <ul style="list-style-type: none"> • They are provided with a road reserve of 60-110 meters. • No direct access of a property to a Class A road • Buffer zones of 10 meters should be provided all along giving access abutting properties • Developments should come after the buffer zone and should be provided with acceleration and deceleration lanes • The junctions should be at minimum of 300meters • Petrol Service Station can be planned with acceleration and decelerations of 80-100meters after the 10metre buffer <p>National trunk road (class B roads)</p> <ul style="list-style-type: none"> • They are provided with a road reserve of 60-110 meters. <p>Primary roads (Class C roads)</p> <ul style="list-style-type: none"> • All designated urban centres should be linked by means of primary roads as a minimum. They are provided with a road reserve of 40 meters. <p>Secondary roads (class D roads)</p> <ul style="list-style-type: none"> • All designated rural centres should be linked by means of secondary roads as a minimum. They are provided with a road reserve width of 25 – 30 meters. <p>Minor roads (class E roads)</p> <ul style="list-style-type: none"> • They range between 3 to 5 Km and are provided with a road reserve width of 20-25 meters.
Railway Network		<ul style="list-style-type: none"> • 60m way leave • A buffer of 30m to be reserved on either side of the railway line • Design gradient • Sub-stations should be located in:- Areas of high population concentration Factories, warehousing • Areas of high production Industrial sites • Mining areas.
Airport and Airstrip		<p>Basic requirements for location of an airport/airstrip include:</p> <ul style="list-style-type: none"> • Bird Strikes-Land use planning around the airport to ensure no dumping sites which attract birds. • Flying Objects-Ensure no quarrying or charcoal burning in airport vicinity. • Availability of ample flat land. • Developments in vicinity should not go beyond 15m high. • Location away from town (isolated) • Feasibility should be done to ensure stability of the rock

Educational Facilities

Type of Institutions	Land Requirements (Ha)	Population Catchment	Requirements
Day care centres	Minimum 0.05	350	To be located within residential neighbourhoods Not to be accessed from a major road exceeding 15m. Not on high rise buildings exceeding two levels. Not within a commercial and industrial area/premises The recommended walking distance is 300-500meters
ECD centres	Minimum of 0.1 Single stream (0.1) Double stream (0.15) Triple stream (0.25)	They follow the pattern of distribution of primary school at 4000 catchment population. A kindergarten independent of primary school should be provided for 2500 catchment population.	Within residential neighbourhood Not to be accessed from a major road exceeding 18m. Not to be accessed from a public transport road route. Not in a designated commercial area Not on high rise buildings exceeding one floor. The recommended walking distance is 300-500meters
Primary schools	Single stream (1.2) Double stream (2.0) Triple stream (3.0)	The pattern of distribution should be for every 4000 catchment population in rural areas and 3500 population in urban areas	Have an access road of a minimum of 12m. Tuition blocks building height not exceeding 3 levels. Not within 300 m of a liquor outlet Accommodation for key staff for boarding schools Co sharing of facilities is allowed Site planning be undertaken to ensure efficient land use. Vertical development is encouraged for optimal land use. Provision of adequate space per student at 4 meters sq in a class room. At gross densities of 50 persons per hectare and above, each primary school should be within easy walking distance of 250-300 m.
Secondary	Single stream(3.4)	8000	Site planning be undertaken to

Type of Institutions	Land Requirements (Ha)	Population Catchment	Requirements
schools	Double stream (3.5) Triple stream (4.5)		ensure efficient land use. Vertical development is encouraged for optimal land use Provision of adequate space per student at 4 meters sq. in a classroom Fronting a minimum of 15 m road Not within 300 m of a liquor outlet Tuition blocks building height not exceeding 3 levels Co-sharing of facilities is allowed Accommodation for subordinate and key staff for boarding schools Provision of a school dispensary in case of a boarding school
Special institutions/ Orphanages	Minimum of 0.4	Depending on the needs of the population	Within major primary schools in the area Have an access road of a minimum of 12m Provision of a boarding section that ought to include accommodation for caretaker, matron and support staff
Commercial colleges	Depending on needs and type of service offered	-	Not to be located within residential estates Preferably to be located within commercial area.
University	The land size for a University should be at least 50 hectares made up of the following: <ul style="list-style-type: none"> • 20 hectares or more to support up to 500 students. • 10 hectares or more for the main campus. • 2 hectares or more for any University land. • 2 hectares or more for open spaces and car parking exclusively. • 2 hectares of land set aside for sewerage plant where there lacks Local Authority sewerage system. • 5 hectares or more for outdoor sports for 500 students. • A University offering agriculture as a course should in addition provide 10 hectares of land for a farm. 		

Public Purpose

	Proposed Standards	Land Allocation
Health Facilities	<p>They should be easily accessible by an ambulance and be provided with basic infrastructural services. Dependent on the level of health service, it is necessary to reserve adequate land for future expansion and for public cemeteries. The public cemeteries should be conveniently located relative to the health facility, major open spaces and other compatible public utilities.</p>	<ul style="list-style-type: none"> • National referral hospital- 20Ha • County hospital- 8Ha • Level 4 hospital- 8Ha • Level 3 hospital- 4Ha • Health centre- 3Ha • Sub health centre- 2Ha • Nursing homes- 0.4Ha • Veterinary clinics-0.1Ha
Fire stations	<p>The land requirement is a minimum of 0.4 hectares to include station, staff accommodation and drilling area.</p> <p>A small fire station would require 1 fire engine and at least 30 staff members to cover a population of between 50,000-100,000 people.</p>	
Police Station	They should be located within residential neighborhoods	<ul style="list-style-type: none"> •Police stations- 2 ha. • Police post- 2.0 ha • Patrol base- 0.2 ha
Community Resource centre	<p>Every centre should have a community centre which will provide the following facilities:-</p> <p>Library/Resource centre Social hall VCT centre Public telephone Amphitheatre</p>	The proposed minimum area should be 1Ha.
Administrative areas	<p>They should be sited away from the administrative zones e.g. professional, manufacturing and utility undertakers' offices to allow close interaction with general public.</p> <p>Factors for their location:</p> <ul style="list-style-type: none"> • Geographical centrality • Spatial compactness • Public parking 	

Public Utilities

Utility	Planning Guidelines
Water	<ul style="list-style-type: none"> • Provision of these facilities should consider catchments population to be served and the per capita consumption in the relation to the available water. • Ground water reserves require buffer zones of 100 meter (bore holes). • Springs protection require a buffer zone of 100meters. • Tree planting is therefore encouraged in these areas. <p>Water reticulation systems</p> <ul style="list-style-type: none"> • Provide for water facilities such as water intake points, and pipeline way leave. • Buffer zones should be provided in areas where these facilities are located. • Intake points treatments work and communal water points require buffer zone of 10 meters (radius) <p>Commercial water points</p> <ul style="list-style-type: none"> • Provided for in high density settlements. • They should be at a distance of 500m from one another. • They should preferably occupy an area of 3 x 3 m.
Sewerage	<p>Sewage collection and sewage treatment plants be considered for all settlements with a population of 3,000 or more having an urban layout.</p> <p>In settlements where an integrated sewage scheme is not provided provision should be made for septic tanks.</p>
Solid Waste Collection	<ul style="list-style-type: none"> • Ensure proper waste disposal in all settlements • Promote PPP in waste management chain • Provide for waste collection services in all urban areas • Dumping sites should be located on the leeward side and have a 100m-protection belt.
Electricity/Power	<ul style="list-style-type: none"> • Source and ability of electricity supply • According to electricity usage requirements for domestic, commerce and industry • Main receiving sub-stations require a minimum of 5% of the exterior spaces that are reserved for landscape. • Main receiving sub-stations 275KV are not suitable to be close to residential areas, open spaces and public facilities. • Require buffer zones in between sub-stations and other land uses (about 50m) • Observe provided wayleaves for transmission lines • Encourage use of renewable energy in new developments • Encourage exploration of green energy such as geothermal, wind and bio fuel energy

Recreational Areas

	Provisions
Recreation in regional context	<ul style="list-style-type: none"> • Provided with public access of a minimum 9m. • Cater for recreation use by providing car-parking spaces, picnic sites and refuse disposal facilities of at least 0.4 ha. • Compatibility of tourist and recreational developments with surrounding land use patterns, cultural values of the local population and not injurious to the natural attraction of the area.
Recreation at community level	<p>(a) Parks</p> <ul style="list-style-type: none"> • A small area of recreational space within walking distance. • Closely located within community centres and social halls, health centre, local shops, primary and secondary schools. • It can be used as a landscaping buffer between major roads and the housing areas and between industrial areas and housing. • It should include 1-2 playing fields and children's equipped playgrounds. <p>(c) Social Halls and Community Centres:</p> <ul style="list-style-type: none"> • The pattern of distribution should be for every 20,000 catchment population. • Land requirement of 0.25 hectares to be located in positions along main pedestrian routes

Agriculture

Land sub-division in rural areas	Agro ecological zone	Minimum Land Holdings
	Low potential area	4 Hectares 10.0 acres
	Medium Potential area	2 Hectares 5.0 acres
	High potential area	2 Hectares 5.0 acres

Industrial

Sector	Planning Provision	Land Requirement		
Industrial Land Use	<ul style="list-style-type: none"> • Separation from residential areas through buffer zones is essential • Site planning and zoning • Minimum plot size to be observed • Provision for loading area • Vehicle parking spaces • Adequate access • Buffer zone 	Category	Min Land Size(Ha)	Catchment Popn
		Light	0.05	30,000
		Medium	4	100,000 to 500,000
		Heavy	20	Over 1M

	<ul style="list-style-type: none"> • Provision for fire breaks • Provision for waste management • Workers hostels • Recreation • Shops and hawker centres • Require conducting EIA 	
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Undeveloped Land

Zone	Standards
Riparian Reserves	<ul style="list-style-type: none"> • Must be a minimum of 30 metres of land on each side of a watercourse (both seasonal and perennial rivers). • Natural flow of river and tributary should be preserved and conserved. • Observe a 100 M buffer from highest water marks from the lake shores
Forest Areas	<ul style="list-style-type: none"> • A buffer zone of 60 metres from the forest reserve edge (including indigenous and plantation forests) should be maintained.
Wetlands	<ul style="list-style-type: none"> • A buffer zone of 30 metres from the high water mark edge should be maintained. • Development permission for wetland zones must be sought. • Prohibited activities include car washing, location of sanitary facilities and solid waste disposal as they can cause pollution.
Slope Areas	<ul style="list-style-type: none"> • Development on slopes of over 5 degrees can be allowed but with implementation of control measures. • No development should be allowed on areas with slopes exceeding 25 degrees.
Tourism Zones	<ul style="list-style-type: none"> • Areas of scenic beauty and cultural villages • Provide a buffer zone of 50meters from the edge • The buffer zone can be used for provision of outdoor furniture, management of solid waste and sanitation • Provide major road access to these tourist sites • Provide for land for hotels and lodges <p>Protected Areas/ National parks and game Reserves</p> <ul style="list-style-type: none"> • Delineate areas • A buffer zone of 50 meters is recommended around the park. • Forest reserve should be buffered by 60 meter reserve use the reserve on compatible land use. • Wildlife corridor of 3 km. Is recommended
Flood Prone Areas	<ul style="list-style-type: none"> • A buffer zone of 30 metres from the high water mark edge should be maintained.
Mines and Quarries	<ul style="list-style-type: none"> • A buffer of 1 Km from the settlement should be maintained. • Exhausted mines should be rehabilitated

13.2.2 Urban Land Use

An urban settlement is an area with an increased density of human-created structures in comparison to the areas surrounding it and has a population of 2,000 people and above.

Categories and Hierarchy of Urban Settlements

Categorizing settlements in hierarchies at national level were undertaken under the Human Settlement Strategy of 1978 that identified five categories of settlement hierarchy as:

Growth Centres: These are poles that aim at inducing growth functions in strategically selected large centres. They are potential centres for urban and Industrial growth.

Urban/ Service Centres: Form the highest category of a planned centre; have the capacity to serve a rural hinterland and function as reception centres for immigrants seeking employment and social amenities.

Rural Centre: Intended to serve a population of about 40,000 people and has a residential population of between 2,000-10,000 people.

Market Centre: Approximately serves a rural population of 15,000 and a residential population of less than 2,000 people

Local Centre: Is at the lowest level of service centre designated to serve the local needs of people within walking distance. It should serve a population of 5,000 people from the hinterland. Table 13.6 below shows classification of settlement.

Table 13.6: Required Facilities per Settlement Category

Hierarchy Hierarchy of Centre:	Catchment Population:	Resident Population:	Facilities:
Local Centre	5,000		<ul style="list-style-type: none"> • Full primary school • Several shops • A dispensary, • A public water supply systems • An open-air market • Health centre with family planning services • Recreational space • Administrative centre
Market Centre	15,000	<2,000	<ul style="list-style-type: none"> • A public water supply • Post office

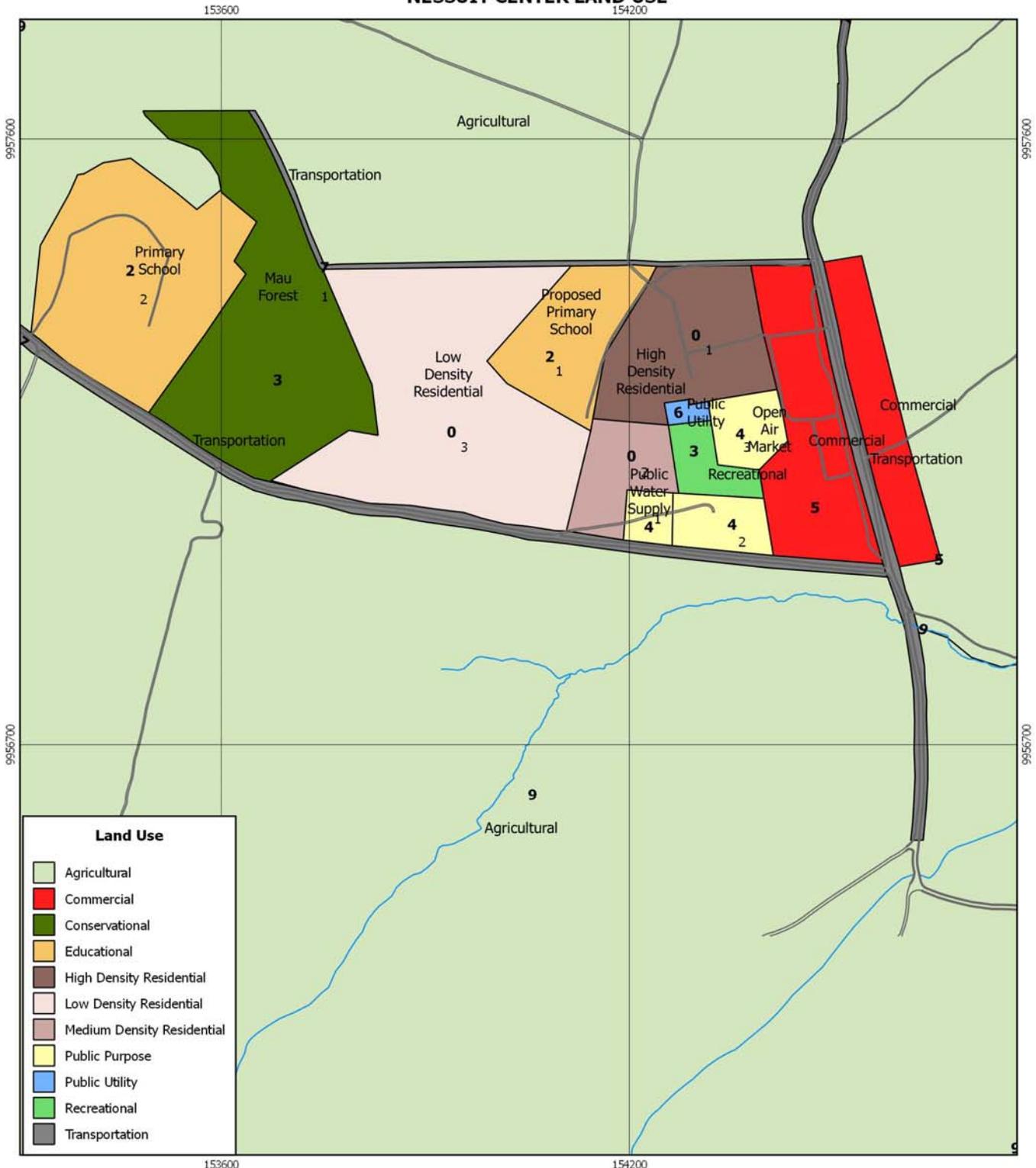
			<ul style="list-style-type: none"> • Telephone facilities • A police post • A local bus service • Other social commercial and local administrative Services. • Should be served by a minor road
Rural Centre	40,000	2,000 to 10,000	<ul style="list-style-type: none"> • A secondary school of at least form four standard • A health centre with a maternity facilities • Development of better shopping facilities • Markets and Banking Facilities • A piped water supply and sewerage disposals systems • Electricity and telephone services postal • Should be planned to have secondary roads
Urban Centre	100,000-150,000	5000>	<ul style="list-style-type: none"> • A hospital • A secondary school • Commercial, industrial, administrative and recreational services

From the above classification some centres within the county have been identified as local centres, market centre and urban centre. Land uses of the selected towns have been prepared outlining the facilities that are required at these urban settlements.

Nessuit

Nessuit is a local centre within Njoro sub-county. Its growth is attributed to migration, proximity to Egerton and the rich agricultural land. According to the criteria of a settlement Nessuit falls under a local centre and should have a Full primary school, Several shops, A dispensary, A public water supply systems, An open-air market, Health centre with family planning services, Recreational space and administrative centre. This is as shown by the land use Map 13.3 below.

NESSUIT CENTER LAND USE



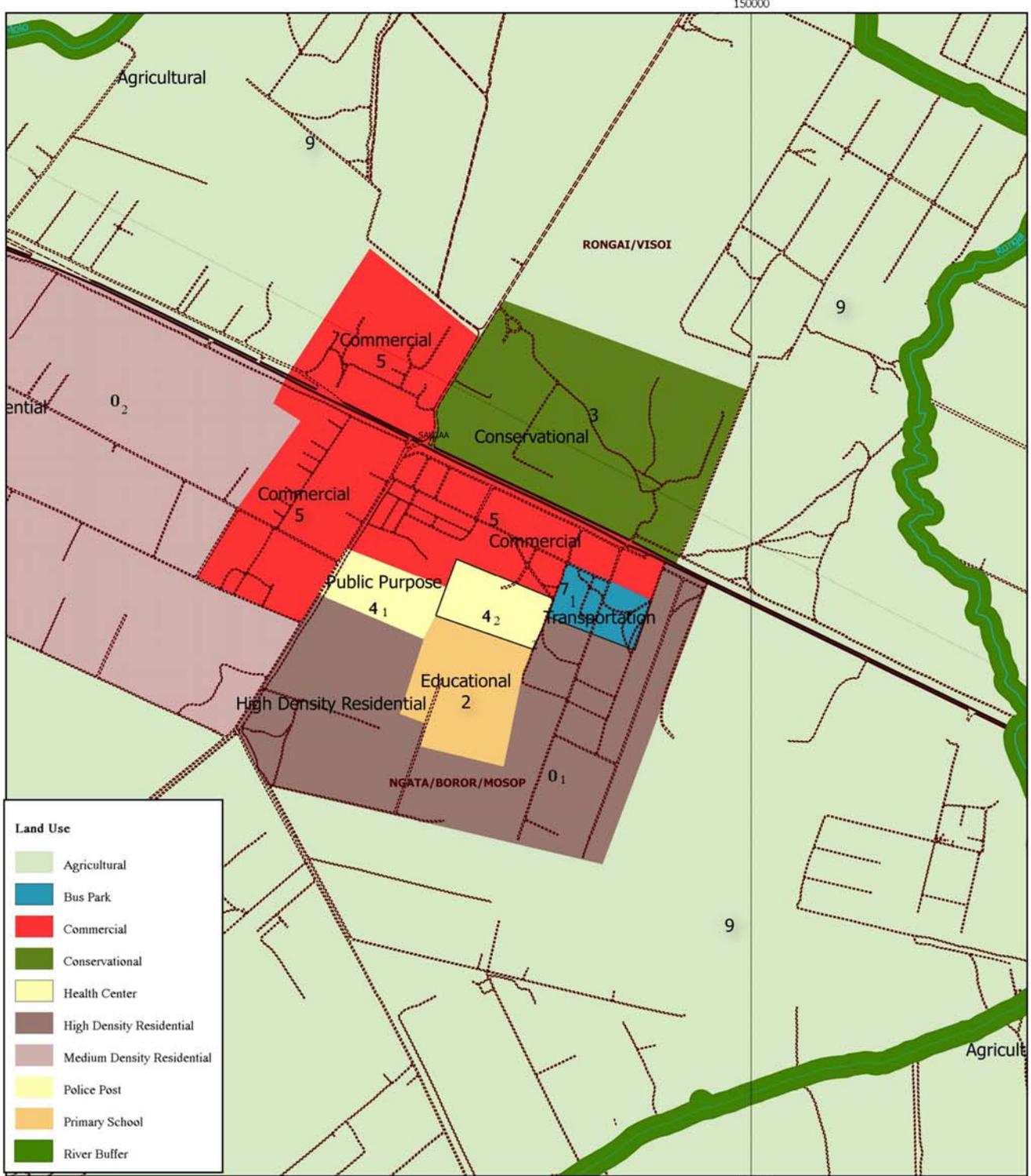
<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Track Murram Road river River Buffer 	<p>Scale 1:7,800</p> 	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 13.3: Nessuit Local Centre land use
Source: Geomaps and Habitat Planners

Salgaa

Salgaa is a market centre located along Nakuru-Eldoret highway. It has grown due to its proximity to the highway; it is within a rich agricultural area thus its growth is attributed to trading activities along the highway. In planning for these market centres, the county government has to provide for a public water supply, post office, telephone facilities, a police post, a local bus service, other social commercial, and local administrative services and should be served by a minor road as outlined in Map 13.4.

SALGAA TOWN LAND USE



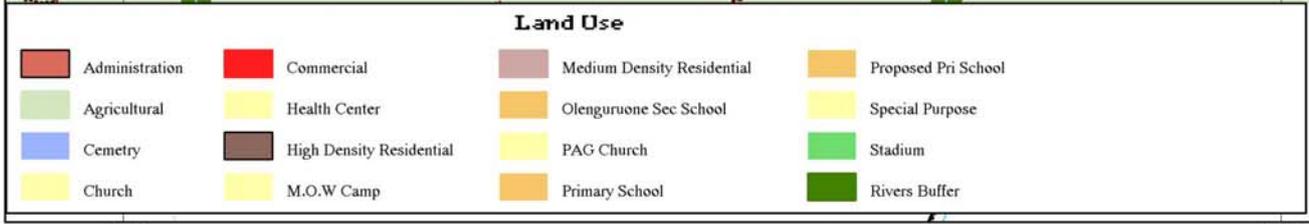
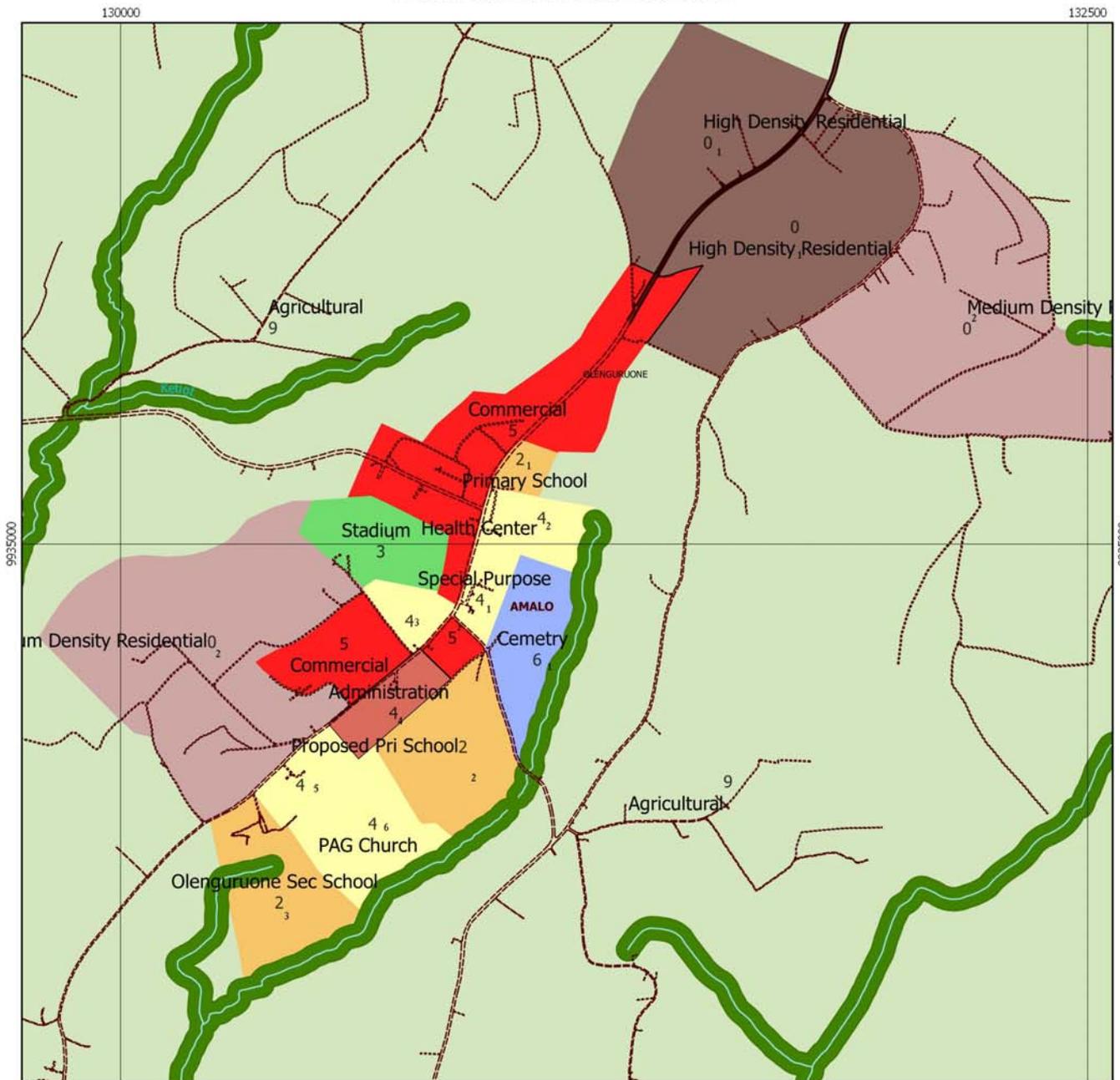
<p>Nakuru County Government Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ■ Major Town ○ Other Town — River — Tarmac - - Murrum --- Motorable track 	<p>LOCATION MAP</p> <p>Date: October 2019</p>	<p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
	<p>Scale 1:15,000</p>			

Map 13.3: Salgaa Market Centre Plan
SOURCE: Geomaps and Habitat Planners

Bahati and Olenguruoni

These are sub-county headquarters and according to their population threshold and the classification of urban area by the urban areas and cities act these two qualify to be towns and ought to have the following; hospital, a secondary school, commercial, industrial, residential administrative and recreational services as shown in maps 13.5 and 13.6 below.

OLENGURUONE TOWN LAND USE

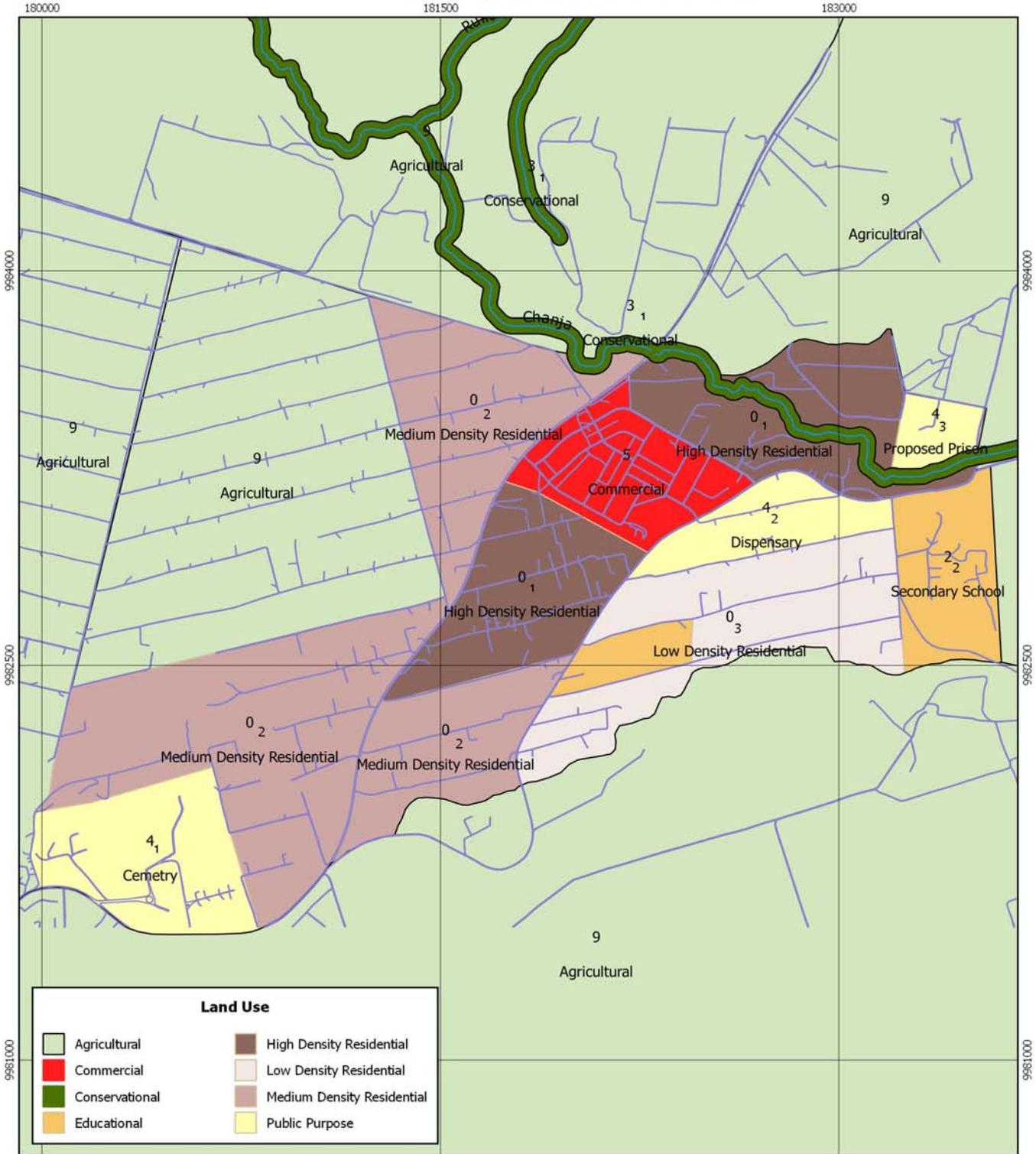


 Ministry of Land, Housing and Physical Planning	PROJECT DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)	LEGEND <ul style="list-style-type: none"> ■ Major Town ○ Other Town — River — Tarmac - - - Murram - · - · - Motorable track 	 Scale 1:15,000	LOCATION MAP  Date: October 2019	 INTERNATIONAL GEOMATICS CONSULTANCY Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com. <small>This map is not an authority on boundaries</small>
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Map 13.4: Olenguruone Urban Centre

SOURCE: Geomaps and Habitat Planners

PROBABLE MODEL FOR BAHATI TOWN



Land Use	
	Agricultural
	Commercial
	Conservational
	Educational
	High Density Residential
	Low Density Residential
	Medium Density Residential
	Public Purpose

<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Roads River River Buffer 	<p>LOCATION MAP</p> <p>Date: October 2019</p>	<p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geofafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
	<p>Scale 1:20,000</p>			

Map 13.5: Bahati Urban Centre

SOURCE: Geomaps and Habitat Planners

Chapter Fourteen: Urban Design and Landscape Concepts

14.1 Overview

Urban design is a planning approach emphasizing on the relation of physical development with space and with each other. The design approach to planning boosts creativity in planning as it explores various design options for the urban areas and allows for evaluation of the impacts of each to the overall form and aesthetics of the area. Further, urban design allows visualization of the various activity spaces in an urban area and their interaction with each other. Through urban design, planners are also able to explore various regional interaction models linking the planning zones within a planning region. This section outlines the urban design framework for Nakuru County.

14.2 Objectives

The objectives of the urban design component in the Nakuru County Spatial Plan are:

- To promote a collective identity of Nakuru County and its urban areas
- To ensure contextualized settlement development patterns
- To ensure inspirational urban form and relate to the County's growth and functions.
- To promote high quality urban life

14.3 Design Vision

The overall design vision for Nakuru County is to give a planning identity of the county and design it as a sustainably competitive region. The development and interlinkage of the urban and rural fabrics of the county is emphasized in the design. The design further looks into the decentralization of urban functions in the various hierarchy and the containment of developments in the designated urban areas. Further, the design pays attention to the individual components and activity sites within the urban areas and how they relate with the urban form.

For regional competitiveness; infrastructure, transportation, communications and energy distribution are key elements. An important aspect of the decentralized concentration strategy is to ensure that the various settlements within the urban system on a regional scale are fully networked through physical infrastructure (transportation and telecommunications). These are further integrated within a developed green structure, as part of a ‘Sustainable City Region’ strategy that recognizes the pattern of urban and rural areas that forms the Kenyan landscape, with its cultural as well as environmental implications.



Figure 14.1: Integrated Urban Nodes

14.4 Urban Design Code

For any planning area to have synergy between envisaged physical planning and built form, an Urban Design Code needs to be formulated for its realization. The smart growth imperative invites alternatives to urban sprawl, including the rebuilding of the urban core and retrofitting under-

utilized commercial and industrial lands. To implement the policy of smart growth, form-based codes designed for local character are needed which include zoning, subdivision, and public works standards for development.

The goal for formulation of form-based codes for urban areas is ‘sustainable development’. The goal can be achieved by inclusion of Smart Growth, New Urbanism, the Transect, and Green Building in the code. Form based codes help in maintaining a high degree of consistency and order and in regulating and coding another kind of urbanism, one that promotes place-based planning and development, without any suburban or urban sprawl.

It is, thus, advocated to promote the Integrated Planning approach and allows maximum flexibility at the Transect/Zonal (based on character areas) local level while standardizing the functional and infrastructural controls; and growth of the region in order to promote a collective image of the urban areas.

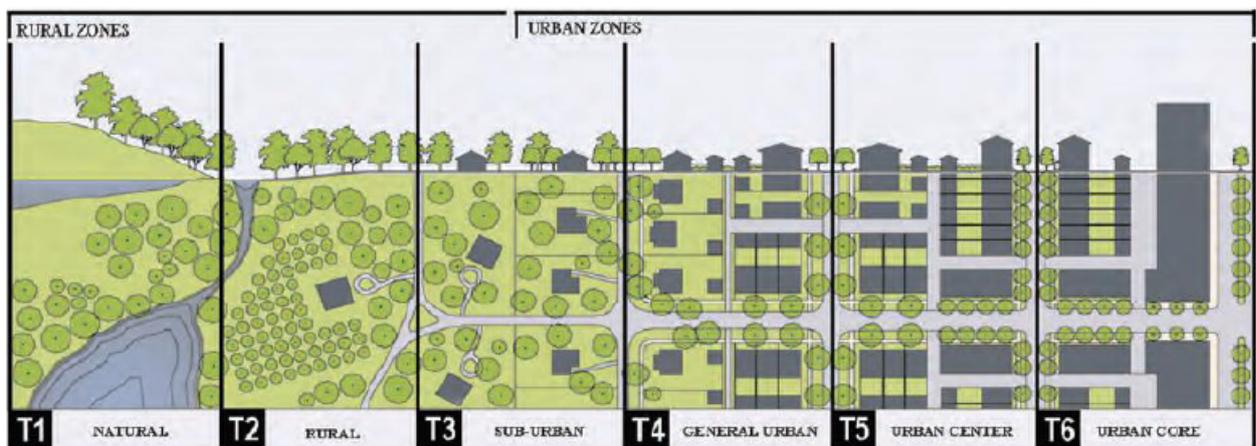


Figure 14.2: Regional Development Continuum

The principle of these codes would be to develop and ensure: -

- Mixed use, walkable, compact development-oriented principles.
- Based on spatial organizing principles that identify and reinforce an urban hierarchy, such as rural-to-urban transect.
- Urban Containment.
- Proactive community visioning
- Prescriptive regulations, describing build-to lines and combined minimum/maximum building heights, and others.

- Protect urban development's encroaching on rich agricultural land.
- Maintain and protect the key natural features throughout and around the settlement (national parks, hills, lakes, forested areas) to ensure the unique character they provide for the town is retained.
- Prevent future growth in areas of high environmental or natural resource value
- Maintain public open space and public access along foreshores, reserves and parks and set development back from areas of high ecological value.
- Encourage plant species which are compatible with the local climate, topography and natural vegetation
- Ensure interconnectivity of parks, public spaces, main streets, services, infrastructure and natural features
- Ensure development responds sensitively to the density and scale of the existing settlement
- Ensure planning and development respond to the local topography and climate
- Ensure provision of commercial and community services

14.5 Urban Design Guidelines

In order to achieve a distinct urban character for the urban areas in the county, comprehensive urban design guidelines need to be formulated for the region based on the following:

- i. **Gateways are transitional zones** enhance the sense of arrival for those entering the City. Similarly, vistas of the City, together with sequential visual experiences along major road corridors leading towards the City Centre, assist in orientation. This is achieved in Nakuru town by greenery, tree lines and street furniture to the city. This should be adopted for the other urban areas.
- ii. **Prominent natural features and landmark buildings** are the prime elements for the orientation and establishment of scale within Nakuru County. The major view corridors in the City relative to hill and landmark buildings must be identified, preserved and enhanced. These includes the natural features such as lakes, hills and the craters.
- iii. **Streetscape:** The legibility of a city is very important to help people orientate themselves both from within and outside the city.

Streetscape treatments that create memorable urban corridors and nodal spaces can help to reinforce the basic legibility of the road system. The treatment of roads and their frontages could include, amongst other devices, the theme of planting, hard scape, street furniture and signage.

- iv. **A distinctive skyline** gives identity to a major city. Landmark buildings that are instantly recognizable and unique further reinforce this identity. The urban skyline and landmarks serve not only as orientating devices but also impart a sense of identity, belonging and pride to the people of Nakuru. The skyline of the urban centres must be developed in a coordinated way that avoids visual congestion and clutter while retaining and enhancing important vistas and views of major landmarks.

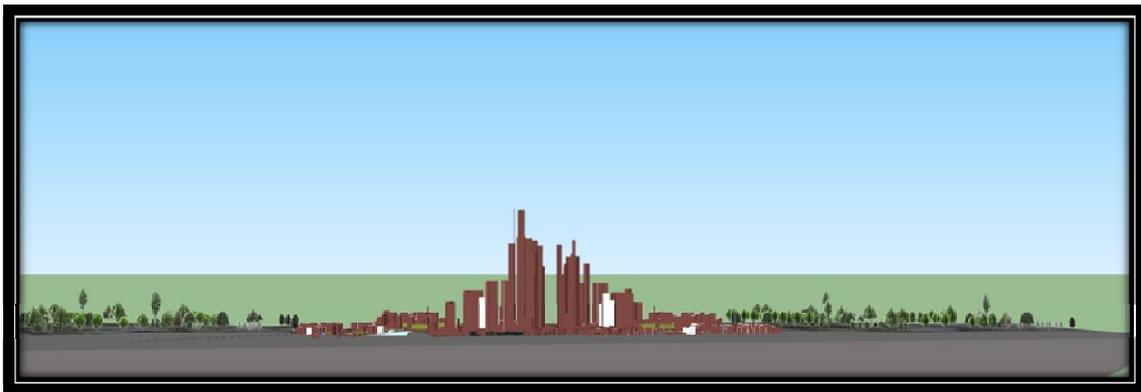


Figure 14.3: Artistic Impression of an Urban Skyline

- v. **The height of buildings** needs to be controlled in certain critical areas of the city so as to protect views of important landmarks, vistas and view corridors. Higher buildings maybe used to accent important nodal points and major entry/ arrival zones, while other buildings should be scaled appropriately to harmonize with existing traditional or proposed lower rise development or particular special character precincts.

The model below outlines the current building heights in the county and it depicts a significant growth as opposed to earlier heights considering that the urban precincts in the county lie along the fault lines thus the justification of height restrictions but the rise in the heights has to come

up with structured design guidelines that provide for safety in case of an impending earthquake.



Figure 14.4: Existing Development Densities in Nakuru Town

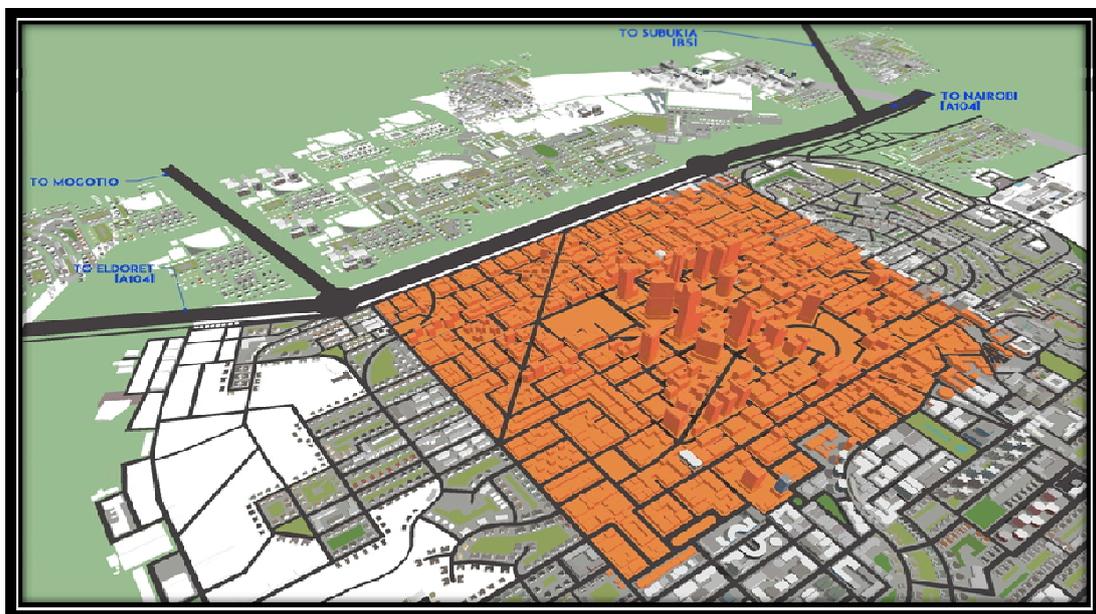


Figure 14.5: Urban Densification Model for Nakuru Town

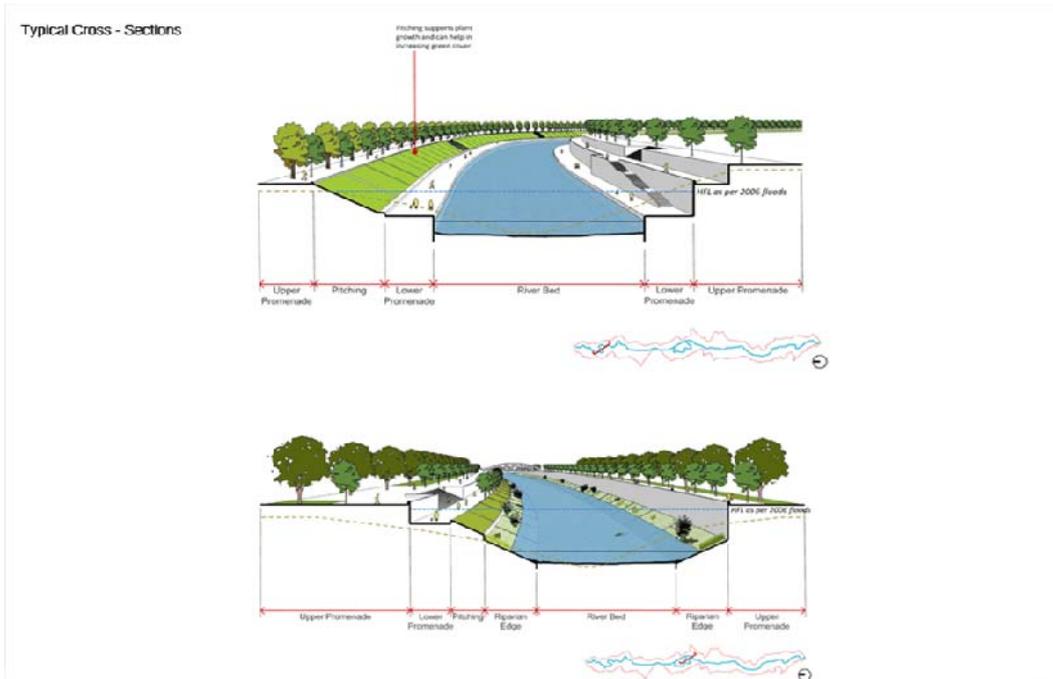
- vi. **Continuous open space network** policy should be developed. A framework of landscaped connections utilizing road, rail and river corridors, infrastructure and utility reserves, parks, plazas and widened landscaped street verges are to connect major parks and

provide a focus for the residential communities through which it passes.

- vii. **Urban space**, nodes, plazas and pocket parks are important in providing identity, structure and landscape amenity to the city. Some spaces such as pocket parks are passive in nature and provide breathing spaces in the city while others such as plazas can be more dynamic and mark major nodal activity areas where there is a confluence of people. Additional parks and plazas will be created in areas where there is a deficiency and which are likely to be developed.
- viii. **River corridor**: A comprehensive plan for the river corridor shall be prepared to maximize the amenity value. The plan should incorporate pedestrian walkways, cycle ways, pocket parks and other urban spaces that connect to the green and pedestrian networks. Guidelines need to be formulated for development along the river corridors, together with measures to make the river more attractive.



Figure 14.6: Riverfront Buffering and Development



- ix. **Districts and precincts:** The character and distinctiveness of districts and local precincts are important in providing interest, texture and structure to the urban form as well as increasing the sense of belonging. This character can result from particular activities or from attractive historic, cultural, and architectural or landscape features.



Figure 14.7: Urban Blocks

- x. **Character areas:** Areas with an attractive character and strong sense of identity must be maintained and enhanced and, where practicable, other areas are upgraded to provide an improved sense of identity and place. Within the City Centre in particular, there is a rich diversity of identity areas and it is important that these should be knit together into a vibrant, coherent and highly imageable city form.
- xi. **Infrastructure development:** All major new infrastructure needs to be sensitively integrated with the overall urban design pattern. With regards to the transport infrastructure it is proposed to develop the city on transit modes based on the urban transect.

14.6 Design Interventions

Some of the interventions recommended for development in Nakuru include:

- i. Redevelopment of urban centres
- ii. Highway front developments
- iii. Redevelopment of urban parks
- iv. Development of lake riparian zones
- v. Urban containment

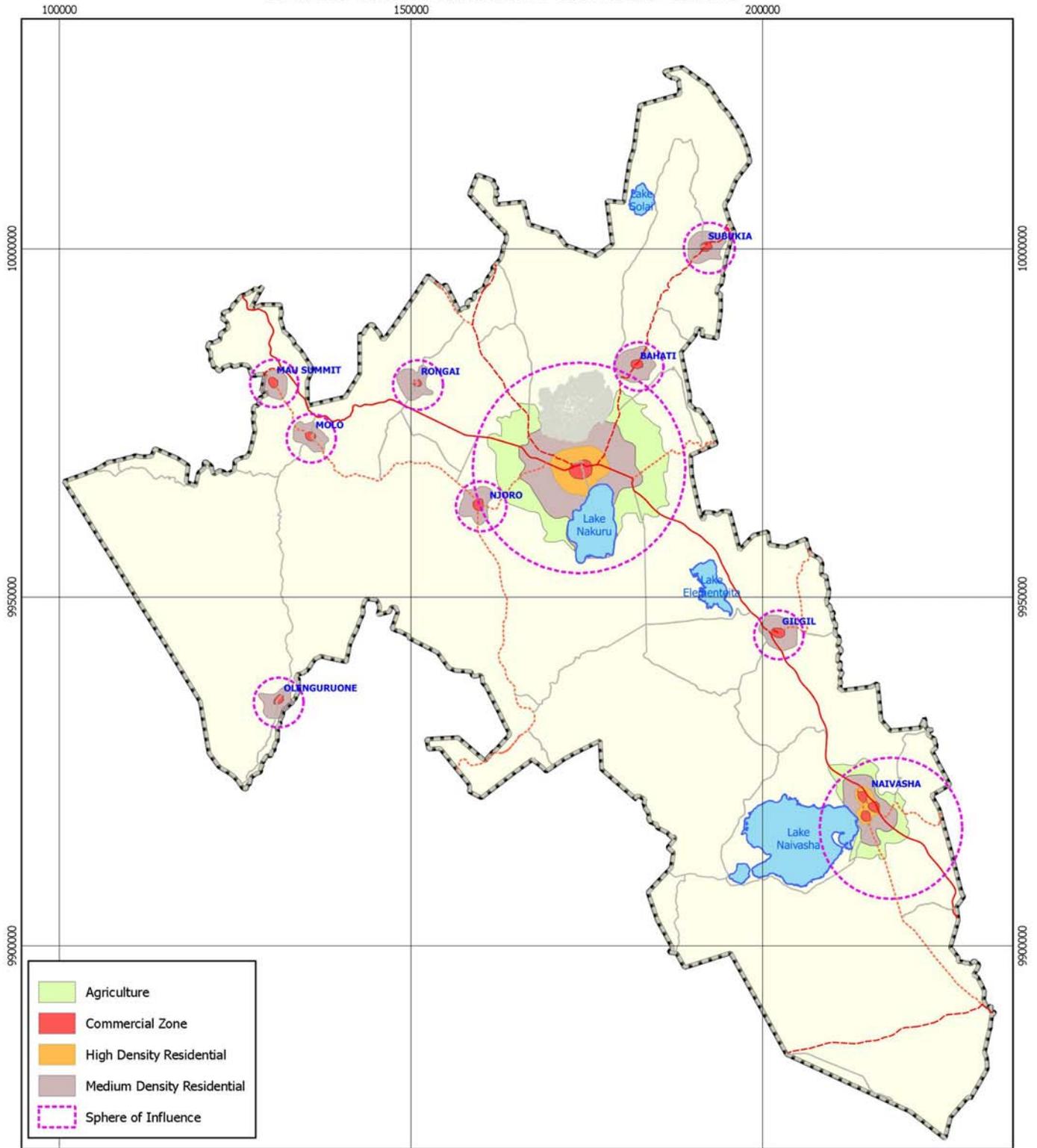
i. Redevelopment of Urban Centres

Urban centres are the engines that run the economy of a region. The management and structuring of urban areas is a key component in how they function and serve the surrounding hinterland and their service catchment areas. The key planning components for consideration in the design of urban areas are;

- Distribution and structure of the centres
- Interconnectivity of the centres
- Service provision and internal linkage of zones within the centres

The established urban hierarchy in the County is aimed at ensuring that the various levels of services are provided for at all levels, further this is to ensure better management of urban services and infrastructure. The design for these urban areas should ensure that they provide space for public infrastructure and that they are compatible and linked. The illustration below shows a model for the sphere of urban influence of various urban areas in Nakuru County.

NAKURU COUNTY SPHERES OF URBAN INFLUENCE



	Agriculture
	Commercial Zone
	High Density Residential
	Medium Density Residential
	Sphere of Influence

Nakuru County Government

Ministry of Land, Housing and Physical Planning

PROJECT

DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)

LEGEND

- Town
- A
- B
- C
- D
- Lake
- Lava
- County

Scale 1:750,000

LOCATION MAP

Date: October 2019

GEOMAPS
Geoinformation Services

INTERNATIONAL GEOMATICS CONSULTANCY

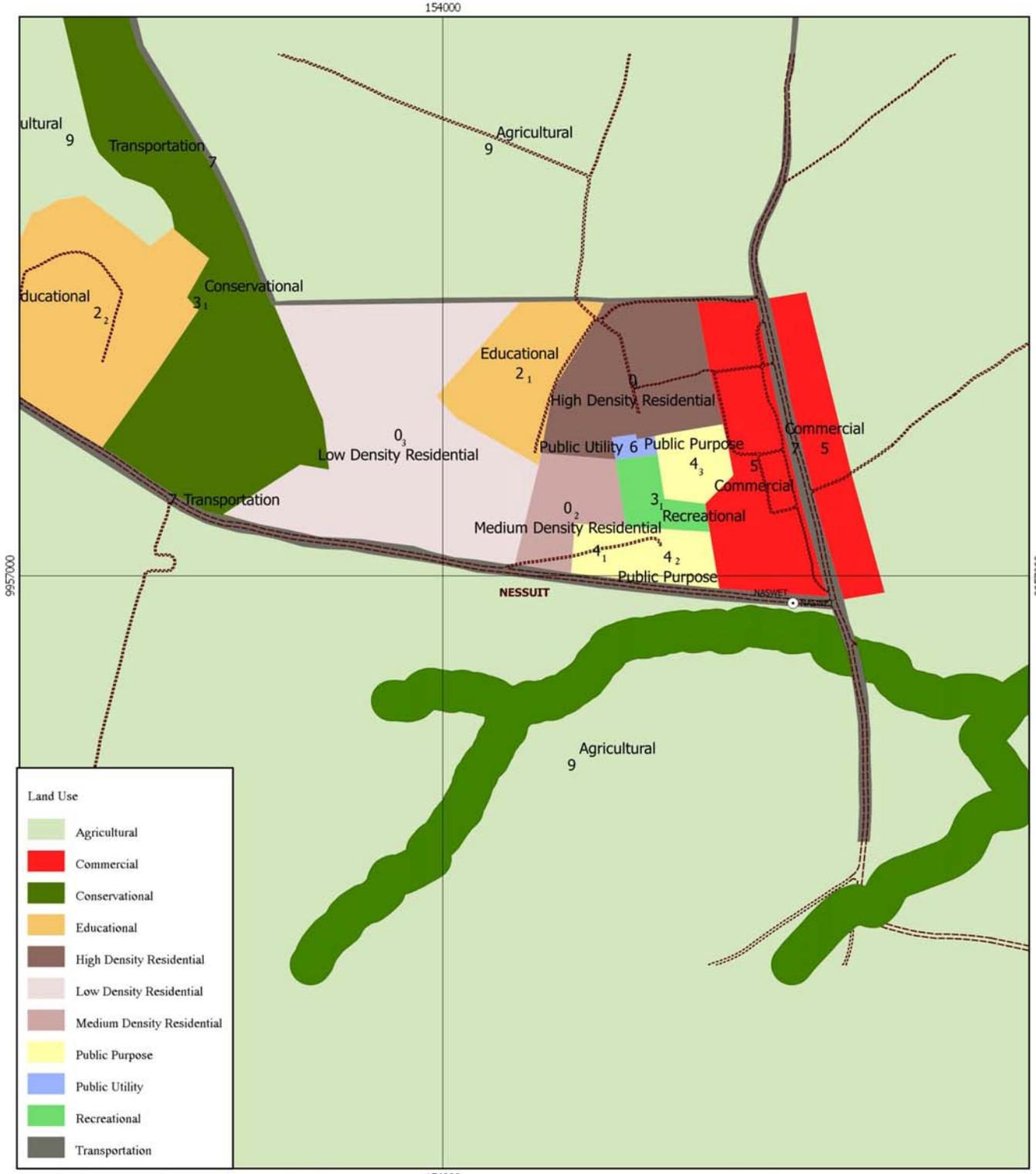
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Tel: 254(020)2715829, 2713350.
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This map is not an authority on boundaries

Figure 14.8: Spheres of Urban Influence

The design and plans for the local centres should take into consideration the provision for work, residential and leisure areas. These should further provide for public areas and conservation zones. The illustrations below show probable model plans for various urban centres taking into account the necessary urban infrastructure.

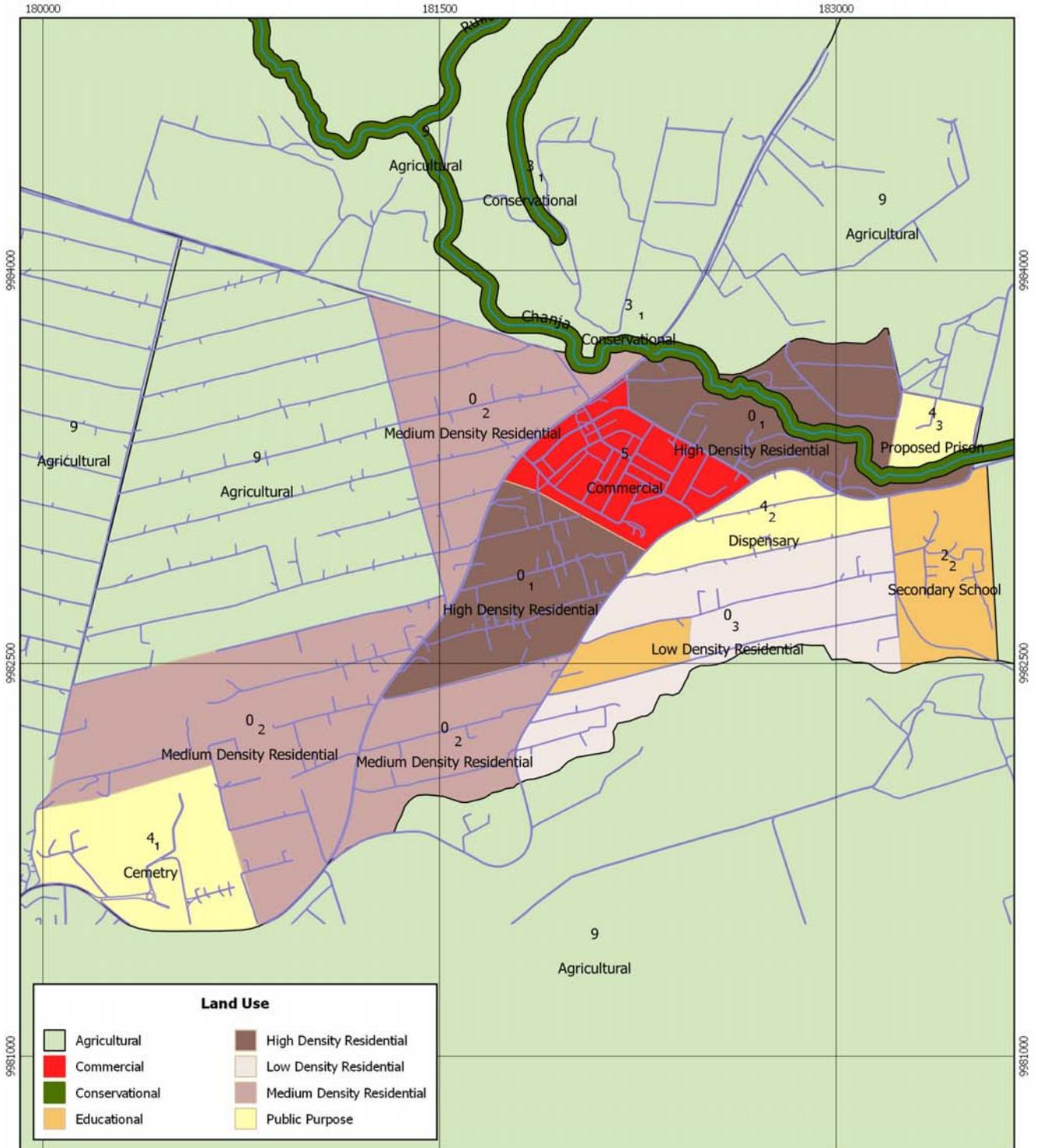
PROBABLE MODEL FOR NESUIT LOCAL CENTRE



 <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Major Town Other Town River Tarmac Murram Motorable track 	<p>Scale 1:8,000</p> 	<p>LOCATION MAP</p>  <p>Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Figure 14.9: Probable Model for Nesuit Local Centre

PROBABLE MODEL FOR BAHATI TOWN



Land Use	
	Agricultural
	Commercial
	Conservational
	Educational
	High Density Residential
	Low Density Residential
	Medium Density Residential
	Public Purpose

<p>Nakuru County Government</p> <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Roads River River Buffer 	<p>Scale 1:20,000</p>	<p>LOCATION MAP</p> <p>Date: October 2019</p>	<p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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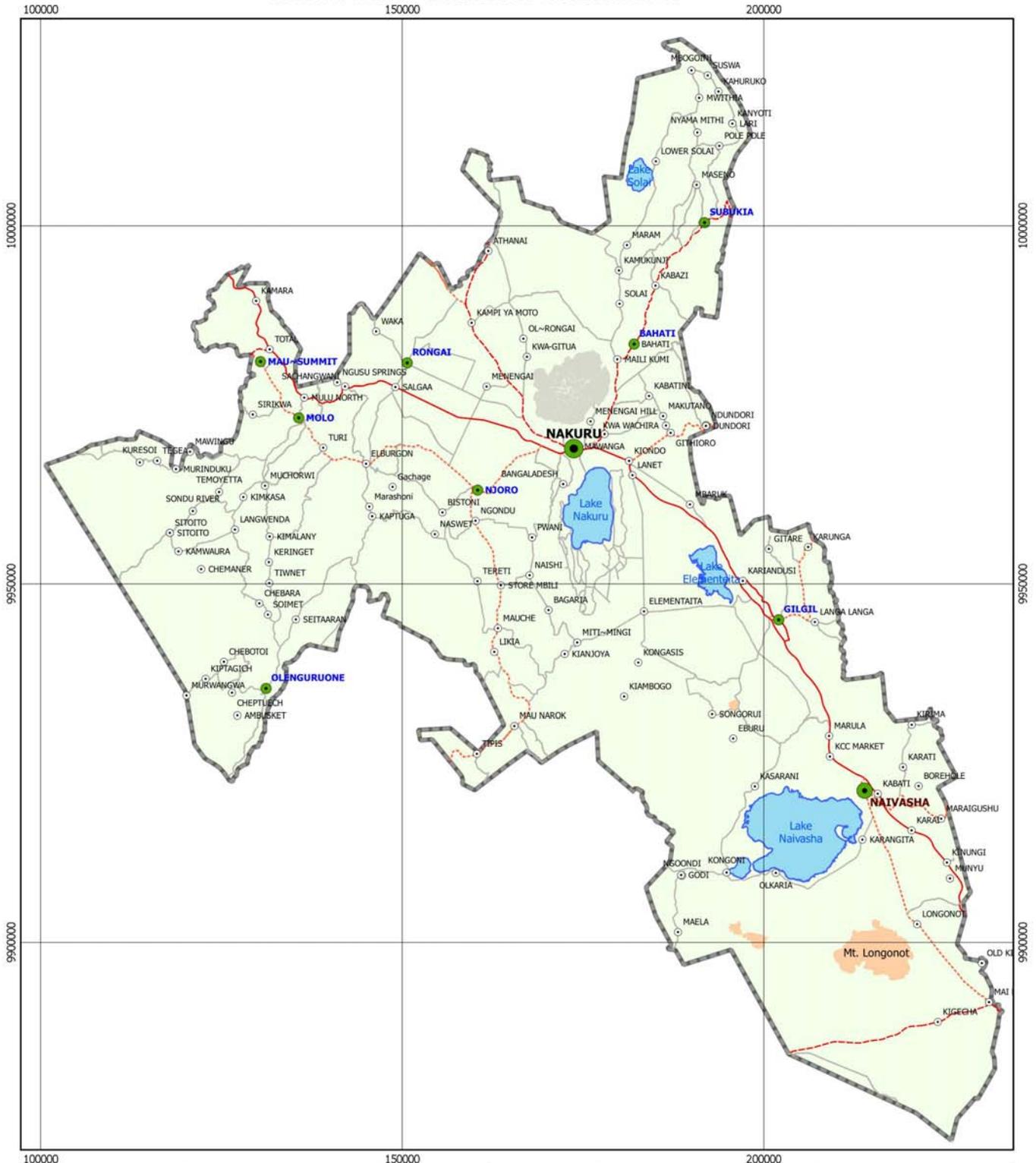
Figure 14.10: Bahati Town

14.6.1 Highway Front Developments

Transportation corridors are a major planning design consideration. Transportation corridors influence the extent and nature of developments taking place and the interlinkage of activity zones. In Nakuru, the A1 Highway is a major design factor as it traverses the county linking the various urban areas and influencing urban developments. The map below shows the various categories of roads linking different hierarchies of urban settlements in Nakuru County.

The design of the roads in the urban areas should be in such a way as to provide for ease in movement for both motorized and Non- motorized users. Further, the roads in the urban areas should have walkways for pedestrians provided for at a safe distance from the motorized vehicle ways. The provision of street furniture such as streetlighting and sheltered bus stops is also encouraged along the urban roads. The developments along the roads are encouraged to have mixed uses as illustrated by the models below.

NAKURU ROADS LINKING TO URBAN NODES



<p>Nakuru County Government</p>  <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ● County H/Q ● Municipality ● Sub-County ○ Other Town — Road Class A — Road Class B — Road Class C — Road Class D Lava County 	<p>LOCATION MAP</p>  <p>Scale 1:730,000</p> <p>Date: October 2019</p>	 <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email: geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Map 14.1: Roads Linking Urban Nodes



Figure 14.11: Design of Urban Roads

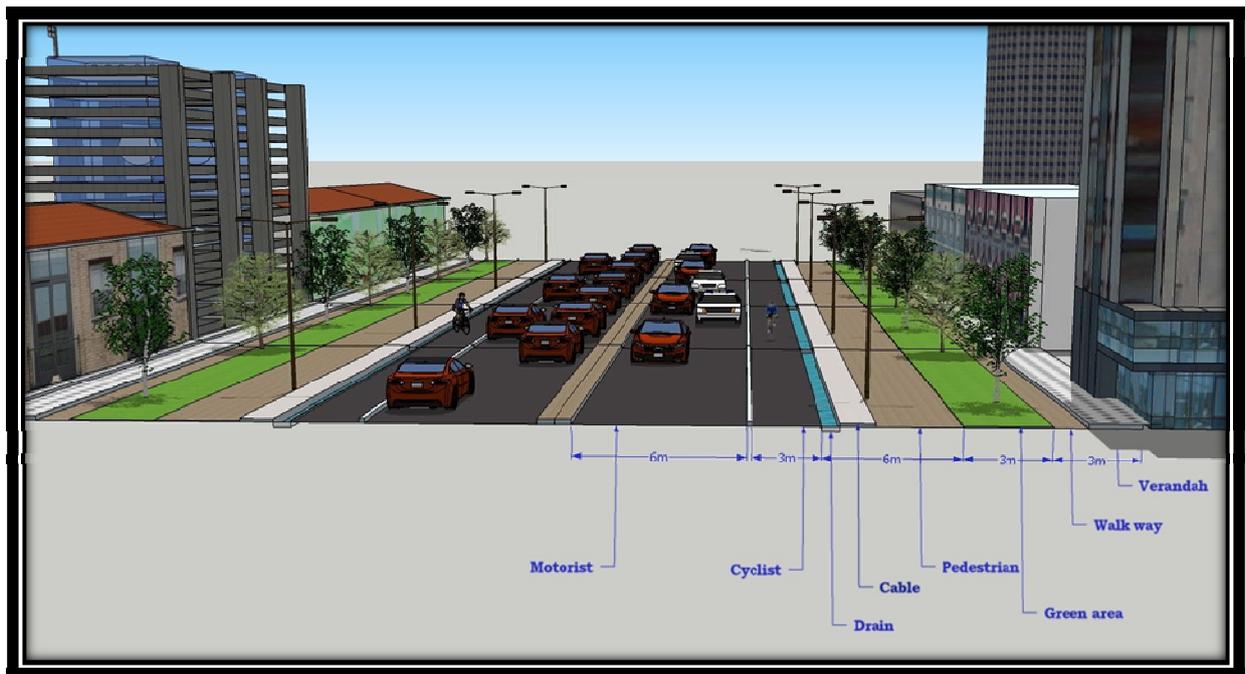


Figure 14.12: Urban Road

14.6.2 Development of Public Spaces

Public spaces in urban areas are an important feature that not only provides space for social interaction but also as a symbol of identity. The public spaces in an urban area play the 'leisure' function in that they provide for places of leisure for the public as well as interaction. In planning, the inclusion of these spaces in the urban areas is a key consideration component and is aimed at ensuring that the urban areas have enough of these in forms of public squares, public parks, open areas and stadiums.

The urban design component in public spaces aims at ensuring that the provided public spaces have a unique character and that they are linked to the surrounding users in an accessible manner. The design of the public spaces should also ensure that they are aesthetically enticing and have sufficient infrastructure to accommodate the public. The designs below show probable developments of urban spaces in Nakuru town, these could be adopted for other urban areas too.



Figure 14.13: Current State of Nyayo Garden



Figure 14.14: Park Development



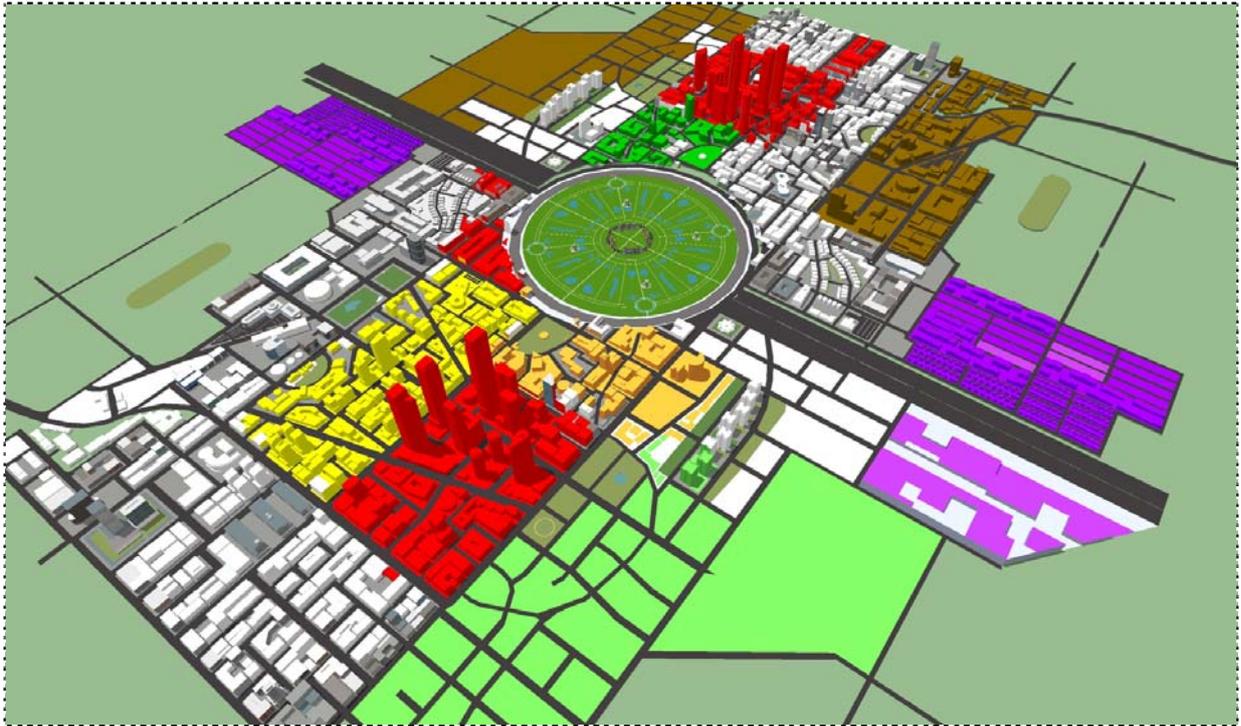


Figure 14.15: The central square

14.6.3 Development of Lake Riparian

Nakuru County is endowed with various environmentally fragile areas including lakes, forests and craters. Due to the sensitive nature of these features, their protection from encroachment and urban development is encouraged. The provision of a buffer zone along the lakes and forests is designed to ensure that the urban developments do not spill into the lake area, further the designed buffer zones are to host lake related activities that are compatible with the fragile environmental areas.



Figure 14.16: Lake Riparian Buffer

14.6.4 Urban Agriculture

Urban agriculture is an important aspect for consideration in growing urban areas. While as Nakuru county has vast agricultural land outside the urban precincts, the inclusion of urban agriculture is aimed at both ensuring that there is enough space for growing household foods and also for increased open space. This ensures that there is ample open space where storm water can sip into the ground and recharge the underground water resources.

The design of urban agriculture should be encouraged in both single and multi-dwelling residential developments. This can be achieved by either the inclusion of rooftop gardens or yard farming. The designs below show possible ways for integration of urban agriculture.

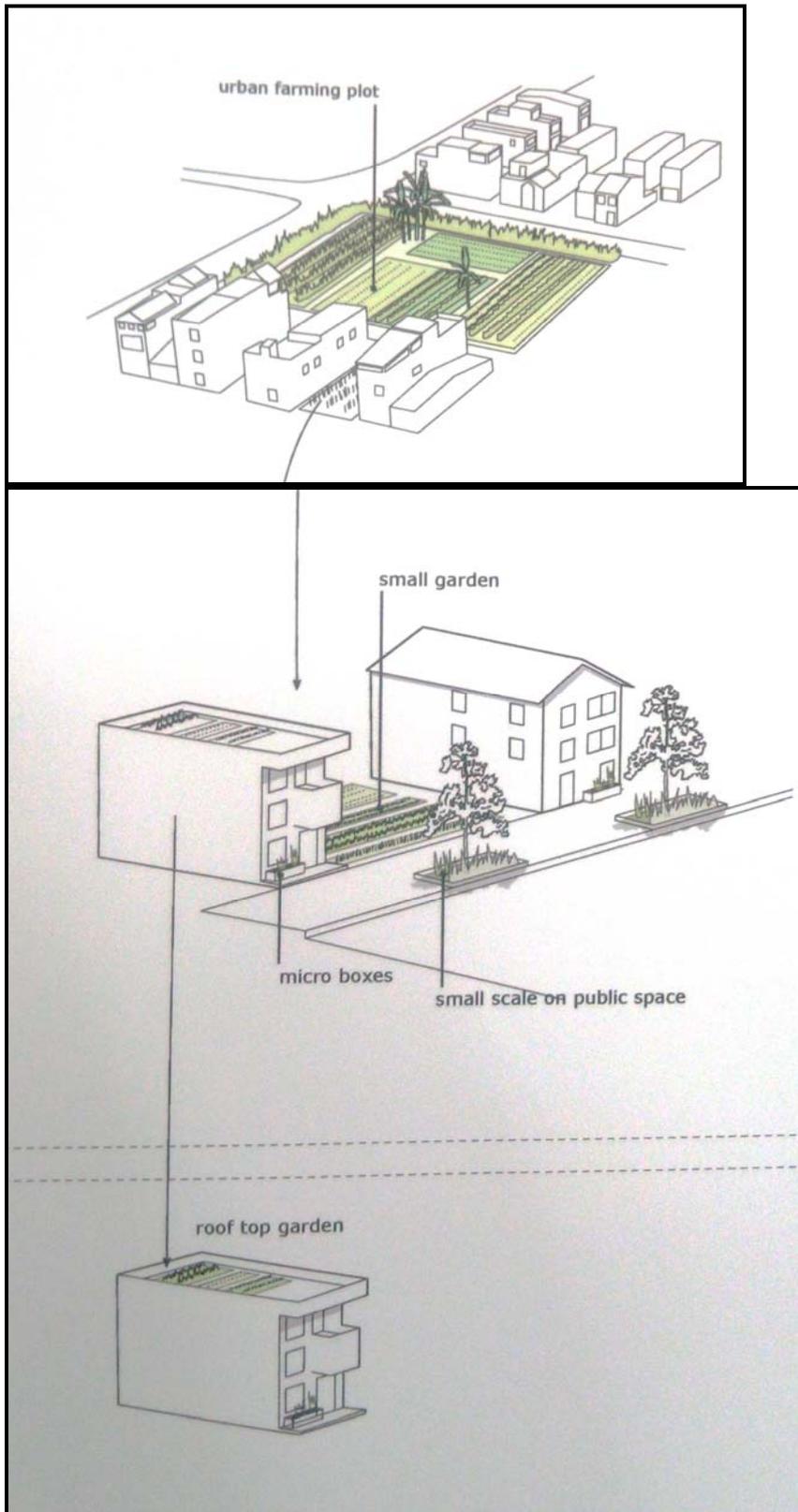


Figure 14.17: Urban Agriculture Concepts

14.6.5 Compact Urban areas

The following considerations inform the thinking and layers explored with the aim of creating better urban futures, calling for planned achieving the

desirable development. The high potential agricultural land coupled with the undulating natural system in Nakuru requires efficient use of land which can only be achieved through densification of development. Such development is expected to achieve more efficient;

- Movement network and public transport
- Mixed Use
- Urban Form and Buildings
- Quality Public environment
- Public Facilities and services

Planning places special emphasis on the importance of compact designs to achieve good urban planning including, public space layout, street patterns, block typology, plot typology, open spaces and finally protection of the environment. Figure below indicates the principles considered in the formulation of the development framework and planning strategy.

URBAN SUSTAINABILITY PRINCIPLES	Social	Infrastructure	Public Space / Pedestrian	Movement Economic	Environmental / Ecological
	CROSS-CUTTING PRINCIPLES – PART 1				
1. Movement Network & Public Transport					
• Movement system: A legible street network, with good connections and access (the grid is the most legible type); accommodating a variety of movement types-pedestrian (sidewalk widths), cycling (non-motorised transport), vehicular and public transport.		✓	✓	✓	
• The provision of public transport services & facilities.	✓	✓	✓	✓	✓
• Establishment of a street grid that promotes connectivity and access; linking the local centres.	✓	✓	✓	✓	✓
2. Mixed Use					
• Mixed land use activities; fine grained (expansive / large land uses at the edge), with an urban activity mix: residential, commercial & recreational; includes trading and markets.	✓	✓		✓	
• (Mixed use & residential) Buildings with a range of unit sizes, to provide for a variety of household sizes (for extended families), designed to human scale (3-4 storey walk-up?).	✓	✓		✓	✓
3. Urban Form & Buildings					
• A compact urban form; density range of 200-400 p/ha (40-80 du/ha) & 50% of built area.	✓	✓		✓	✓
• Sustainable / robust buildings; allowing for incremental development & expansion.	✓	✓	✓	✓	
CROSS-CUTTING PRINCIPLES – PART 2					
4. Quality Public Environment					
• Adequate space for streets & public space: 30-35% streets; 10-15% open space; 50% built area.	✓	✓	✓	✓	✓
• Provision of a variety of a variety of urban spaces and recreation areas- play spaces, parks, sport facilities, squares, natural areas & habitats, rivers & wetlands.	✓	✓	✓		✓
• Active streets: Buildings face the streets with active ground floor uses; this also provides surveillance on to public spaces, streets and parking areas.		✓	✓	✓	
• Development of a quality streetscape; which is tree lined (landscaped) with wide pedestrian sidewalks and cycling lanes.		✓	✓		
5. Public Facilities & Services					
• Provision of community facilities and social services.	✓	✓		✓	
• Urban management: Provision of regular public services to effect urban management and maintenance.	✓	✓	✓	✓	✓

Figure 14.18: Urban Sustainability Principles

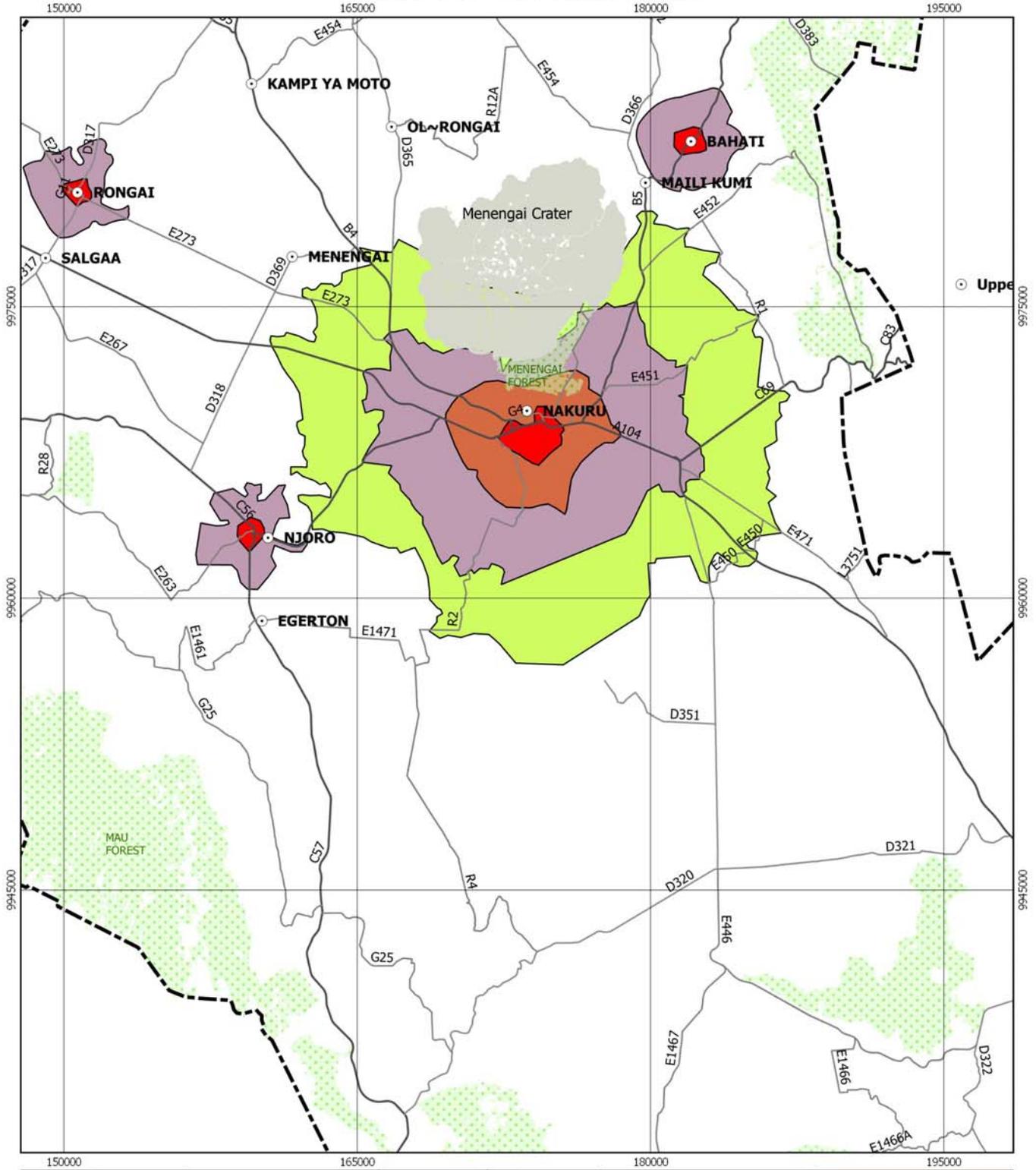
14.6.6 Urban Containment

While as the transport network is an important factor in urban development, the unabated growth of urban developments along the corridors is undesirable as it leads to urban sprawl and encroachment of urban developments to fragile agricultural and ecologically significant areas. Planning measures such as zoning and use of riparian zones is applied in regulating the extent of urban developments. It is proposed that strict

development control be applied to the edges of the urban areas to ensure containment of urban developments.

To aid in urban containment, there is proposed an urban containment buffer area at the edge of the urban areas, this will not only help mark the urban boundary but also act as a noticeable boundary between these zones. With this containment buffer, it will be easier to enforce development control at the urban edges.

URBAN CONTAINMENT NAKURU TOWN



 <p>Ministry of Land, Housing and Physical Planning</p>	<p>PROJECT</p> <p>DIGITAL TOPOGRAPHICAL MAPPING & PREPARATION OF NAKURU COUNTY SPATIAL DEVELOPMENT PLAN PLAN (2015-2025)</p>	<p>LEGEND</p> <ul style="list-style-type: none"> ○ Town — Major Road — Minor Road ■ Forest ■ Crater ■ lake 	<p>LOCATION MAP</p>  <p>Scale 1:270,000 Date: October 2019</p>	 <p>GEOMAPS Geoinformation Services</p> <p>INTERNATIONAL GEOMATICS CONSULTANCY</p> <p>Geomaps Centre . Matumbato Road . Upperhill, P.o Box 61071-00200. Tel: 254(020)2715829,2713350. Email:geomaps@geoafrica.com.</p> <p><i>This map is not an authority on boundaries</i></p>
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Figure 14.19: Urban Containment for Nakuru Town

13.7 Conclusion

The incorporation of design in the planning and management of urban areas is an important aspect that ensures the envisaged urban form is achieved and that the urban areas are aesthetically designed. The plan proposes the development of an Urban Design Section under the Planning Department. This section will be responsible for development of urban design policy and the implementation of the same.

Chapter Fifteen : Plan Implementation and Costing

This section provides an implementation matrix to supplement that provided for each sector in the strategies. It further provides a cost for the key proposed projects.

15.1 Plan Implementation, Phasing, and Cost Estimates

The physical planning sector has provided a good insight into the nature of the challenges encountered in Nakuru County. Based on the objectives of the plan, strategies were proposed to tackle the challenges.

The development proposals are not an end but a means to an end. Those responsible for the implementation should possess the requisite skills needed. The multi-sectoral nature of the plan proposals requires concerted coordination among the various players.

Nakuru County Government bears the responsibility to implement the development proposals. It will therefore be responsible for coordinating the national government departments and other players involved in the implementation.

Considering that the land use proposals cannot be implemented at a go due to time, human resource and limited financial resource factors, the plan proposes a phased implementation programme.

Strategies

- Participation of public and private sector in implementation
- Cooperation among the various stakeholders
- Physical Planning Department of Nakuru county to play a coordinating role

Phasing

Phase one: - 2017-2020 (Short term – to include quick wins)

Phase two: -2021-2024 (Medium term)

Phase three: -2025-2027 (Long term)

Table 15.1: Proposed Projects

No	Proposal	Strategy	Implementing Body	Funding Source	Timeframe
1	Designation of land use for commercial, industrial, residential, public purpose, agricultural	Actual surveying of designated land	NCG	NCG budget	Phase 1
2	Provision of better linkage within the planning urban centres – road linkage	Design of proposed linkages and upgrading of existing ones	NCG/KURA/KERRA/KENHA	NCG and National Government/bilateral partners	Phase I & 2
3	By passes at Gilgil and Nakuru towns	Segregation of local and through traffic	NCG/KURA/KERRA/KENHA	NCG and National Government/bilateral partners	Phase I & 2
	Upgrading of markets	Design and construction	NCG		
	Designating land for informal sector	Actual survey of land designated for this	NCG	NGC, Private sector	Phase I & 2
	Development of rural towns	Provide necessary infrastructure for the towns	NGC	NGC, Private sector	Phase 3
	Development of sub-county headquarters	Decentralize county functions	NCG	NGC, Private sector	Phase 2 & 3

No	Proposal	Strategy	Implementing Body	Funding Source	Timeframe
	Address urban sprawl	<ul style="list-style-type: none"> -Apply development control guidelines -Embark on urban renewal in key towns esp. Nakuru to redevelop dilapidated low-density housing -Apply higher density for development control in the key towns to promote vertical compact development. 	NCG		
	Address rapid subdivision	Apply development control guidelines	NCG		

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Annexes

DATE: 3RD JULY, 2010 DISTRICT: NAKURU COUNTY

URBAN PLANNING STATUS SURVEY

CENTRE	REFERENC E NO.	LOCAL AUTHOR ITY	PLANNED YES/NO	CURRENT PLAN			DESIRED PLAN TYPE	ADM rank	Centre Status
				Approv ed Yes/No	Ref No.	Date			
1. Ambusket		County Council of Nakuru	No	No	-		D.P - N	N	
2. Athinai		“	No	No	-		D.P - N	N	
3. Bagaria	R50	“	Yes	No	R50/88/4		DP – N	SL	
4. Bahati	R295	“	Yes	No	R295/81/ 1		DP – N	DIV	
5. Banita	R298	“	Yes	No	R298/92/ 1		DP – N	N	
6. Chebakundi	R1249	“	Yes	No	R1249/88 /1		DP – N	SL	
7. Cheptuech		“	No	No			DP – N	L	
8. Chesoen	R1933	“	No	No			DP – N	N	
9. Chigamba			No	No			DP – N	SL	
10. Crater Lake	R1739	“	Yes	No	R1739/99 /1		DP – N	N	
11. Dundori	R207	“	Yes	No	R207/97/ 03		DP – N	SL	

CENTRE	REFERENC E NO.	LOCAL AUTHOR ITY	PLANNED YES/NO	CURRENT PLAN			DESIRED PLAN TYPE	ADM rank	Centre Status
				Approv ed Yes/No	Ref No.	Date			
12. Elburgon	R15	“	No	?		?	Z – P	DIV	
13. Emitik		“	No	No			DP – N	L	
14. Elementaita	R31	“	Yes	No			DP – N	SL	
15. Ewatt	R1982	“	Yes	No			DP – N	SL	
16. Game Naishi	R1002	“	No	No			DP – N	SL	
17. Gichobo		“	No	No			DP – N	SL	
18. Gilgil		“	?	?			Z – P	DIV	
19. Githiriga	R1195	“	Yes	No	R1195/87 /1A		DP – N	N	
20. Githioro	R960	“	Yes	No	R960/83/ 1		DP – N	N	
21. Ikumbi	R381	“	Yes	No	R381/87/ 1		DP – N	SL	
22. Itherero		“	No	No			DP – N	N	
23. Kabatini	R390	“	Yes	Yes	R390/76/ 1		DP – R	SL	
24. Kabazi	R347	“	Yes	Yes	R347/74/ 1		DP – R	SL	
25. Kagoto/Kiam aina	R711	“	Yes	No	R711/91/ 1		DP – N	N	
26. Kagumo/Mu nyaka	R7	“	Yes	No	R7/85/1A		DP – N	N	
27. Kahuruko	R1733	“	Yes	No	R1733/95 /1		DP – N	N	
28. Kalau	R50	“	Yes	No	R50/88/5		DP – N	N	
29. Kamwaura	R186	“	Yes	Yes	R186/78/ 1	13/9/79	DP - R	SL	

CENTRE	REFERENC E NO.	LOCAL AUTHOR ITY	PLANNED YES/NO	CURRENT PLAN			DESIRED PLAN TYPE	ADM rank	Centre Status
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30. Kampi Ya Moto	R111	“	Yes	Yes	R111/83/1	15/8/84	DP - R	L	
31. Kandutura	R177	“	Yes	Yes	R177/73/1	15/11/77	DP - R	SL	
32. Kanyotu		“	No	No			DP - N	SL	
33. Kaplomai	R1250	“	Yes	No	R1250/88/1		DP - R	SL	
34. Kapsimbewwo		“	No	No			DP - N	SL	
35. Kapsita	R2198	“	Yes	No	R2198/2002/1		DP - N	N	
36. Kanorero		“	No	No			DP - N	SL	
37. Kariandus	R418	“	Yes	No	R418/87/1		DP - N	L	
38. Karunga	R382	“	Yes	No	R382/70/1		DP - N	L	
39. Keringeti	R157	“	Yes	No	R157/97/1		DP - N	DIV	
40. Kerisoi	R384	“	Yes	No	R384/96/1		DP - N	DIV	
41. Kiambogo	R963	“	Yes	No	R963/84/1		DP - N	DIV	
42. Kiamunyi	R728	“	Yes	Yes	R728/79/1	31/7/85	DP - R	SL	
43. Kihingo		“	No	No			DP - N	L	
44. Old Kijabe	R66	“	Yes	Yes	R66/99/1			SL	
45. Kikopey		“	No	No			DP - N	N	

CENTRE	REFERENC E NO.	LOCAL AUTHOR ITY	PLANNED YES/NO	CURRENT PLAN			DESIRED PLAN TYPE	ADM rank	Centre Status
				Approv ed Yes/No	Ref No.	Date			
46. Kiptagich	R1172	“	Yes	No	R1172/86 /1		DP – N	SL	
47. Kirengero	R1193	“	Yes	No	R1193/94 /1		DP – N	SL	
48. Kirima	R984	“	Yes	No	R984/84/ 1		DP – N	SL	
49. Kongoni	R1736	“	Yes	No	R1736/96 /1		DP – N	N	
50. Kitangwanyi	R953	“	Yes	No	R953/89/ 1		DP – N	SL	
51. Kongasis		“	No	No			DP – N	L	
52. Langwenda	R1199	“	Yes	No	R1199/94 /1		DP – N	SL	
53. Longonot	260 333	“	Yes Yes	Yes Yes	260/69/1 333/75/1	21/4/69 21/5/75	DP – R	SL	
54. Maai Mahiu	R176 R176	“	Yes Yes	Yes Yes	R176/74/ 1 R176/78/ 1	23/1/78 15/3/79	DP – R	L	
55. Maji Tamu	R934	“	Yes	No	R934/90/ 1		DP – N	L	
56. Mau Narok	R178	“	Yes	Yes	R178/73/ 1	30/10/7 4	DP – R	DIV	
57. Mbogoini		“	No	No			DP – N	DIV	
58. Metkei	R1260	“	Yes	No	R1260/89 /1		DP – N	L	
59. Miti Mingi	R1959	“	No	No			DP – N	SL	

CENTRE	REFERENC E NO.	LOCAL AUTHOR ITY	PLANNED YES/NO	CURRENT PLAN			DESIRED PLAN TYPE	ADM rank	Centre Status
				Approv ed Yes/No	Ref No.	Date			
60. Missouri	R367	“	Yes	No	R367/85/ 1		DP – N	N	
61. Moi Dabi – A (Kipkonyo)	R1737	“	Yes	No	R1737/96 /1		DP – N	L	
62. Molo South	R393	“	Yes	No	R393/71		DP – N	L	
63. Murgiyeny – A	R1591	“	Yes	No	R1591/92 /1		DP – N	N	
64. Murgiyeny – B	R1592	“	Yes	No	R1592/92 /1		DP – N	N	
65. Muthaiti		“	No	No			DP – N	SL	
66. Nessuiet		“	No	No			DP – N	SL	
67. New Miti Mingi	R1382	“	Yes	No	R1382/90 /1		DP – N	N	
68. Ngecha	R525 R525	“	Yes	Yes	R525/77/ 1 R525/74/ 1	25/9/79 21/1/75	DP – R	SL	
69. Ngondi	R1730	“	No	No			DP – N	SL	
70. Nguriga	R50	“	Yes	No	R50/97/1		DP – N	L	
71. Ngwataniro	R716	“	Yes	Yes	R716/78/ 1		DP – R	N	
72. Njoro	R23	“	Yes	No	R23/2002 /1		DP – N	DIV	
73. Noiwet	R672	“	Yes	Yes	R672/78/ 11A	2/11/79	DP – N	N	
74. Nuthu	R1192	“	Yes	No	R1192/87 /1		DP – N	SL	

CENTRE	REFERENC E NO.	LOCAL AUTHOR ITY	PLANNED YES/NO	CURRENT PLAN			DESIRED PLAN TYPE	ADM rank	Centre Status
				Approv ed Yes/No	Ref No.	Date			
75. Nyamamithi	R190	“	Yes	Yes	R190/74/ 1	21/1/75	DP – R	SL	
76. Nyandarua Progressive	R1599	“	No	No			DP – N	N	
77. Olenguruon e	R346	“	Yes	Yes	R346/95/ 1	29/5/20 01	DP – R	DIV	
78. Ol Rongai	R927	“	Yes	Yes	R927/82/ 1	17/1/84	DP – R	SL	
79. Piave	R983	“	Yes	No	R983/84/ 1A		DP – R	SL	
80. Pole Pole		“	No	No			DP – N	N	
81. Pwani	R1976	“	No	No			DP – N	N	
82. Rongai	R92	“	Yes	Yes	R92/70/1	12/10/7 0	DP – R	DIV	
83. Rongai Junction	R1299	“	Yes	No	R1299/20 00/2			L	
84. Sach Angwan (Keringet)		?	No	No			DP – N	N	
85. Seguton		“	No	No			DP – N	N	
86. Simatwet	R1935	“	No	No			DP – N	N	
87. Subukia	R386	“	Yes	Yes	R386/79/ 1	26/2/80	DP – R	DIV	
88. Sururu	R1738	“	Yes	No	R1738/20 00/1		DP – N	L	
89. Tangi Tano	R1735	“	Yes	No	R1735/95 /1		DP – N	N	

CENTRE	REFERENC E NO.	LOCAL AUTHOR ITY	PLANNED YES/NO	CURRENT PLAN			DESIRED PLAN TYPE	ADM rank	Centre Status
				Approv ed Yes/No	Ref No.	Date			
90. Tarakwa-A (Mauche)	R1732	“	Yes	No	R1732/98 /1		DP - N	DIV	
91. Tarakwa-B (Mauche)	R1732A	“	Yes	No	R1732A/9 8/2		DP - N		
92. Tomoyota	R933	“	Yes	No	R933/85/ 1		DP - N	SL	
93. Solai - Upper	R625	“	No	No			DP - N	L	
94. Sitoito	R928	“	Yes	Yes	R928/83/ 1	12/11/8 5	DP - R	L	
95. Teret	R1931	“	Yes	No			DP - N	L	
96. Thuthua	R968	“	Yes	Yes	R968/83/ 1	11/6/85	DP - R	N	
97. Tipis Maji Mingi	R394	“	Yes	Yes	R394/84/ 1A	23/1/86	DP - R	N	
98. Karagita		Municipal Council of Naivasha	No	No			DP - N	N	
99. Karai		“	No	No			DP - N	N	
100. Kina mba		“	No	No			DP - N	N	
101. Kinu ngi	R1399/90 /1	“	Yes	?	R1399/9 0/1			N	
102. Mael a		“	No	No			DP - N	N	

CENTRE	REFERENC E NO.	LOCAL AUTHOR ITY	PLANNED YES/NO	CURRENT PLAN			DESIRED PLAN TYPE	ADM rank	Centre Status
				Approv ed Yes/No	Ref No.	Date			
103. Moi Dabi – A	R1737	“	Yes	No	R1737/9 6/1		DP - N	SL	
104. Moi Dabi - B	R1736	“	No	No			DP - N		
105. Morr endat		“	No	No			DP - N	N	
106. Naiva sha	R59	“	Yes	No	R59/200 1/1		S	DIV	M
107. North Karati	R175	“	Yes	Yes	R175/76 /1	8/1/76	DP – N	N	
108. Tara mbeta	R1189	“	Yes	No	R1189/9 1/1		DP – N	N	
109. Barut i	R1200	Municipal Council of Nakuru	Yes	No	R1200/8 7/1		DP – N	N	
110. Naku ru	R7	“	Yes	Yes	R7/1999 /1		SSP	P(D)	M
111. Kibu nja	R329	Molo Town Council	Yes	No	R329/88 /1		DP - N	N	
112. Mau Summit	387	“	Yes	Yes	387/74/ 1		DP - R	N	
113. Molo	R52	“	Yes	Yes	R52/64/ 2		Z - P	DIV	
114. Much orwi	R1194	“	Yes	No	R1194/8 7/2		DP - N	N	

CENTRE	REFERENC E NO.	LOCAL AUTHOR ITY	PLANNED YES/NO	CURRENT PLAN			DESIRED PLAN TYPE	ADM rank	Centre Status
				Approv ed Yes/No	Ref No.	Date			
115. Muki nyai	R620	“	Yes	Yes	R620/78 /1	21/6/79	DP - R	N	
116. Sirik wa			No	No			DP - N	N	
117. Total		“	No	No			DP - N	N	
118. Turi	R392	“	Yes	Yes	R392/78 /1	17/5/79	DP - R	N	

SOURCE: Nakuru county government

TOOL 1 –HOUSEHOLD QUESTIONNAIRE FOR DIGITAL TOPOGRAPHICAL MAPPING AND THE PREPARATION OF SPATIAL PLAN FOR NAKURU COUNTY

Name of interviewer		Time commenced	Time finished	Date

Introduction: *I am working for a company that has been appointed to prepare plans for Nakuru County. As part of this we are undertaking a survey of households to find out how many people are living here, what work they are doing and the services they are receiving. It will help us plan for the future of the County, and make it work more efficiently and serve you better. This survey is confidential. . To the Head of Household: Would you kindly help us by answering a few questions? It should not take more than half an hour to complete.*

Name of County:	Ward:	Sub county:
Length of stay in the area	Years:	Months:

No	Questions	Answers	Indicate the number code
1.SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS			
1.	Record sex of the respondent	01=Male 02=Female	
2.	How old are you? Record age in years	Record actual number of years (years) 99= Don't know	
3.	For how long have you lived in this County? (years)		
4.	What is the highest level of schooling you have attained? <i>(Different from a literacy program)</i>	00=None 01=Some primary education 02=Completed primary 03=Secondary 04=College 05=University 06=Other (specify) 98=No answer 99=Don't know	
5.	What is your main source of income? <i>(Only one is possible. Record the principal income sector.)</i>	00= None 01= Agriculture 02= Trading 03= Pastoralism 04= Transport 05= Fishing 06= Crafts 07= Private services 08= Public services 09= Humanitarian or development group 10= Remittance 11= Other (specify)	

No	Questions	Answers	Indicate the number code
		98= No answer 99= Don't know	
6.	What is your marital status?	01= Married 02= Divorced /separated 03= Widow/widower 04=not married 98= No answer 99= Don't know	
7.	Do you have any child/ children living with you?	01= Yes 02= No 98= No answer	
8.	If YES above, how many children do you have?	Record EXACT number	
9.	How many of the above children are in school?	Record ACTUAL number	
10	Are there any of your children who are of school going age and are currently not attending school?	01= Yes 02= No 98= No answer	
11	If YES above, what are the reasons that they are not attending school?	01= Lack of fees 02= Lack of/ inadequate schools 03= Refused to go to school 04= Married 05= Working 06= Other(specify) 98= No answer	

2. MIGRATION TRENDS (For respondents born elsewhere)			
1.	District of Birth of the respondent		
2.	When did you migrate to this County?	Year...	
3.	Reasons for migration from place of birth to this County.	
4.	Have you at any time moved out of this County?	01= Yes 02= No 98= No answer 99= Don't know	
5.	What were your reasons for emigration?		

3. Employment

3 a. Please list the occupations of all adults (over 18) in the household indicate whether the tasks/ work is skill or unskilled. Tick and describe as appropriate.

Name	Gender	Employee	Self employed	Unpaid family worker	Unemployed	Student	Housewife
1							
2							
3							
4							
5							

3 b. For all the workers described above(employed, self-employed, and unpaid family workers)
Where do the people work from/ place?

Name	At home	Centre of County	Other area (be specific)*
1			
2			
3			
4			
5			

4. Self-employment details

I	Is anyone in the household self-employed?	01 = Yes 02 = No			
ii	If yes, please give me the details of their businesses <i>(In the table on the next page there is space for up to four persons in the household having their own business. Complete one line for each business)</i>	Name	Type of Business	Number of employees	I b
		1			
		2			
		3			
		4			
4 b.	The business premises -Please give me details of the business premises				

I	Where are the business premises located?	Record	
ii	Does he/she own the premises?	01 = Yes 02 = No	
iii	If not, does he/she pay rent?	01 = Yes 02 = No	
Iv	How much rent is paid per month?	Record Actual Amount	
V	How big is it? (in terms of built-up area in Square Feet)	Record Actual measurement	
Vi	Does he/she have a water connection?	01 = Yes 02 = No	
vii	Does he/she have electricity?	01 = Yes 02 = No	
viii	Does he/she have a telephone land line/ mobile/ cell phone?	01 = Yes 02 = No	
ix	Does he/she have an internet connection?	01 = Yes 02 = No	
x	Does he/she have any problems in connection with the business premises you would like to tell me about?	01 = Yes 02 = No	

5. Household Income and Expenditure

i. What is your main source of income?	1..... 2..... 3..... 4.....	
ii. What was your total household expenditure (in Kshs.) last month? (Tick where applicable)	01=Below Kshs 5,000 02=Between Kshs 5,000 - 10,000 03=From Kshs 10,000- 25,000 04=Above Kshs 25,000	
iii. What was your total household income (In Kshs)? Last month?	Total amount	

6. Property ownership, Housing Typology and Tenancy

A. Owners		
i.	What type of house do you occupy? (Observation)	01=Bungalows 02=Flats 03=Single rooms 04= Maisonettes 05= Huts 06= Traditional Swahili 07= Others(specify)
ii.	How is the Housing typology?	01= Permanent 02= Semi –permanent 03= Temporary 04= Others (specify)
iii.	What are the dominant construction materials of the house?	House structure Type of

			materials	
iv.	How many rooms does your house contain, including sitting room?			
v.	Are you the owner of this house/ structure?	01 = Yes 02 = No		
vi.	If not, who owns this house/ dwelling?	01= Landlord 02= Employer 03= Rental 04= Squatter 05= Others (specify)		
vii.	If yes, do you rent out any rooms?	01 = Yes 02 = No		
viii.	If yes, how many rooms do you rent?	Record ACTUAL number		
ix.	How much do you charge per room?	Record ACTUAL number		
x.	Have you built any rooms to your house specially to rent out?	01 = Yes 02 = No		
xi.	If so, how many have you built?	Record ACTUAL number		
xii.	How did you get the money to build these rooms?	Record ACTUAL number		
xiii.	If you borrowed money to build rooms, who did you borrow from?			
xiv.	How much did you borrow?	Record ACTUAL number		
xv.	What was the interest rate?	Record ACTUAL number		
xvi.	What was the repayment period Over what period?	Record ACTUAL number		
vii.	Would you like to build more rooms for renting?	01 = Yes 02 = No		
viii.	What is the size of your land in acres	Record ACTUAL number		
B Tenants (This section will only be applied where the respondent is a tenant)				
i.	Are you a tenant?	01 = Yes 02 = No		
ii.	Please explain your situation (like staying with friend/relative or whether you rent the house / room)	Explain		
iii.	What do you pay for?	01=Rent only 02= Rent and Water 03= Rent +Water+ Electricity		
iv.	How much do you pay in total?	Record Actual Amount		
v.	Do you have a lease agreement?	01 = Yes 02 = No		
vi.	If so, for how long Is The Lease period?	Record ACTUAL number of years or months		

		5=LPG		
		6=Solar		
		7=Biogas		
		8=Others (specify)		
b. Access to Water				
	Question	Answer	Indicate the Number code	
I	What is the PRIMARY WATER SOURCE of your household? TICK ALL that apply.	01=Pipe into dwelling 02=Piped into yard/plot 03=Neighbour's tap 04=Public tap/standpipe 05=Water Kiosk 06=borehole 07=Protected dug well 08=Unprotected dug well 09=Protected spring 10=Unprotected spring 11=Supplied by water vendor		
ii	Reliability of Primary Water Source –How many days per week is your PRIMARY water source NOT available because of breakdown or interruption of service?	Days per week NOT available 0 (Always available) 1 2 3 4		
iii	Distance from your house to the primary water point	01= 0 – 1 km 02= 1 – 2 km 03= 2 – 5 Km 04= > 5 Km 05=Don't know/Not sure		
iv	How much do you spend on water per month?	Record ACTUAL number		
c. Access to Sanitation facilities				
i	Does your household have access to toilet/s?	01= Yes 02= No 98=No answer		
ii	What type of toilet do you have access to?	01=Pit Latrine 02=Flush Toilet/WC 03=VIP Latrine 04=Public Latrine 05=No facility/flying toilets 06=Bush 07=Other		
d. Solid Waste Management				
i	Is there a garbage collection service in your neighborhood?	01= Yes 02= No		
ii	Are you satisfied with refuse / garbage collection services within your neighborhood/ County?	01= No –refuse collection 02= Unsatisfied 03= Satisfied		
iii	If the answer to 5 (i) above is (02) unsatisfied, Give reasons.	i.		

		ii.	
iv	What is the most commonly used mode of Disposing refuse from this household?	01=Dumping in your neighborhood 02=Burning in your compound 03=Burying in your compound 04=Compositing 05=Designated collection point 06=Other methods, specify	
e. Waste water Management			
i	“Grey Water” (i.e. used kitchen or bathroom water) How do you dispose grey water?	01=Pour it into the drain 02=Pour it onto the road or pavement 03=Pour it onto the garden 04=Pour it into a pit latrine 05=Re-use it 06=Other, specify	
f. Health Issues			
1	Please tell me in your own opinion, which are the leading <u>health</u> problems in your County?	01=HIV/AIDS 02= Malaria 03=Typhoid 04=TB 05=Respiratory Tract infections 06=Skin diseases 07=Diarrhea 08=Kwashiorkor 09=Eye Infections 10=STDs 11=Dental problems 12=Others (specify) --	
2	How frequent do you experience ill health in this household?	01=Very frequent 02=Frequent 03=Rarely 04=Never	
3	In your opinion how serious is the problem of HIV/AIDS in your County?	01=Very serious 02=Serious 03=Not serious 04=Not a problem 05=Don't Know	
4	Do you have a VCT centre in this Sub County?	01= Yes 02= No	
5	When a member of this household experiences ill health, what do you do?	01=Purchase medicine (from shop or pharmacy) 02=shop or pharmacy 03=Use public dispensary 04=Use public hospital 05=Use private clinic 06=Use private hospital 07=Use traditional medicine 08=Others (specify) ----	
8	Who often gets sick in this household?	01=Infant (less than 5 years) 02=Children (6 – 12 years) 03=Youth (13 - !8 years)	

		04=Adults (18 – 65 years) 05=Elderly (66+) 06=Other (specify) ---	
9	Do you often get medicine in the health facility that you frequent?	01= Yes 02= No	
10	In your opinion, what is the name of the most reliable <u>health facility</u> used by the people of this village?	Name of health facility	
g. Environmental issues			
1	How does drought affects households	i. ii. iii.	
2	What drought mitigation/adaptation measures have households put in place?	i. ii. iii.	
3	Who is supporting the implementation of mitigation measures?	i, ii. iii.	

9. Transportation

Mode of transport			
1	What mode of transport do you use to get to your place of work / business?	01= Walk 02= Boda boda 03= Motor cycle (rider) 04= Motor cycle (Passenger) 05= Private car (self-drive) 06= Private car (Passenger) 07= Matatu 08= Bus 09=Others, (Specify)	
2	What are some of the problems associated with the specific modes of transportation in the County?	Mode	Problems
		Walking	
		Boda boda	
		Motorcycle	
		Car	
		Matatu	
		Bus	
		donkey	
	Others (Specify)		
3	What are some of the problems / challenges	Means	Challenges
		Road	

	associated with the specific mode of transportation?			
		Air		
		Water		
4	Transport (Total) Fare	Record actual Amount		
9.1 What is your opinion on the service provided by following types of public transport system operating in your County?				
1	Matatu	Very Good = 1 Good = 2 Satisfactory = 3 Poor = 4 No Reply = 0		
2	Bus / mini bus	Very Good = 1 Good = 2 Satisfactory = 3 Poor = 4 No Reply = 0		
3	Tuk tuk	Very Good = 1 Good = 2 Satisfactory = 3 Poor = 4 No Reply = 0		
4	Boda boda	Very Good = 1 Good = 2 Satisfactory = 3 Poor = 4 No Reply = 0		
5	donkey	Very Good = 1 Good = 2 Satisfactory = 3 Poor = 4 No Reply = 0		
9.2. How many trips per day does the household make to different destinations?				
	Type of trip	Number of trips	Mode of transport	
1	Home to work			
2	Home to school			
3	Home to leisure points			
4	Home to shopping areas			
5	Home to...(specify)			
9.3. What is the furthest that members of your household travel to access the following facilities/ places and how long does it take?				
	Place / facility	Location	Distance	Time taken
1	Work areas			
2	Leisure/ recreation			
3	Shopping areas			
4	Educational facilities			
5	Health facilities			
10.Land issues				

1	Do you own land in this County?	01= Yes 02= No 98= No answer 99= Don't know	
2	If yes, Which part of the County?	Name:-----	
3	What is the size of your land? (acres/ hectares)	Record EXACT size(acres/ hectares)	
4	What is the nature of ownership?	01= Trust/ community land 02= Freehold / private land 03= Lease hold 04= Others (Specify)	

11. Agriculture

1	What type of agriculture do you practice on the land?	01= Subsistence 02=Commercial 03=Both 98= No answer	
2	Which crops do you plant on your land? a) Cash crops? b) Food crops?	01=Cash crops 02=Food crops 03=Both 98= No answer	
	c) What is the acreage under crops?	01= <1 acre 02= 1-2 acres 03= 3-5 acres 04=5-10 acres 05=>10 acres 98= No answer	
	d) What is the amount produced from this land?	01= <5 bags(90kgs) 02=5-10 bags 03=10-20 bags 04=20-50 bags 05= >50 bags 98= No answer	
3.	Where do you get your seeds from?	01=previous harvests 02=buy from seed companies 03=from agricultural societies 04=given by well wishers 05=borrow from farmers 98= No answer	
4.	a) Do you practice unconventional farming on your land?	01= Yes 02= No	
	b) If Yes above, Which one?	01= Organic Farming 02= Conservation/Evergreen agriculture 03= Greenhouse farming 04= Hydroponics 05= Mushrooms farming 06= Other. Specify.....	
4	Which livestock/animals do you rear on your land? And how many?	01= Cattle 02= Goats	

		03= Sheep 04= Poultry 05= Pigs 06=Donkeys 07= Fish 98= No answer	
5.	Do you keep unconventional livestock/any new animals?	01=Yes 02=No	
	If answer above is yes, which one?	01= Bees 02= Ornamental animals eg birds, fish, butterflies 03=Guinea Fowl 04= Chameleon 05= Others. Specify.....	
6.	Do you have crop storage facilities at your homestead?	01=Yes 02=No.....	
	If answer above is No, where do you incur postharvest losses	01= Storage 02= Transport 03= Market 04= Others. Specify	
7.	Do extension workers reach your area?	01=Yes 02=No	
	If answer above is No, How do you get agriculture related information?	01= Other farmers 02= Media outlets eg newspaper, radio 03= other stakeholders eg NGOs, experts 04= Others. Specify	
8.	Are there any farmer training centers in this area?	01=Yes, 02=No	
	If Yes, how often do they meet?	01= Quarterly 02= Semi annually 03= Annually 04= Never	
9.	Where and how do you sell your farm produce?	01= Market Centers 02= Neighborhood 03= Cooperatives 04= Companies/Institutions 05= Brokers 04= Others. Specify	

12. Tourism

Tourist& leisure facilities			
i	How far is the closest tourist/ leisure facility from your household	Record ACTUAL number	
ii	What is the furthest point that members of your household travel to access tourist/ leisure facilities (Specify location and distance)	Record ACTUAL Location and distance	
iii	How frequent do members	Record ACTUAL number of visits	

	of your household visit tourist/ leisure facilities? (No of visits in a month)		
iv	Does your household derive employment/ income from tourism?	01 = Yes 02 = No	
v	If your answer to (iv) is yes, is it through permanent employment, casual labour, routine business, or occasional income?	01 = Permanent 02= Casual Labour 03=Routine Business 04= Occasional Income	
12 b. Cultural Heritage			
I	Are there historical heritage buildings and monuments in this County?	01= Yes 02= No 98=No answer 99=Don't know	
ii	If your answer to (i) is yes, do members of your household visit these? If so, how frequently	01= yes 02= No Record Number of times	
Iii	Are they near the existing roads?	01= Yes 02= No 98=No answer	
iv	Are you satisfied with the state of historical heritage buildings and monuments in this County?	01= Yes 02= No 98=No answer 99=Don't know	
v	If unsatisfied, what improvement can you suggest?	1..... 2..... 3..... 4.....	

Suggestions

Is there any special request or proposal you would like us to inform the County Government about? If yes, explain it briefly for me:

Record here.

Tool 2: Focus Group Discussions Checklist

Name of Sub County: -----

Name of Ward: -----

Type of FGD: -----

Name of Facilitator: -----

Date: -----

1.Socio- Demographic Data			
Sub County:		Ward:	
No.	Name	Sex (m/f)	Position in the HH
1			
2			
2. General Background Data			
1	What do most residents in this sub county do to earn a living?		
2	How long have you lived in In this sub County?	No of Years...	
3.	Is this sub County planned?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
3. Community Vision			
1	Community Vision for this sub county by 2035 i.		
2	What facilities would you want to see in place in your sub County? list i.		
3	What facilities would you want to see improved? i.		
4. Agriculture			
1	Which crops do farmers around In this sub County grow as cash crops and food crops?		

	<i>Cash crops:</i>	<i>Food crops:</i>	
	i.	i.	
2.	Do farmers get maximum produce during harvest time from the land they cultivate? Yes <input type="checkbox"/> No <input type="checkbox"/> If No, why is that		
3.	What farm inputs are needed by farmers in this sub county? i		
4.	Where do farmers get farm inputs from? i		
5.	What problems do farmers encounter in readiness for the planting season with regards to inputs (seeds, fertilizer, and manure, labour) from these crops? i.		
6.	What problems do farmers experience when the crops are growing in the farms? list i		
7.	Do you know of any value addition (increasing the economic value and consumer appeal of an agricultural commodity through packaging, processing) for crops produced in this area? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, name the produce and the process? describe		
8.	Where or to whom do you sell your produce?		
9.	Do you encounter any problems when selling your produce? i		
10.	How do farmers transport their produce to their destinations (market, storage, companies, and cooperatives)? i Is it efficient? Yes <input type="checkbox"/> No <input type="checkbox"/> Give reasons for your answer i		
11.	What are the consumption patterns of agricultural produce in this area? Describe		
12.	Where do you get information about agriculture from? i		

	<p>Is it timely?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
13.	<p>a) Are there farmers training centres in this area? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>b) If yes, where / Name</p>
14.	<p>a) Are there any crop storage facilities in this area?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>b) If Yes, is the capacity adequate?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
15.	<p>What problems do farmers encounter in crop farming?</p> <p>i</p>
16.	<p>What can be done to minimize these problems to ensure maximum returns?</p> <p>i</p>
17.	<p>What is the alternative crop that can support many households living around this sub County?</p> <p>i.</p>
11.	<p>Why don't farmers/households grow these crops?</p> <p>i.</p>
12.	<p>How can these new crops be promoted?</p> <p>i.</p>
13.	<p>Who can be major promoters or stakeholders?</p> <p>i.</p>
14.	<p>What would you like the county government to do to improve the livelihoods of crop farmers in the sub county?</p> <p>i.</p>
5	Livestock
1	Do you own any livestock
2	<p>Which type of livestock, list in order of importance</p> <p>i.</p>
3.	<p>What inputs are needed by livestock keepers in this sub county?</p> <p>i</p>

4.	Where do the livestock farmers get inputs from? i	
5.	What are the problems related to inputs supply (labour, feeds) for these livestock? i.	
6.	What are the problems related to production from these livestock? i	
4.	What products do you sell from your livestock? i	
5.	When do you sell livestock and Where do you sell them?	
	Where	when
6.	To who do farmers sell their livestock produce? i	
7.	What type of transport do farmers use to transport their produce? i Is it transportation system efficient? Yes <input type="checkbox"/> No <input type="checkbox"/>	
8.	What are the problems encountered when farmers are selling their livestock produce? i	
9.	Are there any storage facilities or cooling facilities in this area? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, are they government or privately owned?	
	Government owned	Privately owned
10.	a) Do farmers receive any extension services from livestock experts? Yes <input type="checkbox"/> No <input type="checkbox"/> b) If yes, How often?	
11.	What are the consumption patterns for livestock produce in this area? Describe	

	i.
12.	<p>a) Do you know of any value addition (increasing the economic value and consumer appeal of an agricultural commodity through packaging, processing) for livestock produce in this area?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>b) If yes, name the produce and the process?</p> <p>i.</p>
13.	<p>Are there livestock farming training centres in this area? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Which ones, name them</p> <p>i.</p>
14.	<p>What problems do you face in livestock keeping?</p> <p>i.</p>
15.	<p>How can the problems be solved?</p> <p>i.</p>
16.	<p>Which other livestock enterprises do you think can be done in this area?</p> <p>i</p>
17.	<p>Why are farmers not putting up livestock enterprises? Give reasons</p> <p>i</p>
18.	<p>What would you like the county government to do to improve the livelihoods of livestock farmers in the sub county??</p> <p>i.</p>
6. Education	

1	Types of institutions in your sub county?	Types of institutions existing				Private	Public	boarding
		- nursery schools						
		- Colleges						
		- Secondary Schools						
		- Primary Schools						
		- Nursery Schools						
		- Vocational training institutes						
		- Others(specify)						
2	Are their training and Education facilities that you need? Yes <input type="checkbox"/> No <input type="checkbox"/> if yes, Which ones? i.							
3	State problems associated with Education facilities i.							
4	State possible solutions associated with Education facilities i.							
7 Gender Analysis- Twenty four hour day activity profile								
1	Women daily activities		Men daily activities		Youth daily activities			
	Time	Activity	Time	Activity	Time	Activity		
		Wake Up		Wake Up		Wake up		
		Sleep		Sleep		Sleep		
		Total no.of activities		Total no.of		Total no.of activities		
2	Comments and conclusion on women's roles, men's role in the community i.							
8. Income Analysis								

1	List sources of income		
	Sources' of income for men	Amount	Sources of income for women
	amount		
	1		
	2		
	3		
2	<i>Household Income & Expenditure</i>		
	Income	Per month	Expenditure
			Per month
	-		-
3	Calculate how much used on;		
	<i>Food</i>		
	<i>Health</i>		
	<i>Rent/ mortgage</i>		
	<i>Education</i>		
	<i>Water %</i>		
	<i>Sanitation %</i>		
4	Ask the group who in their opinion is rich, poor, medium person in In this sub County?		
5	List the different categories of assets owned		
	Poor	Medium	Rich
	1	1	1
	2	2	2
	3	3	3
9. Livelihood Analysis and Community Asset Analysis			
1	Identify the types of economic activity in the area.		
	i.		
2	Identify the economic activities taken up by women		
	Economic activities taken up by women	Economic activities taken up by Youth	Activities taken up by men

3	Type of enterprises in the area i.			
4	Women specific enterprises i.			
5	Men specific enterprises i.			
6	Youth specific enterprises i.			
7	Approximate number of people employed in an enterprises			
	Jobs -Men enterprises	Jobs-Women enterprise	Jobs-Youth enterpris	
10. Mobility mapping for County residents				
1	Draw a mobility map sketch for In this sub County residents (to clinics, schools , markets etc. <i>(draw in your exercise book)</i>)			
2	Where do most people live? i.			
3	Which places do they visit on daily basis in order to access services? i.			
4	Where do most people work or trade? i.			
5	Which important facilities don't you have in this sub County? i.			
6	Where would you prefer the facilities to be located <i>(in line with the mobility map)</i> Bus park, market, commercial, residential, dumpsite, sewerage treatment plant, cemetery, hospital, university, primary school, secondary school, nursery etc)			
11. Community Participation and Engagement				
1	Do community members participate in meetings organized by government?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
2	How are community members encouraged to attend meetings?			

	i.	
3	Which meetings do community members like attending and why? i.	
4	In cases where the community has worked with the government, what have been the benefits or successes observed? i.	
5	What have been the weaknesses or failures observed? While working with government i.	
6	How can communities be encouraged to participate in development meetings? i.	
12. Local Economic Development		
1	Are you aware of any strategy for this sub County that promotes economic development?	Yes <input type="checkbox"/> No <input type="checkbox"/>
2	What attracts economic activities to In this sub County? i.	
3	What promotes or hinder income-generating activities in this sub County i.	
4	What is making this sub County change/move?	
5	Which economic sectors/ activities are on a growth trend?	
	Economic Sectors	Why
6	What economic sectors/ activities are on decline trend? Why? i.	
7	What are the major obstacles to the economic performance of the sub County? i.	
8	To what extent can these factors be influenced or managed at the local level? i.	
9	What should be done to improve the environment for growth and accelerate investment?	

	i.
13. Drainage	
1	What is the state of drainage in the County? i.
2	Are the channels lined? Yes <input type="checkbox"/> No <input type="checkbox"/>
3	Do people use the drainage channels? Yes <input type="checkbox"/> No <input type="checkbox"/>
4	State problems associated with drainage i.
5	State possible solutions i.
14 .County Roads	
1	Are there internal roads in the sub County? Yes <input type="checkbox"/> No <input type="checkbox"/>
2	Who uses them?
3	When was the last time they were upgraded?
4	State problems with internal roads
5	State solutions to internal roads problems
15. Rural link roads	
1	Are there link roads between the sub County and the rural areas? Yes <input type="checkbox"/> No <input type="checkbox"/>
2	Who uses them?
3	When was the last time they were upgraded?Year
4	State problems with access roads
5	State solutions to the problems of access roads
16. Non- motorised transportation	
1	How are the pedestrians taken care of in In this sub County?
2	How are the boda boda services organized?
3	Are individual cyclists catered for? Yes <input type="checkbox"/> No <input type="checkbox"/>
4	Which other non-motorised means of transport is available in the sub County?
5	How can non -motorised transportation be improved?
1 Livestock corridors	

7							
1	Are there livestock corridors in your sub County? Yes <input type="checkbox"/> No <input type="checkbox"/> if no ,are they needed? Yes <input type="checkbox"/> No <input type="checkbox"/>						
2	If yes, Are they maintained?						
3	What other facilities do you have along the corridor and what don't you have?						
	<table border="1"> <thead> <tr> <th>Existing facilities along the corridor</th> <th>Facilities that are not there</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Existing facilities along the corridor	Facilities that are not there				
Existing facilities along the corridor	Facilities that are not there						
4	Any suggestion regarding livestock corridors? i.						
18	Cattle tracks						
1	Are there cattle trucks in the sub County? Yes <input type="checkbox"/> No <input type="checkbox"/>						
2	Are they maintained? Yes <input type="checkbox"/> No <input type="checkbox"/>						
3	Do they cause any problem in the County? Yes <input type="checkbox"/> No <input type="checkbox"/>						
4	How can the problems be solved? i.						
19	Bus parks						
1	Are there bus parks in the County? Yes <input type="checkbox"/> No <input type="checkbox"/>						
2	How many bus parks are there? No..... Names						
3	What are the problems with bus parks? i.						
4	What are the possible solutions? i.						
20	Lorry parks						
1	Are there lorry parks in the County? Yes <input type="checkbox"/> No <input type="checkbox"/>						
2	How many and where are they? No..... Names						

3	What are the problems on lorry parks? i.
4	What are the possible solutions? i.
21. Markets	
1	Are there markets in the County? Yes <input type="checkbox"/> No <input type="checkbox"/>
2	How many and where are they? No..... Names
3	What are the problems with markets? i.
4	What category of the traders uses the markets? i.
5	Are there traders without a market space existing in the market? Yes <input type="checkbox"/> No <input type="checkbox"/>
6	What are the possible solutions i.
2 Livestock market	
2	
1	Is there a livestock market in this County? Yes <input type="checkbox"/> No <input type="checkbox"/>
2	How many?
3	For what type livestock is sold in the markets? i.
4	Where do the livestock originate from?
5	Where do the traders come from?
6	Are there facilities you require that are not available in the market?
7	Are there any problems with the market? Yes <input type="checkbox"/> No <input type="checkbox"/>
8	How can they be solved? i.
23. Co-operatives	
1	Which cooperative society do you know and like?

2	What activities do co-operatives undertake?
3	What do you like about cooperatives? i.
4	What don't you like, why? i.
5	What can be done to strengthen cooperatives?
6	What other activities can cooperatives undertake? i.
7	Can Cooperative Societies be used as tools for institutions that can steer the development of infrastructure/management in Nakuru? Yes <input type="checkbox"/> No <input type="checkbox"/>
8	What can they exactly undertake?

24.Stakeholders Analysis

1	List the main stakeholders in this County i.						
2	State those who are most active i.						
3	Who are the strongest and weakest stakeholders in this County						
	<table border="1"> <tr> <td>Strong</td> <td>weak</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table>	Strong	weak				
Strong	weak						
4	<table border="1"> <tr> <td>The stakeholder you would want to relate with in the County</td> <td>Are there any disinterested stakeholders</td> </tr> <tr> <td></td> <td></td> </tr> </table>	The stakeholder you would want to relate with in the County	Are there any disinterested stakeholders				
The stakeholder you would want to relate with in the County	Are there any disinterested stakeholders						

25.Safety

1	Where, when and why do you feel unsafe?									
	<table border="1"> <tr> <td><i>Where</i></td> <td><i>When</i></td> <td><i>Why</i></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	<i>Where</i>	<i>When</i>	<i>Why</i>						
<i>Where</i>	<i>When</i>	<i>Why</i>								

2	How safe are the learning institutions in this County?			
3	What is being done to address issues of safety in the County? i.			
4	Who is working on safety improvement? i.			
2 6.	Security			
1	Are there <input type="checkbox"/> Police posts in your area? Yes <input type="checkbox"/> No <input type="checkbox"/> <input type="checkbox"/> Police stations in your area? Yes <input type="checkbox"/> No <input type="checkbox"/>			
2	Are there vigilante groups in the County? Yes <input type="checkbox"/> No <input type="checkbox"/>			
3	Is the Nyumba Kumi security system working in your area? Yes <input type="checkbox"/> No <input type="checkbox"/>			
4	Are there KPRs in you County? Yes <input type="checkbox"/> No <input type="checkbox"/>			
5	What do you think could be done to improve security? i.			
2 7	Disaster management			
1	What types of disaster occur in this County? i.			
2	Is the county government able to respond to disasters like fire in time? Yes <input type="checkbox"/> No <input type="checkbox"/>			
3	If no, why? i.			
4	What are the problems associated disaster management in your area? i.			
5	What are the possible solutions to safety security problems? i.			
28. Governance				
1	Who decides on major improvements of this County? tick <input type="checkbox"/> County Government? <input type="checkbox"/> The people			

	<input type="checkbox"/> NGOs <input type="checkbox"/> Others? Specify								
2	Are men/women/ youth consulted? Yes <input type="checkbox"/> No <input type="checkbox"/>								
3	How? i. ii.								
4	Is there a forum where they are invited? Yes <input type="checkbox"/> No <input type="checkbox"/>								
5	Are there CBOs in this area? Yes <input type="checkbox"/> No <input type="checkbox"/>								
6	List them and their activities? <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">CBO Name</th> <th style="width: 50%;">Activity</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>	CBO Name	Activity						
CBO Name	Activity								
7	Are there NGOs in this County? Yes <input type="checkbox"/> No <input type="checkbox"/>								
8	List them and their activities? <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">NGO Name</th> <th style="width: 50%;">Activity</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>	NGO Name	Activity						
NGO Name	Activity								
9	What are the problems associated with leadership in this County? i.								
10	What are the possible solutions? i.								
29. Informal settlements									
1	Are there unplanned settlements in the County or area? Yes <input type="checkbox"/> No <input type="checkbox"/>								
2	What proportion of land in percentage does it occupy?%								
3	Who owns the land/structure in the unplanned settlements? <input type="checkbox"/> Private? <input type="checkbox"/> Government? <input type="checkbox"/> community <input type="checkbox"/> Council? <input type="checkbox"/> Others? Specify								
4	What problems are associated with these settlements? i.								

5	Give possible solutions to these problems i.
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30.Recreational Facilities

1	Are there any public open spaces in County and or your neighbourhood? Yes <input type="checkbox"/> No <input type="checkbox"/>						
2	Who uses and when are most used?						
	<table border="1" style="width: 100%;"> <tr> <th style="width: 33%;"><i>Who</i></th> <th style="width: 33%;"><i>When</i></th> <th style="width: 33%;"><i>Where</i></th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	<i>Who</i>	<i>When</i>	<i>Where</i>			
	<i>Who</i>	<i>When</i>	<i>Where</i>				
3	If not where would you suggest that they be located? i. ii.						
4	Are there recreation parks to relax when one is tired? Yes <input type="checkbox"/> No <input type="checkbox"/>						
5	Are there children play parks? Yes <input type="checkbox"/> No <input type="checkbox"/>						
6	Are there football pitches etc.? Yes <input type="checkbox"/> No <input type="checkbox"/>						
7	Give suggestions and possible solutions on having recreational facilities in In this sub County i.						

31.Problem ranking

1	Problems faced in this sub County and neighbourhood				
	<table border="1" style="width: 100%;"> <tr> <th style="width: 50%;">sub County level problem</th> <th style="width: 50%;">Neighbourhood problem</th> </tr> <tr> <td> </td> <td> </td> </tr> </table>	sub County level problem	Neighbourhood problem		
	sub County level problem	Neighbourhood problem			

32.Opportunities ranking

1	Identify the existing opportunities						
	<table border="1" style="width: 100%;"> <tr> <th style="width: 50%;">Opportunity</th> <th style="width: 50%;">Why</th> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Opportunity	Why				
	Opportunity	Why					

33.Quick wins and priority projects

1	Identify and list three quick wins and priority projects that will make a difference in In this sub County if implemented	
	<table border="1" style="width: 100%;"> <tr> <td>Priority projects</td> </tr> </table>	Priority projects
Priority projects		

	i)
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TOOL 3: KEY INFORMANT CHECKLIST

Good Morning,

We are from the County Government of Nakuru. We are going round soliciting for views from the residents of this town on the priorities for development. Therefore we are kindly asking you to answer the following questions to help us capture the views of the residents. Thank you.

Name of respondent	Sex	Age	Occupation	Length of stay in the sub county
Name of Town				

1) What are the **5** things that you like about the way this sub county is planned (be specific)

	Things I like about how this sub county is planned
1	
2	

2) What are the **5** things that you do not like about the planning of this sub county?

	Things I don't like about how this sub county is planned	Reason
1		
2		

3) Give us your vision of how you would like to see in this sub county in the year 2035.

4) What other facilities would you want to see in this sub county and where?

Facility	Place/ Area

5) Cultural Heritage- Are there historical heritage buildings and monuments in the sub county? And are they maintained?

The sites/ monuments	Maintained or not	Who is responsible

6) Any other suggestions for the improvement of the sub county

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