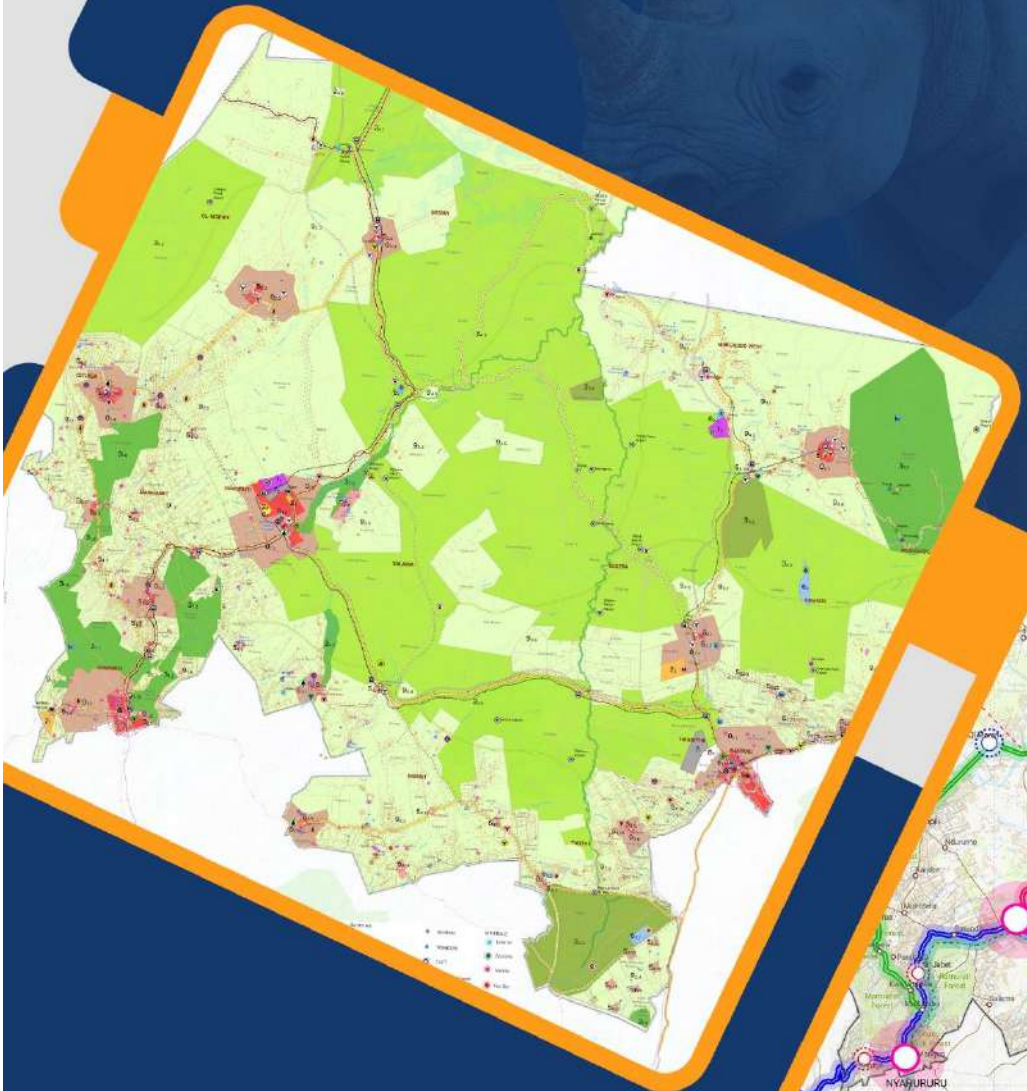
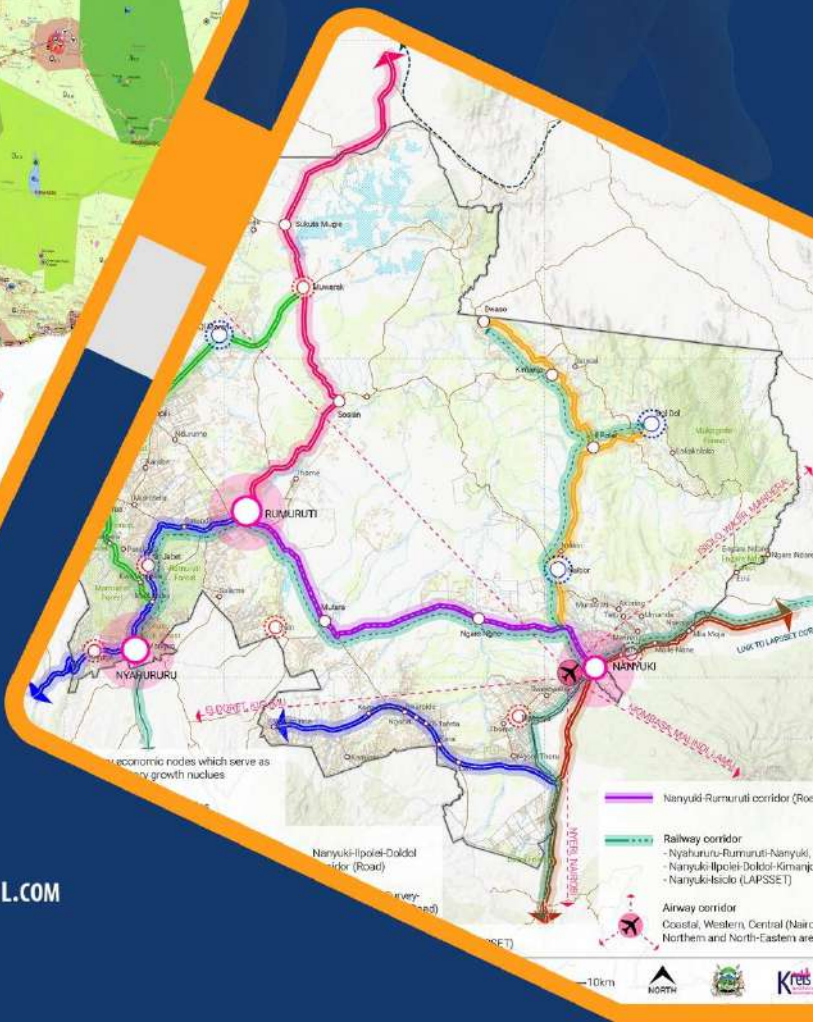
LAIKIPIA COUNTY

SPATIAL PLAN (2023 - 2033)

FINAL DRAFT PLAN

AUGUST 2023





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Vision: *Delivering Sustainable Communities; Settlements; and Places*
Mission: *Value Driven and Action Oriented service*

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ENDORSEMENTS, CERTIFICATIONS & APPROVAL

I Certify that this Plan has been prepared and published as per the requirements of the County Governments Act, 2012; the Urban & Areas Cities Act, 2011; the Physical & Land Use Planning Act, No. 13 of 2019; and other Planning standards and guidelines.

Signed

…… Date ……

Plnr. Samuel Mburu Gituara, MKIP
Registered & Practicing Physical Planner (RPP0247), Lead Consultant, KREIS Spatial Planning & Consulting Associates Ltd

Certified

…… Date ……

Mr. Ekwam Nabos
County Executive Committee Member (C.E.C.M.), Infrastructure, Lands & Physical Planning, Housing, Energy and Urban Development, County Government of Laikipia

Recommended

…… Date ……

His Excellency Hon. Joshua Wakahora Irungu (E.G.H.)
Governor, County Government of Laikipia

Approved

…… Date ……

Name: …… **Designation:** ……

The County Assembly
County Government of Laikipia

Hansard No.

……

FOREWORD

As mandated by the County Governments Act, 2012, the GIS-Based Laikipia County Spatial Plan (2023-2033) has been prepared to provide a framework for land use management in the County for a period of 10 years (2023-2033). This is in accordance with the Constitution of Kenya, 2010, which assigns county planning functions to County Governments. The Plan envisions Laikipia as a model county anchored on sustainable and integrated land use management for development. It will go a long way in contributing towards the achievement of the aspirations of the long-term development blueprint of the Kenya Vision 2030.

The County has a diverse natural capital comprising various species of wildlife, indigenous vegetation, arable lands, scenic landscapes, and extensive rangelands and conservancies. Its human capital portrays a youthful population with a rich cultural diversity. These attributes support economic activities and investments in tourism, crop farming, livestock keeping, industrial development, trade and commerce which support livelihoods and spur the local economy. The strategic location of the County within the Central Region Economic Bloc, proximity to the LAPSSET Corridor and the Isiolo Airport, existing transport networks, and infrastructure developments create a regional linkage with the potential of attracting further investments into the County.

The plan, therefore, seeks to capitalize on the County's strengths and opportunities by providing a spatial framework that will guide land use management, induce urban and rural development, promote sustainable resource utilization, and stimulate socio-economic and infrastructure improvement. The timely completion of the Plan, therefore, is a key milestone for the overall development agenda of Laikipia County. I call for the cooperation and support of all stakeholders and development partners in the successful and effective implementation of the Plan.

Signature: .....

His Excellency Hon. Joshua Wakahora Irungu (E.G.H.)
Governor, County Government of Laikipia

PREFACE

Being an ASAL county, Laikipia's landscape supports livestock keeping, beef farming, and wildlife conservation within the northern and central areas. The southern and eastern parts bordering the Aberdare Ranges and Mt. Kenya respectively, have favorable climatic conditions that support crop, dairy, fish, and poultry farming. These form the main economic activities and means of livelihood for the people of Laikipia County.

A significant challenge that threatens the socio-economic well-being of the people is unsustainable land use management evidenced by uneconomical land subdivision and fragmentation, uncontrolled land use changes, land degradation, and absentee landlords. Other development challenges include poor road connectivity and accessibility, water scarcity, resource-based conflicts, food insecurity, inadequate access to social amenities and infrastructure utilities, and lack of tenure security.

The County Spatial Plan addresses these challenges by providing a spatial development framework that forms the basis for the effective delivery of infrastructure and services while unlocking sectoral development potentials and ensuring balanced growth in all parts of the County. The Plan preparation process ensured adequate citizen and multistakeholder participation, establishment of adequate governance structures and promoted financing of infrastructure and service provision to improve the living standards of Laikipia County residents. The Plan outlines well-thought-out strategies, programmes, and projects which constitute priority components for budgetary spending and resource allocation. I am confident the implementation of this Plan will enhance sustainable land use management towards attainment of our desired vision as a County.

Signature: .....

Mr. Ekwam Nabos
County Executive Committee Member (CECM),
Infrastructure, Lands & Physical Planning, Housing, Energy & Urban Development

ACKNOWLEDGEMENT

The Plan preparation process was a collaborative effort of numerous stakeholders who diligently participated and contributed during the various planning phases.

I, foremost, wish to express my sincere gratitude to the County Government of Laikipia through the stewardship of H.E. the Governor Hon. Joshua Irungu; H.E. the Deputy Governor Hon. Reuben Kamuri; and the CECM for Infrastructure, Lands, Public Works & Urban Development Hon. Ekwam Nabos. I also thank the County Executive Committee Members, Chief Officers led by the department of Lands, Housing and Urban development Mr. Kenneth Kibara, and Directors of the various County Departments for their dedicated technical support and input throughout the Plan preparation process.

My profound appreciation goes to the County Physical Planning team – Physical Planners (Plan. Michael Mudenyo and Plan. Richard Muchoki), surveyors, and GIS experts under the leadership of the CSP Coordinator Dr. Jeniffer Kinoti, who comprised the initial joint planning team and untiringly participated in data management, information sharing, review of outputs, and maintained an active correspondence with the Consultant. I wish to further thank the representatives from various National Government agencies including the National Land Commission led by Plan. Daniel Mmbai, Plan. Robert Koech and Plan. Lucy Mueni; the Ministry of Lands, Public Works, Housing & Urban Development led by Plan. Artur Mbatia and Plan. Ben Amolo; and NEMA who were instrumental in oversight roles, capacity building, and technical development.

The preparation of this Plan would not have been a success without the immense support from the Food and Agriculture Organization (FAO) of the United Nations which established and equipped the County GIS lab, undertook training programmes for the GIS technical team, and facilitated the Plan validation forums. Gratitude also goes to various research and conservation institutions namely, CETRAD led by Dr. Kiteme, Wyss Academy for Nature led by Dr. Ben Okita, Laikipia Wildlife Forum, NRT, and Laikipia Conservancies Association whose information sharing, technical input, and workshop facilitation went a long way in ensuring the successful completion of the Plan.

My sincere appreciation extends to the consulting team at KREIS Spatial Planning and Consulting Associates Ltd. who worked tirelessly throughout the Plan preparation process to deliver this County Spatial Plan. In particular, I would like to acknowledge the Lead Consultant Plan. G. Samuel Mburu and his team which included GIS & Mapping Experts Mr. Solomon Karani and Mr. Collins Mido; Plan. Peter Kaberere; Plan. Cynthia Wamukota; and Plan. Fridah Nzuki.

Finally, I wish to recognize the efforts of sub-county and ward administrators, chiefs, assistant chiefs, village administrators, and representatives of NGOs, CBOs, FBOs, youth, women, and PLWDs during different stages of the planning process. I sincerely acknowledge the people of Laikipia County for participating in the visioning and sensitization exercises, particularly in highlighting the development opportunities and constraints for different parts of the County. Your commitment and invaluable contribution informed the Plan outputs.

Signature: .....
Mr. Nelson Michael Mudenyo Akwata
Ag. Snr. Physical Planner
Lands & Physical Planning, Housing, Energy & Urban Development

EXECUTIVE SUMMARY

Laikipia County Spatial Plan has been prepared in line with the provisions of the Constitution of Kenya 2010, with specific reference to Part 2 of the Forth Schedule which provides for county planning and development as functions and powers assigned to County Governments. Further, Article 66 (1) on the regulation of land use and property, gives power to the State to regulate the use of any land or any interest in or right over any land in the interest of defense, public safety, order, morality, public health or land use Planning.

The legal mandate under which the County Spatial Plan is prepared is the County Governments Act 2012, which provides additional guidance to planning as a function of the County Governments, particularly Section 110 which identifies County Spatial Plans as one of the four main plans that should provide a framework for resource mobilization and allocation at the County level. The CSP is aligned with the National Spatial Plan (2015-2045) that generally directs the country's spatial development in the realization of Vision 2030.

The purpose of the Plan is to provide a strategic socio-economic and infrastructure development pathway for the County over the next 10 years (2023-2033). Since land is a fixed resource, the plan purposes to provide a framework for sustainable and integrated land use management in the County. In the long run, it is expected that the Plan will be able to:

- Provide a framework for the coordination of sectorial developments in the County;
- Provide for major social, physical, and transport infrastructure;
- Guide rural development and settlement, and establish a hierarchy of urban centers for sustainable urban development;
- Propose innovative strategies to enhance the utilization and sustainable management of natural resources;
- Provide a framework for revitalizing industries, trade, and commerce to spur economic development;
- Offer environmental protection strategies aimed at enhancing the conservation and management of land within the County;

- Set out the guidelines, norms, and standards for land use planning in the County as a basis for development control as well as decision-making on major economic investments in the County;

The Plan preparation process commenced with ward-based stakeholder sensitization and visioning workshops. Relevant stakeholders were actively engaged in establishing the strengths, weaknesses, opportunities, and threats for the fifteen wards, which were consolidated to determine the existing development constraints and opportunities for Laikipia County as a whole. The stakeholders also participated in formulating a County Vision which is "*a model county that is anchored on sustainable and integrated land use management for environmental and socio-economic development".* This was drawn from thematic vision statements.

A county-wide socio-economic survey and mapping exercise was done to understand the landscape and natural environment, population and demographic characteristics of the people of Laikipia, land and human settlement patterns, economic activities, transport networks and connectivity, social amenities and infrastructure utilities, and the institutional framework and governance structure. This data was instrumental in the preparation of a GIS-based base map and for detailed thematic synthesis which formed the basis for Plan formulation.

Laikipia County is endowed with extensive rangelands and conservancies, arable land that supports agriculture, diverse wildlife species and population, scenic landscapes, and a youthful population with rich cultural diversity. Its strategic central location and existing transport linkages present opportunities for socio-economic and infrastructure development. The hierarchy of urban centers in the County creates a basis for access to social services and utilities, promotes rural-urban linkages, and facilitates investments in trade, commerce, and industry.

The identified key constraints that impede development in the County are unsustainable land use management; water scarcity and food insecurity, especially in the Laikipia North region; resource-based conflicts; human-wildlife conflicts; poor transport connectivity and accessibility; insecurity of tenure; land degradation and encroachment on ecologically fragile areas; banditry and insecurity in the Laikipia North region; and lack of local physical and land use plans to guide urban development.

A detailed analysis and synthesis of the development opportunities and challenges led to the formulation of six spatial concepts that accurately depict Laikipia's landscape structure. These concepts, based on the functionality of smaller sub-regions, comprise the productive food baskets, the pastoralists' enclave, the great economic corridor, the wildlife wilderness, industrial junctions, and the breathing ecosystems. Splitting the landscape into functional sub-regions enabled in-depth scrutiny of the level of infrastructure development and service provision for different parts of the County.

To ensure balanced development and further enhance the identified functionality of each sub-region, five broad thematic-based strategies have been developed – namely, crop and livestock development strategy; transport, infrastructure, and social services strategy; trade, tourism, industry and mining strategy; environment and biodiversity conservation strategy; and an urban development strategy. Each of these strategies comprises a set of programmes, specific actions, implementation timeframe, and the identified actors tasked with the implementation of various thematic programs.

The Plan outlines detailed land use regulations, standards, and guidelines that form the development control framework intended as an enforcement tool to regulate the use of land or the change in the use of land. A capital investment framework has also been prepared ranking priority projects with their respective estimated cost of implementation and financing plan. To ensure the effective implementation of the Plan, a monitoring and evaluation framework has been prepared to provide feedback on the implementation progress and allow for timely modifications of the implementation timeframe. The CSP implementation oversight and technical committees are key prerequisites for the successful implementation of the Laikipia County Spatial Plan.

Signature: ……
CPA. Kenneth Irumbi Kibara
Chief Officer (C.O),
Lands & Physical Planning, Housing, Energy & Urban Development

ABBREVIATIONS AND ACRONYMS

AEZ	Agro Ecological Zone
ADP	Annual Development Plan
ASAL	Arid and Semi-Arid Land
ASDP	Agricultural Support Development Program
CECM	County Executive Committee Member
CEREB	Central Region Bloc
CETRAD	Centre for Training and Integrated Research in ASAL Development
CFU	Colony Forming Units
CGL	County Government of Laikipia
CIDP	County Integrated Development Plan
CSP	County Spatial Plan
ECDE	Early Childhood Development Education
EMCA	Environmental Management and Co-ordination Act
FAO	Food and Agriculture Organization
FSP	Fiscal Strategy Paper
FY	Fiscal Year
GCP	Gross County Product
GDP	Gross Domestic Product
GIS	Geographic Information System
HPI	Human Poverty Index
KEFRI	Kenya Forestry Research Institute
KeNHA	Kenya National Highway Authority
KENWEB	Kenya Wetlands Biodiversity
KFS	Kenya Forest Service
KMD	Kenya Meteorological Department
KNBS	Kenya National Bureau of Statistics
KPLC	Kenya Power and Lighting Company
KURA	Kenya Urban Roads Authority
KWF	Kenya Wildlife Forum
LAICONAR	Laikipia County National Resources Network
LAPSSET	Lamu Port South Sudan Ethiopia Transport Corridor

LWF	Laikipia Wildlife Forum
MDAs	Ministries, Departments and Agencies
MoALF	Ministry of Agriculture, Livestock and Fisheries
NAWASCO	Nanyuki Water and Sanitation Company
NCCAP	National Climate Change Action Plan
NDC	Nationally Determined Contribution
NDMA	National Drought Management Authority
NGOs	Non-Governmental Organizations
NLC	National Land Commission
NMK	National Museums of Kenya
NPHC	National Population and Housing Census
NYAHUWASCO	Nyahururu Water and Sanitation Company
RTI	Respiratory Tract Infections
SEZ	Special Economic Zone
TDS	Total Dissolved Solids
TVET	Technical and Vocational Education and Training
WASREB	Water Services Regulatory Board
WRA	Water Resource Authority
WRAP	Water Resources Assessment Programme
WRUA	Water Resource Users Association

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PART 1:

INTRODUCTION

1 BACKGROUND OF THE PLAN

1.1 Purpose of the Plan

The Constitution of Kenya, 2010 assigns the responsibility of planning to both the National and County Governments. Therefore, County Governments have the mandate to plan and ensure equitable and sustainable allocation and utilization of resources within their areas of jurisdiction. The County Governments Act, 2012 (amended 2020) provides further guidance to county planning as a function of the County Governments. Part eleven (XI) of the Act, which governs County Planning, identifies four main plans that should provide a framework for resource mobilization and allocation at the County level. These plans are identified in Section 107 as the County Integrated Development Plans (CIDP), County Sectoral Plans, County Spatial Plans (CSP); and Cities and Urban Areas Plans as provided for under the Urban Areas and Cities Act, 2011.

Essentially, a County Spatial Plan provides a framework for land use management in a County. The GIS-based plan has a lifespan of ten years and should be reviewed after every five years. Although the plan is prepared by the County Government, the National Government through the Ministry of Lands & Physical Planning and the National Land Commission among other Ministries, Departments and Agencies (MDAs) are expected to offer technical support and cooperation throughout the process. Additionally, the County Spatial Plan should be aligned with the National Spatial Plan (2015- 2045).

The County Government of Laikipia received support from the Food and Agriculture Organization (FAO) to develop a County Spatial Plan aimed at guiding land use management and development activities within the County for the next ten (10) years. The support from FAO was premised under the auspices of the European Union (EU) Funded Land Program titled "Support to the attainment of Vision 2030 through devolved land reforms in community lands of Kenya'' covering nine (9) counties. The pilot program was however in support of only three Counties namely Laikipia, Tana River, and Samburu. Beyond the support extended in the preparation of the Laikipia CSP, FAO has been supporting group ranches in Laikipia North on sustainable land use practices in the County.

The plan was developed through close collaboration with various MDAs including the Ministry of Lands and Physical Planning, the National Land Commission, Kenya Wildlife Service, Kenya Forest Service, the National Environment Management Authority, the Council of Governors, local conservancies, NGOs, research organizations, development partners, CETRAD, and external consultants among others. The general public was well mapped at the County level and actively engaged in the planning process.

1.2 Vision of the Plan

This was agreed upon through an in-depth synthesis of various stakeholder inputs and taking into consideration the core problems, key thematic areas, and the proposed thematic vision statements. Therefore, the County Spatial Plan vision is to make Laikipia a model county anchored on **"Sustainable and integrated land use management for environmental and socio-economic development".**

1.3 Objectives of the Plan

The overall purpose of the County Spatial Planning process was to provide a framework for land use management system and desired spatial form of development activities within Laikipia County. The objectives of the CSP were mainly aligned with the provisions of Section 103 of the County Governments Act, 2012 (amended 2020).

The specific objectives of the CSP were;

1. To prepare a plan to guide the spatial development of Laikipia County.
2. To produce accurate up-to-date digital topographic maps for planning, infrastructure development and maintenance programmes.
3. To Develop a GIS-based land information system to guide land administration and management.
4. To guide rural development and settlements.
5. To provide a basis for efficient and effective delivery of infrastructure and services.
6. To interpret and localize strategic national and regional development policies and strategies.
7. To identify the vital natural resources within the County, analyze the level of utilization and propose innovative strategies to enhance their utilization and management sustainably.

8. To identify opportunities for job creation and employment.
9. To provide a framework for revitalizing industries, trade and commerce to spur economic development.
10. To formulate strategies for improving transport and communication networks and linkages.
11. To develop strategies to realize a system of urban centers for sustainable urban development.
12. To identify the region's environmental concerns and propose protection and conservation measures.
13. To improve utilization of land-based resources and guide the organization and development of physical development of the human settlements.

1.4 Scope of the Plan

The County Spatial Planning process covered the area within the legal boundaries of Laikipia County. It was intended to guide the spatial distribution of developments undertaken by the County Ggovernment and non-governmental entities e.g. investors and development partners. It was also aligned with national government and regional development strategies and plans to ensure that the people of Laikipia achieve optimal benefits from such initiatives.

1.5 Organization of the Plan

This CSP is presented in six parts and fifteen chapters, namely:

Part 1: Introduction

Chapter 1 - This section details the background and scope of the CSP, as well as the objectives and structure of the Plan.

Chapter 2 - This section presents Laikipia County's contextual information regarding its location and administrative units. It also details the methodology used in developing the CSP, and the supporting constitutional, policy and legal frameworks.

Part 2: Situational Analysis

Chapter 3 - This section presents the County's base map, highlighting the natural and man-made features.

Chapter 4 - This chapter gives an inventory of the County's physiographic characteristics such as topography, geology, soils, hydrology, and climatic conditions; as well as its environmental characteristics and natural resources; including agro-ecological zones, vegetation cover and wildlife.

Chapter 5 - This chapter details the characteristics of the people of Laikipia County in terms of population size, structure and distribution, culture, and other demographic characteristics.

Chapter 6 - This chapter discusses land as a resource, looking at elements such as the uses of land, sizes of land and the suitability of land.

Chapter 7 - This chapter describes the distribution of urban and rural human settlements within the County. It also highlights the hierarchy of urban centres, their level of development and the availability of social services.

Chapter 8 - This chapter describes the economic activities within Laikipia County, such as agriculture, trade and commerce, mining, tourism, industry, and the informal sector.

Chapter 9 - This chapter analyses the social infrastructural facilities within the County, transportation networks and infrastructure systems.

Chapter 10 - This chapter looks at the existing governance structure and institutions operating in Laikipia County, as well as their capacities and responsibilities.

Part 3: Synthesis of Planning Issues

Chapter 11 - This chapter provides an analysis of the emerging issues from the eight thematic areas of physiographic characteristics, population, environment, human settlements, land, economy, transportation and infrastructure, and governance.

Chapter 12 - This chapter provides various possible spatial development scenarios and development models.

Part 4: Plan Proposals

Chapter 13 - This chapter details the policies, strategies and actions proposed for the CSP, responding to the challenges identified in the previous sections.

Part 5: Spatial Development Framework

Chapter 14 - This chapter presents the structure plan that forms the proposed spatial development framework for Laikipia County, details the action plans for areas that require special intervention and presents the preferred Laikipia County Spatial Plan.

Part 6: Plan Implementation Strategy

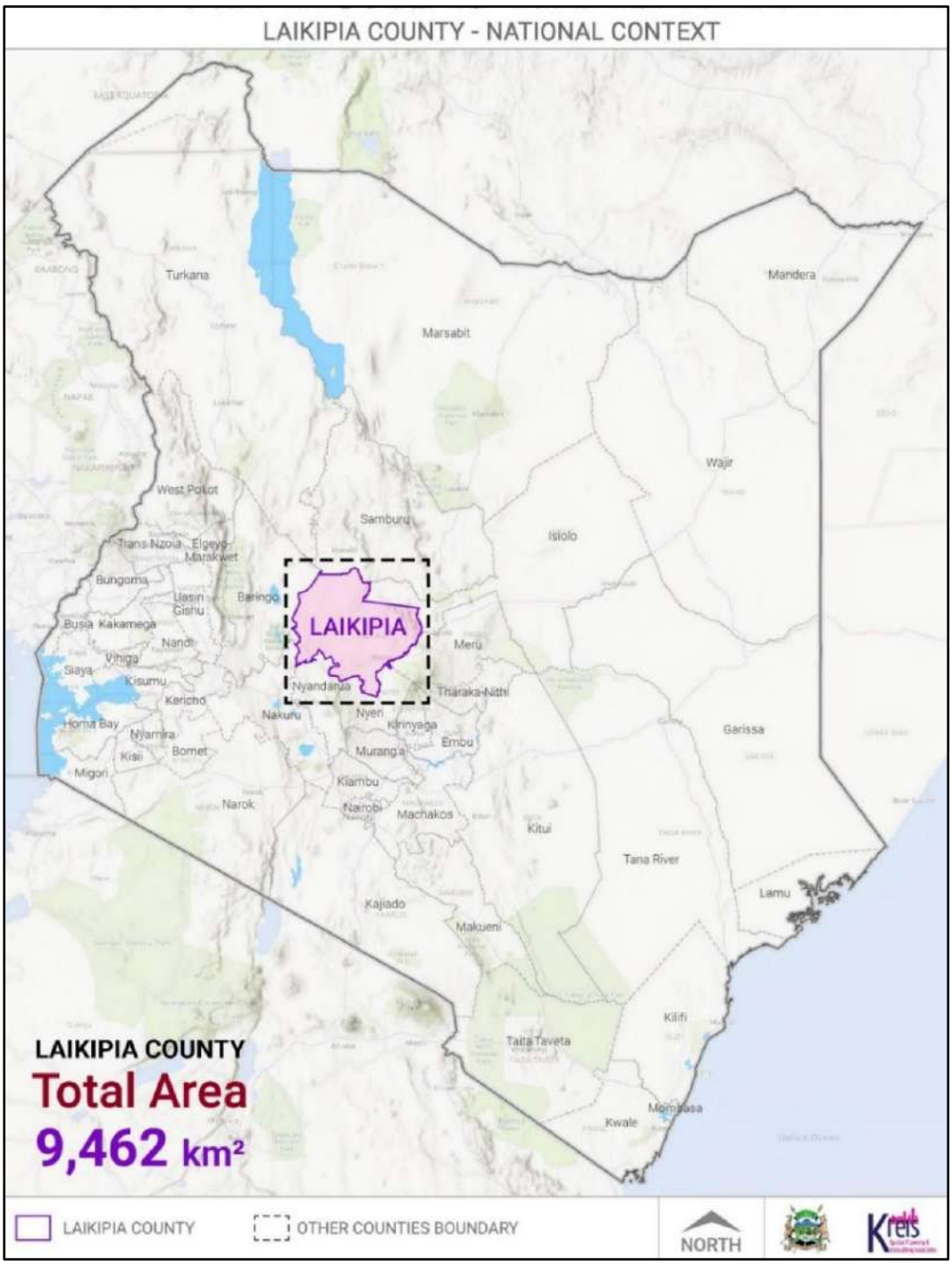
Chapter 15 - This chapter details the various components necessary for plan implementation such as the capital investment plan and the institutional framework for implementation. It also details the scope of the monitoring and evaluation framework, as well as the risk management strategies.

2 THE PLANNING CONTEXT

2.1 Size and Location

Laikipia County lies between latitudes 0°18'' South and 0°51'' North and between longitude 37°11'' and 37°24'' East and stretches across an area of about 9,462 km². The County accounts for 1.6% of Kenya's landmass as shown in map 2-1 below.

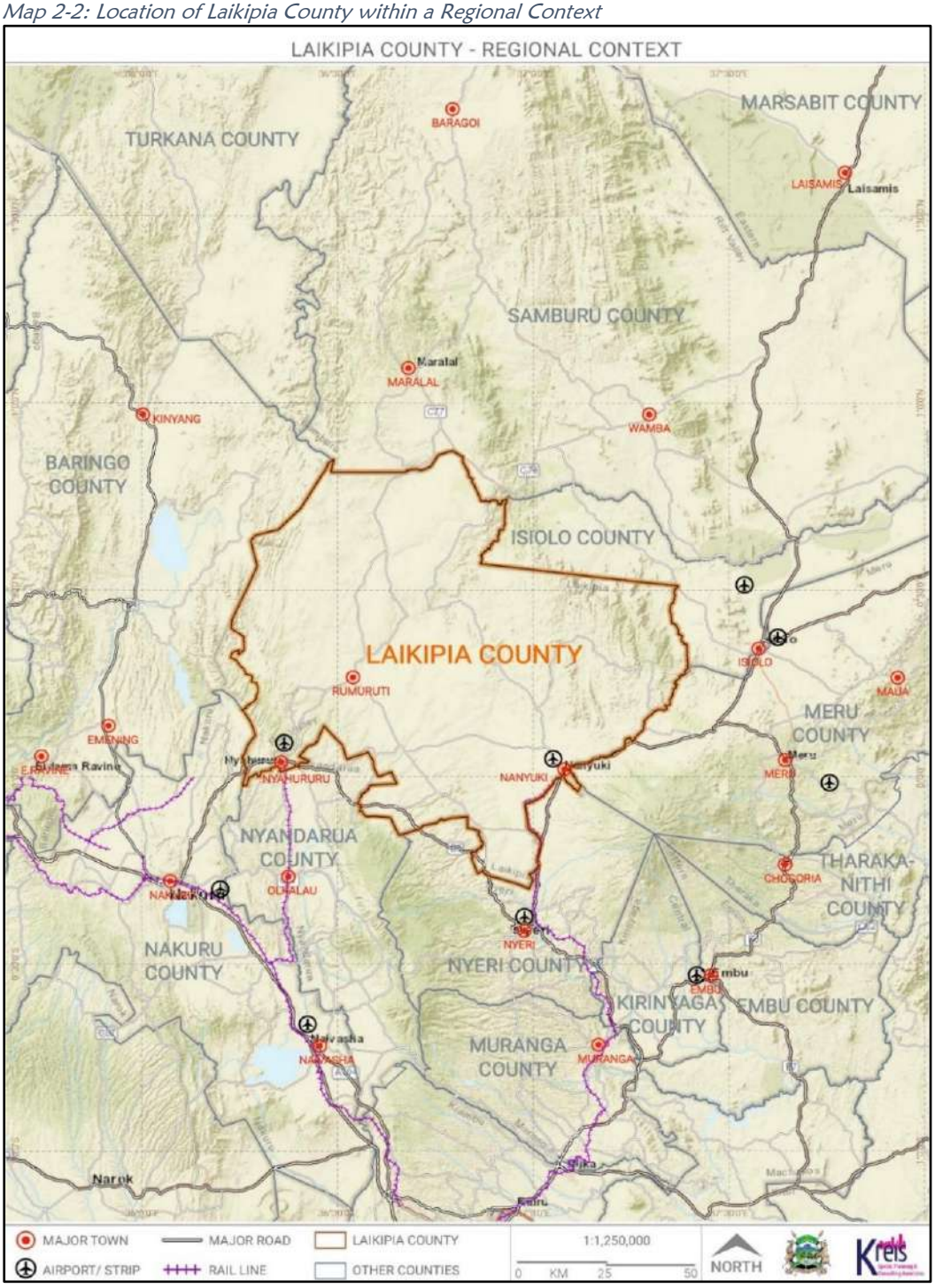
Map 2-1: National Context of Laikipia County



Source: KREIS (modified from IEBC boundaries data, 2013)

It borders Samburu County to the North, Isiolo County to the North East, Meru County to the South East, Nyeri County to the South, Nyandarua County and Nakuru County to the South West, and Baringo County to the West. It lies on the Equator and is bounded to the East by the lower slopes of Mt. Kenya, to the South West by the Aberdare Ranges, and to the West by the Rift Valley Escarpment as indicated in map 2-2 below.

Map 2-2: Location of Laikipia County within a Regional Context



Source: KREIS (modified from IEBC boundaries data, 2013)

2.2 Administrative and Political Units

Laikipia County comprises of five sub-counties; Laikipia East, Laikipia North, Laikipia West, Laikipia Central and Nyahururu. The sub-counties' headquarters are located at Nanyuki, Doldol, Rumuruti, Lamuria and Nyahururu respectively. The gazetted County headquarters is at Rumuruti Township.

2.2.1 Political Units

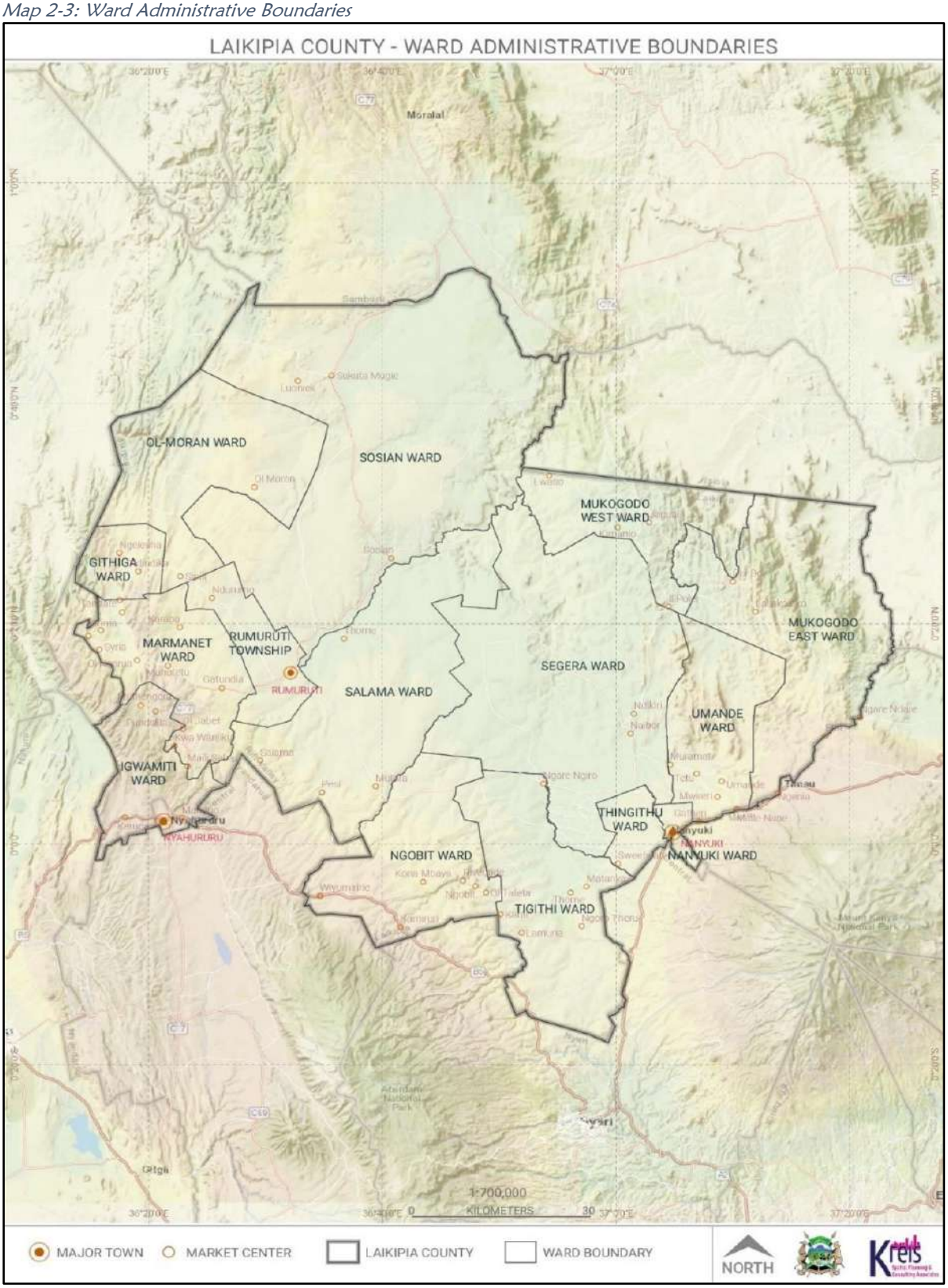
The County has 15 electoral wards as shown in table 2-1 and map 2-3 below. Each ward within the County has significant comparative strength and natural resources endowment that will need harnessing for optimal utilization and livelihood sustenance.

Table 2-1: Political Wards in Laikipia County

Constituency	No. of Wards	Ward Name
Laikipia East	5	Ngobit Tigithi Thingithu Nanyuki Umande
Laikipia North	4	Mukogodo East Mukogodo West Segera Sosian
Laikipia West	6	Ol Moran Rumuruti Township Githiga Marmanet Igwamiti Salama

Source: IEBC, 2013

Map 2-3: Ward Administrative Boundaries



Source: KREIS (modified from IEBC boundaries data, 2013)

2.3 Methodology

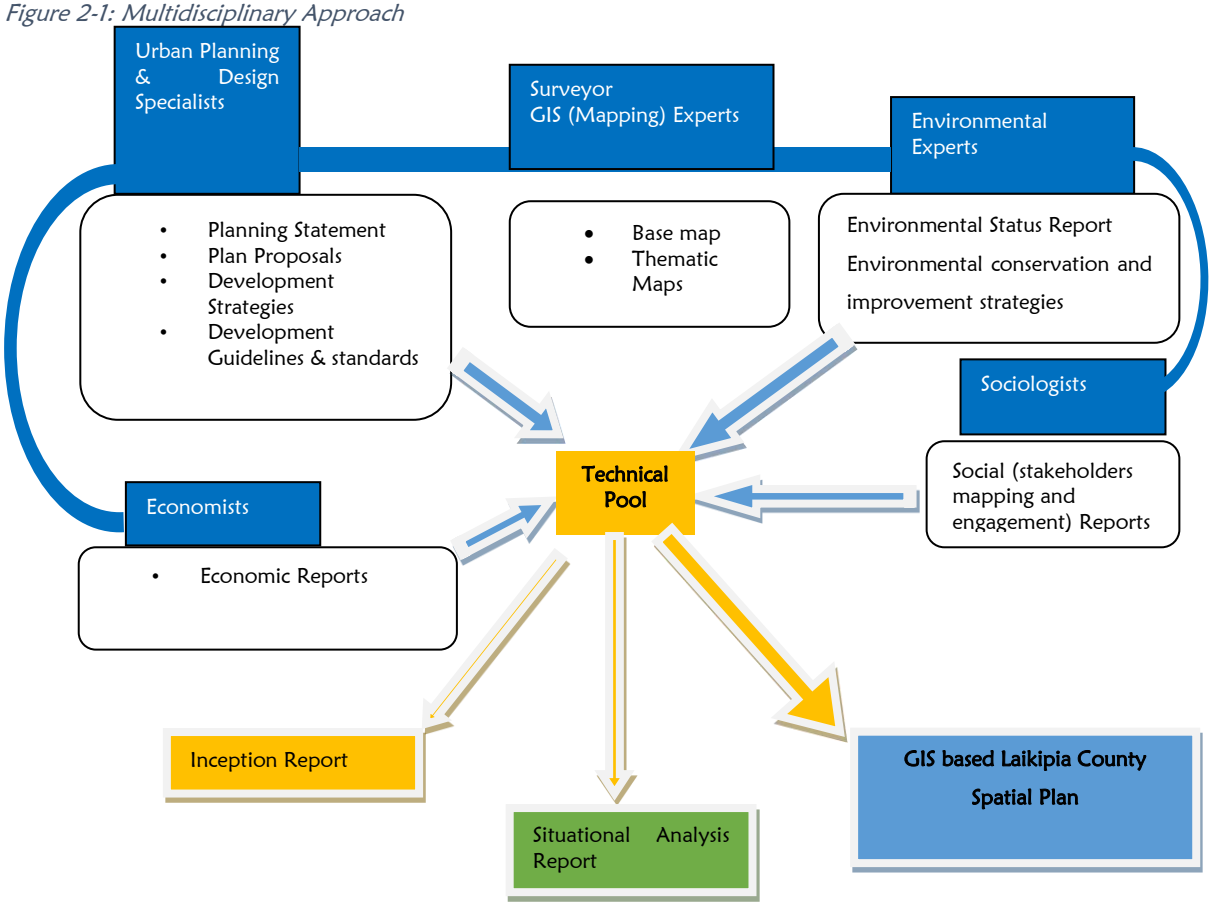
2.3.1 Approach to Plan Preparation

A multi-phased approach was employed in engaging all the stakeholders in the preparation of the Plan. The main approaches adopted are discussed below:

2.3.1.1 Multidisciplinary Approach

The multi-disciplinary approach in the Plan preparation involved all the relevant technical personnel from various disciplines. This approach recognized the importance of drawing specialized expertise from relevant fields into the process. This was necessary given the nature of the expected project outputs. Relevant disciplines were considered during the constitution of the various stakeholders' participation platforms such as the technical teams, project steering committees, thematic groups and the stakeholders' groups. The Consultant's team comprised of various experts from different disciplines namely; Urban Planners, Surveyors, Sociologists/Community Mobilization Experts, Civil Engineers, Mapping Specialists, Environmental Specialists, and Socio-Economic Experts among others.

Figure 2-1: Multidisciplinary Approach



Source: KREIS, 2022

2.3.1.2 Integrated Approach

The project had multiple outputs that affected various development sectors and actors. The consultant in conjunction with the County Government carried out a thorough stakeholders' analysis to determine the project's impact on various sectors and players. This ensured that all the development sectors were integrated into the Plan. Further, there was an integration of the various legal and institutional frameworks guiding the assignment execution. Integrated planning was undertaken to address conflicts between various competing resource users and land uses.

The integrated approach also required that the planning process take cognizance of the existence of other plans and strategies that impact the project outputs. The consultant used lessons learnt from such plans when making proposals for adoption.

The plan, for instance, paid special attention to the proposals contained in many other plans at the County and National levels such as the Rumuruti Municipality Local Physical & Land Use Development Plan, the County Integrated Development Plan and the National Spatial Plan among other spatial frameworks.

2.3.1.3 Environmental Approach

The current urbanization trends have led to the growth of unplanned settlements. Development trends in these settlements more so in developing countries are experiencing environmental problems that require urgent attention. Thus, the preparation of the Laikipia County Spatial Plan took cognizance of the various areas of environmental concern namely: fragile areas, water catchments, sewerage and solid waste management sites. The approach entailed the formulation of environmental protection strategies (mitigation measures) to protect the environmentally-fragile areas, curb pollution and mitigate against the potential adverse effects of any proposed project.

2.3.1.4 Holistic Approach

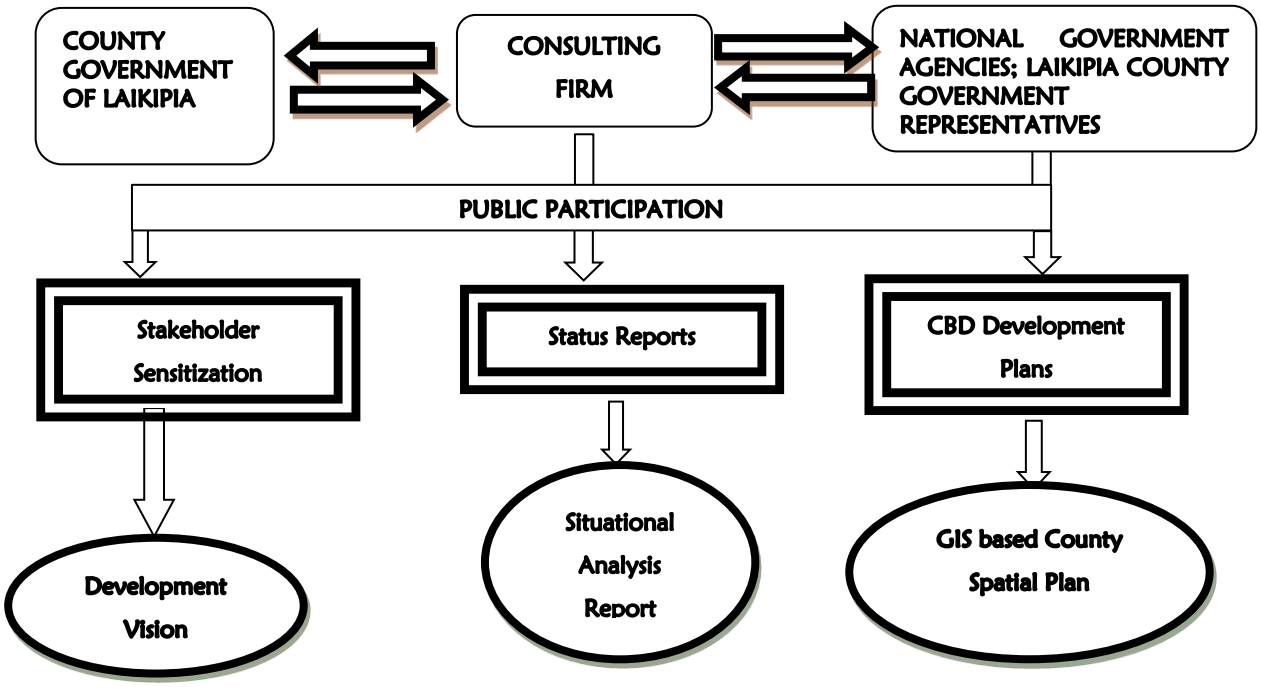
The County Spatial Plan involved an area and/or community-wide focus, fostering holistic development of the planning area with minimum disruption of existing fragile community networks and support structures. To the greatest extent possible, spaces were upgraded in a holistic, integrated and locally-appropriate manner.

This approach emphasized the importance of active participation, dialogue and continual engagement between area residents, Government Agencies and Non-Governmental Organizations operating within the area in ensuring appropriate solutions for the development of the project area.

2.3.1.5 Participatory Approach

The preparation of the CSP strived to involve all the stakeholders in the entire process. The process was participatory starting with the identification, analyses, mobilization and sensitization of the stakeholders who were crucial in assisting the consultant and the client's technical team to work effectively.

Figure 2-2: Participatory Approach



Source: KREIS, 2022

Public Participation is a legal requirement which is clearly outlined in the Kenya Constitution 2010 among other legislations. A participatory and comprehensive stakeholders' analysis was undertaken at an early phase of the project. The Covid-19 Pandemic necessitated innovative ways to ensure all stakeholder concerns and contributions were considered in the preparation of the Plan.

The Consultant in consultation with the Client discussed and agreed on the best modalities of stakeholder engagements. The situation limited social interactions and thus conventional methods of public meetings were not viable at all times. However,

other methods of engagement like technical and steering committee meetings, and focused group discussions were still viable so long as the participants maintained the highest level of hygiene and safe physical distance.

Regular briefings were also undertaken to obtain consensus on divergent issues and proposals. Workshops were considered as they formed the major significant platforms for public participation. The workshops brought all the stakeholders together thus forming the best opportunities for collective decision-making. The workshops were held at convenient and appropriate venues and times to ensure maximum and effective participation.

2.3.2 Stakeholders Engagement

The consultant in partnership with the county government undertook a series of stakeholder engagement as follows: visioning workshops, presentation of the situational analysis and draft plan to the community, county executive, county assembly, county technical team and conservation groups.

2.3.2.1 Key Stakeholders Workshop

The workshop participants were drawn from the County and National Government, Non-Governmental Organizations, research institutions, and community groups. The table below indicates the various organizations that had been represented in the workshop.

Table 2-2: Stakeholders Mapping

County Government	National Government	Non-State Actors
▪ Laikipia County Development Authority ▪ Energy & Mining Department ▪ Health Department ▪ Rumuruti Municipality ▪ Agriculture, Livestock & Fisheries Department ▪ Education and Social Services Department ▪ Administration and ICT Department ▪ ASDSP ▪ Lands and Physical Planning Department	▪ NEMA ▪ WRA ▪ KEFRI ▪ KWS ▪ NDMA	▪ Northern Rangelands Trust ▪ Laikipia Wildlife Forum ▪ FAO ▪ CETRAD ▪ LAICONAR ▪ Save the Elephant org. ▪ Business community representatives

Source: CGL, 2021

The stakeholders were then divided into five groups for the SWOT analysis session and the consolidated issues are presented in table 2-3 below. The Problem Tree Analysis approach encompassing cause–problem–effect was adopted to identify the main planning problems in the County, which include;

a. Land grabbing
b. Land use incompatibility
c. Underdevelopment
d. Unregulated subdivision of agricultural land
e. Pollution
f. Inadequate awareness of the comparative advantage of land/ land resource potential
g. Weak coordination of institutions in land use planning and management
h. Political interference in land use decisions
i. Insufficient finances for implementation of land use management decisions.
j. Land degradation e.g. overstocking
k. Absence of urban spatial plans leading to unguided urbanization
l. Population pressure
m. Invasive species

After enumerating these problems, the Core Planning Problem was identified as '*Unsustainable Land Use Management'* while the other issues were qualified as either causes or effects of the core problem.

Table 2-3: Consolidated County SWOT Analysis

Strengths	Weaknesses	Opportunities	Threats
▪ Arable land ▪ Ranching/ Livestock production ▪ Diverse culture ▪ Availability of rich research data ▪ Vast land for development ▪ Water resources – groundwater, rivers, water pans ▪ Youthful population – human resources ▪ Tourist attractions – wildlife, hospitable climate, cultural diversity, sceneries ▪ Minerals – iron ore, quartz ▪ Available land to cater for a variety of crop farming ▪ Expansive usable land size – conservancies, large farms ▪ Strategic central location ▪ Wildlife diversity ▪ Favorable climate	▪ Unsustainable land use practices e.g. fragmentation ▪ Degradation of ecologically sensitive areas e.g. wildlife corridors ▪ Low levels of value addition and processing ▪ Inadequate educational institutions e.g. tertiary institutions ▪ Poor solid and liquid waste management ▪ Water pollution i.e. from car wash activities and petrol stations ▪ Lack of approved plans to guide zoning ▪ Absentee landlords ▪ Inadequate training opportunities and job opportunities ▪ Lack of a spatial plan and urban development plans ▪ Resource conflicts – water, pasture, forests, land, quarries ▪ Retrogressive cultural practices – FGM, early marriages ▪ Water scarcity ▪ Poverty ▪ Political interference in the development process	▪ Tourism-scenic sights, wildlife ▪ Availability of expansive land parcels ▪ Water resources development ▪ Solar energy potential ▪ Sports and culture ▪ Wider market (CEREB and Amaya Triangle Initiative) ▪ Agro-processing industries by local and external investors ▪ Linkage with other neighboring counties e.g. CEREB and LAPSSET project ▪ Export markets for honey, gums and resins ▪ Mineral resources	▪ Invasive species i.e., Opuntia species ▪ Epidemics/ Pandemics e.g. COVID ▪ Climate change ▪ Corruption ▪ Over abstraction and water pollution by other counties

Source: CGL, 2021

Plate 2-1: A Stakeholder makes a Presentation during the SWOT Analysis Session

Source: CGL, 2021

Visioning Exercise

Each of the five groups was then assigned a thematic area and directed to develop thematic vision statements which were presented as follows:

Table 2-4: Vision Statements for Identified Thematic Areas

Thematic Area	Vision Statement
Natural Resources	Sustainably managed natural resources
Wildlife	Sustainable harmonious wildlife and ranching environment that promotes diverse tourism opportunities in Laikipia County
Agriculture and Livestock Production	Sustainable land management that provides the best crop and livestock production practices
Urbanization	Strategic, well-planned, adaptive, self-sustaining urban centres with high quality of life
Energy	A clean energy-secure County

Source: CGL, 2021

The stakeholders then developed a shared vision statement that takes into consideration the core problem, key thematic areas, and the proposed thematic vision statements. The consolidated vision was stated as '***Sustainable and Integrated Land Use Management for Environmental and Socio-Economic Development'.***

Plate 2-2: Stakeholder Groupwork Sessions

Source: CGL, 2021

2.3.2.2 Subcounty Participatory Workshops

Stakeholder mobilization was done through all sub-county administrators and respective ward administrators. About three hundred stakeholders attended the workshops with representation from the 15 wards across the County as shown in table 2-5 below.

Table 2-5: Subcounty Participatory Workshops

No.	Representative	No. per Ward
1.	Chiefs	2
2.	Subcounty Administrators	1
3.	Ward Administrators	1
4.	Local Nyumba Kumi	1
5.	Agriculture	1
6.	Community Health	1
7.	Gender	1
8.	Child Protection	1
9.	Water (Community Water Projects and WRUAs)	1
10.	Environment	1
11.	Cooperatives	1
12.	Transport – Matatu & Bodaboda	2
13.	Tourism	1
14.	People with Disabilities	1
15.	Youth representatives	1
16.	Women	1
17.	Social Welfare Groups	1
18.	Local NGO/CSO	1

Source: CGL, 2021

Although the workshops were held at sub-counties headquarters, focus group discussions were held at ward levels. The workshops were held within the three constituencies as outlined in table 2-6 below.

Table 2-6: Stakeholder Sensitization Workshops

Subcounty	Date	Venue	No of Wards	Wards
Laikipia East	23/03/2021	Nanyuki Social Hall	5	Nanyuki, Thingithu, Ngobit, Tigithi, Umande
Laikipia West	24/03/2021	Rumuruti Social Hall	7	Sosian, Rumuruti Township, Marmanet, Githiga, Igwamiti, Ol Moran, and Salama
Laikipia North	25/03/2021	Dol Dol Catholic Hall	3	Mukogodo East, Mukogodo West, and Segera

Source: CGL, 2021

Key outputs of the sub-county stakeholder workshops were identifying the strengths, weaknesses, opportunities and threats per ward; and proposing a vision statement of the desired future state for each ward. These were then consolidated according to individual constituencies. SWOT Analysis and Vision statements for wards in Laikipia East Constituency were identified as follows:

Table 2-7: SWOT Analysis for Laikipia East Constituency

Strengths	Weaknesses	Opportunities	Threats
▪ Favorable climate for crop and livestock production. ▪ Water resources (permanent rivers, springs, and groundwater). ▪ Wildlife and tourism. ▪ Good infrastructure (main roads). ▪ Population that would serve as a market/ offer skilled labor.	▪ Poor road network (feeder roads). ▪ Weak marketing linkages for farm produce. ▪ Inadequate water supply. ▪ Inadequate education facilities e.g., TVETs, ECDEs, colleges. ▪ Inadequate health facilities. ▪ Human-wildlife conflicts.	▪ Urban centers/ growth centers. ▪ Tourism. ▪ Water resources development. ▪ Livestock production (beef). ▪ Expanding of the stadium for sporting activities. ▪ Expansion of water dams for irrigation.	▪ Climate change. ▪ Drug and substance abuse. ▪ Human-wildlife conflicts. ▪ Poaching. ▪ Pests and diseases\epidemics ▪ Water pollution upstream.

Strengths	Weaknesses	Opportunities	Threats
▪ Presence of social amenities e.g., education. ▪ Existing urban and market/trading centers. ▪ Cultural diversity. ▪ Strategic location.	▪ Land grabbing. ▪ Uncontrolled land subdivision. ▪ Lack of title deeds. ▪ Poor waste management practices.	▪ Agro-processing e.g., milk processing and production. ▪ Affordable housing.	▪ Water over-abstraction upstream. ▪ Corruption. ▪ Street families. ▪ Cattle Rustling.

Source: CGL, 2021

Table 2-8: Vision Statements for Laikipia East Constituency

Ward	Vision Statement
Tigithi Ward	To be a peaceful and economically empowered ward
Nanyuki Ward	A well-planned ward with adequate infrastructure, services and security
Thingithu Ward	To be a model ward with vibrant urban and rural activities
Umande Ward	To be an agro-industrialized ward with adequate social services for sustainable development.
Ngobit Ward	To be a well-developed ward with adequate physical and social infrastructure and agro-processing enterprises

Source: CGL, 2021

Plate 2-3: Stakeholder Engagement Forum for Laikipia East Constituency

Source: CGL, 2021

SWOT Analysis and Vision statements for wards in Laikipia West Constituency were identified as follows:

Table 2-9: SWOT Analysis for Laikipia West Constituency

Strengths	Weaknesses	Opportunities	Threats
▪ Cultural diversity. ▪ Water resources. ▪ Vast hinterland for expansion. ▪ Favorable climate for agricultural production. ▪ Presence of some industries in Nyahururu town. ▪ Developing urban centers. ▪ Social amenities e.g., hospital. ▪ Wildlife. ▪ Cultural diversity. ▪ Population. ▪ Arable land. ▪ Government offices. ▪ Roads. ▪ Strategic location.	▪ Poor solid and liquid waste management facilities. ▪ Underutilized land/ absentee landowners. ▪ Inadequate water supply. ▪ Corruption and poor enforcement of regulations. ▪ Land grabbing. ▪ Limited public participation/ involvement. ▪ Poor planning. ▪ Poor connectivity – feeder roads. ▪ Delayed development. ▪ Poor electricity connection. ▪ Inadequate social infrastructure.	▪ Wildlife and culture-based tourism. ▪ Educational institutions e.g., universities. ▪ Health facility serving other areas. ▪ Educational institutions. ▪ Industries. ▪ Agriculture. ▪ Mining –murram and ballast.	▪ Insecurity. ▪ Drug and substance abuse. ▪ Deforestation. ▪ Human-wildlife conflict. ▪ Epidemics. ▪ Pests and diseases. ▪ Water pollution upstream. ▪ Cattle rustling.

Source: CGL, 2021

Table 2-10: Vision Statements for Laikipia West Constituency

Ward	Vision Statement
Rumuruti Township	A ward with diverse opportunities for sustainable socio-economic growth
Igwamiti Ward	A ward with quality social services for inclusive development
Salama Ward	A healthy and well-developed ward full of opportunities
Githiga Ward	A secure environment for socioeconomic development
Ol Moran Ward	To be the hub of economic activities
Marmanet Ward	A ward with vibrant tourism and agricultural opportunities

Source: CGL, 2021

Plate 2-4: Stakeholder Engagement for Laikipia West Constituency

Source: CGL, 2021

SWOT Analysis and Vision statements for wards in Laikipia North Constituency were identified as follows:

Table 2-11: SWOT Analysis for Laikipia North Constituency

Strengths	Weaknesses	Opportunities	Threats
▪ Tourism (wildlife based and cultural). Livestock production. ▪ Sand harvesting. ▪ Forest – Mukogodo and Ngare Ndare forests. ▪ Beekeeping ▪ Natural herbs. ▪ Rich culture. ▪ Farming. ▪ Tourism. ▪ Market centers. ▪ Research & extension services. ▪ Mineral deposits. ▪ Enough land for development.	▪ Inadequate water supply. ▪ Human-wildlife conflict. ▪ Unsustainable land use practices e.g., overgrazing and sand harvesting. ▪ Inadequate social amenities. ▪ Mismanagement of developments e.g., boreholes. ▪ High levels of unemployment. ▪ Poor road infrastructure. ▪ Poaching. ▪ Poor planning of trading centers e.g., Naibor town. ▪ Weak marketing linkages for products. ▪ Underutilization of resources.	▪ Minerals e.g., sand and precious stones. ▪ Tourism – sceneries, wildlife, culture. ▪ Livestock production – markets, leather, and abattoirs. ▪ Traditional medicine. ▪ Water resources development- rock catchment, sand dams. ▪ Beekeeping.	▪ Human-wildlife conflicts. ▪ Insecurity (Boundary conflicts, Cattle rustling). ▪ Climate change. ▪ Invasive species (*opuntia spp*). ▪ Drought. ▪ Pests and diseases. ▪ Wildfires. ▪ Poaching. ▪ Deforestation. ▪ Retrogressive cultures. ▪ Mismanagement of resources. ▪ Corruption.

Strengths	Weaknesses	Opportunities	Threats
	▪ Retrogressive cultures.		

Source: CGL, 2021

Table 2-12: Vision Statements for Laikipia North Constituency

Ward	Vision Statement
Mukogodo East Ward	A well-planned and secure ward for inclusive development
Mukogodo West Ward	A peaceful ward with adequate social services and diverse income-generation opportunities
Segera Ward	A peaceful, food-secure ward with a clean and healthy environment
Sosian Ward	A ward with sustainable livelihoods for integrated development

Source: CGL, 2021

Plate 2-5: Stakeholder Engagement for Laikipia North Constituency

Source: CGL, 2021

2.4 Constitutional Context

The Constitution of Kenya 2010 has the following provisions that pertain to land use and spatial planning.

Table 2-13: Constitutional Context

The Fourth Schedule identifies the functions of the County Government including the role of County planning and development. **Article 60 (1)** provides that land in Kenya shall be held, used and managed in a manner that is equitable, efficient, productive and sustainable and in accordance with principles such as equity in access to land, security of land rights, sustainable and productive management of land resources, transparent and cost-effective management of land, sound conservation and protection of ecologically sensitive areas. This article also advocates for the participation of people in decision-making. **Article 61 (1) & (2)** describes land ownership and classification within Kenya. **Article 63** guarantees the rights of communities to their lands and territories. It states that community land consists of land lawfully held, managed or used by specific communities as community forests, grazing areas or shrines and that it includes ancestral lands and lands traditionally occupied by hunter-gatherer communities. **Article 66 (1)** states that the state may regulate the use of any land or right over land in the interest of public safety, order, health or land use planning. **Article 69** envisions the achievement and maintenance of a tree cover of at least ten per cent of the land area of Kenya. **Article 174** outlines principles of promoting socio-economic development and provision of proximate and easily accessible services which equally depend on proper planning, development and management of the utilization of resources. **Chapter Four** contains a progressive Bill of Rights that guarantees all citizens the right to a clean and healthy environment; it makes international law a key component of the laws of Kenya and guarantees the protection of minorities and marginalized groups.

2.5 Legal Context

Preparation of this CSP is anchored on several Acts of Parliament as shown in table 2-14 below:

Table 2-14: Legal Context

Name of Act	Applicability to CSP
Physical and Land Use Planning Act, 2019	Section 3 on the Objects of the Act provides — (a) the principles, procedures and standards for the preparation and implementation of physical and land use development plans at the national, county, urban, rural and cities level; (d) a framework for the coordination of physical and land use planning by County Governments;

Name of Act	Applicability to CSP
Urban Areas and Cities Act, 2011 (Amended 2019)	The Act establishes a legislative framework for the classification of urban areas, governance and management structures of urban areas, and participation by the residents in the governance of urban areas and cities.
County Governments Act, 2012 (Amended 2020)	The Act gives effect to Chapter Eleven of the Constitution; to provide for county governments' powers, functions and responsibilities to deliver services. Among the Act's objectives is to ensure harmony between national, county and sub-county spatial planning requirements. Section 110 (1) of the Act provides for a ten-year GIS-based database system spatial plan for every county as a component part of the CIDP. The CSP shall provide: - A spatial depiction of the social and economic development programme of the County as articulated in the CIDP. - Clear statements of how the spatial plan is linked to the regional, national and other county plans. - Clear clarifications on the anticipated sustainable development outcomes of the spatial plan. Section 110-2(g-j) of the Act requires that CSPs: a. Shall identify areas where strategic intervention is required; b. Shall indicate areas where priority spending is required; c. Shall provide clear clarifications on the anticipated sustainable development outcomes of the spatial plan; d. Shall indicate the areas designated for conservation and recreation. The Act has provisions aimed at protecting the marginalized that include: - Section 102c outlines one principle of county planning as aiming to protect and integrate the rights and interests of minorities and marginalized groups and communities. - Section 103f outlines one objective of county planning as providing the preconditions for integrating under-developed and marginalized areas to bring them to the level generally enjoyed by the rest of the county.

Name of Act	Applicability to CSP
	The Act has provisions addressing climate change and sustainability that include: - Section 103i outlines one objective of county planning as working towards the achievement and maintenance of a tree cover of at least ten per cent of the land area of Kenya as provided in Article 69 of the Constitution. - Section 102b outlines another principle of county planning as aiming to protect the right to self-fulfilment within the county communities and with the responsibility to future generations. The Act requires the County Governor to promote and facilitate citizen participation in the development of policies and plans, and delivery of services in the County.
National Land Commission Act, 2012	States the functions and powers of the NLC such as monitoring and overseeing responsibilities over land use planning throughout the country. In addition, this Act provides for the management and administration of public, private and community land in accordance with land policy principles. It provides a linkage between the commission, County Government and other institutions dealing with land.
Land Act, 2012 (Amended 2016)	It is the substantive law governing land in Kenya which provides for the acquisition of land for public benefit. The government has the powers under this Act to acquire land for projects, which are intended to benefit the public.
Environmental Management and Coordination Act (EMCA) of 1999, (Amended 2015).	Part II of the Act states that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. Part VIII, Section 72, prohibits discharging or applying poisonous, toxic, noxious or obstructing matter, radioactive or any other pollutants into aquatic environments. Section 74 demands that all effluent generated from the sources are discharged only into the existing sewerage system upon issuance of the prescribed permits from approving authorities. The Second Shedule of the Act categorizes all the projects that require environmental impact assessment (EIA),

Name of Act	Applicability to CSP
	Environmental Social Impact Assessment (ESIA) among other environmental assessments.
Water Act, 2016	This Act provides for sustainable management, conservation, use and control of water resources.
Forest Conservation and Management Act, 2016	This Act provides for the development and sustainable management, including conservation and rational utilization of all forest resources for the socio-economic development of the country.
Wildlife Conservation and Management Act, 2013	This Act provides for the protection, conservation, sustainable use and management of wildlife in Kenya. It applies to all wildlife resources on public, community, and private land, and in Kenya's territorial waters. Conservation is recognized as a land use, and wildlife conservancies are promoted as an avenue for protecting dispersal areas, wildlife corridors and habitats outside protected areas (parks and reserves).
Climate Change Act, 2016	This Act strengthens climate change governance, institutional arrangements, and mainstreaming of climate change into sectoral planning, budgeting and implementation at all levels of government.
Energy Act, 2006	This Act promotes the generation and use of renewable energy and energy-efficient technology.

2.6 Policy Context

The policy framework under which this CSP has been prepared is as outlined in table 2-15 below:

Table 2-15: Policy Context

Policy Document	Provisions
Kenya Vision 2030, 2008	The country's blueprint that is geared towards transforming Kenya into "a newly industrializing, middle-income Country providing a high quality of life to all its citizens in a clean and secure environment" through the improvement of key thematic sectors such as Infrastructure; Energy; Security; Tourism; Agriculture; Wholesale/Retail Trade; Manufacturing; Financial Services; and Business Process Outsourcing.

Policy Document	Provisions
National Wildlife Strategy, 2030	Provides an overarching framework that prioritizes, coordinates, and inspires participation in the transformation of the wildlife sector in Kenya. The strategy prescribes principles, objectives, standards, indicators, procedures and incentives for the protection, conservation and management of wildlife resources in the country.
National Land Use Policy (Sessional Paper No. 1 of 2017)	Provides legal, administrative, institutional and technological framework for optimal utilization and productivity of land-related resources. Advocates for the development of County Spatial Plans, Community land use plans for the country with the full participation of all stakeholders and strict adherence to them enforced.
National Urban Development Policy, 2016	It provides a framework for sustainable urban development in various thematic areas such as land, infrastructure, urban safety and disaster risk management among others.
National Environment Policy, 2013	Provides for a better quality of life for present and future generations through sustainable management and use of the environment and natural resources.
National Food and Nutrition Security Policy, 2011	Provides an overarching framework covering the multiple dimensions of food security and nutrition improvement. Its broad objectives are: - to achieve good nutrition for optimum health of all Kenyans; to increase the quantity and quality of food available, accessible and affordable to all Kenyans at all times; and to protect vulnerable populations using innovative and cost-effective safety nets linked to long-term development.

2.7 Linkages to Existing Plans

The CSP is linked to other existing plans which were used as guides during its preparation as detailed in table 2-16 below:

Table 2-16: Linkage of CSP to existing Plans

Plan	Applicability to CSP
National Spatial Plan (2015 - 2045)	The 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. It advocates for the provision of services and facilities such as the establishment of an efficient mass transit public transportation system, expansion of sewerage systems and waste management facilities to meet its functions and defines local urban-rural development systems.
National Water Master Plan 2030	The national plan to assess and evaluate the availability and vulnerability of the country's water resources up to around 2050 considering climate change.
National Climate Change Action Plan (NCCAP II) 2018-2022	A five-year plan that aims to create a low-carbon climate-resilient development pathway which emphasizes sustainable development and prioritizes adaptation while recognizing the importance of increasing the climate resilience of vulnerable groups, including women, youth, persons with disabilities, and marginalized and minority communities
National Adaptation Plan (NAP) 2015-2030	Contains sector strategic adaptation actions for each planning sector to build resilience and enhance adaptive capacities to the impacts of climate change. It outlines key mitigation activities up to 2030 which will include expansion in renewable energy, tree cover of at least 10%, clean energy, low-carbon transportation, climate-smart agriculture and sustainable waste management systems.
Kenya's Nationally Determined Contribution (NDC)	The 2020 updated NDC targets to abate GHG emissions by 32% by 2030 relative to the BAU scenario of 143 $MtCO_2eq$; in line with the country's sustainable development agenda and national circumstances. The timeframe for its implementation is 2030, with milestone targets at 2025.
Laikipia County Integrated Development Plan (2018-2022)	It provides the County's vision for a period of five years while detailing various projects and programmes per sector, with their location for implementation plans.

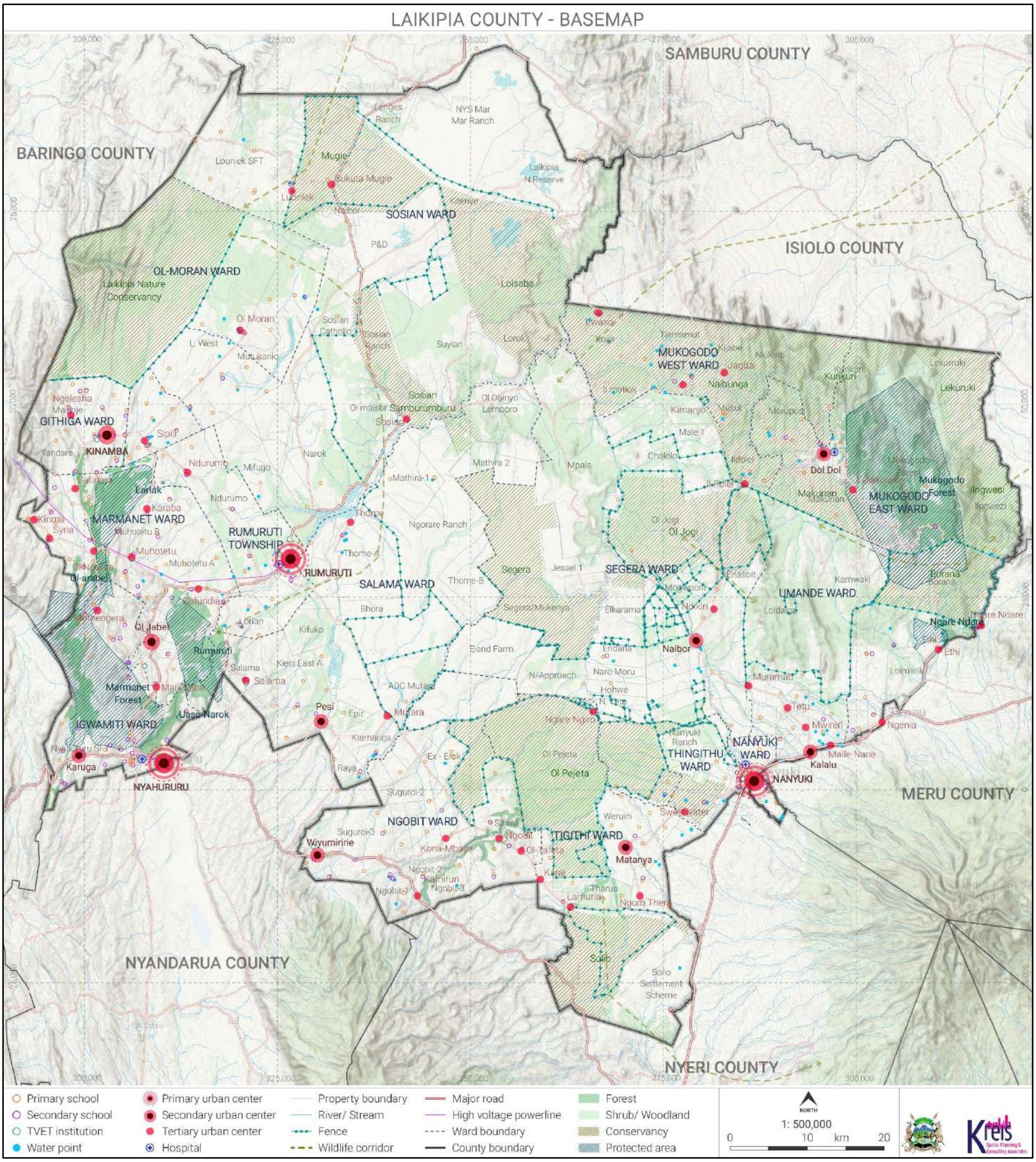
3 BASE MAP

The base map formulation is a very critical process in the formulation of any Spatial Plan as it outlines or depicts a scenario of the existing landscape majorly showing the physical infrastructure including roads, rail lines, power way leaves, and oil pipelines among others; social infrastructure including schools, health facilities; major urban Centres; surface waters; property boundaries; forests, protected areas etc. To ensure this was achieved, data was obtained and overlaid in form of layers in a GIS system to form the base map presented in map 3-1. The data included but was not limited to:

- Cadastral data;
- Protected areas and gazette reserves data;
- Administrative data;
- Social infrastructure data;
- Population and demographics data;
- Land use data;
- Satellite imagery;
- Roads infrastructure data;
- Environmental data;
- Among other forms of data.

The formulated base map then became the unit of query/database in formulating other thematic/sectoral maps required to inform analysis for the draft Plan formulation.

Map 3-1: County Base Map



PART II:

SITUATIONAL ANALYSIS

4 NATURAL ENVIRONMENT

4.1 Overview

The natural environment encompasses the interaction of non-living and living things; which collectively form the natural capital of any given area. The non-living components are the physiographic features that form the natural landscape of the area – topography, geology and soils. The living components of the environment are the biotic factors – plants and animal species.

The natural landscape structure of Laikipia County is shaped by its climate, topography, geology and soils; giving rise to a diversity of ecosystems and species which form the foundation of the County's socioeconomic, environmental and cultural well-being. The various ecosystems encompass forests, rangelands, rivers and wetlands. Each of these ecosystems provides a range of services and values that continually sustain wildlife species, livestock and local community livelihoods.

The County Spatial Plan accentuates the need for the continued preservation of nature that underpins the survival of people and the socioeconomic development of the county. This chapter presents the physiographic characteristics of the County – how they determine the spatial distribution of biodiversity components and the associated potential opportunities and constraints for economic growth and infrastructure development.

4.2 Climatic Conditions

4.2.1 Rainfall

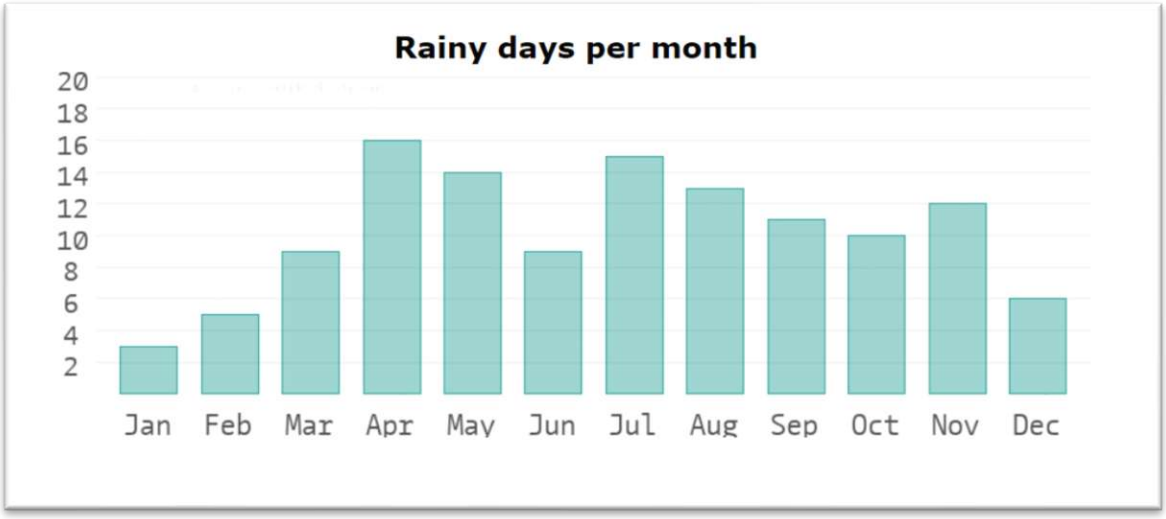
The County experiences relief type of rainfall due to its altitude and location. The seasonal distribution of rainfall is influenced by the Inter-Tropical Convergence Zone near the Equator, where the northeast and southeast trade winds meet. The long rains occur from March to May, while the short rains occur from October to December; except in areas neighboring Mt. Kenya and the Aberdare Ranges which receive rainfall in other periods due to the influence of relief winds.

Higher rainfall averages are experienced in the southwestern areas bordering the Aberdare Ranges and the southeastern areas bordering Mt. Kenya. The Nyahururu-Ngarua-Marmanet area receives high rainfall of between 1000-1300mm annually;

which favors crop production and dairy farming as the main sources of livelihood for the rural population. Nanyuki area receives an average annual rainfall of between 800-1000mm, with the lower average attributed to its location on the leeward side of Mt. Kenya. The average annual rainfall at the northern boundary of the County is about 400mm and it ranges between 400-800mm in the extensive northern and central areas which have vast rangelands and grasslands. The Mukogodo Dry Forest region receives an average annual rainfall of 706mm. The low rainfall averages favor pastoralism, commercial ranching and wildlife conservation as the main economic activities in these parts of the County. It however causes crop failure, food insecurity, livestock emaciation and resource conflicts – especially over water and pasture.

As shown in figure 4-1 below, April records the peak average monthly rainfall and has the highest number of rainy days – making it the wettest month of the year. January is the driest month of the year, with the minimum average monthly rainfall and the least number of rainy days.

Figure 4-1: Monthly Rainfall Distribution



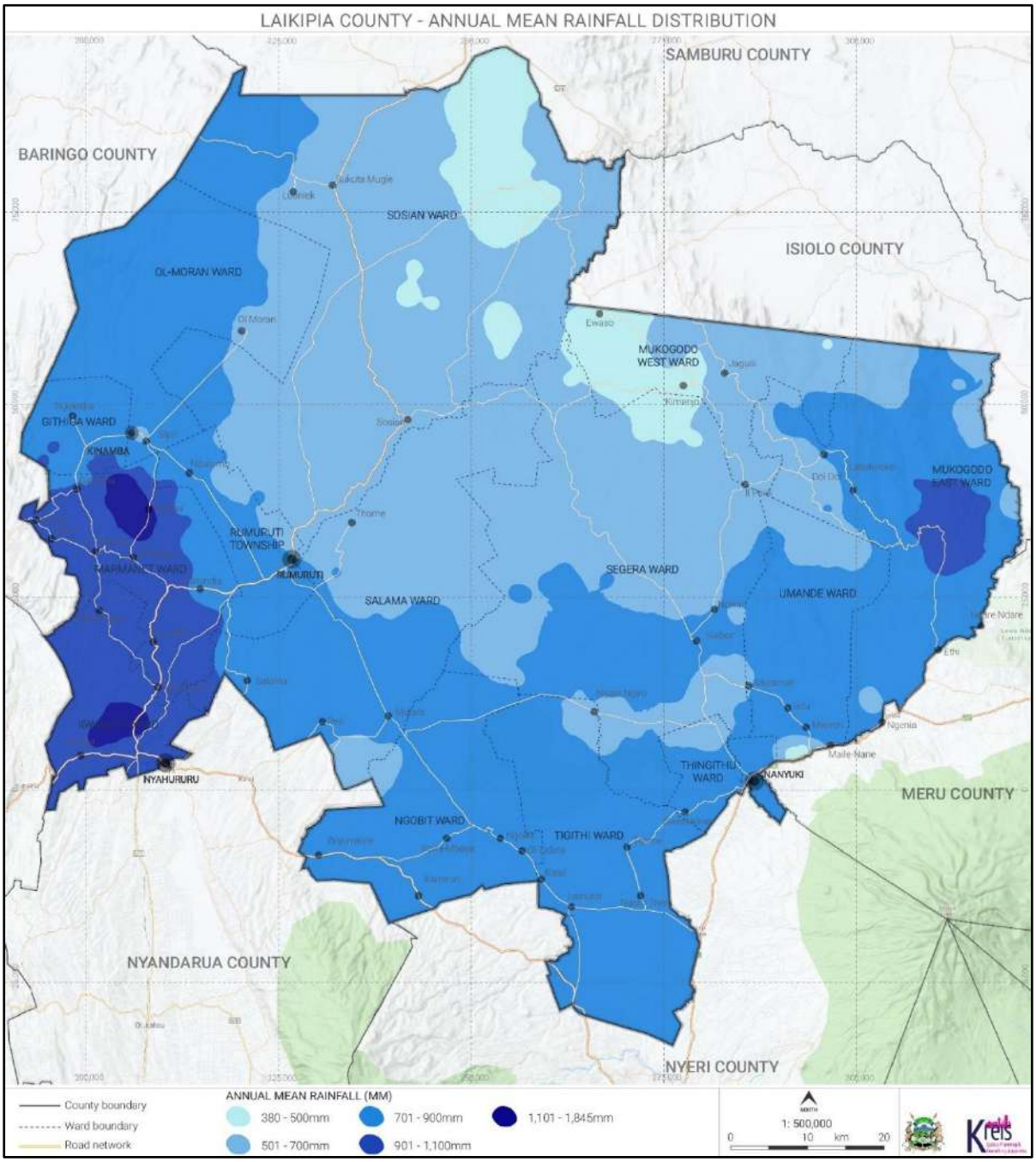
Source: WorldData.info, 2021

The wetter southwestern parts around Nyahururu-Ngarua-Marmanet have a single rainfall season, with April to August being the wettest months. In contrast, the central parts of the County, from Rumuruti Township eastwards, have a distribution pattern with three distinct peaks in April, July-August, and November as shown in figure 4-1 above. Nanyuki, Doldol, and Timau areas have the standard two-peak rainfall pattern that is found in the tropics (CGL, 2020).

The County experiences significant fluctuations in rainfall from year-to-year, both in the average annual rainfall and in the monthly rainfall distribution. Map 4-1 below shows the County's annual average rainfall distribution for the year 2020. It is evident that the southwestern parts of the County received higher rainfall which supports their great potential for agricultural production and related agro-industrial value chains.

Parts of Mukogodo West, Segera and Sosian wards received the least amount of rainfall, which resulted in reduced forage and water for livestock. This negatively affected the livelihoods of pastoralists who inhabit the northern part of the County. During prolonged dry periods, private farms, ranches and conservancies get invaded by illegal nomadic herders in search of water and pasture, both from within Laikipia County and from the neighboring Samburu, Baringo and Isiolo counties a situation which is likely to cause conflicts.

Map 4-1: Average Rainfall for the Year 2020



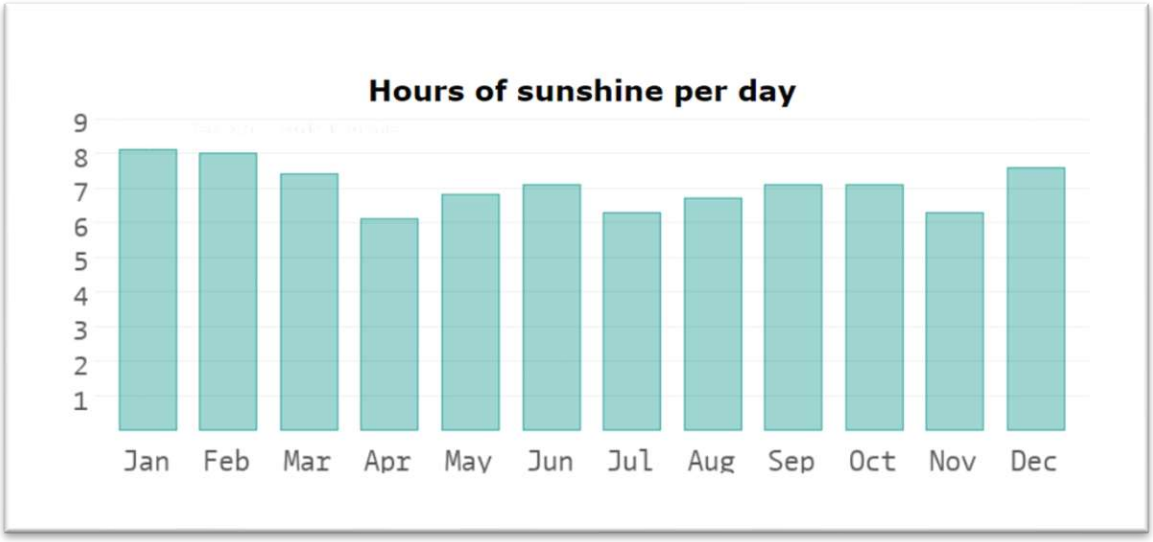
4.2.2 Temperature

Daily temperatures vary with season and altitude, with the highest temperatures being in the months of January to mid-March before the rainy season and the lowest temperatures in the months of July to August. The average temperature in the Laikipia Plateau remains slightly constant throughout the year due to its proximity to the Equator. However, average temperatures within other parts of the County vary considerably from place to place due to differences in altitude.

Average annual temperatures are warmest in the central region of the County with mean temperatures of 18-20^{0}C. Temperatures in Nanyuki range from 16-18^{0}C and from 14-16^{0}C in the Nyahururu-Ngarua area (CGL, 2020). The areas near Mt. Kenya are cooler due to the effect of trade and relief winds, whereas the low-lying areas on the northern and central region are hotter because of their low altitude. The warm weather favors outdoor tourism activities such as nature walks, game drives, horse riding and mountain bike rides.

Due to its strategic location along the Equator and within the ASAL region of the country, Laikipia County has minimal variations in day and night lengths. As shown in figure 4-2 below, January, February and December have the longest hours of sunshine per day, while April, July and November have the least hours of sunshine per day. This is attributed to January, February and December being the driest months, while April, July and November having more rainy days per month, as was illustrated in figure 4-1 above on the monthly rainfall distribution.

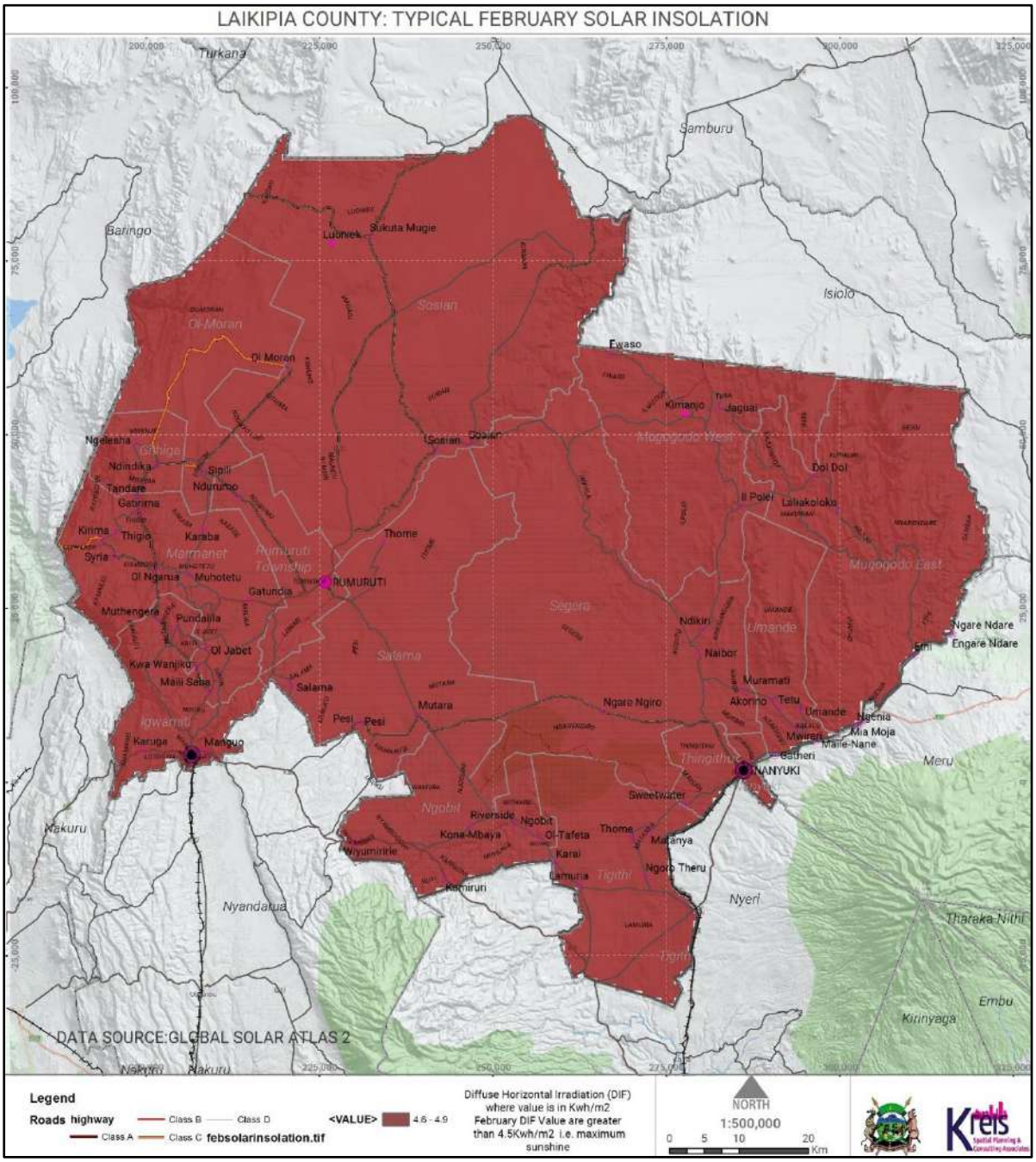
Figure 4-2: Daily Hours of Sunshine



Source: WorldData.info, 2021

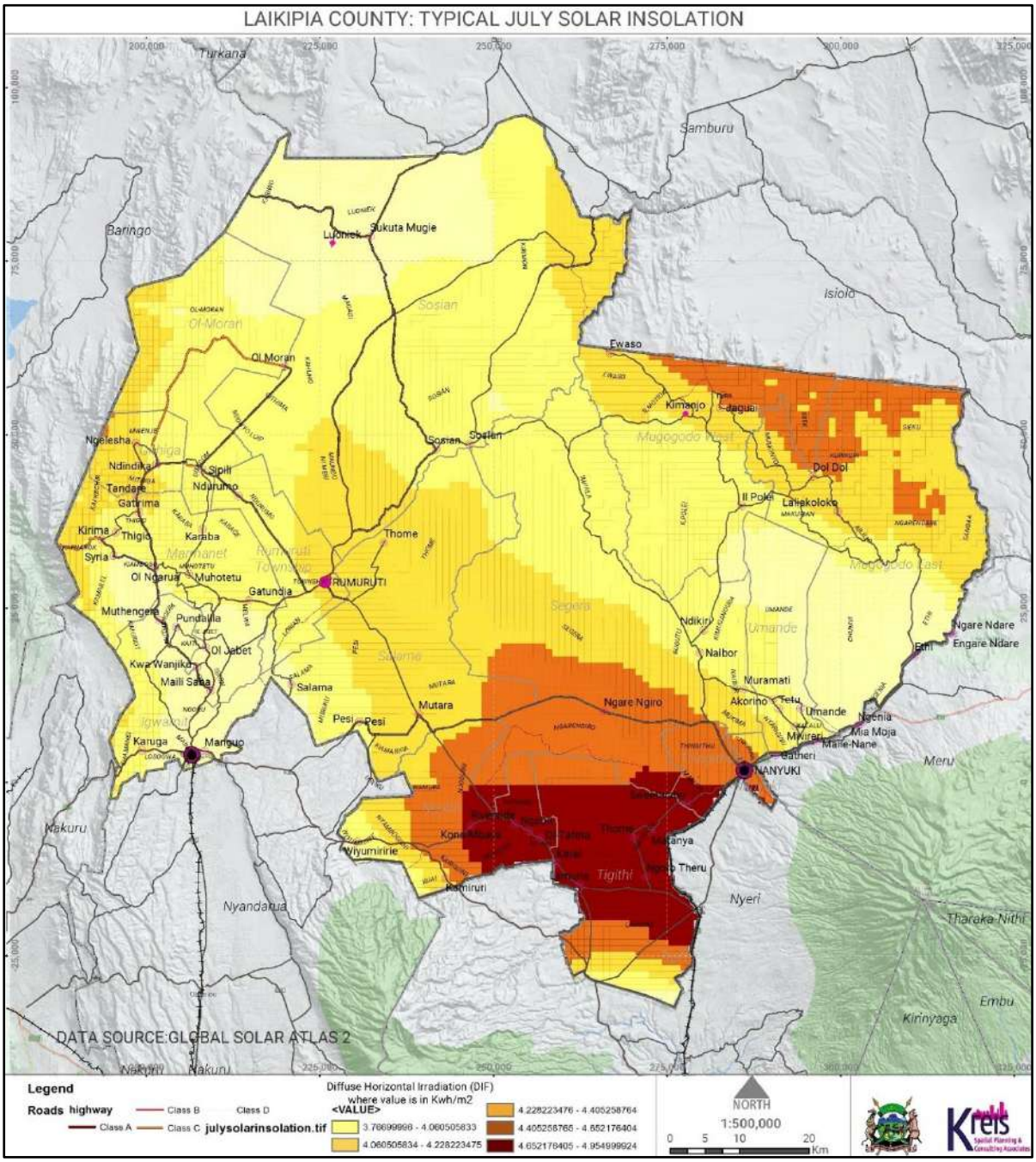
Maps 4-2 and 4-3 below show the highest and lowest solar insolation for the months of February and July respectively, and are essential in the determination of sites that are suitable for establishing solar power farms in the County.

Map 4-2: February Solar Insolation Index



Source: Global Solar Atlas 2; KREIS 2022

Map 4-3: July Solar Insolation Index



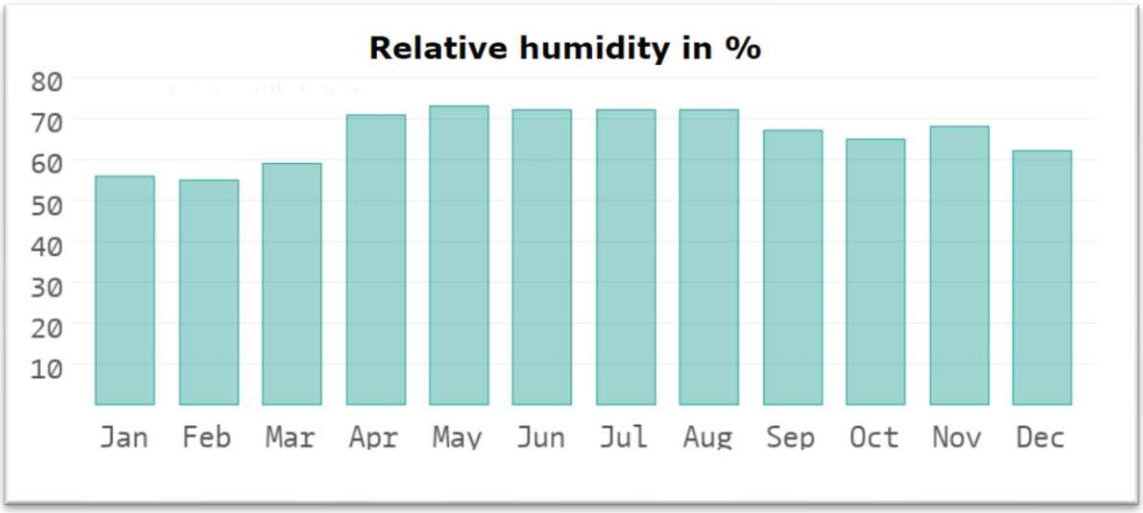
Source: Global Solar Atlas 2; KREIS 2022

The long hours of sunshine per day in the majority of the months make solar a potential source of renewable energy, to supplement the national grid system supply and serve remote areas that lack electricity coverage. Some community boreholes and springs have been equipped with solar-powered pumps for cost-effective reticulation to community water points, animal watering points and homesteads.

4.2.3 Humidity

There is a wide variation in the annual evaporation rate across the County. January and February record the lowest percentage at 55-60%, while May has the highest relative humidity at 73% as shown in figure 4-3 below.

Figure 4-3: Relative Humidity



Source: WorldData.info, 2021

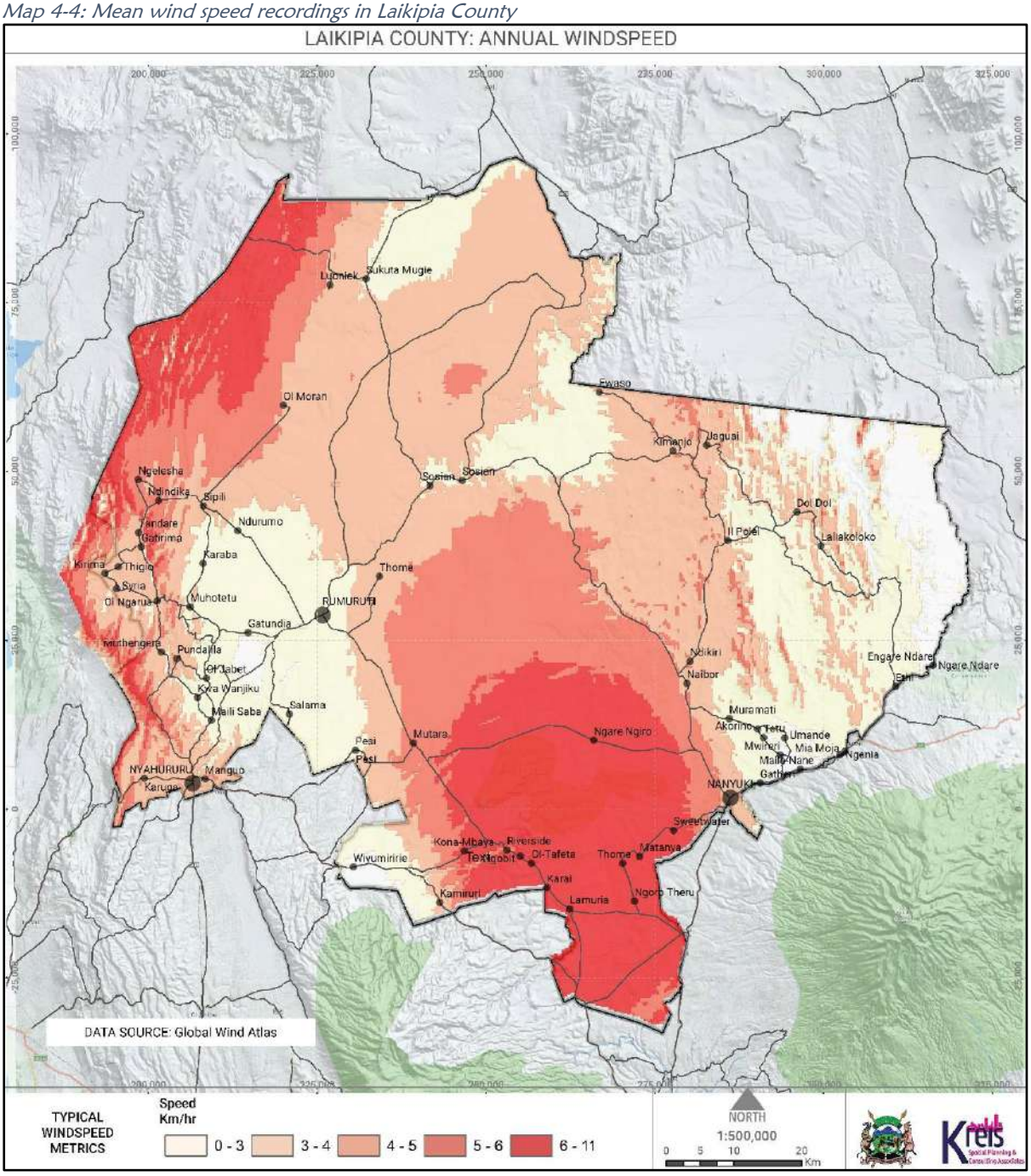
4.2.4 Winds

The wind experienced at any given location is highly dependent on the local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages. In the Nanyuki area, the average hourly wind speed experiences mild seasonal variation over the course of the year, with the windiest month being September and the calmest being January. The average hourly wind speed in Nyahururu and Rumuruti towns experiences significant seasonal variation over the course of the year, with the windiest month being March and the calmest being July (WeatherSpark.com, 2022). That notwithstanding, the potential for wind energy in the County is yet to be fully harnessed.

According to the U.S. Energy Information Administration, utility-scale wind power farms can be set up in areas experiencing average wind speeds of about 5.3m/s. Therefore, the recorded mean windspeed in Laikipia County as shown in map 4-4 indicates that over half of the County holds the potential for siting of wind power farms to supplement energy provision within the County. Huge potential is specifically

recorded in Tigithi, Ngobit, Segera, Salama, Sosian, Githiga, Marmanet, Igwamiti, Mukogondo west & Ol Moran wards.

Map 4-4: Mean wind speed recordings in Laikipia County



Source: CGL; GWA; Energy Data Info; KREIS 2022

4.2.5 Climate Change

Climate change refers to the changes in climate over time due to natural variability and anthropogenic forces. Like most parts of the country, the County is facing climate variability which negatively impacts the local livelihoods of communities whose

economic activities are primarily dependent upon climatic conditions. The notable extreme conditions include:

4.2.5.1 Heat Stress and Drought

Heat stress and drought have become major agricultural risks for areas in the drier northern pockets around Mukogodo and Rumuruti which receive the least rainfall of between 250-500mm annually. Prolonged drought in the region results in pasture deterioration, drying of water sources, temporary emigration, acute malnutrition among children, livestock emaciation, natural resource-based conflicts among pastoralists, crop losses and human-wildlife conflict over water and pasture (MoALF, 2017).

Plate 4-1: Dry River Bed

Source: KREIS, 2022

The major rivers and streams that were initially permanent and used to flow from the Aberdare Ranges and Mt. Kenya throughout the year are now becoming seasonal. A substantial increase in horticultural farming activities upstream has led to increased water abstraction along major water catchment areas by both large and small-scale farmers. As a result, the volume of water in these rivers has reduced and others dried up leaving pastoralists with little water downstream, particularly during the dry periods.

4.2.5.2 Flash Floods

Rainfall trends over a 35-year period (1981-2015) showed that the first-season rainfall average has not changed significantly, although the second-season average rainfall has increased by over 50mm (MoALF, 2017). This increase in precipitation in the second season has increased the risk of flash floods, which cause massive soil erosion, displacement of people, destruction of property and in some cases death. Other impacts are flooding in low-lying areas, pressure on infrastructure systems, crop and livestock losses, and the occurrence of diseases such as diarrhoea and cholera.

In 2013, flooding cases associated with heavy rainfall were reported in the County during the October-December rainfall season, especially in areas along major rivers and in the lowland areas due to increased precipitation (KMD, 2020). The County Government is constructing retention dams to store water as a long-term flood adaptation measure, and as sources of water for irrigation, livestock and household consumption.

4.2.5.3 Uncertainty in the onset of Seasonal Rainfall

Agricultural value chains in the County face the threat of uncertainty in the onset and duration of rains during the planting season. Initially, farmers used to plant on specific dates but with the changing weather, there is no certainty on when to prepare the land and when to plant. This results in delays in the planting season and post-harvest losses caused by aflatoxin and mould when the rains come during harvest time.

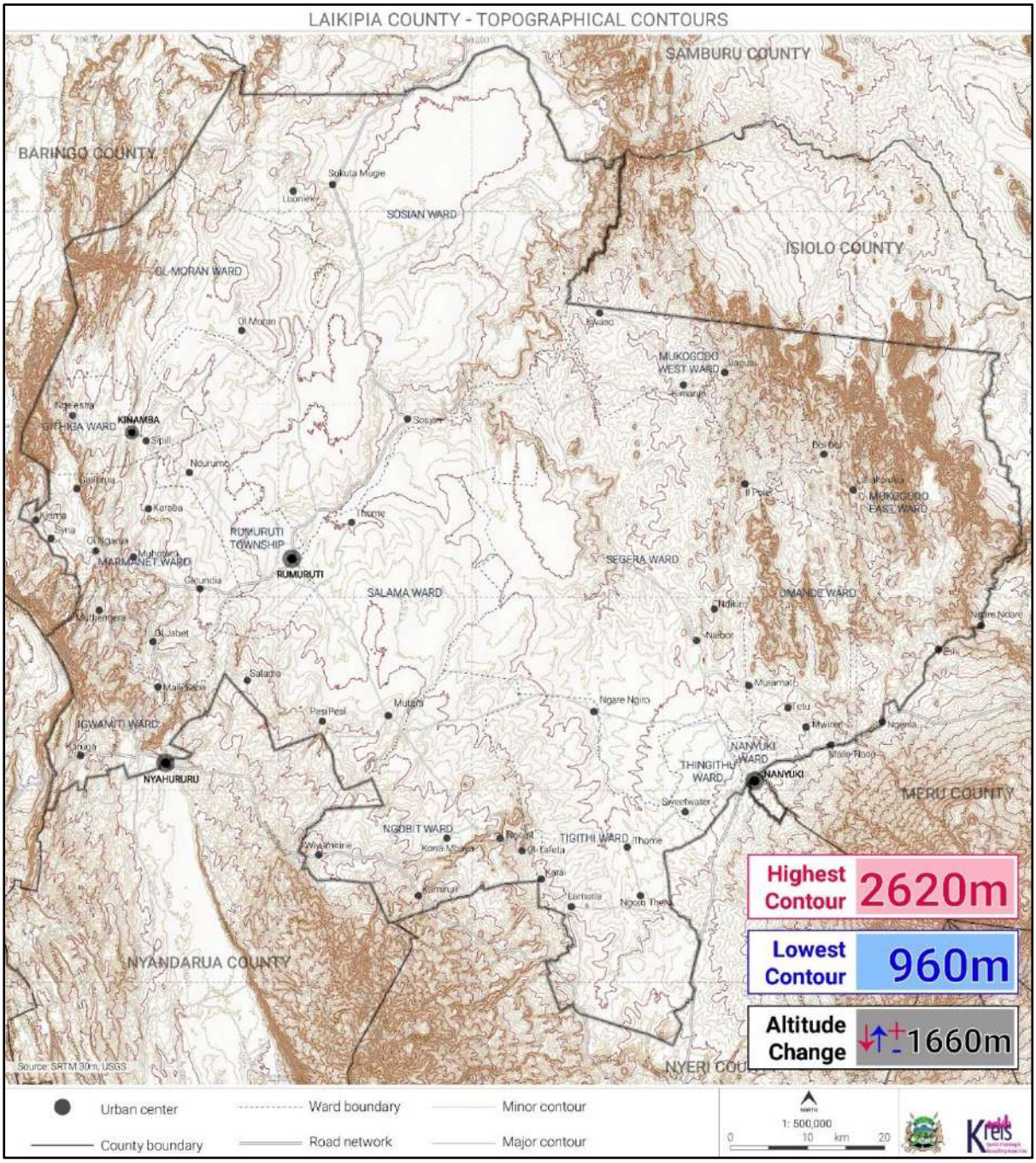
The marketing of products is also affected since farmers are often forced to sell immediately after harvesting at low prices. Wards most prone to this threat include parts of Sosian, Ol-Moran, Githiga, Marmanet, Rumuruti, Igwamiti and Salama. (MoALF, 2017). This calls for synergized efforts from the National Government, County Government and development partners to ensure that more agro-based value addition chain industries are established in those wards and in other urban centers within the County.

4.3 Topography and Slope Analysis

The County is generally dominated by the nearly level to gently undulating Laikipia Plateau that covers much of the western and southern parts. The Plateau is an area of low rolling hills dominated by rangelands – whose altitude varies between 960m above

sea level in the north and 2620m above sea level in the south, as shown in maps 4-5 and 4-6 below. The Ewaso Nyiro Basin forms the lowest region in the north at 1500m above sea level and the highest region at 2611m above sea level being around Marmanet Forest. The northeast part of the County has a hilly topography in the areas around the Mukogodo Dry Forest, the Lolldaiga Hills and some of their adjacent areas.

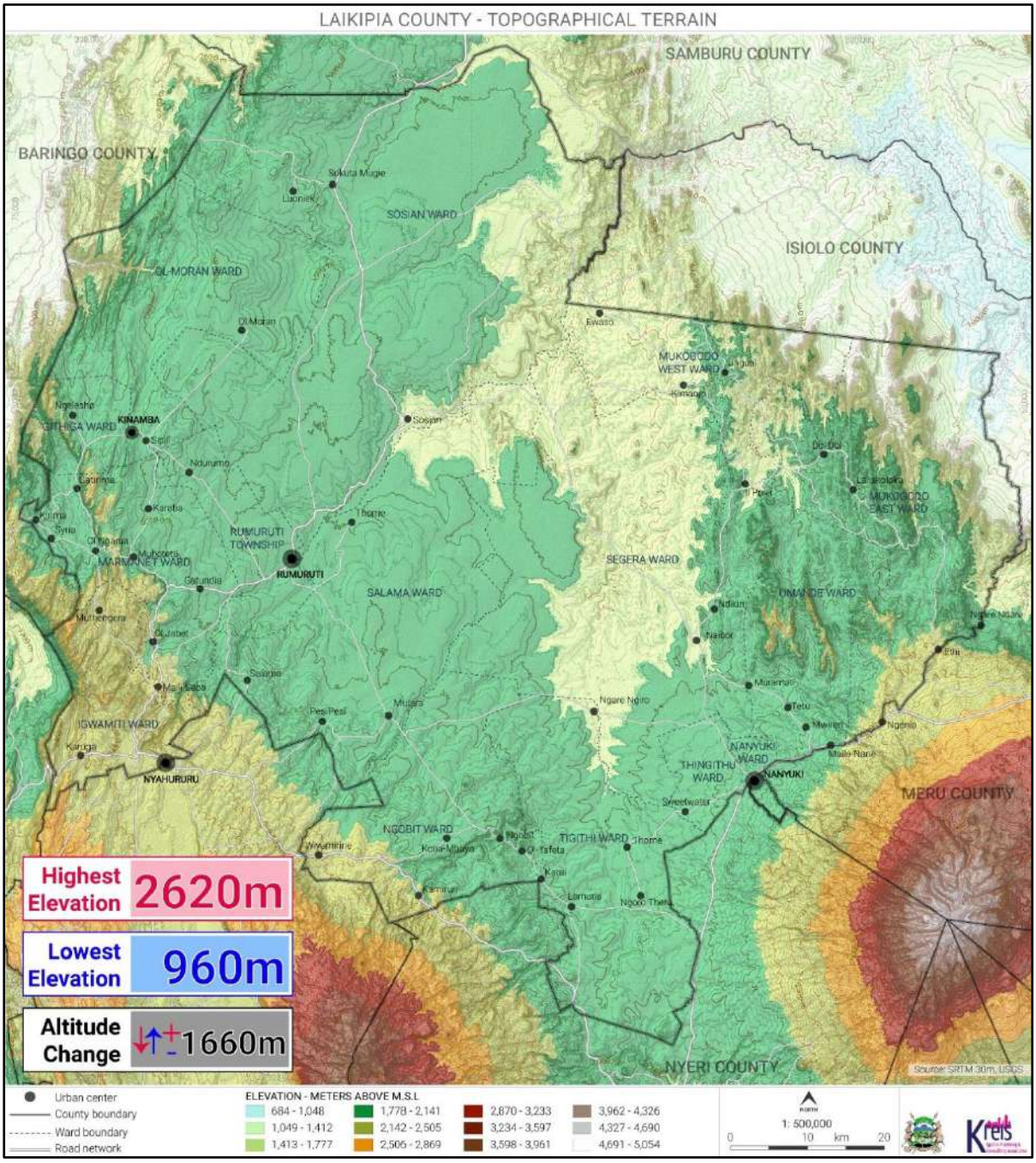
Map 4-5: Topographical Contours



Source: SRTM; USGS; KREIS 2022

The Aberdare Ranges and the Mt. Kenya landmass have significant climatic influences over the Laikipia Plateau and give rise to several altitude-related agro-ecological zones that range from sub-humid to semi-arid and arid habitat zones (Lane, 2005). These zones allow for crop farming, livestock keeping and wildlife conservation as the principal economic activities in the County.

Map 4-6: Topographical Terrain



Source: SRTM; USGS; KREIS 2022

The level landscape offers extensive lands that are suitable for the establishment of commercial ranches, wildlife conservancies, horticultural greenhouse farms and mechanized large-scale farms. This is visible in wards such as Umande, Mukogodo East, Mukogodo West, Segera, Sosian, Ol-Moran, Salama, Ngobit and Tigithi. The gently undulating Laikipia Plateau and its low rolling hills are of scenic importance to the County, making tourism a significant economic activity and to a large extent impacting the drainage structure of the County as detailed in sections below.

Plate 4-2: Undulating Laikipia Landscape (A) and Level/Flat Landscape (B)

Source: KREIS, 2022

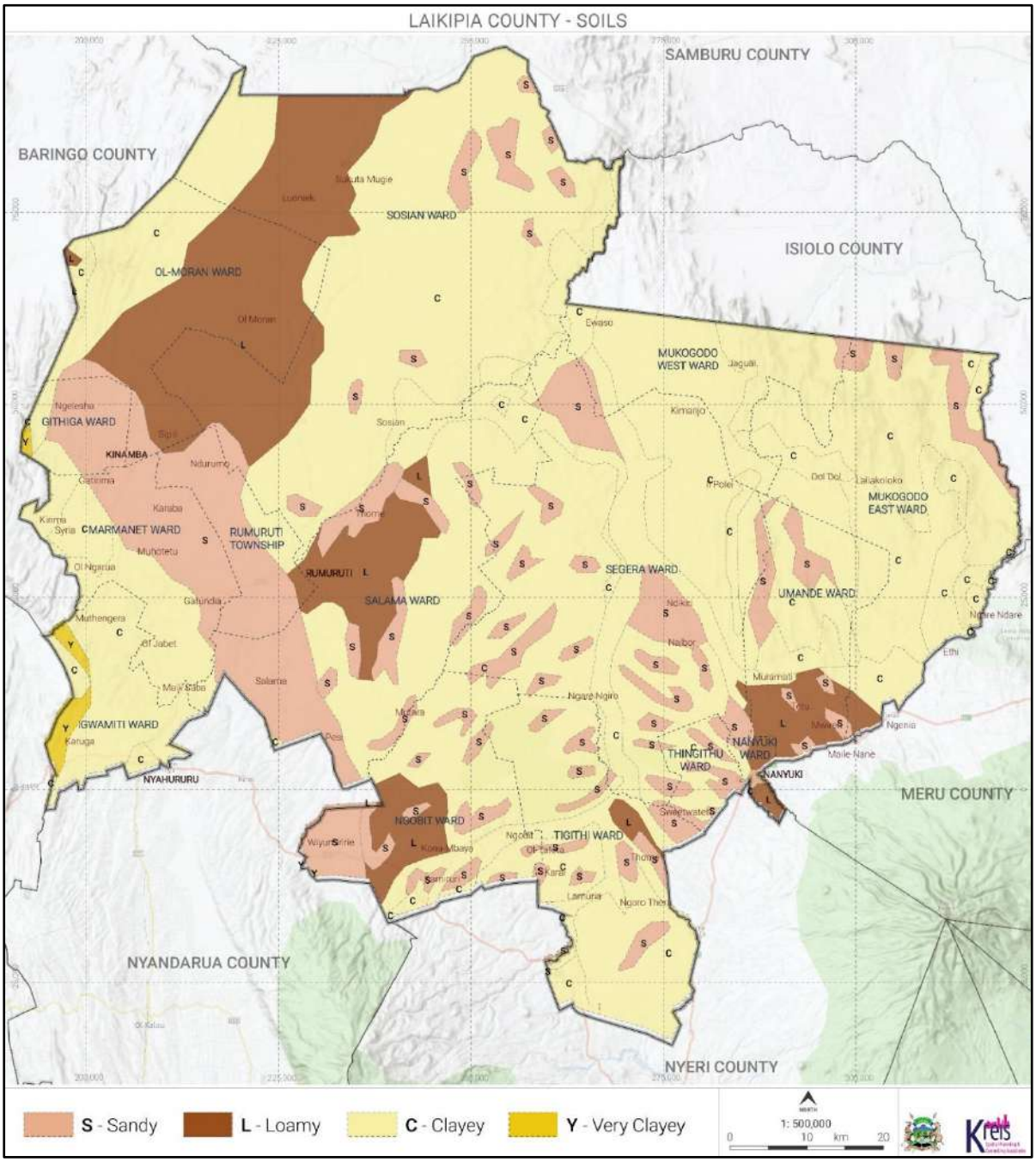
Incidences of soil erosion and land degradation are common in the areas around Rumuruti, Mukogodo East and Mukogodo West wards due to overstocking and overgrazing by pastoralists. The northeastern part of the County (around Mukogodo Dry Forest and the Lolldaiga Hills) has steep landscapes and rock outcrops – some of which have extensive ancient erosion gullies that pose challenges in the construction of roads. This makes such areas to be underserved by road networks and infrastrucrure utilities – electricity and telecommunication coverage.

4.4 Geology and Soils

4.4.1 Soils

The main soil characteristics in the County are loam, sand and clay as shown in map 4-7 below. Black cotton soils are spread in most parts of the plateau, with dark-brown to red friable soils and rocky soils spread especially on the hills. The distribution of soils in the County is mainly determined by the kind of parent rock and the terrain under which they are formed. Time and biological activities have also contributed to soil formation, although to a lesser degree.

Map 4-7: Soils Distribution in Laikipia County



Source: KREIS (modified from Laikipia County GIS Lab data)

The soil types, characteristics, suitability and distribution within the County are detailed in table 4-1 below.

Table 4-1: Soil Characteristics and Distribution

Soil Type	Soil Characteristics	Soil Suitability	Soil Distribution
Soils on Mountains and Major Scarps			

Soil Type	Soil Characteristics	Soil Suitability	Soil Distribution
Upper slopes: Dominated by rock outcrops. Upper and middle slopes: Rocky loamy and clayey soils. **Lower slopes:** Loamy and rocky soils.	The shallow, rocky and gravelly soils have very low available water capacity and restrict the growth of plant roots. The steep slopes cause rapid surface runoff and severe erosion once grass and shrub cover is reduced due to overgrazing.	These soils are suited for extensive livestock grazing and as wildlife habitats.	They occupy about 2% of the County in the rugged and steep areas in the western part including the Mukutan Gorge and the low mountain north of Ngarua.
Soils on Hills and Minor Scarps			
Soils developed on Basic Igneous Rocks: Rocky clay-loam to clay on steep slopes. Firm clay-loam to clay on gentle slopes.	On the steep slopes, the shallow and rocky soils have: ▪ Very low available water capacity. ▪ Severe soil erosion. ▪ Low natural fertility. On the gentle slopes, the deep soils have: ▪ Medium to high available water capacity. ▪ Medium runoff where there is good ground cover. ▪ Moderate soil erosion hazard. ▪ A tendency to crust or seal in overgrazed areas or areas under cultivation. ▪ Adequate nutrients for most rain-fed crops.	Most of these areas are only suitable for grazing and as wildlife habitats.	They occupy about 4% of the County and occur in two areas; in the south around Ngobit, and the northwest around Mugie.
Soils developed on Basement System Rocks:	These soils have several limitations: ▪ They are shallow, with gravel stones and rock outcrops.	These soils are best suited for extensive livestock grazing, forestry and wildlife habitats.	They occupy about 6.5% of the County and occur in the northern and eastern parts,

Soil Type	Soil Characteristics	Soil Suitability	Soil Distribution
Rocky sandy clay-loam to sandy clay on the upper slopes. Friable sandy clay on the middle and lower slopes. Rock outcrops occur on the peaks and ridges. Alluvium occurs along streams.	▪ Runoff is rapid to medium. ▪ The available water capacities are very low for shallow soils and medium for deeper soils. ▪ Damage from erosion is high where there has been heavy overgrazing. ▪ Low supply of plant nutrients.		especially in the Mukogodo region.
Soils developed on Volcanic Foot Ridges: Clay-loam soils	The deep soils have: ▪ High clay contents. ▪ High available water capacity. ▪ Good infiltration. ▪ High permeability. ▪ In most parts they have adequate organic matter and nitrogen levels, therefore being of medium to high fertility. ▪ Most of the other plant nutrients are sufficient for a wide range of crops.	These soils are best suited for agriculture.	These soils occupy a total area of about 7% of the County. They occur between Anadanguro and Aljiju (in Mukogodo Forest), and in the regions around Nyahururu, Ngarua, Muhotetu and Muruku areas.
Soils on the Structural Plateaus: Dark greyish brown to very dark grey cracking clay.	The dark cracking clays have: ▪ Moderate surface drainage. ▪ Poor internal drainage especially when the moisture content is high. ▪ Are very sticky and plastic when wet, and extremely hard when dry hence are difficult to till.	Most areas are under extensive grazing (private ranches) Some patches of land, having been subdivided, are under cultivation of maize, beans, potatoes and vegetables.	These soils cover the largest part of the County (about 62%) with a total area of 602,700ha. They are found in Lamuria, Matanya and Nanyuki in the southeast, and cover most areas of the central parts of Ol Pejeta, Mutara and Rumuruti, and

Soil Type	Soil Characteristics	Soil Suitability	Soil Distribution
Reddish brown to dark brown, clay.	▪ Relatively low available water capacity. ▪ Sheet erosion occurs especially in sloping areas due to low infiltration rates. The red to brown clays has: ▪ Good surface and internal drainage. ▪ Moderate to good available water capacity. Most of these soils are well supplied with potassium and other bases, but phosphates are variable and may require applications depending on the crops being grown. Organic matter and nitrogen levels are moderate.		Sosian and Kirimun in the north.
Soils on the Uplands and Non-Dissected Erosional Plains: Dark reddish-brown sandy clay-loam to clay. Some areas, especially those with strongly eroded topsoil are gravelly or stony.	The available water capacity for plant use is medium to high in the deeper soils; but low to medium, in shallow and gravelly soils. The natural fertility of the soils under well-managed vegetation (such as in private ranches) is fair to good. The soils are susceptible to surface crusting and sealing, especially where vegetation cover has been	The soils are suited for extensive grazing and wildlife management.	These soils cover extensive areas of about 17% (170,950ha) in the northeast region of the County; the entire Mukogodo and parts of Naibor, Mpala and Ewaso.

Soil Type	Soil Characteristics	Soil Suitability	Soil Distribution
	depleted, resulting in medium to rapid runoff. Hence erosion hazard in these areas is common.		
Soils on Bottom Lands and Swamps: Firm clay	These soils are found in level to almost flat areas where alluvium derived from the surrounding areas has accumulated.	The swamps are cultivated at the peripheries by smallholder farmers.	These soils cover about 0.5% of the County in the Ewaso Narok Swamp to the northeast of Rumuruti, Pesi and Marura Swamps

Source: CGL, 2021

While most of the soil types in the County support agriculture, limiting factors to optimum agricultural production are the poor weather conditions characterized by low rainfall amounts and prolonged drought periods.

Plate 4-3: Black Cotton Soils and Cracking Clay Soil in a dry River Valley

Source: KREIS, 2022

4.4.1.1 Soil Erosion

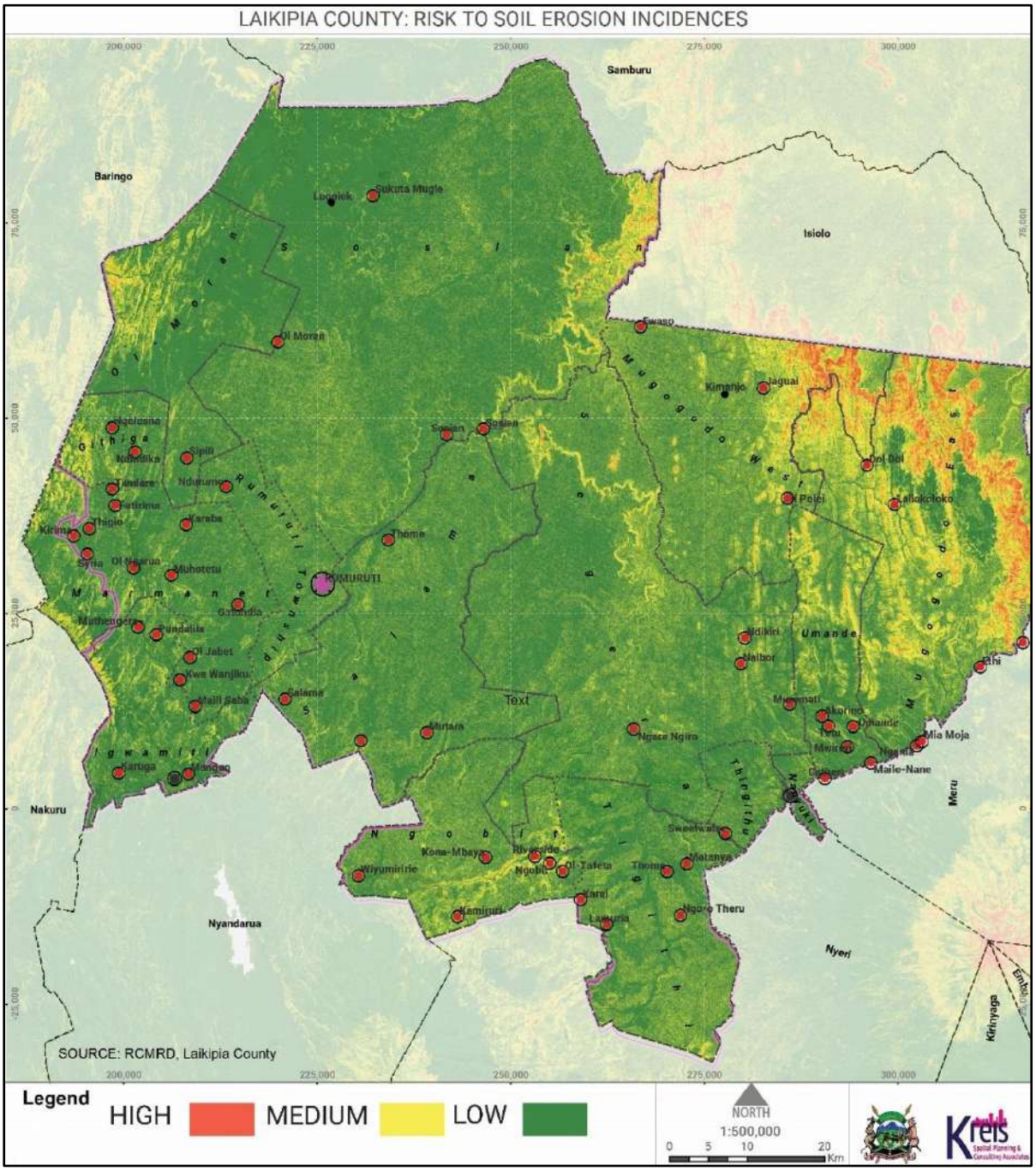
Due to topography, drainage structure and amount of rainfall received in the County, there have been varying degrees of topsoil loss through erosion with some areas experiencing soil loss depths of up to 2523mm per year as seen in map 4-8 and plate 4-4 below. Soil erosion is rampant in the northern parts of the County where pastoralism is the main source of livelihood for the local communities. This is caused by overstocking and overgrazing which deplete ground cover and leave the soil bare and predisposed to erosion.

Plate 4-4: Soil Erosion resulting in Land Degradation in areas of Laikipia North

Source: KREIS, 2022

Soil erosion has become a menace that threatens the livelihood systems of the local communities, especially those that rely on subsistence agriculture and livestock keeping. This is because it results in land degradation, reduced forage, soil nutrient deficiency, and increased siltation of water sources in low-lying areas.

Map 4-8: Soil Erosion Incidences



4.4.2 Geology

Laikipia County is underlain by metamorphic rocks of the Precambrian age that form part of the extensive African Basement Complex, which extends south to Mozambique and west to West Africa. In Laikipia County, the metamorphic basement complex rocks are exposed at the surface in the northeastern parts, including most of Mukogodo East and West wards, the Lolldaiga Hills, Umande Ward and some parts of Sosian and Segera wards as seen in the geological structure map of the County (Map 4-9).

The greater part of the County has volcanic formations, which overlie the metamorphic basement complex buried at varying depths. The western parts of the County are a build-up of extensive flows of phonolite lavas originating from the Aberdare Ranges and the edge of the Rift Valley Escarpment. The south and eastern parts of the County have basalts and other volcanic materials originating from Mt. Kenya (Ministry of Agriculture, 1983).

Below is a detailed description of the County's geologic structure:

1. Metamorphic Rocks of the Basement Complex

These rocks are originally laid down as sediments and then fundamentally altered by heat and pressure. In Laikipia County, these rocks mainly consist of gneisses, migmatites and granites. All these rocks are associated with soils which are generally intermediate in texture. The rocks of the Basement Complex occupy the northeastern parts of the County in Laikipia North Constituency.

2. Volcanic Lavas and Deposits

Volcanic formations overlie the metamorphic rocks of the Basement Complex. These formations are of two general types – lavas which are spread in sheets and various volcanic deposits. They are grouped as follows:

a) Lava Sheets of Phonolitic Composition

These include the Nyahururu phonolites and Rumuruti phonolites. The lavas weather chemically to form clays and the soils associated with them are dominantly clay textured. The phonolites cover most of the western (Nyahururu-Ng'arua) and north-western (Rumuruti-Sosian-Kirimun) parts of the County.

b) Volcanic Sediments of the Nanyuki Formations

These consist of sediments washed down from Mt. Kenya. Most of the soils formed from these are heavy-cracking clays, while some places have silty loam. They cover most of the central parts of the County including Ol Pejeta, Mutara and Segera ranches.

c) Volcanic Ashes, Lava and Mudflows of the Sirimon Formations

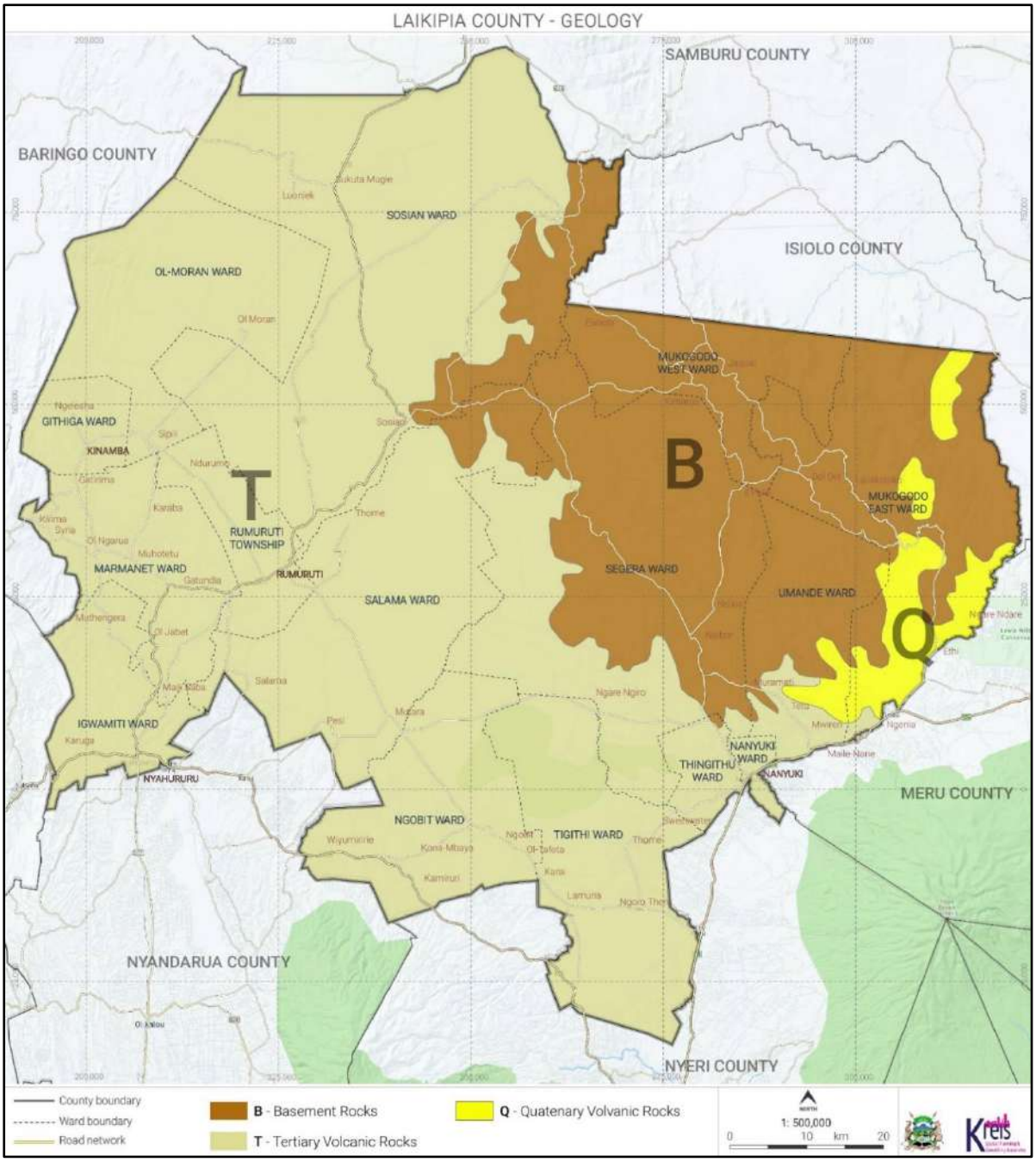
These formations consist of phonolitic lavas or mudflows in which blocks and pieces of lava are embedded in silty or clay material and ash deposits. Most soils developed from these formations are heavy clay in texture.

They occur to the north of Mt. Kenya around Matanya, Naro Moru and Lamuria areas.

d) Basalt Lavas

Lavas of basaltic composition occupy minor areas to the north of Nanyuki and Timau. They weather chemically to clay, with little or no sand and the soils derived from them are heavy clay in texture.

Map 4-9: Geologic Structure in Laikipia County



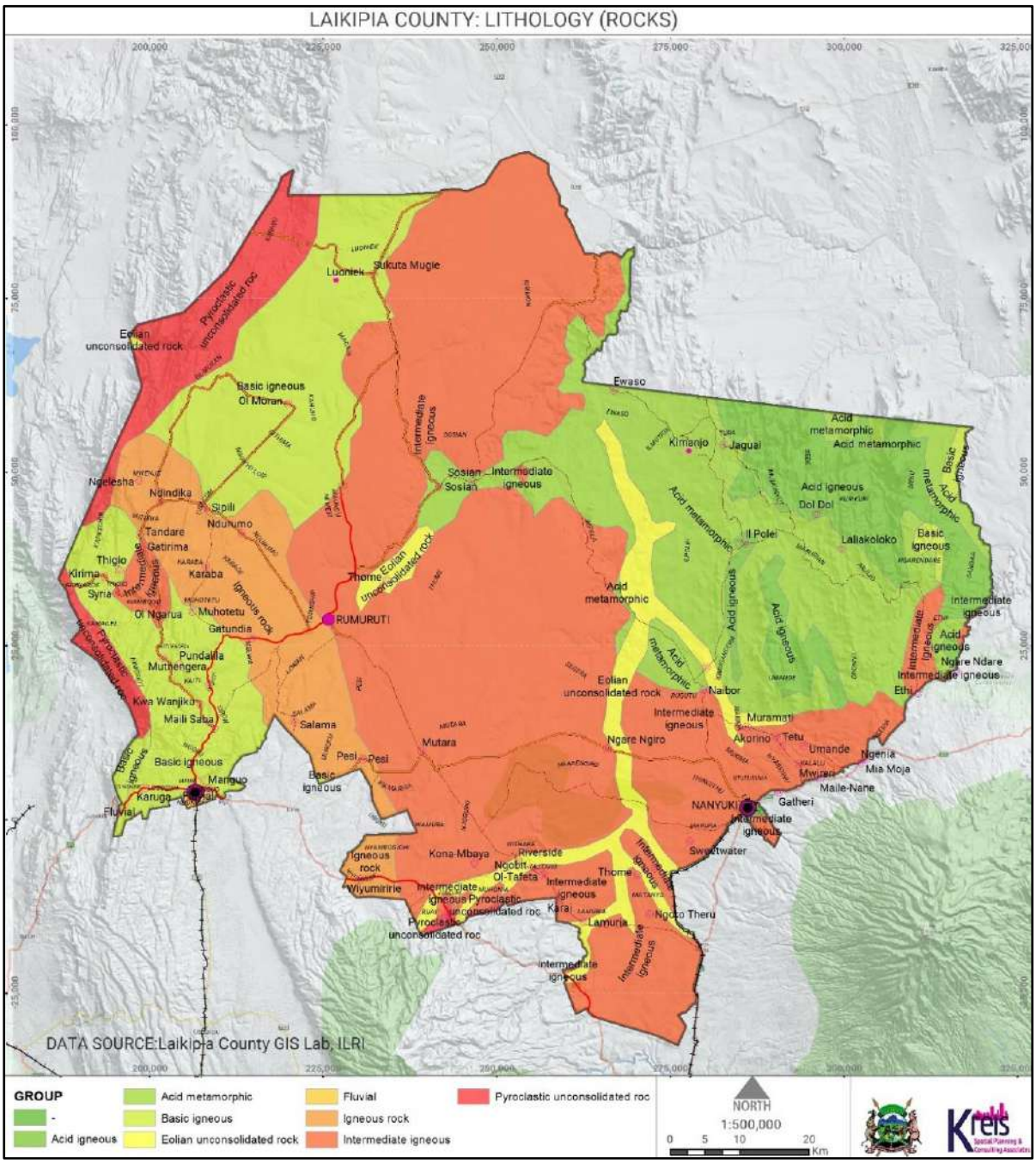
Source: KREIS (modified from Laikipia County GIS Lab data)

4.4.3 Minerals

The geologic structure and soil composition of an area are fundamental factors in determining the availability and exploration of minerals. Since the County is underlain

by metamorphic rocks, the greater part has volcanic formations which overlie the metamorphic basement complex. The rock composition and characteristics are shown in map 4-10 below.

Map 4-10: Physical Characteristics of Rocks in Laikipia County



Source: KREIS (modified from Laikipia County GIS Lab data)

A field survey commissioned by the County Government found substantial deposits of exploitable minerals, including iron ore (hematite and laterites), bentonite, kaolin, bauxite, sepiolite, mica, vermiculite, marble, limestone and garnets. Limestone is

evident in the form of veins which are exposed on the ground surface in areas of Laikipia North. However, there is limited exploitation of the mineral whose numerous uses include – but are not limited to steel manufacturing, paper production, water treatment and purification, and plastic production. Marble is also visible in exposed rocks along dry river valleys in Loibor Soit areas of Laikipia North.

Plate 4-5: Exposed Limestone Veins and Marble in Rocks within the environs of Kimanjo Area

Source: KREIS, 2022

Additionally, rocks such as quartzites, granites, basalts and phonolites are also available within the County and spread in various locations as highlighted and summarized in table 4-2 and map 4-11 below.

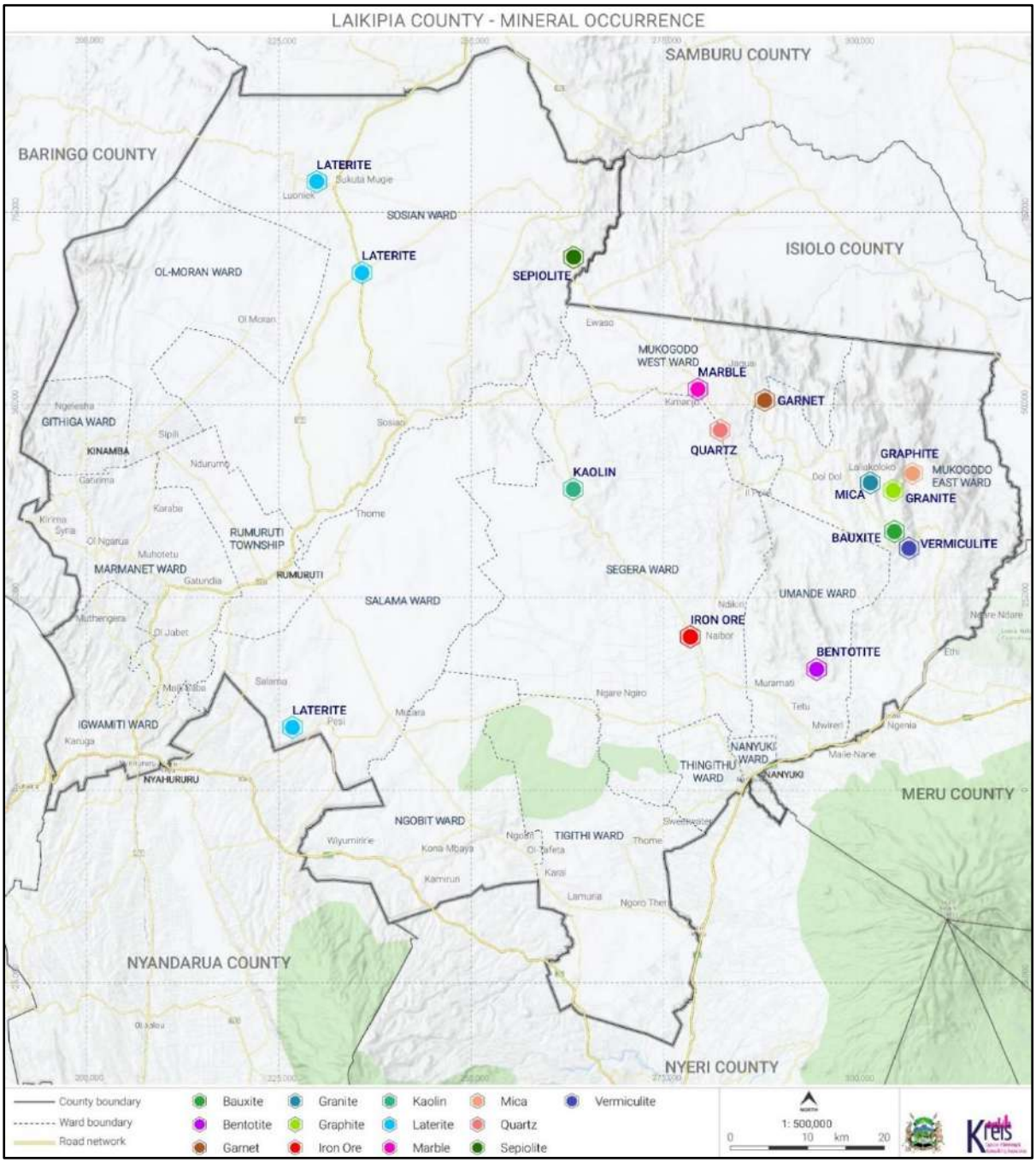
Table 4-2: Mineral Occurrence in Laikipia County

Mineral	Location	Coordinates
Iron Ore	Naibor/Mugwooni, Sosian, Ol-Moran, Salama, Segera, Ng'arua and Rumuruti	37N 0278453, UTM 0019868
Laterite	Found between Kirimon and Mugie where thicknesses of up to five meters were observed; all the way to Luoniek. Also observed at Muyuarak (Posta), Tinga Mara (33.9% Fe), Ol Maisor and Suguta (34.4% Fe) ranches among other areas covered by the volcanic formations.	Between (7N0 262698, UTM 0072503 and 37N 02229926, UTM 0078952; and Luonyek 37N 0226772, UTM 008103 Munyuarak (Posta) - 37N 0235821, UTM 0067173
Sand and Gravel	All the tributaries of the Ewaso Ng'iro river have gravel and sandy beds, providing sources of building sand. The volcanic gravels and sand are abundant in the steep lower courses of the rivers which descend the Laikipia escarpment.	-
Quartz	A big outcrop of quartzite occurs at Ilpolei near the road to Kimanju. The milky quartz was located in the Mukogodo Forest while the green quartz occurs in the Loldaiga Hills.	Ilpolei near the road to Kimanju (37N 0282342, UTM 0046718)
Graphite	Mukogodo Forest; Ol Doinyo Ng'iro	
Granite	These rocks are widespread in Mukogodo areas and they form the inselbergs on top of the hills and are exposed on the dry river beds.	37N 0304793 UTM 0038860
Bauxite	Almost all of the aluminium that has been produced in the world has been extracted from bauxite and hence the primary ore of aluminium. The mineral is found around Olarjiju.	Olarjiju near Olarjiju Primary School (37N 0304979, UTM 0033541)
Marble	Loibor Soit in Kimanjo	-
Limestone	Loibor Soit in Kimanjo	
Kaolin	Significant reserves occur in Impala ranch.	37N 00263237, UTM 0039062
Sepiolite	Also known as meerschaum forms a 10m thick unit on top of the Miocene sedimentary rocks and is overlain by phonolites around Kirimon area.	37N 0263305, UTM 0069182

Mineral	Location	Coordinates
Bentonite	Clays rich in minerals of the bentonitic family in Laikipia County occur at two localities in the Nanyuki area in considerable quantities.	Both sites are said to be in the Lolldaiga ranch.
Garnet	Most of the garnets are crushed for use in the preparation of abrasive (sand) paper and cloth. Broken almandine garnets are common in the Jaguai area.	37N 0288120 UTM 0050616
Sillimanite	Lenses of almost pure sillimanite occur as segregations in the sillimanite gneisses near Kirimon and Ngoteiya at the Nanyuki-Maralal border area.	-
Mica	Mukogodo Forest	location 37N 0304793, UTM 0038860
Vermiculite	Member of the mica family that was found at Olarjiju. Its colour varies from golden yellow to brown to black.	37N 0305744, UTM0032308
Phonolites & Basalt	The resources are voluminous in Laikipia County and are used as raw materials for aggregate. They are both used in building and road construction and as dimension stones (walling stones, curb stones and paving stones).	-

Source: CGL, Department of Water, Environment & Natural Resources, 2021

Map 4-11: Mineral Occurrence in Laikipia County



Source: KREIS, 2022 (modified from CGL, Department of Water, Environment & Natural Resources, 2021)

It is evident that in most of the areas where these mineral deposits occur, not much exploitation has been witnessed especially at the industrial level. It would be prudent for the County Government to explore ways to sustainably exploit some of these minerals at an industrial scale for economic enhancement and livelihood improvement.

4.5 Hydrology and Water Resources

4.5.1 Water Towers and Catchment Areas

The drainage pattern in Laikipia County drains towards the north. The County's surface water sources are essentially from two water towers – Mt. Kenya and the Aberdare Ranges, which are the catchment areas of numerous perennial rivers that drain into the upper Ewaso Ng'iro North watershed basin and into the Lorian Swamp in Isiolo County. The forested areas and the high Laikipia plateau also give rise to seasonal streams. These play a vital role in enhancing the quantity of water flow, particularly to the downstream lowlands in the northern parts of the County.

4.5.2 Rivers

The County is part of the upper Ewaso Ng'iro North River Basin, given its proximity to Mt Kenya and the Aberdare Ranges. The main rivers are Ewaso Ng'iro and Ewaso Narok. The source of the Ewaso Ng'iro river is the eastern Aberdare Ranges, while the Ewaso Narok river has its source at Lake Ol Bolossat, whose catchment is the western and southern part of the Aberdare Ranges. Ewaso Narok river flows down to form the Thompson Falls in Nyahururu Town. It then flows across the Laikipia Plateau in the central parts of the County and sustains the Rumuruti Forest and the Ngare Narok Swamp before finally joining the Ewaso Ng'iro North River at Impala Ranch.

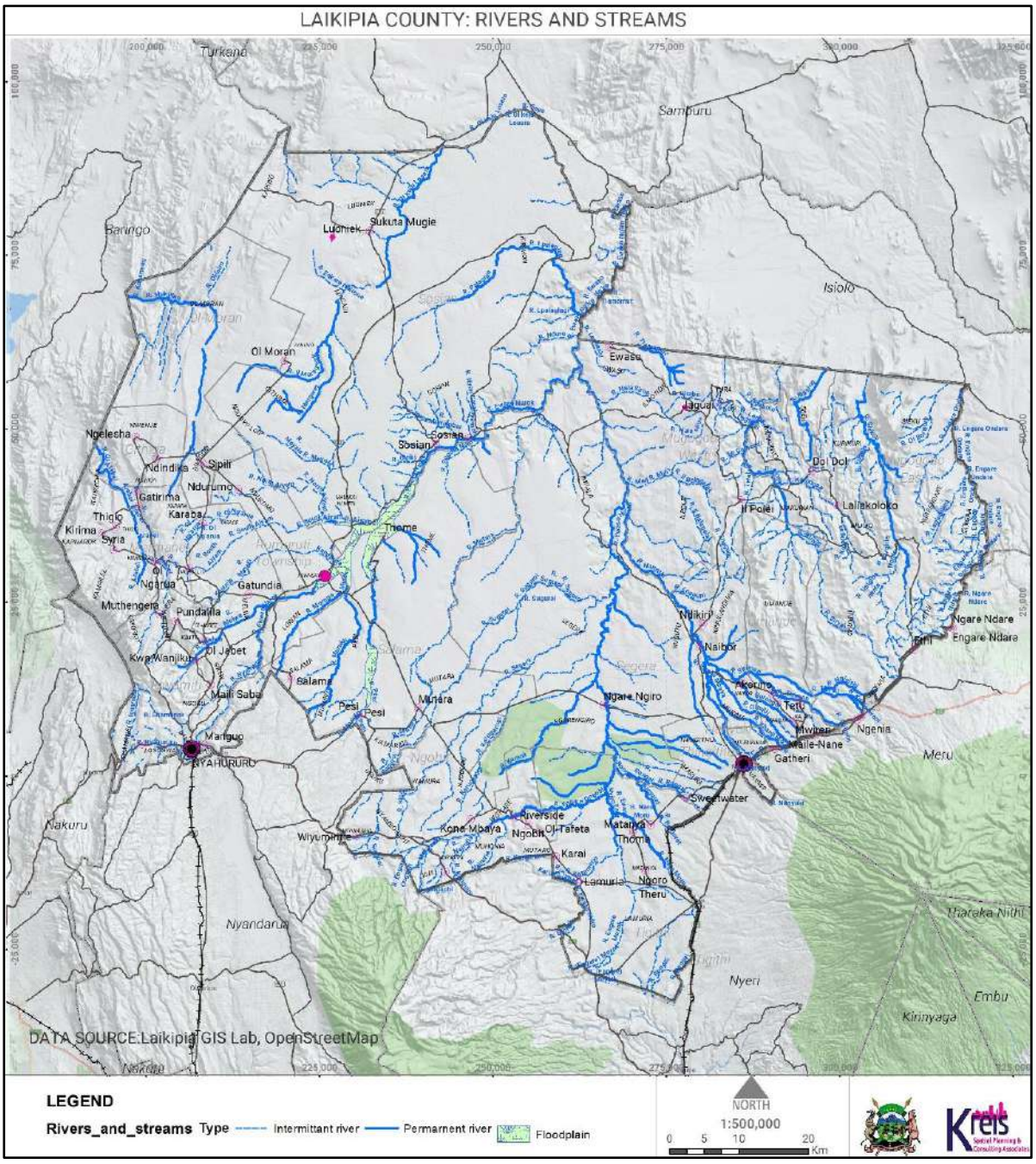
Plate 4-6: Ewaso Narok River and Nanyuki River

Source: KREIS, 2022

Other rivers arising from the Aberdare Ranges are Pesi, Mutara, Suguroi, Nairutia, Sigira, Makiruaki and Karugarugi. The main rivers that flow from the slopes of Mt. Kenya are Nanyuki and Engare Ndare which flow northwards in the eastern part of the County.

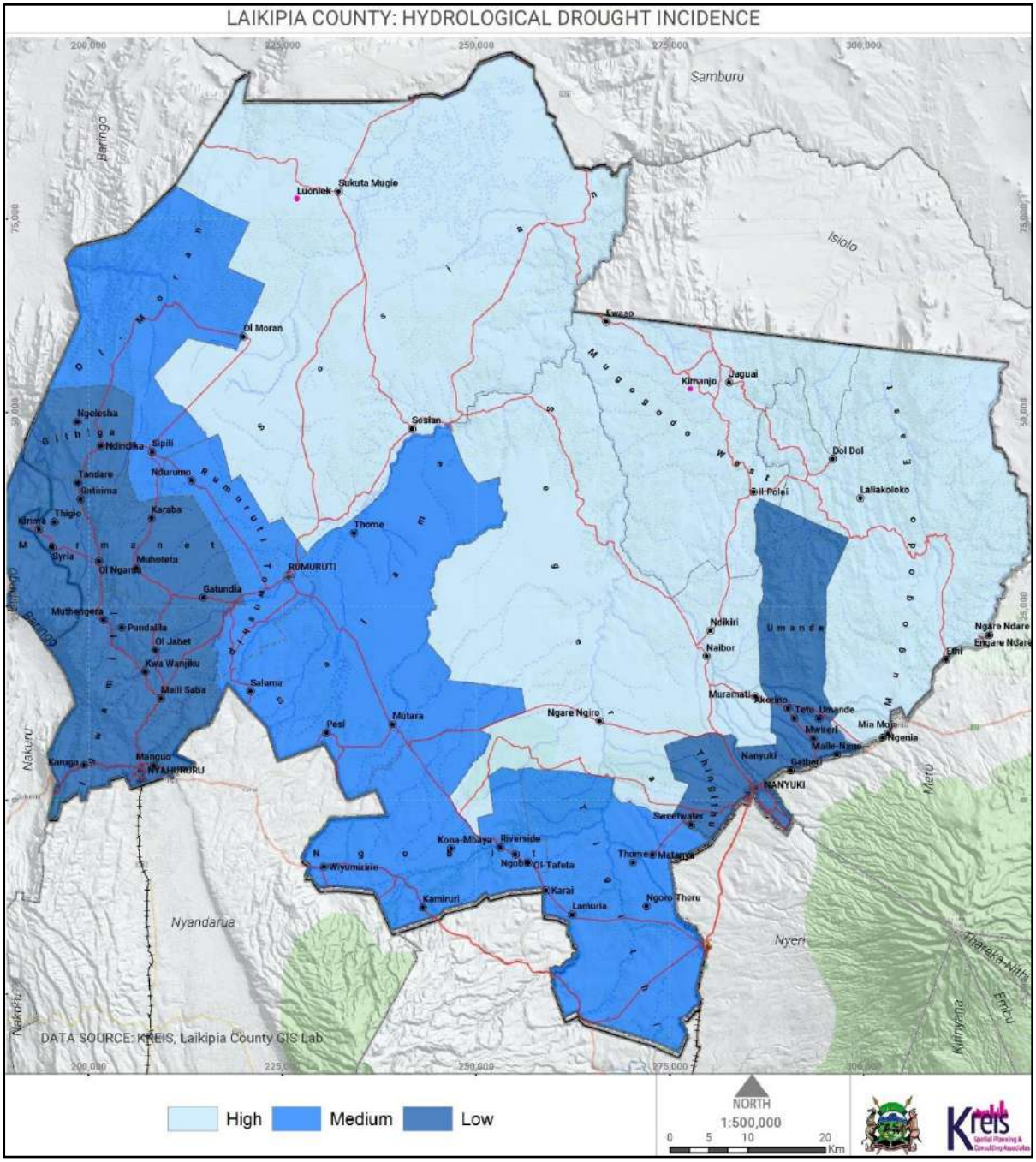
Other tributaries from Mt. Kenya are Naro Moru, Burguret, Rongai, Likii, Sirimon, Timau and Ngusishi rivers. The flow of these rivers to the north is in synchrony with the County's topography as shown in map 4-12 below and to a large extent, determines the human settlement pattern. This is because the rivers are the major sources of water for domestic purposes, livestock and wildlife consumption and for irrigation farming (MoALF, 2017).

Map 4-12: Drainage Profile and Features



Unsustainable anthropogenic land use activities in the upper regions heavily reduce water outflow to the north, resulting in prolonged periods of hydrological drought incidences as seen in map 4-13 below. Water conflicts in the Ewaso Ng'iro North River basin are rampant during dry seasons when small-scale farmers practicing irrigation, agribusinesses and urban water intakes compete over low river flows (Kiteme, 2020).

Map 4-13: Laikipia County Hydrological Drought Incidence



4.5.3 Groundwater

4.5.3.1 Groundwater Recharge

Groundwater recharge is usually controlled by the local climatic, physiological & geological conditions; land- cover; land use; soil type; and drainage. Therefore, different areas tend to have different groundwater recharge conditions. In most cases, the local aquifer systems are recharged by the local rainfall except where the aquifer lies in a river valley, in which case the river also helps to recharge such aquifers. This is the commonest case in the local aquifers located in the weathered basement zones as described above.

An isotope investigation was undertaken in Laikipia District in 1985 by Schotterer and Müller of the Geographical Institute of the University of Bern, to determine the direction of groundwater flow in the district, especially the resident times in each area. The findings of the isotope study were that the resident time for the water from the rainforest zone of the mountains, the alpine zone and Doldol areas was less than 30 years. However, the resident time in the areas at the foothills and the plains is about 4,000 years, while the groundwater from Kinamba area is over 10,000 years old.

The main recharge areas for the groundwater in this system are in the zone lying between 3000-3500m above sea level in Mt. Kenya and Nyandarua Range. This zone coincides with the humid and semi-humid zones of the two mountains. In this zone, rainfall exceeds evapotranspiration in 2-3 months or more per year and therefore the excess moisture percolates to recharge the groundwater. The groundwater flow direction was assessed to be from the mountainous areas of the surrounding plains.

In the Mukogodo area, annual rainfall reaches a maximum of about 500mm. It serves as a source of recharge for the aquifers in the region. It also supports a dry land forest between Doldol and Anadanguru areas, helping to store rainwater temporarily as it infiltrates into the soil and eventually percolates into the aquifers.

4.5.3.2 Groundwater Potential & Local Aquifers

The groundwater potential and availability follow the geological distribution pattern. This is because different types of rocks are more susceptible to the formation of groundwater reservoirs than others. The Ewaso Ng'iro North River Catchment Conservation and Water Resource Management Study, (2002) classified the

groundwater potential of Laikipia as high. The chances of striking groundwater through boreholes are high, but there is a wide variation in the anticipated yields. The average borehole yield in Laikipia is low at 2-3m^3/hour but may rise to 5-6m^3/hour if drilling is deepened. This is because more old-land-surfaces which constitute aquifers will be intercepted.

In the former Laikipia District, local aquifers occurred in Mukogodo Division which is underlain by metamorphic rocks. In this area, borehole depths range from 6m - 150m with the mean average being 31m. Depth to the aquifer ranges between 20m – 140m, while the mean average is 72m. Borehole yields range from 0.5–14 m^3/hour with a mean average of 4.1 m^3/hour.

According to the 2002 Ewaso Ng'iro North River Catchment Conservation and Water Resource Management Study, three regional hydrological zones and their hydrogeological characteristics were identified in Laikipia County. These include:

a. Zone 2 - Nanyuki-Rumuruti-Suguta Plains and Marmanet Ridge Zone

In this zone, recharge is largely from Mount Kenya and Nyandarua Ranges. There is a wide variation in borehole depths from 0m for springs to 204m. The water rest level varies between 40m – 55m deep. Boreholes yields range from 1 – 15m^3/hour, with an average of 5.7m^3/hour.

b. Zone 3 - Lariak-Sipili Plateau Zone

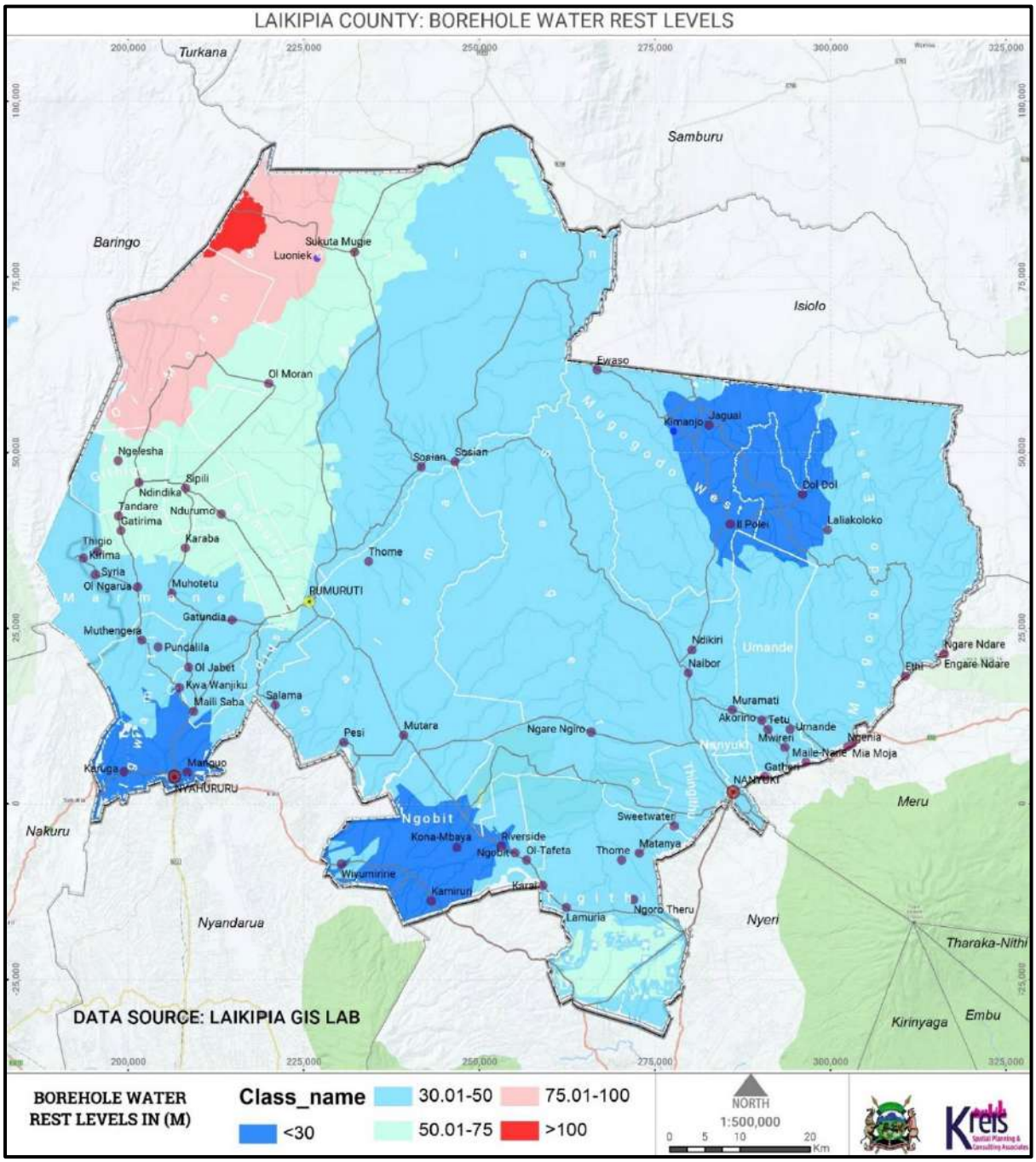
In this zone, the geological formations are the Igwamiti Phonolites and the Upper Ewaso Narok Phonolites. The depths of the aquifers range between 140m – 270m. Borehole yields are in the range of 7m^3/hour but range from 3 – 11m^3/hour.

c. Zone 4 - Nyahururu to Upper Pesi Zone

Geologically, this zone is underlain by the Thompson Falls Phonolites. The depth to the groundwater aquifers is less than 100m and the water rest level is less than 60m deep. However, yields are rather poor at 1m^3/hour on average. The high-water levels indicate good recharge conditions, while the low yields reflect weathering to form high clay content along the old-land surface, the horizons in which the groundwater is stored.

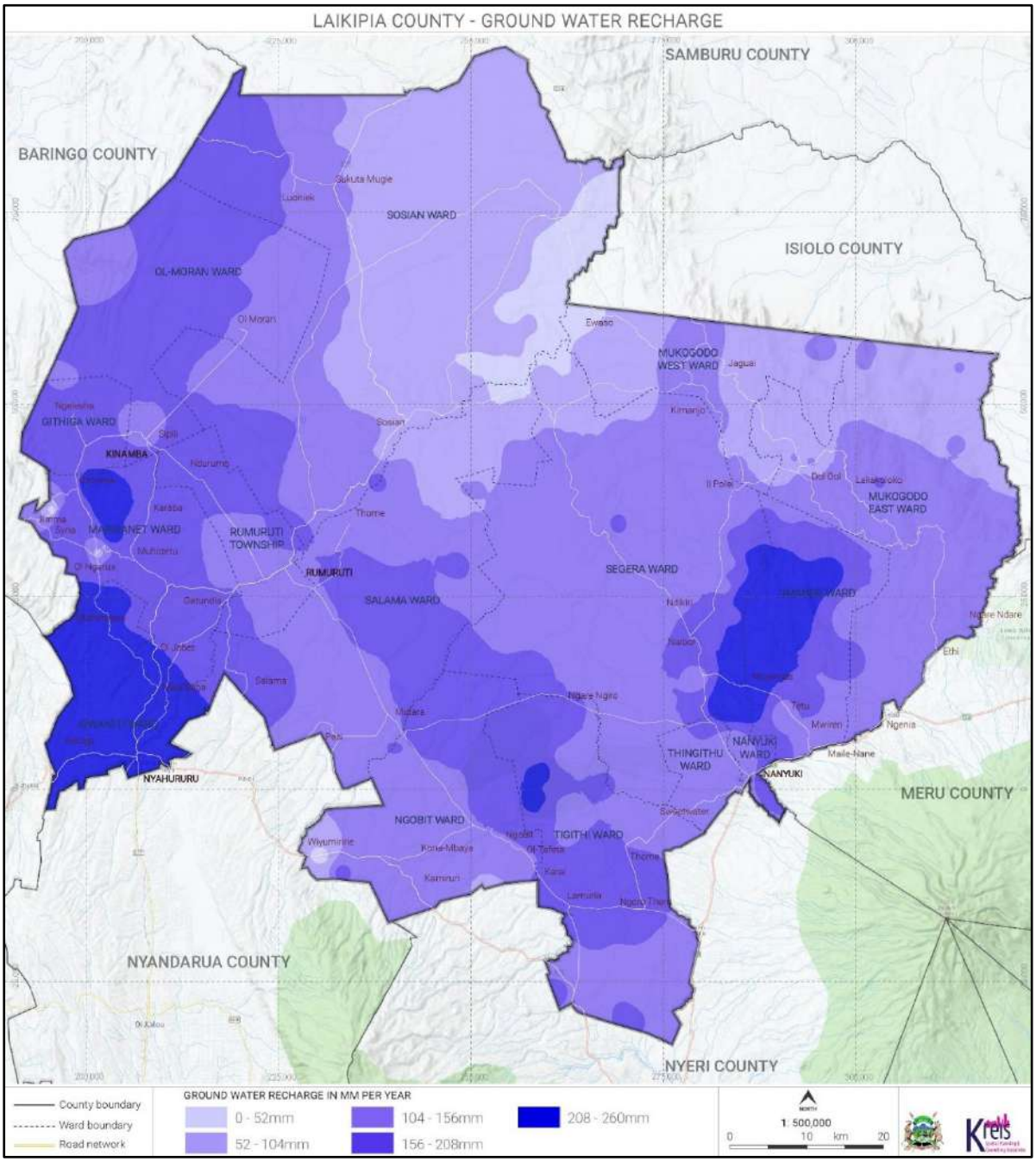
These are summarized in maps 4-14 and 4-15 below.

Map 4-14: Laikipia County Groundwater Potential



Source: KREIS (modified from RCMRD & Laikipia County GIS Lab data)

Map 4-15: Groundwater Recharge in mm/per Annum



Source: KREIS (modified from RCMRD)

4.5.3.3 Groundwater Quality

From WRAP's study (1987) the conclusion on the groundwater quality for Laikipia District was that the quality is within the maximum permissible level of TDS of 1500mg/l. However, high fluoride values were found in the volcanic areas. Groundwater in the volcanic rocks was considered acceptable for domestic use, however, the slightly high fluoride content can cause teeth fluorosis.

4.6 Agro-Ecological Zones

The interplay of climate, altitude, soils and hydrology on the natural landscape creates distinctive eco-climatic regions. Agro-ecological zones are thus the geographic divisions of an area into units which have similar eco-climatic characteristics that favor agriculture and related activities. Laikipia County has four agro-ecological zones; upper highland sub-humid, low highlands, upper midlands and lower midlands as detailed in table 4-3 and map 4-16 below.

Table 4-3: Agro-Ecological Zones

Zone	Description	Wards	Dominant Activities
Upper Highland Sub-Humid (UH 2-3)	▪ Rainfall is over 1000mm/year. ▪ Temperature ranges from 19°C to 25°C. ▪ Soils are well drained and fertile with plenty of humus. ▪ Altitude is over 2100m asl.	Igwamiti, Githiga	Dairy farming Crop farming (beans, maize, wheat, Irish potato) Fish farming
Low Highlands (LH 1-5)	▪ Rainfall ranges from 700-1000mm/year and is erratic. ▪ Temperature ranges from 15°C to 25°C. ▪ Soils are moderately well drained with less humus. ▪ Altitude is between 1500-2100m asl.	Ngobit, Umande, Nanyuki, Thingithu, Igwamiti, Marmanet, Githiga	Crop farming (maize, wheat, beans, sunflower, and barley) Fish farming Dairy farming
Upper Midlands (UM5 - UM6)	▪ Rainfall ranges from 500-700mm/year and is erratic. ▪ Temperature ranges from 15°C to 28°C.	Segera, Nanyuki, Tigithi, Rumuruti, Salama, Mukogodo East	Beef farming Crop farming (sorghum, hay and millet)

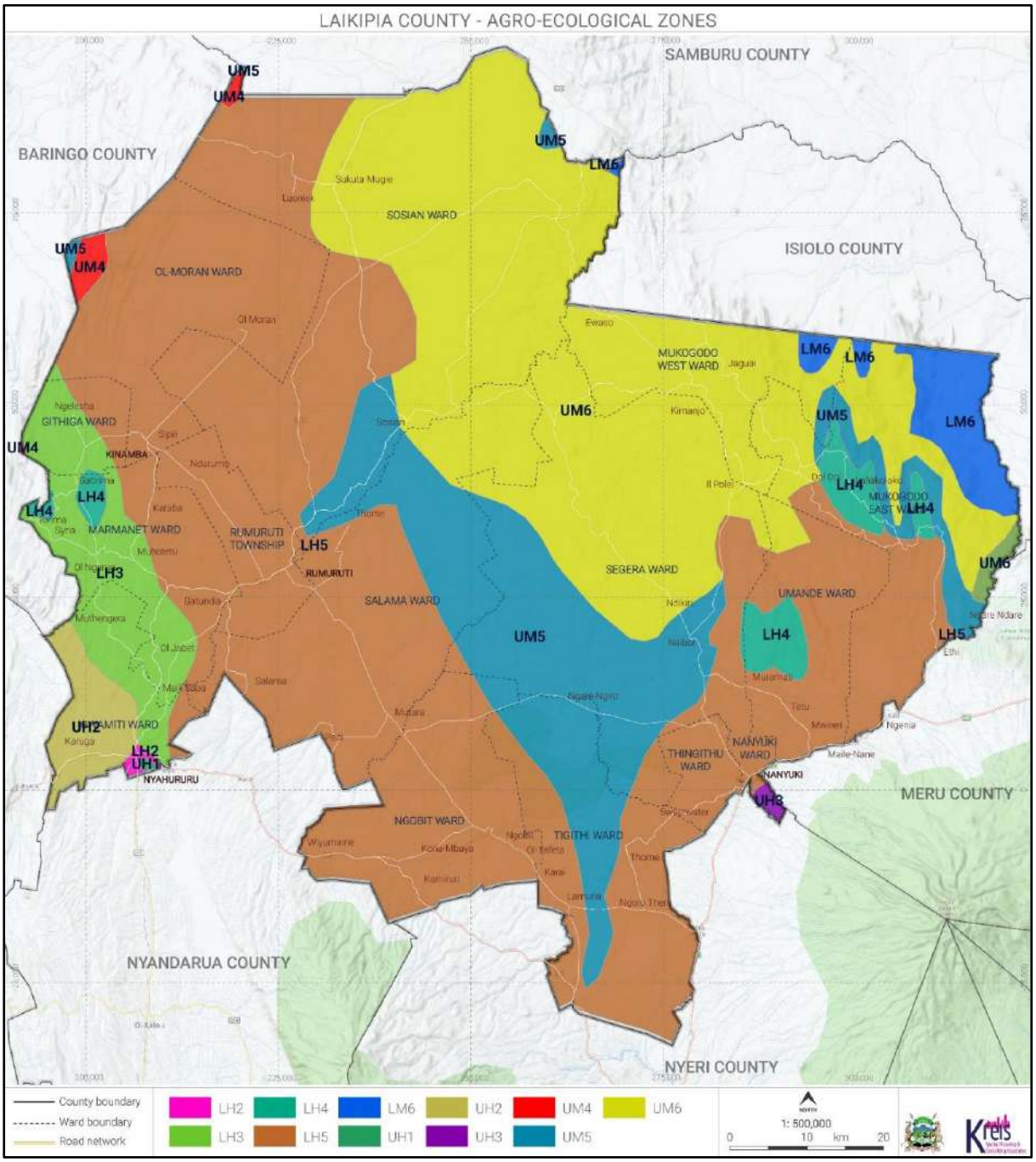
Zone	Description	Wards	Dominant Activities
	▪ Poorly drained soils with less humus. ▪ High evaporation.		
Lower Midlands (LM3 - LM5)	▪ Rainfall ranges from 400-500mm /year. ▪ Temperature ranges from 15^{0}C to over 28^{0}C. ▪ Soils are shallow and less fertile. ▪ High evaporation. ▪ Altitude is around 1500m ASL.	Mukogodo West, Mukogodo East, Segera, Sosian	Ranching Beef farming Sisal farming

Source: County Government of Laikipia, 2021

From table 4-3 above, it is apparent that robust rain-fed agricultural potential for food crops, dairy and fish farming lies in Laikipia West and Nyahururu sub-counties. These areas act as the County's primary food baskets – ensuring food security and nutrition to both rural and urban populations. Laikipia Central and East sub-counties have a medium potential for rain-fed food crop farming and rely on irrigation farming to boost production. They however have high a potential for forage grasses and legumes (hay, sorghum, millet) and beef farming.

The entire Laikipia North Sub- County lies within the lower midlands zone, whereby eco-climatic conditions do not favor food crop farming. Nevertheless, the dry weather conditions create extensive rangelands that support pastoralism, ranching and wildlife conservation. Sisal farming, which thrives well in ASAL areas with low rainfall, is done at a small scale along boundaries to demarcate land parcels.

Map 4-16: Laikipia County Agro-Ecological Zones



Source: KREIS, 2022 (Modified from Laikipia County GIS lab data)

Specific physiographic characteristics within each agro-ecological zone give rise to ecosystems of varying land use potential that support species of plants, animals and human activities. Rivers draining from Mt. Kenya and the Aberdare Ranges in the upper highland sub-humid zone create riverine and wetlands ecosystems along their flow; while dry weather conditions and volcanic soils in the lower midlands form the rangeland ecosystem.

Laikipia County has four main ecosystems – rangelands, forests, rivers and wetlands; which collectively form the ecologically sensitive areas that call for biodiversity conservation measures in a bid to achieve sustainable development. These ecosystems support a diversity of species of plants and animals and sustain local communities through the range of services they offer.

The County's biodiversity components are detailed in the sections below; outlining their current status, the ecosystem services they offer, the threats they face, and the actions being taken to protect them by community associations, conservation institutions and both levels of government.

4.7 Vegetation

Laikipia is in a transition zone for three major vegetation types; 'Somalia-Masai semi-desert grassland and shrubland', 'Somalia-Masai *acacia Commiphora spp* bushland and thicket', and 'Afromontane undifferentiated montane vegetation' (Butynski & de Jong, 2021). The vegetation varies from agricultural croplands; through different categories of leafy bushlands and grasslands; to an upland dry forest and plantation forests; and various swamps and marshy wetlands (Lane, 2005).

Plate 4-7: Natural Vegetation

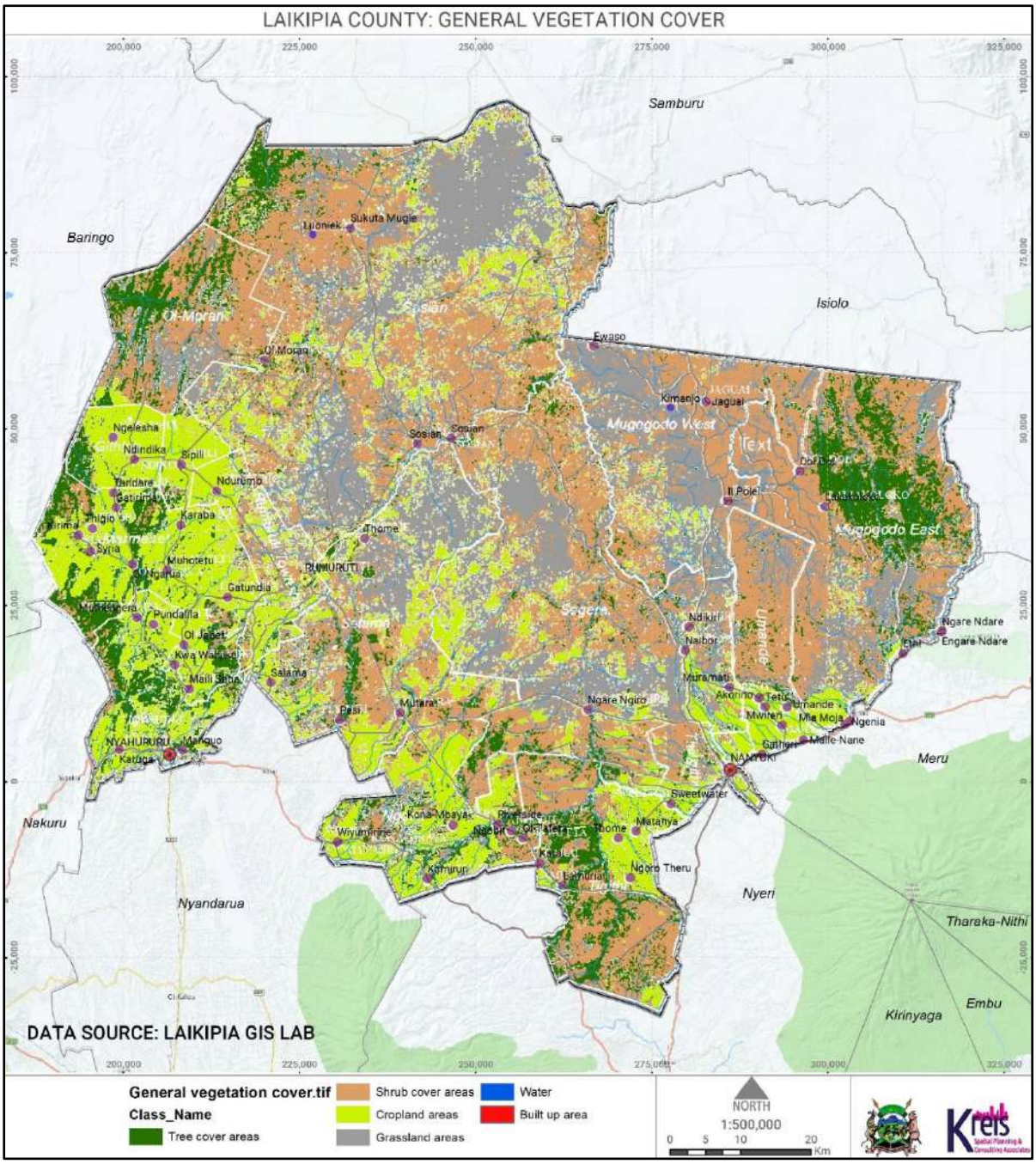
Source: KREIS, 2022

Most of the vegetation cover is determined by the precipitation levels, soil type within the specific areas and the degree of human modification. Map 4-17 below, shows the disaggregated spatial distribution of vegetation cover within the County.

4.7.1 Croplands

The County's agricultural landscape is characterized by small-scale subsistence farms, large-scale farms and vast ranches used for commercial beef farming. Croplands are lands that are primarily under food crop farming of maize, beans, Irish potatoes, wheat, sorghum, sunflower and coffee among others. Irrigation farming within wetlands and along riverine ecosystems has increased cropland vegetation in the County. The main threats facing this type of vegetation are prolonged drought, delays in the onset of seasonal rainfall, land use changes and associated uneconomical subdivisions, and population pressure that results in over-exploitation of land and declining soil fertility.

Map 4-17: Distribution of Vegetation in Laikipia County



Source: KREIS, 2022 (Modified from Laikipia County GIS lab data)

Kenya's Agricultural Farm Forestry Rules of 2009 advocate for high-value fruit tree species within agricultural lands as an approach to increase the national tree cover. In line with these rules, the County Government of Laikipia has put efforts towards up-scaling the level of fruit production – avocado, orange, mango, bananas and pineapples. These will form a significant percentage of the cropland vegetation in the County.

4.7.2 Rangelands

Rangelands dominate the landscape of ASAL regions in Kenya which are characterized by dry weather conditions; with low annual rainfall and high mean temperature. In Laikipia County, rangelands are areas covered by shrublands and grasslands – encompassing Mukogodo East and West, Sosian, Segera, Umande, Tigithi, Salama, and Ol Moran wards. Rangeland ecosystems provide continuous wilderness habitats that support diverse wildlife species within the public, community and privately-owned ranches.

These ecosystems have shaped the nature and productivity of the County's free-range pastoral livelihoods and culture. Incentivized and irrigated crop farming would also do very well in most of these parts given that the land is highly arable but lacks enough rainfall.

Plate 4-8: Livestock Rearing and Wildlife Conservation in Laikipia's Rangelands

Source: KREIS, 2022

4.7.2.1 Shrublands

This type of vegetation is dominated by an assortment of leafy bushes, thickets, short trees, and species of grasses. The shrublands in the County have scattered shrubs of the Acacia genus and species of Aloe, Euphorbia, Carissa edulis, Rhus natalensis, and Euclea divinorum among others (Muasya, Young, & Okebiro, 1994).

Plate 4-9: Scrubs and Scattered Vegetation in Laikipia's Shrublands

Source: KREIS, 2022

4.7.2.2 Grasslands

In grassland ecosystems, grass cover exceeds shrubs and woody plants; forming the main distinction between grasslands and shrublands. They have the appearance of an open savannah landscape dominated by perennial grasses and acacia trees, which are depended upon by the pastoral Maasai community in Laikipia North, and numerous wildlife species including ungulate herbivores such as elephants, zebras, gazelles, impalas, rhinoceros and buffalo; as well as predators like lions, wild dogs and hyenas (Riginos, Porensky, Veblen, & Odadi, 2012).

4.7.3 Threats facing Rangeland Ecosystems

Ecosystem support functions of rangelands in the County are insistently threatened by climate change (prolonged dry spells), overstocking and overgrazing by the pastoralists, land use changes and subdivisions, charcoal burning, increasing demand for speculative land, the proliferation of invasive plant species, competition for forage between livestock and wildlife, and encroachment by human activities. Degradation of rangelands jeopardizes pastoralists' livelihoods and sustainable wildlife conservation.

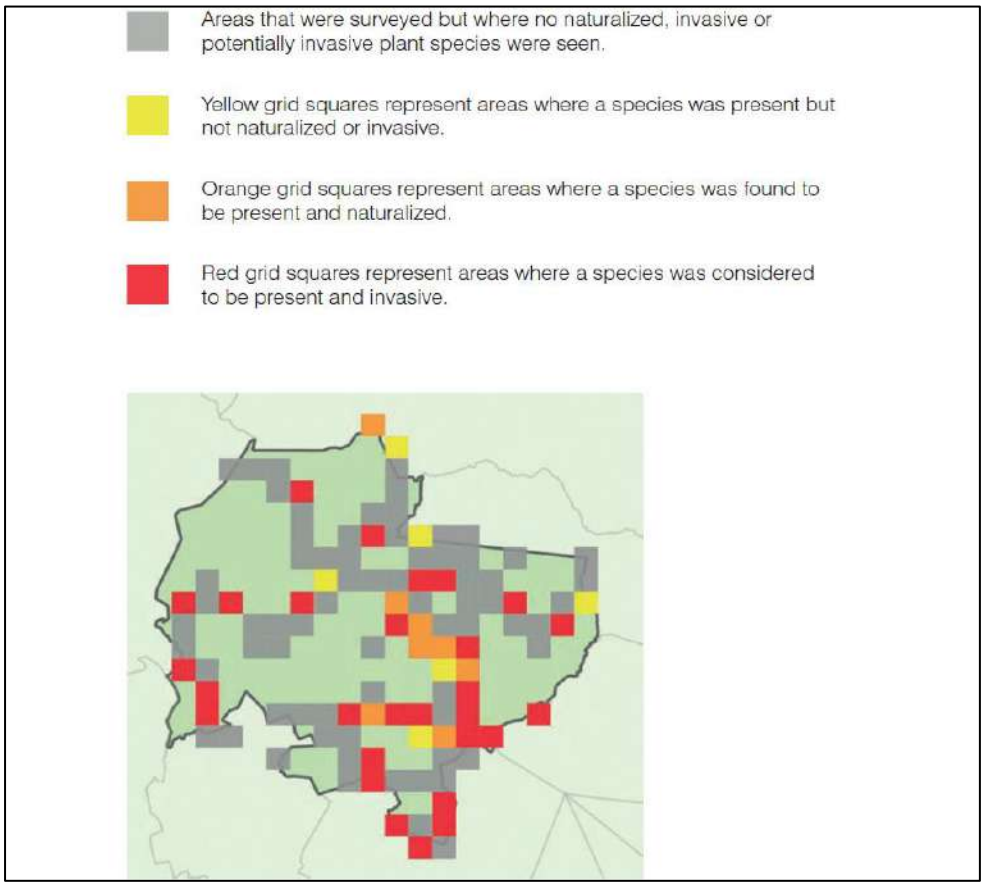
This County Spatial Plan underpins the need to promote sustainable management of rangeland ecosystems; through policy and institutional frameworks, and the involvement of community associations in safeguarding biodiversity in the County.

4.7.3.1 Invasive Plant Species

These are alien plant species that have been introduced by people, either intentionally or unintentionally, outside of their natural range or outside of their natural dispersal potential, and are destructive to the environment in which they have established and proliferated (UNEP 2002; Witt & Luke 2017). They can either be neutralized – if they reproduce consistently and have established self-sustaining populations that are not yet widespread; or invasive – if they produce large numbers of reproductive offspring that are spread over substantial distances (Richardson et al. 2000; Blackburn et al. 2011).

A preliminary assessment of naturalized, invasive and potentially invasive alien plant species in Laikipia County was done in 2020 by Witt, Nunda, Beale and Kriticos; to determine their presence and distribution in the County. They relied on established 1/16-degree grid squares of 11x11km, in which they undertook broad-scale roadside surveys recording all naturalized and invasive species as shown in figure 4-5 below.

Figure 4-4: Survey Grids of Naturalized and Invasive Species in Laikipia County



Source: Witt, 2017; Witt, Nunda, Beale, & Kriticos, 2020

During the surveys, one hundred and forty-five alien plant species were seen and recorded. The disaggregation of dominant growth forms of all alien species in Laikipia considered to be naturalized, invasive or potentially invasive is shown in table 4-4 below.

Table 4-4: Growth Forms of Alien Species in Laikipia County

Growth Form	All Alien Species	Naturalized	Invasive
Woody tree or shrub	59	19	10
Herb	31	20	13
Climber	16	3	2
Succulent herb	16	9	4
Succulent tree or shrub	14	13	7
Aquatic	4	2	1
Woody tree or shrub or climber	4	1	0
Fern	1	0	0

Source: Witt, Nunda, Beale, & Kriticos, 2020

Widespread species in the County included *Opuntia stricta*, *Opuntia ficus-indica*, and *Austrocylindropuntia subulate* among other succulents in the semi-arid regions in Laikipia North and East (Witt, 2017). These succulents might have been intentionally introduced for ornamental purposes or may have invaded the region through natural dispersal from surrounding areas.

Plate 4-10: Invasive Species of the Genus Opuntia in Laikipia North

Source: KREIS, 2022

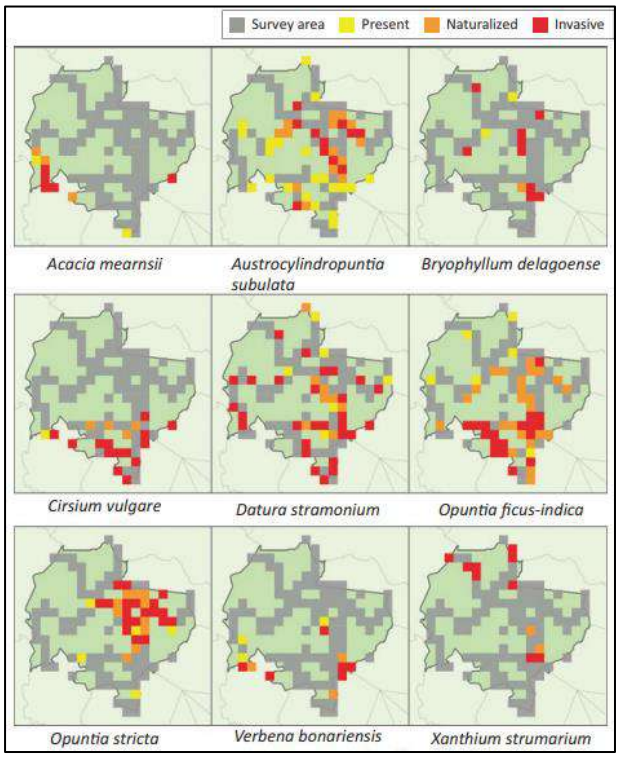
In the higher rainfall areas to the west and southwest parts of the County, introduced trees such as black wattle (*Acacia mearnsii*) and Australian blackwood (*Acacia melanoxylon*), and shrubs/climbers such as Mauritius thorn (*Caesalpinia decapetala)* and yellow Cestrum (*Cestrum aurantiacum)* are invasive species. Introduced plants, such as famine weed (*Parthenium hysterophorus*) and 'mathenge' (*Prosopis juliflora)* have the potential to become problematic in Laikipia, unless eradicated or controlled (Witt, 2017).

Prosopis juliflora is native to rangelands in Mexico and South America (central and northern regions), where it grows as a shrub or small tree. It is colloquially known in Kenya by its Swahili name 'Mathenge' or more popularly as 'Mesquite' which is a general term used for many of the 44 species belonging to the genus Prosopis. It is characterized by rapid growth rates, extensive dispersal capabilities, large and rapid reproductive output and broad environmental tolerance. It displaces natural vegetation, reduces biodiversity and competes for resources with crops and livestock – therefore reducing the productivity of agricultural systems. It can also cause physical harm to humans, livestock and wildlife. It results in the loss of infested land since land uses are displaced contributing to general pressures on land and conflicts related to land and land use.

Prosopis pods are a valuable source of carbohydrates, sugar and proteins for livestock and, occasionally human populations during dry seasons. Although the plant provides all those benefits, if left unmanaged, it has direct and indirect negative impacts on man and the environment which include colonization and devastation of critical grazing land, farmlands and rangelands; blockage of roads, footpaths, human settlements, irrigation canals, river banks, water points and other habitats; death of livestock due to indigestion; and occasional tooth decay (due to high sugar content of pods) among others. The potential ecological disaster caused by Prosopis invasion on the wetland ecosystems is demonstrated by the near impossible complete eradication of the species once established.

The distribution of the nine most prevalent invasive species is shown in figure 4-5 below.

Figure 4-5: Distribution of the Most Widespread Invasive Species in Laikipia County



Source: Witt, 2017; Witt, Nunda, Beale, & Kriticos, 2020

Invasive plant species are a significant threat to the sustainability of biodiversity and the productivity of rangelands because they reduce the abundance of native plant species by displacing valuable forage species, and diminish their carrying capacities to support wildlife and livestock – while some of the invasive species are forage. Poor management of the community ranches in Laikipia North makes them highly susceptible to invasive plant species, as compared to private ranches. There is also the risk of high management costs as conservancies attempt to restore lost biodiversity and degraded rangelands.

Plate 4-11: Opuntia Species in Laikipia's Rangelands

Source: KREIS, 2022

Therefore, effective management strategies for invasive plant species need to consider activities related to prevention, Early Detection and Rapid Response (EDRR), and control measures. As most of the invasive plants present in Laikipia County were intentionally introduced, the most effective approach is to prevent further introductions. The ERDD method entails a surveillance strategy for the early detection of invasive species and taking immediate eradication actions before they become abundant and widespread. In cases where surveillance does not result in the early detection of a potentially problematic plant, and eradication is no longer feasible, it is essential to adopt control strategies (Witt, 2017).

Control methods take the form of cultural, physical (manual or mechanical), chemical or biological means as discussed below:

a. Cultural Control

This includes the use of grazing, flooding, and fire to reduce unwanted weed abundance in a particular area. However, grazing can further promote the spread of some species

of invasive plants, flooding can be difficult to implement, while fire can stimulate seed germination of some plant species and as a result contribute to their densification.

b. Physical Control

Manual control involves the direct removal of the above-ground parts of a plant with an axe or a slasher, or the uprooting of plants using a hoe, a garden fork or a spade, or by hand pulling. Mechanical control on the other hand involves the use of machinery or equipment (e.g. bulldozers or tractors). It is often used to remove dense stands of woody weeds, but can be expensive and may leave soils bare and so susceptible to erosion—which also promotes the proliferation of *opuntia spp* when dumped in erosion gulleys.

c. Chemical Control

This entails the use of herbicides, applied alone or in combination with other methods to alter the metabolic processes of a plant by either killing it or suppressing its growth. However, herbicides are expensive to purchase, may require repeated application, heavy concentration may cause environmental damage and affect non-target species, and succulent plants like *Opuntia spp* may have high resistance to chemicals.

d. Biological Control

This involves the use of host-specific natural pathogens, mites and insects to control invasive species. Biological control agents include gall-forming insects, defoliators (e.g. leaf-feeding beetles), leaf miners, sap-suckers such as insects and mites with piercing and sucking mouthparts, flower-bud and seed feeders, stem-borers, crown-feeders, root-feeders, and disease-causing microorganisms such as bacteria, viruses, fungi and nematodes.

The most cost-effective way of controlling invasive plants is by combining two or more of the methods, for example, manual control applied in conjunction with chemical and biological control. This is commonly known as Integrated Pest Management (IPM) and should be implemented whenever possible to reduce costs and improve the efficacy of control across any landscape (Witt, Nunda, Beale, & Kriticos, 2020).

Rehabilitation is done after control and it involves activities which convert a cleared piece of land into land suitable for use in terms of habitation or cultivation. The objective of restoration is to restore land cleared of invasive species to a situation where it matches, closely as possible, the original condition. Cleared areas are very prone to re-invasion, while restored areas are more resistant to invasive plant regeneration and invasion. In areas where degradation is not severe, restoration can be achieved through Accelerated Natural Regeneration (ANR), which relies largely on activities or actions that facilitate natural processes, such as seed germination of native species from the soil seed bank. (FORRU, 2006).

4.7.3.2 Control of Invasive Species in Laikipia's Rangelands

Laikipia County has been at the forefront of engaging different stakeholders working on projects related to the management of invasive species. Through the Department of Environment and Natural Resources, the County Government leads a stakeholder Forum that comprises representation from 13 group ranches across Laikipia North, NEMA and existing conservation institutions such as Laikipia Wildlife Forum, Northern Rangelands Trust and World Vision International-Kenya. This Forum monitors the implementation of different management projects aimed at curbing the spread of *Opuntia stricta* and *Acacia reficiens* – through mechanical removal, biological control, mapping of the extent of invasive species and increasing awareness via sensitization of local communities on the negative effects of invasive species. The County Government is working towards the development of a County Environmental Action Plan and a County Invasive Species Policy. The Forum is in the process of producing a documentary that will provide information on the efforts made in managing the invasive species in the County (LWF, 2020).

4.7.4 Forests

Forest ecosystems support a diversity of plant and animal species. They provide important ecological services – water catchment areas, sequestration and storage of Carbon (IV) Oxide, regulation of nutrient cycling, and control of soil erosion and floods (MEWNR, 2015). They are a source of fuelwood, building materials, medicinal herbs and non-wood products.

Laikipia County is covered by gazetted forests with an area totalling about 580km^2, and one non-gazetted forest. Mukogodo Dry Forest reserve in Laikipia North Subcounty covers a landmass of 30,189 Ha – with a mosaic of closed forest, open forest and open grasslands. It is the main gazetted natural forest in the County and is located on the leeward side of Mount Kenya. It is inhabited by an indigenous and minority community known as the Yaaku. The forest and surrounding group ranches are located in the core of Kenya's Laikipia–Samburu ecosystem; which hosts the country's second-highest density of wildlife – including the highest concentration of elephants outside of protected areas. The forest reserve hosts a critical corridor of regular elephant movement between the Samburu lowlands, the Laikipia plateau and Mt. Kenya Forest Reserve (LWF, 2020). Other forests in the County include Rumuruti, Marmanet, Ol Arabel, and Lariak in Laikipia West.

The gazetted forest boundaries accumulate to a total of about 6.8% of the County. Out of this, the actual forest cover is 2.9% which is far below the agreed standard forest cover of 10% for the country. Vegetation cover in the gazetted forests is distributed as follows:

a. Indigenous - 40,749.6Ha
b. Plantation - 1,944.3Ha
c. Grassland - 3,459.7Ha
d. Bush land - 8,378.2Ha

The main forest products are timber, fencing poles, wood fuel, pastures and natural herbs. Forests have contributed significantly to supporting natural wildlife habitats, beekeeping, carbon sequestration, research on flora & fauna and eco-tourism.

4.7.5 Threats facing Forest Ecosystems

Factors that have led to the depletion of the forest cover in the County include:

Table 4-5: Threats on Forests in Laikipia County

Region	Forest Name	Type of Threat	Remarks
Laikipia West	Lariak	Bush clearing for cultivation, human settlements, and logging.	This is due to the increase in human population.
	Marmanet	Logging for construction materials i.e. fencing poles.	
	Rumuruti	Logging for construction materials.	

Region	Forest Name	Type of Threat	Remarks
		Livestock grazing and wildlife destruction.	
Laikipia East	Burguret Woodlands	Harvesting of construction materials and forest clearing for cultivation.	Forest woodland is along the Burguret river and has little control and protection from KFS, WRA
Laikipia North	Mukogodo	Logging for fencing poles, construction materials and firewood, charcoal burning, livestock and wildlife grazing.	A major threat is around Dol-Dol town and Lariakorok.

Source: CGL, 2021

The Laikipia County Forest Conservation Strategy (2013-2030) proposes various strategic objectives and actions for medium and long-term management of forests in the County. Some of the specific activities provided for in the Strategy include:

a. Mainstreaming participatory forest management in County plans and strategies.
b. Making an inventory of existing forests, i.e. gazetted and on-farm forests.
c. Undertaking assessments of all gazetted and on-farm forests to determine their status and existing management systems.
d. Undertaking surveys and mapping of the gazetted forests.
e. Developing and implementing indigenous forest conservation plans in the gazetted forests, private and community lands.
f. Encouraging participatory forest management through education, training and awareness-raising strategies.
g. Establishing three forestry research centers, one in each constituency.

In line with the aforementioned County Strategy, and as a measure to achieve the national threshold on forestation, the County Government of Laikipia in collaboration with National Government agencies like KFS will have to incentivize tree planting. This particularly should be done within the private ranches and farmlands in a bid to reach at least 10% forest cover throughout the County. Economically, the County Government of Laikipia is already reaping monetary benefits from compensation attributed to carbon sequestration. On a forecast, the County would be set to generate more revenue from carbon credits if the forest cover is increased.

4.8 Wetlands

A wetland is a natural or man-made area of land that is permanently or occasionally water logged; that plays a key role in river flow stabilization, acts as a water source, and aids in flood control. According to an assessment that was carried out by CETRAD to determine the ecological status and socio-economic dynamics of wetlands within the Upper Ewaso Ng'iro River Basin, the County has five main swamps that are located downstream along the rivers and streams draining from Mt. Kenya and the Aberdare Ranges. These wetlands include Ewaso Narok, Pesi, Marura, Moyok and Mutara swamps. Generally, wetland ecosystems provide countless economic, social, recreational, scientific, and cultural values; act as ecological habitats for various flora and fauna; and perform crucial ecological functions through carbon storage, water purification and waste detoxification (Thenya, et al., 2011).

4.8.1 Threats facing Wetland Ecosystems

Wetland ecosystems in Laikipia County support a myriad of socio-economic activities of forest users, pastoralists and farmers and maintain a great number of wildlife (Laikipia Wildlife Forum, KENWEB & NMK, 2014). However, the sustainability of these wetlands is threatened by immense pressure from increasing agricultural activities, wide catchment population and rapid land use changes, all of which have significantly reduced their ecological and life support functions, as detailed in the discussion below:

a. Ewaso Narok Swamp

This wetland is located in Rumuruti, along the Ewaso Narok River. Its catchment areas are Nyandarua Ranges, Lake Ol Bolossat and the numerous tributaries feeding into River Ewaso Narok. It is a biodiversity hotspot that acts as a sponge, absorbing excess surface run-off and thereby ensuring flood control/regulation and soil erosion prevention. Vegetation within the wetland absorbs nutrients and toxic substances from inflowing water, thus improving the water quality flowing downstream.

Human settlements are very close to the wetland boundary, with majority of the settlements located inside the swamp. Since it is government land, the people living within the wetland do not have legal documents of land ownership. Crop farming is practised and the main crops grown are maize, beans and tomatoes. There is also horticulture farming for commercial purposes using flooding and furrow irrigation

systems. Free-range rearing of cattle and sheep is also done; with the wetland acting as a grazing field during dry periods.

Reduced water volume in the wetland has led to increased resource conflicts, specifically between humans and wildlife in the area. Encroachment of farming activities along the riparian reserve and abstraction of water for irrigation has reduced the volume of water flowing in River Ewaso Narok, which is the lifeline of communities in Laikipia, Isiolo and Wajir counties downstream. This has in turn affected the ecological balance of Ewaso Narok Swamp. Other challenges include flooding/water logging since most of the farming takes place in the wetland.

NEMA envisions strengthening governance structures to promote sustainable use of wetlands from local to national levels. Section 42 of EMCA 1999 mandates the Cabinet Secretary for Environment and Forestry, upon recommendation from NEMA, to impose conservation orders and restrictions on wetlands. Therefore, the national government has published a notice of intent to declare Ewaso Narok Swamp in Rumuruti Municipality as a protected area following threats of massive degradation (Ministry of Environment and Forestry, 2022). Other proposed conservation measures on the swamp include the construction of a dam to store excess surface runoff/overflow for use during dry spells; discouraging cutting down of trees for charcoal while encouraging afforestation; the use of improved irrigation systems which utilize less water such as sprinklers and drips; regulating encroachment of human settlements; and reducing over-grazing in the swamp.

b. Pesi Swamp

The people living within this wetland do not have legal documents on land ownership since it is government land. Most of the farming activities are under irrigation with the main types of irrigation being flooding and furrow systems. The main crops grown are maize, beans and tomatoes. Crop damage by wildlife is common, especially from elephants, monkeys and birds. The main source of household water is River Pesi whose flow discharge has been decreasing.

The main challenges facing the wetland are human-wildlife conflicts, increased human settlements and cultivation, and flooding during rainy periods. Proposed conservation

measures on the swamp include the construction of a dam along Kanyagia and Pesi rivers to hold surface runoff and thus reduce over-utilization of the swamp; the use of improved irrigation systems which utilize less water; and improving security in the area to reduce cattle rustling and hence increase livestock rearing.

c. Moyok Swamp

There is subsistence farming within the wetland, with the three main types of crops being maize, beans and cabbages. All the farming activities are under irrigation using flooding and open canal systems. However, elephants, monkeys, hares, porcupines and wild pigs cause damage to crops in the area. The swamp acts as a livestock watering point, as well as a grazing area for the local population and pastoral communities from the Laikipia North region.

The wetland experiences challenges such as increasing human settlements; water inadequacy especially during dry seasons; and upstream-downstream conflicts especially due to the abstraction of water for irrigation. Proposed conservation measures for the wetland include protection of the riparian area by uprooting eucalyptus trees in the swamp and planting tree species that consume less water; encouraging the use of alternative sources of water such as roof harvesting of rainwater, digging of small pans and wells; and construction of a dam to store excess surface runoff.

d. Mutara Swamp

Crop farming is practised within the wetland owing to water availability and fertile soils. The three main crops grown are maize, beans and cabbages. Majority of the households practice flooding and open canal irrigation in their farms. Elephants and wild pigs cause major damage to crops; however, electric fences have been erected to limit these human-wildlife conflicts. There is also free-range rearing of cattle and sheep.

Challenges facing the wetland are water conflicts between upstream-downstream users, water shortage during dry periods, encroachment from increasing human settlements, upstream-downstream conflicts arising from the unregulated abstraction of water for irrigation, and human-wildlife conflicts. Proposed conservation measures for the wetland include the use of improved irrigation systems such as drip tapes, sprinklers and greenhouses; planting of indigenous trees along the river bank; construction of a

dam and boreholes to be used by farmers in the drier regions for irrigation, livestock and domestic purposes; and increasing security measures on cattle rustling to encourage more livestock keeping.

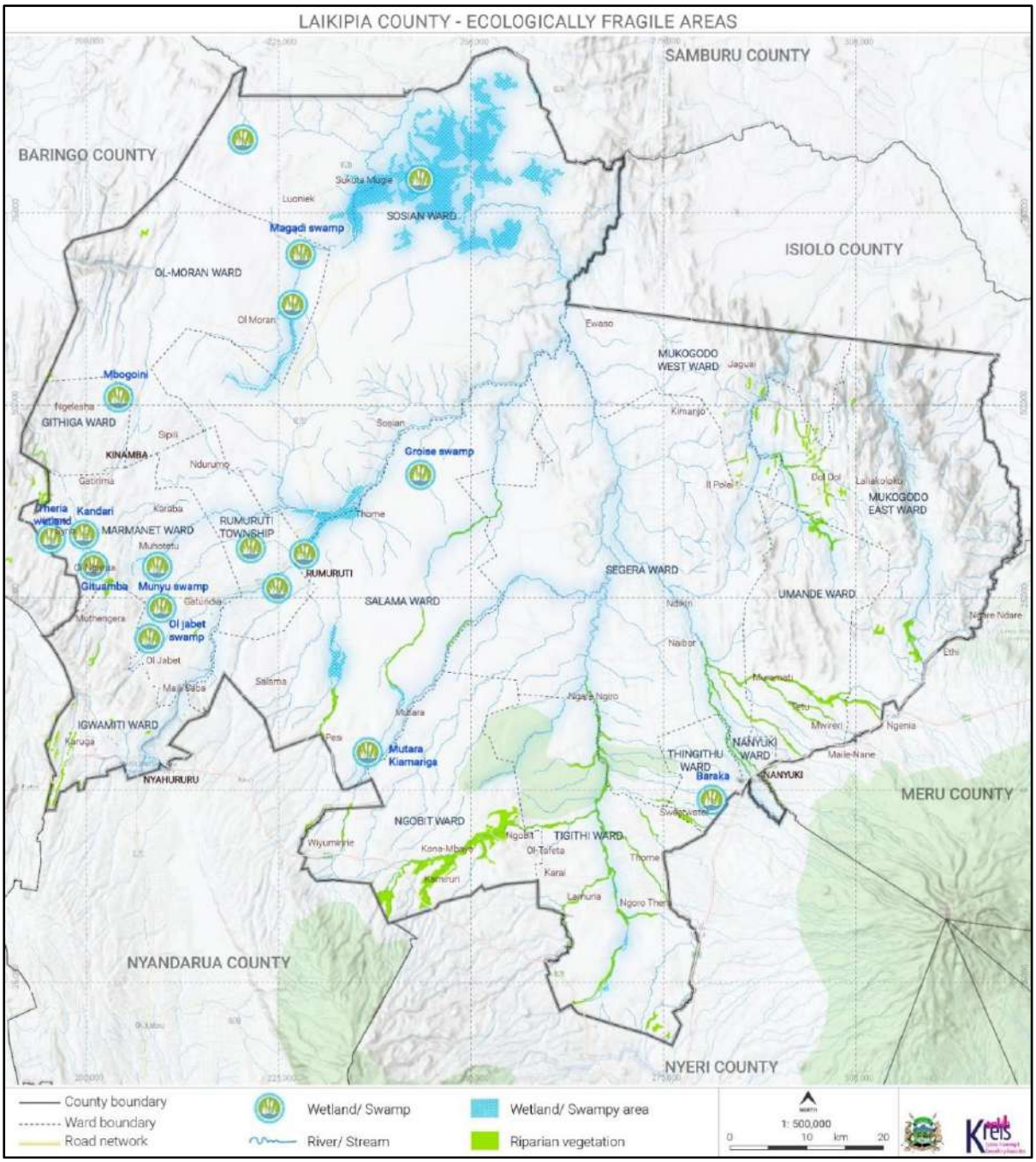
e. Marura Swamp

Water availability and fertile soils are the main factors that support rain-fed crop farming, with the main crops grown being maize, beans and Irish potatoes. Irrigation farming is also practised within the wetland using flooding and furrow systems. Human-wildlife conflicts arise from elephants, birds and gazelles causing damage to crops. There is also free-range rearing of cattle and sheep. The population sources water from River Marura, which is facing challenges of declining river flow discharge, pollution and siltation.

The wetland ecosystem experiences challenges such as increasing human settlements; clearing of reeds and other indigenous vegetation for irrigation, cultivation and settlement; land subdivision to accommodate more farms; conflicts between upstream and downstream users over water consumption; and the presence of planted blue gum trees which consume a lot of water. Proposed conservation measures for the wetland include uprooting all the blue gum trees in the swamp, reducing water intakes upstream along the Burguret River which feeds the wetland; and construction of a dam and boreholes to be used by farmers in the drier regions for irrigation, domestic and livestock use.

As shown in map 4-18 below, other wetlands in the County include Ol Jabet, Magadi, Mbogoini, Munyu, Kandari, Theria, Groise, Baraka, Matigithi, Lotorumbuzi, Suguroi, Mathanji, Kandutura among others. Most of these very crucial wetland ecosystems need to be protected from encroachment and further harm as a way of sustaining their significance and ecological services for future generations.

Map 4-18: Critically Fragile Ecosystems in Laikipia County



Source: KREIS, 2022

4.9 Wildlife

4.9.1 Wildlife Ecosystems and Habitats

Approximately 35% of Kenya's wildlife population is found within protected terrestrial areas (national parks, reserves, sanctuaries and forest reserves) as well as in protected marine parks and reserves (Ministry of Tourism and Wildlife, 2018). The largest proportion (65%) of the wildlife population is found outside protected areas, within human-modified landscapes in private and community-owned conservancies (Kenya Wildlife Conservancies Association, 2016).

Laikipia County lies within the Greater Ewaso Ecosystem which covers most of the central part of the northern Kenya rangelands. According to Ojwang', et al. (2017), this ecosystem falls within the administrative entities of seven counties – Laikipia, Samburu, Isiolo, Meru, Marsabit, Wajir, and Garissa. The landscape occupies a vast area, extending from the slopes of Mt. Kenya and the Aberdare Ranges in the southwest to the arid lowlands east of the Lake Turkana shoreline and Mt. Marsabit in the north. It is dominated by seven broad land use categories, namely:

a. Livestock production within the pastoral community ranches.
b. Mixed livestock production and wildlife conservation practised on large private ranches, especially in Laikipia County.
c. Wildlife conservation restricted to protected areas such as the Laikipia, Marsabit and Meru National Parks.
d. Wildlife conservation restricted to private properties such as the Ol Jogi, Lewa, and Solio conservancies.
e. Conservation forestry restricted to forest reserves, although patches of dry forest occur across the landscape such as the Mukogodo Dry Forest.
f. Agro-forestry, mostly in high-rainfall areas outside protected areas.
g. Crop farming, dairy keeping, fish farming and horticulture within the high-rainfall areas.

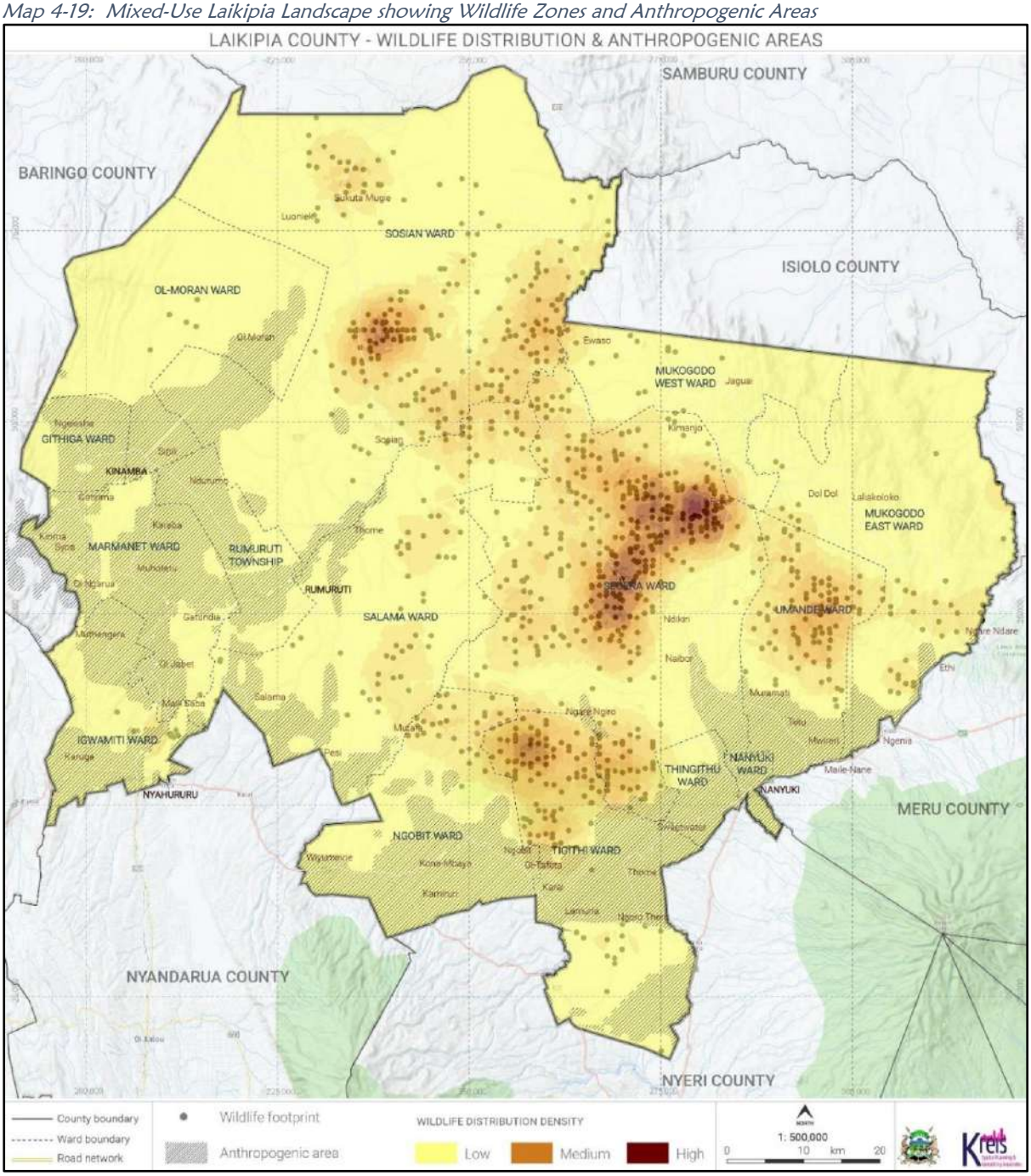
The Greater Ewaso Ecosystem provides for wildlife migratory corridors and dispersal areas between the slopes of Mount Kenya, protected national parks, Laikipia conservancies, and Isiolo, Meru and Samburu counties. However, increased human pressure emanating from population increase, expansion of settlements, agricultural activities, land fragmentation and infrastructure projects incessantly threaten the sustainability of wildlife migratory corridors and dispersal areas.

Laikipia County owes its wildlife diversity to its wealth of ecosystems comprising vast rangelands, forest reserves, and wetlands which provide natural habitats for the wildlife population. Wildlife conservation in the County is mainly done within the protected private ranches which have assumed a conservation-compatible land use. While a majority of these private ranches practice mixed-use activities between commercial

livestock production and wildlife-based enterprises, approximately twenty-nine ranches are managed in favor of wildlife conservation (Graham, 2012).

As shown in map 4-19 below, the county's landscape in the western, southwestern and eastern parts have been modified by anthropogenic activities; and are characterized by human settlements and small-holder farms in which subsistence rain-fed agriculture is the principal economic activity and irrigation farming is done along rivers and within wetlands.

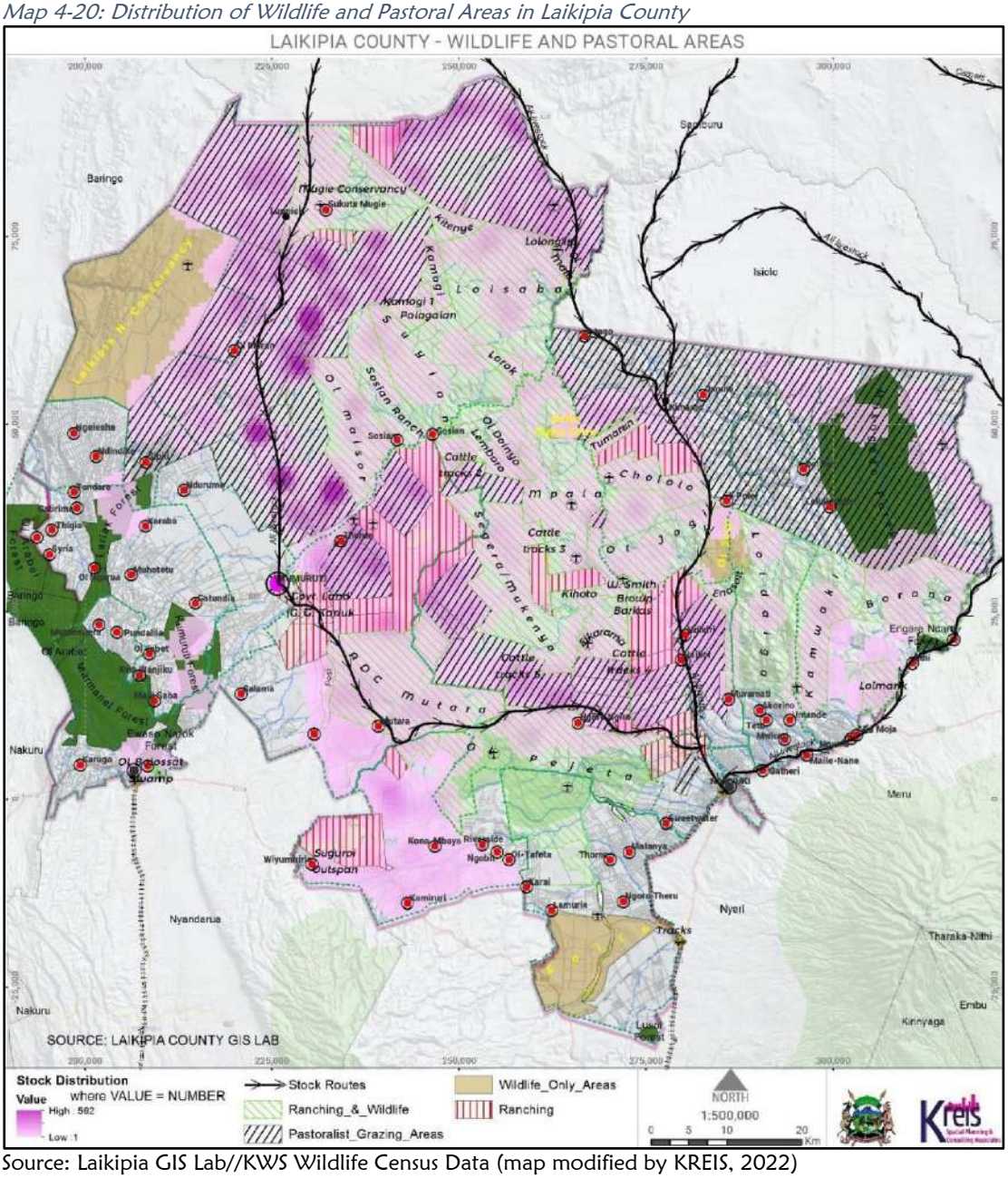
Map 4-19: Mixed-Use Laikipia Landscape showing Wildlife Zones and Anthropogenic Areas



Source: Laikipia GIS Lab//KWS Wildlife Census Data (map modified by KREIS, 2022)

From map 4-19, it can be deduced that about two-thirds of the County is dedicated to wildlife conservation and livestock ranching, with about a third of the County being actively utilized for anthropogenic activities – majorly human settlements and farming. A huge percentage of the land under wildlife conservation and livestock ranching is mostly dry with characteristically harsh weather and a possible explanation for the distribution disparity is represented in map 4-20 below.

Map 4-20: Distribution of Wildlife and Pastoral Areas in Laikipia County



Source: Laikipia GIS Lab//KWS Wildlife Census Data (map modified by KREIS, 2022)

While conservancies such as Solio and Ol Jogi are primarily used for wildlife conservation, a majority of the other conservancies engage in mixed-use wildlife conservation, livestock ranching and farming.

4.9.2 Wildlife Population and Distribution

The Greater Ewaso Ecosystem holds a large population of wildlife of diverse species; concentrated mainly within the Laikipia-Samburu-Isiolo-Meru landscapes as shown in table 4-7 below. The Laikipia plateau supports abundant and diverse wildlife populations, including more than 70,000 large herbivores, of which nearly half are Burchell's zebras – a subspecies of plain zebras. It provides habitat to the critically endangered black rhinos, as well as the endangered Grevy's zebras and more than 3,000 elephants. Other ungulate wildlife species include Jackson's hartebeest, reticulated giraffe, buffalo, and various antelopes – impala, kudu, oryx, eland, kongoni, Grant's and Thompson's gazelles. Carnivores include lions, leopards, striped hyenas, and wild dogs (Ojwang', et al., 2017).

Additionally, more than 540 species of birds, 87 species of amphibians and reptiles, and almost 1,000 species of invertebrates have been recorded in Laikipia (Graham, 2012).

Table 4-6: Wildlife Population in Laikipia-Samburu Ecosystem

Wildlife Species	Population Estimate (No.)	
	2012	2021
Black Rhino	-	
Elephants	3,493	
Grevy's Zebra	1,206	
Burchell's Zebra	24,887	
Giraffe	1.105	
Buffalo	2,071	
Grant's Gazelle	1,940	
Thompson's Gazelle	687	
Impala	2,144	

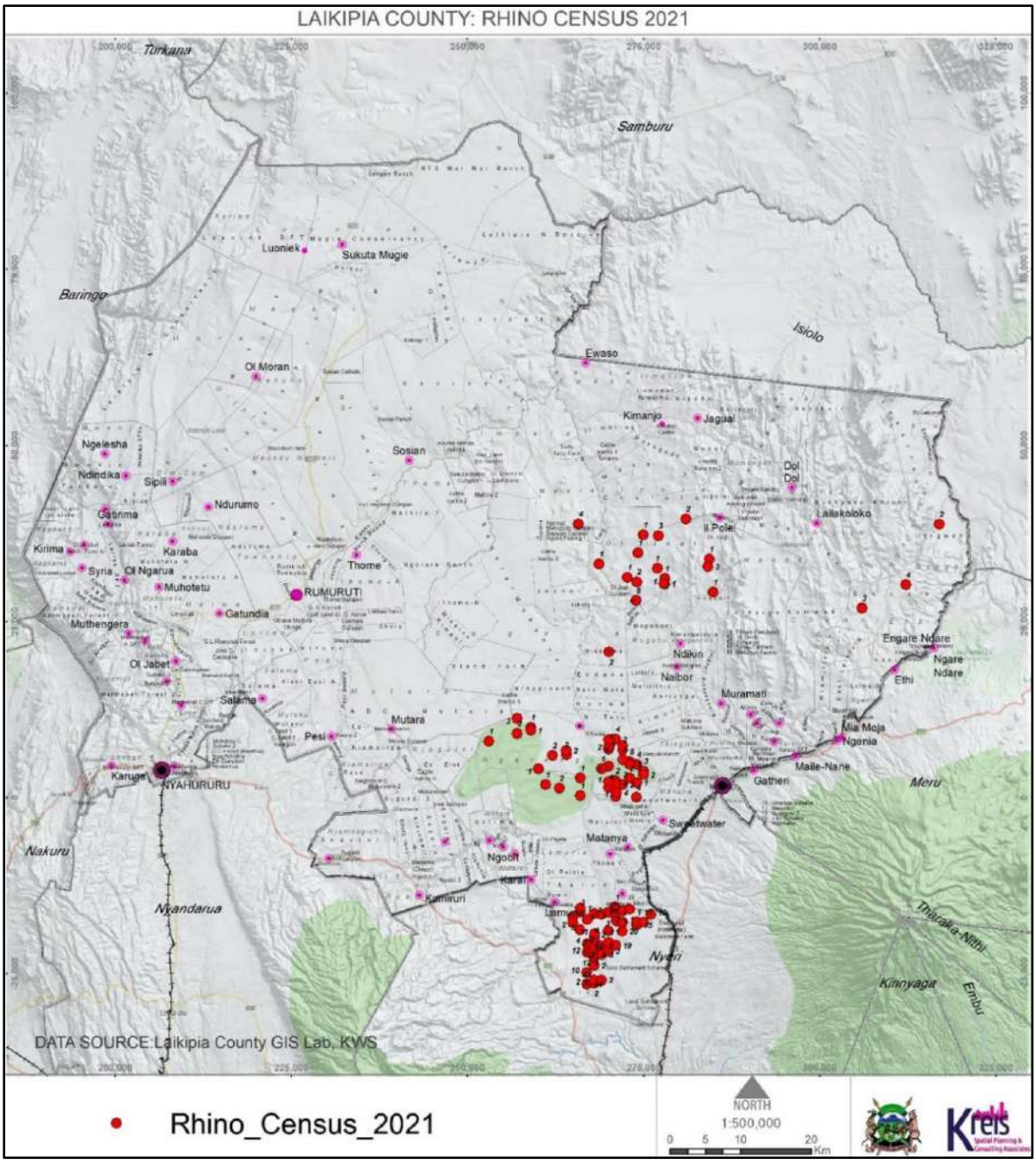
Source: Kinnaird, O'Brien, & Ojwang', 2012//KWS Wildlife Census Data

These wildlife species make tourism a major economic activity in the County, and an exemplary hotspot for a conservancy-based approach in which people, livestock and wildlife co-exist in mutual benefit. Conservancies create buffers around natural landscapes and maintain connectivity between several ecosystems; and are therefore fundamental to the resilience of wildlife populations in the country (Damiana, et al., 2020). A detailed analysis of the current population, threats and conservation measures of each wildlife species is given in the description below:

Black Rhino

In the 1970s, the population of Kenya's Black Rhinos declined due to poaching and limited natural habitats for expanding the rhino range. Laikipia conservancies (Lewa-Borana, Ol Pejeta, Ol Jogi, Il Ngwesi and Solio) hold the most significant black rhino population in Kenya as can be seen in map 4-21 below.

Map 4-21: Black Rhino Distribution and Count, 2021



Source: KWS Wildlife Census Data (map modified by KREIS, 2022)

To safeguard the sustainability of this critically endangered species, the Black Rhino Action Plan (2017-2021) was developed with a long-term vision to have a meta-population of at least 2,000 black rhinos of the eastern African subspecies (Diceros bicornis michaeli) in Kenya, and in suitable habitats as a global heritage (KWS, 2017). The Action Plan's overall goal was to achieve a meta-population of 830 Black Rhinos by the end of 2021, a goal which was successfully surpassed by having 853 Black Rhinos as of 31st December 2020 (National Wildlife Census Report, 2021).

The Kenya Wildlife Service works with conservancies to enhance biological monitoring and management of each rhino population and their respective habitats to optimize the net growth of the national population, expand their range and maintain genetic diversity (KWS, 2017). In 2013, twenty-one Black Rhinos were introduced into the 32,000 acres Borana Conservancy which borders the Lewa Wildlife Conservancy. The fence separating these two conservancies was dropped, forming one continuous Lewa-Borana landscape in which rhinos roam freely within the 92,000 acres of natural wilderness. Conservation measures in this landscape include wildlife spatial monitoring and reporting, fostering collaboration with other conservation partners, rangelands management, livestock husbandry and promoting coexistence with neighboring communities to mitigate human-wildlife conflicts (Borana Conservancy Newsletter, 2021).

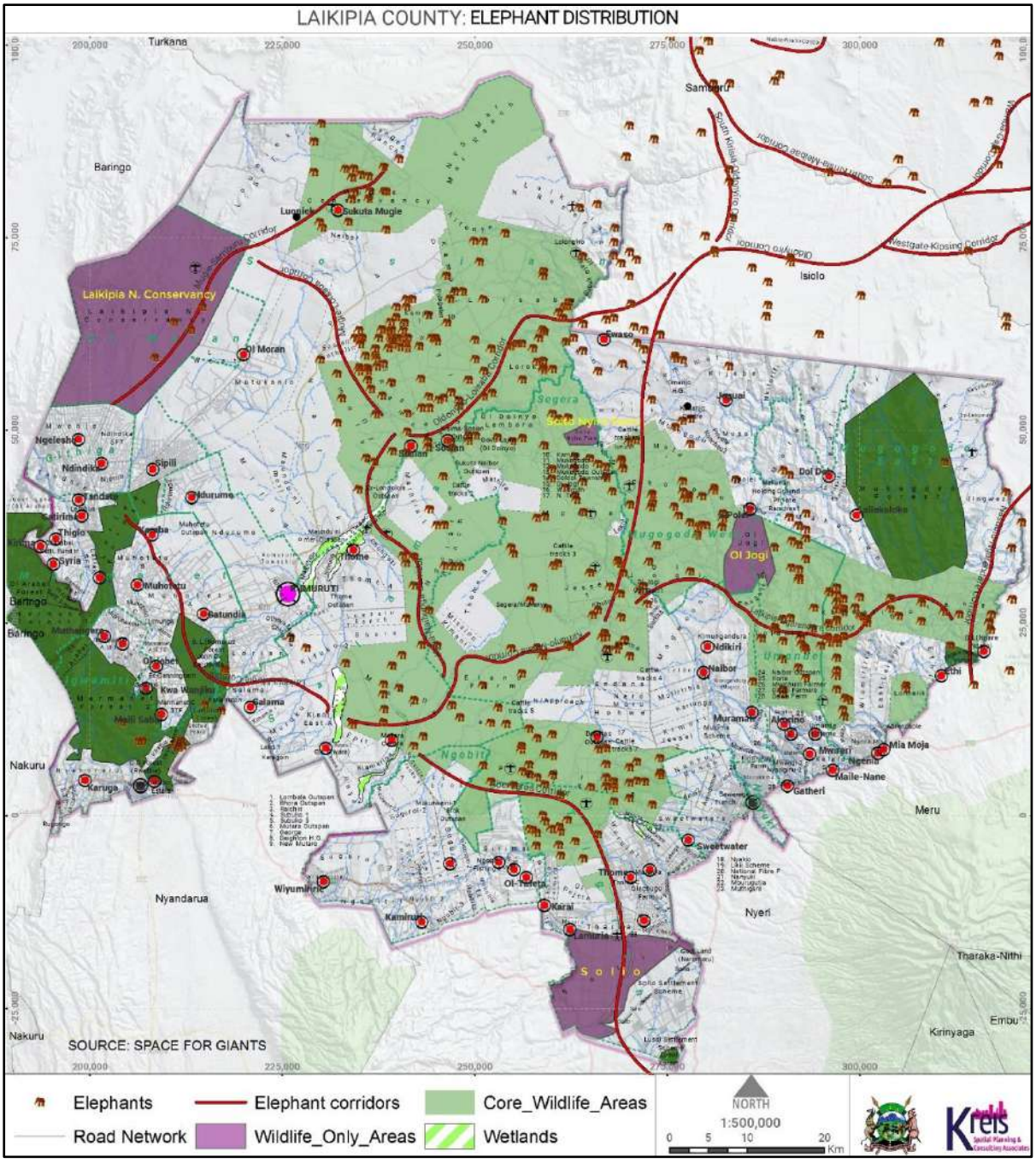
Other conservation agencies within the Laikipia Landscape that collaborate towards the conservation of Black Rhinos include Save the Rhino International, KWS, Laikipia Wildlife Forum, Kenya Wildlife Conservancies Association, the Association of Private and Community Land Rhino Sanctuaries, Il Ngwesi Community Conservancy, the Ngare Ndare Forest Trust, and the Laikipia Conservancies Association. Due to risks associated with the conservation of the rhinos, two conservancies - Mugie and Mukutan Conservancy ceased being rhino sanctuaries. Laikipia conservancies also hold 72% of Kenya's white rhino population (Kenya Wildlife Conservancies Association, 2016).

Elephant

The Greater Ewaso Ecosystem has the second largest elephant population in the country, after the southern Kenya rangeland ecosystems of Tsavo-Mkomazi, Amboseli,

and the Mara (Ojwang', et al., 2017). The Laikipia-Samburu-Isiolo landscape has dual-purpose elephant movement corridors and dispersal areas as shown in map 4-22 below.

Map 4-22: Elephant Distribution and Movement, 2021



Source: KWS Wildlife Census Data (map modified by KREIS, 2022)

These corridors are very important in the sustenance of both wildlife and livestock, as they allow seamless movement through the extensive ranches and conservancies that are privately owned. The wetter areas on the slopes of Mt. Kenya, Rumuruti Forest, and Mukogodo Dry Forest are significant elephant grazing areas during the dry periods.

Plate 4-12: Elephants Grazing in the Laikipia Rangelands

Source: KREIS, 2022

Just like other wildlife species, elephants are migratory in nature. However, over time the elephants' routes have changed due to human encroachment on the migratory corridors, as well as obstructive infrastructure in the form of roads and restrictive fences – which interferes with their dispersal areas and forces them to explore new paths. For instance, in Laikipia West, the Lariak-Rumuruti elephant corridor is completely blocked by human settlements and agricultural activities. The Solio – Mt. Kenya passage is partially blocked, while the Aberdares – Mt. Kenya Forest passage has been completely blocked by the Nairobi-Nanyuki Highway, and by land subdivisions (Ojwang', et al., 2017).

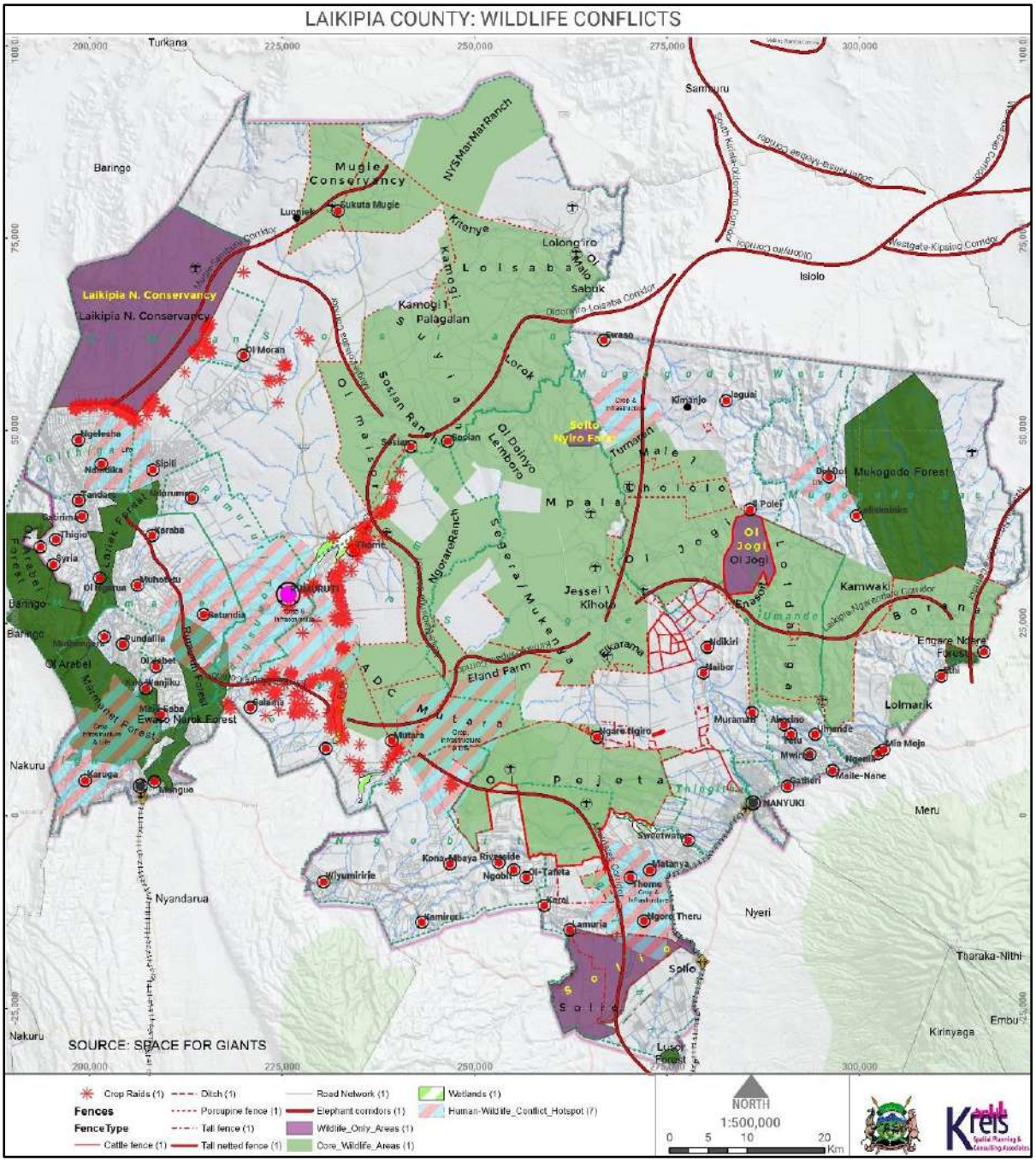
Plate 4-13: Restrictive Low-hanging Fencing and Obstructive Infrastructure on a Movement Corridor

Source: KREIS, 2022

Human-wildlife conflicts arise due to increased human settlements and cultivation across elephants' migratory corridors, coupled with common pasturelands and water

sources that are shared by small-holder farmers, pastoralists' communities and wildlife populations. Such cases are frequent in Umande, Tigithi and Ngobit wards in Laikipia East; Rumuruti, Igwamiti, Salama, and Marmanet wards in Laikipia West; Mukogodo East, Mukogodo West, and Segera wards in Laikipia North.

Map 4-23: Human-Wildlife Conflict Areas

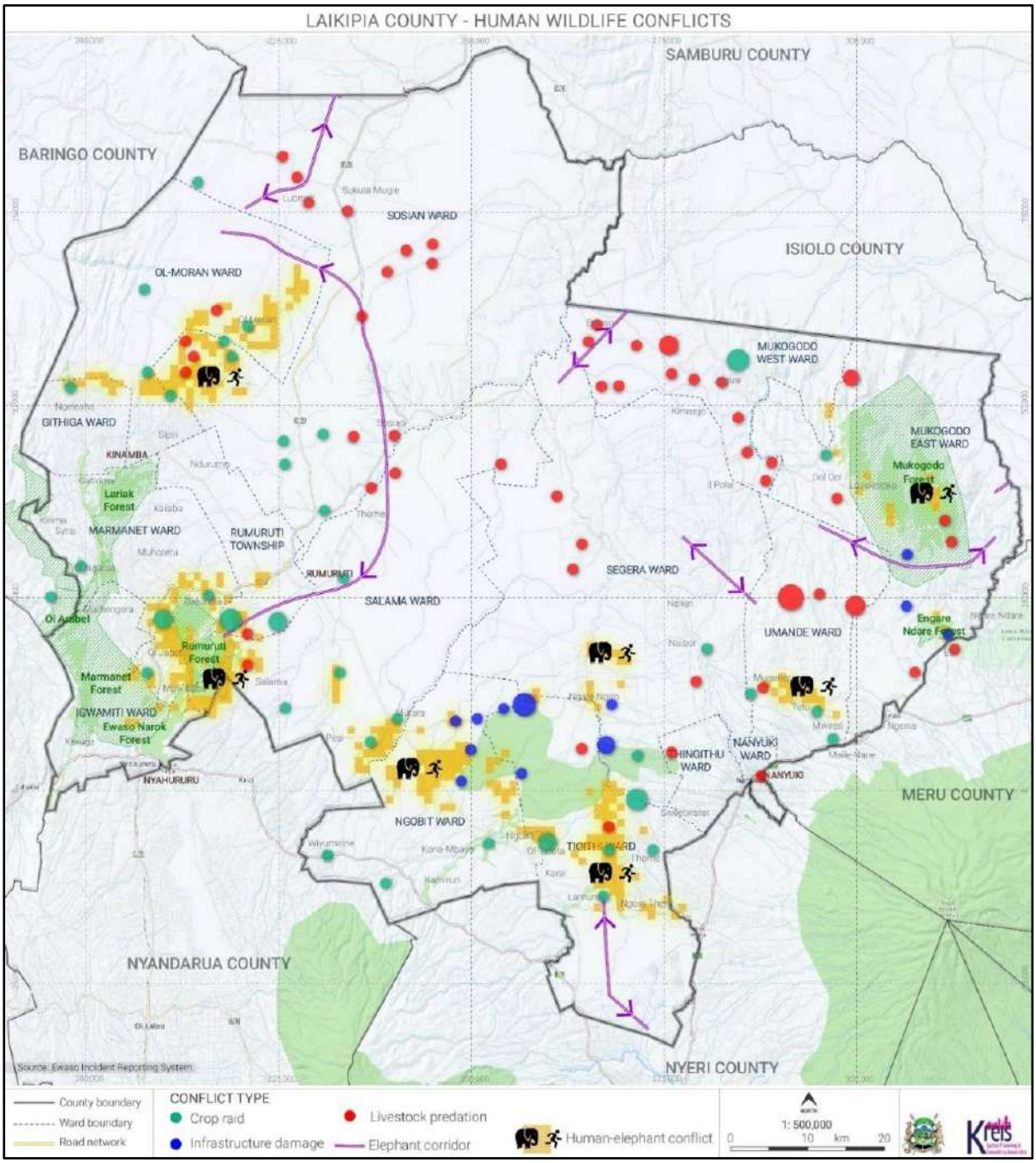


Source: KREIS, 2022 (modified from Laikipia County GIS Lab Data)

Forms of human-wildlife conflicts include crop damage, livestock predation especially in the shared pasturelands, and damage to infrastructure as shown in map 4-24 below.

Some of the specific conflict hotspot areas are around Rumuruti Forest, the Mukutan Conservancy, along Ngare Narok River, and in Doldol Town.

Map 4-24: Human-Wildlife Conflicts by Type



Source: KREIS, 2022 (modified from Ewaso Incident Reporting System)

While the erection of fences across migratory corridors restricts the free movement and dispersal of elephants, it is an approach towards the mitigation of human-wildlife conflicts. Some of the ongoing measures to mitigate human-wildlife conflicts in Laikipia County include erecting a 10-km electric fence around Doldol Township by the County

Government of Laikipia; fencing project for Naibunga Conservancy by the Northern Rangeland Trust; trench work along Mukutan Conservancy by the Kenya Defense Forces; and fencing of Solio Community Conservancy by the County Government of Laikipia.

Plate 4-14: Fencing around Marmanet Forest; Low Restrictive Stone Fencing


Source: KREIS, 2022

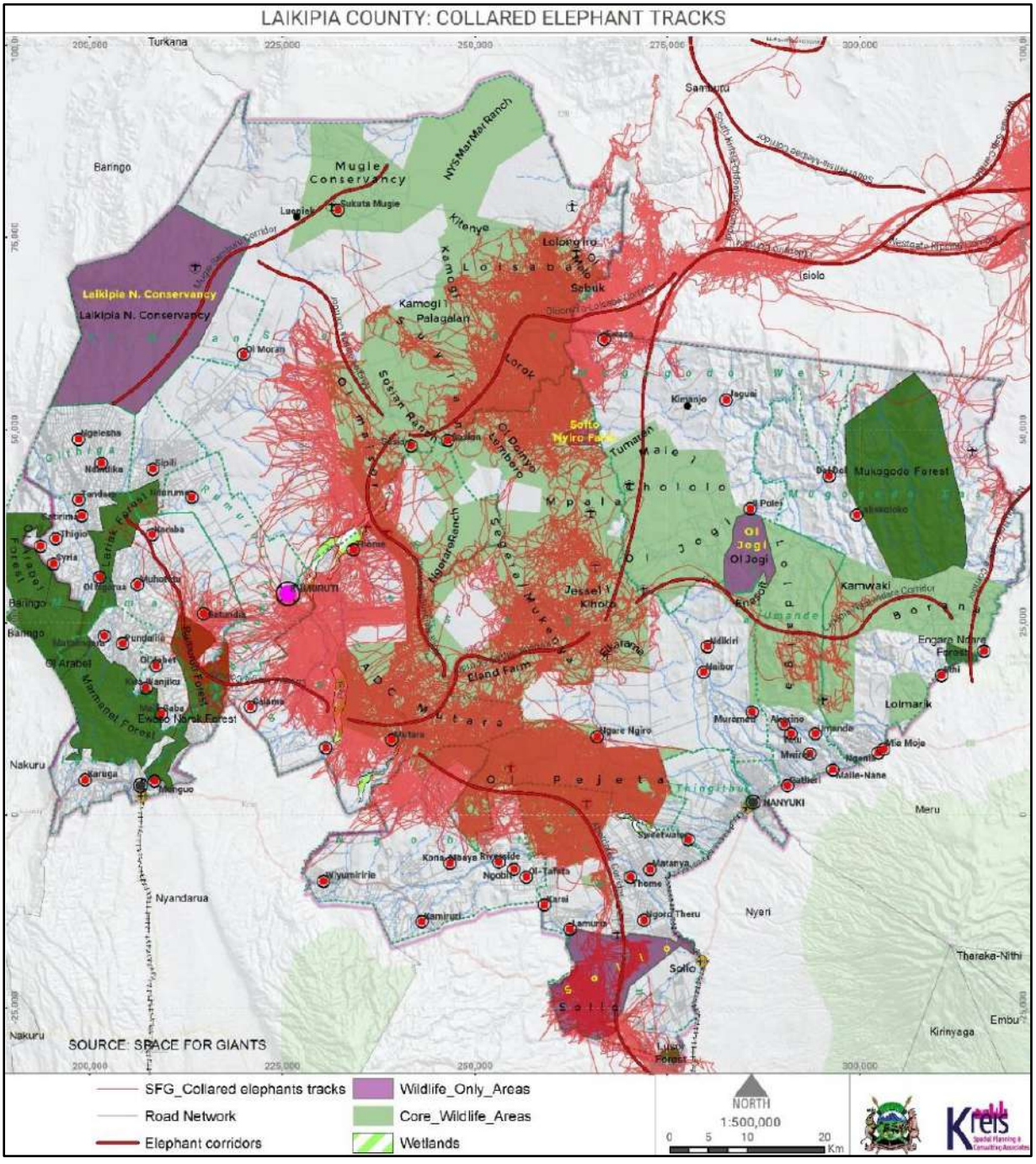
Plate 4-15: Fencing Projects


Source: KREIS, 2022

Other conservation measures by the County Government, conservation agencies, private conservancies and community ranches are creating healthy rangelands through reseeding programmes, and control of invasive plant species that threaten the

sustainability and carrying capacity of shrublands. 'Save the Elephants' and 'Space for Giants' are organizations that have partnered with KWS and the Northern Rangelands Trust among other conservation institutions to secure the future of elephants through research, GPS Radio Tracking and monitoring of illegal killings within the northern rangelands landscape. Over the period, collared elephant movements and dispersal areas have been recorded as seen in map 4-25 below.

Map 4-25: Collared Elephant Movement Corridors and Dispersal Areas



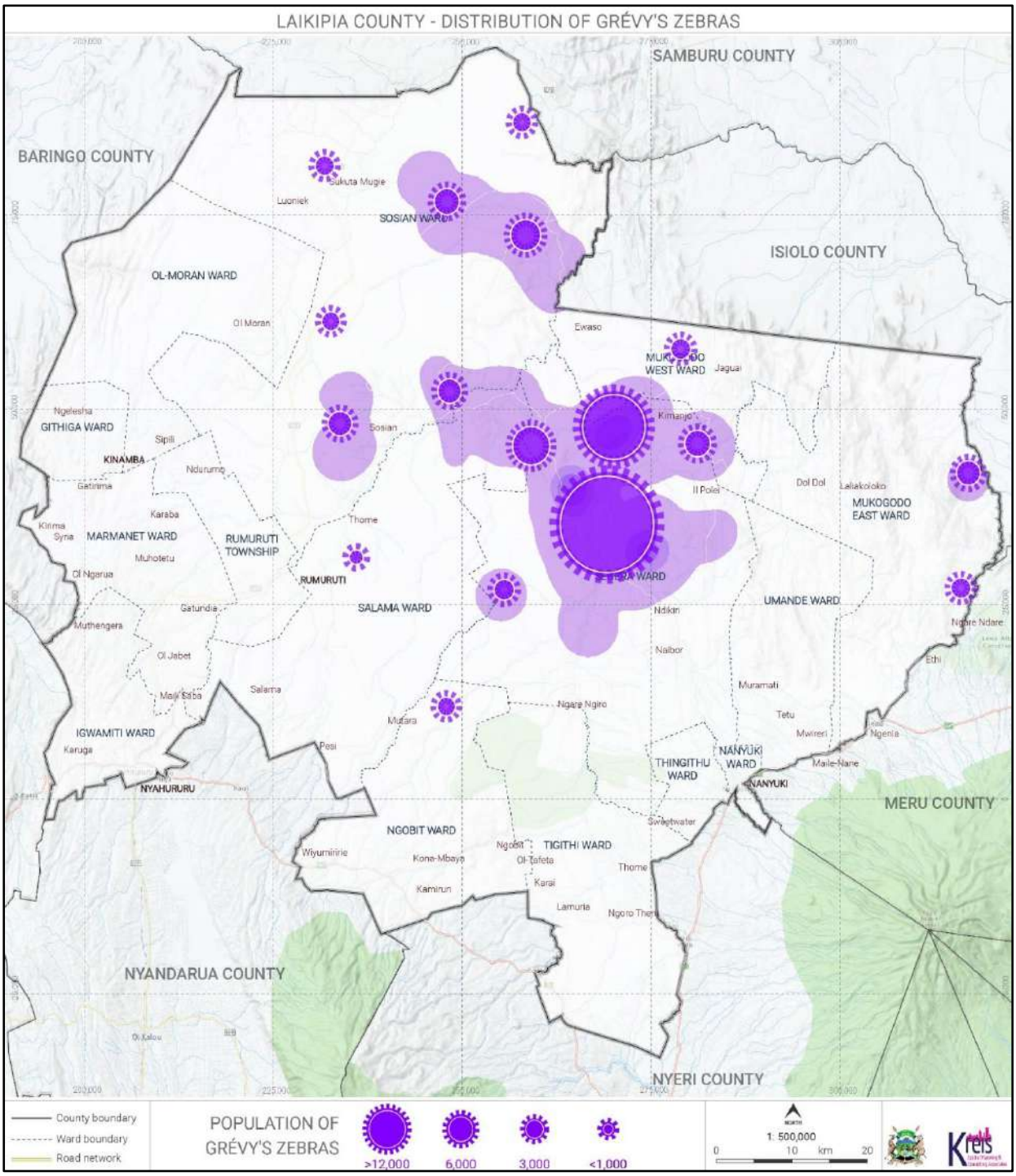
Source: KWS Wildlife Census Data (map modified by KREIS, 2022)

Grevy's Zebra

Kenya hosts 90% of the global population of the endangered Grevy's zebra (KWS, 2012). The Greater Ewaso Ecosystem has been an important habitat and dispersal area for these Grevy's zebras since the 1980s, especially within the landscapes of the Laikipia-Samburu-Isiolo-Marsabit landscape. In particular, the County's Grevy's zebra population is spread over several conservancies, including Ol Jogi, Pyramid, Mpala, Mugie, Ole Naishu, Loisaba, and Ol Pejeta. Monitoring of individually identified Grevy's zebras has shown that they move from Laikipia County to the Samburu National Reserve and onward to the Meibae Conservancy in Samburu County (Ojwang', et al., 2017).

However, there has been a decline in their population stemming from habitat loss, degradation and climate change. Intrusive infrastructure, such as the LAPSSET corridor, is a potential threat to the sustainability of the Grevy's zebra since it is planned to cut through their core landscape areas in Isiolo and Samburu counties. In the Laikipia rangelands, Grevy's zebra and plains zebra ranges overlap, with the densities of plains zebra outnumbering that of Grevy's zebra. The outcome is increased cases of hybridization where Grevy's zebra males' mate with plains zebra females, producing a hybrid species of zebra.

Map 4-26: Grevy's Zebra Distribution and Count, 2021



Source: KWS Wildlife Census Data (map modified by KREIS, 2022)

The Grevy's Zebra Trust, an organization dedicated to the conservation of Grevy's Zebras in Kenya, works in partnership with communities within the northern rangelands to monitor Grevy's zebras through citizen science, as well as to co-design site-specific and tailored solutions to threats facing the species. Among its conservation actions is the advocacy of rerouting the LAPSSET's oil pipeline that was to traverse through a core

breeding area for Grevy's zebra in Meibae Conservancy in Samburu County; which was achieved through robust consultation with the oil pipeline consortium (Grevy's Zebra Trust, 2022). Some of its other conservation measures include:

a. Creating Healthy Rangelands

Since the loss of grazing habitat is the major threat to Grevy's zebra, the Trust uses the healthy rangeland conservation measure of regenerative grazing. This involves employing traditional livestock management methods used by pastoralists to address the root cause of land degradation and directly improve the health of soils and plants. Actions include setting aside areas for dry and wet season grazing and allowing recovery time for grasses, clearing invasive species and reseeding bare land (Grevy's Zebra Trust, 2022).

b. Supplementary Feeding

In 2017 and 2019 when the country experienced prolonged drought conditions, the Trust with support from the National Grevy's Zebra Technical Committee undertook an intensive program of supplementary feeding and water point management in all regions of their operation. Using hay monitors employed from the local communities, they established various feeding sites in areas where forage was severely depleted through which they provided fresh hay at regular intervals (Grevy's Zebra Trust, 2022).

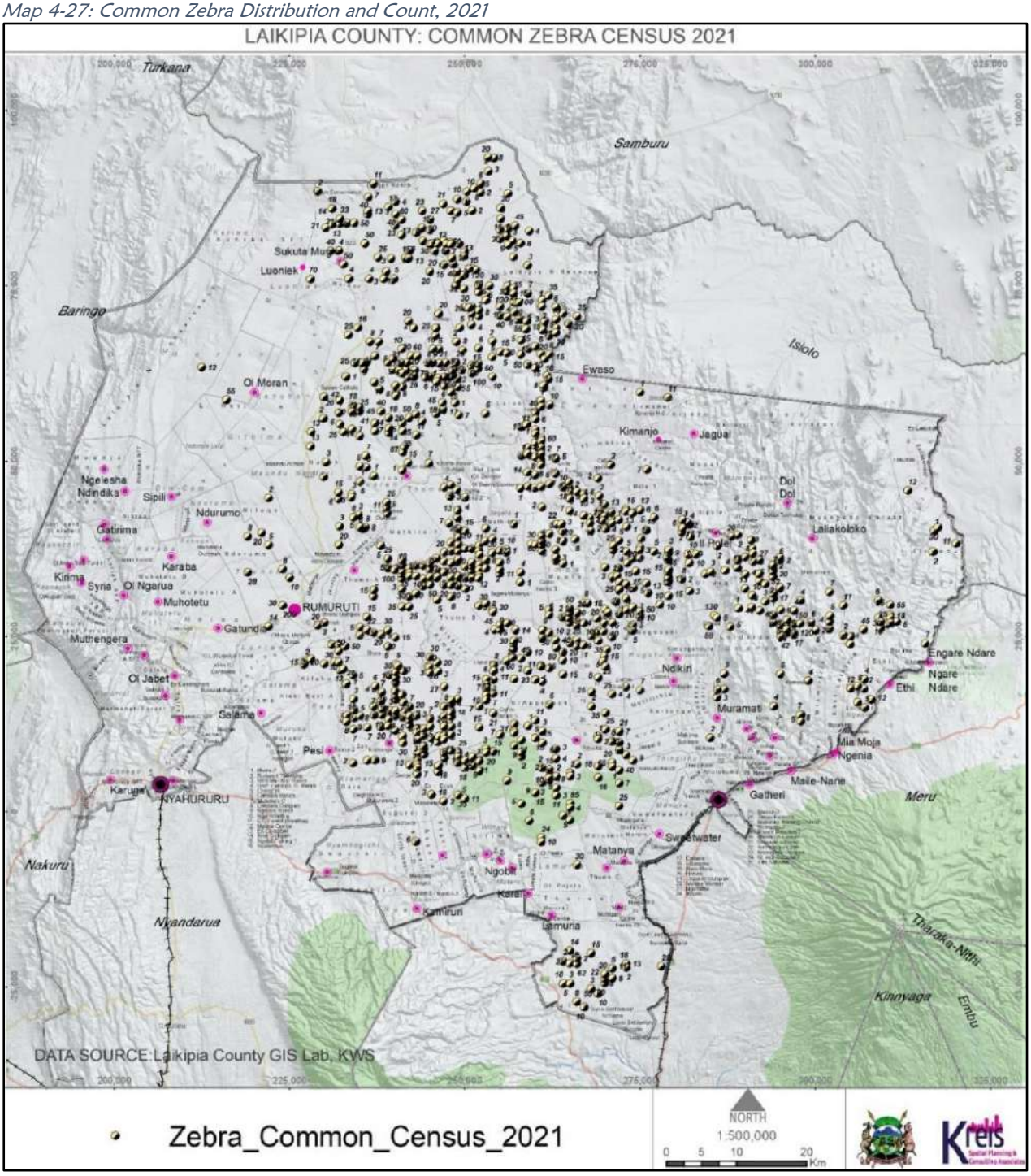
c. Water Point Management

Water point management was done in two ways – construction of dedicated wildlife water points and digging wells in dry-season river beds for exclusive wildlife use. They engaged water monitors from the local communities to manage these water points daily. These intervention measures significantly improved the chances of survival for Grevy's zebra populations in areas where they were particularly vulnerable during the dry season and helped other wildlife species in the area as well (Grevy's Zebra Trust, 2022).

Burchell's Zebra

Also referred to as plains zebras, they are the most numerous wildlife species in Laikipia County. The greater Ewaso ecosystem holds Kenya's second largest population of Burchell's Zebras mostly outside protected areas within the Laikipia-Samburu-Isiolo landscape, after the Mara ecosystem in the southern rangelands (Ojwang', et al., 2017).

Map 4-27: Common Zebra Distribution and Count, 2021

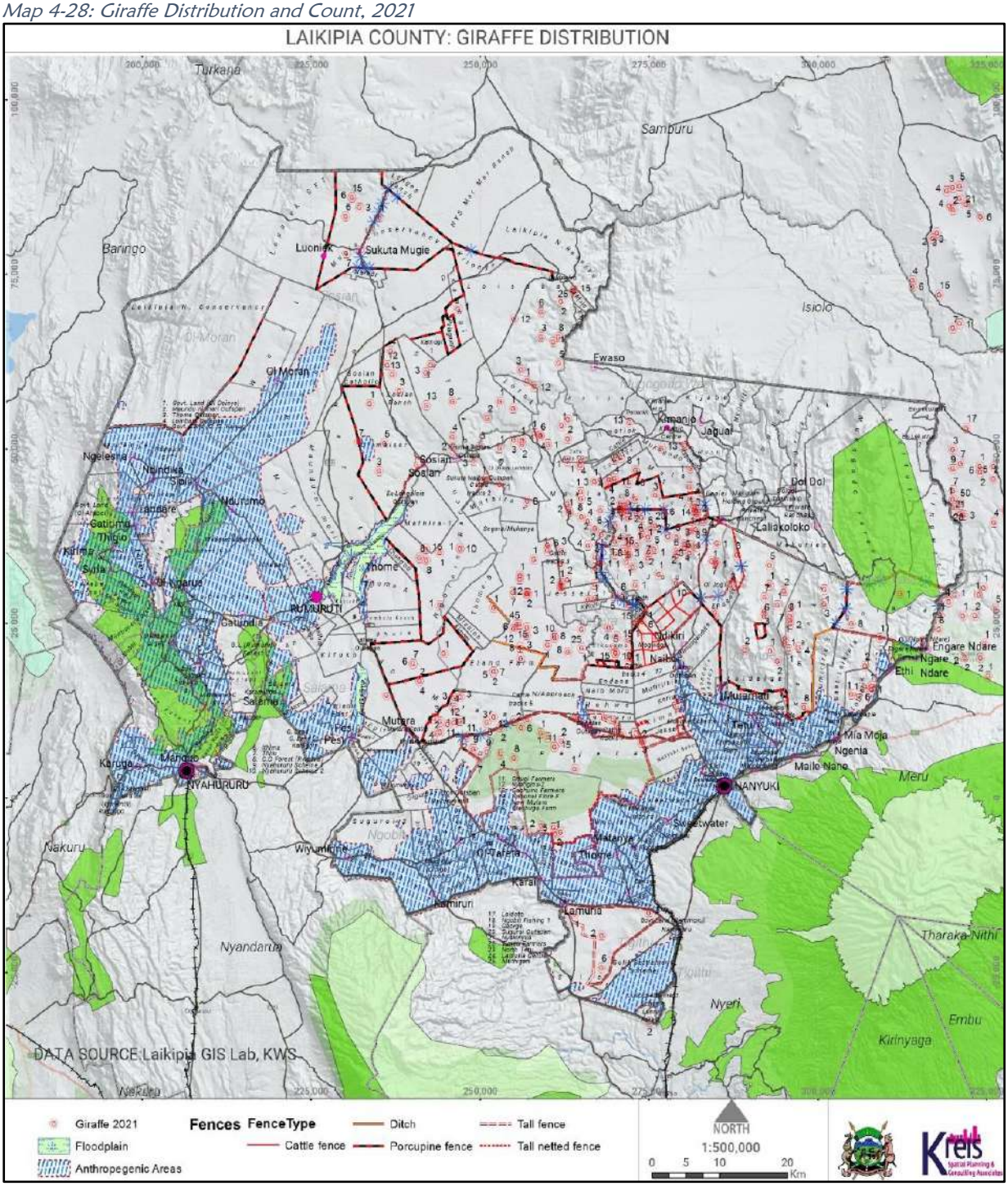


Source: KWS Wildlife Census Data (map modified by KREIS, 2022)

Reticulated Giraffe

In the 1970s, giraffes were distributed widely across the Greater Ewaso Ecosystem. However, the current distribution of reticulated giraffes in Laikipia County shows they are found particularly in the Solio, Segera, Ol Pejeta, Ol Jogi, Colcheccio, Mugie, Sosian, and Kisima ranches (Ojwang', et al., 2017).

Map 4-28: Giraffe Distribution and Count, 2021

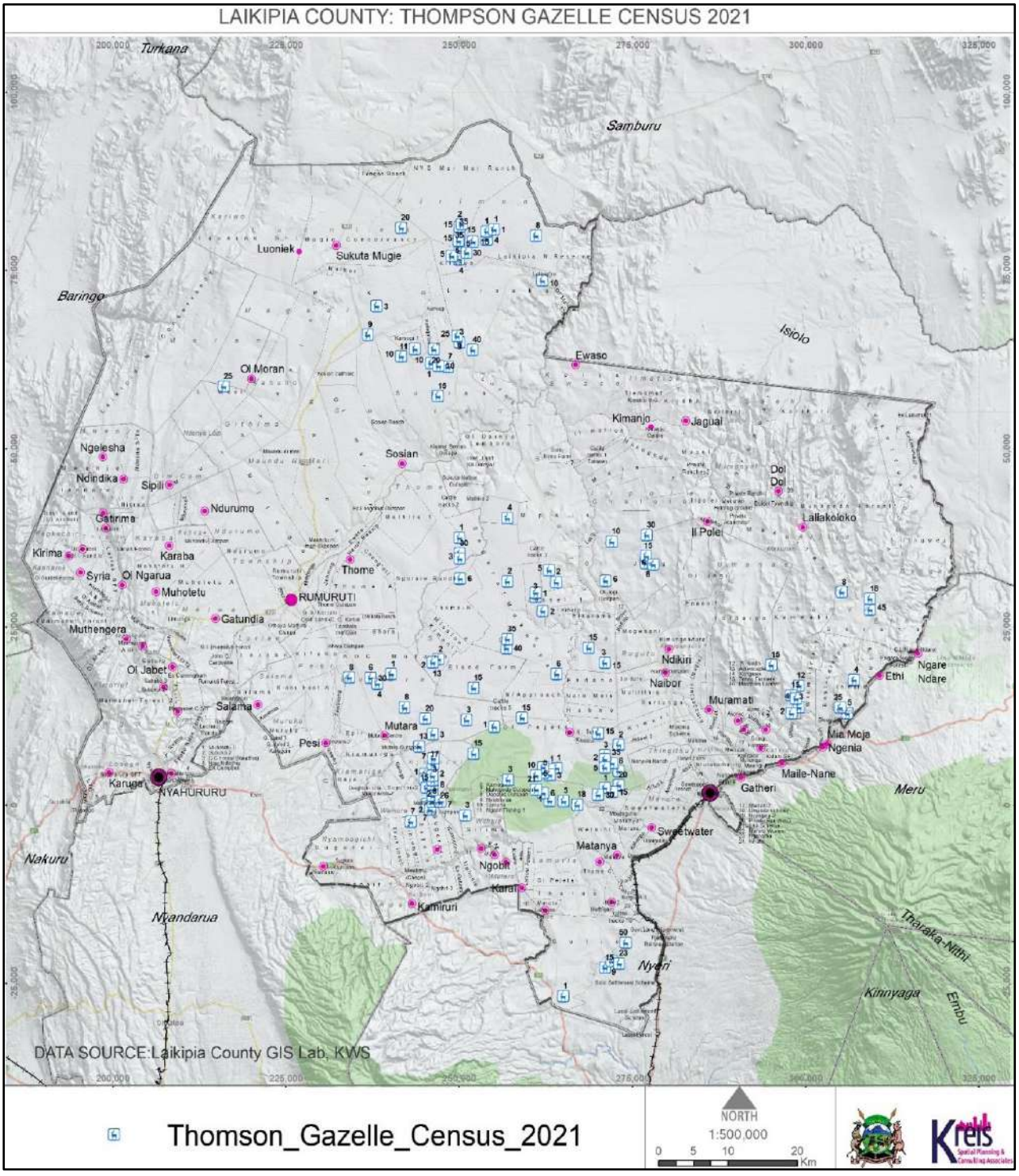


Source: KWS Wildlife Census Data (map modified by KREIS, 2022)

Thompson's Gazelle

Although not as many in number as the Grant's Gazelles, the Laikipia-Samburu savannah landscape provides a natural habitat for the Thompson's Gazelles.

Map 4-29:Thompson's Gazelle Distribution and Count, 2021

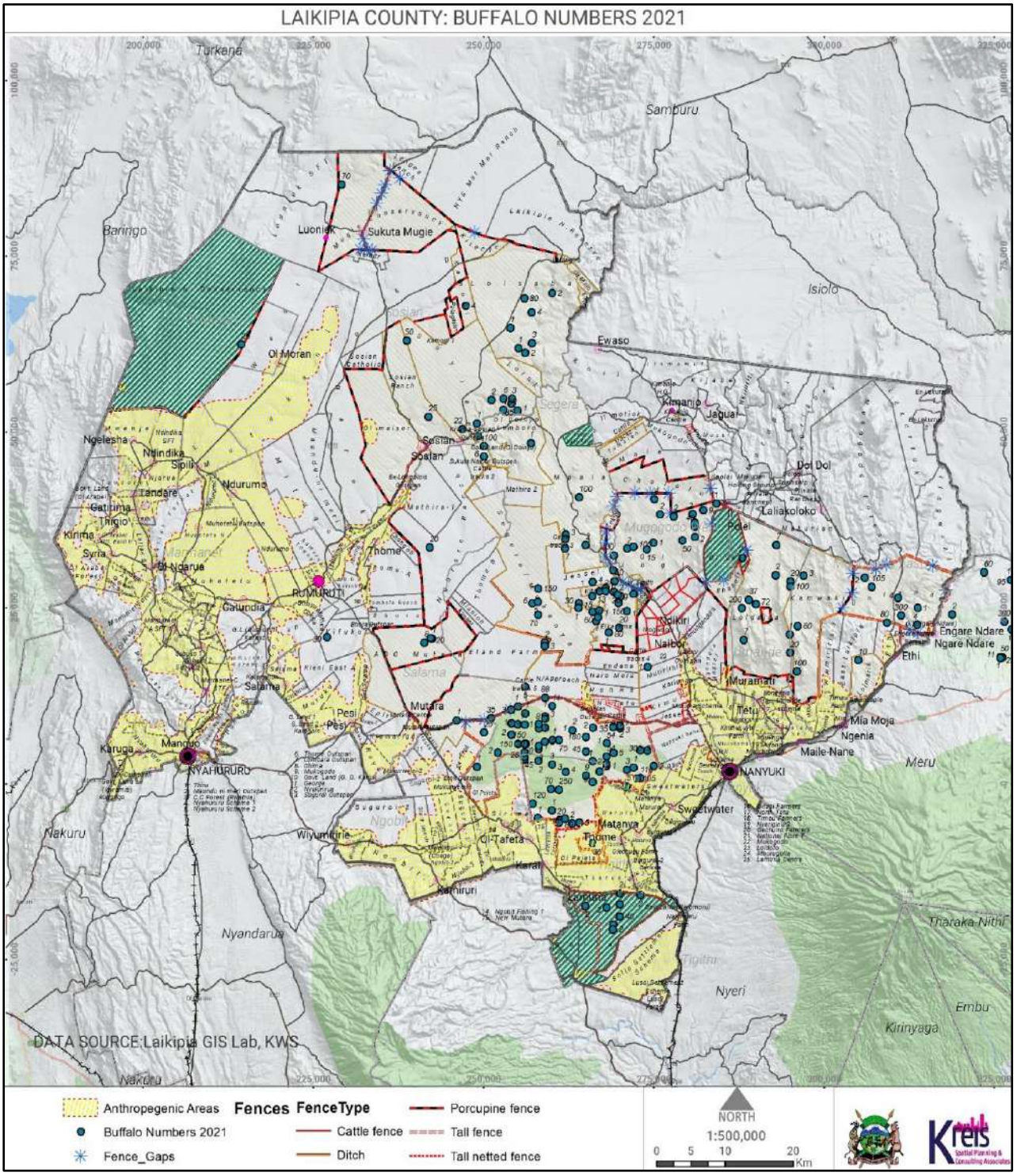


Source: KWS Wildlife Census Data (map modified by KREIS, 2022)

Buffalo

The Laikipia-Samburu-Marsabit ecosystem accounts for about 15% of the total buffalo population in Kenya (National Wildlife Census Report, 2021).

Map 4-30: Buffalo Distribution and Count, 2021

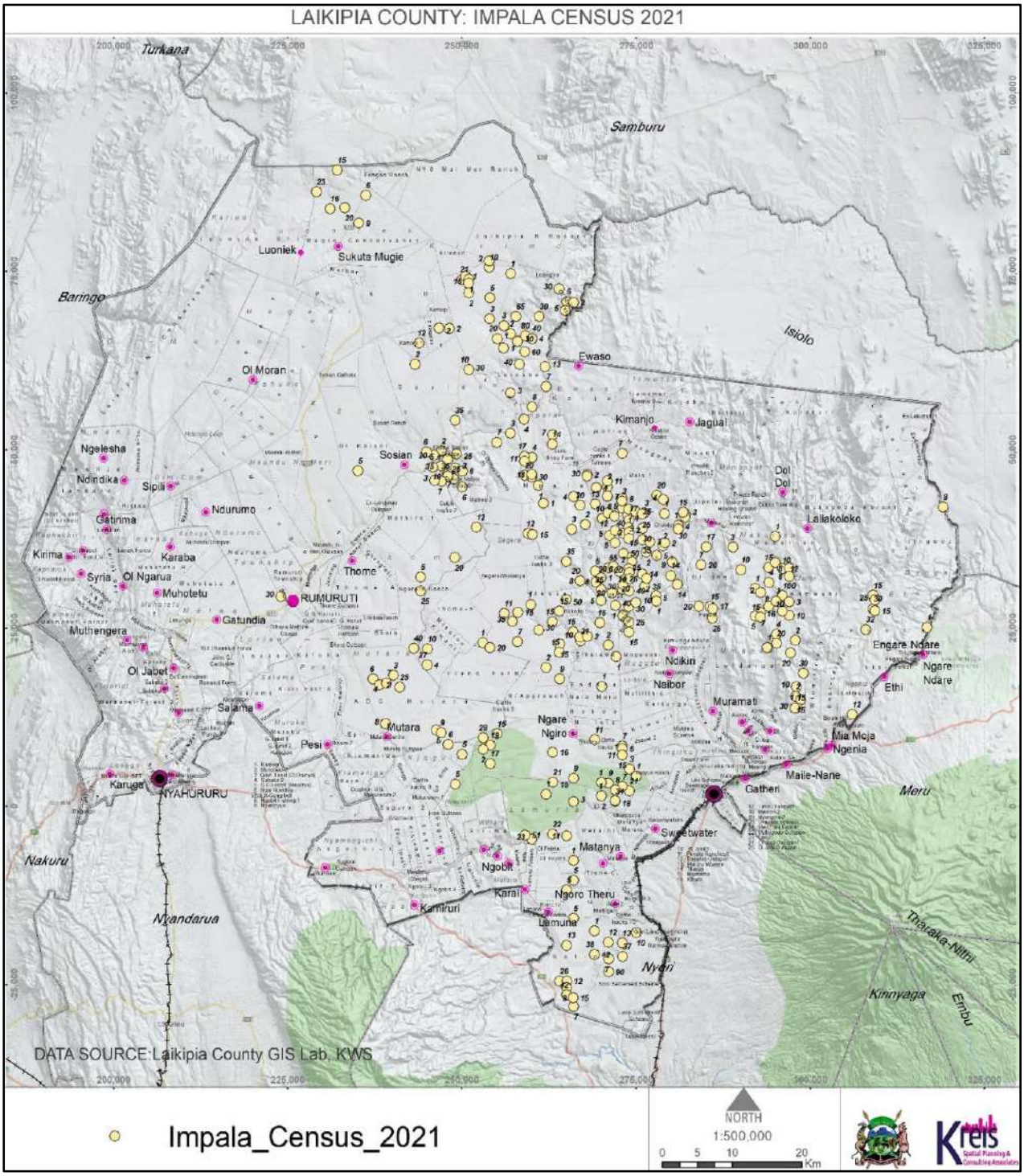


Source: KWS Wildlife Census Data (map modified by KREIS, 2022)

Impala

The Laikipia-Samburu landscape is home to a significant population of impalas.

Map 4-31: Impala Distribution and Count, 2021



Source: KWS Wildlife Census Data (map modified by KREIS, 2022)

4.9.3 Wildlife Threats

The heterogeneous and resilient habitats of the Greater Ewaso Ecosystem support a diversity of wildlife populations. The Laikipia Plateau in particular plays an essential role in sustaining wildlife species outside protected areas, within extensive ranches and conservancies. However, the capacity of the landscape as a wildlife sanctuary has been decreasing over the years owing to the anthropogenic factors detailed below:

a. Population Increase

The gradual increase in both rural and urban populations in the County exerts pressure on land and land-based natural resources. With population increase, land use changes are inevitable. There have been numerous land subdivisions of the former large-scale farms into smaller uneconomical land parcels, mainly for agriculture and settlements. Encroachment of agricultural activities and settlements in areas which were initially wildlife dispersal areas and movement corridors reduces the carrying capacity of such areas to support wildlife, consequently inducing more human-wildlife conflicts.

b. Habitat Fragmentation

The former wildlife dispersal areas and ranges are diminishing due to land fragmentation since the majority of land in the County is under private land tenure – either small-holder farms or large-scale ranches. The erection of fences around these private properties severs connected/continuous landscapes and therefore limits migration and free movement of wildlife. Obstructive infrastructure such as the construction of roads across wildlife habitats results in partial or complete blockage of movement corridors. The LAPSSET Corridor, for instance, is a potential threat to the natural landscape of the Greater Ewaso Ecosystem; since it is planned to traverse through continuous wildlife breeding areas and dispersal ranges in Isiolo and Samburu counties.

The impact of habitat fragmentation is the separation of herds and trapping them into smaller restricted areas. Obstructed movement corridors jeopardize natural breeding, increase cases of in-breeding, and limit the long-term sustainability of isolated/unconnected populations. They also endanger wildlife as they attempt to cross over such barriers.

Plate 4-16: A Striped Hyena knocked down by a Vehicle on a Road across a Wildlife Habitat

Source: KREIS, 2022

c. Habitat Degradation

Land degradation is widespread in areas where traditional pastoralism persists, especially within the community ranches in the Mukogodo region. This emanates from high livestock densities stemming primarily from the changing lifestyle of the pastoralists from nomadism to sedentarism. Overstocking and overgrazing, coupled with prolonged drought periods result in grazing pressure between wildlife and large herds of livestock – ultimately reducing the carrying capacity of the landscape (Ojwang', et al., 2017).

Plate 4-17: Degradation of Land caused by Overstocking; Habitat Degradation in Laikipia's Rangelands

Source: KREIS, 2022

Invasive plant species are major causes of habitat degradation within rangelands in Laikipia County. For instance, the existing Opuntia species and the potentially invasive Prosopis juliflora threaten the sustainability of rangelands, especially within the

community ranches in Laikipia North Subcounty. These species displace and reduce the abundance of natural grass species. This calls for integrated approaches among key stakeholders encompassing community associations, conservation agencies and the County Government.

The rangelands in Laikipia County are faced with limited surface water sources; in which people, livestock and wildlife all share these limited sources. Climate change has brought about prolonged drought periods and delays in the onset of seasonal rainfall – which results in water scarcity and human-wildlife conflicts over the available surface water sources.

d. Increasing Conservation Costs

Escalating costs of ranching and conservation operations present a major threat to the underlying financial viability of conservation-compatible land use in Laikipia County. In most cases such forms of land use are not profitable, incurring significant costs and losses for landowners. The potential for further taxes (local and national) to be levied over these operations presents a significant threat to the continued management of land for conservation purposes. In addition, increasing land values are creating growing opportunity costs for landowners currently engaged in conservation-compatible land use in the County, posing a threat to pro-conservation properties that are financially vulnerable (Graham, 2012).

4.9.4 Wildlife Conservation

Conservancies have the capacity of playing important roles in diversifying the tourism sector and protecting critical wildlife habitats while generating employment and revenue. Alongside ensuring sustainable wildlife conservation and rangelands management; conservancies have become platforms for securing rural community livelihoods, developing social infrastructure, promoting peaceful co-existence and building community resilience to environmental shocks (Kenya Wildlife Conservancies Association, 2016).

Conservation-compatible land use has been a significant success in Laikipia County, evidenced by the numerous conservancies in both private and community land tenure. The County Government has engaged a host of conservation agencies to ensure that

35% commitment of lands in the County is limited to wildlife conservation as a primary land use (CGL, 2022). These actors include Laikipia Wildlife Forum, Laikipia Conservancies Association, the Grevy's Zebra Trust, Save the Elephants, Northern Rangeland Trust, Mpala Research Center, Ewaso Lions, Space for Giants, and Kenya Wildlife Service among others.

The Laikipia Conservancies Association's vision is to ensure a connected and well-managed Laikipia landscape that conserves nature and improves people's lives. Among its many goals is to facilitate a collaborative planning and conservation management approach among conservancies across the County. It comprises a total of 24 conservancies, of both community and private ownership as shown in table 4-8 below.

Table 4-7: Members of Laikipia Conservancies Association

No.	Conservancy Name
1.	Borana Conservancy
2.	El Karama Conservancy
3.	Il Mamusi (Mukogodo)
4.	Il Ngwesi Conservancy
5.	Kuri Kuri Group Ranch
6.	Mukutan Conservancy (Ol Ari Nyiro)
7.	Lekurruki
8.	Loisaba
9.	Lolldaiga
10.	Makurian Group Ranch
11.	Mpala Research Centre
12.	Mugie Conservancy
13.	Naibunga Central
14.	Naibunga Lower
15.	Naibunga Upper
16.	Ol Jogi ltd
17.	Ol Maisor
18.	Ol Pejeta
19.	Ol-Lentile
20.	Ole Naishu
21.	Sangare Ranch
22.	Segera
23.	Sosian Samburumburu
24.	Suyian

Source: Kenya Wildlife Conservancies Association, 2022

Generally, conservation approaches currently being undertaken in the County to protect wildlife populations and their natural habitats include expanding the habitat range for the conservation of black rhinos; anti-poaching operations through the use of

GPS tracking collars and monitoring by trained rangers; rangelands management through reseeding of bare lands and control of invasive plant species; community-led conservation via increasing conservation awareness of the local communities; mitigation of human-wildlife conflicts; and creation of recovery programmes for endangered wildlife species. For the continued survival of diverse species in the County, it is mandatory to maintain existing wildlife dispersal areas and migration corridors; and to restore previous routes that have been interfered with or lost (Ojwang', et al., 2017).

Plate 4-18: Unhindered wildlife migratory corridors between different ranches

Source: KREIS, 2022

For this purpose, the County Spatial Plan has been prepared with reference to the national goals for resilient ecosystems provided for in the National Wildlife Strategy of 2030. These include:

Goal 1: Maintain and Improve Habitat and Ecosystem Integrity – It aims to reduce loss of biodiversity, protect ecosystem functions, enhance connectivity, and increase resilience. Its strategic actions are to identify priority ecosystems for conservation actions; to support integrated data-driven land use planning; and to protect, rehabilitate and restore wildlife habitats and their connectivity (Ministry of Tourism and Wildlife, 2018).

Goal 2: Enhance Species Protection and Management – It aims to ensure healthier and more resilient wildlife populations. Its strategic actions are to catalyze the conservation of endangered and threatened species; reduce poaching, over-utilization of and illegal wildlife products trade; and promote co-existence as an approach to reduce human-wildlife conflicts (Ministry of Tourism and Wildlife, 2018).

The 2012-2030 Wildlife Conservation Strategy for Laikipia County is anchored on the aforementioned national goals for promoting resilient wildlife ecosystems. Its vision is to make Laikipia County one of Africa's greatest conservation successes. Among the strategic objectives to help realize that vision is to secure and increase space for wildlife in the County by 2030. The identified conservation targets are:

a. To have the County Government provide incentives to landowners for the conservation of wildlife.
b. To encourage the maintenance of land that currently exists under conservation-compatible land use to remain committed to that land use.
c. To ensure that land offering high potential wildlife habitat (where wildlife is currently absent or exists at low numbers) is committed to conservation-compatible land use.
d. Within the context of stable wildlife populations, to have more than half of Laikipia's residents view wildlife as an asset.

Additionally, the Strategy aims to maintain habitats and enhance connectivity to maximize the diversity of species, ecosystem services and human well-being by 2030.

This will ensure that wildlife populations can move unhindered within the Laikipia landscape, as well as within the larger adjacent ecosystems. It also aims at promoting effective collaboration among stakeholders to enable effective wildlife conservation in Laikipia County (Graham, 2012).

Therefore, in line with these policy frameworks, the County Spatial Plan supports the need for sustainable conservation of wildlife species and ecosystems. It will therefore make provisions in areas where no continuous movement corridors are established, as well as provide regulatory guidelines for restoring and maintaining encroached corridors.

4.10 Emerging Issues

Sector	Opportunities	Constraints
Climatic Conditions	▪ High rainfall amount and intensity in areas of Laikipia West and East supports rain-fed agriculture. ▪ Low rainfall amount in Rumuruti and Mukogodo areas favors livestock keeping, ranching and wildlife conservancies. ▪ The County's strategic location along the equator provides a potential for solar energy.	▪ Evaporation exceeds rainfall in most of the areas resulting in widespread moisture deficits within the County. ▪ Climate change has resulted in reduced agricultural production, depletion of forage, emaciation of livestock, temporal emigration of the pastoral communities, and human-wildlife conflicts over water and pasture.
Topography	▪ Level landscape of the Laikipia Plateau allows for the establishment of vast ranches and conservancies.	▪ Uneven terrain in some parts of the County inhibit the construction of roads, leaving such areas inaccessible. ▪ Areas with sloppy terrains and pastoralism activities are

Sector	Opportunities	Constraints
	▪ The undulating landscape and low rolling hills are of scenic importance, promoting tourism activities.	susceptible to soil erosion due to overstocking and over-grazing.
Geology and Soils	▪ The vast underlying metamorphic rocks are rich in mineral ores making quarrying and mining potential economic activities in the County. ▪ The soils in the County support agriculture, ranching and wildlife conservation.	▪ Over-stocking and over-grazing by pastoralists leave the soil bare and vulnerable to soil erosion and land degradation. ▪ The challenge of unregulated sand scooping in dry river beds in Laikipia North.
Hydrology and Water Resources	▪ Ewaso Ng'iro and Ewaso Narok rivers and their many tributaries are sources of water for domestic use, livestock and irrigation purposes. ▪ The County has the potential for underground water which can be tapped through the drilling of boreholes.	▪ Encroachment of agricultural activities on riparian reserves and wetlands. ▪ Soil erosion and flooding are threats in the low-lying areas in Laikipia North.
Vegetation	▪ The County is endowed with vast rangelands	▪ Rangelands degradation caused by prolonged drought

Sector	Opportunities	Constraints
	which allow for ranching and wildlife conservation. ▪ The forests are natural wildlife habitats and have contributed significantly towards beekeeping, carbon sequestration, research on flora and fauna and eco-tourism.	and high livestock densities by pastoralists reduces forage for wildlife and livestock. ▪ Invasive plant species threaten the sustainability of rangelands in the County. ▪ Forests face encroachment and deforestation for charcoal, fencing materials and firewood.
Wetlands	▪ Wetland ecosystems provide fertile soils for irrigation farming. ▪ Wetlands act as grazing fields for livestock during prolonged drought periods.	▪ Encroachment on wetlands for settlement and agriculture. ▪ Conflicts arise between upstream and downstream users due to the unregulated abstraction of water for irrigation.
Wildlife	▪ Conservation-compatible land use within private and community-owned conservancies is key to protecting critical wildlife habitats and ecosystems. ▪ Conservancies have the capacity of diversifying the tourism sector to generate more revenue, provide employment opportunities and improve local community livelihoods.	▪ Shared pasturelands and water sources increase cases of human-wildlife conflicts. ▪ Wildlife dispersal areas have been declining due to population increase, land subdivision, land fragmentation and development of obstructive infrastructure. ▪ Habitat degradation is a significant threat to the sustainability of wildlife populations in the County.

5 POPULATION AND DEMOGRAPHY

5.1 Overview

This chapter incorporates population size, composition, distribution and density; population of special groups, population projections and migration trends. It details the demographic characteristics of the County's population. Population data is important in spatial planning as it determines the location and distribution of public amenities and the nature of land use development.

5.2 Population Characteristics

Population is defined as the total number of people living within a specific geographical area at a given period. Demography is defined as the study of human population – their size, composition and characteristics across places – and the processes through which population change.

5.2.1 Size and Structure

According to the National Population and Housing Census, 2019, Laikipia County's total population stood at 518,560 persons; with 259,440 males, 259,102 females and 18 intersex persons. The number of households in the County was 149,271. The average household size stood at 3 persons. This represented a 30% increase from 399,227 persons recorded in the previous census in 2009, representing an estimated average annual growth rate of 2.64%. This is shown in table 5-1 below.

Table 5-1: Population Size and Structure

Total	Male	Female	Intersex	No. of Households	Density (Persons per Sq. Km)
518,560	259,440	259,102	18	149,271	55

Source: KNBS, 2019

5.2.2 Population Density and Distribution

The County's population density stood at 55 persons per square kilometre in 2019 with Nyahururu Subcounty being the most densely populated at 190 and Laikipia North administrative Subcounty being the least at 14 persons per square kilometer. Population

in the County is unevenly distributed with Nyahururu Subcounty having the highest population at 30% and Laikipia North having the lowest at 7%.

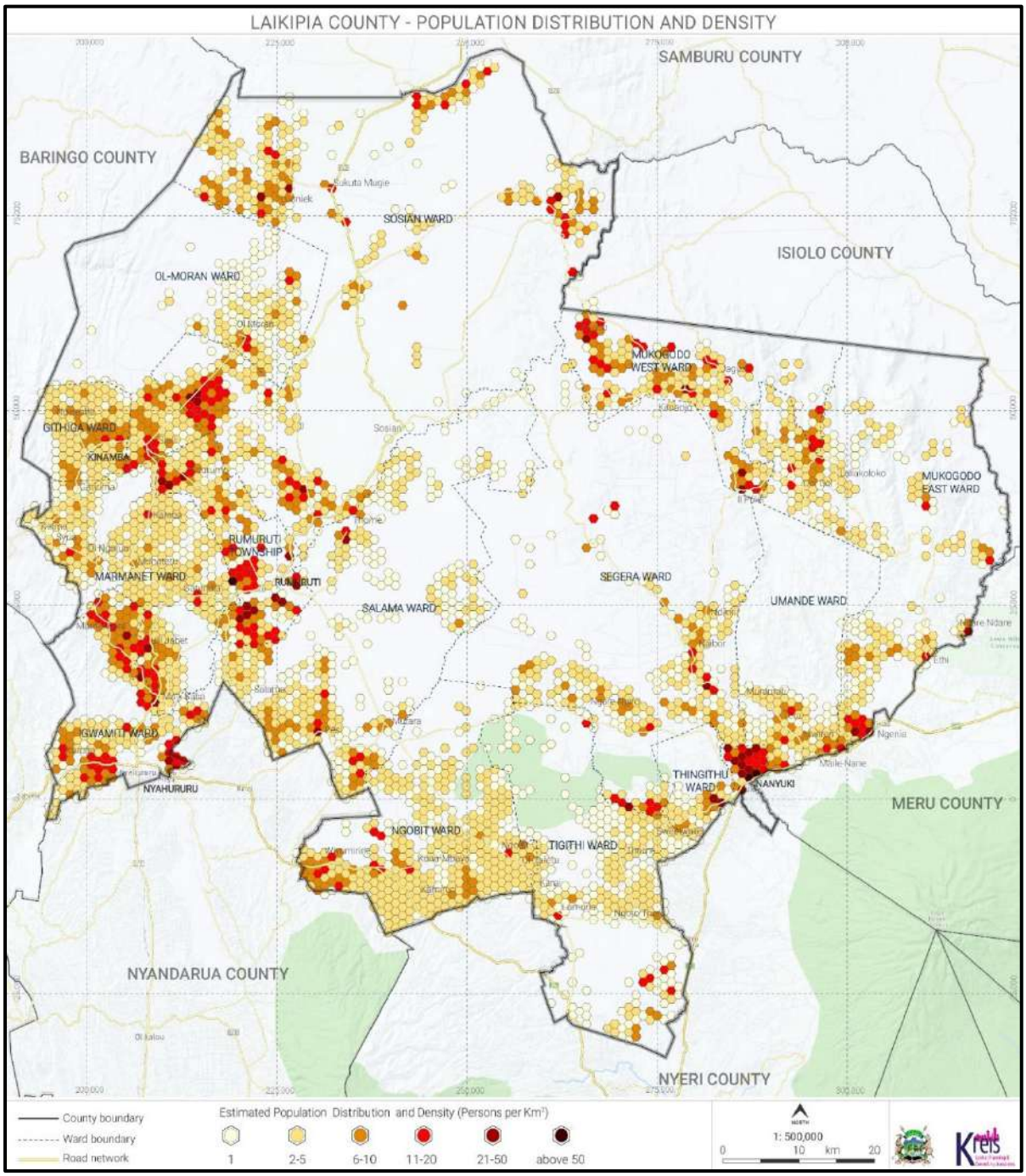
This significant difference has been attributed to the different weather and economic conditions across the subcounties. The former hosts the major urban centre of Nyahururu and has a favourable climate for crop and livestock farming, unlike the latter which has only Doldol Town with poor weather conditions and pastoralism being the major livelihood system. Table 5-2 and map 5-1 below detail the population distribution in the County as captured from the 2019 NHPC.

Table 5-2: Population Distribution and Density per Subcounty

Subcounty	Total	Male	Female	No. of Households	Density (Persons per Sq. Km)
Laikipia Central	95,594	47,888	47,705	30,372	78
Laikipia East	102,815	52,078	50,732	33,505	67
Laikipia North	36,184	18,067	18,116	7,752	14
Laikipia West	129,263	65,158	64,102	33,025	38
Nyahururu	154,704	76,249	78,447	44,617	190
TOTAL	518,560	259,440	259,102	149,271	55

Source: KNBS, 2019

Map 5-1: Laikipia County Population Distribution



Source: KREIS, 2022 (data source - KNBS 2019)

Given the physiographic characteristics and climatical conditions of some areas in the County, it is evident from the census data outlined in table 5-3 below that some wards experience higher population densities than others. In particular, Nanyuki and Thingithu wards top the list with population densities of 1053 and 360 persons per sq. km respectively while Segera ward has the least number of people per sq. km recorded

at 15 as shown in table 5-3 and map 5-1. This can be explained by the fact that Nanyuki and Thingithu wards are highly urbanized with Segera Ward being one of the sparsely populated wards as most of the land is utilized for ranching and wildlife conservation.

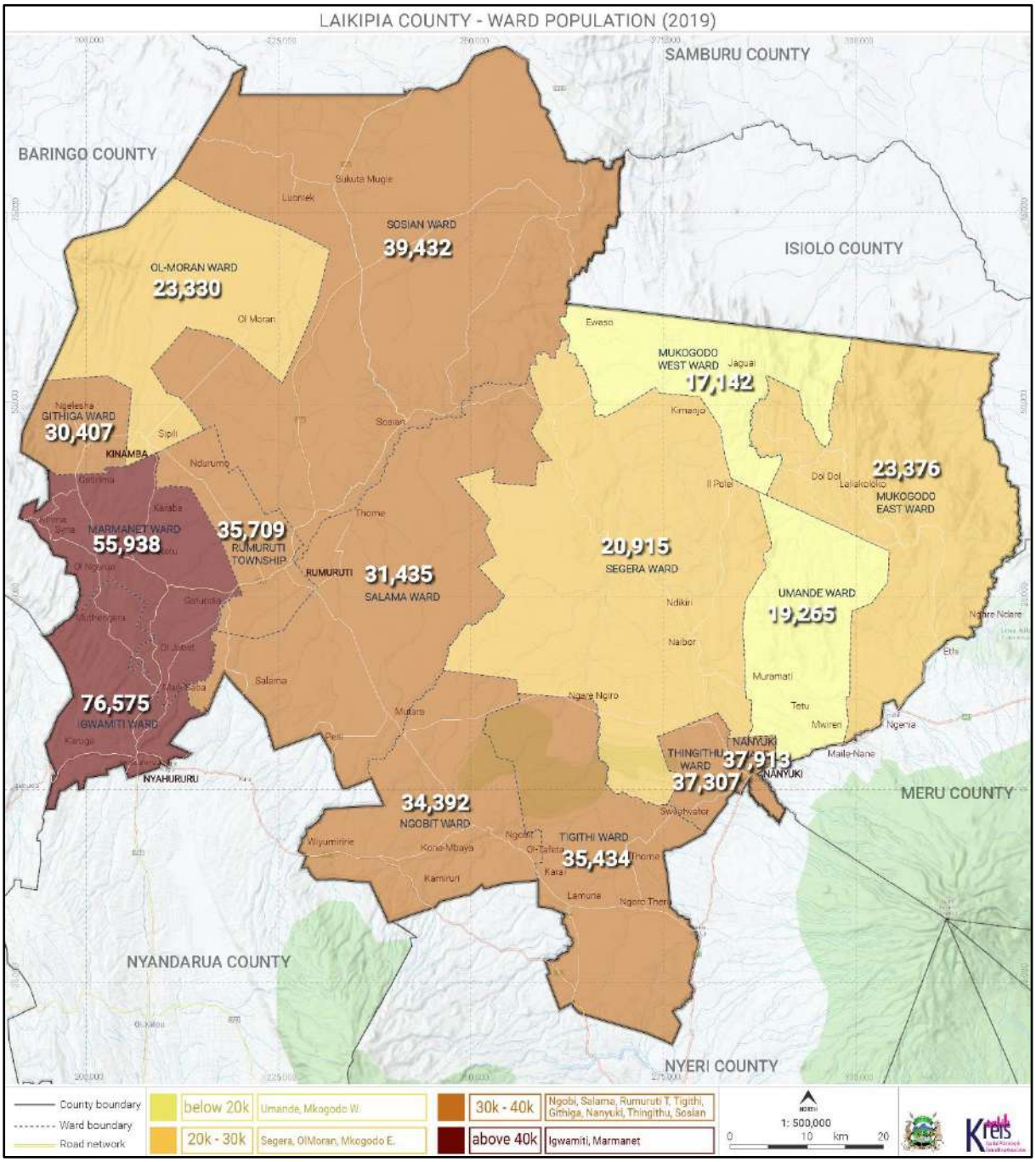
However, in the recent past, a lot of land subdivision has happened in areas such as Segera and continues to happen with minimal development control measures being applied. A consequence of this will be an influx of population to such areas with little or no amenities to support life functions, increased human-wildlife conflicts, and/or other resource-based conflicts. As a planning intervention, the ideal scenario would be a situation where the rapid land subdivision is highly controlled, with attraction to more densified human settlements around the urban areas as a measure to ensure service provision to the ever-growing population as well as ensure livestock rearing and wildlife conservation continues to thrive within the County.

Table 5-3: Population Size and Density per Ward

Constituency	Ward	Total Population in 2019	Land Area (Sq. Km)	Density (Persons per Sq. Km)
Laikipia West	Olmoran	23,330	590.6	40
	Rumuruti Township	35,709	242.2	147
	Githiga	30,407	135.6	224
	Marmanet	55,938	432.4	129
	Igwamiti	76,575	269.6	284
	Salama	31,435	914.6	34
	Sub-Total	253,384	2,585.0	98
Laikipia East	Ngobit	34,392	457.7	75
	Tigithi	35,434	562.0	63
	Thingithu	37,307	103.5	360
	Nanyuki	37,913	36.0	1053
	Umande	19,265	289.1	67
	Sub-Total	164, 311	1,448.3	113
Laikipia North	Sosian	39,432	2,203.7	18
	Segera	20,915	1,380.0	15
	Mukogodo West	17,142	831.2	21
	Mukogodo East	23,376	1,084	22
	Sub-Total	100,865	5,498	18
GRAND TOTAL		**518,560**	**9,532.20**	**54**

Source: Laikipia County Statistical Abstract, 2021

Map 5-2: Population Distribution by Ward



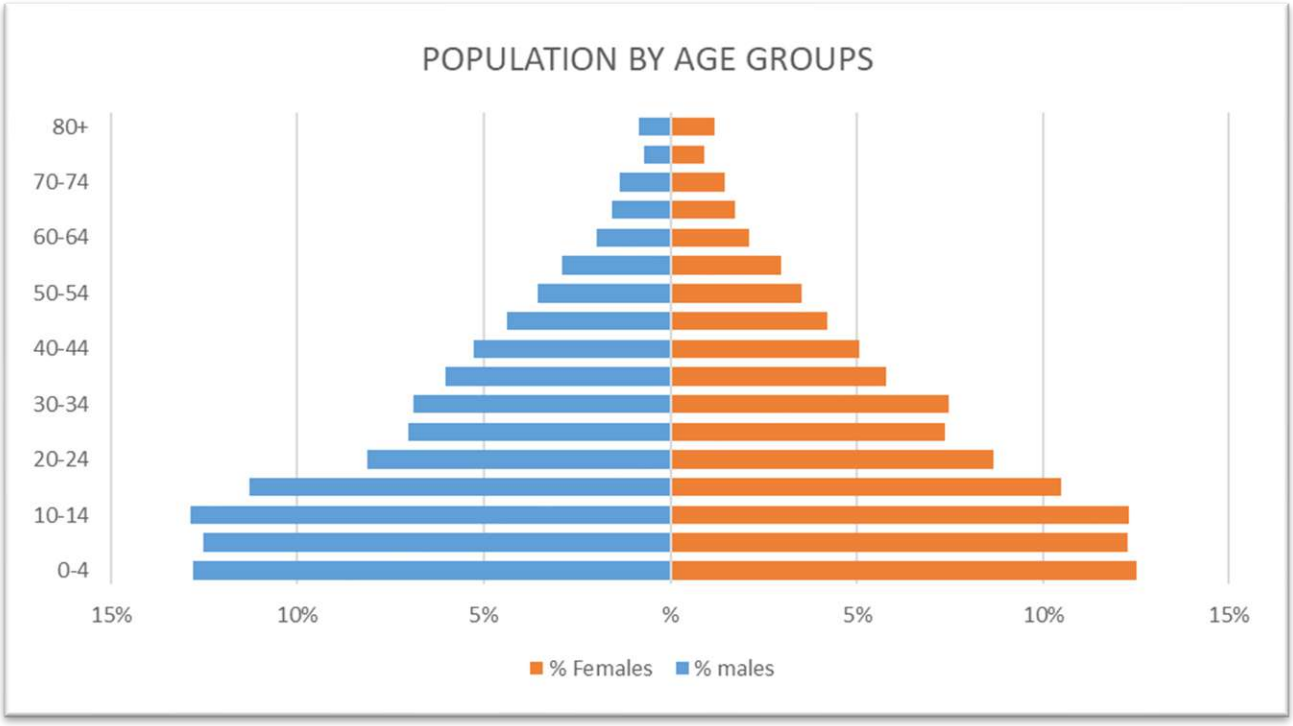
Source: KNBS 2019; KREIS,2022

5.2.3 Population Composition by Age Cohort

The County's population composition across the various age groups depicts a population that is very youthful with 73% being 35 years and below, according to the KNPHC 2019. Majority of the males fall in the 10-14 years category while the females are in the 0-4 years, with the highest number being 10-14 years of age for both males and females. The population composition and structure thus has a broad base in the

early years with the subsequent age groups in decreasing order as shown in figure 5-1 below.

Figure 5-1: Population Pyramid



Source: KNBS, 2019

It is evident from figure 5-1 that the County will still have a huge youthful population during the lifespan of the Plan. The dominating young population demands basic socio-economic services including education facilities, health care facilities, employment zones and recreation facilities. There is a need to match the capacity of the existing social facilities with the growing numbers of the youthful population and provide employment opportunities for the increasing labor force.

5.2.4 Special Groups

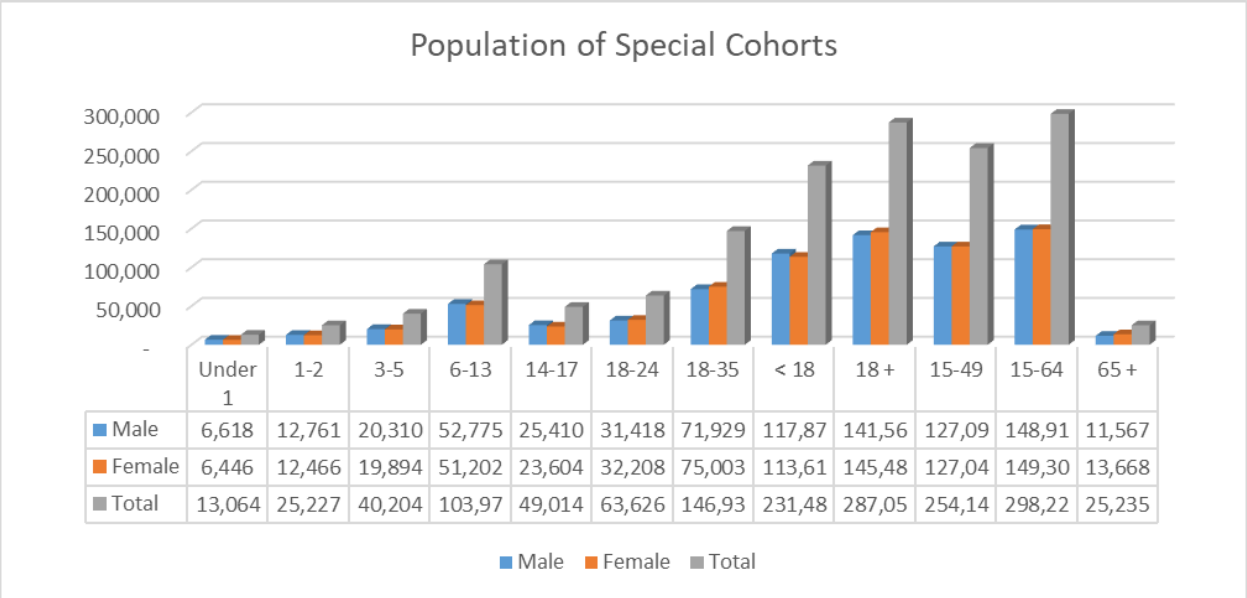
The Laikipia County Statistical Abstract categorizes special age groups as follows:

- Children under one year
- Children of school-going age ECDE (3-5 years)
- Children in primary schools (6-13 years)
- Children in secondary schools (14-17 years)
- The youth (18-35 years)

- Children (Under 18 years) and adults (18+ years)
- Women of reproductive age (15-49 years)
- Active labor force (15-64 years)
- The elderly (65+ years)

The special age group cohort contributes to the dependency ratios of the County. The youth, children and women of reproductive age should be planned for in terms of education provision and healthcare provision. The active labor force is included in the plan in terms of employment creation and industrial advancement. The elderly are prioritized in the provision of facilities such as markets and passive recreation areas.

Figure 5-2: Population of Special Cohorts



	Under 1	1-2	3-5	6-13	14-17	18-24	18-35	< 18	18 +	15-49	15-64	65 +
Male	6,618	12,761	20,310	52,775	25,410	31,418	71,929	117,87	141,56	127,09	148,91	11,567
Female	6,446	12,466	19,894	51,202	23,604	32,208	75,003	113,61	145,48	127,04	149,30	13,668
Total	13,064	25,227	40,204	103,97	49,014	63,626	146,93	231,48	287,05	254,14	298,22	25,235

Source: KNBS, 2019

5.2.5 Population Projections

According to the 2019 KPHC report, the total population of Laikipia County stood at 518,560 persons, as shown in table 5-4 below.

The annual average population growth rate of the County is estimated at 2.64%. Population projection was based on the formula: **Pt = Pert**

Where Pt represents the expected future population for a given time period (t); Po is the base year population as per the 2019 KPHC (518,560); e is the natural logarithm

base of 2.71828; r is the County's population growth rate (2.64%); and t represents the time period at a 5-year interval.

Table 5-4: Population Projections

Constituency	Ward	2019	2021	2026	2031
Laikipia West	Olmoran	23,330	24,580	28,071	31,929
	Rumuruti Township	35,709	37,623	42,883	48,871
	Githiga	30,407	32,037	36,516	41,615
	Marmanet	55,938	58,926	67,164	76,543
	Igwamiti	76,575	80,679	91,959	104,801
	Salama	31,435	33,120	37,750	43,022
	Sub-Total	253,384	266,965	304,289	346,781
Laikipia East	Ngobit	34,392	36,235	41,301	47,069
	Tigithi	35,434	37,333	42,553	48,495
	Thingithu	37,307	39,307	44,802	51,058
	Nanyuki	37,913	39,945	45,530	51,888
	Umande	19,265	20,298	23,135	26,366
	Sub-Total	164, 311	173,118	197,321	224,876
Laikipia North	Sosian	39,432	41,546	47,354	53,967
	Segera	20,915	22,036	25,117	28,624
	Mukogodo West	17,142	18,061	20,586	23,461
	Mukogodo East	23,376	24,629	28,072	31,992
	Sub-Total	100,865	106,271	121,129	138,044
GRAND TOTAL		**518,560**	**546,355**	**622,739**	**709,701**

Source: KNBS, 2019

By the end of the planning period, the population will have risen to 709,701 persons holding all factors constant. Therefore, there will be an increased demand for social amenities, public utilities and physical infrastructure services. Additionally, it is expected that rapid land subdivision, land speculation, urban sprawl and encroachment on agricultural lands, and other fragile ecosystems will be a resulting scenario if the planning policies will not be thoroughly enforced. The high population will also lead to an increase in the labour force which will compete for the limited employment opportunities and therefore, more livelihood development strategies will be needed to sustain the expected population.

5.2.6 Urban and Rural Population

The County's urban population in 2019 stood at 127,360 persons comprising of 63,163 males and 64,193 females, while the rural population stood at 391,200 persons comprising 196,277 males and 194,909 females.

The population is projected to stand at 152,947 persons & 174,305 persons for urban areas and 469,792 persons & 535,396 persons for rural areas in 2026 and 2031 respectively as shown in table 5-5 below. This means that majority of the County's population is rural, standing at about 75.4 per cent. The distribution of males to females is similar to the County's ratio of 1:1 in both cases.

With the current rapid rate of land subdivision, most rural neighborhoods are being converted to urban-like neighborhoods. This conversion of agricultural land to residential and commercial land uses is impacting negatively on food security and is increasing resource-based conflicts.

Table 5-5: Urban and Rural Population Projections

Category		2019	2021	2026	2031
Rural	Male	196,277	206,876	235,709	268,625
	Female	194,909	205,434	234,066	266,752
	Total	**391,200**	**412,325**	**469,792**	**535,396**
Urban	Male	63,163	66,574	75,852	86,445
	Female	64,193	67,659	77,089	87,855
	Total	**127,360**	**134,237**	**152,947**	**174,305**

Source: KNBS, 2019

The County has 1 municipality (Rumuruti) and 5 other major urban centres with a population of over 2,000 persons as per the 2019 KNPHC. These include Nanyuki and Wiyumiririe in Laikipia East, Nyahururu, Rumuruti and Kinamba in Laikipia West constituencies. These urban centres host key economic activities, especially on wholesale and retail trade, accommodation and food services, manufacturing, finance and insurance activities. The existing and projected population of the urban centers is shown in table 5-6 below.

Table 5-6: Population Projection per Urban Centre

Urban Centre		2019	2021	2026	2031
Karuga	Male	1,196	1,261	1,436	1,637
	Female	1,105	1,165	1,327	1,512
	Total	2,301	2,425	2,763	3,149
Kinamba	Male	2,326	2,452	2,793	3,183
	Female	2,564	2,702	3,079	3,509
	Total	4,890	5,154	5,872	6,692
Nyahururu	Male	18,304	19,292	21,981	25,051
	Female	19,345	20,390	23,231	26,476
	Total	37,650	39,683	45,214	51,528
Rumuruti	Male	6,696	7,058	8,041	9,164
	Female	6,359	6,702	7,637	8,703
	Total	13,056	13,761	15,679	17,868
Wiyumiririe	Male	1,102	1,162	1,323	1,508
	Female	1,347	1,420	1,618	1,844
	Total	2,449	2,581	2,941	3,352
Nanyuki	Male	36,343	38,306	43,644	49,739
	Female	36,468	38,437	43,794	49,910
	Total	72,813	76,745	87,441	99,652

Source: KNBS, 2019

Urban Centres are known to be the engines of growth where rapid exchange of goods and services leading to increased production and GDP takes place. In that regard, the consideration of these Urban Centres as special economic areas will be embraced in the Plan formulation. These will be targetted as key activity and production nodes where employment opportunities and industrial expansion will be created and targeted.

5.2.7 Migration Trends

The last ten years have marked significant growth in the County's population. This has been fueled by migration into the County either for business, employment or for settlement. The popularity of the County as an ideal area for settling and tourism destination area is attributed to its favourable weather conditions, geographical centrality to the northern, eastern, western and southern parts of the country, and the availability of vast rangelands suitable for wildlife conservation. Other reasons for migration include family ties, marriage and education. However, there has been increased insecurity within some parts of the County including the larger Ol Moran and Luoniek areas which has resulted in temporary emigration from the County. This,

however, has not had a major impact on the permanent population dynamics as it happens temporarily, with the majority of the population returning to their land as soon as the resource/land-based conflicts are resolved.

5.3 Demographic Characteristics

5.3.1 Life Expectancy Rates

The national life expectancy in 2021 was 66.95 years, a 0.39% decrease from 67 years in 2020. In 2019, the County had the highest life expectancy at 71.9 years compared to 67 years reported nationally. Life expectancy in the County has been on an upward trend, owing to improvements in food security, improved healthcare and disease control, improved social statuses, economic empowerment and an increase in income from other activities.

5.3.2 Mortality and Morbidity Rate

The five most prevalent diseases for persons under 5 years of age in the County are as shown in table 5-7 below. This is a vulnerable age group and it should be planned for since it is influenced by the environment within which they survive, availability of health facilities, proper sanitation facilities as well as recreation centers. The facilities play a critical role in supporting their lives.

Table 5-7: Disease Prevalence for Persons under 5 Years

Disease	Laikipia North	Laikipia West	Laikipia East	Total	Percentage
Upper Respiratory Tract Infection	17,315	33,029	19,740	70,084	31.4
Tonsilitis	17,351	33,029	1,970	52,350	23.4
Diseases of the skin (inclusive of. wounds)	2,114	6,988	3,554	12,656	5.7
Diarrhoea	3,370	5,035	2,774	11,179	5.0
Ear Infections/Conditions	756	2,900	5,230	8,886	4.0

Source: KNBS, 2019

The leading diseases for persons of age 5yrs and above include; Respiratory Tract Infections (RTI), diseases of the skin, rheumatism and joint pains, diarrhoea and

hypertension as shown in table 5-8 below. The HIV prevalence rate stands at 3.2 per cent (CIDP, 2018-2022). This calls for synergized efforts between the County and National Government in mainstreaming the health sector in the County to cater for health needs.

Table 5-8: Disease Prevalence for Persons aged 5 Years and Above

Disease	Laikipia North	Laikipia West	Laikipia East	Total	Percentage
Upper Respiratory Tract Infection	35,583	63,659	35,275	134,517	19.2
Hypertension	1,766	23,579	12,968	38,313	5.5
Diseases of the skin (inclusive of wounds)	6,124	17,853	11,376	35,353	5.1
Intestinal worms	3,663	24,493	5,000	33,156	4.7
Arthritis, Joint Pains etc	7,423	10,080	15,365	32,868	4.7
Other Diseases of Respiratory System	4,974	19,202	7,869	32,045	4.6

Source: KNBS, 2019

5.3.3 Fertility Trends

The fertility rate stands at 3.2 births per woman (CIDP, 2018-2022) which is lower compared to the national fertility rate of 3.9 births per woman. That notwithstanding, the fertility rate is an indication of the continued growth within the County and the need to enhance equitable access to healthcare.

5.3.4 Literacy Levels

According to the KPHC, 2019, about 27% of Laikipia County residents had completed secondary level of education or above. Laikipia East constituency had the highest share of residents with secondary level education or above at 13%, Laikipia West constituency followed with a share of 12% while Laikipia North constituency had the lowest share at 0.6%.

A total of 24% of Laikipia County residents have no formal education (CIDP, 2018-2022). Laikipia North Constituency has the highest share of residents with no formal education, at 49.2% attributed to among other reasons, the cultural and pastoral leaning of the majority of residents. This is thrice Laikipia Central Constituency, which

has the lowest share of residents with no formal education (CIDP, 2018-2022). Table 5-9 below shows the literacy levels per Subcounty.

Table 5-9: Literacy Levels

Subcounty	Persons with Zero Literacy		Percentage of the Total Population (%)
	Male	Female	
Laikipia Central	2,317	3,266	6.3
Laikipia East	5,092	6,693	12.6
Laikipia North	7,106	8,784	49.2
Laikipia West	14,275	17,056	26.6
Nyahururu	4, 790	7,092	8.3
Total	**33,580**	**42,891**	**16.1**

Source: KNBS, 2019

In addition, Laikipia North Subcounty had the least number of persons attending school at all levels of education – from primary to tertiary level, while Nyahururu Subcounty had the highest number of persons. This is outlined in table 5-10 below.

Table 5-10: Population in Learning Institutions

Subcounty	Population currently in Schools/Learning Institutions					
	Pre-Primary	Primary	Secondary	TVET	University	Adult Basic Education
Laikipia Central	5,689	18,542	8,263	884	650	17
Laikipia East	6,133	18,395	7,181	1,008	839	38
Laikipia North	3,274	6,690	1,333	89	84	45
Laikipia West	8,817	25,935	8,808	628	572	47
Nyahururu	10,159	32,532	13,622	1,259	2,703	25
Total	**34,072**	**102,094**	**39,207**	**3,868**	**4,848**	**172**

Source: KNBS, 2019

5.3.5 Labor Force

According to KNBS and SID 2019, 16% of the residents with no formal education, 22% of those with primary education and 32% of those with secondary level of education or above are working for pay. Persons outside the labor force represent what was formally referred to as the economically inactive population. It includes full-time students, homemakers, the retired, incapacitated persons and those who are either too young or too old to work.

The 35-64 age group forms the main labor force, whereas the 18-24 age group forms the largest share of the economically inactive population in the County as summarized in table 5-11 below. This means that more employment opportunities will need to be created to cater for the inactive population through the 10-year cycle of the Plan.

Table 5-11: Labor Force

Age-Group	No. of Persons in the Labor Force		Outside the Labor Force
	Working	Seeking Work/ No Work Available	
5-14	10,985	-	118,139
15-17	4,236	-	31,339
18-24	32,613	5,707	24,576
25-34	60,165	7,316	5,579
35-64	109,321	7,435	5,380
65+	21,975	459	2,636
Total	239,295	21,564	187,649

Source: KNBS, 2019

5.3.6 Poverty Index

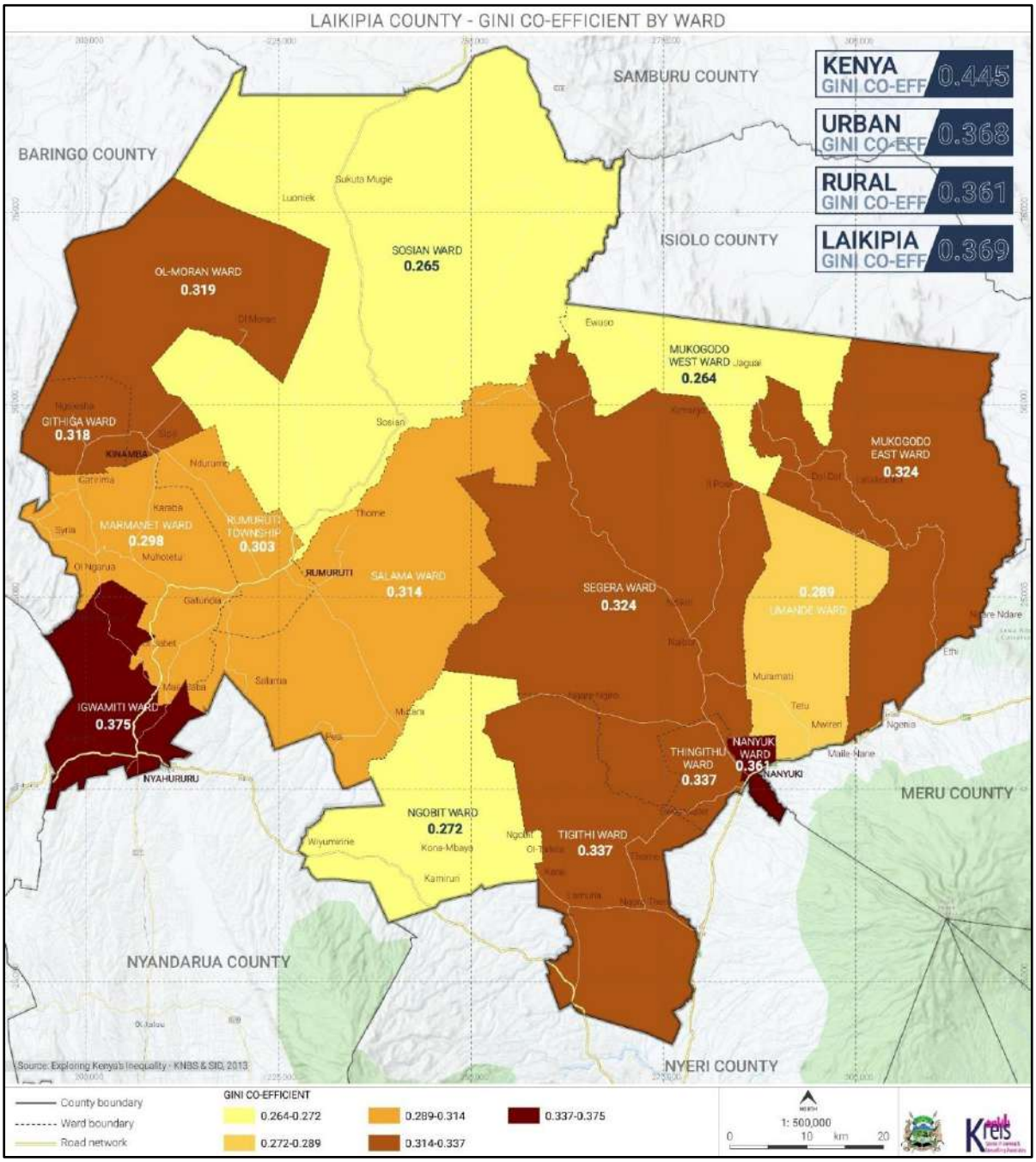
The County Human Poverty Index stands at 57.3 which is high compared to the national HPI of 29.1 (CIDP, 2018-2022). The high poverty levels may be attributed to the insecurity of land tenure, insecurity, harsh weather conditions, and low literacy levels among others. Additionally, the gap between the rich and the poor measured through the income disparity is higher within the wards that host active urban areas compared to the wards that are majorly encompassed of ranches and conservancies.

A study undertaken by KNBS & SID in 2013 to explore Kenya's inequality assessed the Gini index within Laikipia County. From the study, Mukogodo West and Sosiani wards were found to have low-income disparities at 0.264 and 0.265 Gini coefficients respectively. On the other hand, Igwamiti and Nanyuki wards were found to have the highest income disparities at 0.375 and 0.361 Gini coefficients respectively meaning they were more unequal in wealth distribution when compared to the other wards. Currently, it is expected that the situation has not changed considering the economic models and livelihood systems of the people have not significantly changed and it would be expected that the same case applies to the resulting Gini index holding all factors constant.

In most occasions, the Gini coefficient is used as a way to portray development imbalance and inequality. However, within Laikipia County, as viewed from the lens of the modern contemporary world, the wards that have high Gini coefficients can be said to be more developed in terms of urbanization, services and infrastructure provision as compared to the wards with low Gini coefficients.

Further, areas with a low Gini coefficient index within the County could potentially be areas of high inequality in wealth distribution but due to the limitation of the sample size and the geographical areas involved, they appear to be areas of low inequality. The ward-based Gini index assessment was a basis for some of the considerations and policy guidelines formulated as part of the Plan proposals and is shown in map 5-3 below.

Map 5-3: Gini-Coefficient by Ward



From the map above, it can be concluded that Laikipia County, with an average Gini coefficient of 0.369 is well within the National averages for both Urban and Rural areas recorded at 0.368 and 0.361 Gini coefficients respectively but performing better than the national average recorded at 0.445.

5.3.7 Dependency Ratios

For specific age cohorts, the County had ECDE-going children (3-5 years) at 7.75 per cent. The primary (6-13) and secondary school (14-17) attending age groups stand at

20.1 per cent and 9.4 per cent respectively meaning there is a very low transition between the primary school level and secondary school level. This means that the anticipated creation of jobs and industries may absorb very few people from Laikipia in the formal sector if the transition issue is not resolved. The youth population (18-35) stands at 28.3 per cent (CIDP, 2018-2022). This calls for well-tailored programmes to address the special needs of these specific cohorts. The needs include the provision of employment opportunities, recreation facilities, education facilities and health facilities.

5.3.8 Heritage and Culture

There are numerous ethnic groups found in and around Laikipia County including but not limited to the Maasai, Samburu, Rendile, Somali, Pokots, Kalenjins, Meru, Kikuyu, and Turkana. The County's unique and diverse culture is a major draw to the tourism industry. This has propelled the local economy in terms of employment creation and as a thriving tourism destination. The Spatial Plan recognizes the contribution of cultural tourism activities in sustaining local livelihoods, especially of the Maa Community residing in the County.

Several women's groups and cooperatives in Laikipia North have established cultural manyattas which have eco-friendly accommodation facilities. These women engage in beadwork, Aloe vera farming, beekeeping and eco-tourism activities to earn a living. Some of these cultural heritage sites include Twala-Tenebo, Arjiju, Naatum, Ngambolo, Osuguroi, Rapunye, Ntumutu, Il Ngwesi Community Lodge, and Ol Gaboli Eco-Lodge.

Yaaku is the County's main cultural site located in Laikipia North, whereas Twala is the main cultural campsite in the County (CIDP, 2018-2022). To promote cultural tourism, the County Government has set development initiatives to rehabilitate these cultural manyattas and eco-lodges through the construction of resource centers, bandas and cottages.

Plate 5-1: Display of Beadwork and Traditional Ware in Twala-Tenebo Cultural Manyatta

Source: African Conservation Center (ACC), 2022

5.4 Emerging Issues

Sector	Opportunities	Constraints
Population	The majority youthful population in the County is a human resource.	▪ Rapid population growth within the urban areas exerts pressure on existing natural resources, social services and infrastructure.
Demography	Rich cultural diversity in Laikipia County provides an opportunity for cultural tourism.	▪ Poverty and unemployment. ▪ Some areas have low literacy levels. ▪ Gender-based violence. ▪ Retrogressive cultural practices such as FGM and early marriages.

6 LAND TENURE AND LAND USE

6.1 Overview

Land is a major factor of production and an essential input for human settlements as well as economic development. Land is currently the most important resource from which the country generates goods and services for the people. Land supports agriculture, vast habitats, and natural resources and is also a cultural resource, with the communities in the County attaching rich value to both its existence and access to it. Land use involves the management and modification of the natural environment.

Laikipia County covers an approximate area of about 9,462.2 sq. km and is ranked as the 15th largest county in Kenya by land size. The major land cover categories in Laikipia are forests, savannahs/rangelands, shrublands, grasslands, and wetlands among other surface water bodies. These are used for varied land uses such as agriculture, pastoralism, water catchments, nature reserves, urban and rural settlements, industry, mining, transport and communications, tourism, and recreation.

This section discusses the main uses of land in Laikipia County, land tenure systems, land use patterns as well as the challenges in the land sector which limit the optimal utilization of land in the County.

6.2 Land Tenure

6.2.1 Historical Development of Land

Historically, Laikipia County was used by nomadic pastoralists (mostly the Maasai community) up to the early part of the 20th century when the area was occupied by white colonial farmers. Upon independence in the 1960s, the land was subdivided into small-scale farms which were mainly bought by farming communities from central Kenya. Due to the aridity of the region, this set the stage for wetland conversion/encroachment since the adjacent areas were too dry for farming.

Currently, the wetlands form important livelihood support systems mainly for farming and pastoral communities and in most cases, they are the basis for most resource-based conflicts.

Contrary to the farming communities, the pastoral Maasai community were able to utilize the vast expanse of grazing land to support their livelihoods sustainably given

their nomadic nature influenced by prevailing climatic conditions. During the colonial era, however, most of the land was converted to large commercial ranches pushing the Maasai into the northern parts of the County since the central areas of the County were already preoccupied with farming and ranching communities. In the central parts of the County, the large, sparsely populated ranches enjoy the luxury of balancing their use of the land to match the land's regenerative capacity. In the County's arable southwest and northeast corners, the population grew rapidly reaching over 7% between 1967 and 1979 causing land pressure and forcing people to the much drier northern parts of the County that were still occupied by the farming communities.

6.2.2 Existing Categories of Land

According to the Constitution of Kenya (2010), there are three interests on land in Kenya notably private, community and public land. Map 6-1 and table 6-1 below explain the existing land tenure systems in Laikipia County.

Table 6-1: Size and Percentage of Land Area under different Land Tenure Types

Land tenure	Area (km2)	%
Communally Owned Ranches	712.68	7.35
Forest Reserves	719.86	7.43
Government Land	830.98	8.57
Privately Owned Ranches	3,940.71	40.65
Privately Owned Smallholder Farms	3,379.91	34.86
Swamp	33.37	0.34
Urban	77.28	0.80
Total	9,462.2	100

Source: CGL, 2021

6.2.2.1 Public Land

Public land in Kenya refers to land un-alienated by the Kenya Government, used or occupied by state organs such as the Kenyan Army and BATUK in Laikipia; Agricultural Development Corporation (ADC) Mutara land; minerals and mineral oils; government forests such as Mukogodo Forest; and game reserves. Other lands in Kenya that fall into this category are water catchment areas, national parks, government animal sanctuaries, roads, rivers, lakes and other water bodies, the territorial sea, the exclusive economic zone and the sea bed. The public land is held in trust for the people by the County Government and administered on their behalf by the National Land Commission.

In the County, some of the Government lands are used for training by the military and National Youth Service (NYS), and also for purposes of Research by the research institutions. In addition, they are also used as livestock holding grounds by the Ministry of Agriculture, Livestock and Cooperatives during quarantines or by the Agricultural Development Corporation. Public schools, public hospitals, stadia, open spaces and sports grounds also fall into this category.

The main challenge facing public land is, land degradation, encroachment and land grabbing in various parts of the County.

6.2.2.2 Community Land

Community land comprises land registered in the name of group representatives, transferred to a specific community and land held, managed or used by communities such as community forests, grazing areas or shrines. Other pieces of land that fall under community land are ancestral lands and those traditionally occupied by hunter-gatherer communities, held as trust land by the County governments. Community land is held by communities based on ethnicity, culture or similar interest.

There are 13 group ranches in Laikipia representing 7.45% of the total land area. All of them are in the northern dry part of the County and are occupied by pastoralists who use them for communal grazing. However, some of the group ranches such as Il Ngwesi, Kijabe, Lekuruki and Koija have wildlife conservancies and tourist lodges. In terms of tenure arrangement, all group ranches have not been subdivided and remain intact though faced by growing population pressure that is putting a strain on natural resources.

6.2.2.3 Private Land

Private Land in Kenya consists of land held by a person under freehold tenure and leasehold tenure. The land is mostly under leasehold in the urban areas and freehold in the rural areas and is acquired through inheritance, purchase and through allocation by the government. Smallholdings sit on 27.21% of the total land area in Laikipia County. These farms were initially large-scale farms bought by groups of individuals who later subdivided them into smallholdings of between two and five acres. There are three categories of farmers in this group: those who bought land and settled to escape

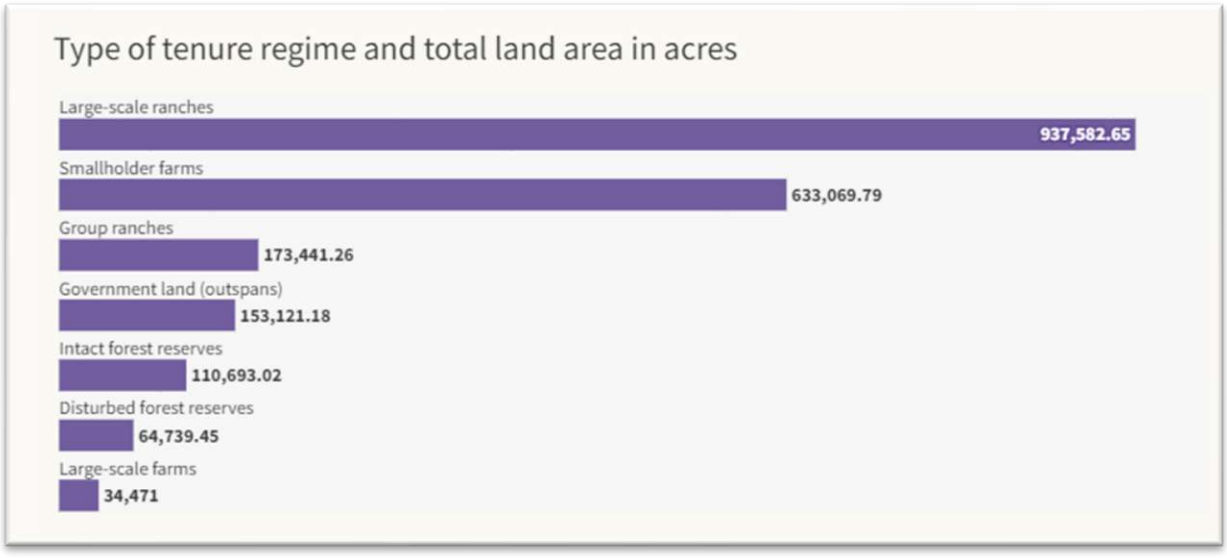
land pressure in their ancestral homes, those who bought the land for speculative purposes, and those who bought land and used it as collateral for bank loans.

There are 48 large-scale ranches sitting on 40.3% of the total land area in Laikipia County, some of which are still owned by the descendants of the colonial settlers. The ranches occupy huge tracts of land, the three largest being Ol Pejeta with 90,000 acres, Mukutan Conservancy with 86,000 acres, and Loisaba with 56,400 acres.

Majority of these large-scale ranches were acquired during the colonial period and legislation governing their ownership was taken from the colonial law and integrated into the constitution of independent Kenya, under the land transfer agreement between the colonial government and the Kenyatta regime. Within these ranches is an integrated economic system that includes livestock rearing, horticulture farming, wildlife conservation and tourism activities (Letai, 2021). In addition, the County has 23 large-scale farms occupying 1.48% of the land in the County. These farms are mostly owned by individuals from the former Central Province who bought the land following sub-division by the Kenyatta administration, or through land-buying companies, which opted not to sub-divide the land but to use it as collateral to access bank loans.

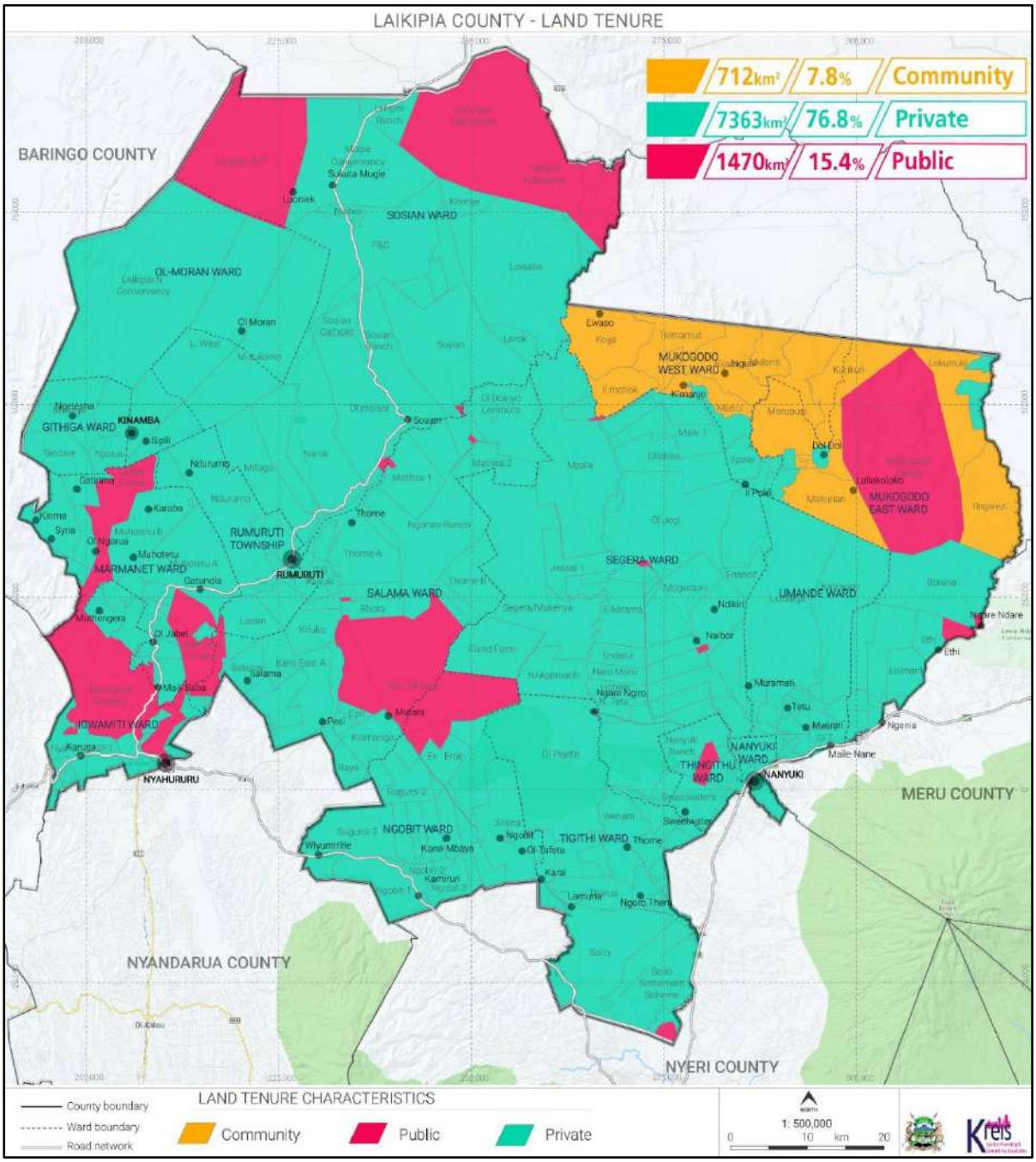
Figure 6-1 outlines the different land tenure regimes in Laikipia County as outlined in a recent study undertaken in 2021 and map 6-1 shows their spatial distribution.

Figure 6-1: Land Tenure in Laikipia



Source: Ministry of Lands, 2021

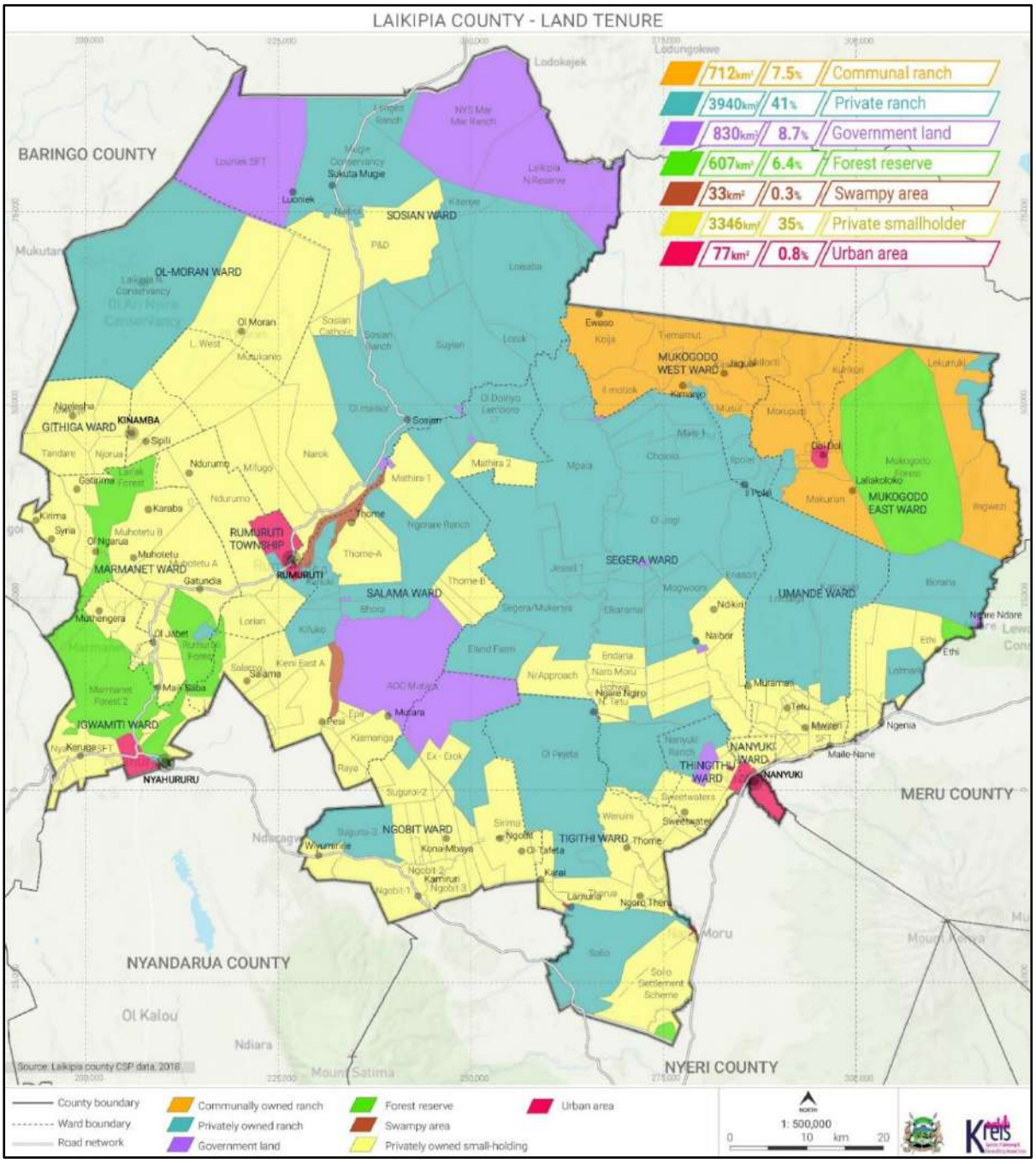
Map 6-1: Existing Land Tenure



Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

Most of the public land highlighted above is further disaggregated into either forest reserves, government-owned land and swampy/ wetland areas representing various percentages as shown in map 6-2 below.

Map 6-2: Disaggregated County Land Tenure Map



Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

6.3 Land Use Management

6.3.1 Land Sizes

The average farm size for private small-scale holders in Laikipia County is 2 acres while for large-scale holders is 20 acres. The group ranching communities hold an average of 10,000 acres, each with an average land holding of 23 acres (approximately 10.06 Ha) per household. Additionally, about 48 privately owned ranches cover more than 2000

acres of land each (approximately 809 Ha). The privately-owned ranches practice wildlife conservation and beef cattle rearing with an average size of 4,046.9 hectares and account for over 50% of the total County land mass.

According to government records, the percentage of landowners with title deeds in Laikipia County is estimated to be 65.3%. This percentage is partially attributed to absentee landowners and long land adjudication and transfer processes.

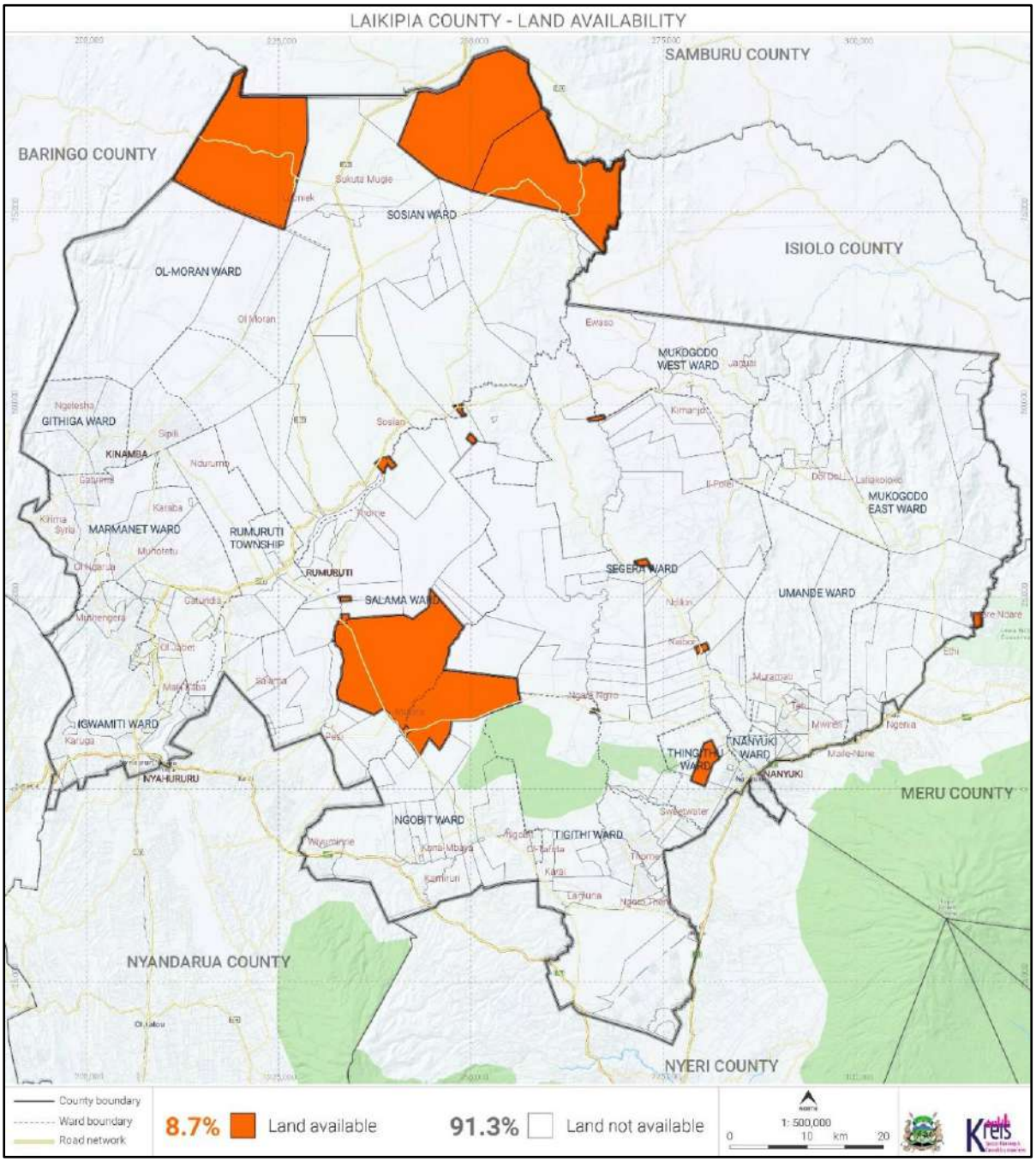
6.3.2 Land Availability Analysis

The mandate of Planning as bestowed by the constitution to the County Governments allows them to exercise their planning jurisdiction on both private and public land. In that regard, any land within a county jurisdiction can be deemed as being available for controlled development irrespective of the tenure regime governing it. However, it is critical to consider various parameters before depicting a scenario where the land within a County could be considered to be wholesomely available for certain levels of development. This is because certain land uses must be omitted from any land that could be considered available for active and immediate development. These include:

a) Any land of a gazetted forest reserve, National Parks etc;
b) Any special purpose area like a military barrack, police installations, training ground etc;
c) Any publicly committed and active land use like an operational university, health facility, public offices, cemetery etc;
d) Any wetland or surface water body including their riparian reserves; and
e) Any other protected site by an Act of parliament for purposes of posterity.

In addition, given the complex procedures involved in the acquisition of private property for public purposes, then, properties held by individuals or corporations privately are omitted in a land availability assessment focusing on depicting any available land for immediate development. Therefore, guided by the parameters above, an assessment of the available land within Laikipia County indicates that just a small chunk, about 8.7% of the County would have land available for immediate development as shown in map 6-3.

Map 6-3: Land Availability



Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

However, it would be worth noting that any undeveloped or inactive public purpose properties would also be deemed available for immediate development on an urgent and need basis. This is because the acquisition of such properties would not pose huge challenges compared to the complex process that would be abided by while acquiring private property.

The measure of land availability is also used to check on the level of support attached to various livelihood systems. For instance, the consolidation of smallholdings belonging to absentee land owners that had previously been subdivided into units of between two and five acres is now being merged to form bigger units of 500 acres and above. Thereafter, the land is sold off and fenced. This further reduces the land available to pastoralists and to squatters who have been using such idle land to graze livestock and grow crops. It leaves them with limited options and increases their vulnerability to food insecurity, as they have to rely on relief food to survive (Letai, 2021).

On various scales, the County's land capacity especially that attributed to supporting livelihood systems including wildlife conservation, livestock production and farming can be increased by the introduction of effective and efficient methods of soil conservation and land management. In the northern and eastern parts where rainfall is insufficient, the introduction of irrigation farming and drought-resistant crops can help to optimize production and improve rural livelihoods. Also, it would be prudent for the government to ensure that crucial land management frameworks are developed to discourage cases such as idle land speculation in Laikipia County. This would mean that maximum utilization is attained for all available land. To complement the land availability assessment, land suitability analysis has been done to outline spatial possibilities of the landscape as detailed in the sections below.

6.3.3 Land Suitability Analysis

Understanding land tenure and land use within the County is key to enabling the proper and efficient use of land as a resource. Land suitability enables public authorities to track land potential, which in turn allows returns to be made on land above its cost of utilization.

The ability of the land to support livelihoods varies across the County. The main parameters of assessment are; agro ecological zones, natural resources availability including water, minerals, energy, flora, fauna, terrain analysis, existing land uses, agricultural production areas, land availability index and protected areas. Almost half of the County is ASAL. These areas can support large-scale livestock production as well as other economic activities related to the same. In an aim to optimize the utilization of land, the County needs to reorganize and adjust land allocation to follow their

capabilities and potentials as well as address concerns arising from the need to protect the environment.

The main economic activities in Laikipia are; tourism which is greatly supported by the vast livestock ranches and wildlife conservancies; together with agriculture mainly on subsistence or horticultural scales. In terms of Agricultural suitability, the County Government of Laikipia disaggregates the County into four distinct categories as outlined in table 6-2.

Table 6-2: Agricultural Land Suitability

Category	2017	2018	2019	2020
Arable Area	1,998.7	1,998.7	1,998.7	1,998.7
Non-Arable Land	7,511.3	7,511.3	7,511.3	7,511.3
Water Mass	22.2	22.2	22.2	22.2
Urban Area	234.3	234.3	234.3	234.3

Source: CGL, 2021

6.3.3.1 Agricultural Suitability

Land in the County has low agricultural potential and this hinders production. Only about 20% of the total land in the County lies in the high and medium potential category where crop cultivation is viable. The total area under crops is about 198,400 ha of which 80% is under food crops. This is equivalent to the estimated arable land by the County Government at about 1998.7 sq. km with the non-arable land/ low potential areas constituting about 7,511.3 sq. km (79% of the total land area). Most of this land is unsuitable for crop farming naturally but suitable for livestock rearing and settlement.

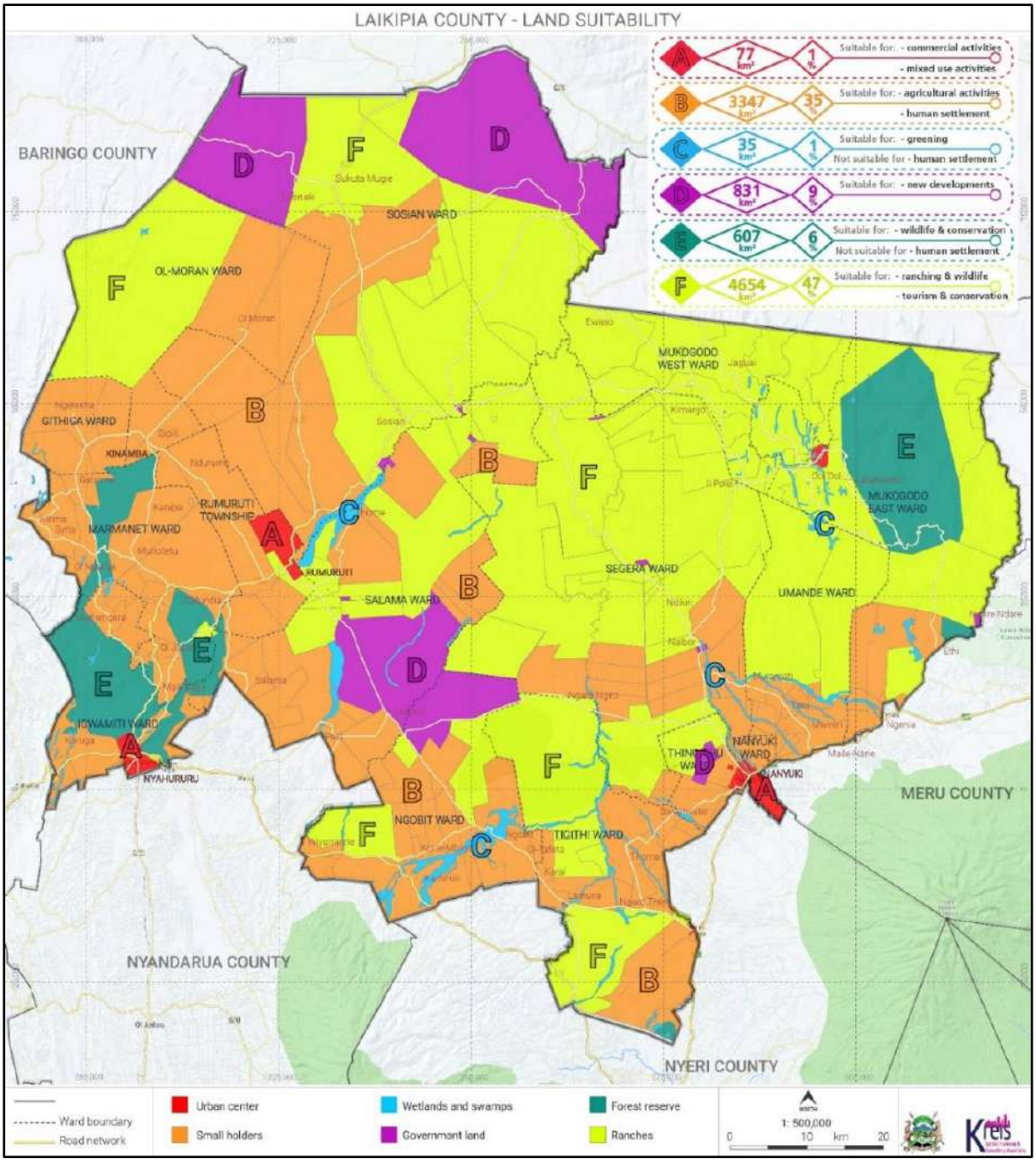
A huge chunk of the arable land, however, is yet to be actively utilized for maximum production. This has been attributed to climatic conditions, land tenure systems, poverty and insecurity which have compromised the confidence in agricultural investments by the resident community.

6.3.3.2 Livestock Ranching Suitability

Livestock keeping is an important economic activity that supports the livelihoods of many communities in the County. Areas classified as marginally capable can support rangeland ranching and livestock production and related activities. Such areas include

Laikipia North and East Sub counties. Map 6-4 below shows the general spatial suitability impression of the County.

Map 6-4: Generalized Countywide Land Suitability



Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

6.3.4 Land Use

There are nine main types of land use categories in the country which are also available within Laikipia County. They include: Agricultural, Commercial, Residential, Industrial,

Educational, Public Utility, Public Purpose, conservation/recreational and Transportation land uses as expounded below.

Table 6-3: Land Use Categories in the County

Land Use	Description	Remarks
Agricultural	It is the dominant land use in the County comprising rangelands, farmlands, forests and grasslands.	Rapidly reducing due to land use conversions, subdivisions and climate change.
Educational	It comprises land both private and public that has ECDEs, Primary and secondary schools and tertiary institutions.	This land use has been on an increase due to increasing population, transition and educational awareness. It acts as available land for citing public social amenities.
Residential	This land use encompasses human settlements. They include single-dwelling units, apartment complexes, and the manyattas.	This land use is on the increase due to the increase in urban and rural populations.
Public Purpose	Land that is occupied by social amenities such as hospitals, churches, social halls, administrative offices, multi-purpose halls and conference facilities.	This land use has the potential for increament through County Government measures of ensuring adequate distribution of social amenities.
Commercial	This type of land is designated for businesses, warehouses, holiday homes, shops and any other infrastructure related to commerce. It is commonly used for office buildings, restaurants, shops and other businesses. And while it usually doesn't take up much space, it's critical to the economy of a community.	This land use is on the increase due to the increase in urban and rural populations and the need for people to set up livelihood survival mechanisms.
Public Utility	Land occupied by power way-leaves, power substations, stormwater drainage, sewer lines, sewer treatment sites, solid waste management sites, fibre optic cable, water pipelines, Base Transceiver Stations etc.	Planning and development control within urban centers are key measures that provide for this land use.
Industrial	Urban-industrial land usage consists of the siting of manufacturing and processing plants, factories, and in rural areas, it includes mines and quarries.	This land use has the potential to increase owing to the conducive environment for industry and innovation in the County including mineral exploration opportunities.

Land Use	Description	Remarks
Transportation	Transport land is designed for the roads, railways, airports/airstrips, walkways, bus stops, intermodal termini and parking facilities that help people and goods get from one destination to the other.	The land use has been on the increase due to the construction of new roads and the improvement of the existing ones for ease of mobility and access to services. With proposal for an airport and more corridors, the land use is set to continue increasing.
Recreation/ Conservation	This includes land set aside for parks, open spaces, athletic fields, playgrounds, stadia and swimming pools. This land provides places for people to relax, engage in sporting activities and hold social functions.	The facilities undergo improvement yearly.

Source: KREIS, 2022

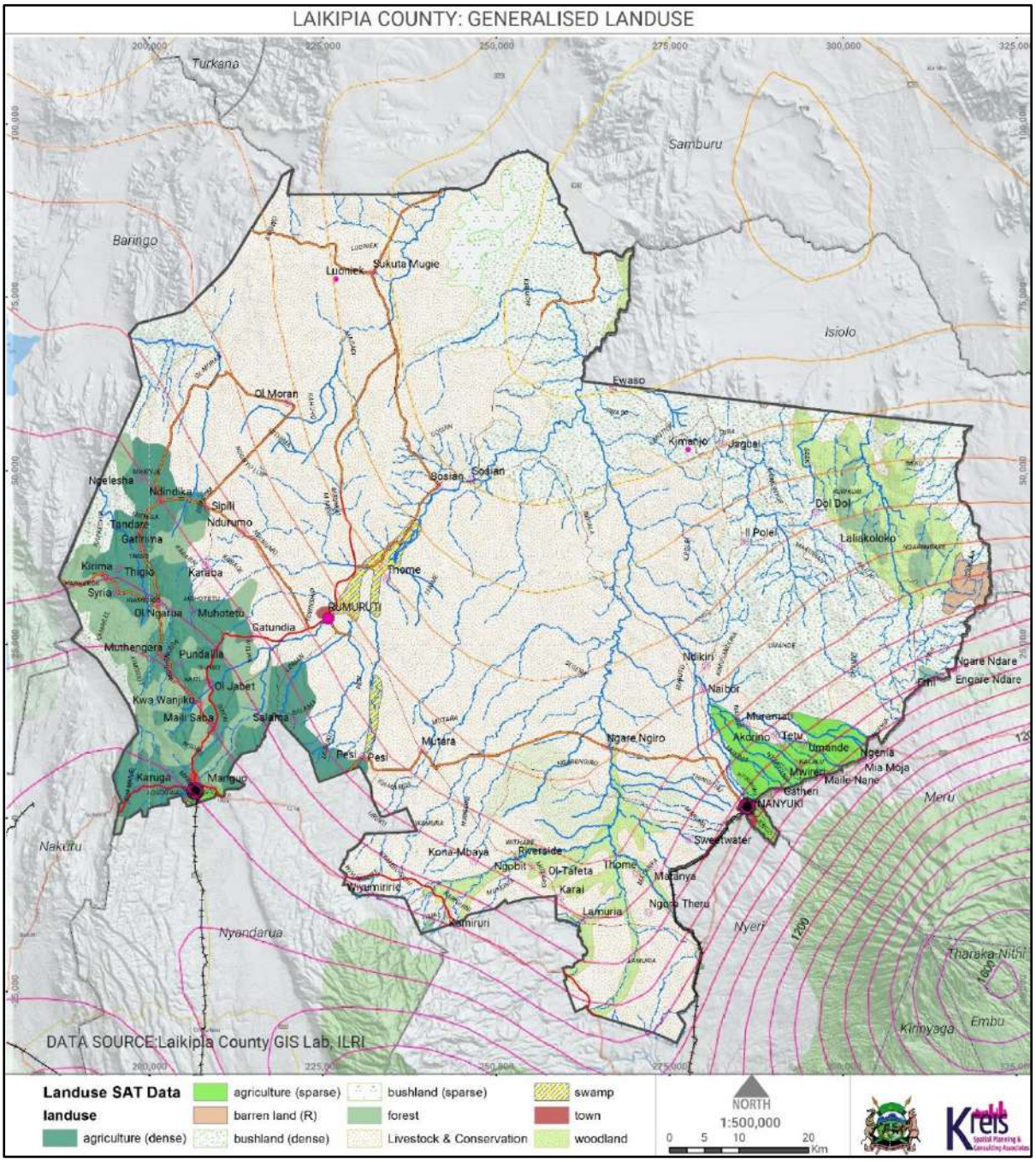
In Laikipia County, there are 7 distinct generalized land use patterns that are mostly influenced by the land tenure structure and human settlement patterns. These mostly revolve around Agriculture (including among others; livestock ranching, pastoralism, mixed farming, irrigated cultivation, horticulture etc); conservation and recreation (rivers, forests, rangelands etc); wildlife conservation and urban-related commercial activities. These are summarized in table 6-4.

Table 6-4: Size and Percentage of Land Area under different Land Use Types

Land use	Area (km2)	%
Mixed Farming	2,133.45	22.01
Pastoralist Grazing Areas	3,103.67	32.01
Ranching	588.21	6.07
Ranching & Wildlife	2,792.00	28.80
Timber, charcoal & informal grazing	416.09	4.29
Urban	81.99	0.85
Wildlife Only	579.38	5.98
Total	9,694.79	100.00

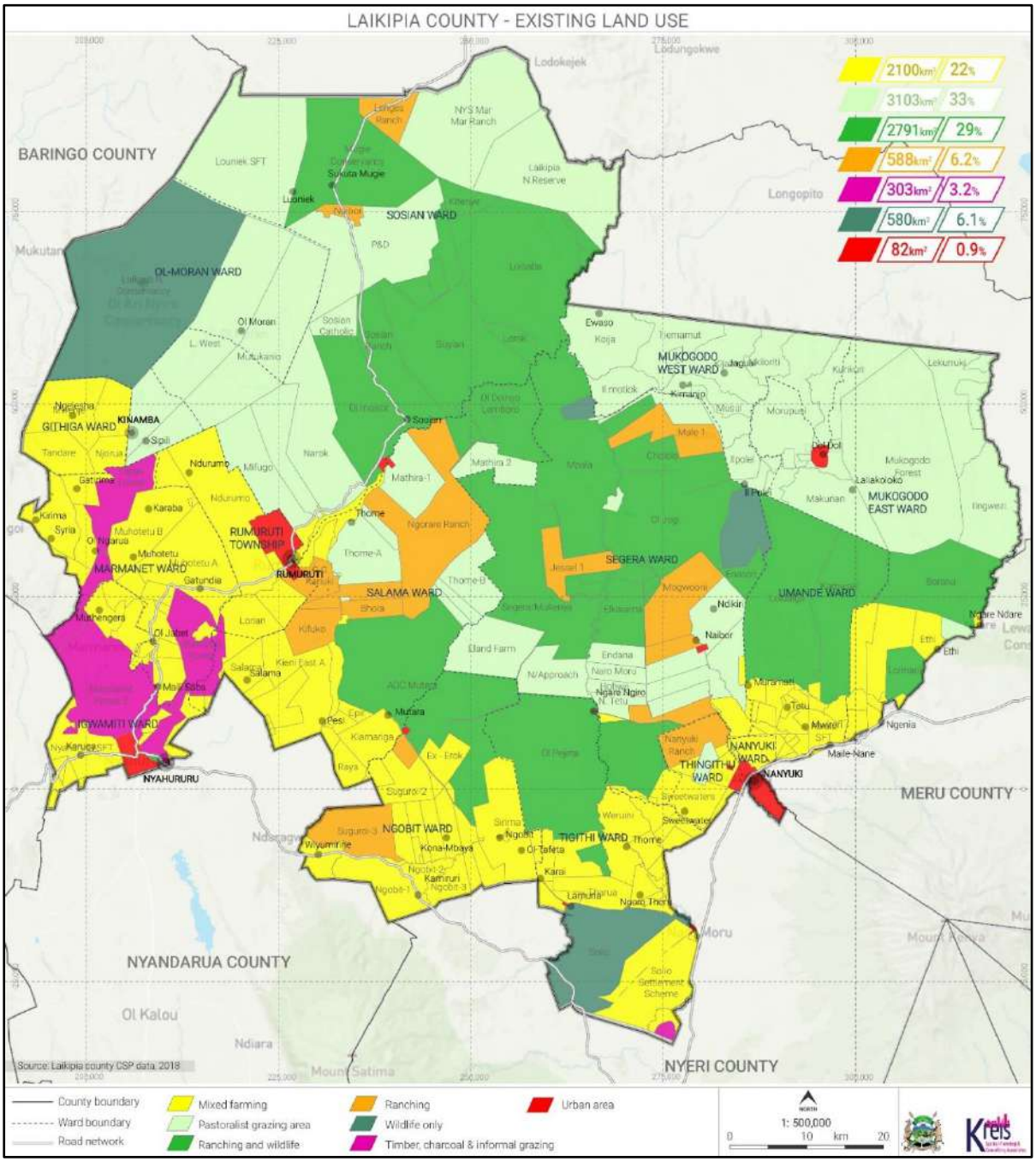
Source: CGL, 2021

Map 6-5: Generalized County Land Use Structure



This generalized land use structure for the County and more particularly, the more specific property boundaries land use structure shown in map 6-5 align with the generalized land suitability map. In the next 10 years, as anticipated in the plan, most developments will continue following the current land use dynamics, but with a guiding framework.

Map 6-6: Existing Land Use Structure



Recurrent drought periods, increased human and livestock populations and inappropriate agricultural and settlement practices are the primary causes of land use changes. The increased number of people searching for economic security in the ASAL has led to intensified cultivation, expansion of cultivated land, overgrazing, and harvesting of trees for fuelwood. The result is deforestation, acute water shortages, loss of biological diversity, soil erosion and most of the resource-based conflicts.

Laikipia has witnessed the emergence of squatters and new settlement schemes such as Solio and Wiyumiririe. The squatters' problem hinders the realization of improved lives for all. There are about 4,712 squatters in the County with 1,021; 1,090; 400 and 2,201 squatters distributed in Kwa Mbuzi, Kahurura, Kandutura and Ontulili villages respectively (CGL, 2021). The prevalence of these squatters and upcoming/ new human settlement areas has a huge impact on the changing land use dynamics within the County. This is because where land tenure is highly limiting, then most of these squatters tend to encroach on public land including forests, and wetland ecosystems leading to their unsustainable utilization in the long run.

Additionally, the human settlement areas induce the need for road development for improved access needs. Once most of the roads are done, they open up more and more areas of the County to development and land speculation accompanied by a change in land use pattern from the predominant agricultural use to human settlements, commercial, education and public purpose. The extent of conversion is usually within a corridor of about 20 km along the road.

6.3.5 Summary

Over the years, the increase in population has resulted in urban sprawl, encroachment into environmentally sensitive areas and loss of natural vegetation in addition to being the major cause of resource-based conflicts. Human activities such as illegal logging and overgrazing have largely contributed to a reduction in the forest cover and grasslands. In those areas occupied by farming communities, forest cover has been exploited either for charcoal burning, firewood or timber production as people look for alternative sources of livelihood. In the smallholdings where pastoralists have land titles, there is constrained mobility leading to overgrazing and slow regeneration. This in turn has led to the degradation of the land and the emergence of unpalatable invasive species of plants like *Prosopis juliflora* that render grazing areas unusable, further compounding the problem of access to pasture in the few areas left for pastoralists to graze.

In the group ranches, the most degraded rangelands are overrun by *opuntia stricta*, an invasive species of cactus whose fruit is harmful to livestock and has caused economic losses. The carrying capacity of group ranches is stretched to the limit, while it is plenty on neighboring private commercial ranches with large tracts of land that are in most

cases underutilized. In that regard, land use planning and zoning are necessary to enhance the land capacity of Laikipia holistically.

This will create settlement zones away from areas mapped as agricultural lands, ecologically sensitive areas, ranches, and public purpose land while allowing for mechanization and other adaptable technologies, which enhance economies of scale and sustainable natural resource use and management.

6.4 Emerging Issues

Sector	Opportunities	Constraints
Land Tenure	▪ Extensive land in the County is suitable for agriculture, livestock keeping and wildlife conservation. ▪ Improvement of land tenure through adjudication, survey, registration and issuance of title deeds will spur more development.	▪ There is declining land productivity due to excessive land subdivision. ▪ There are cases of land degradation due to soil erosion, over-grazing and increased population growth. ▪ Insecurity of land tenure limits land development. ▪ Absentee land ownership leaves the land bare for speculation.
Land Use Management	▪ Land use planning by providing a spatial framework within which development activities can be harmoniously undertaken.	▪ Ownership conflicts limit land use development. ▪ Uncontrolled land subdivision limits the productivity of the land. ▪ Insecurity in some regions forces people to migrate to other areas. ▪ Soil erosion causes decreasing land productivity. ▪ Resource based conflicts

7 HUMAN SETTLEMENTS AND URBANIZATION

7.1 Overview

This chapter presents the existing human settlement structure in terms of the categories, types, nature, distribution and housing typologies within rural and urban settlements in Laikipia County. It gives a detailed analysis of how human settlements determine the spatial location of urban areas and their significance as growth nodes and service centers. It further analyzes the County's urbanization trends and hierarchy of urban centers with their functional specialization.

7.2 Nature and Distribution of Human Settlements

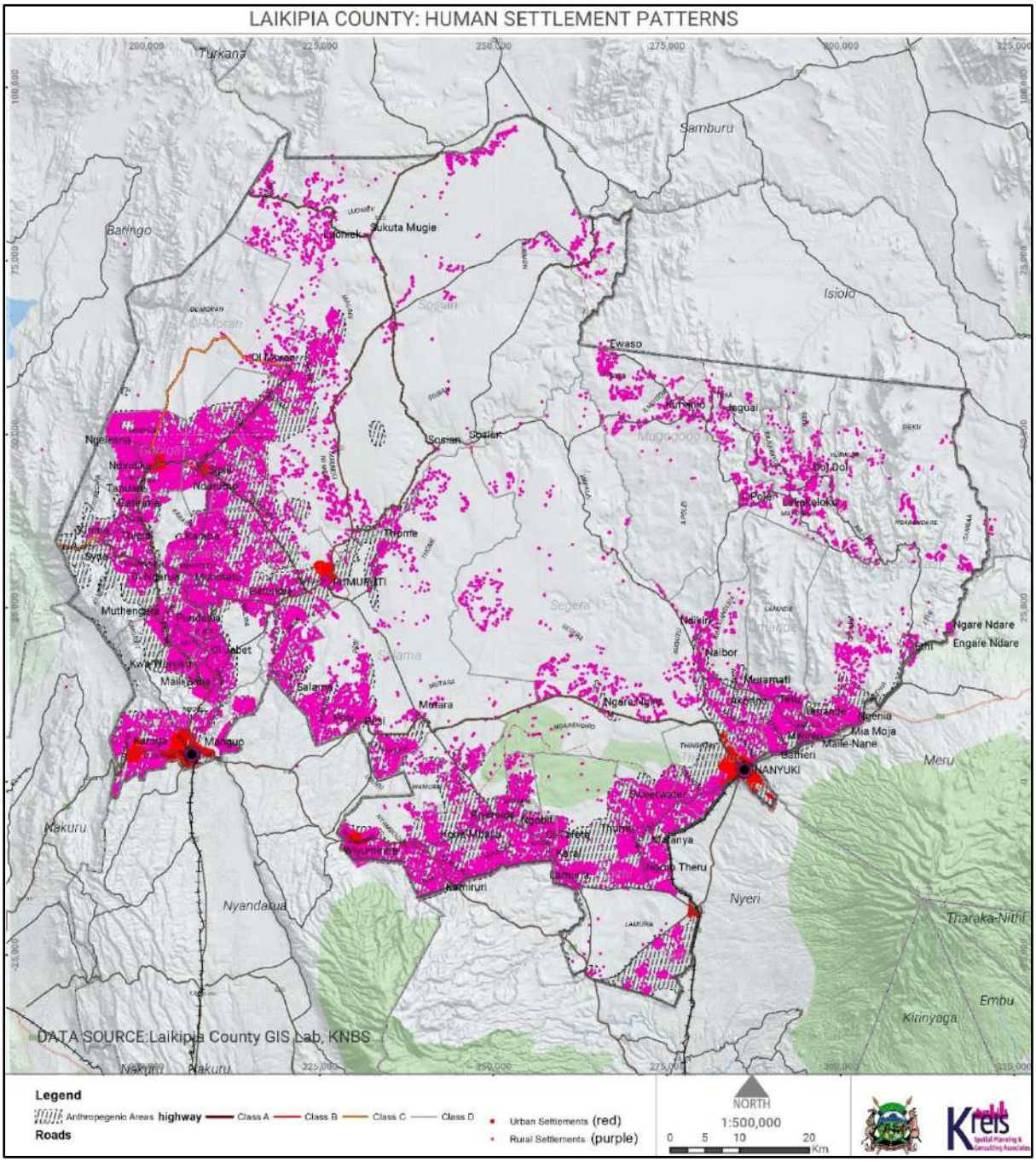
7.2.1 Classification of Human Settlements

Human settlements encompass both the physical structures within which people reside and the social systems within which people interact and are organized. Generally, human settlements are classified within rural and urban contexts, forming rural settlements and urban settlements respectively.

Laikipia County has 2 main categories of human settlements; rural and urban settlements as shown in map 7-1 below. However, majority of the settlements are rural in nature, while urban settlements are concentrated within the main urban centers. There are pockets of informal settlements but mostly found within the environs of established urban centres. They include Majengo, Likii A and B, Maina, African Location in Rumuruti, Debetas, Juakali, Mutara, and Pesi among others.

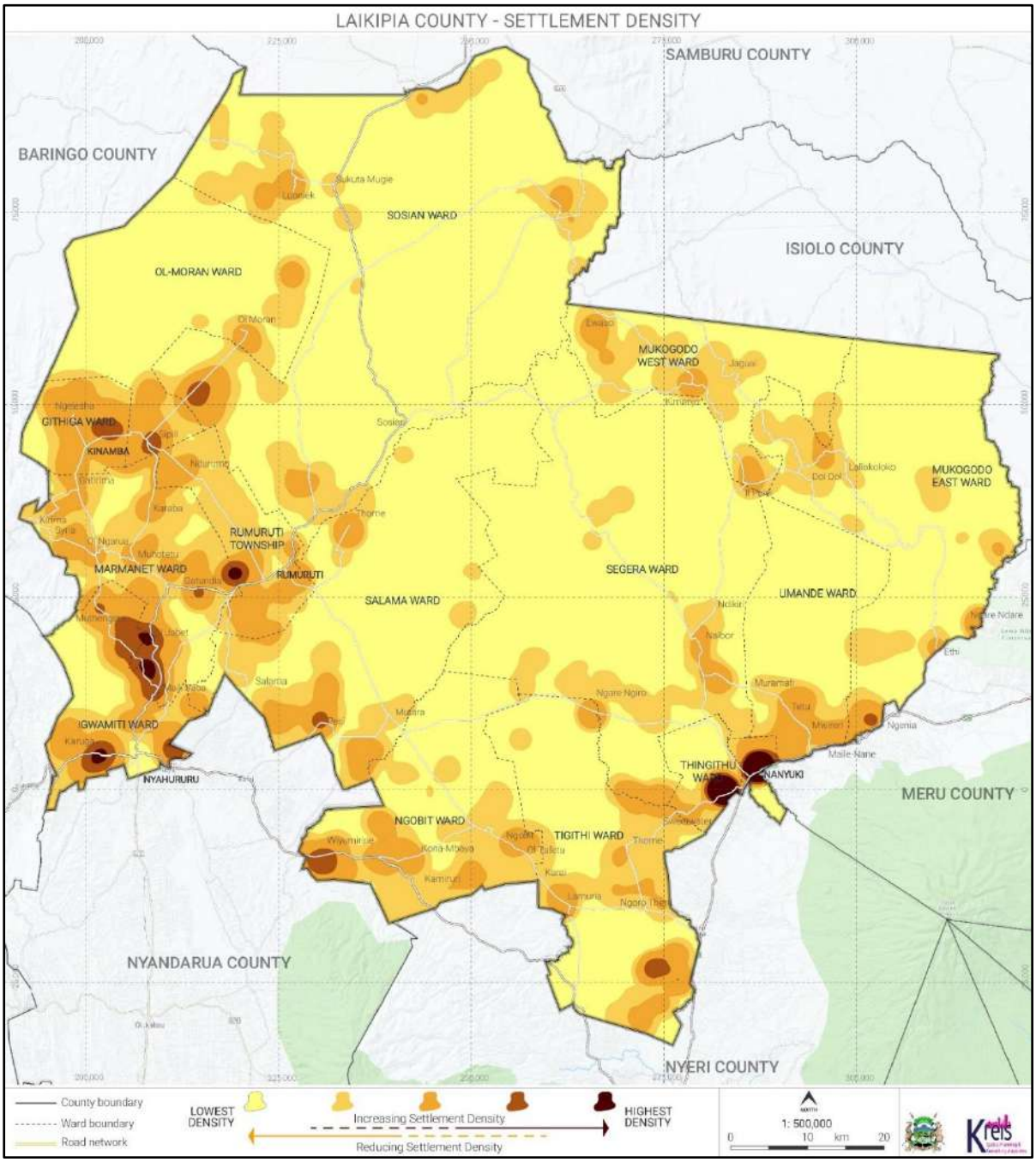
The settlements distribution is such that more human footprint is evident in Laikipia East and West than in Laikipia North. To a large extent, this is attributed to the land tenure structure, favorable land conditions that support agricultural activities, and urbanization trends within the general areas. The maps below show the human settlement distribution and density.

Map 7-1: Classification and Distribution of Human Settlements



Source: KREIS, 2022 (data captured from KNBS, 2019 and Laikipia County GIS lab)

Map 7-2: Laikipia County Human Settlement Density



Source: KREIS, 2022

7.2.2 Human Settlement Patterns

Human settlement patterns refer to the spatial layout of dwelling units and human activities in either a rural or urban setting. The distribution of these settlements is determined by the nature of the physical environment – weather and climatic conditions, terrain, resource availability, and land suitability; economic factors – livelihood zones with a high potential for income generation, investments and

employment opportunities; proximity to services – markets, schools and health centers; and the level of connectivity – transport networks to facilitate movement of goods and services etc.

In Laikipia County, three settlement patterns manifest, they include; nucleated, linear and sparse settlements.

a. Nucleated Settlements

These are settlements in which the dwelling structures/buildings are clustered around central areas such as water sources, wetlands, forests, market centers/service nodes, and road junctions. Nucleated settlements are found within the main urban centers of Nanyuki, Nyahururu, Rumuruti and Kinamba, as well as around the smaller trading centers and markets. The rationale for this settlement pattern is the need to access services, improved sources of livelihoods and employment, and to be within the service radius of infrastructure utilities.

There are nucleated settlements around wetlands within the Ewaso Ng'iro River basin, specifically around Lake Ol Bolossat, Ewaso Narok, Pesi, Marura, Moyok, and Mutara swamps. Over the years, there has been an increase in the number of human settlements around these wetlands, attributable to water availability and fertile soils which support farming activities and livestock keeping. This increase in settlements exerts pressure on the wetlands' ecosystems, significantly affecting their ecological and life support functions.

Plate 7-1: Nucleated Settlement Pattern in Kinamba Town

Source: Google Earth, 2022

These settlements create ease in siting of and access to social services and physical infrastructure because the settlements lie within the range/service radius of these amenities and utilities. However, there are disadvantages such as over-population exceeding available infrastructural utilities, congestion, uncontrolled sprawl into agricultural lands where such settlements lack a zoning guideline or poor enforcement of the same, community/socio-cultural driven conflicts, competition and pressure on available natural resources.

b. Linear Settlements

These are settlements which are structured along a linear feature; either a road, railway line, or a river/stream. In Laikipia County, the settlements are more prevalent along the main transport corridors, especially along the Nanyuki-Nyahururu Road, Nanyuki-Doldol Road, Nyahururu-Ol Ngarua-Kinamba Road, and Nyahururu-Rumuruti-Maralal Road. These settlements have led to the emergence of linear towns such as Maina, Maili Saba, Ol Jabet, Ol Ngarua, Tandare, Sipili, Ol Moran, Gatundia, Maundu Meri, Mouwarak/Posta, Juakali, Naibor, and Kiwanja Ndege among others.

The distribution pattern of these settlements is determined by the need to have ease of access to transport networks and infrastructure utilities like piped water, the national grid electricity coverage and telecommunication Base Transceiver Stations. The main

economic activity of people within these settlements is trade and commerce. These transport corridors provide ease of access to markets for agricultural products, livestock and other commodities such as charcoal.

Other linear settlements are found along the Ewaso Ng'iro River basin, especially along Ewaso Narok, Pesi, Mutara, Suguroi, Burguret, Ngare Narok, Aiyam and Nanyuki rivers. People settle along the rivers and streams to access water for domestic use, livestock and irrigation purposes. The main economic activities within these settlements are crop farming and livestock keeping.

Plate 7-2: Linear Settlement Pattern in Juakali Urban Center

Source: Google Earth, 2022

c. Sparse Settlements

This settlement pattern is characterized by scattered dwelling structures/buildings over a vast area of land. It is common in Mukogodo East, Mukogodo West, Segera and Sosian wards, whose population comprises of mainly nomadic communities residing within community lands and group ranches. These areas have scattered pockets of settlements which are usually concentrated in small villages for security reasons. During extreme dry periods, the men (morans) temporarily migrate in search of water and pasture, leaving women and children behind. In some cases, the entire community migrates abandoning the villages, e.g. Sieku village in Mukogodo East Ward.

Factors that have influenced this settlement pattern are dry weather conditions, rugged terrain, extensive community lands, private ranches and vast wildlife conservancies. Hence, the main economic activity within these settlements is pastoralism.

Sparse settlements are characterized by inadequate provision of social services, transport networks and physical infrastructure. This is because majority of the settlements are located outside the coverage range/service radius of social amenities and utilities. Therefore, people have to travel long distances to access basic social services, examples being in Tassia and Sanga Villages. Mobile clinics such as the Borana Mobile Clinic have helped in the provision of healthcare services and counselling to neighboring local communities in Laikipia North.

Plate 7-3: Scattered Nomadic Settlements in Mukogodo West Ward

Source: Google Earth, 2022

7.3 Characteristics of Rural Settlements

Rural settlements are dwelling units/houses situated within rural areas, and with agriculture being the main economic activity of the local communities. In Laikipia County, rural settlements form the larger percentage of human settlements with nucleated, linear and sparse distribution patterns determined by the available structuring elements. The community structure of these rural settlements comprises villages formed from the clustering of several individual homesteads.

7.3.1 Rural Housing Typologies

Rural housing typologies in the County are influenced by the culture of local communities and the availability of construction materials. The main housing typology is single dwelling units characterized by wood, brick or stone walls; concrete or earth floors; and iron sheets or grass-thatch as the main roofing materials. The house type for the pastoral Maasai community is the *manyatta.*

Plate 7-4: A Typical Rural Homestead

Source: KREIS, 2022

Rural homesteads are generally characterized by the main house (usually with a detached kitchen), a granary/storage facility, pit latrine, cattle shed (for those practicing livestock rearing), a poultry pen, and farmland whose sizes vary according to individual households. Lack of tenure security limits permanent developments within these rural settlements. Their main economic activities are crop farming – either small-scale or large-scale and livestock keeping. Beekeeping has become common in areas within Mukogodo East, Mukogodo West, Segera and Githiga wards. Since the County is an eco-tourism hub, holiday homes/bandas, cultural manyattas and cottages are popular within the wildlife conservancies and ranches.

Plate 7-5: Cultural Cottage

Source: KREIS, 2022

7.3.2 Rural Housing Density

There is low housing density within rural settlements as compared to that of urban settlements. Laikipia North Constituency has the least rural housing density due to the nomadic nature of the communities and the sparse settlement pattern. Laikipia West and East constituencies have relatively high rural housing densities due to nucleated settlements and favorable weather conditions that support agricultural livelihoods.

7.4 Characteristics of Urban Settlements

Urban settlements are residential buildings/houses situated within and around urban centers. In Laikipia County, these settlements are found within the major trading centers and are characterized by rapid social change and modernization, cultural heterogeneity, and occupational specialization. The distribution pattern of these settlements is nucleated or linear depending on the available structuring elements, and access to social services and infrastructure utilities is high.

7.4.1 Urban Housing Typologies

There are several housing typologies ranging from single-dwelling units, to multi-storey houses, mixed-use buildings, and high-rise apartments. Majority of the rural centers have single-dwelling units and horizontal mixed-use buildings. Multi-storey, vertical

mixed-use buildings and high-rise apartments are the housing typologies common within the urban centers of Nanyuki, Nyahururu and Rumuruti towns. The main materials are building blocks or clay bricks for walls, iron sheets or versatile steel tiles for roofing, and concrete or floor tiles.

In line with the National Government's development agenda of affordable housing, the County Government of Laikipia in partnership with the National Housing Corporation has planned to construct 2,000 affordable units in Nanyuki, Nyahururu, Rumuruti, Wiyumiririe and other towns in the County. The proposed construction site for affordable housing in Nanyuki Town is along the Nanyuki-Marura road, off the Nyeri-Nanyuki road.

7.4.2 Urban Housing Density

Urban settlements in the County have a high housing density. Laikipia North Constituency has a relatively low urban housing density since it has one major urban center (Doldol), as compared to Laikipia West and East constituencies whose urban housing density is high owing to the presence of Nyahururu, Rumuruti, Kinamba and Nanyuki major towns. Demand for housing in these urban centers is high, attributable to the exponential increase in urban population.

7.5 Hierarchy of Human Settlements and Service Centers

The resident population and spatial distribution of human settlements in an area determine the type and level of service centers within and around them. According to the Human Settlement Strategy of 1978 and the Physical Planning Handbook of 2007, there are four categories of service centers within human settlements as detailed below:

a. Urban Center

Also referred to as a major center, it forms the highest category of a planned center with a capacity to serve its rural hinterlands. It has a resident population of at least 5,000 people and is intended to serve a catchment population of 100,000-150,000 people. Services and facilities provided for in urban centers include commercial offices, library, post office, cinema halls, fire station, an assembly hall, police station, sports and recreational center, bus station, a hospital, 50-60 shops of general convenience goods, 4-5 major supermarkets or departmental stores, 4-5 banks, and 1-2 restaurants/hotels.

b. Rural Centre

This center is comparable to an intermediate center in urban areas. It has a residential population of between 2,000-10,000 people and is planned to serve a catchment population of 15,000-50,000 people. Service provisions and facilities for a rural center are commercial offices, health center, social hall, community center, secondary school, industrial estate, markets of various categories, a post office, petrol stations, 4-5 general shops, 2-3 butcheries, 1-2 fruit and vegetable shops, 1-2 stationery shops, 1-2 cafes, bars and hairdresser/barber shops.

c. Market Centre

It has a residential population of less than 2,000 people. It is envisioned to approximately serve a population of 15,000 people. Facilities for provision in market centers are 2-3 general shops, 1-2 tailor shops, 1 butchery, 1 bar, sub-post office and parking areas. Adjacent and interdependent facilities include markets of various categories, kiosks, a primary school, a health center with family planning services, a youth polytechnic center and a secondary school.

d. Local Centre

This is the lowest level of service centers designated to serve the local needs of people within a walking distance. Its catchment population is 5,000 people within rural areas. Facilities for provision in local centers are a primary school, kiosks, general shops, tailor shops, butchery, bar, sub-post office and parking area.

The resident population, catchment population, nature of services and level of service delivery increase as one ascends the settlement's hierarchy. Table 7-1 below outlines the hierarchy of service centers in Laikipia County.

Table 7-1: Hierarchy of Human Settlements and Service Centers

Constituency	Urban Center	Rural Center	Market Center	Local Center
Laikipia East	Nanyuki Wiyumiririe Matanya	Lamuria Kalalu Ngobit Mirera Umande Mutara Pesi	Solio	Thuthuriki

Constituency	Urban Center	Rural Center	Market Center	Local Center
Laikipia West	Nyahururu Rumuruti Kinamba	Ol Moran Sosian Sipili Ol Ngarua Marmanet Karuga Ol Jabet Thome Gatundia	Survey Maina Maili Saba Tandare Shamenei	Maundu Meri
Laikipia North	Doldol	Naibor Il Polei Mouwarak/Posta Louniek	Chumvi Juakali Kimanjo Kiwanja Ndege	Ewaso Mwireri Muramati

Source: CGL, 2022

The radius of influence of the urban and rural centers in the County, gives the range people travel to access basic goods and services. The urban centers offer the highest level of services and usually have administrative, industrial, residential and recreational functions. They provide a wide range of employment opportunities in both formal and informal sectors and also act as key transport hubs within the larger regional context.

7.5.1 Rural-Urban Linkages

Rural-urban linkages play an important role in the local economies and livelihoods of people. A range of environmental, social, political, economic and cultural changes contribute to the increase of rural-urban livelihoods over time. These include economic development, improved technical and infrastructural connectivity between rural and urban people and places, and the changing expectations and aspirations of women and young people. People leave rural areas because of land shortage, low agricultural productivity, poverty, war and natural disasters, and migrate to urban areas in search of employment, education and a 'modern way of living'.

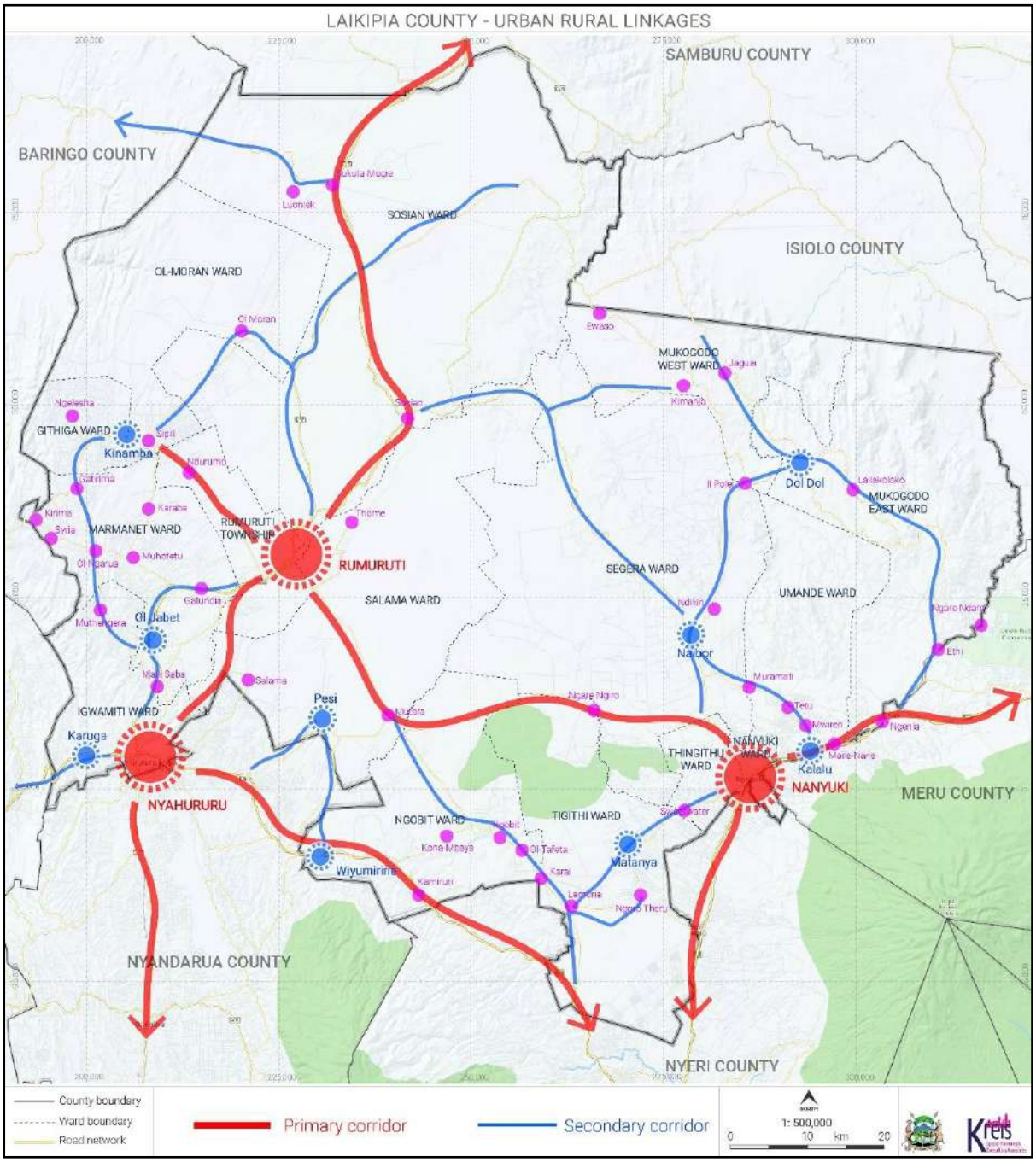
These linkages take the form of an exchange of goods and services associated with livelihoods and production. They encompass various kinds of resource flow – principally labor, natural resources, commodities, and financial flows. There is an exchange of raw materials and finished or semi-finished goods, whose sources are found in rural areas and urban areas respectively. Whereas urban areas facilitate extractive processes in rural areas, rural areas facilitate manufacturing in urban areas. The exchange

of labor is driven by urban centers' need for human resources – which rural areas have in abundance, especially in the semi-skilled and unskilled categories.

Rural-urban linkages in Laikipia County comprise the flow of people, goods and services between the main urban centers and the rural, market and local service centers, as well as with the rural hinterlands. The urban centers act as nodes, attracting various uses within and around them. They are relatively adequately served with social services and infrastructural utilities as compared to the smaller service centers. In Laikipia County, the circulations are centered within the main towns of Nanyuki, Nyahururu and Rumuruti. These centers are activity nodes which serve the County as well as the larger regional area.

A key facilitator of rural-urban linkages in the County is the connectivity through transport networks. The Nanyuki-Nyahururu, Nyahururu-Kinamba and Nyahururu-Rumuruti-Maralal roads form the major transport corridors for the flow of people, goods and services. Nanyuki's strategic location allows for linkages to Nyeri and Meru counties, Nyahururu serves both Laikipia and Nyandarua counties, while Rumuruti serves Laikipia, Baringo and Samburu counties as shown in Map 7-3 below.

Map 7-3: Urban-Rural Linkages



Source: KREIS, 2022

7.6 Urbanization

7.6.1 Urbanization Trends

Urbanization generally refers to the increase in the number of the urban population. This increase is caused by the natural increase of people through births and rural-urban migration. According to the United Nations Human Settlements Programme, by 2020

Kenya's urban growth rate was 4.23% and projections show that more than half of the total population of the country will be living in urban areas by 2025.

As was discussed earlier, the total urban population in Laikipia County was 127,360 persons in 2019. Projections for 2026 and 2031 were 152,947 and 174,305 persons respectively, indicating a gradual increase. The majority of this population resides in the County's main urban centers.

7.6.2 Impacts of Urbanization

As urban centers grow in size and functionality, several positive impacts are realized such as increased employment opportunities, improved access to social services – better healthcare and education, improved standards of living, and access to public infrastructure utilities. In Laikipia County, the chances of securing either formal or informal employment are higher within urban settlements as compared to within rural settlements. This is attributed to the numerous activities and investments in trade, commerce, agro-processing, manufacturing, tourism and hospitality sectors in urban centers.

However, challenges arise when the rate of urbanization is not in tandem with the provision of social services and utilities. These include urban poverty, informal settlements, poor spatial order, traffic congestion, insecurity, competition for resources, environmental pollution and exerting immense pressure on the surrounding agricultural lands. There are also rapid land use changes due to urban sprawl that are evidenced by the conversion of land from the predominant agricultural use to commercial and residential uses.

With specific reference to housing, the increase in the urban population is not matched by an increase in the supply of adequate and affordable housing units. This has resulted in the growth of informal settlements within various urban centers as detailed in table 7-2 below. These informal settlements lack adequate infrastructure for water, sanitation and stormwater drainage. The exponential expansion and densification of these settlements cause sub-standard levels of public health and hygiene.

Table 7-2: Informal Settlements within Urban Centers

Name and Area of Informal Settlement	Land Tenure	Status of Tenure Regularization	Level of Development (Type of Structures)	Government Interventions in the Settlement
Majengo (21Ha) and Likii A (80Ha)	Public	Planning and survey have been done.	Semi-permanent single-storey structures.	▪ NLC to hasten issuance of allotment letters and leases. ▪ Laikipia County Government to provide ownership documents. ▪ Upgrading of housing units.
Maina (10Ha)	Public	Planning and survey have been done, but the plan is not approved.	Semi-permanent single-storey structures.	
African Location (170Ha)	Public	Planning and survey have been done.	Temporary single makeshift units.	▪ NLC to hasten issuance of allotment letters and leases. ▪ Laikipia County Government to provide ownership documents ▪ Titling process is ongoing. ▪ Upgrading of housing units.
Likii B (39Ha)	Public	Planning and survey have not been done.	Semi-permanent single-storey structures.	▪ NLC to hasten issuance of allotment letters and leases.
Thigio (0.5Ha) Kinamba-Sosian (1Ha) Debatas (2Ha) Juakali (2Ha) Mutara (3Ha) Pesi (1Ha) Kanyoni (17Ha) 3 Villages in Doldol (100Ha)	Public	Planning and survey have not been done.	Temporary single makeshift units.	▪ Laikipia County Government to plan, survey the area and allocate. ▪ Upgrading of housing units.

Source: CGL, 2022

The semi-permanent and temporary makeshift structures are attributed to a lack of tenure security. The County Government has so far conducted surveys and urban planning exercises in Majengo, Likii A and B, Maina and African Location informal settlements. These development control measures will ultimately result in the upgrading of the settlements through improved provision of social services and infrastructure utilities.

Plate 7-6: Informal Settlements

Source: KREIS, 2022

7.6.3 Classification of Urban Centers

The Urban Areas and Cities Act of 2011 (Amendment of 2019) classifies urban areas into four categories namely; city, municipality, town and market center as detailed in table 7-3 below.

Table 7-3: Categories of Urban Centers

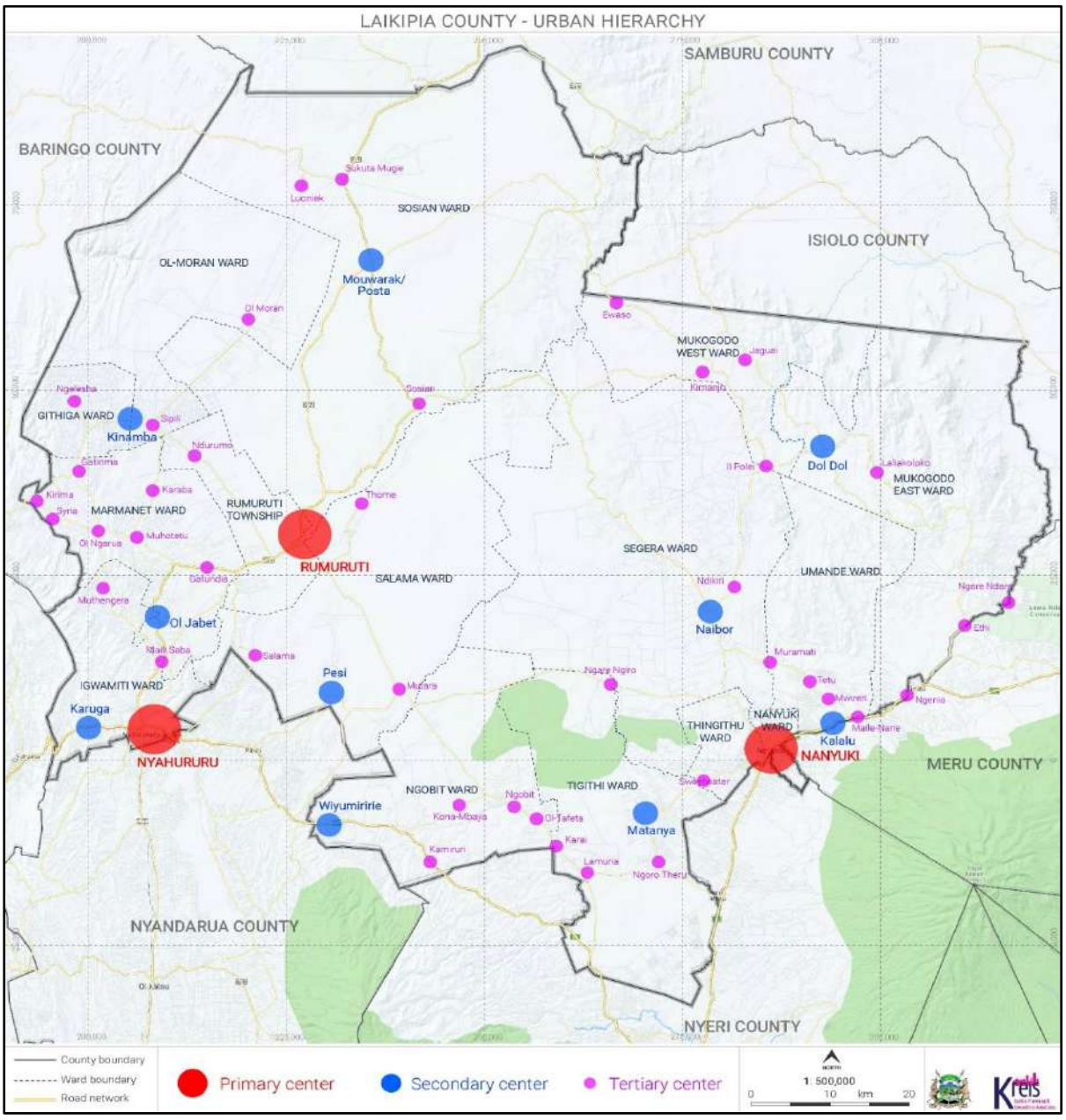
Category	Resident Population	Services to be Provided
City	At least 250,000	Planning and development control, city economic development plan, traffic control and parking, water and sanitation, street lighting, outdoor advertising, cemeteries and crematoria, public transport, library services, stormwater drainage, ambulance services, health facilities, fire-fighting and disaster management, control of drugs, sports and cultural activities, electricity and energy provision (gas, kerosene, biomass etc.), abattoirs, refuse collection, solid waste management, pollution (air, water, soil) control,

Category	Resident Population	Services to be Provided
		child care facilities, pre-primary education, local distributor roads, conference facilities, community centers, county hospital, constituent university campuses, polytechnic, national school, stadium, airport, airstrip, theatre, administrative seat, financial hub, museum, historical monument, postal services, funeral parlor, recreational parks, management of markets, animal control and welfare, religious institution, organized public transport, ICT and telecommunication services.
Municipality	At least 50,000	Planning and development control, traffic control and parking, water and sanitation, street lighting, outdoor advertising, cemeteries and crematoria, public transport, libraries, stormwater drainage, ambulance services, health facilities, fire-fighting and disaster management, control of drugs, sports and cultural activities, electricity and energy provision (gas, kerosene etc.), abattoirs, refuse collection, solid waste management, pollution (air, water, soil) control, child care facilities, pre-primary education, local distributor roads, community centers, county hospital, constituent university campuses, polytechnic, county school, stadium, airstrip, theatre, library/ICT services, administrative seat, local economic development plan, museum/cultural centers, telecommunication/postal services, funeral parlor, recreational parks, animal control and welfare, religious institution.
Town	At least 10,000	Street lighting, cemeteries and crematoria, library services, health facilities, sports and cultural centers or facilities, abattoirs, refuse collection, solid waste management, pollution (air, water and soil) control, child care facilities, pre-primary education, community centers, vocational institution, primary or high school, bus park, road network, streets, walkways, sideways and cycle ways, postal services or telecommunication, funeral parlor or mortuary, recreational parks, animal control and welfare, religious institution.
Market Center	At least 2,000	Street lighting, health facilities, sports and cultural centers/facilities, abattoirs/slaughterhouses, refuse collection, solid waste management, childcare facilities, pre-primary education, community centers, primary school, bus park, road networks, streets, walkways, sideways, cycleways, recreational parks, animal control and welfare.

Source: Urban Areas and Cities Act, 2011 (Amendment of 2019)

Regarding the above categorization of urban centers, Laikipia County has 1 municipality (Rumuruti) and two major towns namely; Nanyuki and Nyahururu. The general hierarchy of urban centers in the County is as shown in map 7-4 below.

Map 7-4: Urban Hierarchies



Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

Rumuruti Municipality

Rumuruti is the only urban center with a municipality status in Laikipia County. It is also the gazetted County headquarters, owing to its central location and ease of access from all parts of the County. It is situated along the Nyahururu-Maralal Road. The urban

center has existing national government and county houses, low and high-density residential areas, meat processing and Juakali industries, education facilities (pre-primary, primary, secondary and a polytechnic), a recreational garden, open space and stadium, County offices, district headquarters, prison facility, district hospital, NYAHUWASCO service provider, police station, social hall, open-air market, wholesale market, livestock market and cattle auction yard, commercial zone, public water tank and pump house, bus park, paved access roads, street lighting and numerous religious facilities.

Rumuruti Municipality has a proposed Local Physical and Land Use Development Plan for the period 2021-2031 which provides for the establishment of low, medium and high-density residential houses, an Export Processing Zone, a Special Economic Zone, hides and skins banda, light industrial warehouses, educational facilities including a Laikipia University campus, community center, conservation area, green park, Laikipia people's park, stadium and playground, showground and recreational park, a one-stop business center, County administration offices, cultural center, disaster management office, dispensary and Mama Lucy Referral Hospital, fire station, high court, museum, techno hub, sewerage treatment plant, cemeteries and crematorium, a railway station, parking areas, bus parks and matatu terminus.

Nanyuki Town

The town is situated north of the Equator at 01'0.000"N, 374'0.120"E and 1,976m above sea level. It is a colonial center which was established in 1907 by British Settlers. It is served by a meter gauge railway from Nairobi which was constructed in 1930. Nanyuki Town was the initial County headquarters, housing County and Administrative offices. It has a military function since it is the main airfield of the Kenya Air Force, and houses the British Army Training Unit Kenya (BATUK).

The town has an existing railway station, commercial zone, industrial park, open-air market, prison facility, police station, law courts, road network, streets, walkways and cycleways, parking areas, educational facilities, Nanyuki Teaching and Referral Hospital, agro-processing and manufacturing industries, stadium, hospitality services, postal services, bus park and matatu terminus, airfield/airport, NAWASCO service provider, informal settlements, and numerous religious institutions.

However, the existing plan for Nanyuki Town was prepared in 1991 and does not correspond to the current development status and needs of the town. The County Spatial Plan, therefore, highlights the need for the preparation of a Local Physical and Land Use Development Plan for the town, as well as boundary delineation and upgrading to municipality status owing to its increasing urban population.

Nyahururu Town

This is a colonial town that was established by white settlers. Due to its favorable weather conditions, Nyahururu plays a significant agricultural function in the County. It is easily accessible via a road network comprising the Nyeri-Nyahururu road and the Nyahururu-Rumuruti-Maralal road. It is also served by the 78km Gilgil-Nyahururu meter gauge railway line.

The town has a County referral hospital, mortuary, police station, stadium and playground, educational facilities including Nyahururu Kenya Medical Training College and Laikipia University Town Campus, commercial zone, prison facility, law courts, sports facilities, tourist sites, road network, streets, walkways and cycleways, Administrative and County offices, open-air market, bus park and matatu terminus, railway station, parking areas and numerous religious institutions.

However, the 1991 draft plan for Nyahururu Town was never approved, and therefore the existing approved plan is for 1977. This plan is outdated and does not correspond to the current development status and needs of the town. The County Spatial Plan highlights the need for the preparation of a Local Physical and Land Use Development Plan for the town, as well as boundary delineation and upgrading to municipality status owing to the high and increasing urban population.

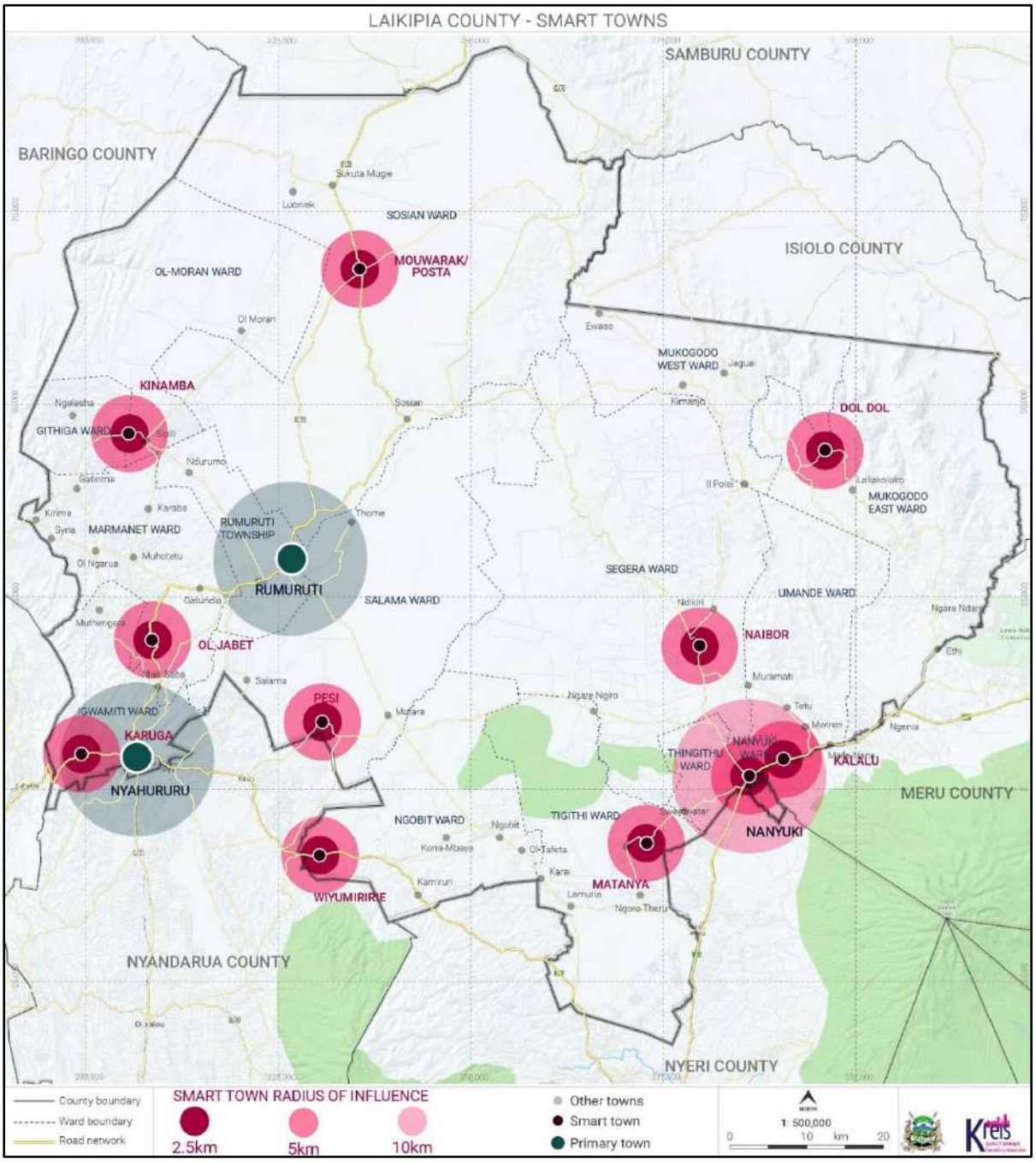
7.6.4 Growth Centers

Growth centers are nodes with the potential of inducing numerous economic activities within and around them, and with the capacity to accommodate more growth and development within the wider regional context. The County Government identified several growth centers that were to be upgraded to modern towns through the Smart Town Initiative of 2018-2022. These centers include Nanyuki, Kinamba, Wiyumiririe, Karuga, Ol Jabet, Matanya, Pesi, Kalalu, Naibor, Doldol and Mouwarak/Posta as

shown in map 7-5 below. The radius of influence of each center is given as well, showing zones of confluence between neighboring centers. Such zones have a high potential for economic growth and development due to the concentration of trading activities and investment opportunities.

The urban centres have been prioritized for land use planning and infrastructure improvement as an approach to attract more investments into the County. Through this initiative, each of the identified towns is planned to have public sanitation facilities, well-paved roads with good drainage, paved markets, pedestrian walkways, parks, recreational areas, street naming and address systems, internet hotspots, social halls and well-marked parking bays in well-kept green environments.

Map 7-5: Urban centres and their Radius of Influence



Source: KREIS, 2022

The majority of urban centers in the County lack land use plans, while others such as Nanyuki and Nyahururu towns have outdated land use plans. The County Spatial Plan, therefore, highlights the need for land use planning of the urban centers, as an approach to guide sustainable urban growth and development in the County. It also identifies the need to have a Land Management Strategy for Laikipia County that will provide for the preparation of a County Land Use Policy, regularization of land tenure in informal

settlements, preparation of land subdivision guidelines, preparation of land use plans for the urban areas, reclamation of grabbed public land, and delineation of urban boundaries.

7.7 Emerging Issues

Sector	Opportunities	Constraints
Human Settlements	▪ Rural settlements provide food security through crop farming and livestock keeping, especially in Laikipia East and West constituencies. ▪ Urban settlements provide avenues for social change, modern ways of living and occupational specialization. ▪ The main transport corridors facilitate rural-urban linkages within the County and the larger regional context.	▪ Sparse human settlements in Laikipia North Constituency limit the provision of social services and infrastructure utilities. ▪ Insecurity of tenure limits development within both rural and urban settlements in the County. ▪ Insecurity arising from conflicts between farmers and pastoralists in Ol Moran Ward causes displacement and migration of people.
Urbanization	▪ Urban centers provide avenues for employment opportunities, improved access to social services, improved standards of living, and access to public infrastructure utilities. ▪ Identified growth centers and urban centres will spur more socio-economic development and investments in the County.	▪ Urbanization is not in tandem with the level of provision of social services and infrastructure within the urban centers. ▪ Due to an inadequate supply of housing, there are pockets of informal settlements within the urban centers. ▪ Majority of the urban centers lack land use plans and some have outdated plans that do not respond to the current development needs.

8 ECONOMIC BASE

8.1 Overview

Understanding the spatial character and distribution of economic activities over the County's geographic area and how each activity contributes to the economy is fundamental. The wealth of Laikipia County lies in its natural capital depicted by unique physiography, varied climatic conditions, and ecological biodiversity encompassing wildlife, vegetation, water resources, and wetlands. This natural resource base acts as the defining element of the spatial framework within which economic activities are grounded. The economic welfare and livelihoods of the County's population, with specific reference to the rural population, are primarily dependent upon the distribution of natural capital. This makes agriculture, tourism, and associated service activities, trade, and commerce (of fresh farm produce, livestock, and livestock products), agro-processing and value addition industries, and mining and quarrying the key natural resource-based economic activities in the County.

Its additional economic vibrancy is brought about by the wealth of man-made capital namely road networks, railway connectivity, airport/airstrips, industrial zones/parks, commercial zones, reliable energy sources, and telecommunication services. These physical infrastructure utilities and provisions create an enabling environment that attracts investments and encourages local businesses to thrive; by enhancing the flow of people, goods, and services in the County, and within the larger regional context.

Moreover, Laikipia County is a member of the Central Kenya Economic Bloc (CEKEB) which cumulatively contributes 26.3% of the country's GDP. It consists of ten-member counties located within the larger Mount Kenya region, namely; Embu, Kiambu, Kirinyaga, Laikipia, Nakuru, Nyandarua, Nyeri, Meru, Murang'a and Tharaka Nithi. This bloc is intended to create a shared trading environment that will encourage inter-county trade and help them leverage economies of scale. It will also provide an advantageous environment in which local businesses will thrive, ultimately empowering the region economically (CoG, 2022).

8.2 Agriculture

Agriculture is the pillar of the County's economy as it contributes significantly to the Gross County Product (GCP) through employment creation (self-employment and

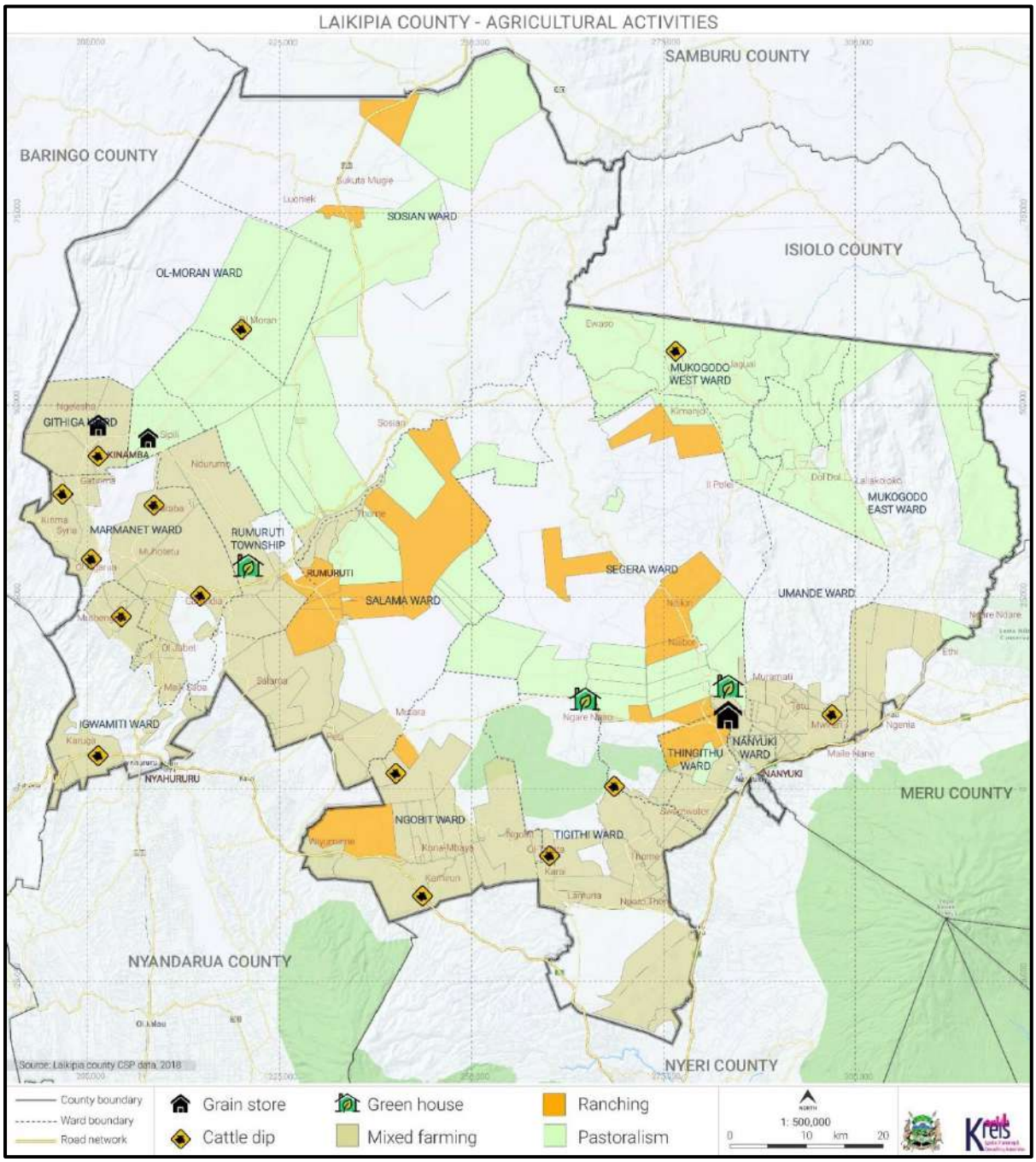
casual labor), income generation, trading activities especially for fresh produce and livestock products, purchasing of agricultural inputs (seeds, fertilizers, and equipment) and in many other ways along the value chain. In 2017, its contribution to the GCP was Ksh. 35,489 million (KNBS, 2019).

According to the Laikipia County Statistical Abstract 2021, agriculture is the main source of livelihood for the majority of people. This sector employs the largest share of the population, with a total of 158,361 persons having it as the main form of employment in the County. The highest number of people (47,890 persons) employed in the agricultural sector are in Laikipia West Subcounty, while Laikipia North has the least at 13,619 persons because of unfavorable climatic conditions. Other than employment, this sector also creates a path towards hunger, malnutrition, and poverty eradication in rural areas, by providing nutrition and food security.

The County is dependent on rain-fed agriculture. Overall, 74,338 households across the County engage in farming. The distribution of households practicing farming per subcounty is 18,787 households in Laikipia Central; 13,192 households in Laikipia East; 5,898 households in Laikipia North; 24,338 households in Laikipia West; and 28,514 households in Nyahururu (Laikipia County Statistical Abstract, 2021). The high numbers of households doing farming in Nyahururu, Laikipia West, and Laikipia Central subcounties are attributed to the favorable climatic conditions. On the other hand, Laikipia North Subcounty has the least number of households engaging in farming due to the dry and unfavorable weather conditions.

The County's agricultural production is further sub-divided into crop farming (based on the level of production - either large-scale farming for commercial purposes or small-scale farming for subsistence basis), livestock keeping (especially for the pastoralists and ranch owners), mixed farming with livestock husbandry, agro-forestry, fish farming, beekeeping, and intensive horticulture farming as shown in map 8-1 below.

Map 8-1: Distribution of Agricultural Activities



Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

The actual acreage of agricultural land is 1,984 km², representing 21% of the county's total land mass (CIDP, 2018-2022). Majority of the areas have arable farming lands thus increasing agricultural potential as shown in table 8-1 below.

Table 8-1: Agricultural Land Potential by Area and Constituency in 2020

Constituency	High-Potential (Ha)	Medium-Potential (Ha)	Low-Potential (Ha)	All Other Land (Ha)	Total (Ha)
Laikipia East	87,420	4,360	10,470	42,570	144,820
Laikipia West	184,560	42,952	13,895	16,543	257,950
Laikipia North	255,874	54,750	228,658	4,148	543,430
Total	**337,854**	**102,062**	**253,023**	**63,261**	**946,200**

Source: Department of Agriculture, Livestock and Fisheries, CGL

Laikipia North Constituency has the largest portion of high-potential arable land. This is because it has bare land in which no cultivation has been done on it, as its population relies mainly on nomadic livestock keeping. This region also has the highest portion of low-potential land due to dry weather conditions and soil degradation arising from overstocking and overgrazing.

8.2.1 Crop Production

The agro-ecological zones in Laikipia County have favorable climatic conditions for agriculture, as shown in table 8-2 below.

Table 8-2: AEZ Agricultural activities

Zone	Wards	Dominant Activities
Upper Highland Sub-Humid (UH 2-3)	Igwamiti, Githiga	Dairy farming, fish farming, crop farming (beans, maize, wheat, Irish potato)
Low Highlands (LH 1-5)	Ngobit, Umande, Nanyuki, Thingithu, Igwamiti, Marmanet, Githiga	Crop farming (maize, wheat, beans, sunflower, and barley), fish farming, dairy farming
Upper Midlands (UM5 - UM6)	Segera, Nanyuki, Tigithi, Rumuruti, Mukogodo East, Salama	Beef farming, crop farming (sorghum, hay and millet)
Lower Midlands (LM3 - LM5)	Mukogodo West, Segera, Mukogodo East, Sosian	Ranching, beef farming, sisal farming

Source: Department of Agriculture, Livestock and Fisheries, CGL

Crop production requires well-drained soils and a suitable climate. The County's strategic location in proximity to Mt. Kenya and the Aberdare Ranges offers favorable climatic conditions for crop production. Climatic conditions in the upper highland sub-

humid, lower highlands and upper midlands zones support crop, fish, and dairy farming – making these the main sources of livelihood. Dry climatic conditions in the lower midlands zone in the north and northeastern parts of the County make ranching and pastoralism the main means of livelihood.

Crop farming in the County is practiced either for subsistence or commercial purposes. A total of 74,338 households across the County engage in the production of food crops and/or permanent crops. The main permanent crops grown are avocado, citrus fruits, mangoes, and macadamia; while the main food crops grown are maize, beans, Irish potatoes, cassava, green grams, sorghum, millet, and vegetables such as tomatoes, cabbages, onions, and kales (Laikipia County Statistical Abstract, 2021).

Plate 8-1: Crop Production

Source: KREIS, 2022

The total area under crop production is shown in table 8-3 and map 8-2 below.

Table 8-3: Area Cropped, Production and Value for Major Crops 2019-2020

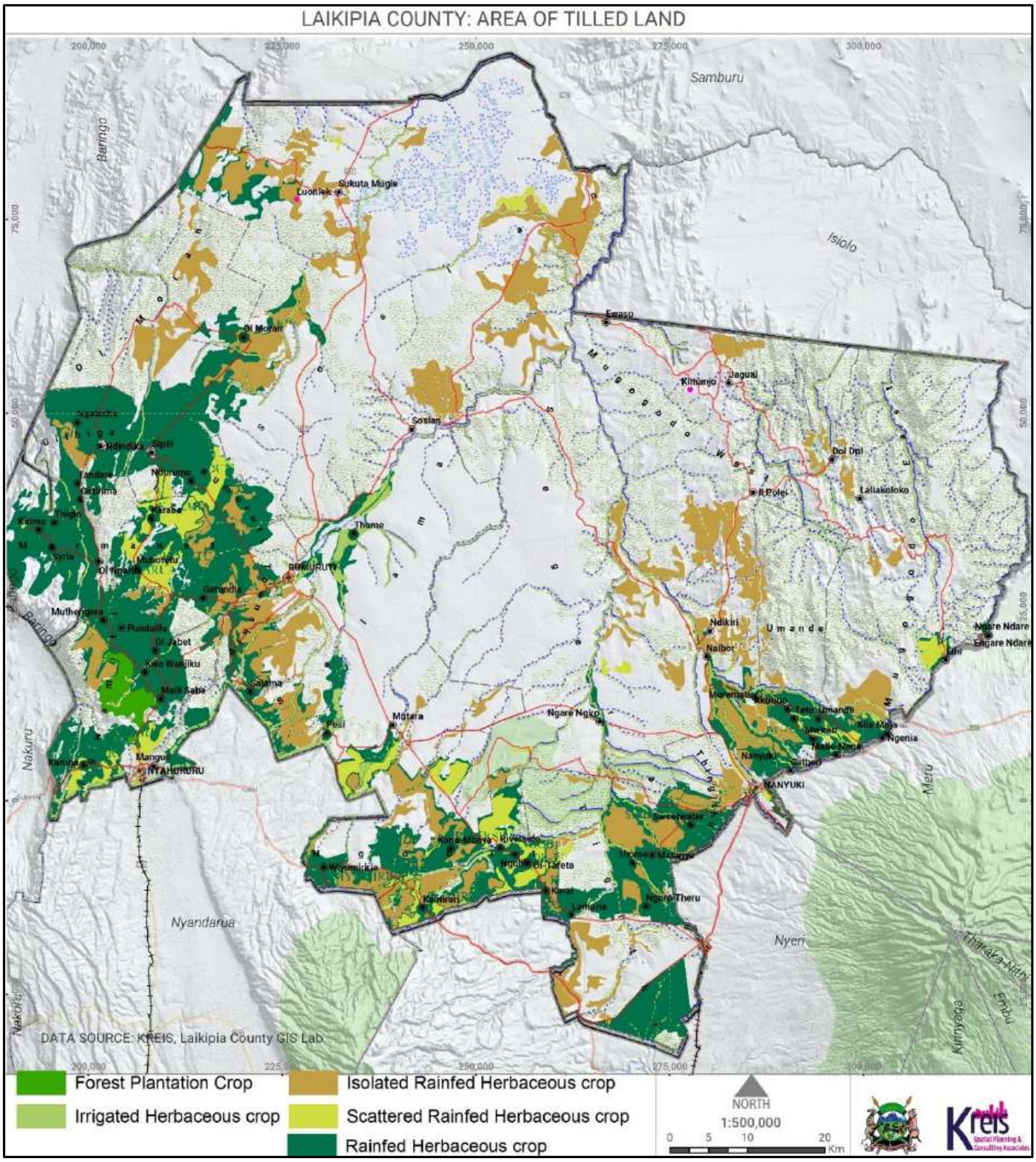
Crop	2019			2020		
	Area (Ha)	Production (MT)	Yield/Ha (MT)	Area (Ha)	Production (MT)	Yield/Ha (MT)
Maize	44,569	129,535	2.90	46,470	133,834	2.88
Beans	21,005	27,845	1.30	22,035	32,391	1.47
Wheat	7,992	15,112	1.80	7,984	14,611	1.83
Irish Potato	2,442	27,044	11.00	2,436	26,406	10.84
Sorghum	875	997	1.13	969	1,172	1.21
Coffee	79	78	0.98	85	105	1.24

Source: Department of Agriculture, Livestock and Fisheries, CGL

The table above indicates an increase in yields per hectare for each of the major crops produced in the County. This can be attributed to the adoption of climate-smart agricultural practices and the training of farmers through agricultural extension services. Taking maize production for instance which is the common type of crop cultivated in the County, the average production per acre is 15 bags. Farmers in the County aim to increase production to an average of 40 bags per acre (CGL, 2019).

Production of more bags of cereals/grains will therefore increase income generation for households that practice crop farming. Using the example of an average selling price of Ksh. 2,800 per 90kg bag of maize, a farmer who produces 15 bags for commercial purposes earns approximately Ksh. 42,000 in one season. An increase in production to 40 bags per acre would increase the farmer's income to Ksh. 112,000 in one season. Once the input expenditure is eliminated and all other production costs are constant, the farmer is assured of an increased income every season.

Map 8-2: Tilled Land Agriculture



The government, through the National Cereals and Produce Board, has grain stores at Doldol, Nyahururu, and Nanyuki towns. The County Government plans to increase the production of maize in Githiga, Ol Moran, and Marmanet wards. This is through the construction of three-grain warehouses at Kinamba, Sipili, and Mutanga/Muhotetu towns, with funding from the European Union (CGL, 2019). At the institutional level, food stores are common, particularly in schools on the school feeding programme. Granaries are the common storage facility at the household level.

Plate 8-2: Grain Warehouses at Nanyuki and Ol Moran

Source: KREIS, 2022

Crop farming activities in the County have been affected by several constraints that include climate change (prolonged drought, unreliable and inadequate rainfall), declining soil fertility due to unsustainable farming practices, uneconomical land subdivision and fragmentation, water-resource conflicts between farmers and pastoralists, crop damage by wildlife in some areas, post-harvesting losses, inadequate extension services, poor access markets, under-utilization of agricultural land,

fluctuating market prices for farm produce, high cost of labor and inputs, and inadequate adoption of on-farm value addition.

To curb the negative effects accruing from declining soil fertility, the County Government is promoting conservation agriculture by training farmers on crop rotation and the use of organic manure to restore soil nutrients. In addition, it also plans on increasing farmers' access to extension services and excavating water pans to support irrigation farming (Laikipia County ADP, 2021-2022).

8.2.1.1 Small-Scale Farming

This entails primarily rain-fed farming of perennial crops by small-scale farmers on a subsistence basis. It involves the cultivation of crops such as maize, beans, green grams, millet, sorghum, potatoes, and vegetables. In some households, small-scale farming is integrated with small-scale livestock rearing of poultry and dairy cattle. These households depend on food and income from the sale of their farm products and upon markets for the provision of inputs.

The majority of the agricultural households are small-scale holders whose average farmland size is 2 acres mainly used for food crop production. Smallholder farmers grow approximately 70% of the food they consume (CIDP, 2018-2022).

On average, the overall gross returns of smallholder farming is Ksh.30,000 per acre, taking into account the consumption of crops and livestock products, and the selling of the surplus. During planting and harvesting seasons, some of these small-scale farmers employ casual workers to assist on the farms (LWF, 2013). On average, 114,810 persons are self-employed while 6,590 persons are casually employed within these small-scale farms (Laikipia County Statistical Abstract, 2021).

The use of irrigation farming increases the yields/output per acre. Farmers have embraced irrigation at the small-scale levels to help reduce losses emanating from prolonged drought and inadequate rainfall. There are 22 operational small-scale irrigation clusters mainly in the southern and western parts of the County at Jikaze, Mutaro, Munanda, Gatitu, Muthaiga, Mutara, South Imenti, Thome, Mwiyogo, Nkando, Nturukuma, Nyambogichi, Mukima, Marura, Gakeu, Mia Moja, Melwa, Pesi, Ngarengiro, Ngarachi/Thigio and Wangwaci (CIDP, 2018-2022). These irrigation

clusters act as essential food baskets for the entire County. Settlements located within wetland ecosystems rely on irrigation farming as the main means of livelihood, owing to fertile soils and water availability. They include households living around Ewaso Narok, Pesi, Mutara, Marura, and Moyok swamps.

Small-scale sisal farming is also done along boundaries to demarcate land in the lower midland zone in Laikipia North Subcounty. Nonetheless, this region has the potential for increased sisal production which thrives well in ASAL areas with low rainfall. Sisal fiber has numerous uses such as in the making of mats, ropes, baskets, cordage, and dartboards. Through sisal farming, women and youth in this region have the opportunity to earn income by selling sisal fiber products. Encouraging large-scale production of sisal can also help the farmers gain direct access to markets and drive out middlemen who purchase from them at low prices (Laikipia Rural Voices, 2018).

There is small-scale cultivation of sunflower seeds in Ol Moran Ward, whereby farmers intercrop it with maize to achieve optimum yields. Ideally, two kilograms of sunflower seeds are recommended per acre to achieve a plant population of 800-1000 plants per acre. Under favorable conditions, sunflowers take three to four months to reach maturity, allowing for three harvesting seasons annually. The seeds can be used to extract sunflower oil and the residue compacted to animal feeds in the form of seedcakes (Laikipia Rural Voices, 2018).

The majority of small-scale farmers suffer challenges from prolonged drought, post-harvesting losses, declining soil fertility, and human-wildlife conflicts. To limit these conflicts, farmers opt to postpone the harvest time to coincide with the season when the wildlife is less likely to be a threat. Other issues include inadequate access to financial services to help them enhance their farming operations and livelihoods, financial limitations to adopting modern technologies, or access to information in response to climate change, thus, increasing their vulnerability to food insecurity.

8.2.1.2 Large-Scale Farming

This is crop farming that is carried out in large parcels of land and mostly involves employing modern farming technologies such as mechanization. The level landscape of the Laikipia Plateau allows for large-scale production in extensive farmlands. The average farm size for large-scale holders is 20 acres, mainly used for wheat and maize

production. There are four small milling plants in Nanyuki and Nyahururu towns supporting value addition on maize and wheat (CIDP, 2018-2022). Other crops that are mainly grown are beans, vegetables, avocado in Laikipia West, tomatoes, and hay for commercial purposes which is undertaken in ranches such as Ol Pejeta.

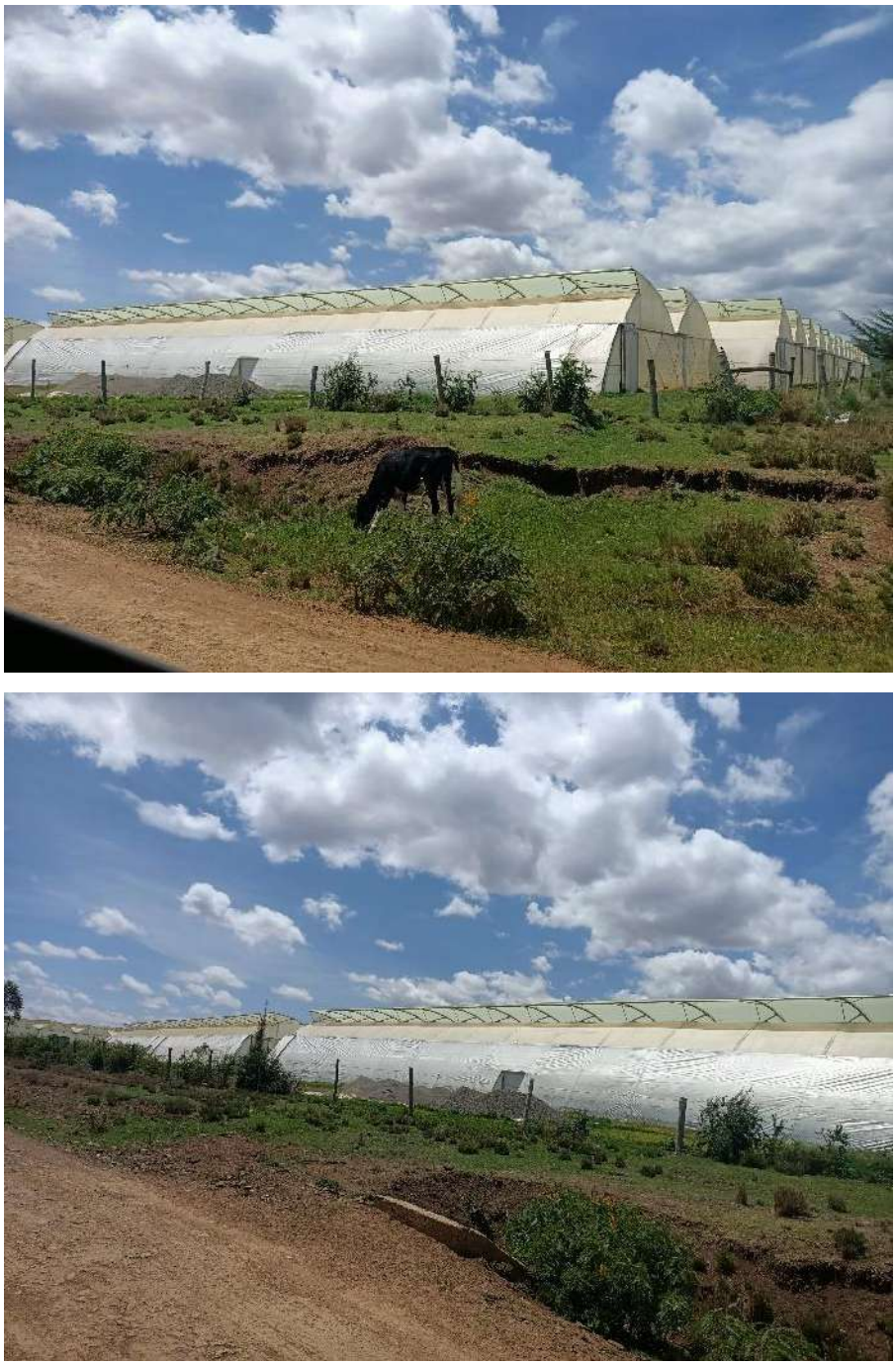
In some cases, irrigation has been adopted to ensure the optimization of crop yields and reduce losses associated with prolonged drought and inadequate rainfall. Large-scale extensive farming produces a surplus that can be sold to obtain capital for other investments. However, there are low returns for large-scale extensive farming as compared to intensive farming practices (LWF, 2013). Soil degradation is also common owing to unsustainable agricultural practices such as intensive tillage and the use of inorganic fertilizers.

8.2.1.3 Horticulture and Floriculture Farming

Horticulture and floriculture production both at large-scale and small-scale levels is on the increase in Laikipia County. It constitutes the production of cut flowers, tomatoes, French beans, chillies, and watermelons. Additionally, there are efforts towards up-scaling fruit production such as avocado, orange, mango, bananas, pineapples, and coffee (CIDP, 2018-2022). Horticulture farming in the County is under irrigation using water from dams, pans, boreholes, and rivers. It is also done in greenhouse farms to reduce risks associated with adverse weather conditions, and for effective management for optimization of yields.

This type of agriculture provides the highest returns per acre; for instance, floriculture production and cultivation of vegetables for export generate overall average gross returns ranging from Ksh. 2 million – Ksh. 4.4 million per acre. It also offers the highest employment per acre, with an approximate 6,000 workforce mainly comprising casual laborers from the neighboring communities (LWF, 2013).

Plate 8-3: Horticultural Farming



Source: KREIS, 2022

The main horticultural crops, as shown in table 8-4 below, are tomatoes, potatoes, cabbages, watermelons, kale, spinach, butternuts, capsicum, onions, carrots, chillies, French beans, and snow peas. There are also pockets of pineapple, avocados, oranges, and macadamia nuts farms in the County. Horticultural produce is marketed locally and also exported outside the country through exporting companies like AAA Growers, Frigoken, and Home Grown among others.

Table 8-4: Area under Irrigation by Type of Crop (2019-2020)

Crop	Hectares	
	2019	**2020**
Tomatoes	2,673	2,811
Onions	262	470
Cabbages	380	454
Kales	265	320
Spinach	134	198
Snow Peas	72	83
Melons	42	48
Egg Plant	5	7
Sweet Pepper	6	8
French Beans	87	130
Butternut	15	17
Chilis	25	27
Okra	2	4
Baby Corn	5	11
Total	**3,973**	**4,588**

Source: Department of Agriculture, Livestock and Fisheries, CGL

The table above indicates an increase in acreage under irrigation for each of the horticultural crops produced in the County. This can be attributed to the adoption of climate-smart agricultural practices and the training of farmers through agricultural extension services.

8.2.2 Livestock Production

Livestock production is dominant in most parts of the County, with 45.8% of households owning livestock. The main livestock types are cattle, goats, sheep, poultry, camels, donkeys, pigs, and rabbits. As per the 2019 NPHC, the livestock population in the County has been on an increase as compared to the previous years, with the count being 72,860 dairy cattle, 221,760 beef cattle, 379,960 local-breed goats, 17,650 dairy goats, 347,640 local-breed sheep, 2,348 sheep for wool, 1,676 pigs, 5,628 local-breed rabbits, 610 exotic-breed rabbits, 11,956 camels, and 15,850 donkeys. Poultry keeping also increased, with the tally being as follows: 431,520 indigenous chickens, 18,680 broilers, 21,460 exotic layers, 4,940 ducks, 3,600 geese, and 3,280 turkeys (Laikipia County Statistical Abstract, 2021).

Plate 8-4: Rearing of Small Stock

Source: KREIS, 2022

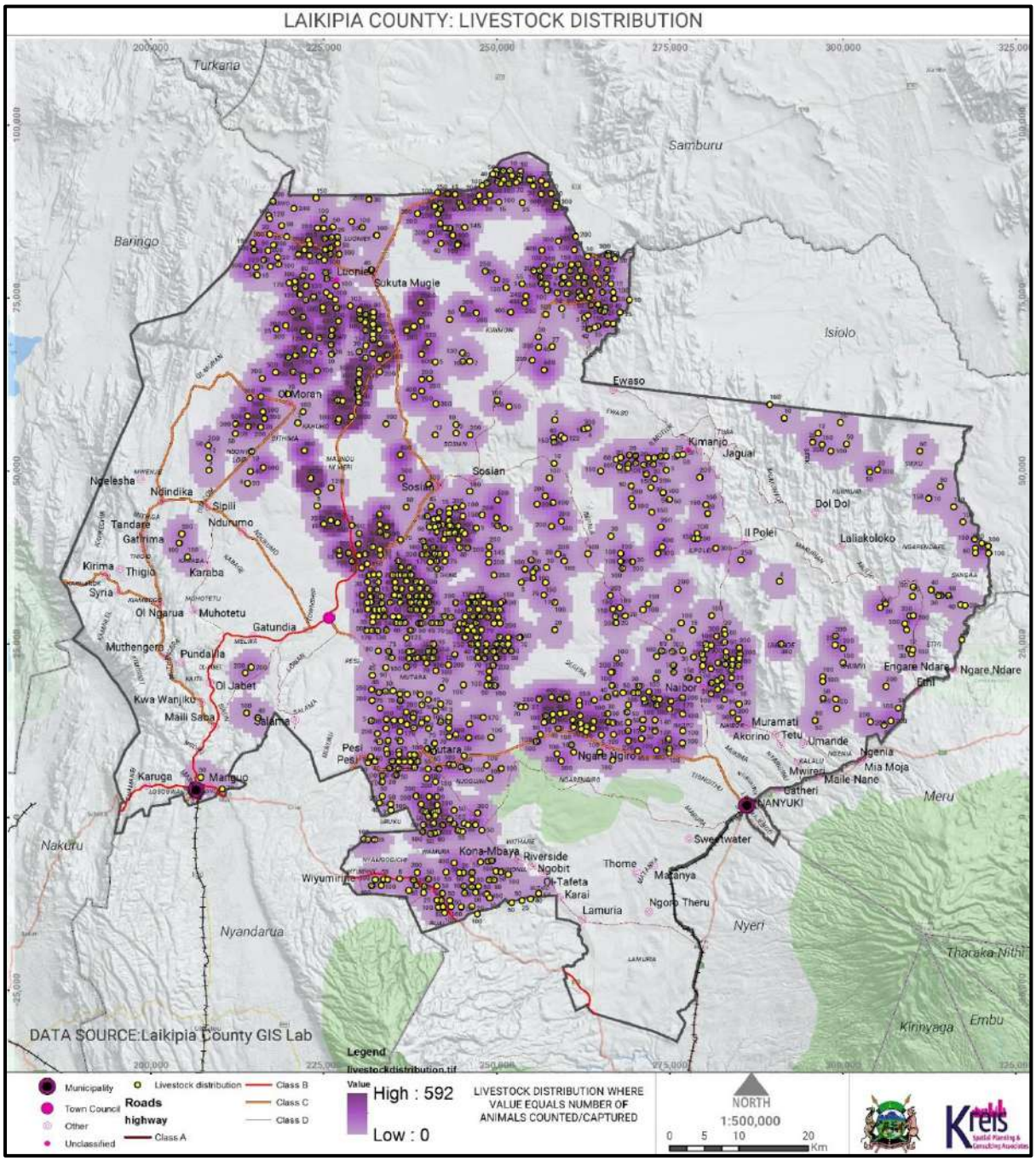
The small stock (sheep and goats) is mostly reared for subsistence purposes such as food and income, while the large stock (cattle and camels) is reared for food and commercial purposes. These animals are reared by individual farmers, pastoralist communities, and in private ranches and conservancies. Local breeds of cattle, goats, sheep, rabbits and indigenous chicken form the majority of the livestock reared in the County. This is because they are well-adapted to the prevailing weather conditions, they can produce

milk and meat even when fed low-quality feeds/forage, and are resistant to diseases. Exotic breeds on the other hand are capital intensive – require high-quality feeds which are costly to obtain and specialized structures, and demand high levels of management.

The County is a leading producer of high-quality beef from Boran cattle in the country. With specific reference, the number of beef cattle increased from 201,200 in 2017 to 232,848 in 2020. Their value after slaughter also increased from Ksh. 441.7 million to Ksh. 746.8 million within the same period (Laikipia County Statistical Abstract, 2021).

Livestock infrastructure in the County constitutes fifty holding grounds, stock routes and outspans, two public and three private abattoirs, five auction yards, and thirty-three slaughter slabs. The highest number of animals slaughtered are sheep (74,879), goats (35,576), cattle (17,621), pigs (607), and camels (558). The main livestock products include beef, mutton, milk, eggs, pork, wool, hides, and skins. Leather production in the County entails 21,516 cattle hides, 527 camel hides, 36,863 goat skins, and 91,056 sheep skins (Laikipia County Statistical Abstract, 2021).

Map 8-3: Laikipia County Livestock Distribution



Source: KREIS, 2022 (modified from Laikipia County GIS lab data; KNBS 2019)

8.2.2.1 Pastoralism

Pastoralism forms the main occupation of the majority of people in Laikipia North Constituency. It is mainly done on community lands and assumes a nomadic way of life whereby communities temporarily move in search of water and pasture. The main livestock breeds reared are cattle, sheep, goats, camels, and donkeys. Pastoralism is a major means of livelihood given that a total of 20,419 persons in the County rely on

pastoralism-related activities as the main form of employment. Laikipia North Subcounty has the highest number of persons (10,713) engaging in pastoralism, followed by Laikipia West Subcounty (5,668 persons), Laikipia East (2,675 persons), Laikipia Central (787 persons) and Nyahururu (576 persons). The small number of people practicing pastoralism activities in Nyahururu and Laikipia Central is attributed to more crop farming activities in these subcounties.

Plate 8-5: Livestock Keeping in Laikipia County

Source: KREIS, 2022

The average gross return is estimated to be Ksh.1,000-3,000 per acre inclusive of milk, meat, fuelwood collection for sale, and own consumption (LWF, 2013). The contribution of livestock production to the local economy of the County is through:

a. Being a source of livelihood for the pastoralist communities.
b. Offering employment to locals as herders and casual laborers.
c. Injecting money into the economy through the purchase of inputs such as feeds, hay, veterinary drugs, and equipment.
d. Paying taxes through CESS and livestock market taxes.

Water scarcity and pasture degradation due to overstocking and overgrazing are the major challenges affecting pastoralism in the County. Due to pasture and water shortages, conflicts have become endemic between both pastoral and non-pastoral communities. Temporal migration of the communities in search of water and pasture limits the provision of social services in Laikipia North Subcounty. The people are thus forced to travel for long distances to access health and education services.

Plate 8-6: Pastoralism

Source: KREIS, 2022

To support pastoralism, the County Government has set up projects such as the construction of a water pan at Ntumodet and modernizing the livestock markets in Rumuruti, Kimanjo, Ol Moran, and Mouwarak towns. In particular, the Rumuruti modern livestock market is planned to be one of the largest livestock markets in the CEKEB region (CGL, 2022). The Mouwarak livestock market is set to be a major contributor to peace in the region and livelihoods, as more than five ethnic groups converge every week to trade in livestock. Additionally, the hay shed in Matanya provides enough hay for local consumption and benefits the pastoral communities during dry seasons.

8.2.2.2 Ranching

There are 32 private ranches, one government ranch and 13 group ranches including Il Ngwesi, Kuri Kuri, Lekurruki, Tiamamut, Musul and Makurian among others. Ranches in the County produce the highest-quality beef stock. They also practice Boran breed

genetic harvesting for national and regional markets (CIDP 2018-2022). Livestock breeds in ranches are both local and improved, either under controlled grazing or under uncontrolled grazing – characterized by free grazing in natural pastures. There is no movement of livestock to long distances in search of feed/pastures and water.

Extensive ranching is divided into two land uses, namely; pure ranching and mixed ranching.

a. Pure Ranching

It is a type of ranching that produces exclusively livestock products, i.e. meat, milk, embryos, skins, and hides on a large-scale basis in ASAL areas. There are a few remaining pure livestock ranches in the County since a majority of the large land holdings have diversified uses. It is estimated that six people are employed per 1,000 acres. Pure ranches are estimated to generate at least Ksh. 82 million per year on approximately 100,000 acres of land (LWF, 2013). The ADC Mutara Ranch in the County is an example of a pure ranch that concentrates on beef ranching for the production of genetic breeding materials for Borana cattle. It has however recently embraced eco-tourism activities (bird shooting, camps, wildlife sanctuary) in a bid to supplement the ranching activities (Agricultural Development Cooperation, 2021).

b. Mixed Ranching

A type of ranching that has diversified activities including wildlife conservation, wildlife-based tourism, livestock keeping, and British Army training leases. The presence of the British army has a significant impact on Laikipia's economy, as it is estimated to spend approximately Ksh. 10 billion per year in the County. Mixed ranches are more profitable compared to pure ranches. Usually, 3 to 15 people are employed on 1,000 acres of land. They generate at least Ksh. 2 billion annually (LWF, 2013).

Several privately-owned ranches in the County engaging mainly in ranching activities have the carrying capacity to act as secondary wildlife areas. These include Naibor, Nanyuki, Loldoto, Kifuko, Bhora, Lombala, Barkas, Brown, W. Smith, G.G Kariuki, Mogwooni, and Lenges ranches. Some ranches lack the carrying capacity to accommodate wildlife due to mixed farming activities such as in Ol Pejeta large-scale

farms, Muthigani, Mureru, Mukima Scheme, John C. Cardoville, Bhora 2, and Jenning ranches (CGL, 2021).

Other privately-owned ranches are used as grazing areas by the pastoralist communities. Herders and ranch owners have entered into emergency grazing agreements to mitigate forage deficits, conflicts, and loss of livestock. These grazing agreements ensure mobility, access rights, and access to limited resources and thus, are a coping strategy that increases resilience to the impacts of drought (World Bank, 2020). Such ranches include Ex-Lekurruki 1, Ex-Lekurruki 2, Mukogodo, Il Polei, Makurian Holding Ground, Munishoi, Lekiji, Thome Outspan, and Eland Farm ranches. These ranches also have the carrying capacity of acting as secondary wildlife grazing areas (CGL, 2021).

Ranches that have mixed-use with wildlife conservation include Borana, Sosian, Lolong'iro, Kitenye, Ol Maisor, Mpala, Lolldaiga, Mugie, Ol Doinyo Lemboro, Sabuk, Lorok, Tumaren, Kamogi, Palagalan, Ol Malo, Suyian, Chololo, Kamwaki, Enasoit, Kihoto, and El Karama ranches. These have the carrying capacity to act as core wildlife areas. Ol Jogi Rhino Sanctuary, Solio Rhino Reserve and Soito Nyiro Farm Conservancy are primarily used for wildlife conservation (CGL, 2021). Mukutan Conservancy is in the transition to a mixed wildlife/cattle/agriculture model.

Challenges facing ranching in the County are pasture depletion and deterioration that emanate from overstocking beyond the required carrying capacity, overgrazing, and prolonged drought due to climate change. To mitigate these challenges, the County Government has set targets to reseed rangelands. So far, it has managed to reseed 300 acres of land in Tiamamut and Musul group ranches (Laikipia County ADP, 2021-2022).

8.2.3 Apiculture

According to the 2021 Laikipia County Statistical Abstract, a total of 2,982 households engage in beekeeping in the County. Laikipia North Subcounty has the highest number of households (1,072) practicing apiculture, especially in Mukogodo East, Segera, and Mugokodo West wards as was identified in the community sensitization and visioning workshops.

It is mainly undertaken by pastoralists and farmers practicing mixed farming in farm woodlots, fenced areas, and forests to allow for pollination. The main product is honey

which is harvested using traditional log hives, with only a few farmers using modern hives such as Langstroth and Kenya Top Bar Hive (KTBH). The majority of the people use the traditional method of smoking during harvesting, which is normally destructive to the bees and surrounding vegetation.

In value addition, 5 no. co-operative societies are available at basic levels of packaging honey and related byproducts. Through a partnership between the County Government and World Vision, a total of 625 modern hives have been procured and distributed; with 102 hives distributed by the Department of Agriculture, Livestock and Fisheries and 550 hives distributed by World Vision (Laikipia County ADP, 2021-2022).

8.2.4 Aquaculture

Fishing activities are carried out in ponds, rivers, and water reservoirs. The main species produced are Catfish and Tilapia (CIDP, 2018-2022). Generally, 363 households use the fish pond system, while only 26 households employ the fish cage system. Fish farming is mainly done in Laikipia Central Subcounty, where a total of 134 and 13 households use fish ponds and fish cages respectively. Very few households in Laikipia North Subcounty engage in fish farming, with only 7 households having fish ponds and 1 household using the fish cage system (Laikipia County Statistical Abstract, 2021).

Production infrastructure to support fish farming in the County comprises approximately 900 fish ponds with an average of 1,000 fish stock capacity. There are 125 water reservoirs viable for aquaculture and one fingerling multiplication farm in the County. Rumuruti Fish Farm Programme is a prospective aquaculture training, demonstration, and fish seed bulking facility. Key achievements in this sub-sector involve the management of 5 ponds under the Rumuruti Fish Farm Programme, and the stocking of 16 dams and 200 fish ponds with fingerlings as a measure by the County Government to improve household livelihoods (Laikipia County ADP, 2021-2022).

8.2.5 Agroforestry

Farm woodlots are a common feature in the southwestern parts of the County. The farmers use the woodlots for timber, poles, firewood, and beekeeping. Farmers also practice fruit tree farming – the main fruits are citrus (oranges and lemons), avocadoes, mangoes, coffee, and nuts (macadamia). The main value chain processes from forestry products include furniture, wood carvings, honey packaging, and herbal medicines.

Other value chain includes; cosmetic products from Aloe Vera and Sandalwood, several bamboo products and processing of cattle feeds.

Plate 8-7: Agro-Forestry

Source: KREIS, 2022

However, the diversity of tree species in the County has been decreasing owing to land degradation caused by overgrazing, unsustainable exploitation of natural resources, adverse effects of climate change, and invasive plant species. Harvesting of timber, firewood, and burning of charcoal for sale are other challenges facing forestry in the County.

The Laikipia Permaculture Center (LPC) in collaboration with 'reNature' and the Leopold Bachman Foundation are promoting regenerative agroforestry practices in the

County using a community-based groups approach. This is a form of cultivation that combines agriculture and tree planting hence utilizing their complementary roles for enhanced resilience, increased biodiversity, and improved profitability while warranting climate-friendly utilization of land resources. The outcome is reduced soil erosion, increased soil fertility, and high-water retention capacity due to the presence of organic matter. It is been implemented in community groups such as Lekiji, Nabulu Mukuri, Nabulu Kimugadura, Ereri Vision, Mukima, Muramati and Ensongoyo Youth Group (LPC, 2020).

To encourage agroforestry, the County Government plans to distribute more than 10,000 fruit trees to farmers across the County – 6,000 avocados and 4,000 mangoes, through ward agricultural officers. Wards in Laikipia East are set to receive more avocado trees, wards in Laikipia West will receive mango trees only, while wards in Laikipia North will receive a favorable share of each (CGL, 2021). According to the 2021-2022 Laikipia County Annual Development Plan, the County Government has successfully facilitated the planting of 11,525 fruit tree seedlings. This will improve local livelihoods and ensure food security and nutrition in the County.

8.2.6 Agriculture-Related Livelihood Zones

Agriculture impacts on livelihoods as described below:

a. Pastoral Zones – PZ

The majority of households in this zone depend on livestock production as the main source of income and food either directly or indirectly through a sale. Market purchases account for about 65 percent of household food needs. The zone is characterized by sedentary farmers who migrate livestock between regular seasonal areas; dry and wet season areas to look for pasture and water, a highly variable agro-climate, recurrent droughts, and low total annual rainfall ranging between 250-400 mm per annum.

b. Marginal Mixed farming - MMF

Food sources in this region are highly diversified and comprise food/cash crop production. The livestock units are either indigenous or improved and insufficient to compensate for crop losses. The zone is highly drought-prone, especially after the March-May long-rains season. The short-rain season is more reliable and accounts for

close to 70 percent of total annual crop output. Crop production is limited by poor agro-climatic conditions and low application of recommended agronomic practices.

c. Mixed Farming – MF

The main household activities in this region include all or either a combination of more than one of the following: food crops growing, cash crops growing, and small-scale livestock keeping. Households depend on food and income from the sale of farm products (crops and livestock) and upon markets for the provision of their inputs. Production of farm products is integrated and food sources are highly diversified.

Each of the livelihood zones contributes to cash incomes as shown in table 8-5 below:

Table 8-5:Livestock Average-Percentage Contribution of Cash Income

Livelihood Zone	Average Income Contribution from Livestock (%)
Pastoral Zone (PZ)	90
Marginal Mixed Farming (MMF)	75
Mixed Farming (MF)	45

Source: Department of Agriculture, Livestock and Fisheries, CGL

In the Pastoral and Marginal Mixed Farming zones, the rearing of livestock is the main source of livelihood for the majority. The main type of livestock are cattle, sheep, goats, camels, poultry, pigs, and donkeys. The main livestock products include beef, mutton, chevon, milk, poultry, meat, eggs, skins, and hides. Amongst the Maasai, Pokot, and Samburu communities, livestock is a form of savings, source of food, financial capital, and the basis of wealth description. Opportunities for pastoral farmers immensely depend on the livestock assets that they own.

8.2.7 Agricultural Extension Services

Agricultural extension services are important for the dissemination of knowledge and new technologies to the farmers and other stakeholders within agricultural value chains. These services are accessed through field days, demonstrations, seminars and workshops, and farm visits by County agricultural extension officers. The state of service delivery in Laikipia County is slightly above average with about 65% access to extension services (CIDP, 2018-2022). Some farmers, especially the horticultural and commercial

ranchers, are quite advanced in extension service acquisition. Some farmers get extension services directly from researchers, expatriates, and the Internet, while others carry out the research themselves. Laikipia East and West constituencies lead in the level of access to the extension services.

The challenges faced in the provision of extension services include the inadequate capacity to cope with the demand for extension service provision due to low funding and shortage of extension officers, limited machinery and equipment, and transport constraints that inhibit staff mobility.

The County Government, through its Department of Agriculture, Fisheries and Livestock, has partnered with the Food and Agriculture Organization to boost agricultural livelihoods, with a special focus on women, youth, and the disabled. The goal of the partnership is to help these vulnerable groups adapt to climate change by employing climate-smart agricultural practices, in a bid to improve food nutrition and reduce poverty. It aims at funding over ten farmer groups from various value chains to venture into modern farming activities, the major focus being indigenous chicken rearing.

So far, County agricultural extension officers have been training different farmer groups in three wards, namely; Mukogodo East, Umande, and Tigithi. Over fifty local chicken brooders have been constructed for individual farmers. Other value chains set to benefit from this partnership are the rearing of improved indigenous chicken, beekeeping, dairy goat and sheep (Dorper) keeping, and the production of Irish potatoes and beans (CGL, 2022).

8.2.8 Value Addition

Value addition activities in the County include meat processing in Rumuruti Town – Ngare Narok Meat Industries, honey and wax production, and processing within Rumuruti, Lariak, Marmanet, and Mukogodo forests, and Nina's Yoghurt production in Nanyuki (Laikipia County Statistical Abstract, 2021). There are seven milk-cooling plants run by dairy co-operatives and individual groups (CIDP, 2018-2022). There are also KCC milk processing plants in Nyahururu and Nanyuki towns. The County has numerous grain milling plants such as Nanyuki, Sitara, Ngarua, Menengai, and Daiga grain millers. These engage in the production of maize flour and animal feeds. Medicinal

plants such as Aloe Vera and African Wild Potato are grown in small portions in Laikipia North Constituency and have not been commercially exploited for useful end products. Nevertheless, initiatives by self-help groups are in place towards the exploitation of Aloe Vera.

There is an eco-fuel company that produces energy and agricultural products for agriculture and industrial customers, through a no-waste manufacturing process based entirely on croton nut. The company sources the croton nut from local communities in Laikipia East and West, through a proprietary collection network. Organic fertilizer, made from the waste of the oil pressing is sold to farms to restore soils depleted from chemical-based intensive agriculture (farmbizafrica.com, 2018).

Although agro-processing remains inadequate, the County has a great potential for value addition of farm produce (grains and fruits), livestock products (mainly milk, hides, skins, and meat), and in processing and marketing of medicinal plants. So far, the County Government has set measures to increase the value addition of milk. It has conducted four trainings on yoghurt and cheese making. Additionally, it has formed and trained two milk cooperatives, namely; Ngenia and Salama Vision, as well as trained two milk cooler committees (Laikipia County ADP, 2018-2022).

8.2.9 Agriculture, Livestock and Fisheries Development

According to the 2018-2022 CIDP, the agriculture sector is categorized as a core component of the County's economic pillar; which aims at increasing the GCP and ultimately improving the standards of living of the population through better nutrition. Programmes earmarked for this sector in the 2018-2022 period were administration, planning, and support services; crop development and management; fisheries development and management; and livestock resources development and management. To implement these programmes, the County Government allocated the Agriculture, Livestock and Fisheries sector Ksh. 80 million in 2019/2020 FY. This budget apportionment was intended to ensure increased productivity through irrigation farming, the use of better seed varieties, improved animal husbandry, embracing and encouraging feedlot farming, and contracting farmers among other contemporary agricultural approaches (Laikipia County FSP, 2020).

Several flagship/transformative projects for agricultural development were identified namely; on-farm value addition, providing access to regional and international markets for livestock from both private and government ranches; putting 2,000 acres under hay production each year, establishing 15 model farms (one per ward) to support agro-tourism; and increasing fish production through cage fish farming. To end drought emergencies the County set to reseed 200 acres of rangelands per year, construct two modern slaughterhouses, introduce drought-resistant crops and encourage farmers to practice conservation agriculture.

So far, key achievements in the crop production sub-sector include procurement of two soil testing kits, planting of 11,525 fruit tree seedlings, complete construction of two-grain warehouses in Sipili and Kinamba towns, reaching 41,222 farmers through extension services, excavation of 800 household water pans and drilling of 1 borehole (in Magimi-Kamangura Village, Tigithi Ward) to support irrigation farming (Laikipia County ADP, 2021-2022).

A highlight of the achievements in livestock production is the stocking of 204,000 fish fingerlings, procurement and distribution of 102 modern hives, formation and training of 2 milk cooperatives, reseeding of 300 acres of land in Tiamamut and Musul group ranches, reaching 1,142 livestock farmers through extension services, vaccination of 189,740 animals (inclusive of cattle, sheep, goats, and dogs) against livestock diseases, distribution of breeding stock for breeds improvement (8 boran bulls, 12 Galla goats and 12 Dorper rams), distribution of 1,800 kgs of pasture seeds and fodders, and licensing of 35 slaughterhouses, 117 meat containers, 19 artificial insemination service providers, 54 slaughter men, and 12 hides and skins curing premises (Laikipia County ADP, 2021-2022).

Additionally, the agriculture sector has been identified as a key contributor to achieving the GCP growth rate of 10% annually in the 2020-2023 period. To realize this, budget allocations to the agriculture sector have been increasing from Ksh. 85.9 million in the 2020/2021 FY to a projected Ksh. 93.6 million in the 2021/2022 FY. Further, the projected allocation for 2022/2023 FY is Ksh. 101.99 million. The County Government still aims to ensure sustainable agriculture and livestock growth driven by irrigation farming, mechanization, diversification of crops, fodder production, use of feedlots,

contract farming, improved logistics, and value addition among many more (Laikipia County FSP, 2020).

8.3 Tourism

Tourism is among Kenya's top sources of foreign exchange, dominates the service sector, and contributes significantly to employment, especially in rural areas where economic opportunities are limited. Laikipia County is one of the country's most exhilarating wildlife-based safari tourism destinations owing to its rich biodiversity that comprises a combination of diverse wildlife, wilderness experience, scenic landscapes, unique Maasai culture, ecological conservation areas, and cultural sites.

8.3.1 The Main Tourist Attractions

Specific tourist attractions in the County are detailed below:

8.3.1.1 Wildlife

Wildlife contributes substantially to the national economy through tourism as a prime tourist attraction. As discussed earlier in the chapter on the natural environment, under the wildlife section, Laikipia's landscape hosts the second-largest wildlife population outside Kenya's national parks and reserves, after the Mara-Serengeti ecosystem. It has the highest populations of endangered large mammals in Kenya, including half of the country's rhino population, significant populations of elephants, the Grevy's zebras, reticulated giraffes, and wild dogs. It also provides sanctuary to over 50% of Kenya's bird species (Butynski and De Jong, 2014). Other wildlife species include lions, cheetahs, buffalos, hyenas, antelopes, and plain zebras among others.

Within the private conservancies, tourists get to have a wildlife encounter and a wilderness experience through mountain bike rides, safari walks, horse riding, and car drives in the open-top safari vehicles (Borana Conservancy Newsletter, 2020). The County has two tourism circuits, Laikipia West stretching from Wiyumiririe to Loisaba Conservancy, and Laikipia East circuit stretching from Ol Pejeta, Doldol to Il Ngwesi Conservancy. These circuits give tourists the opportunity to see wildlife, experience the wilderness and enjoy the rich Maasai culture. The larger Northern Frontier also forms the bigger regional circuit, encompassing Lake Turkana, Sibiloi National Park, Koobi Fora, Matthews Mountain Range in the Namunyak Conservancy, and Mt. Nyiru. This

frontier provides a desert-like tour experience and interactions with the Turkana, Rendile, Samburu, El Molo, and Pokot communities.

8.3.1.2 Eco-Tourism

This is a type of tourism directed towards exotic – often threatened natural environments to see wildlife, support ecological conservation efforts and contribute towards the improvement of the welfare of local communities. In the Laikipia North region, eco-tourism is the dominant activity particularly at Il Ngwesi, Kuri Kuri, and Lekurruki community conservancies.

Fully owned and run by the Maasai community, the Il Ngwesi Conservancy is the only community ranch in Kenya that has an up-market tourist eco-lodge. The community engages in wildlife conservation and eco-tourism activities. Tourism activities include wildlife viewing from the lodge/rooms, bush drives, sundowners, bush breakfasts by the Ngare Ndare River, visits to the Mukogodo Forest, overnight camping experiences, enjoying Maasai songs and dances, taking walks to the Rhino Sanctuary, and visiting Maasai bomas (Il Ngwesi.com, 2017).

8.3.1.3 The Maasai Cultural Practices

Both local and international tourists visit Laikipia to behold the nomadic nature of the Maasai community, their exceptional housing typology (manyattas), their distinguishable mode of dressing (brilliant red blankets and colorful bead jewelry), and the traditional swords, spears, and wooden clubs of the morans. Traditional songs and dances are key attraction activities in the County, especially in the community eco-lodges in Laikipia North Subcounty. Tourist visits to the Maasai bomas offer opportunities to learn beading skills from the local women, and hunting and honey harvesting techniques from the Maasai men.

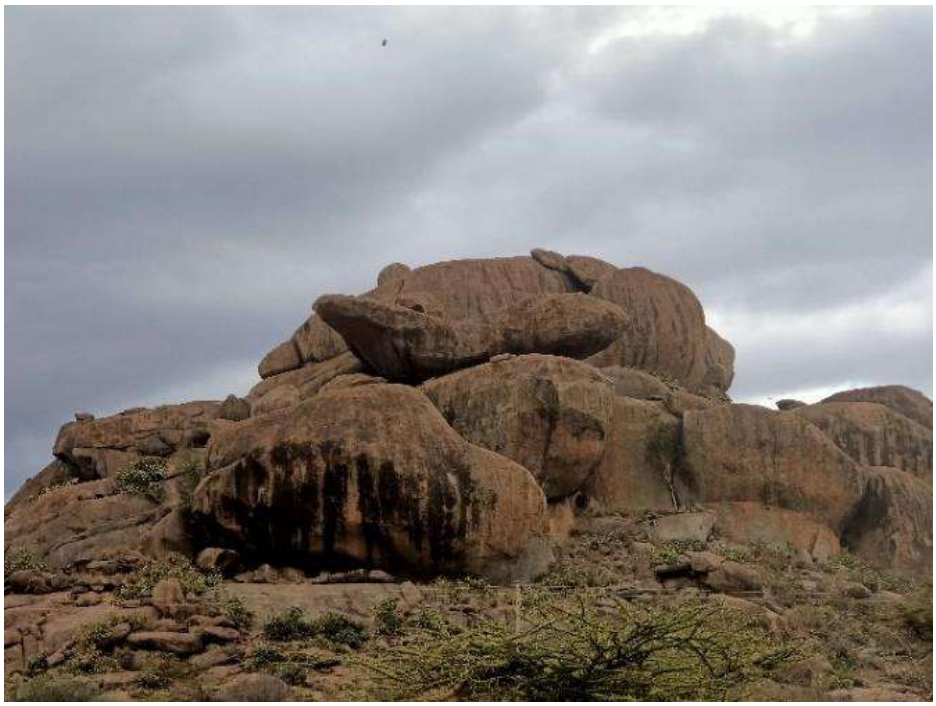
8.3.1.4 The Thompson's Falls

Thompson's Falls is a 74m scenic waterfall on the Ewaso Ng'iro River, which drains from the Aberdare Mountain Ranges. This site attracts numerous local and international tourists to Nyahururu town, which helps in improving the local economy through accommodation and food services. The locals also have curio shops where they sell African wear, ornaments, jewels, carvings, African regalia, and paintings.

8.3.1.5 Scenic Landscapes

The Laikipia Plateau has extremely scenic landscapes comprising of low rolling hills, undulating terrain, extensive level/flat lands, rangelands with wooded vegetation, grasslands with livestock and wildlife, the Mukogodo dry forest, and stunning rock outcrops.

Plate 8-8: Scenic Rock Outcrops in Laikipia County



Source: KREIS, 2022

8.3.1.6 Equator Crossing Point

Nanyuki Town, which is right in the center of Kenya, is known mainly for its equator crossing point. It attracts numerous locals and foreigners who just want to stand on the equator. The locals also arrange for an experiment to depict how the Coriolis Effect works to show the strength of the world's gravitational pull.

Plate 8-9: Equator Crossing Point in Nanyuki

Source: KREIS, 2022

8.3.1.7 Proximity to Mt Kenya

The County offers breathtaking views of snow-capped Mt Kenya and the Aberdare Ranges. Proximity to Mt. Kenya National Park makes Nanyuki Town an accommodation hub in the region.

8.3.1.8 Accommodation and Food Service Activities

There are numerous operational hospitality facilities ranging from hotels, lodges, resorts, villas, sports clubs, holiday homes, retreat centers, farmhouses, cultural centers, and tented camps across the County as shown in map 8-4 below. The majority of them are located in Nanyuki and Nyahururu towns, with a few in Wiyumiririe and Rumuruti towns. Others are situated within the conservancies such as Ol Pejeta, Borana, Lolldaiga, and Il Ngwesi. According to the 2018-2022 CIDP, there are only thirty-six registered hotels and lodges with a total bed capacity of 1,064 persons.

The 2021 Laikipia County Finance Bill defines 'one-star' as low-budget/economy-class hotels, 'two-star' as standard budget hotels, and 'three-star' as middle-class comfort hotels. The 'four-star' are first-class hotels with spacious well-designed bedrooms and

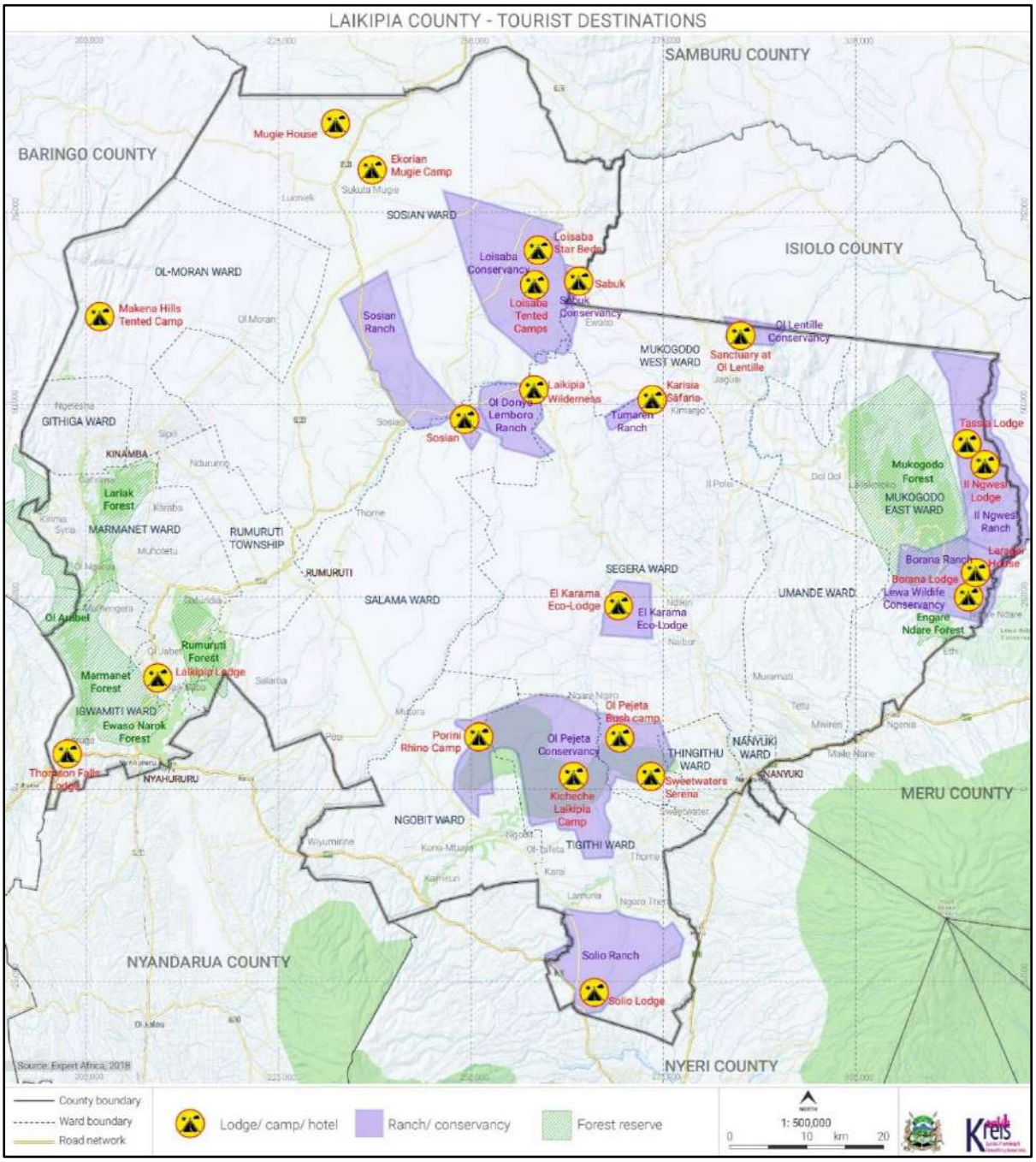
en-suite bathrooms, enough staff to provide all necessary services, 24-hour room service, laundry, a lobby, a bar and restaurant, and internet access.

Plate 8-10: Hotel and Accommodation Facility

Source: KREIS, 2022

A total of 4,180 persons are employed in the hospitality sector, with the number of males and females being 1,692 persons and 2,488 persons respectively. Nyahururu Subcounty has the highest number of people (1,023 persons) having accommodation and food service activities as their main employer, while Laikipia North Subcounty has the least at 75 persons (Laikipia County Statistical Abstract, 2021).

Map 8-4: Tourist Destination Sites



8.3.2 Contribution of Tourism Activities to the County's Economy

This sector contributes directly and indirectly to both the local economy of Laikipia County as well as the overall Kenyan economy through employment creation, revenue generation, and improving the lives of local communities. Tourism properties in the County generate at least a minimum of Ksh. 320 million per year (LWF,2013). In 2017, accommodation and food service activities contributed to Ksh. 512 million to the County's GCP (KNBS, 2019). In the 2017-2018 period, visitors to tourist attractions

increased by 12.5% from 135,903 to 152,980 (Laikipia County FSP, 2020). In the 2018-2019 period, the number of tourist arrivals in the County was 86,000 (Laikipia County ADP, 2021-2022).

For the wildlife conservancies, tourism remains a key revenue stream and continues to be dedicated to supporting the livelihood systems of the communities living around them, by ensuring that conservation actions directly or indirectly benefit the local people. This support is in the form of employment opportunities, locally-outsourced procurement and transport services, co-sharing of benefits accruing from ecosystem services, and through corporate social programmes. Over the 2017-2021 period, these conservancies have offered employment to approximately 2,495 local persons from within the County. Conservancies also rent out infrastructure within their premises to community members to run micro-enterprises such as curio shops and canteens. In addition, the conservancies also enter into fattening and stress grazing agreements with the neighboring communities as a measure to safeguard their pastoral-based livelihood systems.

Social development programmes in education, health, micro-enterprise and infrastructure sectors are significant in improving the livelihoods of local communities. Some of the conservancies' programmes in support of the education sector include the construction of schools' infrastructure such as classrooms, teachers' quarters, toilets and dormitories; supporting local schools through food drive programmes, provision of water via bowsers, payment of ECDE teachers, offering scholarships and bursaries to students, sponsoring educational trips and equipping school libraries. In the health sector, the conservancies participate in health outreach programmes through mobile clinics and contribute towards equipping and refurbishment of neighboring local health centers.

Conservancies' contribution to infrastructure development includes seasonal repair and maintenance of roads, water supply to community watering points and regular maintenance of fences to minimize crop damage through human-wildlife conflicts. Other programmes with a positive impact on local community livelihoods include the provision of livestock and agricultural extension services, promoting beekeeping

through provision of a ready market for harvested honey, empowerment of women groups, and promotion of visits to cultural bomas.

8.3.3 Impact on County and National Revenue Budgets

Wildlife conservation in Laikipia County is a significant activity that contributes towards raising own-source revenue for the County Government. Over the 2017-2021 period, wildlife conservancies in the County contributed approximately US$1,016,908 in the form of annual taxes. The conservancies in the County also generate revenue for the National Government through the payment of corporate taxes and value-added tax. Over the 2017-2021 period, these conservancies remitted approximately US$3,155,219 in form of corporate taxes and approximately US$1,228,969 in form of VAT.

8.3.4 Tourism Development

In the 2018-2022 medium-term period, programmes identified by the County Government for this sector were on tourism promotion and development. Priority measures in promotion and marketing included data collection and research, promotion activities, infrastructure development, and online marketing. In the 2019/2020 FY this was allocated Ksh. 17.6 million, while cooperative and tourism sector financing support for recovery was allocated Ksh. 47.5 million (Laikipia County FSP, 2020).

So far, specific achievements by the County Government to ensure tourism promotion and development as per the 2017-2021 Trade, Tourism, Industrialization, and Cooperatives Scorecard are:

a) Meeting the target to increase tourist arrivals from 86,000 in the 2018/2019 period to 90,000. The number of arrivals rose to 94,600, indicating a 10% increase (Laikipia County ADP, 2021-2022).
b) Meeting the target to upgrade four tourist attraction sites, by managing to upgrade seven sites through rehabilitation and construction of resource centers and lodges in Ngambolo Cultural Center, Ol Gaboli Eco-Lodge, Twala Tenebo, Naatum and Arjiju cultural manyattas, and Il Ngwesi Community Lodge in Laikipia North; and rehabilitation of the Thompsons Falls stairway and signage, and Manguo Hippo Point in Laikipia West.
c) Fencing of Solio Community Conservancy and Kalalu playfield.

d) Holding tourism promotion events in Rumuruti such as the Nanyuki Amateur Fun Race, Miss Tourism Laikipia, exhibitions to promote Destination Laikipia, and Laikipia Indigenous Fair.

On-going measures in tourism development include the rehabilitation and maintenance of Nanyuki Central Park in Laikipia East, the development of Ushanga Centre in Ngare Ndare, the construction of a Resource Centre at Makurian, the rehabilitation of Nyahururu Park, and the establishment of Chepkisaa Tourism and Cultural Heritage Center.

8.4 Trade and Commerce

Trade is the exchange of goods and services between two or more parties in consideration of money or money's worth. Commerce is the exchange of goods and services between parties, together with activities such as transportation, insurance, warehousing, advertising, etc. that complete the exchange. The County Government, through its Trade, Tourism, Creative Economy & Co-operatives Department has remarkably improved the local business environment and promoted enterprise development. Currently, the County's business environment comprises numerous financial institutions, trading/urban centers, commodity and livestock markets, and numerous MSMEs. Revenue streams from this sector are in the form of single business permits, parking fees, liquor licenses, market entrance/stalls/shop rents, and agricultural produce CESS.

8.4.1 Financial Institutions

The County's financial institutions are as shown in table 8-6 below.

Table 8-6: Number and Distributions of Financial Institutions

Constituency	Banks	SACCOs	Insurance Companies	Micro-Finance	No. of ATMs
Laikipia East	15	71	15	4	25
Laikipia West	10	43	19	4	14
Laikipia North	-	18	-	-	0
Total	**25**	**132**	**34**	**8**	**39**

Source: Laikipia County Statistical Abstract, 2021

These institutions are enabling mediums of commerce and boost the trading power of local entrepreneurs by availing business loans, savings accounts, digital financial services, mortgages, and financing for automobiles.

According to the 2019 KNBS report on Gross County Product, the finance and insurance activities sector contributed Ksh. 6,275 million to the GCP in 2017, making it the third revenue-generating sector after agriculture and trade (wholesale, retail, and repair of motor vehicles) sectors. A total of 1,356 persons in the County are employed in financial and insurance companies, with the number of males and females being 607 persons and 749 persons respectively (Laikipia County Statistical Abstract, 2021). The number of active SACCOs increased by 6.5% from 124 societies in 2018 to 132 societies in 2019. Their share capital expanded by 36.7% from Ksh. 266.7 million to Ksh. 364.7 million in the 2018-2019 period (Laikipia County FSP, 2020).

8.4.2 Trading Centers

The majority of the County's trading activities are concentrated in the main urban centers of Nanyuki, Nyahururu, Rumuruti, and Kinamba as shown in map 8-5 below. The main types of business within these centers are wholesale and retail enterprises. In 2017, wholesale, retail, and repair of motor vehicles and motorcycles contributed Ksh. 7,132 million to the GCP (KNBS, 2019).

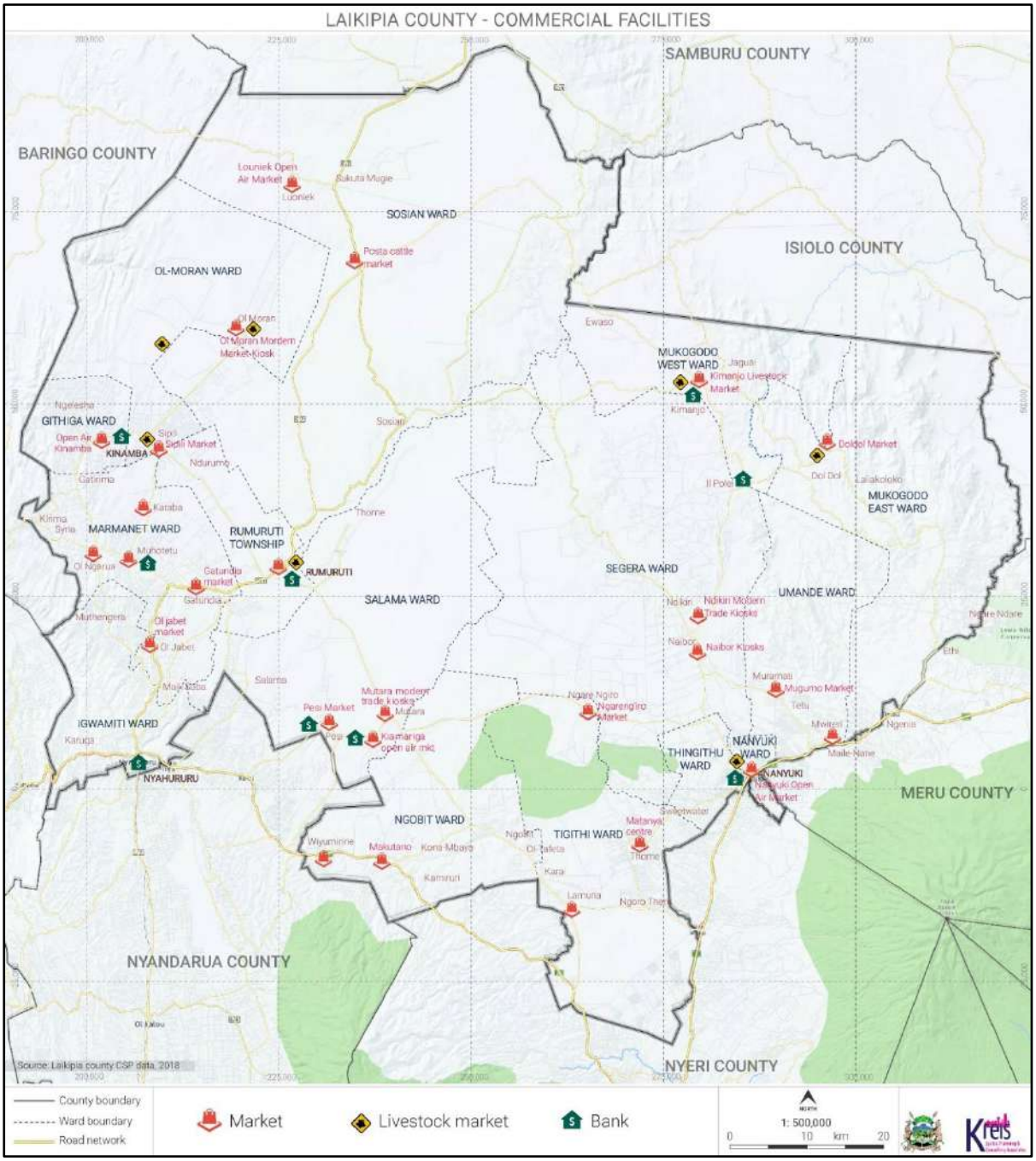
Plate 8-11: Trade Centres

Source: KREIS, 2022

In 2019, the total number of licensed business establishments in retail and wholesale trade, and repair of motor vehicles and motorcycles was 11,948. The total number of persons employed in these businesses was 7,627 persons, with 4,193 females and 3,434

males. However, men dominate automobile services. Nyahururu Subcounty had the highest number (2,175 persons) while Laikipia North Subcounty had the least (111 persons) employed in this sector (Laikipia County Statistical Abstract, 2021). The small number in Laikipia North Subcounty is attributed to the lack of major urban centers since Doldol is the only main trading center. These businesses within the various trading centers offer employment opportunities and thus help in sustaining and improving local livelihoods.

Map 8-5: Distribution of Commercial Facilities



Similar to the national and global business environments, the Covid-19 pandemic negatively affected businesses in the County. It forced the closure of numerous businesses and those that continued to operate received little returns on investments made. People lost their jobs as businesses shut down while in some, lay-offs of employees were necessary to cut on losses. Businesses that experienced adverse negative impacts of the pandemic were mainly accommodation and food services, recreation and entertainment services, and PSVs transport providers. Many people lost their means of livelihood.

Nonetheless, in the post-pandemic era businesses have been able to slowly recover from its impact, as well as build resilience against future unanticipated risks. The County Government established an economic stimulus programme aimed at rejuvenating the economy and cushioning the vulnerable members of the society and sectors of the economy from the economic shocks of the pandemic. Wholesale and retail businesses were able to recover from the pandemic through the adoption of e-commerce using digital platforms. Traders in the County have widened their market range and can access customers from other counties around the country.

The County Government further plans to improve the business environment for local businesses to thrive and as a measure to attract new large investors. Additionally, it plans on growing licensed businesses in the County to 70,000 businesses which would support 100,000 employees (Laikipia County FSP, 2020).

8.4.3 Commodity and Livestock Markets

The main commodity markets in the County are in Nanyuki and Nyahururu towns which have established commercial zones. The main livestock markets are in Rumuruti, Doldol, and Kimanjo towns. Other market centers include Olmoran, Sipili, Wiyumiririe, Lamuria and Debatas (CIDP, 2018-2022). The County Government has embarked on infrastructure development projects to boost market services including rehabilitation of existing markets; construction of new markets, modern stalls, and bodaboda shades; fencing of market areas; drilling of boreholes to avail water to the traders; drainage, roofing repainting, and general repairs works; construction of bus parks and parking spaces, among many others (Laikipia County ADP, 2021-2022).

Plate 8-12: Modern Kiosks

Source: KREIS, 2022

As shown in table 8-7 below, the County has a total of 35 markets which range from wholesale to open-air markets *(refer also to map 8-5)*. The operational status of these markets is; twenty-seven active, six inactive, and two partially active.

Table 8-7: Commodity and Livestock Markets in Laikipia County

No.	Name	Status	Location
1.	New Market	Active	Nanyuki
2.	Nanyuki Old Open-Air Market	Active	Majengo
3.	Marikiti Market	Active	Majengo
4.	Nanyuki Mtumba Market	Active	Majengo
5.	Ukumbusho Market	Active	Nanyuki
6.	Lamuria Market	Active	Lamuria
7.	Wiyumiririe Market	Active	Wiyumiririe
8.	Nyahururu Open Air Market	Active	Nyahururu
9.	Nyahururu Wholesale Market	Active	Nyahururu
10.	Nyahururu Cereals and Fresh Produce Market	Active	Nyahururu
11.	Nyahururu Mtumba Market	Active	Nyahururu
12.	Thompson Falls Gate	Active	Nyahururu
13.	Rumuruti Fresh Produce Market	Active	Rumuruti
14.	Sipili Fresh Produce Market	Active	Sipili
15.	Kinamba Open Air Market	Active	Kinamba
16.	Ngare Ngiro Open Air Market	Active	Segera
17.	Kimanjo Open Air Market	Active	Kimanjo
18.	Doldol Open-air Market	Active	Doldol
19.	Luoniek Open Air Market	Active	Luoniek
20.	Mouwarak Open Air Market	Active	Mouwarak
21.	Doldol Livestock Market	Active	Doldol
22.	Kimanjo Livestock Market	Active	Kimanjo
23.	Ol Jabet Market	Active	Ol Jabet
24.	Debatas Stalls	Partially Active	Segera
25.	Naibor Market and Stalls	Inactive	Naibor
26.	Thome Stalls	Inactive	Thome
27.	Ewaso Open Air Market	Inactive	Ewaso
28.	Makutano Market and Stalls	Active	Makutano
29.	Karandi Kiosks	Active	Karandi
30.	Kalalu Open Air Market and Stalls	Partially Active	Kalalu
31.	Ndikiri Stalls	Inactive	Ndikiri
32.	Mutara Center Stalls	Active	Mutara
33.	Sosian Kiosks	Inactive	Sosian
34.	Ndurumo Kiosks	Active	Ndurumo
35.	Ol Moran Kiosks	Inactive	Ol Moran

Source: Department of Trade, CGL, 2022

8.4.4 Micro, Small and Medium Enterprises (MSMEs)

The County Enterprise Fund was established in 2014 to create 30,000 employment opportunities in the private sector by 2022. This would be achieved through starting

new MSMEs and expanding the existing MSMEs across the County. The fund is also intended to promote enterprise development for the youth, women, PLWDs, and marginalized communities (CGL, 2020).

The County has an estimated 25,706 licensed MSMEs and 50,000 unlicensed MSMEs, totalling to 81,706. These are in agriculture and forestry, wholesale trade, retail trade, repair of motor vehicles, repair of motorcycles, accommodation and food services, construction, information and communication, arts and music, professional and technical services (Laikipia County ADP, 2021-2022). These MSMEs have provided employment opportunities and helped sustain and improve the local livelihoods of the people.

However, the Covid-19 Pandemic adversely affected MSMEs in the County, with some being forced to shut down either temporarily or permanently. In the post-Covid period, the MSMEs have been able to recover from the pandemic through several measures promoted by the County Government (CGL, 2021). These were:

a. Increasing internet connectivity has facilitated the adoption of e-commerce using digital platforms.
b. Nurturing of MSMEs innovations to boost the production of personal protective gear, ventilators, and hand sanitizers in Nanyuki and Nyahururu towns through the Laikipia Innovation and Enterprise Development Programme.
c. Introducing an economic stimulus fund that can be accessed by MSMEs at a subsidized rate of 5%. This was through partnerships with National, KCB, Co-operative, Family, and Equity banks.
d. Subsidizing loan interests from local banks so that businesses can resume their normalcy – the County Government pays 5% and the borrower of the loan pays 7%.

8.4.5 Trade and Commerce Development

In its 2018-2022 medium-term plan, the County Government earmarked several programmes in trade development, namely; market infrastructural development – construction of new markets and market kiosks, rehabilitation of the existing market structures; operationalization of all existing green produce and cereal markets; extensive trade promotion and marketing; intensifying training on entrepreneurial skills and

management; and sourcing and facilitating markets linkages for livestock, livestock products, and agricultural products (CIDP, 2018-2022).

So far, the implementation status of these projects is ongoing in the Rumuruti market, Kinamba new market, Nanyuki new market, Gatundia new market, Rumuruti livestock market, and several markets in Marmanet Ward (Mutanga, Karaba, and Muruai markets). Three slaughterhouses are being constructed in Ngare Ndare in Mukogodo West Ward, Sipili in Ol Moran Ward, and Kinamba in Githiga Ward. Market toilets are still under construction at Matanya town in Tigithi ward and Likii in Nanyuki Ward. There is an ongoing construction of pit latrines in Rumuruti, Ol Moran, and Doldol livestock markets. To boost the informal economic sector, there is an ongoing construction of two shoe shiner sheds and two hawker sheds in Igwamiti and Nanyuki wards (Laikipia County ADP, 2021-2022).

The Laikipia County Development Authority embarked on a capital project of creating a support mechanism for businesses through training programmes to boost MSMEs in the County in the 2019/2020 FY. The project is 80% complete, having fully trained 204 business development officers (Laikipia County ADP, 2021-2022).

The Laikipia Innovation and Enterprise Development Programme provides business development services to 1,700 MSMEs who are supporting 20,000 jobs. Through this programme, 174 business development officers have been trained on enterprise development basics, business planning, access to finance, marketing, leadership skills, client engagement basics, and creating an industrial economy and development (CGL, 2022). Additionally, vetting and disbursement of loans to qualifying enterprises targeting 5,000 MSMEs is still ongoing (Laikipia County ADP, 2021-2022).

8.5 Industry and Innovation

The number of industries grew by 4.6% from 435 in 2018 to 455 industries in 2019. The increase was mainly due to an increase in enterprises dealing with grain mill products, wood and wood products, and dairy products (Laikipia County FSP, 2020). The various types of industrial activities include manufacturing, agro-processing, Juakali, and service stations. There are existing industrial zones in Nanyuki and Nyahururu towns, and a proposed one in Rumuruti Township. The range of manufacturing activities includes agro-processing, garments, assembly of automotive components and

electronics, plastics, paper, chemicals, pharmaceuticals, metals, and engineering products. The main manufacturing facilities in the County are shown in table 8-8 below.

Table 8-8: Manufacturing Facilities

Manufacturing facilities	Location	Estimated Population	Key Activities
Nanyuki Industrial Park	Nanyuki	300	Welding, leather processing, textile, and fabrication
Nyahururu Common Manufacturing User Facility	Nyahururu	300	Welding, leather processing, assembling, weaving, and fabrication
Rumuruti Common User Facility	Rumuruti	200	Welding, leather processing, and fabrication
Lamuria Common User Facility	Tigithi	150	Welding, fabrication, and leather processing

Source: CGL, 2019

Agricultural-related processing within the County includes alcoholic drinks processing/packaging, KCC milk processing in Nanyuki and Nyahururu towns, and Nina's yoghurt processing in Nanyuki town. The County has 7 Juakali associations with a membership of 344 artisans who are involved in welding, fabrication, and carpentry among other activities (CIDP, 2018-2022). Storage and distribution of petroleum products is undertaken within several service/filing stations in the towns and trading centers across the County.

Plate 8-13: Jua Kali and Petroleum Storage and Distribution Industry

Source: KREIS, 2022

Table 8-9 and map 8-6 below shows the distribution of manufacturing activities in the County.

Table 8-9: Types of Industrial Activities

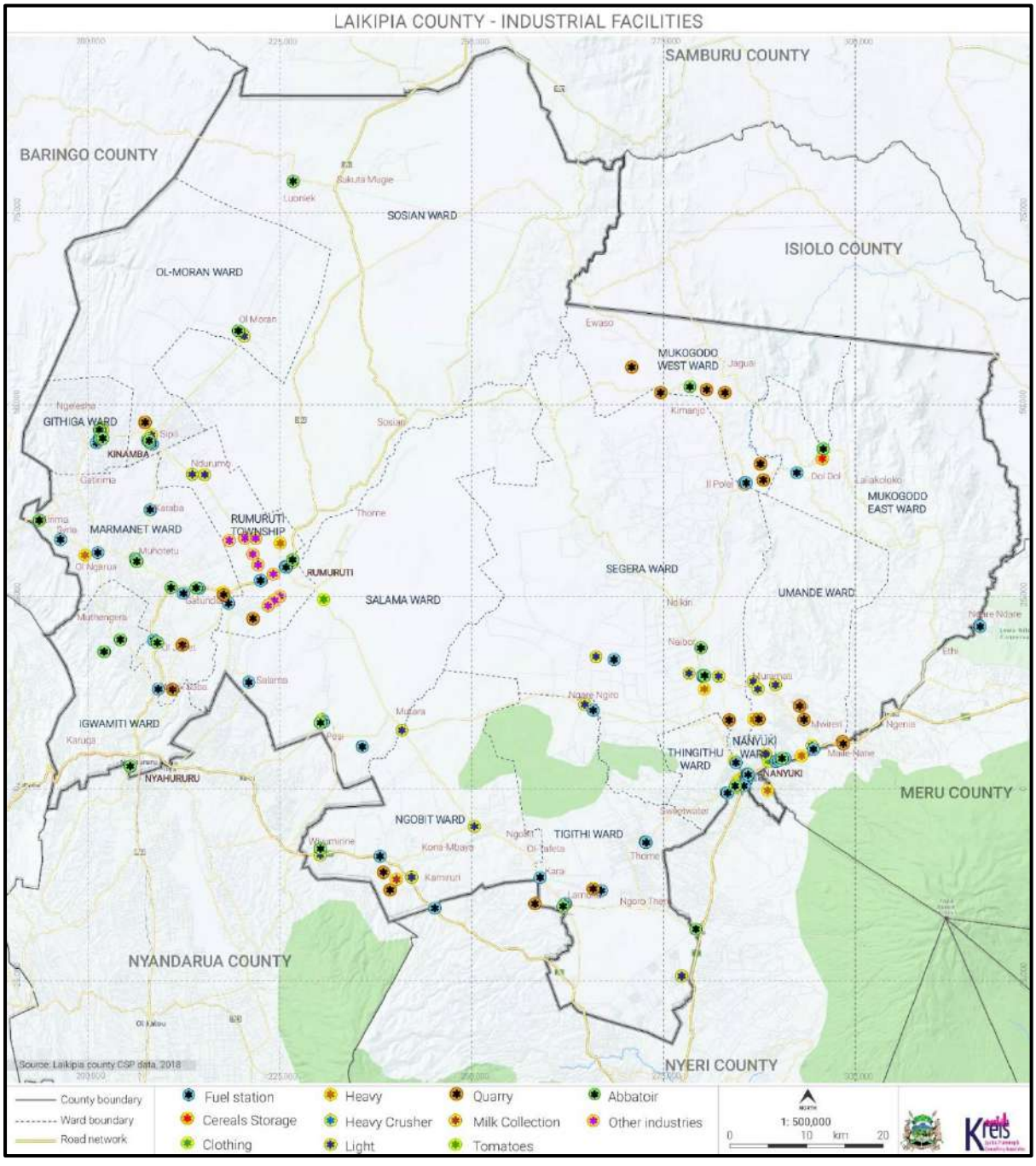
Type of Industry	Constituency			Total
	Laikipia East	Laikipia West	Laikipia North	
Meat and meat products	3	-	-	3
Processing and preserving fish	-	1	-	1
Processing & preserving of fruits & vegetables	5	-	1	6
Dairy products	8	2	-	10
Grain mill products	19	24	4	47
Bakery products	8	6	-	14
Confectionery	20	18	-	38
Other food products	3	-	1	4
Animal feeds	4	5	3	12
Beverages/bottled water	1	1	1	3
Textiles	5	6	-	11
Wearing apparels	1	4	-	5
Wood and products of wood	16	29	3	48
Refined petroleum products	1	-	-	1
Chemicals and chemical products	1	-	-	1
Other non-metallic mineral products	5	3	3	11
Fabricated metal products	59	63	11	133
Transport equipment	-	2	-	2
Other manufacturing	10	7	1	18
Electricity	1	-	1	2
Milk Processing	8	2	-	10
Fruits	1	-	1	2
Animal feeds	5	5	3	13
Timber	13	11	-	24
Water	3	5	-	8
Leather	1	3	1	5
Breweries	1	1	1	3

Source: CGL, 2019

Laikipia East Constituency has the highest number of manufacturing activities, mainly concentrated within Nanyuki Town. In Laikipia West, manufacturing activities are

majorly concentrated in Nyahururu, Rumuruti, and Kinamba towns. Good road connectivity, infrastructure utilities, and strong rural-urban linkages spur manufacturing in these towns.

Map 8-6: Distribution of Manufacturing Activities



8.5.1 Contribution of Manufacturing to the County's Economy

In 2017, the manufacturing sector contributed Ksh. 706 million to the Gross County Product (KNBS, 2019). A total of 1,305 persons are employed in the sector, with the number of males and females being 892 persons and 413 persons respectively. This

makes manufacturing a male-dominated sector in the County. Laikipia East Subcounty has the highest number of persons engaging in manufacturing activities (336 persons), while Laikipia North Subcounty has the least at 8 persons (Laikipia County Statistical Abstract, 2021). This is because of the presence of numerous manufacturing activities in Laikipia East, and the few in Laikipia North as shown in table 8-9 above.

8.5.2 Industry and Innovation Development

The County's potential for industrialization is yet to be fully exploited, as most of the industries are agricultural-based. Proximity to Isiolo Airport, Kenol-Sagana-Nanyuki-Isiolo Highway, and the old commuter railway offer great potential for industrialization and investment in the County.

In its 2018-2022 medium-term plan, the County Government earmarked several programmes in industry development, namely; setting up cottage industries and agro-processing plants for value addition; mapping out all industrial parks; and profiling all business and investment opportunities for industrial development (CIDP, 2018-2022).

According to the 2020 Laikipia County FSP, priority development measures in this sector included manufacturing and investment promotion support programs namely; construction of common manufacturing facilities, product development, ICT business systems, investment profiling, creation of linkages, and partnerships, brand promotion, and field operations support services. These activities were allocated Ksh. 41 million. So far, the implementation status of equipping common manufacturing facilities in Igwamiti, Tigithi, and Marmanet wards to benefit 50 MSMEs is ongoing (Laikipia County ADP, 2021-2022).

Other approaches by the County Government to boost manufacturing include:

a. **Laikipia Innovation and Enterprise Development Programme**

The Programme targets innovations within the manufacturing sector, which it considers to be key drivers of industrialization in the County. It has engaged over 400 enterprises and has so far helped in certifying 154 products with KEBS, filing 16 products for utility models, and availing 74 products manufactured in the County to local and international markets. The County Government is also planning and modernizing its urban centers to support industrialization, and refocusing its workers on production and

manufacturing-oriented enterprise development. Other initiatives include handholding local SMEs and partnering with local banks to provide subsidized loans at 7.5% (CGL, 2021).

In a bid to combat the Covid-19 Pandemic, the County Government through this programme encouraged innovations from MSMEs in the production of personal protective gear, ventilators, and hand sanitizers in Nanyuki and Nyahururu towns. MSMEs involved in producing protective equipment like face masks and gowns included Clej Supplies Limited, Nanyuki Vision Tailors in Nanyuki town and Jimco in Nyahururu town. Nanyuki-based EM Naturals, which is an SME dealing in cosmetics, expanded production to include hand sanitizers and help meet the demand (CGL, 2020).

b. Rumuruti Special Economic Zone

The County Government has set aside 200 acres in Rumuruti for the establishment of a special economic zone that is envisioned to develop Rumuruti into an industrial town, especially in the manufacturing of agricultural equipment and food processing. The SEZ is planned to attract both local and foreign investments, expand and diversify the production of goods and services for domestic and export markets, promote value addition in the agriculture sector, promote local entrepreneurship through Small and Medium Enterprises (SMEs), and stimulate rural and regional industrialization by exploiting the available mineral resources in Laikipia.

The 132kV Nanyuki-Rumuruti Grid Project which is intended to supply adequate and reliable power to Rumuruti Township and its surrounding environment is a measure to ensure the achievement of the vision of the SEZ. Additionally, the County Government has started the Electricity Rebate Program through which local manufacturers will get a refund of 30% on their monthly energy bills up to Ksh. 100,000 and a 50% refund on annual bills with a cap of 50,000 (CGL, 2022).

8.6 Mining and Quarrying

As discussed earlier, the County has substantial deposits of exploitable minerals, including iron ore, bentonite, kaolin, bauxite, sepiolite, mica, vermiculite, marble, and

garnets. There are also numerous exploitable rocks such as quartzites, granites, basalts, and phonolites.

Currently, quarrying activities in the County mainly involve the extraction of sand, soil, granite, and ballast. Sand harvesting is spatially predominant as it naturally occurs along rivers and streams, with red-sand harvesting being carried out along riverbeds in Laikipia North. Crushing of ballast to produce quarry dust and excavation of gravel and murram is also done by private companies to provide raw materials for the construction of roads and buildings.

Plate 8-14: Quarrying Activities in the County

Source: KREIS, 2022

8.6.1 Contribution of Mining and Quarrying to the County's Economy

Economic activities around mining and quarrying in Laikipia County have grown from Ksh. 81 million in 2013, to Ksh. 117 million in 2017, and Ksh. 136 million in 2019. The total number of persons engaging in mining and quarrying activities in the County is 448, with 408 males and 40 females. This sector is, therefore, male-dominated. Laikipia Central Subcounty has the highest number of people (113 persons) employed in quarrying activities, while Laikipia West Subcounty has the least at 37 persons. In Laikipia North Subcounty where red sand harvesting along riverbeds is common, 76 persons registered mining as their main form of employment (Laikipia County Statistical Abstract, 2021).

8.6.2 Mining and Quarrying Development

Mineral experts believe there is a huge opportunity to grow this sector further by exploiting iron ore and other recently discovered deposits (CGL, 2020). To achieve the

development goals for the 2018-2022 medium-term plan, the County Government intends to have mining as a key pillar that will boost its local economy. This will be through attracting detailed exploration and incentivized investment into the value addition of the minerals. The County allocated Ksh. 10 million to support mining exploration and development (Laikipia County FSP, 2020). As a capital project, the Laikipia County Development Authority planned to establish the existing mine blocks in the 2019/2020 FY. The completion status of the project is 80%, with an ongoing online registration of the mine blocks.

8.7 Transport and Related Services

The County has an integrated transport network comprising road, rail, and air transport. These transportation options create a favorable environment in which local businesses thrive and also attract extra investments, particularly in the trade, tourism, and manufacturing sectors. The major transport routes serving the County are the A102 Nairobi-Isiolo-Marsabit road, C55 Gilgil-Rumuruti road, A2 Rumuruti-Mararal road, and B65 Nakuru-Nyeri road (CIDP, 2018-2022). These transport routes provide connectivity within the larger CEKEB region, allowing for inter-county trading relations. Landing grounds within the private ranches and conservancies facilitate tourism activities by enabling the flow of local and international tourists into the County, which in return generates revenue.

In 2017, transport and related services contributed to Ksh. 5,904 million to the Gross County Product (KNBS, 2019). The annual fee charged by the County Government for registration of matatu SACCOs is Ksh. 30,000 and that of an individual PSV matatu is Ksh. 500. Other streams of own-source revenue from this sector include charges for PSV monthly tickets, daily and monthly parking fees, penalties, impounding, and towing fees using County recovery facilities (Laikipia County Finance Bill, 2021-2022). A total of 4,845 persons are employed in the sector, with the number of males and females being 4,711 persons and 134 persons respectively. This makes public transport service provision a male-dominated sector in the County. The County Government has set priority allocations towards road infrastructure improvement – opening up new roads and maintaining existing roads. This will enhance additional transport and related services in the county

8.8 Resource Mobilization

Before the promulgation of the Constitution of Kenya 2010, resource mobilization and allocation had been solely a function of the Central Government. Public funds were allocated to ministries according to their specific budgets, through which they would flow down to the lower levels of administration via de-concentration. However, with the new Constitution, a devolved system of government was adopted which introduced county governments. Therefore, revenue mobilization is a shared responsibility between the two levels of government. The largest portion of revenue is collected at the national level since it is often easier and more efficient to centralize tax collection (i.e. income tax, import/export duties, VAT). Revenues mobilized by county governments are taken into a consolidated account of the National Treasury. Every fiscal year, the National Parliament approves a Division of Revenue Act that relies on the technical advice of the Commission on Revenue Allocation to determine the conditional grants and unconditional equitable share of revenue that is to be assigned to the two levels of government, to enable them to offset their budgetary responsibilities.

However, county governments rely heavily on intergovernmental fiscal transfers from the National Treasury as their principal sources of revenue. This over-reliance limits the county governments' ability and motivation to fully exploit their fiscal capacities. The result is a shortage in own-source revenue, which impedes the efficient and effective allocation of budgets to finance development projects and programmes. It is thus essential for county governments to mobilize local revenues to their optimum potential.

8.8.1 County Revenue

County governments in Kenya have two main sources of revenues – those collected directly from residents and businesses (own-source revenues), and those collected at the national level and passed on to counties as intergovernmental fiscal transfers. Laikipia County's total revenue constitutes an equitable share from the National Government, conditional grants, and own-source revenue as shown in table 8-10 below.

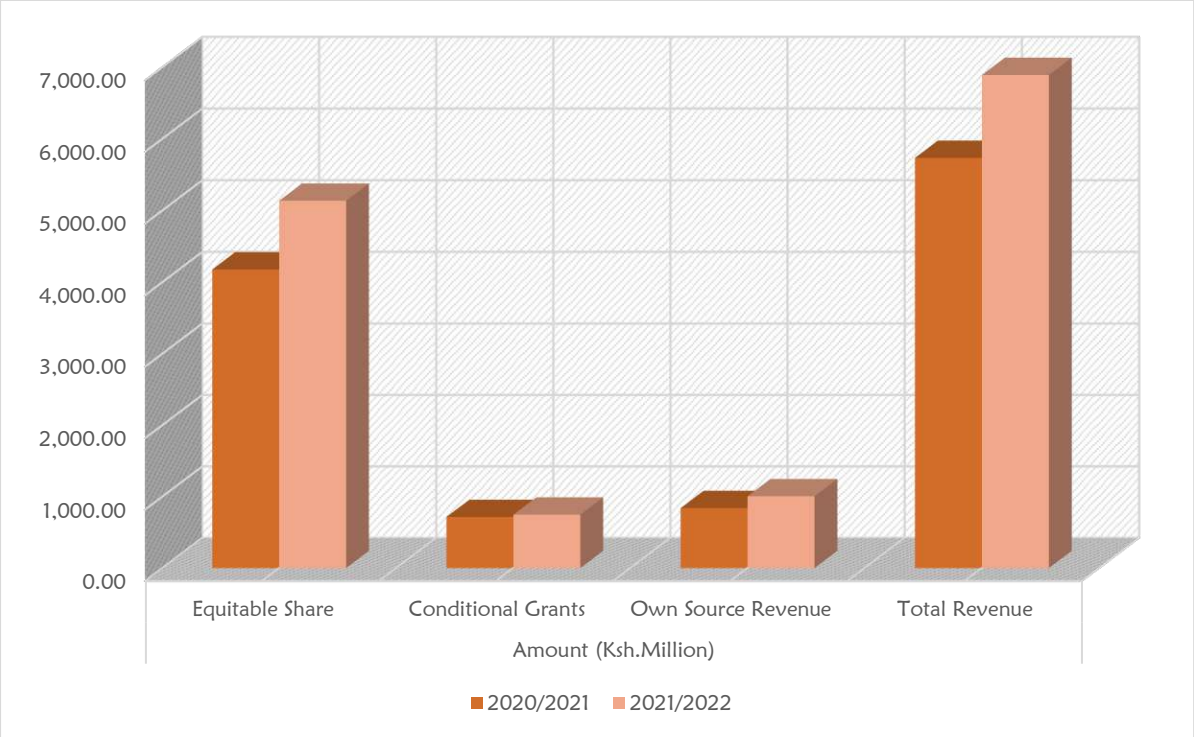
Table 8-10: Aggregate of Total County Revenue

Fiscal Year	Amount (KES Million)			
	Equitable Share	Conditional Grants	Own-Source Revenue	Total Revenue
2020/2021	4,177.80	715.83	840.40	5,734.03
2021/2022	5,136.27	748.11	1,006.00	6,890.37

Source: Kenya Economic Survey, 2022

The equitable share is an unconditional allocation of revenue that the County is supposed to use without any restrictions. The conditional grants are revenues received from the National Government with imposed restrictions on how the County should use them, usually for delivering on identified national priorities. Own-source revenue constitutes revenues the County raises by collecting taxes, fees, fines, and user charges in one fiscal year. From table 8-10 above, it is evident that there has been an increase in all these three revenue sources, consequently increasing the County's total revenue in the 2021/2022 FY.

Figure 8-1: Summary of County Revenue for 2020/2021 – 2021/2022



Source: Kenya Economic Survey, 2022

8.8.1.1 Own-Source Revenue

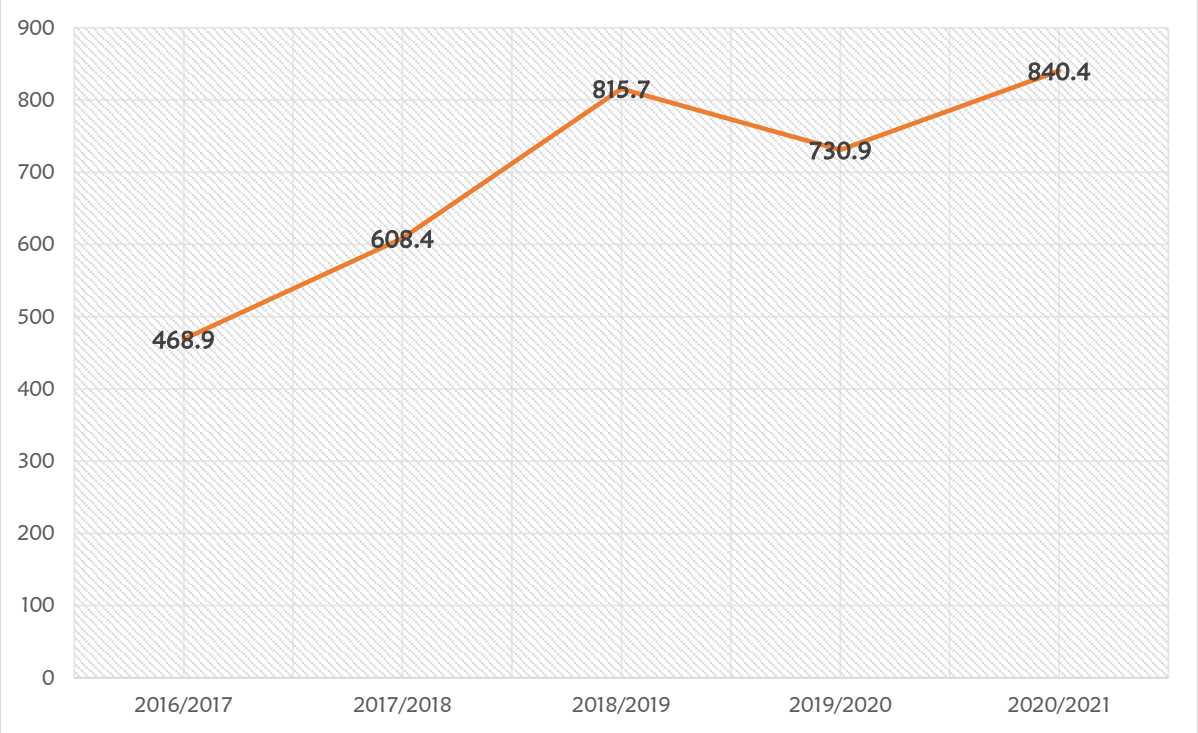
The County's own-source revenue is fundamental to its functioning and funding of service delivery. Its key revenue streams are hospital services, single business permits, parking fees, land rates, liquor licenses, market entrance charges, trading centers' stalls/shop rents, natural resources exploitation fees, social premises use charges, and agricultural produce CESS among others. The County has been registering an increase in its locally-sourced revenue over the past fiscal years, as shown in table 8-11 below.

Table 8-11: Own-Source Revenue in the County

Fiscal Year	Amount of Own-Source Revenue (KES Million)
2016/2017	468.9
2017/2018	608.4
2018/2019	815.7
2019/2020	730.9
2020/2021	840.4

Source: CGL, 2021

Figure 8-2: Own-Source Revenue in the County



Source: CGL, 2021

The 2018-2022 CIDP outlined the County's medium-term framework for achieving fiscal balance and growing the GCP by at least 10% annually.

In the 2018/2019 FY, the County recorded the highest amount of its own-source revenue at KES 815.7 million. The Laikipia County Revenue Board had planned to increase its revenue collection by enhancing locally generated revenue in the 2019/2020 FY. The target was to raise this revenue from KES 815.7 million generated in 2018/2019 FY up to KES 1,006.9 million in the 2019/2020 FY. It however did not meet this target and collected KES 730.9 million because of economic and social disruptions of the Covid-19 Pandemic (Laikipia County ADP, 2021-2022).

The business environment was severely affected as shops closed down – especially in the accommodation and food service industry, PSVs transport providers, and recreation and entertainment services. Cases of unemployment also increased as some people lost their jobs temporarily or permanently, which impacted negatively on their means of livelihood. The County established an economic stimulus package whose aim was to rejuvenate the economy and cushion the vulnerable members of the society and sectors of the economy from the economic shocks of the pandemic.

In the 2020/2021 financial year, the County's own-source revenue grew to KES 840.4 million, indicating a positive economic recovery from the effects of the pandemic. This was mainly attributed to increased internet connectivity in the County through a partnership with Safaricom, to create a cashless tax system that made payment of taxes easier and more efficient. The County Government has set targets to help achieve a 10% economic growth rate and ultimately improve the Human Development Index of the people (Laikipia County Fiscal Strategy Paper, 2020). Those targets are:

a. Improving access and quality of health services.
b. Setting enough resources for infrastructural developments to help spur economic growth through increased access to markets and movement of goods and people.
c. Promoting corporate governance for sustained efficiency, enhancing autonomy, and cultivating accountability for better service delivery.
d. Harnessing innovation to incubate industries and support manufacturing – through the establishment of vocational training institutes and industrial parks.
e. Increasing agricultural productivity through irrigated agriculture, improved seed varieties, improved animal husbandry, embracing and encouraging feedlot

farming, provision of extension services and contracting farmers among other contemporary agricultural approaches.

The County Government aims to realize these targets through the expansion of its tax base and fostering collaboration with the private sector and development partners to complement the implementation of earmarked programmes.

8.8.1.2 Gross County Product (GCP)

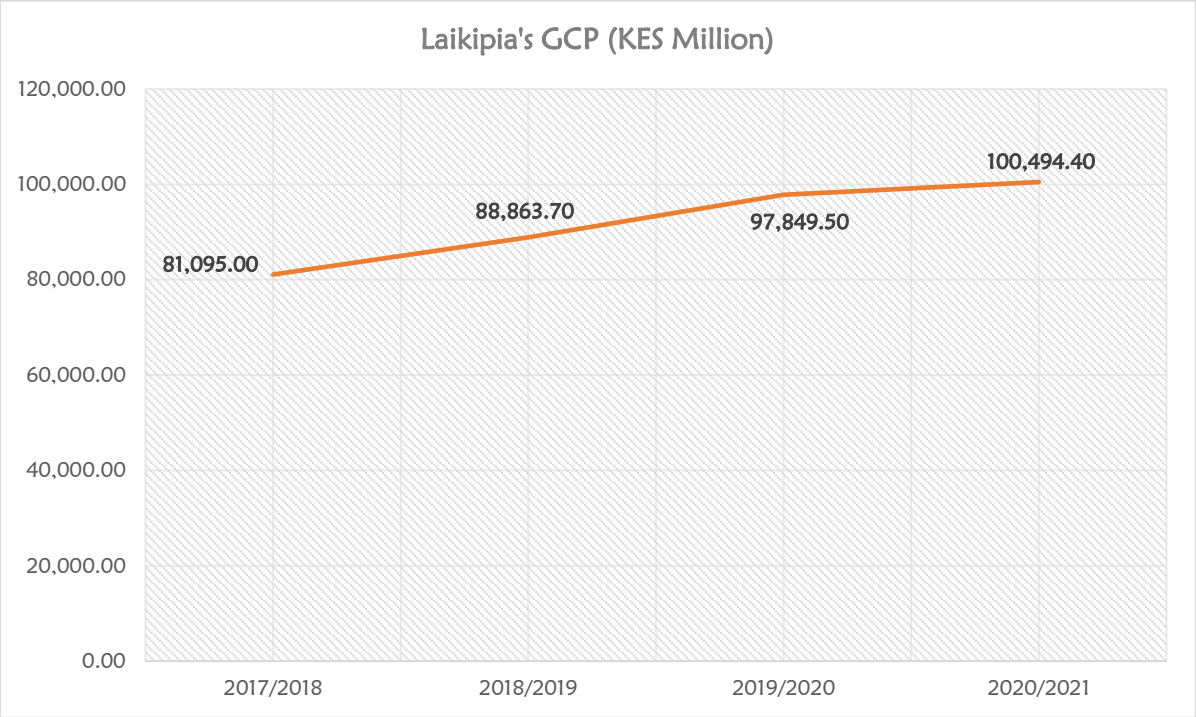
Gross County Product is a measure of how much each county contributes to Kenya's GDP. Laikipia County has a high growth rate of 8.9% as compared to the national average growth rate of 5.6%. According to the 2019 GCP report by KNBS, the County had a GCP of KES 81 billion in 2017 at current prices. This has since grown to an estimated KES 89 billion in 2018, KES 98 billion in 2019, and KES 100 billion in 2020 at current prices as shown in table 8-12 below.

Table 8-12: Laikipia County's GCP from 2017-2020

Fiscal Year	Amount in (KES Million) at Current Prices
2017/2018	81,095.0
2018/2019	88,863.7
2019/2020	97,849.5
2020/2021	100,494.4

Source: Laikipia County Statistical Abstract, 2021

Figure 8-3: Laikipia County's GCP from 2017-2020



Source: Laikipia County Statistical Abstract, 2021

The key economic activities that have contributed to this increase are agriculture, trade, real estate services, construction, and transport and storage services. Revenue from accommodation and service activities decreased in 2020 owing to the Covid-19 Pandemic. As shown in table 8-13 below, other economic activities that contribute to the County's GCP are mining and quarrying, manufacturing, electricity supply, water supply, waste collection, ICT services, finance and insurance activities, education, public administration and defense, and other service activities.

Table 8-13: Contribution of Economic Activities to the GCP & its Growth from 2017 - 2020

Sector	2017 Amount in (KES Million)	2020 Amount in (KES Million)
Agriculture	35,489	46,038
Mining and Quarrying	117	152
Manufacturing	706	724
Electricity Supply	723	847
Water Supply and Waste Collection	755	947
Construction	5,606	7,052
Wholesale, Retail and Repair of Automobiles	7,132	8,793
Transport and Storage	5,904	8,239

Accommodation and Service Activities	512	322
ICT	916	998
Financial and Insurance Activities	6,275	6,134
Real Estate Services	4,913	7,023
Professional, Technical and Support Services	605	601
Public Administration and Defense	6,006	6,817
Education	3,489	3,142
Human Health and Social Work Activities	1,697	2,084
Other Service Activities	1,014	1,205
Total	**81,095**	**100,494**

Source: Laikipia County Statistical Abstract, 2021

8.8.2 County Expenditure

County Governments' expenditure is divided into two broad categories; recurrent and development expenditure. Recurrent expenditure is the regular spending incurred for the ongoing operations of a County Government. It includes compensation to employees, purchase of goods, services, operations, and maintenance. Development expenditure on the other end is the expenses incurred to buy, improve, or extend the life of capital items/fixed assets such as roads, buildings, health facilities, and schools among others.

According to the 2021 Kenya County Budget Transparency Survey, Laikipia County is among the counties that published all four quarterly budget implementation reports required in the 2020/21 FY. This involved preparation and dissemination of three quarterly financial statements and one annual financial statement for the 2019/2020 FY. It is also among the counties that had their approved Programme Based Budgets consistently available in the last four County Budget Transparency Surveys conducted by International Budget Partnership Kenya between 2018 and 2021.

8.8.2.1 Overall Budget Allocations

Laikipia County's total budget allocations are as follows:

Table 8-14: County's Overall Budget Allocations

Details	Amount (Ksh.)			
	2019/2020	2020/2021	2021/2022	2022/2023
Total Recurrent Expenditure	3,813,986,834	4,370,525,135	4,321,484,608	4,253,445,390
Total Development Expenditure	1,370,688,577	1,436,909,865	1,580,600,853	1,738,660,937
Total Budget	**5,184,675,411**	**5,837,435,000**	**5,902,085,461**	**5,992,106,327**

Source: Laikipia County Fiscal Strategy Paper, 2020

The County's budget has been increasing annually due to incremental allocations to finance priority targets in the various departments. In the 2019/2020 FY, the public service and County administration sector was allocated the highest budget at Ksh. 2.8 billion, while the Laikipia County Development Authority received the least allocation at Ksh. 22.5 million. Projections for allocations in the 2021/2022 FY for these two sectors were Ksh. 3.2 billion and Ksh. 25.5 million respectively (Laikipia County FSP, 2020).

The County Government is committed to upholding its fiscal responsibility by progressively bringing personnel emoluments down towards the required 35% of the total budget target, reducing recurrent expenditure so that it does not exceed the County Government's total revenue, allocating above 30% of the total budget to development expenditure, and sustaining revenue growth (Laikipia County FSP, 2020).

8.8.2.2 Sector Ceiling

Given that the agriculture sector is the main contributor to the County's economy, allocations to the Agriculture, Livestock, and Fisheries Department have been increasing, from Ksh. 80 million in 2019/2020 FY, to Ksh. 85.9 million in the 2020/2021 FY, and to a projected Ksh. 93.6 million in the 2021/2022 FY. Further, the projected allocation for 2022/2023 FY is Ksh. 101.99 million. This budget will help in achieving the priority measures identified for the development of the agricultural sector, especially in the support of irrigation farming, improved seed varieties, extension services, subsidized farm inputs, and livestock vaccines (Laikipia County FSP, 2020).

Allocation to the Trade, Tourism, Enterprise Development, and Cooperatives Department in the 2019/2020 FY was Ksh. 132.8 million. This has since increased to

Ksh. 147.1 million in the 2020/2021 FY, and to a projected Ksh. 160.1 million for the 2021/2022 FY. Further, the projection for the 2022/2023 FY allocation is Ksh. 174.7 million. This budget will help in meeting the priority measures identified for the development of this sector, especially on MSMEs support programs, cooperatives, and tourism financing for recovery, and in promoting manufacturing and investments.

8.9 Emerging Issues

Sector	Opportunities	Constraints
Agriculture	▪ The County has the potential for more agricultural production through irrigation farming, climate-smart farming technologies, and value addition. ▪ There are available livelihood opportunities in horticulture and floriculture farming. ▪ Apiculture and aquaculture have a significant underutilized potential that needs maximum exploitation. ▪ There are untapped investment opportunities in value addition and agro-processing industries.	▪ Unfavorable climatic conditions limit rain-fed agriculture in the drier parts of Laikipia North and West. ▪ Climate change has reduced agricultural production, both in crop farming and livestock keeping. ▪ Human-wildlife conflicts cause crop damage/losses, particularly in Laikipia West and East regions. ▪ Insecurity in areas within the northwestern region limits optimum agricultural production for both crop and livestock products.
Tourism	▪ The rich wildlife population and presence of endangered species present opportunities for more conservation measures and programmes through public-private partnerships. ▪ Tourism is perceived as a high-return investment by the private sector as seen in the numerous hotels, lodges, camps, resorts, villas, sports clubs, holiday homes, and cultural centers.	▪ Cases of human-wildlife conflicts are rampant across the County. ▪ Prolonged drought periods result in pasture depletion, biodiversity degradation, and water scarcity, which in turn affect tourism. ▪ Insecurity in the northwestern region limits tourism activities. ▪ Land use changes and subdivisions are a threat to the vast scenic landscapes,

Sector	Opportunities	Constraints
	▪ Investments in this sector have the prospect of creating more employment opportunities and sustaining livelihoods in the County. ▪ There exist many biodiversity conservation opportunities in eco-tourism that can help raise the livelihoods of the pastoral communities in Laikipia North.	community ranches, and wildlife conservancies.
Trade and Commerce	▪ Rehabilitation of existing markets and construction of new markets provide more opportunities for MSMEs start-ups, thus boosting local trade. ▪ The identified urban centres act as growth centers, attracting more economic investments and activities within and around them. ▪ The livestock markets at Rumuruti, Dol dol, and Kimanjo promote livestock keeping and sustain the livelihoods of the pastoralists. ▪ The use of e-commerce has boosted trading activities.	▪ Insecurity in the northwestern region limits investments in trade and commerce. ▪ The Covid-19 Pandemic severely impacted businesses, leading to permanent shutdowns and loss of employment.
Industry and Innovation	▪ There exist untapped opportunities in value addition, agro-processing, and general-commodity industries. ▪ The Rumuruti Special Economic Zone provides a favorable environment that will attract both local and foreign investments.	▪ Insecurity in the northwestern region limits investments in industry and innovation.
Mining	▪ This sector has great economic potential for the exploitation of different minerals including limestone, iron ore and quartz among others	▪ Unregulated sand scooping along rivers in Laikipia North.

9 TRANSPORT, PHYSICAL AND SOCIAL INFRASTRUCTURE

9.1 Overview

The socioeconomic well-being of people and communities is anchored fundamentally on infrastructure systems. These systems form the framework within which people interact, goods and services flow, markets thrive and urban functions are distributed. They are generally termed as capital assets that propel the economic growth and prosperity of geographic regions and countries as a whole. Transport systems are a form of physical infrastructure which create and facilitate connectivity between places and communities. Other physical networks comprise energy, telecommunication, water reticulation, drainage, and waste management systems whose provision collectively determines the level of development of an area. Social infrastructure on the other end is the assets within which social services are availed and accessed by a population.

The nature, level, and capacity of infrastructure systems are heavily dependent on the size and distribution of the present and projected catchment population. As populations increase, the need for more and higher-capacity infrastructure systems arises. The inadequate provision creates socio-economic stresses which result in low economic productivity. It is therefore essential for these systems to be in tandem with the rate of population growth in any given geographic area. This chapter details the existing transport, physical, and social infrastructure facilities within Laikipia County; in terms of capacity, condition/state, distribution, and development priorities.

9.2 Transport Infrastructure

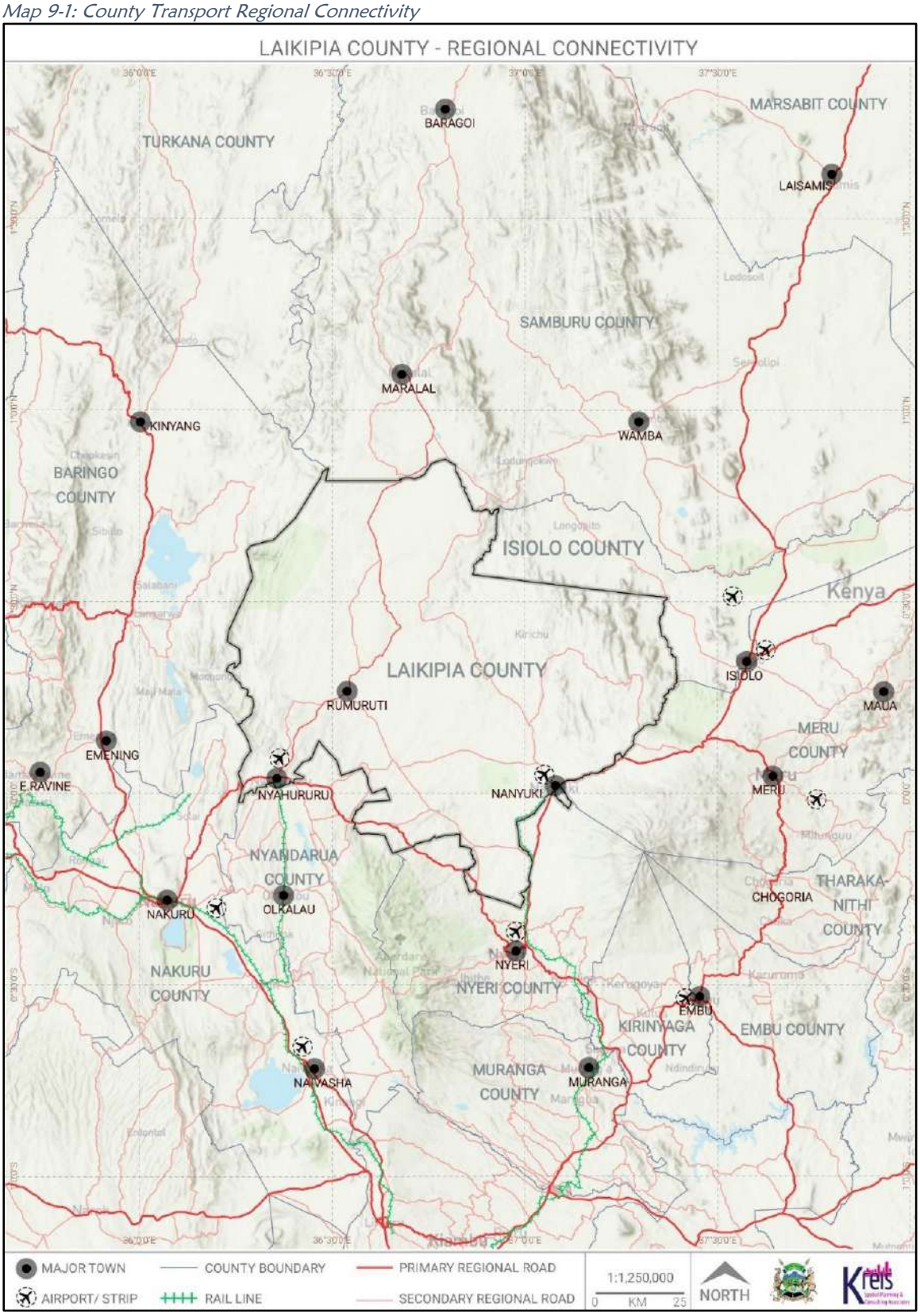
This comprises road, railway, and air transport networks, namely; roads/streets/walkways, railway lines, and airways; and their termini facilities including bus parks, parking areas, train stations, and airport/airstrips/landing grounds.

9.2.1 Regional Connectivity (Inter-County Connectivity)

Transport infrastructure linkages create connectivity between Laikipia County and its neighboring counties as shown in map 9-1 below. Within the regional connectivity, Laikipia County is strategically served by the Isiolo Airport, a Trans-National Highway and Railway (LAPSSET corridor project), and a National Highway through Nanyuki to Meru together with the Nyeri Nyahururu road. Doubtlessly, this makes Laikipia quite

competitive in terms of the movement of goods and services within the region and therefore, optimal production within the County is required.

Map 9-1: County Transport Regional Connectivity



Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

9.2.2 Countywide Road Networks and Distribution

Road networks are a means of opening up regions and other geographical areas to development through the movement of goods, information, and migration of people which leads to the setting up of human activities. According to the 2018-2022 CIDP, the total classified road network in the County is 9,065.1km, out of which over 80% are feeder roads. The bitumen, gravel, and earth roads stand at 434.8km, 3,441.5km, and 5188.8 km, respectively are shown in table 9-1 below.

Table 9-1: Category and Length of Roads

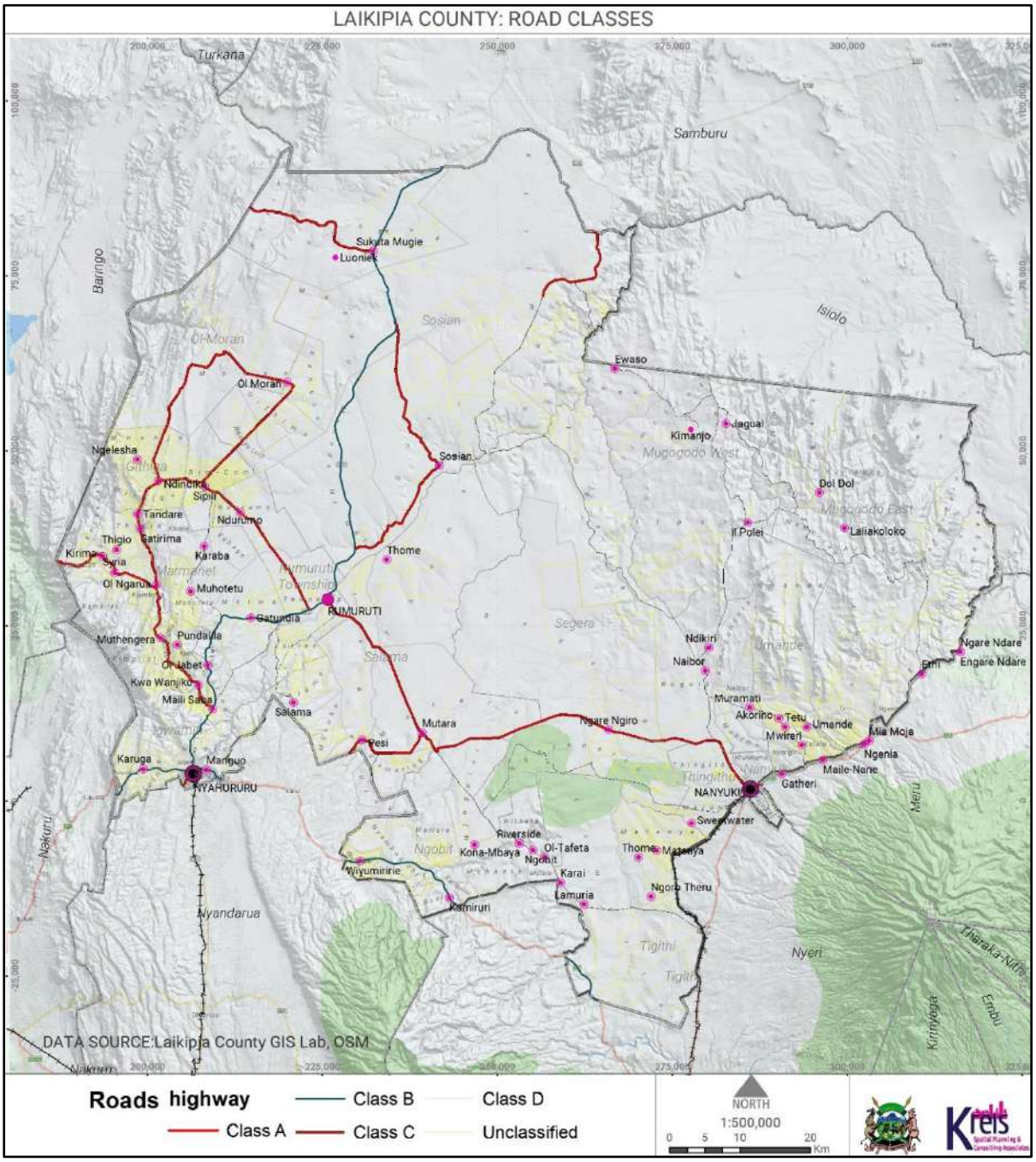
Category	2017(Km)	2018(Km)	2019(Km)	2020(Km)
Paved/ Bitumen Roads	222.1	223.6	383.7	434.8
Gravel Roads	2,796.0	2,946.0	3,083.3	3,441.5
Earth Roads	4,116.0	3,966.0	4,436.5	5,188.8
Total	**7,134.10**	**7,135.60**	**7,903.50**	**9,065.1**

Kenya Urban Roads Authority (KURA), Department of Infrastructure, CGL

The major transport routes serving the County are Nairobi-Isiolo-Marsabit (A2), Gilgil-Nyahuhuru-Rumuruti-Mararal (A4) and Nakuru-Nyeri (B65). These routes facilitate good connectivity within the wider CEREB region, consequently providing for inter-county trading relations and economic development. They also enable strong rural-urban linkages between the main urban centers (Nanyuki, Rumuruti, and Nyahururu) and their rural hinterlands.

The distribution and classification of the road network are shown in map 9-2 below.

Map 9-2: Laikipia County Transport Networks and Distribution



9.2.2.1 Urban Roads

The majority of the roads within the major urban areas are tarmacked and in good condition. The upgrading of the Great North Road to a dual carriageway between Kenol and Marua is expected to boost the growth of the major urban centers. The roads are easily accessible by the population and most of the regions are adequately served as shown in map 9-3 below.

Table 9-2: Type and Length of Urban Roads

Type of Road	2017	2018	2019	2020
Earth	52.0	69.0	99.0	119.00
Murram	64.7	66.7	77.0	117.00
Bitumen	22.1	22.6	33.1	36.80
Total	138.8	158.3	209.1	272.8

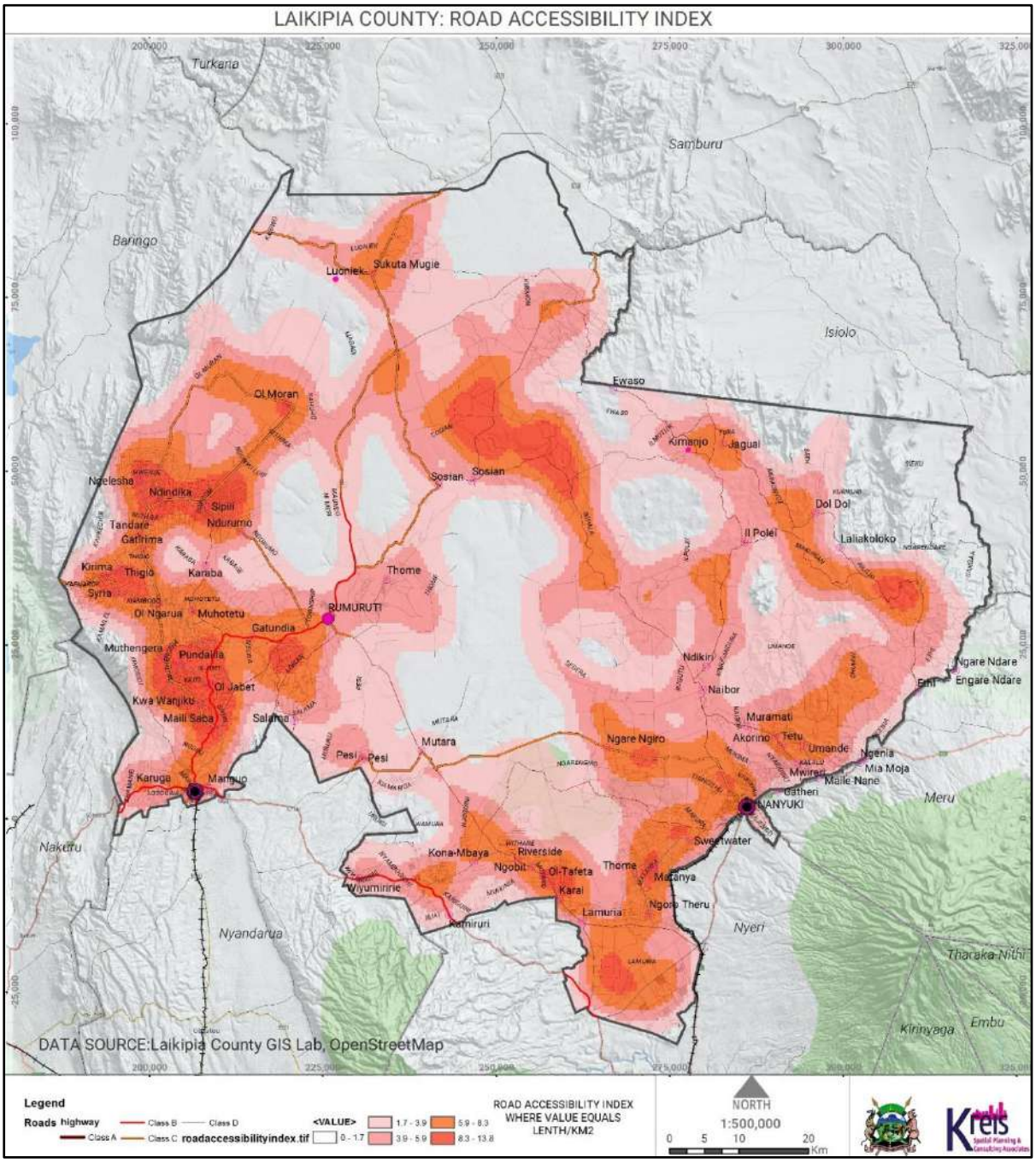
Kenya Urban Roads Authority (KURA), Department of Infrastructure, CGL

Plate 9-1: Urban Roads




Source: KREIS, 2022

Map 9-3: Road Accessibility Index



9.2.2.2 Rural Roads

The roads within the rural areas are of gravel, murram, and earth status. This is attributed to the steep/ harsh terrain and the vastness of the region which makes infrastructure development costly. Consequently, this has resulted in the inability to transport goods and services to the markets and the inaccessibility to public facilities like schools and health centers.

The rural roads are at times impassable and break off during the rainy season, therefore, hindering the movement of goods and services from one area to the next. They also hinder timely access to hospitals and schools. Additionally, in some parts of the County, this condition of the roads has been attributed to significant security threats that necessitate the need to improve them to all-weather roads.

Plate 9-2: Rural Roads

Source: KREIS, 2022

However, where most of these roads traverse the wildlife conservancies and ranches, they are seen as the most preferred as they help deter the movement of vehicles and in a way contribute positively to managing illegal wildlife activities such as poaching. Further, the roads are seen as a way of managing development and urban sprawl which help manage land speculation and urbanization which would otherwise be seen as degrading the large biodiversity ecosystem.

9.2.3 Railway Transport

There exists an old railway network covering 25km, serving Nanyuki Town, and a smaller stretch of about 2km serving Nyahururu Town. The line offers cheaper and safer transport alternatives for bulk cargo to the players in the agricultural sector, trade, and mining. The railway line cuts through the Central Region Economic Bloc and thus promoting trade in the region. The extension of the railway line to Isiolo Town is set to link CEKEB to new markets that are expected to be served by the LAPSSET Corridor.

The railway line is expected to be a boon to agribusiness--the main source of livelihood for residents in the region. As more farmers become aware of its operationalization, it will help in moving beef, horticulture, floriculture, milk, and potatoes which are the main agricultural products from Laikipia, Nyandarua, and Nakuru counties. The reintroduction of livestock rail transport wagons from Nanyuki station to the Kenya Meat Commission slaughterhouse in Athi River is also a major motivation for livestock keepers. KMC provides farmers with a ready market for their beef cattle and transportation with a railway ensures farmers save on transport costs.

Plate 9-3: Railway Line

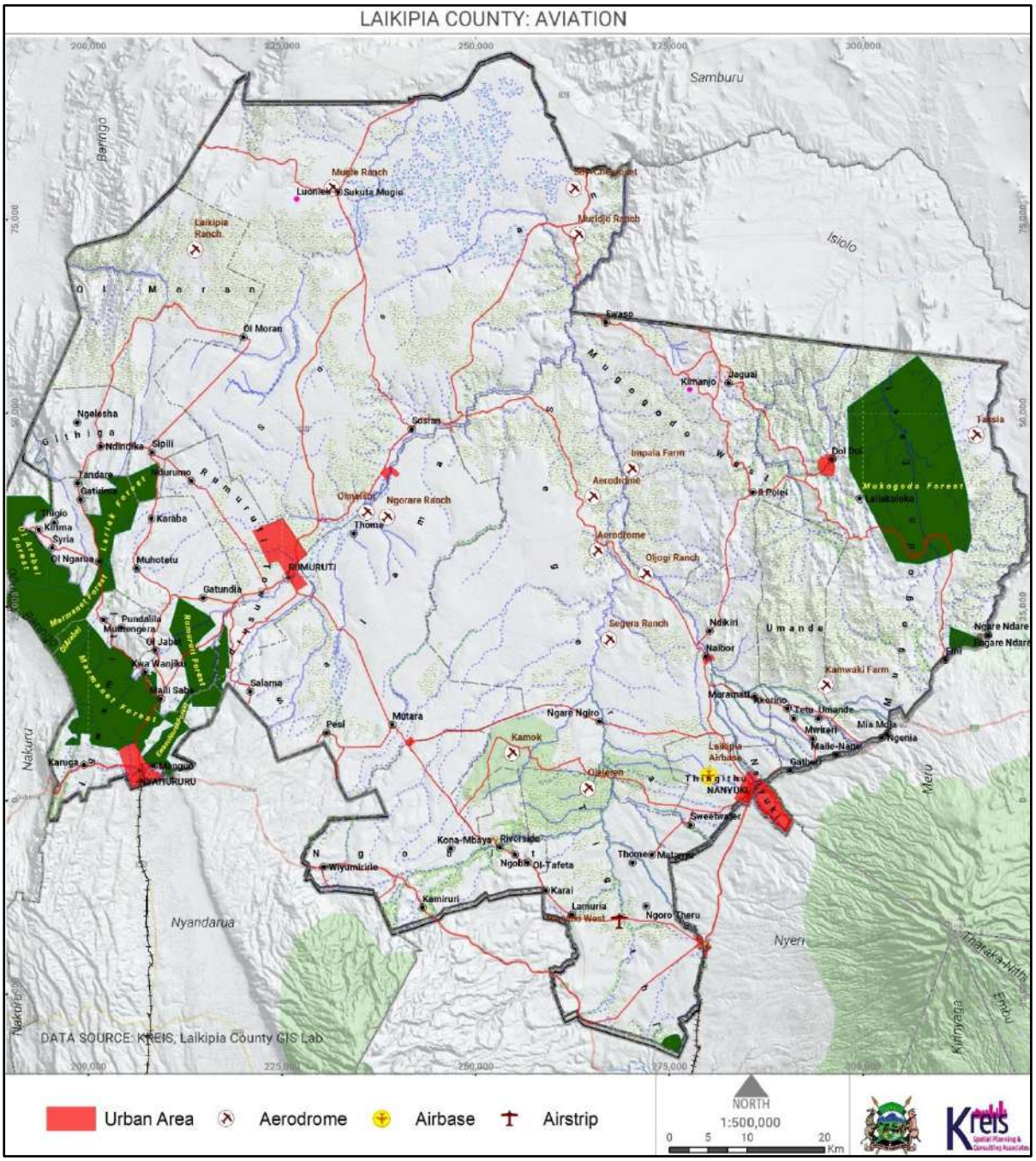
Source: KREIS, 2022

9.2.4 Air Transport

The County is served by one airstrip near Nanyuki Town. There is a proposed airport at Kandutura within Rumuruti municipality, and two proposed airstrips at Makurian in Laikipia North and Rumuruti in Laikipia West. There are several landing grounds majority of which are within private ranches/conservancies. Air transport should be tapped into to strengthen the tourism sector as well as improve horticultural and

livestock trade markets. Map 9-4 below shows the aviation service index and the specific areas of influence.

Map 9-4: Aviation Service Index



9.2.5 Public Transport

Public transport is the main means of transport used by the residents. Matatus, probox, and boda boda are used to move people and goods from the urban areas to the rural areas and vice versa. The probox is used for longer distances in the vast rural areas due

to the unwillingness of private investors to invest in large-capacity vehicles plying most rural roads due to the road conditions.

9.2.6 Non-Motorized Transport (NMT)

NMT refers to non-engine means such as walking, cycling, wheelchair, scooter, and handcart use. They play a unique role in the sense that they are efficient and also part of the green transport system. They provide basic mobility, affordable transport, access to motorized modes, physical fitness, and enjoyment. NMT contributes to access to health care, education, and economic opportunities. However, there lacks infrastructure for NMT such as dedicated paths for cyclists and pedestrians in urban areas.

Plate 9-4: Non- Motorised Transport Activities

Source: KREIS, 2022

9.2.7 Parking Facilities

Besides parking facilities in Nanyuki town other terminals are located in Nyahururu, Rumuruti, Kinamba, and Dol-dol towns. There are limited parking facilities for boda boda, taxis, and lorries within the urban centers. Through the physical planning and development of urban centres, there will be the construction of access roads, bus parks,

parking areas, paving of streets, and provision of street lighting within each of the identified towns. This will boost economic activities and make them local growth centers.

Plate 9-5: Boda Boda Sheds

Source: KREIS, 2022

9.3 Water, Waste Management, ICT & Energy Infrastructure

This encompasses water reticulation networks, solid and liquid management systems, Information and Communication Technology (ICT) services, and energy sources.

9.3.1 Water Access and Distribution

9.3.1.1 Water Sources

Water sources in the County comprise rivers (some perennial and others seasonal), boreholes, springs, rock catchment, rain-harvesting, pipe systems, dams, and pans. The percentage distribution of households and their main sources of drinking water is given in table 9-3 below.

Table 9-3: Distribution of Water Sources

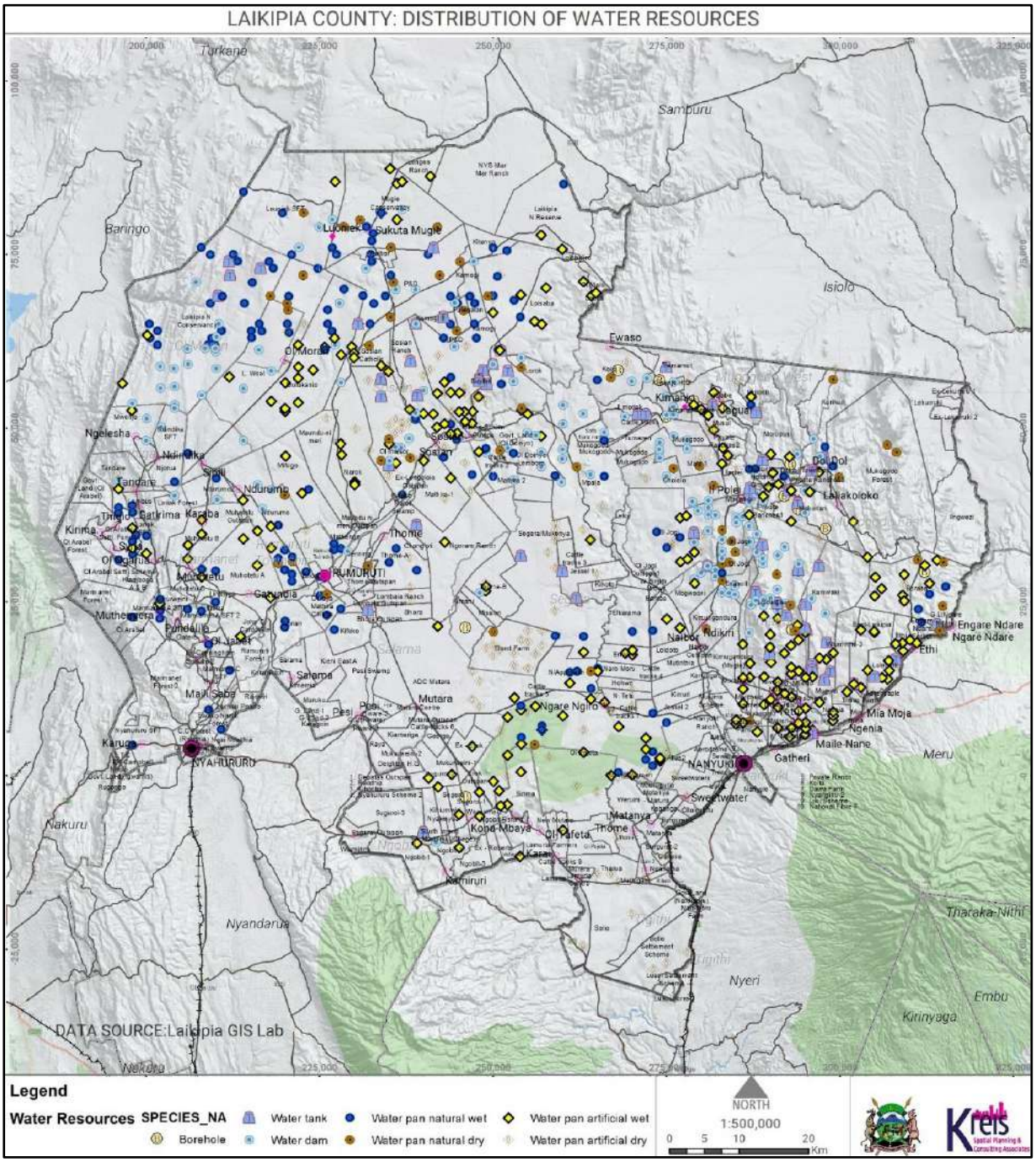
Main Source of Drinking Water	Percentage Distribution of Conventional Households (%)
Pond	0.8
Dam	5.7
Stream/River	20.8
Protected Spring	1.2
Unprotected Spring	1.7
Protected Well	8.7
Unprotected Well	2.7
Borehole	10.3
Piped into Dwelling Unit	12.5
Piped to Plot	19.7
Bottled Water	0.4
Rain Harvesting	5.8
Water Vendor	3.0
Public Tap/Standpipe	6.5

Source: Laikipia County Statistical Abstract, 2021

The highest number of households (20.8%) source their drinking water from rivers/streams. These are mainly households located within rural areas. While only 10.3% of households source their drinking water from boreholes, other activities such as irrigation farming, horticulture production in greenhouses, and intensive livestock keeping rely on boreholes as reliable sources of water. Households within the major towns have access to piped water from either public or private water service providers.

Water resources within the County are distributed as follows:

Map 9-5: Countywide Distribution of Water Resources



The main sources of water in the County are further detailed below:

Rivers

Laikipia County lies within the upper Ewaso Ng'iro North River basin. Therefore, the Ewaso Ng'iro River and its tributaries which originate from Mt. Kenya and the Aberdare Ranges are the sources of water in the County. Its main tributaries are Ewaso Narok

(Ngare Naro), Narumoru, Likii, Sirimon, Ontulili, Ngare Ndare, Melwa, Ngobit, Rongai, Timau, Moyak, Pesi, Suguroi, Mutara, Nanyuki, and Burguret rivers.

Plate 9-6: Water Sources - Likii River and Ewaso Narok River

Source: KREIS, 2022

However, the quality of water from these rivers requires treatment before human consumption due to pollution and contamination arising from the use of inorganic fertilizers in the agricultural areas upstream, as well as activities such as the washing of clothes, bathing, and swimming. Other challenges facing rivers as sources of water include unregulated abstraction for irrigation; decreasing river flow discharge and drying of perennial streams due to reduced precipitation and climate change; siltation attributable to soil erosion; and encroachment on riparian reserves which leads to the destruction of riverine ecosystems.

Dams and Pans

These form the main sources of water for small-scale irrigation, and domestic and livestock purposes especially for the dry months of January and February. Laikipia North Subcounty has numerous dams that serve the rural communities such as Kanjul, Mbobo, Kariunga, Doldol, Tiemamut, Pisha, Mosrai, and Il Motoic earth dams among others. Pans in Laikipia North include Endama pan that serves a population of 1,200 in Segera Ward, Musul Pan serving a population of 1,800 in Mukogodo West, and Chumvi Pan with a capacity of 15,000m^3 in Mukogodo East. Challenges facing dams and pans in the County are high levels of siltation and drying up during dry periods.

Plate 9-7: Water Pans for Wildlife and Livestock

Source: KREIS, 2022

Springs

Protected springs are other sources of water among the rural population. Water tanks have been constructed to store the water, making them act as community water points with livestock watering troughs. In some areas, the water tanks are equipped with high-lift electric pumps. Examples include the Loiragai water project in Mukogodo West Ward; Lariek, Ol Jabet, Limunga, and Chui Muhotetu water projects in Marmanet Ward; Pesi Kirima water project in Salama Ward; Kaichakumi Spring in Igwamiti Ward among many others. The challenge facing springs in the County is the leaking of the constructed water tanks and the breakdown of water pumps.

Rock-Catchment

A huge percentage of Laikipia North is known to harbor very harsh and unforgiving natural terrain with gaping and huge rock structures. Most of the huge rocks in Mukogodo West especially have been converted to water collection points that are then collected in strategic storage tanks and reservoirs for use by the community. Some of these water projects are shown in table 9-4 below.

Table 9-4: Rock Catchment Water Projects

Ward	Name of Water Project	Capacity	Population Served
Mukogodo West	Soito Narok rock catchment	100m³	800
	Tiemamult rock catchment	50m³	700
	Ndonyo Kimano rock catchment	200m³	800 for humans 800 for livestock
	Il Polei rock catchment	100m³	700
	Risha rock catchment	50m³	800
	Musul rock catchment	150m³	700 for humans 1000 for livestock

Source: Laikipia County Water Master Plan, 2019

Plate 9-8: A Rock Catchment and Community Storage Tank

Source: KREIS, 2022

Boreholes

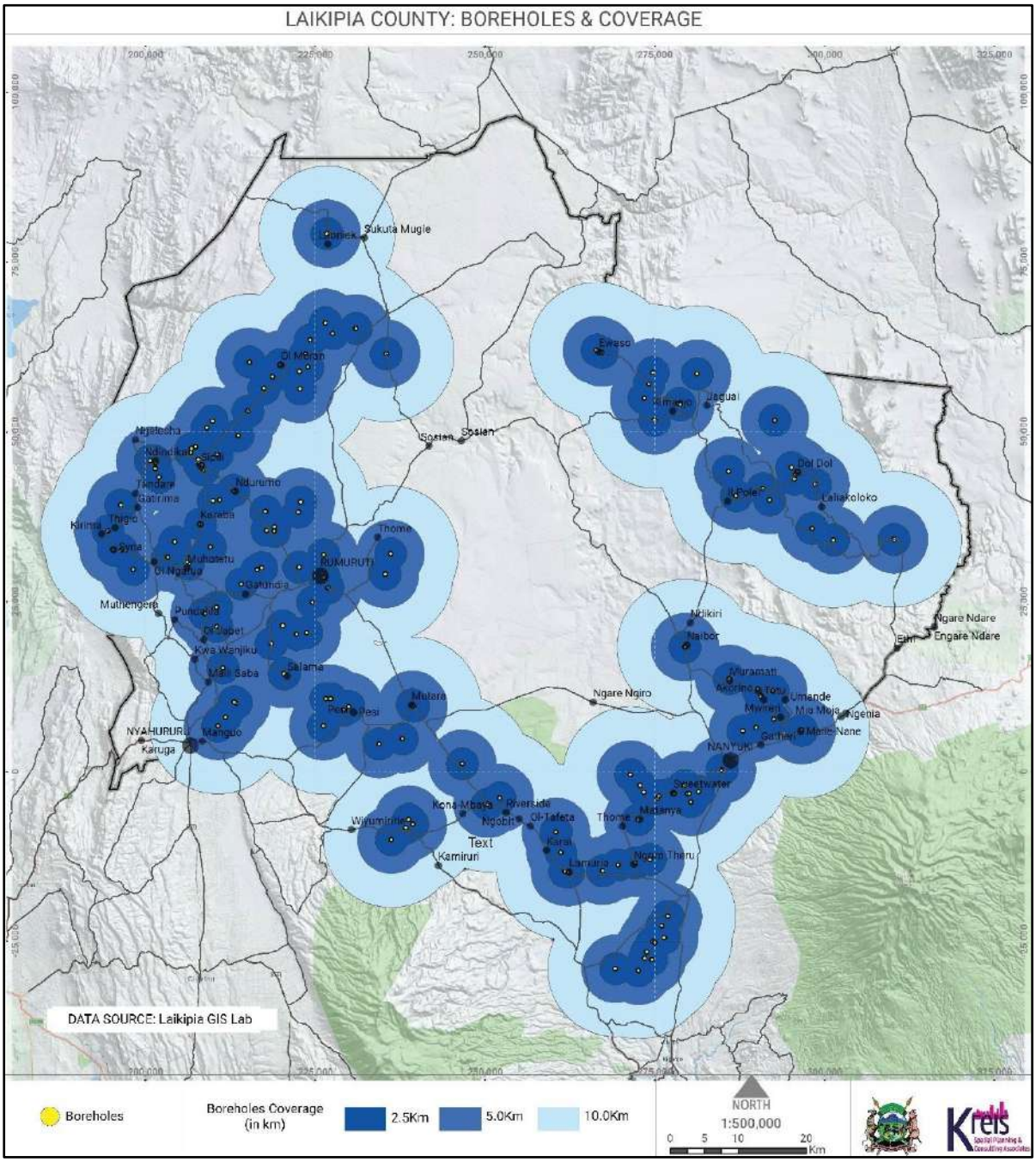
There are numerous boreholes drilled across the County as shown in map 9-6 below, for both private and public use. These have been fitted with solar-powered pumps to enable reticulation to homesteads, schools, hospitals, and community water points. Examples of functional boreholes that use solar energy in Laikipia North Subcounty, whose solar insolation is relatively high, include Lonick, Gathani, Ngare Mare, Lolora, Milango, Mowarak/Posta, Lowabene, and Naibor water projects among many others.

Plate 9-9: A Solar Powered Borehole in Matanya and Water Storage Tank within Nanyuki Township

Source: KREIS, 2022

The main challenge facing boreholes is inefficient maintenance of the solar panels and pumps resulting in regular breakdowns which make them non-operational.

Map 9-6: Distribution and Coverage of Boreholes in the County



9.3.1.2 Water Demand

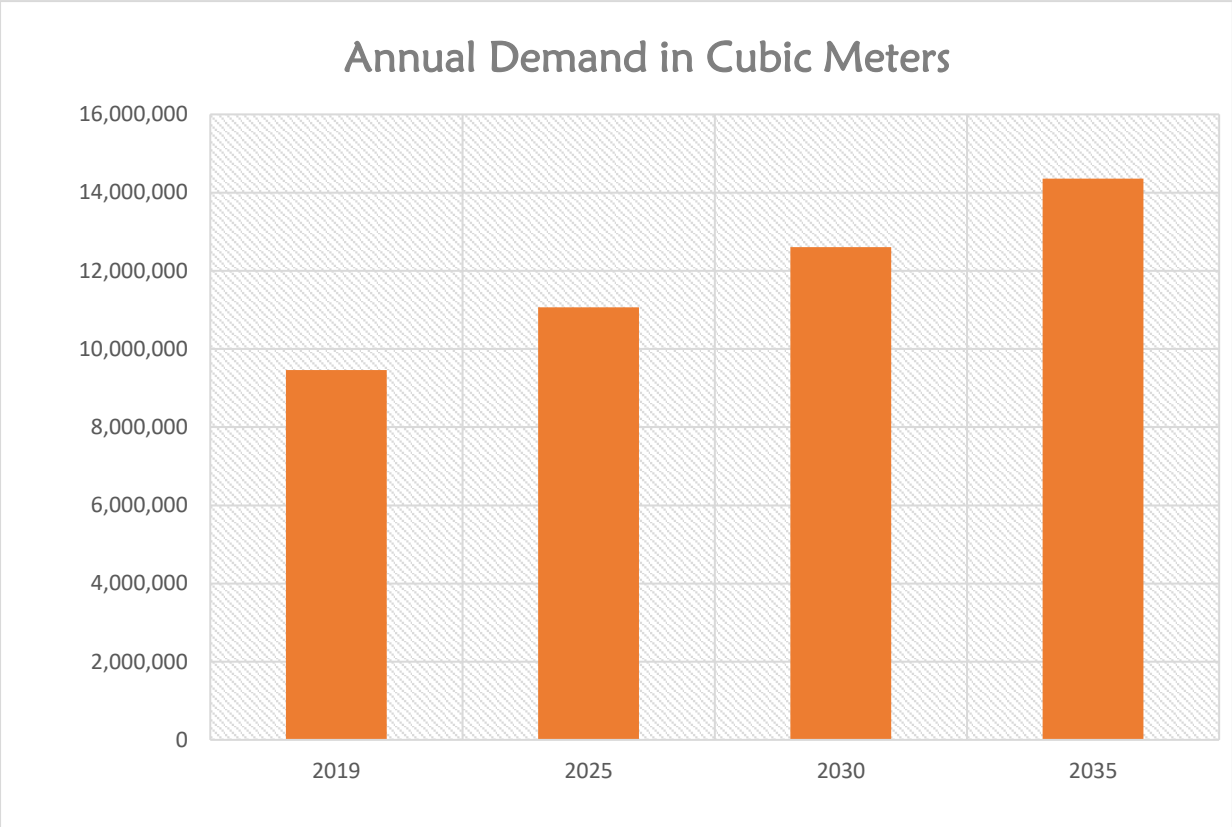
According to the World Health Organization (WHO), the average amount of water needed to ensure that most basic needs are met and few health concerns arise is between 50-100 litres of water per person per day. With the assumption that the average daily consumption of water per head is 50 litres, daily and annual projections for the entire County are as follows:

Table 9-5: Projected Water Demand per Person

Year	2019	2025	2030	2035
Population Projection	518,560	606,316	690,688	786,801
Projected Daily Water Demand (m^3)	25,928	30,315.8	34,534.4	39,340.1
Projected Annual Water Demand (m^3)	9,463,720	11,065,267	12,605,056	14,359,118.3

Source: KREIS, 2022

Figure 9-1: Projected Annual Water Demand



Source: KREIS, 2022

An increase in population is directly proportional to an increase in water consumption and demand. As the County's population continues to increase, there is a need to ensure equitable and adequate access to clean water, by increasing the capacity of existing water supply systems, sustainably exploiting groundwater sources, and maximumly harvesting rainwater through the roof and rock catchments.

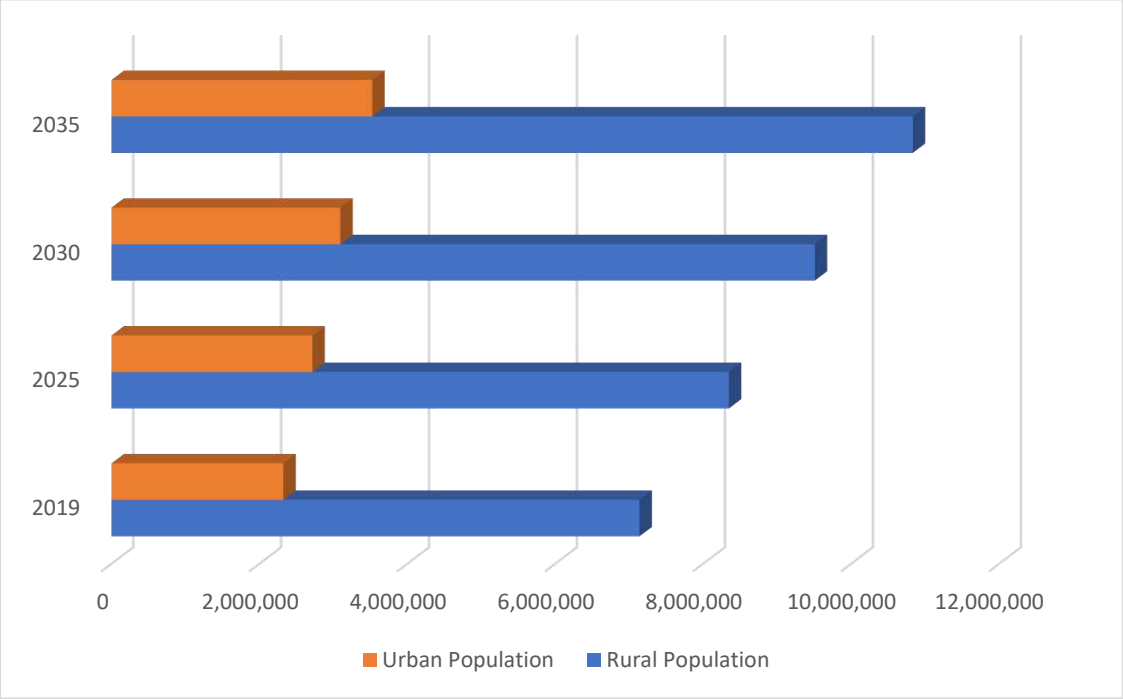
Since the larger percentage of the County's population is rural, the projected annual water demands for the rural population are higher than those of the urban population as shown in table 9-6 and figure 9-2 below.

Table 9-6: Projected Annual Water Demand for Rural and Urban Populations

Category	2019	2025	2030	2035
Rural Population Projection	391,200	457,403	521,053	593,560
Projected Annual Water Demand for Rural Population (m^3)	7,139,400	8,347,605	9,509,217	10,832,470
Urban Population Projection	127,360	148,913	169,635	193,241
Projected Annual Water Demand for Urban Population (m^3)	2,324,320	2,717,662	3,095,839	3,526,648

Source: KREIS, 2022

Figure 9-2: Projected Annual Water Demand for Rural and Urban Populations



Source: KREIS, 2022

The main method of water access for the urban population is piping into a dwelling or plot by the County water and sanitation companies or individually from private boreholes, especially in the main urban centers. As the urban population continues to grow, the capacity of these water companies/providers should also increase to ensure adequate supply.

As was discussed earlier, the total count of livestock in the County continues to increase. Consequently, it is anticipated that there will be an increased demand for water for

livestock, especially among the pastoral communities in the drier region of Laikipia North Subcounty. This calls for measures to increase the number and capacity of dams and water pans, as well as the various rock catchments. Additionally, as the County Government plans on increasing irrigation farming to ensure food security and improved nutrition, an annual irrigation water demand of 75 million m^3/year is required to support the irrigation of approximately 9,300 hectares (Laikipia County Water Master Plan, 2019). Excavation of household water pans is another measure to ensure there is water for irrigation farming.

9.3.1.3 Water Supply

29 WRUAs run water resources across the County in collaboration with Water Resource Authority (WRA). There are 3 water service providers, 507 small water projects, and 10 community irrigation schemes in the southern and western parts, established through government and development partners' support. Out of the ten irrigation scheme projects, only 5 of them are operational. The two main water and sanitation companies are:

Nyahururu Water and Sanitation Company (NYAHUWASCO)

The company provides water services in Laikipia West Subcounty. Its service area is approximately 250 km^2 and covers Nyahururu, Marmanet, Igwamiti, and Rumuruti towns and their environments. As shown in table 9-7, NYAHUWASCO has two main raw water abstraction points; the main one is near Thompson Falls and the other smaller one is in Rumuruti town, both along the Ewaso Narok River.

Table 9-7: NYAHUWASCO's Water Sources and Reticulation

Source/ Intake	Scheme Served	Average Daily Abstraction (m^3/day)
Ewaso Narok River near Thompson Falls	Nyahururu Town, Igwamiti and Rumuruti	6,500
	Marmanet	2,400
Rumuruti Intake	Rumuruti	300
Chui Springs	Marmanet (Kite area)	100
Muthengera Borehole	Marmanet (Muthengera area)	80
Total		**9,380**

Source: NYAHUWASCO, 2022

The current abstraction volume is estimated at 9,380m³/day, while the total production is approximately 9,100m³/day. All the treatment plants have a combined design capacity of 16,400m³/day. The company currently has 17,295 water connections and serves approximately 85,000 people. The highest number of water connections are for domestic/residential use as shown in table 9-8 below.

Table 9-8: NYAHUWASCO's Current Water and Sewer Connections

Connection Category	Number of Connections
Domestic/ Residential	15,336
Industrial and Commercial	1,633
Institutions and Schools	287
Water Kiosks and Yard Taps	38
Bulk (To another WSP)	1
Total	**17, 295**
Sewer Connections	**6,075**

Source: NYAHUWASCO, 2022

The company has two standard conventional treatment units in Rwathia and Nyahururu, and a CFU in Rumuruti. The projected water demand in the cluster is as shown in table 9-9 below.

Table 9-9: NYAHUWASCO's Current and Projected Water Demand

Scheme	Demand (m³/day)		
	2018	2022	2024
Nyahururu and Igwamiti	6,500	6,900	7,200
Marmanet	4,800	5,400	5,700
Rumuruti	650	950	1,200
Combined	**11,950**	**13,250**	**14,100**

Source: NYAHUWASCO, 2022

The company intends to expand water supply systems in the following areas:

Table 9-10: NYAHUWASCO's Expansion Plans

Area	Status
Kinamba Town and its environments	3 boreholes complete, 29.6km pipelines ranging from 32-160mm under construction, construction of 108m³ elevated steel tank complete, 1 more borehole to be constructed soon. The project was expected to be completed by August 2022.

Area	Status
Rumuruti water supply system	Proposal submitted to JICA office
Augmentation of water distribution systems in Nyahururu Town and Marmanet scheme, including expansion of Nyahururu intake	Proposal submitted to JICA office

Source: NYAHUWASCO, 2022

The company faces several challenges, namely:

a. Highly polluted raw water that requires a lot of treatment to portable water standards.
b. Lack of adequate water supply infrastructure to supply the required water demand to households in some areas of service.
c. Highly dilapidated water distribution network leading to high operational costs and water losses.
d. Inadequate internally generated funds to meet the cost of infrastructural development needs.
e. Lack of land for critical infrastructure such as sewerage works in urban centers such as Rumuruti, Kinamba and Ol Jabet.

Nanyuki Water and Sanitation Company (NAWASCO)

It operates as a county water service provider mandated to serve Nanyuki Town and its environment, including parts of Nyeri and Meru Counties. It covers a total of 286km^2 as per the Water Services Regulatory Board (WASREB) and is divided into three major distribution blocks namely; Nturukuma, Sweet Waters, and Central Business District. The three blocks are further divided into 19 sub-blocks for purposes of effective and efficient service provision - meter reading, billing, disconnections, and reconnections.

Table 9-11: NAWASCO's Intake Points and Reticulation

Source/ Intake	Scheme Served	Average Daily Abstraction (m^3/day)
Likii Central River in Mt. Kenya Forest	Nanyuki Town, Makutano, Ruai and Ichuga	14,645
Nanyuki High Borehole	Nanyuki Town	-
Njoguini Borehole	Njoguini and Sweetwaters	178
Katheri Borehole	Nturukuma and Katheri	433
Inoro Borehole	Baraka, Njoguini and Sweetwaters	41
Baraka Borehole	Baraka and Nabosa areas	115

Source: NAWASCO, 2022

The main source of water/intake point is River Likii. The abstracted water from two intakes is channelled to NAWASCO's water treatment plant whose design capacity is approximately 12,000m³. The treated water is augmented by groundwater from 3 boreholes for regular supply and one for emergency and dry months. Water is transmitted around the service area through gravity. There is also a notable number of customers upstream of the treatment works who receive water through pumping.

Table 9-12: NAWASCO's Current Water and Sewer Connections

Connection Category	Number of Connections
Domestic/ Residential	17,125
Industrial and Commercial	905
Institutions and Schools	46
Water Kiosks and Yard Taps	13
Bulk (To another WSP)	-
Total	**18,089**
Sewer Connections	**8,066**

Source: NAWASCO, 2022

Majority of the connections are for domestic/residential use. As the population increases, the water demand is projected to increase as shown in table 9-13 below.

Table 9-13: NAWASCO's Current and Projected Water Demands

Category	Demand (m³/day)			
	2019	2020	2030	2040
Domestic Use	11,607.22	11,874.33	14,907.94	18,716.56
Pre-Schools	86.08	88.07	110.56	138.81
Primary Schools	165.07	168.87	212.01	266.18
Secondary Schools	68.57	70.15	88.07	110.57
Colleges	15.00	15.35	19.27	24.19
Hospitals	118.29	121.01	151.93	190.74
Administration and Commercial Use	655.25	670.33	841.58	1,056.59
Livestock Use	235.60	242.66	326.12	438.28
38%, 32%, 22%, 14% NRW	4,921.41	4,240.25	3,664.65	2,931.87
Total	**17,872.49**	**17,491.02**	**20,322.13**	**23,873.79**

Source: NAWASCO, 2022

To respond to the projected increasing water demand, the company has plans to increase its abstraction capacity and extend its reticulation as presented in table 9-14 below.

Table 9-14: Expansion Plans

Area	Status
Airstrip/ Ngarariga	Proposal to abstract water from the Aberdares drafted 66km of the proposed pipeline surveyed. The project adds approximately 10,000m3/day of water into the current system.
Sweetwaters/ Mirera	Two boreholes - Reli B and Yard were drilled to boost and expand supply areas within these regions.
Treatment Works to the Proposed KWS Storage Tank with a 4km DN 150mm Diameter HDPE Pipe	Detailed design carried out.
Water Reticulation System in Taji Estate	Bill of Quantities and layout developed.

Source: NAWASCO, 2022

Challenges that the company faces include an unstandardized pipe network, zero pressure management, high physical losses from the dilapidated network including AC pipes, meter inaccuracy due to old meters, and low flows from Mt. Kenya Forest intake, especially during dry seasons (NAWASCO, 2022).

Challenges facing Water Access and Distribution in the County

As discussed earlier, Laikipia County lies within the upper Ewaso Ng'iro River basin. Challenges facing water access in this basin are high demand due to rapidly increasing population, land sub-use changes, climate change resulting in prolonged drought periods, ineffective water management institutions, and degradation of water catchment areas (Lesrima, Nyamasyo, & Karatu Kiemo, 2021).

9.3.2 Waste Management

Waste management impacts the level of public health and environmental quality, with more emphasis on urban centers which have higher population densities as compared to rural areas. Detailed in this sub-section are the systems and methods used to manage and dispose of solid and liquid wastes in Laikipia County

9.3.2.1 Solid Waste Management

The main methods of disposal for solid wastes are burning in the open (33.5%), burning in a pit (25.1%), and collection by the County Government (15.4%) as shown in table 9-15 below.

Table 9-15: Methods of Solid Waste Disposal

Main Method of Disposal	Total Number of Households (%)
Collected by County Government	15.4
Collected by a community association (CBOs, youth groups, Faith-Based Organizations)	0.1
Collected by a private company	0.6
Dumped in the compound	8.1
Dumped in the street/vacant plot/drain/waterways	0.7
Dumped in a pit latrine	3.6
Burnt in the open	33.5
Buried	3.0
Dumped in a compost pit	9.9
Burnt in a pit	25.1

Source: Laikipia County Statistical Abstract, 2021

Within urban centers, the rate of waste generation is high for both households and businesses. The average mass of waste generated in Nanyuki and Nyahururu towns per person per day is 0.45kg, and its density varies from 100kg/cubic meters to 600kg/cubic meters. Nanyuki, Nyahururu, and Rumuruti towns have an established solid waste management system with designated dumpsites, refuse collection trucks, and staff (CIDP, 2018-2022). Approximately 22,988 households in the County have their waste collected by the County Government, 896 households are served by private waste collectors, and only 149 households are served by community associations. However, open dumping of solid wastes in vacant plots, drains, and waterways is common within urban centers. This ultimately results in environmental pollution and degradation, high risks of contracting sanitation diseases, and clogging of sewer and drainage lines.

Based on the assumption that the average mass of waste generated per person per day in urban areas is 0.45kg, the annual projections for solid waste generation for the urban population in Laikipia County are as follows:

Table 9-16: Annual Projections for Solid Waste Generation

Year	2019	2025	2030	2035
Population Projection	127,360	148,913	169,635	193,241
Projected Daily Solid Waste Generated (kg)	57,312	67,011	76,336	86,958
Projected Annual Solid Waste Generated (kg)	20,918,880	24,458,960	27,862,549	31,739,834

Source: KREIS, 2022

From the above projections, it is evident that the County needs an integrated sustainable solid waste management system for the urban areas since population increase is directly proportional to waste generation. This CSP should therefore provide a comprehensive waste management strategy, as an environmentally sustainable option.

9.3.2.2 Liquid Waste Management

Liquid waste is generally classified into grey water from kitchens, bathrooms, and laundry areas; and black water from toilets that contains excreta. Management of grey wastewater is easy since it contains relatively low amounts of contaminants, and can be reused in small-scale irrigation of vegetable gardens. Blackwater/sewage on the other hand contains high levels of bacteria and hence requires biological or chemical treatment before it is released into water bodies. Stormwater is another time of liquid waste, common in urban areas due to concrete built-up spaces. Therefore, stormwater drainage is usually integrated into the sewer management systems in urban areas.

The percentage distribution of conventional households by the main mode of human waste disposal in Laikipia County is as shown in table 9-17 below.

Table 9-17: Methods of Human Waste Disposal

Main Method of Human Waste Disposal	Total Number of Households (%)					
	Laikipia Central	Laikipia East	Laikipia North	Laikipia West	Nyahururu	Total
Main sewer	5.5	20.3	0.1	0.1	11.3	**8.9**
Septic tank	6.0	8.7	0.8	1.8	5.4	**5.2**
Cess pool	0.1	0.2	-	0.1	0.1	**0.1**
VIP latrine	13.2	10.4	5.9	12.4	13.1	**12.0**
Covered pit latrine	67.0	51.2	18.3	49.4	62.9	**55.8**
Uncovered pit latrine	7.6	5.5	6.2	15.2	6.1	**8.3**
Bucket latrine	0.1	0.2	0.4	0.2	0.1	**0.2**
Open disposal/bush	0.3	3.6	68.1	20.7	0.9	**9.4**
Bio-septic tank/biodigester	0.1	0.1	0.2	-	0.1	**0.1**

Source: Laikipia County Statistical Abstract, 2021

Out of the conventional 145,776 households in the County, 81,343 use pit latrines as the main mode of disposing of human waste. Laikipia North Subcounty has the least percentage distribution of households using pit latrines, with bush/open disposal being the main method of human waste disposal. This is attributed to the nomadic lifestyle of the population and results in low levels of public health due to the contamination of water sources.

Nanyuki and Nyahururu towns have established sewer treatment systems; NAWASCO and NYAHUWASCO respectively. Laikipia East and Nyahururu sub-counties have the highest percentages of households served by municipal sewers. However, the capacity of these wastewater treatment plants is low and sewer connections are still limited to a small section of the urban population. The use of septic tanks is common within urban centers in Laikipia East and Central, and Nyahururu sub-counties.

With the assumption that the average wastewater generated per person per day is 36.8 litres, the annual projections for wastewater generation for the urban population in Laikipia County are as follows:

Table 9-18: Annual Projections for Waste Water Generation

Year	2019	2025	2030	2035
Population Projection	127,360	148,913	169,635	193,241
Projected Daily Liquid Waste Generated (litres)	4,686,848	5,479,998	6,242,568	7,111,269
Projected Annual Liquid Waste Generated (litres)	1,710,699,520	2,000,199,416	2,278,537,320	2,595,613,112

Source: KREIS, 2022

Given that urban areas are producers of large volumes of liquid waste, the County needs a comprehensive liquid waste management strategy.

9.3.3 Information Communication Technology

9.3.3.1 Mobile Networks and Internet Connectivity

Map 9-7 below shows the distribution of Base Transceiver Stations (BTS) in the county, indicating good mobile phone coverage with over 70% of the population estimated to own mobile phones. The main service providers are Safaricom, Airtel, and Telkom. The

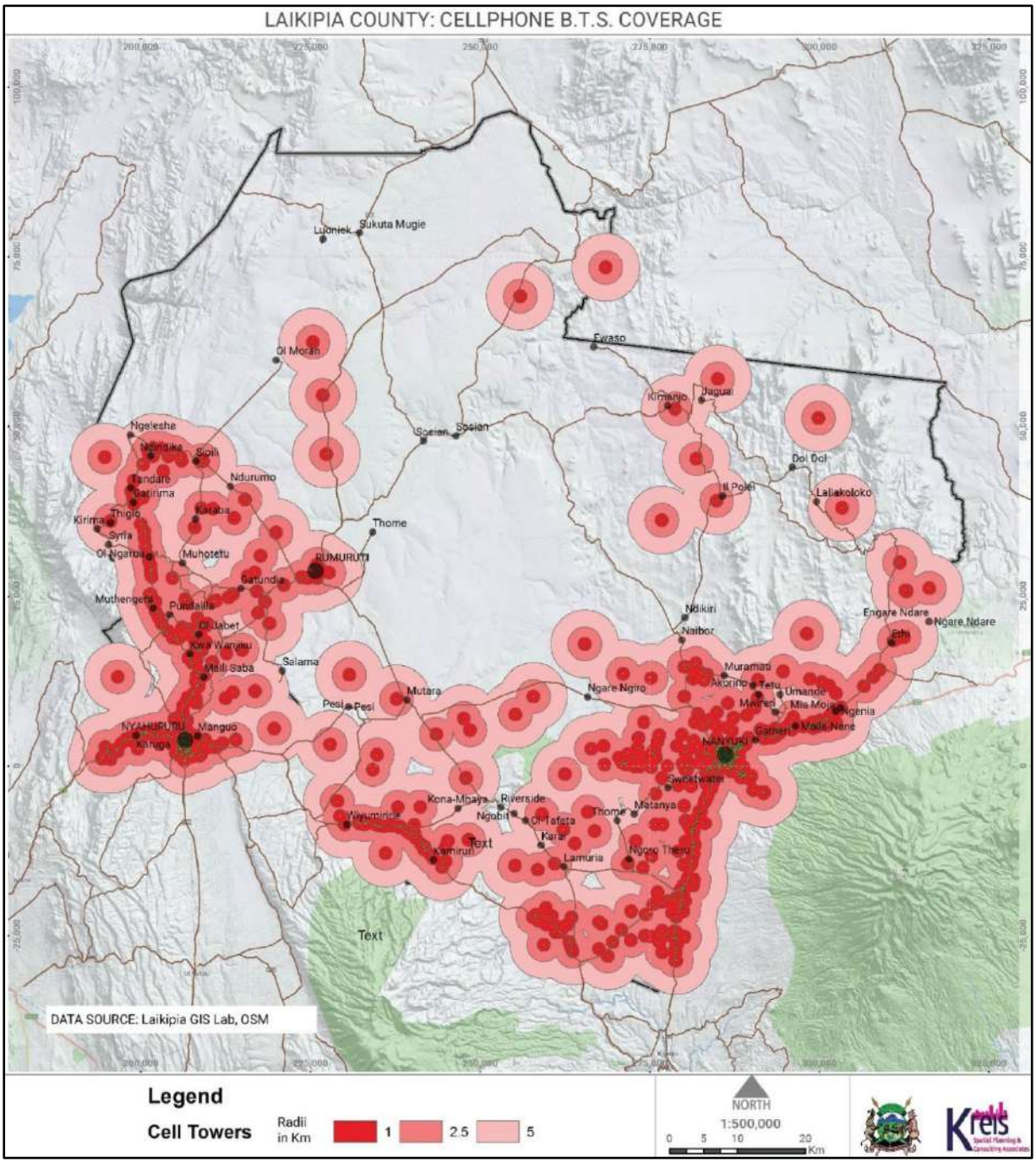
distribution of these stations is along settlement patterns and within the major towns and trading centers. Internet connectivity is mainly available in urban centers. However, a higher population is estimated to have access to the internet through mobile phones. The hilly terrain in the northern region of the county causes poor mobile network coverage.

The county is connected to the National Optic Fibre Backbone Infrastructure (NOFBI) serving Nanyuki, Nyahururu, and Rumuruti Towns. High-speed fibre optic connectivity in Nanyuki Teaching and Referral Hospital has facilitated improvement in telemedicine, real-time patient monitoring, and collaboration between medical practitioners, ultimately improving the level of healthcare delivery. Through the Smart Town Initiative, there is high-speed internet connectivity in Ol Jabet Town.

9.3.3.2 Postal Services

The County is served by four main post offices located at Doldol, Rumuruti, Nanyuki, and Nyahururu towns and one substation at Kinamba, Ol jabet. There is one Huduma Center in Nanyuki Town. The main providers of courier services are G4S, EMS, Securicor, Wells Fargo, and through PSVs.

Map 9-7: Coverage of Cellphone B.T.S



Source: CGL GIS lab; OSM; KREIS 2022

9.3.4 Energy Systems

The percentage distribution of energy sources for cooking in the County are as shown in table 9-19 below.

Table 9-19: Energy Source for Cooking

Energy Source for Cooking	Distribution of Households (%)					
	Laikipia Central	Laikipia East	Laikipia North	Laikipia West	Nyahururu	Total
Electricity	0.3	0.8	0.2	0.1	0.4	**0.4**
Paraffin	3.0	4.6	0.4	1.0	1.4	**2.3**
Gas (LPG)	25.0	38.2	4.2	7.6	19.7	**21.2**
Biogas	0.4	0.4	0.4	0.3	0.3	**0.3**
Firewood	57.2	38.2	85.8	73.6	56.0	**58.0**
Charcoal	14.0	17.7	8.8	17.4	22.0	**17.7**
Solar	-	0.2	0.1	0.1	0.1	**0.1**

Source: Laikipia County Statistical Abstract, 2021

Firewood accounts for the main type of cooking energy among the rural population, and the use of LPG by the urban population. In Laikipia North Subcounty for instance, 85.8% of the households rely on firewood for cooking, since it is locally available. The use of LPG for cooking is prevalent within urban centers, with the highest percentage (38.2%) being in Laikipia East and the least (4.2%) in Laikipia North. Nyahururu Subcounty has the highest number of households (22%) that use charcoal for cooking, while Laikipia North has the least (8.8%).

The percentage distribution of energy sources for lighting in the County is shown in table 9-20 below.

Table 9-20: Energy Sources for Lighting

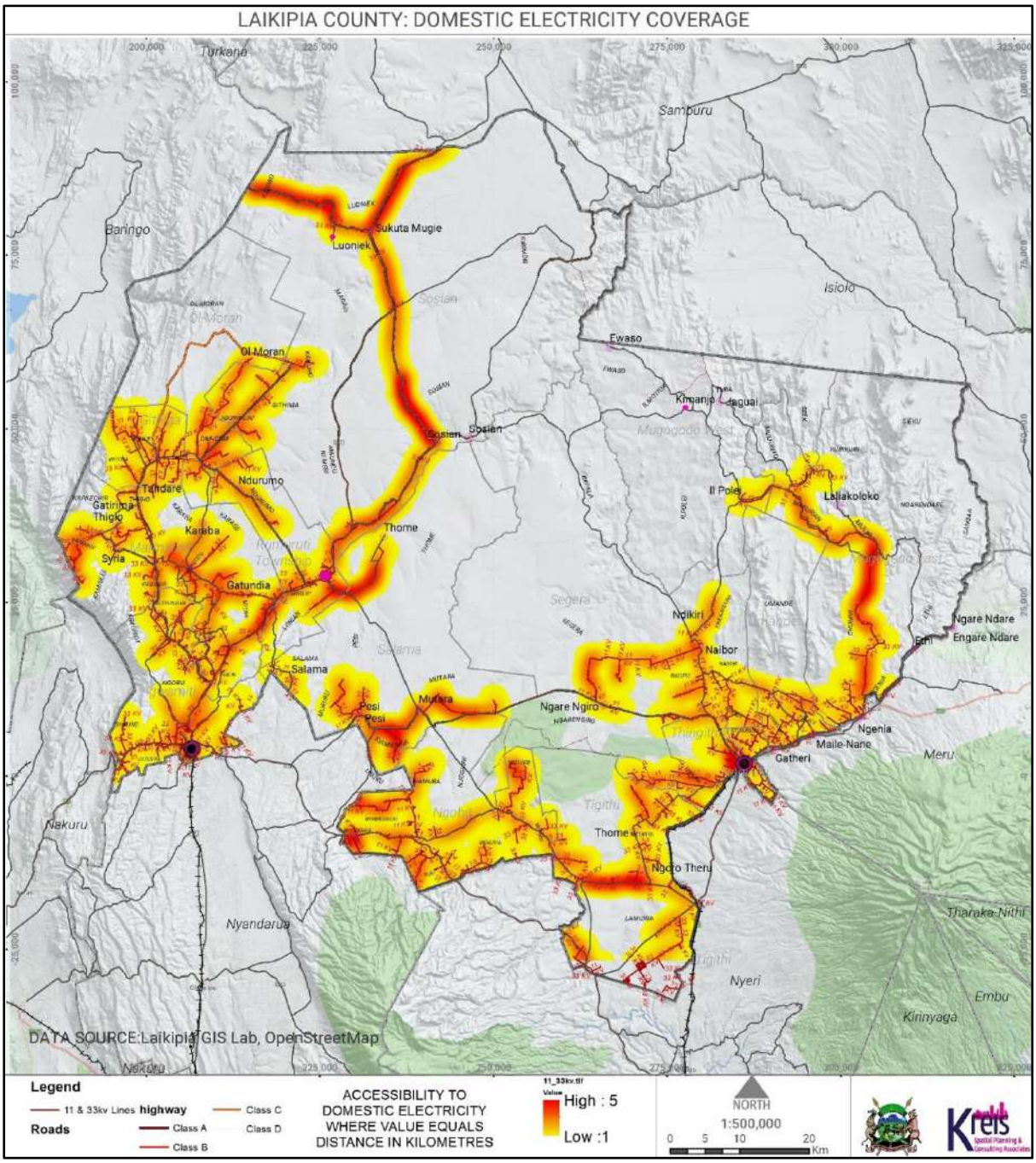
Energy Source for Lighting	Distribution of Households (%)					
	Laikipia Central	Laikipia East	Laikipia North	Laikipia West	Nyahururu	Total
Electricity	46.2	63.9	5.3	18.8	48.0	**42.2**
Paraffin (pressure lambs, lanterns and tin lamps)	16.2	10.7	11.2	23.9	20.3	**17.8**
Gas lamps	0.1	0.1	0.2	0.1	0.1	**0.1**
Wood	0.2	1.3	30.1	7.4	0.7	**3.8**
Solar	31.0	16.1	21.5	36.1	24.3	**26.4**
Solar-charged torches/spotlights	3.0	4.3	19.3	7.4	3.6	**5.3**
Dry cell battery torches/spotlights	1.6	1.5	9.8	3.7	1.2	**2.3**
Candle	1.0	1.3	0.3	1.1	1.4	**1.2**
Battery	0.7	0.7	0.4	1.2	0.6	**0.7**
Generator (diesel/petrol)	0.2	0.1	1.8	0.3	-	**0.2**
Biogas	-	-	-	-	-	**-**

Source: Laikipia County Statistical Abstract, 2021

From the table above, electricity is certainly the main type of energy used for lighting in the County, with the highest percentage (63.9%) being in Laikipia East and the least (5.3%) in Laikipia North. As can be seen on map 9-8 below, the County is served by 11kV and 33kV lines along the main road reserves and within the major urban centers. However, there is low electricity coverage in Laikipia North due to the sparse nature of human settlements, the nomadic culture of the pastoral communities, and the hilly terrain in some areas.

Solar power is the second most used energy source for lighting at the homestead level, especially in remote areas which are not connected to grid power. Laikipia West has the highest percentage of households using solar power (36.1%), while Laikipia East has the least at 16.1%. The Laikipia North region receives high solar insolation throughout the year, therefore, availing suitable locations for siting solar power plants. A key achievement for the County Government is the installation of 216 solar-powered street lights at market centers in all 15 wards (Laikipia County ADP, 2021-2022). Even though there is insignificant use of biogas energy for both cooking and lighting, the County has the potential to harness it since livestock keeping is a major economic activity and source of livelihood for the local communities.

Map 9-8: Electricity Coverage



9.4 Social Infrastructure

This entails the social services – education, health, recreation facilities, and open spaces the County Government provides in terms of their number, distribution infrastructural capacity, and service index. In the MTP for the period 2018-2022, the County Government's priorities and strategies for social infrastructure development are set to establish ECDEs, VTCs, stadiums, social halls, cultural centers, childcare facilities, primary and secondary schools, and ICT centers.

9.4.1 Education Facilities

Laikipia County shares in the Education 2030 Agenda that pledges to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". Its goal is to enable everyone to study, learn, and fulfil their full potential. Achieving inclusive, quality and relevant education for all reaffirms the belief that education is one of the most powerful and proven vehicles for sustainable development.

Almost one in every four persons (25%) in Laikipia County has no formal education. 53% of the population has attained primary-level education, while only 23% of the population has secondary education. It is also estimated that only 7.3% of the population has attained tertiary education.

Table 9-21: Types of Educational Facilities

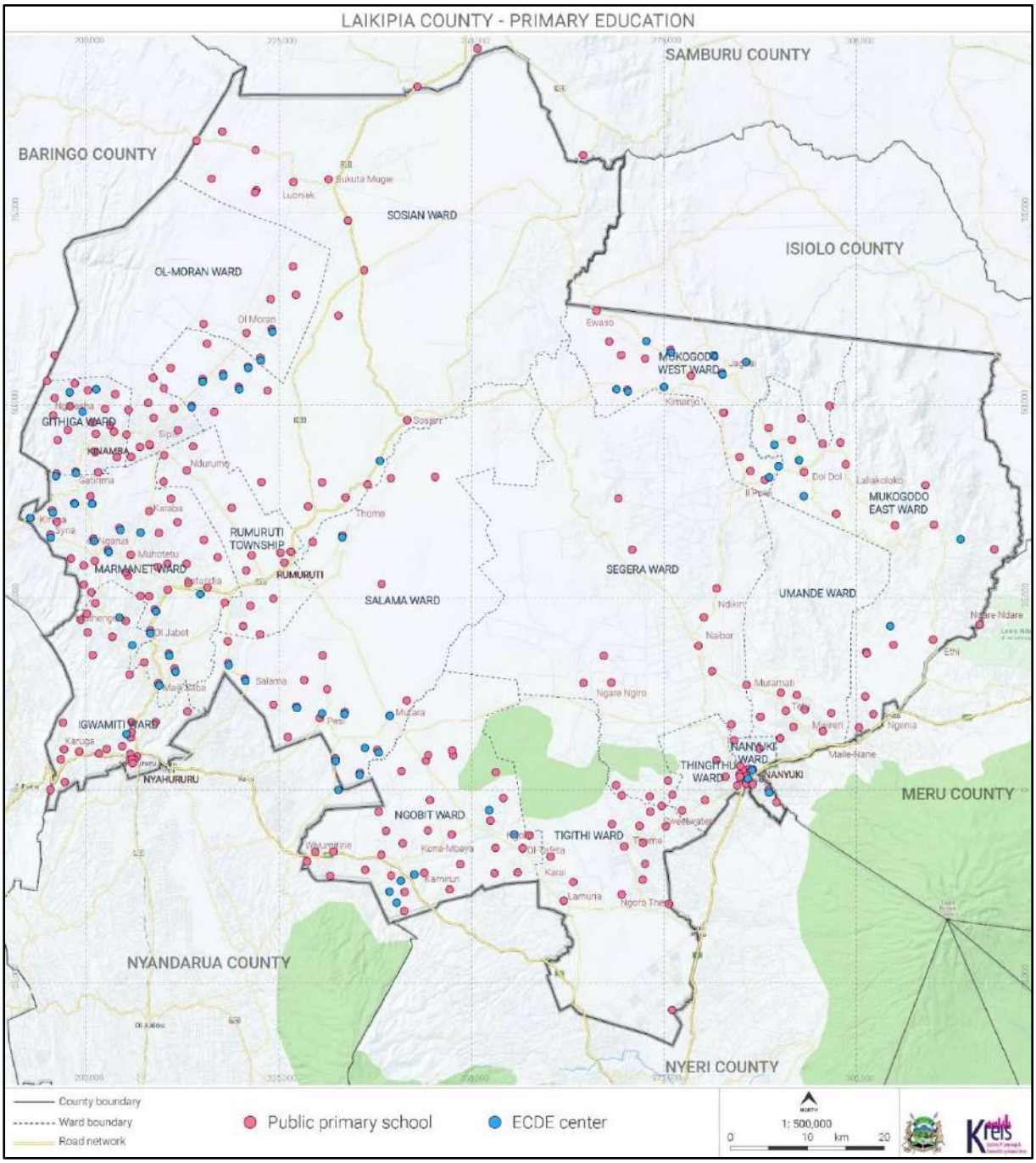
Institution	Public		Private	
	2019	2020	2019	2020
Pre-Primary	442	442	139	139
Primary	292	295	83	70
Secondary	120	122	18	18
Institutes of Technology	2	2	-	2
Universities	1	1	-	-
Vocational Training Centres	10	10	3	3
Total	**867**	**872**	**243**	**232**

Source: Department of Education, CGL// Laikipia County Statistical Abstract, 2021

In the MTP for the period 2018-2022, the County Government's priorities and strategies include establishment of 15 Model ECDE centers. In 2020, the County had 442 public ECDE centers and 139 privately run ECDE centers with a total enrolment of 20,644 and 7,563 pupils respectively. The number of trained teachers was 796 in public ECDE centers and 247 in private ECDE centers with a teacher-pupil ratio of 1:26 in public and 1:31 in Private ECDE centers. The gross enrolment rate stands at 80% while the net enrolment rate is 79% with a completion rate of 95% (CIDP, 2018-2022). Based on the Physical Planning Handbook standards, access to an ECDE should be within 300-500m in residential areas. Areas, where the population has no access to an ECDE facility within a 500m radius, include Mukogodo East and West wards, this is attributed to the vastness of the area in relation to the population as well as the migratory culture of the pastoral community. Some areas like Nanyuki and Rumuruti

have access to private ECDEs while the nearest public ECDE is 2km away. Map 9-9 below shows the distribution of ECDE centres.

Map 9-9: Primary Education Facilities

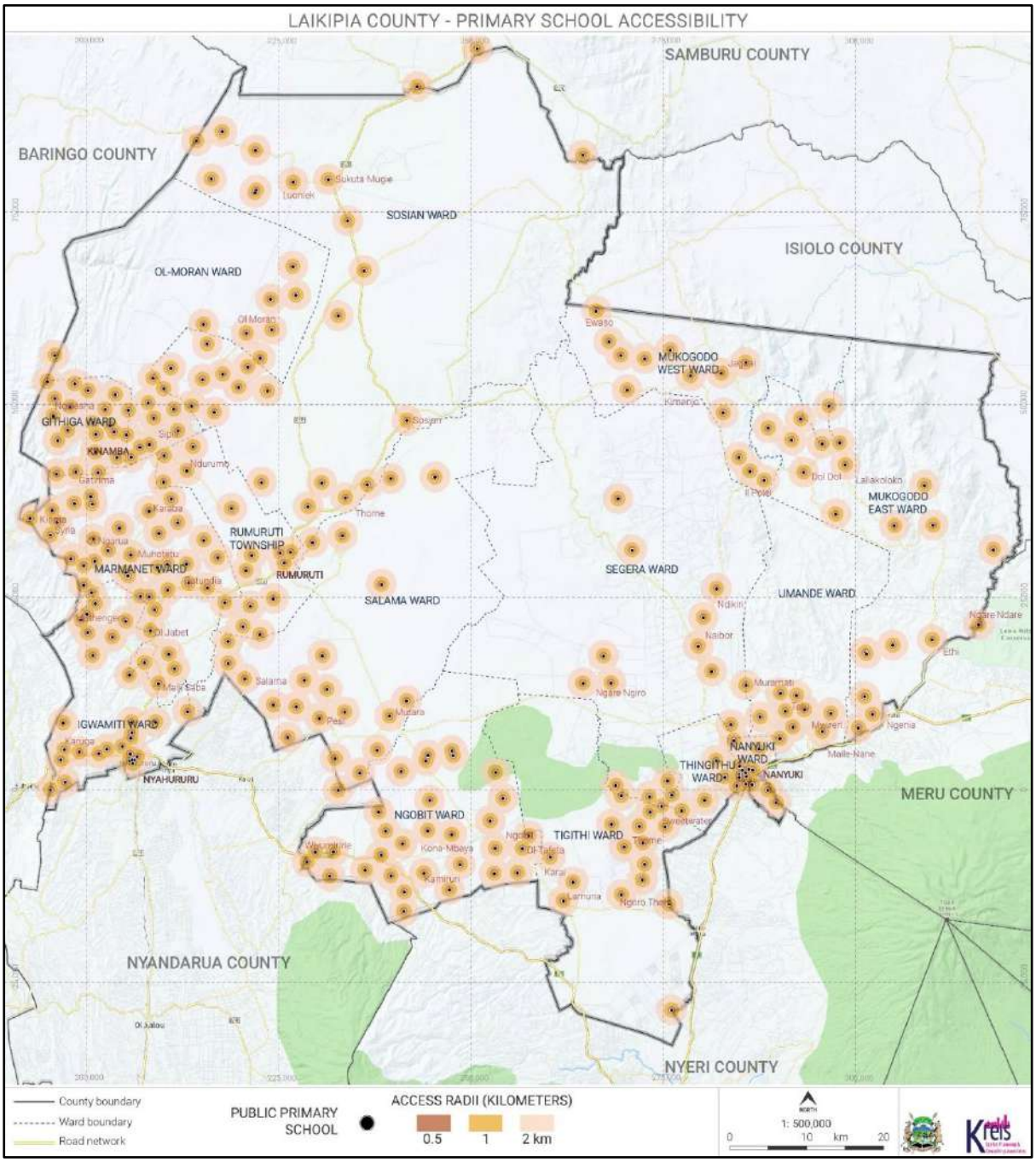


Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

There were 286 public and 87 private primary schools with a total enrolment of 85,848 and 14,975 pupils respectively in 2020. The number of primary school teachers is 4,432 giving a teacher-pupil ratio of 1:46. The net enrolment rate is 94.5%. Primary education is readily accessible as shown in map 9-10 below and since 90% of the population is

located between 0 and 4.9km from the nearest primary school with only 10% located over 5km mainly in Laikipia North.

Map 9-10: Primary School Accessibility

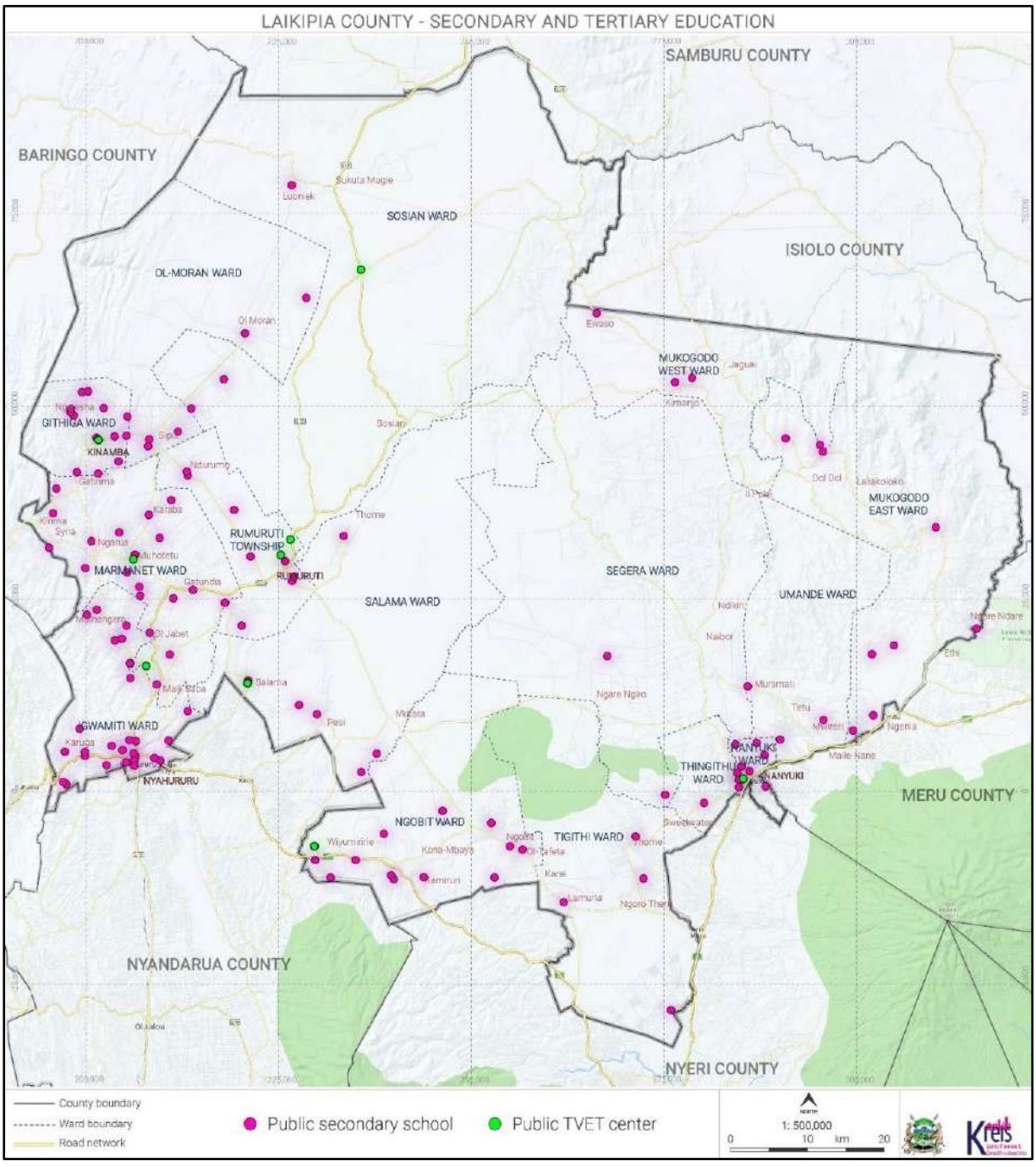


Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

In 2020, there were 121 public secondary schools with a total enrolment of 40,143 students. There were 18 private secondary schools with a total enrolment of 2,519 students. The number of teachers in public schools was 881 giving a teacher-student ratio of 1:26. The gross enrolment rate was 84.8% with Nyahururu having the highest

and Laikipia North having the least, this is attributed to the high population rates in Nyahururu and many educational facilities as compared to Laikipia North which has limited educational facilities.

Map 9-11: Secondary and Tertiary Education Facilities



Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

The County has limited facilities for tertiary education – Laikipia University, one university campus, one branch of a management institute, one KMTC branch, and a

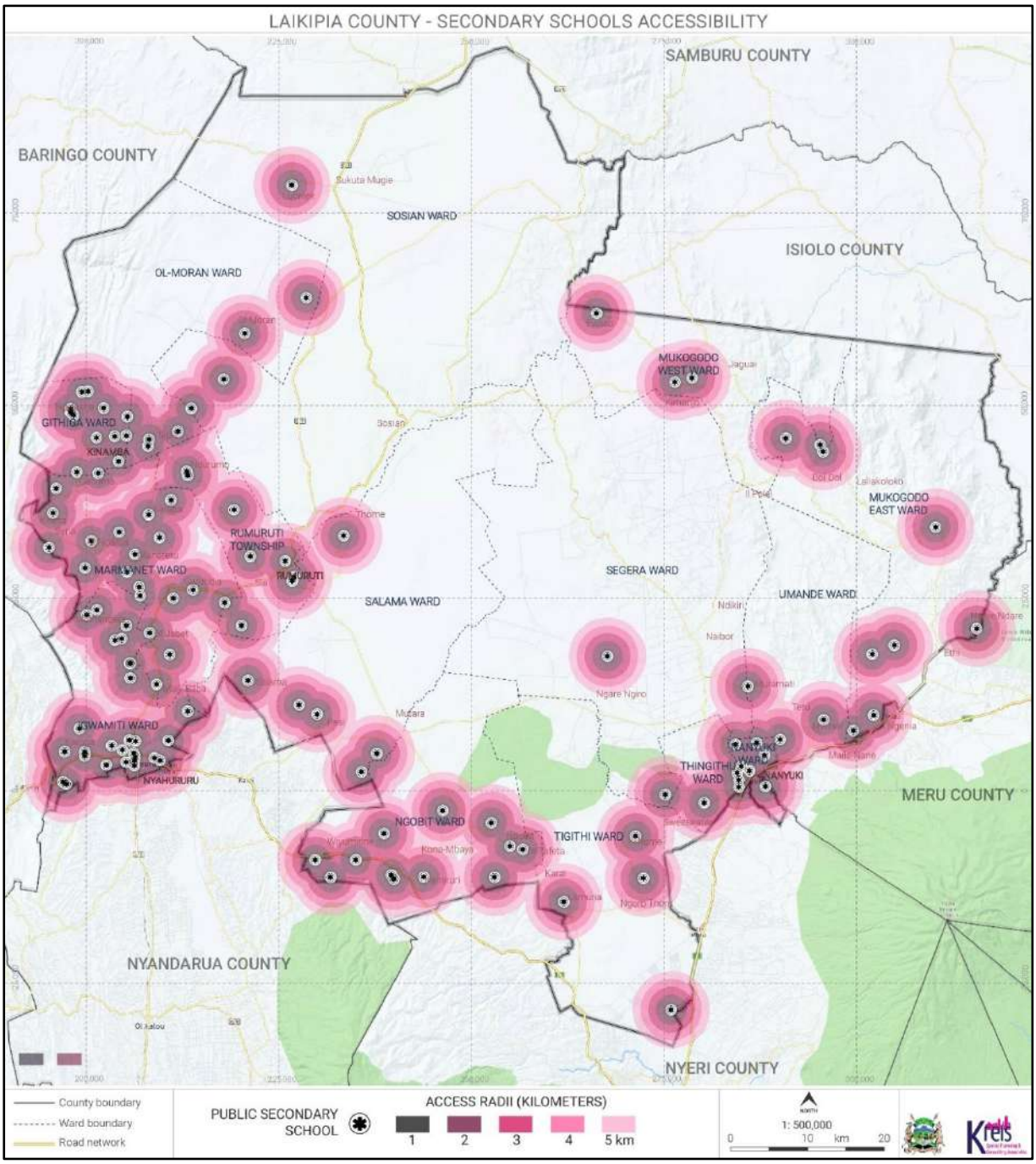
host of middle private-level colleges. There were 10 public vocational training centers in 2017 with a trainee enrolment of 617 and 59 instructors. There are also 3 private vocational training centers run by faith-based organizations (CIDP, 2018-2022). According to the 2019, KNBS Housing and Population Census, only 3.4% of the County's population had attained tertiary-level education.

Plate 9-10: Laikipia TVET and University

Source: KREIS, 2022

Map 9-12 below shows secondary school accessibility within a service radius of 5km.

Map 9-12: Secondary School Accessibility



Source: KREIS, 2022 (modified from Laikipia County GIS lab data)

9.4.2 Health Facilities

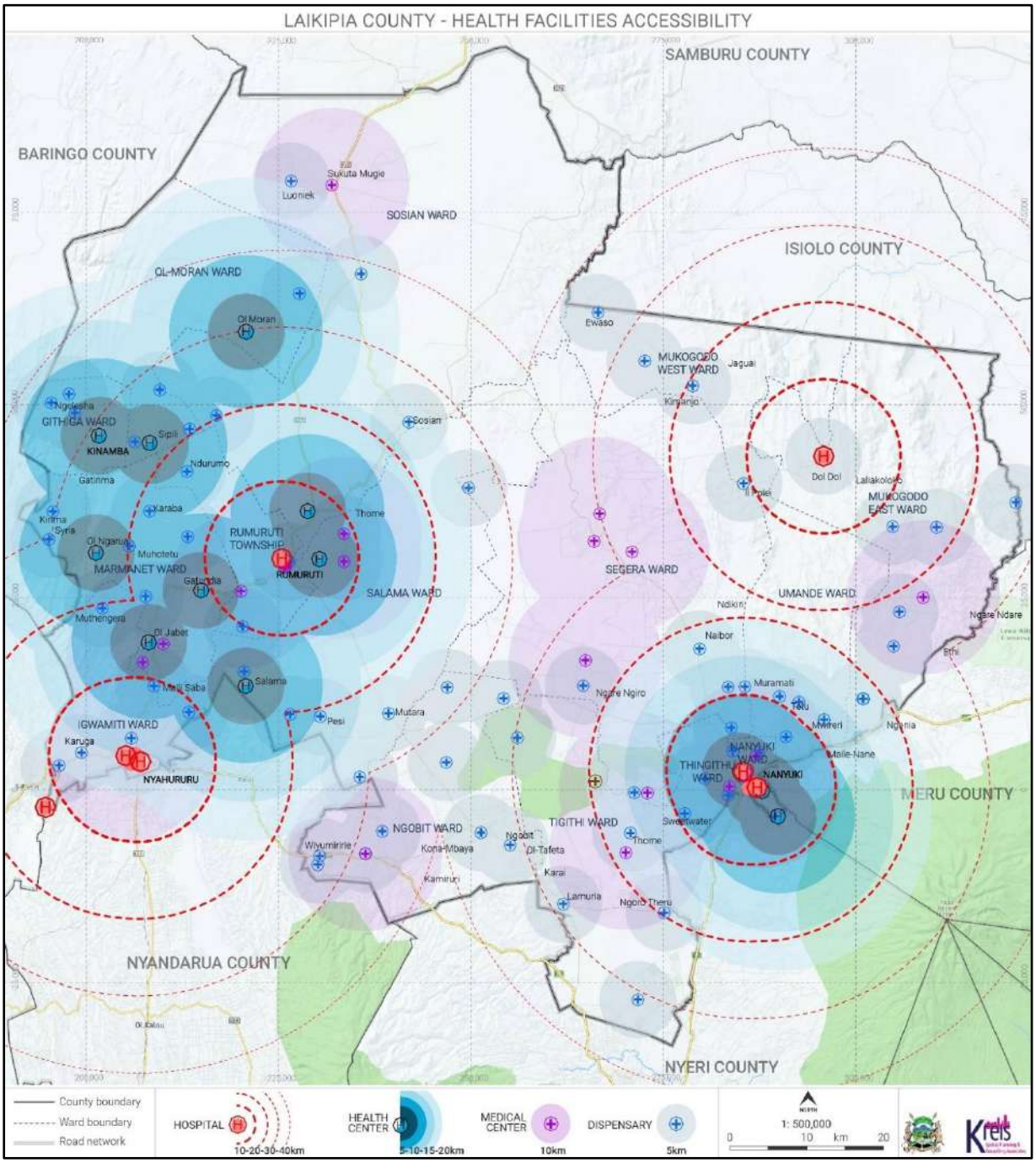
The health infrastructure in the County consists of four subcounty hospitals at Kimanjo, Ndindika, Doldol, and Rumuruti towns; and two County referral hospitals at Nanyuki and Nyahururu towns. The County has six public health centers and four FBOs-managed health centers. There are 64 public dispensaries, 12 FBO-managed dispensaries, 10 NGO-managed dispensaries, and 36 private-run clinics. In addition,

there are 4no. private hospitals, 1no. nursing home, 1no. private health center, 6no. private dispensaries and 35 private clinics (CIDP, 2018-2022) as shown in map 9-13 below.

The average distance travelled to access the nearest health centers is 2-3km in the urban centers and 3-5 km in the rural areas, which is below the recommended distance given by the WHO standards of 5km. This however indicates a good distribution of public health facilities in the County. Laikipia North Subcounty is under-served with most health centers located above 5km away. Hospitals are located within a radius of 10-40km which is above the recommended WHO standards. The County should plan to provide more hospital facilities to substitute the health centers in case of emergencies or disease outbreaks; this will reduce the pressure on existing ones and the distance travelled by the residents in search of health services.

Following the National Government's development agenda of ensuring affordable healthcare, the County Government of Laikipia has embarked on citizen sensitization and enrollment in the National Health Insurance Fund (NHIF). Through this effort, over 70% enrollment has been achieved, with the County paying NHIF contributions for over 4,500 households. The County has also managed to enlist at least 39 health facilities offering NHIF services; which is an average of two NHIF-accredited health facilities in every ward. The County Government has also managed to construct and rehabilitate over 30 health facilities while upgrading the two Level 4 hospitals to acquire credentials for Level 5 status. The County has a total of 11 functional existing ambulances (Laikipia County ADP, 2021-2022).

Map 9-13: Health Facilities Accessibility



Source: KREIS, 2022

9.4.3 Recreation Facilities

Nanyuki and Nyahururu stadia are the main stadia in the County. Institutional and community play fields also support sports events across the County. There is an athlete's camp at Nyahururu KFS station. There are four community Sports grounds in Rumuruti, Solio, Matanya and Doldol.

Public parks

The County has several green and open spaces which are used for a range of activities. The activities within the open and green spaces include recreation, exercising, socializing, noise and air pollution regulation, and camping among other activities. Green spaces are classified according to the activities that they host. These include urban parks and gardens, street trees, green roofs, community woodlands, and meadows.

Plate 9-11: Recreational Open Space in Nanyuki

Source: KREIS, 2022

Sports Grounds

Sporting facilities in the County encompass stadia, sports clubs and playgrounds.

Table 9-22: Recreational Facilities

Stadia	Recreational facilities
Nyahururu Stadium **Nanyuki Stadium** **Rumuruti Stadium** Doldol Stadium	▪ Nyahururu Town: - Thompson falls, DCC compound, Manguo Hippo park, Sports Club ▪ Nanyuki Town: - Central Park, green park (Kiriari park) Sports Club, Ukumbusho green park and Muthaiga ▪ Mugie Farm Sports Club ▪ Lolomarek Farm Sports Club and Polo Game
Proposed Recreational Facilities: Rumuruti green park Doldol forest station	

Source: Source: CGL, 2019

9.4.4 Security Services

There is a total of 7 police stations, 67 police posts and 2 anti-stock theft units (ASTU). Most of these police stations are located in high-density population areas such as Urban and Peri-Urban areas, whereas the ASTUs are located in areas prone to cattle theft (CIDP, 2018-2022). To reduce incidences of insecurity in the County, there has been 100% implementation of all the County security oversight committee resolutions, construction of three floodlights, and installation of 216 solar-powered street lights at market centers in the 15 wards.

9.4.5 Fire and Disaster Risk Management Facilities

To ensure public safety and disaster risk management in the 2019/2020 FY, the County Government embarked on the construction of the Nanyuki Fire Station which is at a 70% completion level. In the 2020/2021 FY, the County Government plans on constructing a fire station at Nyahururu Town. Completed fire preparedness measures include the recruitment of 95 enforcement officers and training of 12 officers on specialized firefighting skills, maintenance of two fire engines, and procurement of assorted fire equipment and accessories (Laikipia County ADP, 2021-2022).

9.5 Emerging Issues

Sector	Opportunities	Constraints
Transport Infrastructure	▪ The tarmacked urban roads are in good condition, which creates a favorable environment for businesses and other investments. ▪ Maximum utilization of the existing old railway lines serving Nanyuki and Rumuruti towns has the potential to boost industrial activities within the County. ▪ The existing airstrip at Nanyuki and the other proposed airstrips will open up the County to local and international tourism.	▪ Road construction is limited in areas with steep terrains and rock outcrops, leaving such places inaccessible e.g., in Mukogodo West Ward. ▪ Some of the earth/murram rural roads get washed away during heavy rains, making them impassable, especially in Laikipia North. ▪ Insecurity in some regions such as Ol Moran Ward limits transportation services for both goods and people.

Sector	Opportunities	Constraints
Physical Infrastructure	▪ The County is served by various water sources whose adequate reticulation can be improved. ▪ The numerous boreholes across the County can be used to enhance small-scale irrigation farming and thus ensure food security. ▪ There is a need for alternative energy solutions (solar and biogas) for the unconnected households and underserved areas to ensure equitable electricity access in the entire County.	▪ There is inadequate reticulation of water in the drier northern region. ▪ Unregulated abstraction of water from rivers for irrigation purposes in the upstream areas causes water shortage downstream for the pastoral communities. ▪ The majority of the trading centers lack centralized sewerage systems. They thus rely on onsite sanitation systems such as septic tanks and pit latrines. ▪ The hilly terrain in areas in Laikipia North limits the erection of electricity lines, hence leaving such areas unconnected to the grid system.
Social Infrastructure	▪ Some areas are well served by education and health facilities.	▪ There are inadequate social halls, conference facilities, and open spaces within the County. ▪ While some parts are well served by education and health services, other areas face challenges of inadequate ECDEs; classrooms and sporting facilities within primary and secondary schools; and inadequate institutions for technical education.

10 GOVERNANCE

10.1 Overview

Governance refers to the exercise of political and administrative authority at all levels in the management of a country's affairs. It comprises the mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences. It is therefore an essential tool in determining the level of success or failure of any development agenda for National and County Governments. Effective and efficient implementation of the proposals of this County Spatial Plan is underpinned by the cooperation of various institutional actors in the public and private sectors.

10.2 National Government

The National Government is mandated by the Constitution of Kenya to offer policy direction to county governments through the formulation of overarching national policies and standards. It also has constitutional duties to ensure equitable revenue allocation to county governments, to finance major projects within the counties that require its intervention, and to offer technical assistance to county governments. It executes its functions through various ministries, departments and agencies to promote development in all sectors within both national and county levels.

With specific reference to national spatial planning as an approach to guide the country's socio-economic development and realize its Vision 2030, the national institutional framework encompasses key actors such as the Ministry of Lands, Housing and Urban Development; the Ministry of Environment and Forestry; the Ministry of Trade, Investment and Industry; the Ministry of Cooperatives and MSMEs Development; the Ministry of Roads, Transport and Public Works; NEMA, KPLC, KWS, KFS, Survey of Kenya, Council of Governors, among many other actors.

10.3 County Government

The Constitution of Kenya states that there shall be a county government for each county, consisting of a county assembly and a county executive. The roles of the county governments include:

a. Preparation, approval and implementation of County Spatial Plans, Local Physical and Land Use Development Plans, County Integrated Development Plans, Integrated Strategic Urban Development Plans, Sectoral Plans, development control and enforcement.
b. Formulating County specific policies; Implementing national policies, standards and guidelines; as well as Planning Research at the County level.
c. To ensure there is proper coordination in terms of the participation of communities in governance issues at the local level.
d. To provide pre-primary education services, village polytechnics, home craft centers and child care facilities.
e. To coordinate the implementation of specific national government policies on natural resources and environmental conservation.
f. To facilitate and coordinate County public works and services including stormwater management in built-up areas and water and sanitation services.
g. To ensure the protection of natural resources and environmental conservation in the County.
h. To enable mobility, accessibility and connectivity through the provision of proper transportation and infrastructure in the County.

10.3.1 County Planning

According to the County Governments Act of 2012 (amended 2020), the county planning framework shall integrate economic, physical, social, environmental and spatial planning. A county planning unit shall be 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.
d. Ensuring meaningful engagement of citizens in the planning process.
e. Ensuring the collection, collation, storage and updating of data and information suitable for the planning process.
f. Ensuring the establishment of a GIS-based database system.

The designated planning authority in the county shall appropriately organize for the effective implementation of the planning function within the county. To this effect, the

County Government facilitated and monitored the process of preparing the County Spatial Plan, its formulation and the adoption of planning proposals within the County.

However, the County Government of Laikipia experiences several limitations:

a. Inadequate financial resources- The County is experiencing difficulties in finding sufficient, appropriate and continuous funding for their work as the national government allocations are not sufficient for the development in all sectors.
b. Insufficient working facilities- Institutions within the County Government lack adequate facilities to aid in project implementation and monitoring.
c. Weak information systems- The County Government has overlapping projects where the institutions have failed to distinguish the existing projects in the old dispensation and struggle to compete with each other for funding.
d. Inadequate skilled personnel- The County has not employed the necessary technical staff personnel required to undertake the responsibilities of fast-tracking the projects proposed. The existing personnel in most sectors of the County are overwhelmed by the devolution to serve in the different wards as they await the recruitment of extra personnel.
e. Limited capacity within the community to actively participate in the prioritization of development activities.

10.4 Private Sector

The private sector plays a major role in the County. It has partnered with various development sectors to ensure that the drivers of development in the County are met. The private sector is comprised of financial institutions, MSMEs, educational institutions and credit and savings societies. The roles of the private sector are:

a. To promote quality education and training, ICT and innovation in the County
b. To promote and partner with the Ministry of Health in healthcare provision i.e. construction of private clinics and mission hospitals
c. Provision of training and employment by investing in the establishment of County innovation and skills development centers with linkages to industry stakeholders who provide employment opportunities.
d. Provide hospitality services and promote investment in the conservation of tourist attraction areas/sites.

e. Promotion of private enterprises and competition to enhance economic development
f. Providing knowledge and expertise on sustainable land/ space utilization and investing resources as per the spatial plans.

Private sector-led growth contributes greatly to poverty reduction. This CSP contributes to providing good policies and proposals which will enable the County Government to provide effective public goods and services.

However, the private sector in the County faces some limitations which include:

a. Lack of infrastructural facilities - The private sector cannot fully provide for the community's development needs when the County has not availed infrastructure such as accessible roads, reliable water and energy sources.
b. Lack of sufficient coordination among partners - There is no coordination among partners implementing community-based programmes, resulting in duplication of services, conflicts and inadequate utilization of resources.
c. Lack of a County Industrial Development Policy - This has denied the sector the availability of industrial development guidelines as well as identifying areas of industrial investment.

10.5 Civil Society

This is an aggregate of Non-Governmental Organizations and institutions that are concerned with the social well-being of citizens. They are usually financed by a variety of public and voluntary contributions i.e. grants from foreign organizations and donors, governmental agencies and private organizations. Some of the roles of civil society include:

a. Creation of awareness on rights and privileges of the public/citizens.
b. Provide technical support and training on food security and modern agricultural farming methods.
c. Provision of affordable education institutions for pre-primary and primary education e.g. bridge international academies.
d. Partnership with the County Government to improve the quality of health indicators in the County.

e. Provision of healthcare and feeding programmes.
f. Training on environmental management and conservation of water catchment areas.

The preparation of the County Spatial Plan recognized the right of the civil society to participate in the spatial planning process. The civil society offered collaboration through various stakeholder engagement forums and raised environmental concerns and land tenure issues which formed a crucial component of the proposals addressed by the Spatial Plan.

However, the civil society experiences limitations such as political interference, poor coordination with other actors resulting in duplication of projects, poor governance and management, inadequate resources to access extremely remote places, limited capacity and inadequate networking initiatives.

10.6 Cooperatives

Laikipia County has approximately 200 registered cooperative societies. Out of these, 152 are active, while 48 are dormant. Some of the general roles of cooperatives include the promotion of financial and banking services, provision of extension and advisory services, and facilitation of social development and well-being of various groups in the society through awareness and education programmes.

Cooperative societies in the County face several limitations, namely:

a. Weak marketing arrangements - The cooperatives lack marketing strategies and information for agricultural produce and therefore do not fully utilize the potential of resources from farmers. Most of the small-scale farmers are not informed of the financial services accessible to them.
b. Limited human resource personnel - The cooperatives have understaffed technical and support staff to handle devolved functions in the various subcounties.
c. Poor leadership and management - There are political interferences, which are experienced in the cooperative's election of its management. This has seen the election of leaders with political affiliations who are not interested in the socioeconomic development and interests of the members.

d. Inadequate financial resources - The cooperatives have poor institutional arrangements, which are unable to mobilize financial resources for extension services and support to development projects.
e. Weak policy and legal framework- The regulations put in place concerning co-operatives are not being followed through by registered co-operatives and do not address the operation and management of co-operatives effectively.

10.7 Gender perspective in Governance

In Laikipia County, the representation of women in governance and leadership is commendable. There is gender mainstreaming both at the executive and departmental levels.

10.8 Emerging Issues

Opportunities	Constraints
▪ Support by civil society organizations to initiate development projects. ▪ Devolved funds from the national government to help in steering development. ▪ Comprehensive policy guidelines to guide development. ▪ Well-developed institutions and policies in delivering public service.	▪ Lack of a clear spatial framework to guide development projects. ▪ Political interference in finance allocation and infrastructure development. ▪ Limited public participation in planning and implementation. ▪ The weak linkage between development planning and budgetary allocation. ▪ Poor interdepartmental linkages and operations.

PART III:

SYNTHESIS

11 SUMMARY OF THE EXISTING SITUATION

11.1 Overview

This section outlines the identified strengths, weaknesses, opportunities and threats according to the various sectors under analysis.

Sector	Strengths	Weaknesses	Opportunities	Threats
Natural environment	▪ The AEZs influence the distribution of agricultural activities: - The upper highland sub-humid zone has favourable climatic conditions that support rain-fed agriculture, dairy keeping and mixed farming. - The loam and black cotton soils support agriculture. - Low rainfall amounts in the low midland zone favors livestock keeping, ranching and wildlife conservation. ▪ The level landscape of the Laikipia Plateau allows for the establishment of vast ranches, conservancies	▪ Over-stocking and over-grazing by the pastoral communities leave the soil bare, making it vulnerable to massive soil erosion. ▪ There are cases of crop damage arising from human-wildlife conflicts over shared grazing lands and watering points. ▪ Livestock diseases and pandemics affect livestock keeping. ▪ Unregulated abstraction of water from rivers for irrigation purposes in the upstream areas causes water shortage downstream for the pastoral communities.	▪ The numerous water sources (rivers, boreholes, dams and pans) increase the potential for irrigation farming which helps ensure food security and sustain local livelihoods. ▪ Forests provide the opportunity for beekeeping and eco-tourism. ▪ The County has the potential for underground water which can be tapped through the drilling of boreholes. ▪ The presence of mineral deposits provides opportunities for mining and quarrying investments.	▪ Climate change has resulted in reduced agricultural production, depletion of forage, emaciation of livestock, temporal emigration of the pastoral communities, and human-wildlife conflicts over water and pasture. ▪ Soil erosion and flooding impact agricultural productivity in low-lying areas. ▪ Encroachment on riparian reserves and wetlands by human activities. ▪ Wetland ecosystems are facing degradation and utilization pressure from increasing human

Sector	Strengths	Weaknesses	Opportunities	Threats
	and large-scale mechanized farming. ▪ The wetland ecosystems provide fertile soils for crop farming and act as grazing fields for livestock during prolonged drought periods.			settlements and activities. ▪ Invasive plant species such as *Opuntia spp* threaten the quality of forage in the rangelands.
Population and Demography	▪ Population increase in the County – both rural and urban population. ▪ The County has a rich labour force – 73% of the population comprises youth below 35 years of age. ▪ The County has a diverse culture. The Maasai community attracts tourists through their traditional dances, jewelry and cultural manyattas.	▪ The nomadic nature of the pastoral communities hinders the provision of social services and amenities. ▪ Cases of poverty and unemployment are significant inhibitors of economic development in the County.	▪ Rich cultural diversity in Laikipia County provides an opportunity for cultural tourism.	▪ Rapid population growth exerts pressure on existing social services and infrastructure. ▪ Retrogressive cultural practices such as FGM and early marriages are common in some areas within the County. ▪ Cases of epidemics and pandemics – the Covid-19 Pandemic.
Human Settlements and Urbanization	▪ Rural settlements provide food security through crop farming and livestock keeping.	▪ Sparse human settlements in Laikipia North Constituency limit the provision of social services and infrastructure utilities.	▪ Sparse settlements in Laikipia North allow for extensive community lands, and the establishment of private	▪ Insecurity of tenure limits development within both rural and urban settlements in the County.

Sector	Strengths	Weaknesses	Opportunities	Threats
	▪ Urban settlements provide avenues for social change, modern ways of living and occupational specialization. ▪ Urban centers are nodes for improved access to social services, utilities and employment opportunities.	▪ Uncontrolled urbanization causes increased urban poverty, increased informality, and congestion and exerts pressure on surrounding agricultural lands. ▪ Urbanization is not in tandem with the level of provision of social services and infrastructure within the urban centers.	ranches and wildlife conservancies. ▪ Identified growth centers will spur more socio-economic development and investments in the County.	▪ Due to an inadequate supply of housing, there are pockets of informal settlements within the urban centers.
Land Tenure and Land Use	▪ Generally, the County has arable land that is suitable for crop production and livestock keeping. ▪ Land use planning has provided a spatial framework within which development activities are harmoniously undertaken.	▪ Declining land productivity due to excessive land subdivision. ▪ Insecurity of tenure and absentee landowners limit developments on the land.	▪ Improvement of land tenure through adjudication, survey, registration and issuance of title deeds will spur more developments.	▪ Increased land degradation due to soil erosion, over-grazing and increased population growth. ▪ Cases of land grabbing of community lands.
Economic Base	▪ The various agricultural practices offer employment and are a means of livelihood to the local communities. ▪ The ASAL nature of the County provides habitat	▪ Encroachment into wildlife migratory corridors by intrusive infrastructure severs connected/continuous landscapes.	▪ The County has the potential for more agricultural production through irrigation farming, climate-smart farming technologies and value addition.	▪ Habitat degradation - climate change has altered precipitation patterns, leading to prolonged drought, water shortage and reduced forage for wildlife on the

Sector	Strengths	Weaknesses	Opportunities	Threats
	to diverse wildlife species which attract tourists. ▪ The undulating landscape and rolling low hills are of scenic importance to the county. ▪ Tourism is promoted by the private sector as seen in the private conservancies, numerous hotels, lodges, camps, resorts, villas, sports clubs, holiday homes and cultural centers. ▪ The numerous trading centres offer markets for goods and services. ▪ The livestock markets at Rumuruti, Doldol, Mouwarak and Kimanjo enhance livestock keeping among the pastoral communities. ▪ There are several agro-processing industries in the county for dairy, grain milling and honey.	▪ Insecurity in the northwestern parts of the County limits tourism activities. ▪ Poaching of wildlife in areas of Segera, Thingithu and Mukogodo.	▪ There exist many opportunities in eco-tourism investments that can help raise the livelihoods of the pastoral communities. ▪ Rehabilitation of existing markets and construction of new markets provide more opportunities for MSMEs start-ups, thus boosting local trade. ▪ The identified urban centres act as growth centers, attracting more economic investments and activities within and around them ▪ There exist untapped opportunities in value addition, agro-processing and general-commodity industries. ▪ The Rumuruti Special Economic Zone provides a favorable environment that will attract both	rangelands and grasslands. ▪ Invasive plant species (Opuntia spp) threaten the quality of forage in the rangelands. ▪ Land use changes and unsustainable subdivisions of land continuously reduce natural ecosystems that support wildlife populations. ▪ There is unregulated sand scooping along rivers in Laikipia North.

Sector	Strengths	Weaknesses	Opportunities	Threats
	▪ Sand harvesting and ballast quarrying provide local building and construction raw materials, as well as employment opportunities.		local and foreign investments. ▪ The mining and quarrying sector has great economic potential that has not been exploited.	
Transport, Infrastructure and Social Services	▪ The County is well connected by both road, railway, and air ▪ The County has a good road network which promotes rural-urban linkages. ▪ The numerous water sources (rivers, boreholes, dams, pans and rock catchment) act as sources of water for domestic, irrigation and livestock purposes. ▪ Presence of telecommunication services and internet connectivity in the County.	▪ There is inadequate reticulation of water in the drier northern region. ▪ There are inadequate social halls and conference facilities within the County. ▪ Some areas face challenges of inadequate ECDEs; classrooms and sporting facilities within primary and secondary schools; and inadequate institutions for technical education. ▪ Majority of the trading centers lack centralized sewerage systems and rely on onsite sanitation systems such as septic tanks and pit latrines.	▪ Maximum utilization of the existing old railway lines serving Nanyuki and Rumuruti towns has the potential to boost industrial activities within the County. ▪ Nanyuki airstrip can be elevated to a minor airport to complement the proposed airport in Rumuruti ▪ The existing airstrip at Nanyuki and the other proposed airstrips will open up the County to local and international tourism. ▪ The County has the potential to harness solar power to supplement the supply	▪ Poor road connectivity in some areas inhibits accessibility and movement. ▪ The hilly terrain in areas in Laikipia North limits the erection of electricity lines, hence leaving such areas with inadequate connectivity. ▪ Poor waste management in urban areas.

Sector	Strengths	Weaknesses	Opportunities	Threats
		▪ There is inadequate electricity coverage in areas of Laikipia North. ▪ Poor road conditions in most parts of the County	from the national grid system.	
Governance	▪ The devolved government structure promotes development up to grassroots levels. ▪ Public participation in community development programmes and projects.	▪ Misappropriation of public funds. ▪ Limited capacity in both personnel and funds to fully execute functions. ▪ Poor interdepartmental linkages and operations.	▪ The County Government has the technical capacity to implement the CSP. ▪ Comprehensive policy guidelines to guide development in the County.	▪ Political interference in finance allocation and infrastructure development.

To conclude, this situational analysis serves as a basis for responsive and informed plan formulation as presented in the chapters below.

12 SYNTHESIS AND DEVELOPMENT OF SPATIAL CONCEPTS

12.1 Overview

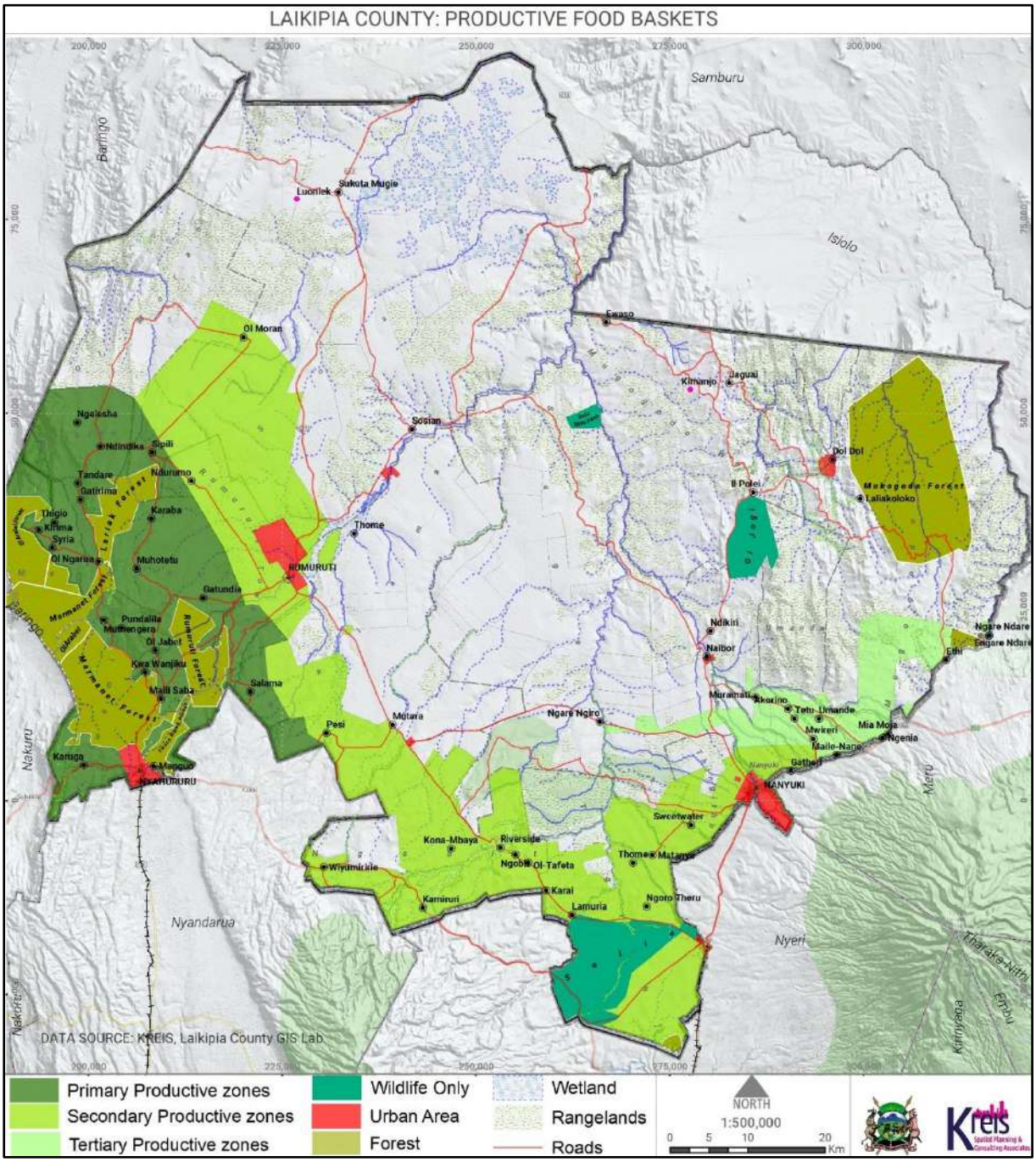
Developing spatial concepts is an important phase in the preparation of plans to guide the spatial development of any given area. To comprehensively conceptualize the landscape of Laikipia County, it is essential to split it into various functional sub-regions based on their climatic conditions, topography, vegetation, availability of natural resources, level of infrastructure and service provision, dominant economic activities, the nature and distribution of human settlements. This division enables the identification of existing development potentials within each sub-region and informs the types of spatial concepts that should be developed to further enhance the identified functionality.

A detailed analysis and synthesis of the County's landscape establishes six spatial concepts; the productive food baskets, the great economic corridor, the pastoralists enclave, the wildlife wilderness, industrial junctions and the breathing ecosystems. These concepts are further elaborated in the sections below:

12.2 The Productive Food Baskets

The spatial layout of the County presents three agricultural productive sub-regions; classified as primary, secondary and tertiary based on their level of production. The sub-regions cumulatively form the productive baskets and possess the potential of ensuring food security and nutrition for both the rural and urban populations. This spatial concept is mainly assigned to Igwamiti, Marmanet, Githiga, Salama, Rumuruti Township, Ngobit, Tigithi, Ol Moran, Thingithu, Nanyuki and Umande wards. These three sub-regions are best suited for agricultural production, ecological conservation, agro-processing and value-addition functions.

Map 12-1: Productive Food Baskets Spatial Concept



12.2.1 Primary Agricultural Productive Sub-Region

This sub-region comprises Igwamiti, Marmanet and Githiga ward, and parts of Salama ward. Generally, these wards fall within the upper highlands sub-humid and low highlands agro-ecological zones whose altitude ranges from 1500m to over 2100m ASL, rainfall amount varies between 700mm/year to over 1000mm/year, and soils are fertile and well drained. Hydrological features include the Aberdare Ranges as the main water

tower, numerous rivers (Ewaso Narok, Igwamiti, Sharmanei, Melwa, Kasuria, and Arabel among others), and forests (Rumuruti, Marmanet, Ol Arabel and Lariak).

These climatic conditions and hydrological features favor rain-fed agriculture as the dominant economic activity and source of livelihood for the rural population. The main agricultural activities are small-scale food crop farming; large-scale farming of maize, wheat and hay; mixed farming with livestock husbandry; fish farming; dairy keeping; and bee keeping. The human settlement pattern in this sub-region is dense and clustered. As a result of population growth, human settlements have encroached on the Marmanet Forest and increasingly exert utilization pressure on wetland ecosystems and riparian reserves.

Transport networks form the main structuring elements for this sub-region, namely the B5 (Nyeri-Nyahururu) road, the A4 (Nyahururu-Rumuruti-Maralal) road, and the C51 (Maili Saba-Kinamba) road. These road networks enhance rural-urban linkages through which farmers can access agricultural inputs and markets for their produce.

The primary urban center is Nyahururu Town with a high concentration of commercial activities, agro-based industries, social services and infrastructure utilities. The town is experiencing rapid urbanization which has induced urban sprawl within its immediate periphery areas, leading to the growth of secondary towns – Karuga, Ol Jabet and Kinamba. Tertiary centers within this sub-region include Salama, Gatundia, Maili Saba, Ol Ngarua, Tandare, Kwa Wanjiku, Muthengera, Muhotetu, Gatirima, Karaba and Ndindika among others.

The Spatial Plan has prioritized the delineation, planning and classification of these centers for the development of agro-based industries, infrastructure utilities and social amenities.

12.2.2 Secondary Agricultural Productive Sub-Region

Ngobit, Tigithi, Thingithu, Salama, Rumuruti Township and Ol Moran wards constitute this sub-region. Ngobit and Thingithu wards lie within the low highland zone where rainfall ranges between 700-1000mm/year and supports dairy, fish and crop farming. Tigithi, Rumuruti, Ol Moran, and Salama lie in the upper midlands zone with rainfall

ranging between 500-700mm/year and are suitable for beef farming and crop farming of maize, sorghum, hay and millet.

The main hydrological features in this sub-region are Mt. Kenya and Aberdare Ranges water towers, wetlands (Ewaso Narok, Pesi and Mutara swamps) and rivers (Pesi, Mutara, Suguroi, Morogo, Rongai, Naro Moru and Likii among others). These rivers support irrigation farming within the pockets of dense and clustered human settlements. However, increase in settlements has caused encroachment and utilization pressure on the riparian reserves.

The Solio Settlement Scheme lies within this sub-region. The scheme comprises 7 villages namely; Village 1 (Furaha), Village 2 (Rehema), Village 3 (Bahati), Village 4 (Tetu), Village 5 (Mathingira), Village 6 (Mukandamia), and Village 7(Bahati). Irrigation farming to supplement rain-fed agriculture within the settlement is an adaptive measure to ensure food security for the local population.

Transport networks form key structuring elements – the B5 (Nyeri-Nyahururu) road, the A4 (Nyahururu-Rumuruti-Maralal) road, the B22 (Nanyuki-Rumuruti) road, and the D367 (Rumuruti Old) road. Rumuruti Township and Nanyuki Town are the primary urban centers in this sub-region and act as the main drivers of economic growth. Secondary urban centers with clustered commercial activities are Ol Moran, Sipili, Wiyumiririe, Pesi, Mutara, Ngobit, Lamuria, Matanya and Castle. The Spatial Plan has prioritized the delineation, planning and classification of these centers for the development of agro-based industries, infrastructure utilities and social amenities.

Smaller tertiary centers include Ndurumo, Sweetwaters, Kona Mbaya, Ngorotheru, Mirera, and Gatheri among others. These are linear centers situated along the road networks and at road junctions. The presence of agricultural markets and roads promotes trading activities within/among the urban centers and enhances rural-urban linkages.

12.2.3 Tertiary Agricultural Productive Sub-Region

Wards in this sub-region comprise Nanyuki, Umande, Segera, Sosian and sections of Mukogodo East (Ngenia and Ethi) with private smallholder farms. Umande and Nanyuki wards lie within the low highland zone with rainfall ranging from 700-

1000mm/year, while Segera, Sosian and Mukogodo East wards are within the upper midland zone that experiences rainfall between 500-700mm/year. The main hydrological features are Mt Kenya and rivers (Rongai, Likii, Nanyuki, Sirimon, Timau, Ngusishi, Engare Ndare among others). Agricultural activities within the smallholder farms include dairy, fish, beef and crop farming of maize, wheat, beans, vegetables and hay. Horticulture and floriculture Greenhouse farming is carried out in the largescale farms. This sub-region also encompasses crop and beef farming within wildlife conservancies and ranches.

The main structuring element is the A2 (Nyeri-Nanyuki-Isiolo) road which traverses through Nanyuki Town. Other key road networks are the Nanyuki-Naibor-Il Polei road, the Naibor-Muramati-Tetu road, the Ethi-Doldol road, and the Naibor-Sosian road. Nanyuki Town is the primary urban center attributed to its high concentration of functions – commercial, industrial, residential, educational, social services and public utilities. Rapid urbanization in Nanyuki Town has resulted in urban sprawl within its neighboring agricultural areas in Thingithu and Umande wards. Secondary centers in this sub-region are Kalalu, Naibor, Umande, Mwireri, Ngenia, Tetu, Jua Kali, Maili-Nane, Ethi, and Chumvi.

To support the productive food baskets concept, the Plan proposes a crop and livestock development strategy aimed at enhancing agricultural production for improved food security and nutrition in the County through intensification, diversification, conservation and value-addition. Some of the necessary interventions include:

Strategic Interventions

- Establish value addition and agro-processing industries within the food baskets areas.
- Support irrigation farming through sand scopping community dams and pans, providing dam liners and drip kits to farmers'groups.
- Increase awareness on improved drought-resistant seed varieties, improved livestock breeds and modern post-harvesting storage techniques.
- Establish infrastructure to support fish farming – ponds, dam liners, cage systems and cold storage facilities.
- Encourage conservation agriculture – use of organic manure, agroforestry and soil conservation practices to maintain soil fertility.
- Improve market accessibility through improved road linkages to enhance agricultural food chains.
- Increase access to mobile agricultural extension services.

Strategic Interventions
▪ Enforce development control measures to regulate the uneconomical subdivision of prime agricultural lands. ▪ Delineation of urban extents and promotion of compact urban developments to protect prime agricultural land

12.3 The Pastoralists Enclave

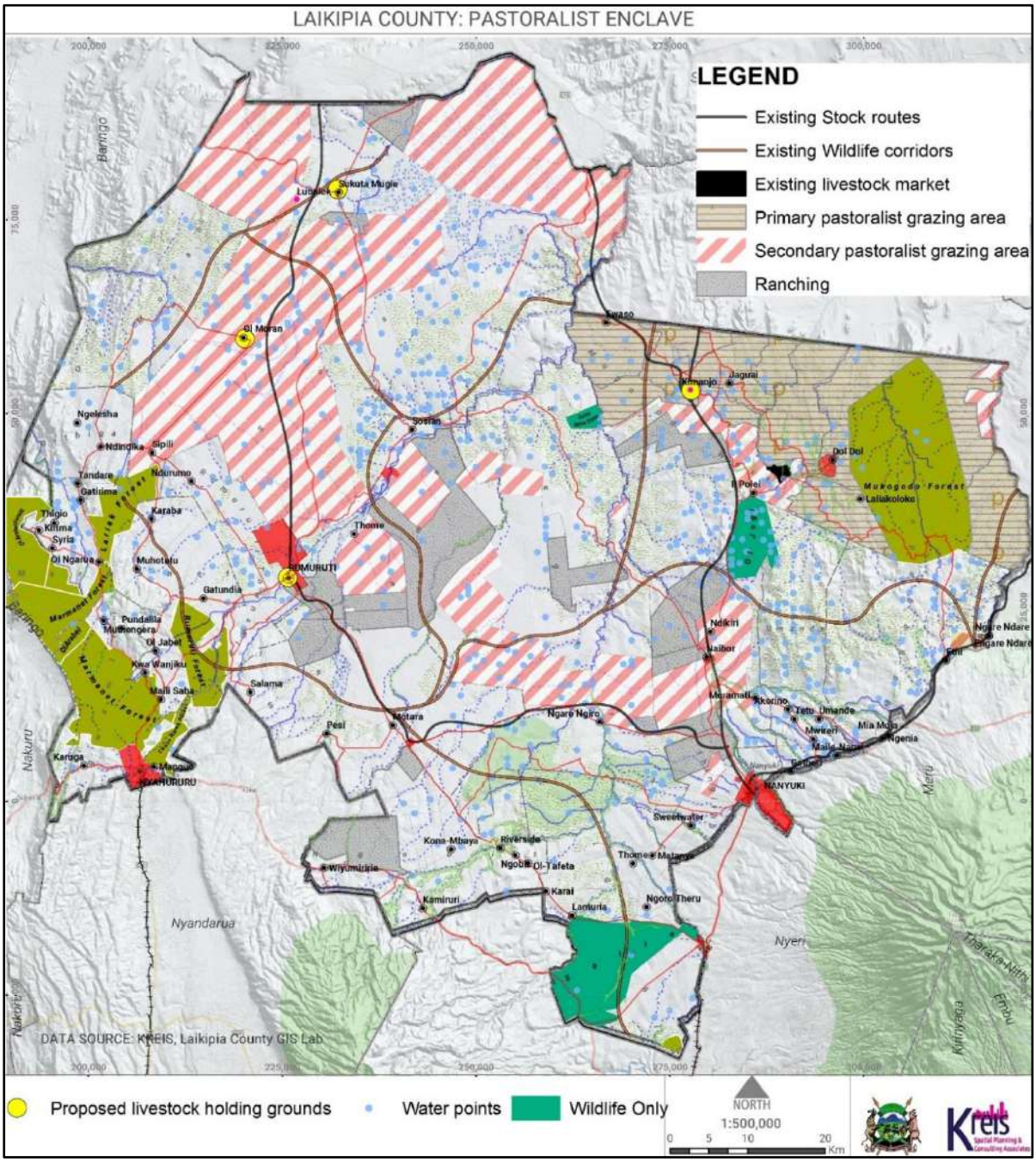
This spatial concept is primarily assigned to the pastoralists sub-region within the Laikipia North region – primarily Mukogodo West Ward and parts of Mukogodo East, Sosian, Ol Moran and Segera wards. It also encompasses the pockets of private ranches and conservancies within the County that act as secondary pastoralist grazing areas, especially during prolonged drought periods.

This sub-region is located within the lower midland zone whose rainfall ranges between 400-500mm/year. The main hydrological features include the Mukogodo Dry Forest, low-lying flood plains, and rivers (Ewaso Narok, Karunga, Naia Sirua, Sinyai, Engala, Il-Balagelak among others). The dry climatic conditions and extensive rangelands favor nomadic livestock keeping as the main economic activity and source of livelihood for the pastoralists' communities.

The land tenure system in this sub-region is community-owned land, namely; Il Ngwesi, Lekurruki, Kurikuri, Musul, Tiemamut, Kijabe, Il Motiok and Koija community ranches. There are existing stock routes that allow for nomadic livestock movements from Samburu County through Laikipia to Mt. Kenya. Cattle rustling, insecurity, prolonged drought, invasive plant species, and rangeland degradation are major threats on the pastoralists' livelihoods.

Doldol is the primary urban center with a concentration of commercial, administrative, educational, public utilities and health functions. Other urban centers include Kimanjo, Il Polei, Ewaso, Chumvi, Ngare Ndare, Mia Moja, Kiwanja Ndege, Lukusero, Mouwarak, Louniek and Jaguai. To boost livestock production in this sub-region, the County Government has established livestock markets in Doldol, Kimanjo and Mouwarak centers.

Map 12-2: Pastoralists Enclave Spatial Concept



To support this concept, the Plan proposes a crop and livestock development strategy that supports livestock production to ensure sustenance of local livelihoods within the pastoralists' sub-region. Key identified interventions include:

Strategic Interventions
▪ Increase access to mobile veterinary services for the nomadic communities. ▪ Improve livestock breeds through Artificial Iinsemiation (AI) services. ▪ Educate and increase awareness on sustainable livestock practices to reduce land degradation arising from overstocking and overgrazing.

Strategic Interventions
▪ Rehabilitate existing livestock infrastructure – livestock markets, sale yards, holding grounds, cattle dips, vaccination crushes, watering points, community dams and water pans. ▪ Promote rangelands conservation, pasture regeneration and eradication of invasive plant species in the community ranches. ▪ Encourage conflict resolution mechanisms to settle resource-based conflicts between the pastoralists, farmers, property owners, and private ranch/conservancy owners. ▪ Establish government/community-funded fodder/feeder farms within the County to mitigate drought-related incidences. ▪ Encourage grazing agreements between pastoralists and private ranch/conservancy owners for grazing permission during prolonged drought periods. ▪ Promote value-addtion through establishment of relevant agro-based industrial infrastructure

12.4 The Great Economic Corridor

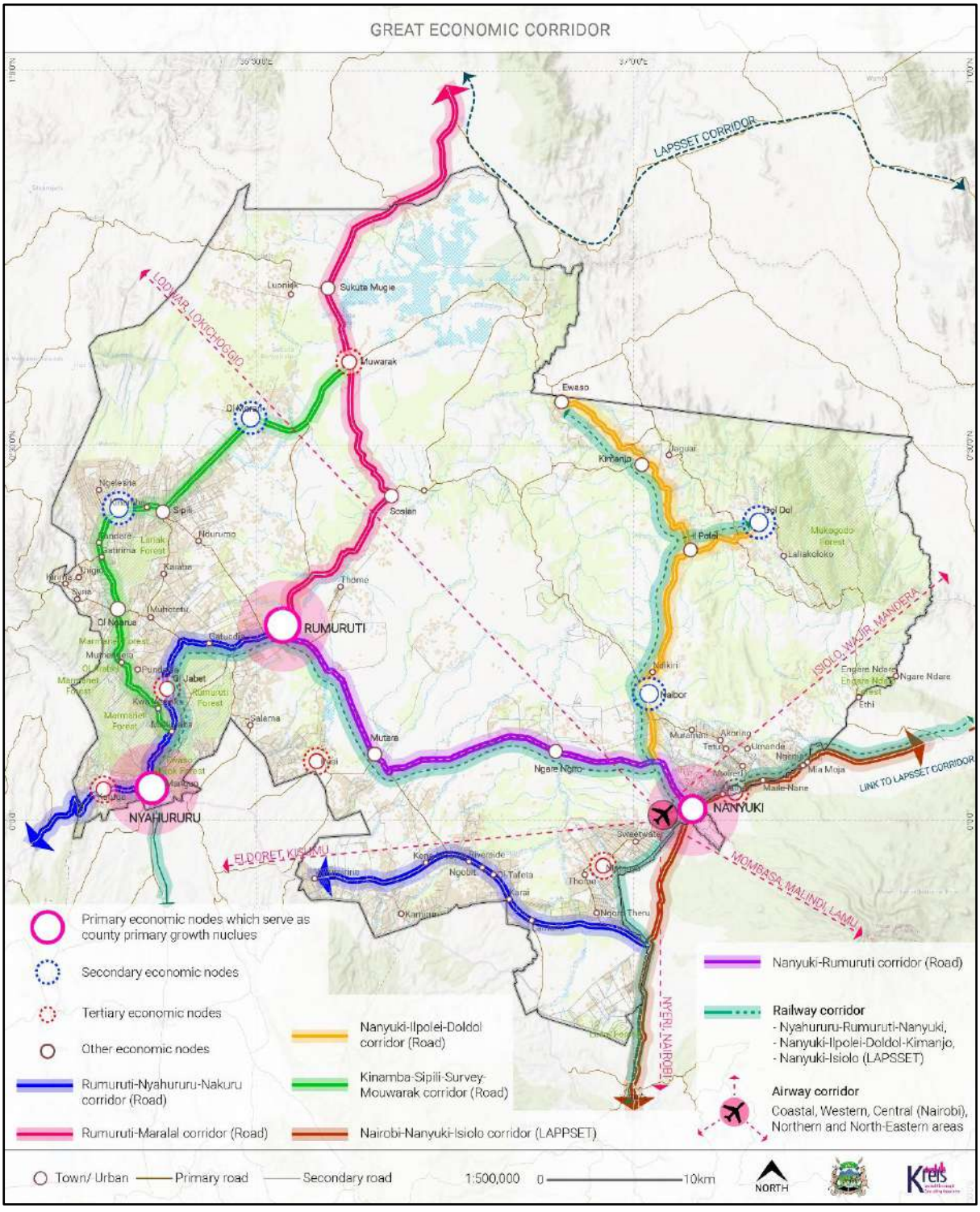
The concept is underpinned on the existence of road networks that connect the County to other growth centers within the wider regional context. Its key focus is to establish major road and rail transport linkages for the three primary urban centers – Nanyuki, Rumuruti Township and Nyahururu. These centers are the main drivers of economic development in the County, and have the highest agglomeration of commercial activities, urban population, educational facilities, social services and infrastructure utilities.

The concept's structuring elements are the A2 (Nyeri-Nanyuki-Isiolo) road, the B5 (Nyeri-Nyahururu) road, the A4 (Nyahururu-Rumuruti-Maralal) road, the B22 (Nanyuki-Rumuruti) road, and the C51 (Maili Saba-Kinamba) Road. Another important element is the existing meter-gauge railway connection to Nanyuki and Nyahururu towns. The County's proximity to the LAPSSET corridor through Maralal and Isiolo towns presents opportunities for air, rail and pipeline linkages. These transport networks form strong urban linkages within the CEREB region and are therefore enablers of economic growth in the County.

The Plan proposes the extension of the existing railway line from Nyahururu Station to Rumuruti Station and further along the economic corridor to the Nanyuki Station. Further extension of the railway line is proposed from Rumuruti Township northwards to meet the LAPSSET Corridor at Maralal; and from Nanyuki town along the Nyeri-

Nanyuki-Isiolo road to join the LAPSSET Corridor at Isiolo. To support mining activities in the Laikipia North region, the Plan proposes for the extension of the railway line from Nanyuki town to Doldol and Kimanjo centers through Il Polei. It also recommends to link Rumuruti to the proposed LAPSET corridor oil pipeline.

Map 12-3: The Great Economic Corridor Spatial Concept



The corridor is envisioned to create more rural-urban linkages and therefore spur polycentric urban growth. It will also provide a linear framework for siting of industrial activities in agro-processing and value addition.

To support this concept, the Plan proposes a transport, infrastructure and social services development strategy that highlights the need to provide supportive infrastructure and services to propel development through the following interventions.

Strategic Interventions
▪ Exploit advantages of CEREB and LAPSSET corridor for regional, national and international connectivity. ▪ Reclassify and upgrade the existing road networks to create seamless intra and inter-transport linkages. ▪ Revamp and extend the existing railway lines serving Nanyuki and Nyahururu towns. ▪ Enhance the capacity and distribution networks of the municipal water and sewerage companies. ▪ Prepare an integrated solid waste management strategy for the urban areas. ▪ Increase electricity and telecommunication connectivity in all areas. ▪ Identify suitable sites for the establishing of solar and wind power farms. ▪ Equipping, staffing, renovating and ugrading existing social amenities.

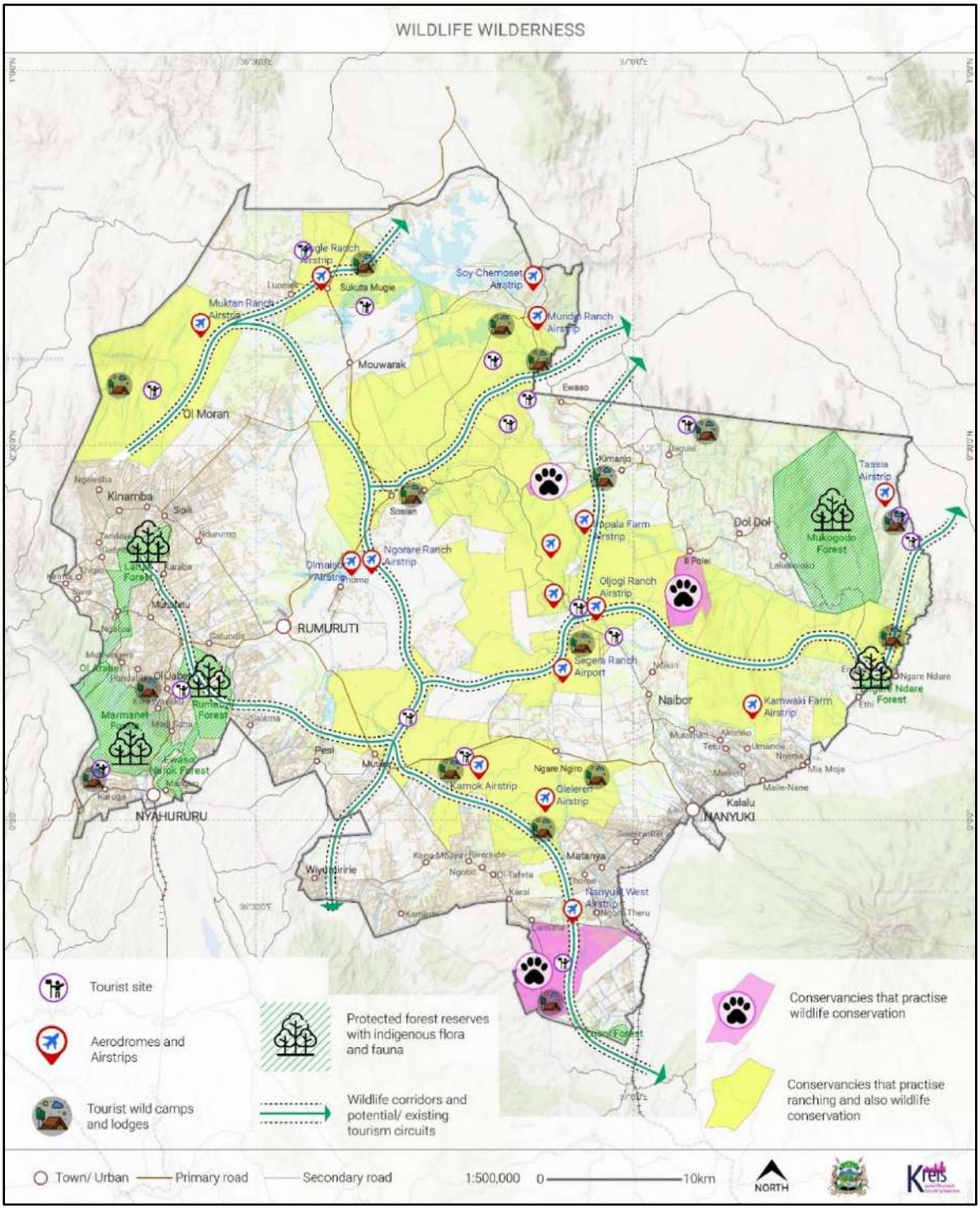
12.5 The Wildlife Wilderness

This concept is modelled around the ranching and conservancies sub-region that encompasses Segera, Umande, Mukogodo East, Sosian, Salama, Ol Moran, Thingithu, Ngobit and Tigithi wards. Laikipia's landscape hosts the second-largest wildlife population outside protected parks and reserves, with a diversity of species namely; black rhinos, Grevy's zebras, elephants, Burchell's zebra, Thompson's Gazelle, buffalos, birds, striped hyenas, wild dogs, reticulated giraffes, antelopes, and lions among others.

The County has two tourism circuits; the Laikipia West circuit stretching from Wiyumiririe-Loisaba Conservancy and the Laikipia East circuit from Ol Pejeta-Doldol-Il Ngwesi Conservancy. These circuits allow for wildlife-based, culture-based, and eco-tourism as significant economic activities in the County. Majority of the private conservancies assume a conservation-led land use concept for mixed wildlife conservation and ranching activities. A few conservancies such as Ol Jogi and Solio primarily practice wildlife conservation.

The key structuring elements within this sub-region are wildlife migratory corridors and dispersal areas, road networks, private airstrips/landing grounds, and tourist accommodation facilities. These include hotels, lodges, resorts, villas and sports clubs among others.

Map 12-4: Wildlife Wilderness



The main challenge for the wildlife wilderness sub-region is encroachment on wildlife dispersal areas, the erection of intrusive/obstructive infrastructure across wildlife migratory corridors, ranglelands degradation, habitat destruction, and uneconomical land fragmentation.

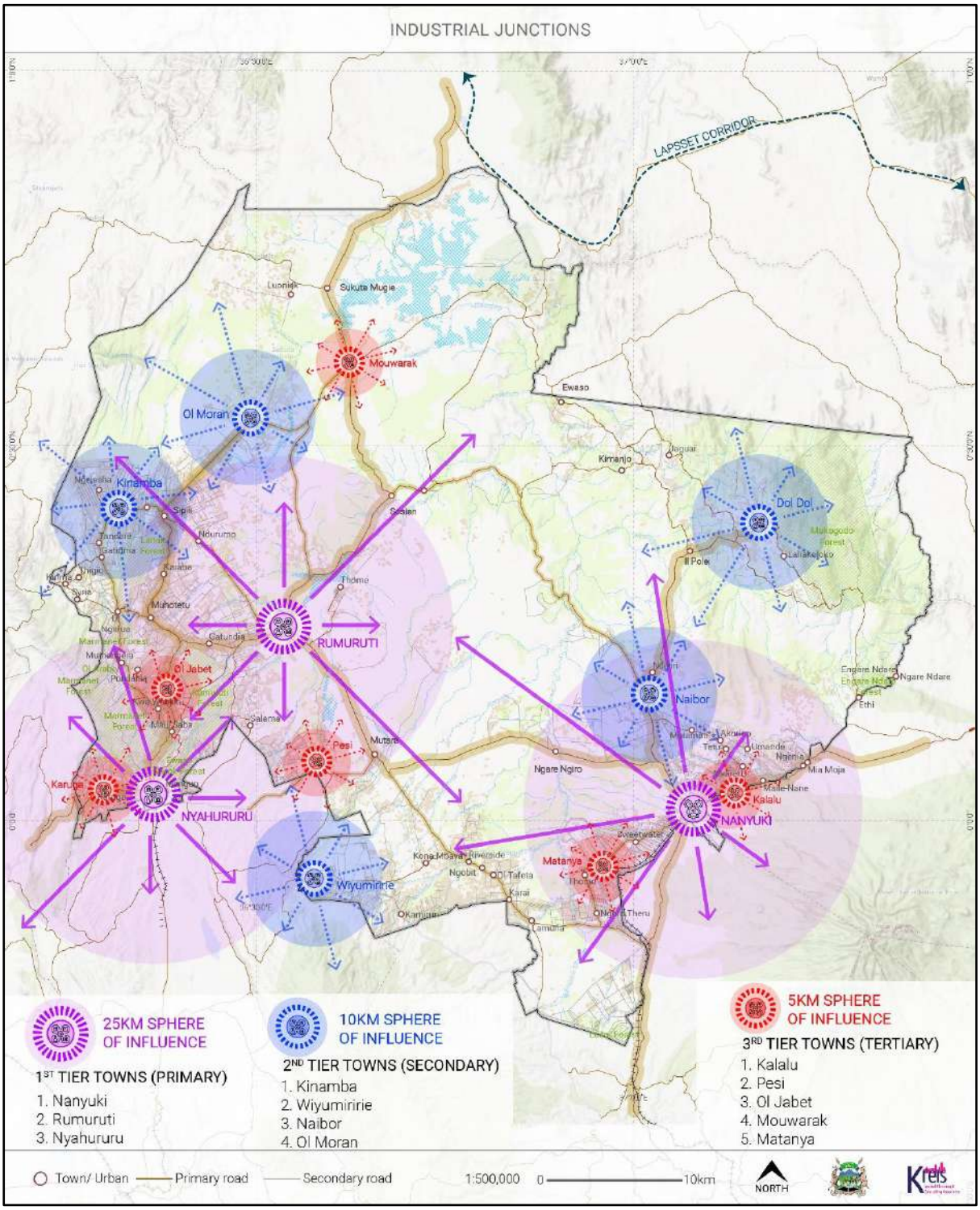
To support this concept, the Plan proposes a trade, tourism, industry and mining development strategy that supports sustainable wildlife conservation and promotes wildlife-based tourism in the County through the following interventions.

Strategic Interventions
▪ Identify, map and protect (gazette) wildlife migratory corridors to reduce human-wildlife conflicts. ▪ Protect interconnected/continuous wildlife habitats by limiting intrusive infrastructure within the ecosystems. ▪ Ensure sustenance of the biological, socio-cultural and environmental values of natural ecosystems which act as wildlife habitats. ▪ Promote sustainable rangelands management through reseeding and control of invasive plant species. ▪ Preserve and rehabilitate cultural heritage centers and tourist attraction sites. ▪ Recognize wildlife conservation as a significant land use in the County. ▪ Market Laikipia County as an international safari-based tourist destination.

12.6 Industrial Junctions

Urban centers are activity nodes and key facilitators of economic growth in the County. They have been conceptualized as industrial junctions which accomodate urban functions – administrative, commercial, residential, industrial, transport, infrastructure and public purpose. Key structuring elements for these junctions are transport linkages and agglomeration of economic activities. The industrial junction's concept is further stepped down into three levels – primary, secondary and tertiary junctions based on the envisioned concentration of urban functions.

Map 12-5: Industrial Junctions Spatial Concept



12.6.1 Primary Industrial Junctions

These are the primary urban centers which have the highest concentration of urban functions. Rumuruti Municipality is the main primary industrial junction owing to its central location and administrative role. It is linked to Nanyuki and Nyahururu towns through the A4 Nyahururu-Rumuruti-Maralal road and the B22 Nanyuki-Rumuruti

road. Subject to its Local Physical and Land Use Development Plan (2021-2031), Rumuruti Municipality is prioritized as the County's focal development node with provisions for a Special Economic Zone, Export Processing Zone, airport, railway station, pipeline depot, County referral hospital, affordable housing units, hides and skins banda, light industrial warehouses, universities and TVETs, stadium, recreational park, fire station, rescue and rehabilitation centres, training and research centres, techno hub, sewerage treatment plant, and cemeteries. Infrastructure to boost industrialization in Rumuruti Municipality is the A4 Nyahururu-Rumuruti-Maralal road and other road networks; the proposed railway station, SEZ, pipeline depot and EPZ; Rumuruti Solar Farm, and the 32kV Nanyuki-Rumuruti Grid Project.

Nanyuki town is the primary industrial junction for Laikipia East region. Its numerous urban functions include residential, educational, public purpose, commercial, industrial, and administrative among others. It provides for manufacturing, agro-processing, and Juakali activities. As a transport junction, Nanyuki is served by the A2 Nyeri-Nanyuki-Isiolo road, the B22 Nanyuki-Rumuruti road and other road networks, and the Nairobi-Nanyuki railway line. It is strategically located within the CEREB region and is accessible from Nyeri, Meru and Isiolo counties. Its road linkage to Isiolo resort town provides an opportunity to benefit from the LAPSSET Corridor.

Nyahururu town serves as the primary industrial junction for Laikipia West region. Among other key urban roles, it has a high concentration of manufacturing, Juakali, agro-processing and value-addition industries. The transport and infrastructure enablers that promote urban functions in the town are the B5 Nyeri-Nyahururu road, the A4 Nyahururu-Rumuruti-Maralal road and other road networks, the Gilgil-Nyahururu railway line, and NYAHUWASCO's water reticulation system.

The Plan proposes boundary delineation, reclassification and conferement of municipality status to Nanyuki and Nyahururu towns, which will prompt the preparation of Local Physical and Land Use Development Plans, operationalization of the municipal boards, grant of charter, provision of infrastructure an services as require spelt out in the Urban Areas and Cities Act.

12.6.2 Secondary Industrial Junctions

These are secondary urban centers with mid-level commercial and industrial activities among other functions. The concept is assigned to – Kinamba, Sipili, Karuga, Wiyumiririe, Makutano, Doldol, Naibor, Ol Moran and Mouwarak. Road and infrastructure networks create favorable environments for investments. Kinamba, Sipili, Karuga, Wiyumiririe, Ol Moran and Naibor towns are suitable for siting agro-processing and value addition industries – grain, milk, meat, fish, honey, and fruits processing and packaging. Livestock products value addition industries such as leather tanneries, hides and skins bandas, and meat processing facilities are proposed in these secondary industrial junctions.

Doldol and Mouwarak towns are the main urban centers in Laikipia North region, located within the pastoralists sub-region in which livestock keeping is the main economic activity. The presence of livestock markets makes them suitable for value-addition industries such as leather tanneries. The Plan envisions Doldol as a key industrial node in Laikipia North for investments in mineral exploration within and around the Kimanjo area which has exploitable mineral deposits.

The Plan proposes boundary delineation, reclassification and conferement of town status to these secondary urban centers, which will necessitate the preparation of Local Physical and Land Use Development Plans.

12.6.3 Tertiary Industrial Junctions

These are tertiary urban centers with a low concentration of urban functions. They act as service centers which facilitate access and distribution of goods produced within the primary and secondary industrial junctions. This concept is allotted to centers such as – Ol Jabet, Pesi, Lamuria, Matanya, Kalalu, Umande, Sosian, Kimanjo, Il Polei, Louniek, Maili Saba, Castle, Ethi, Chumvi, Salama, Ngareng'iro, Thome among others. Road networks serving these centers enable rural-urban linkages which increase access to markets for agricultural produce. They have been prioritized for siting of value addition and agro-processing industries for both crop and livestock products.

The Plan proposes boundary delineation, reclassification and conferement of market centers status to these tertiary urban centers, which will necessitate the preparation of Local Physical and Land Use Development Plans.

To support the industrial junctions' concept, the Plan proposes a trade, tourism, industry and mining development strategy intended to induce and promote investments in trade, tourism, manufacturing, processing and mining activities. Necessary interventions for this concept include:

Strategic Interventions
▪ Develop a County Land Management Strategy that will provide for regularization of land tenure in informal settlements, preparation of land subdivision guidelines, preparation of land use plans for the urban areas, reclamation of grabbed public land, and delineation of urban boundaries. ▪ Exploit advantages of CEREB and LAPSSET corridor for regional, national and international connectivity. ▪ Establish value addition and agro-processing industries within urban centers to support agricultural value chains. ▪ Create a conducive business environment to boost trading activities and MSMEs investments. ▪ Integrate industrialization and environmental protection through policy and regulatory frameworks. ▪ Establish support infrastructure for mining investments and ensure sustainable mineral exploitation. ▪ **Conferment, funding and operationalization of municipalities, towns a**nd market centres to promote good governance, sustainable development, improved service delivery and quality of life

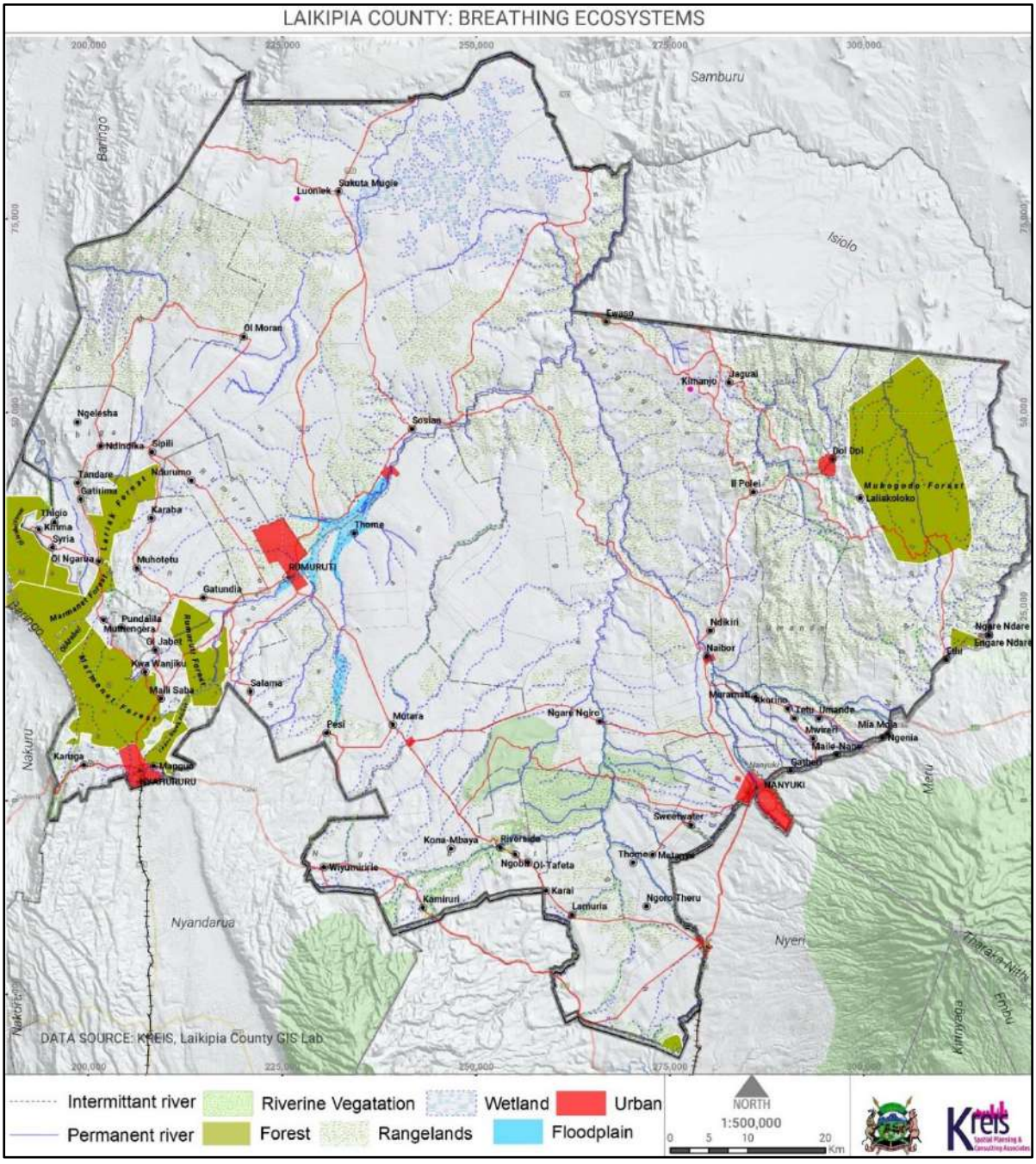
12.7 The Breathing Ecosystems

This spatial concept is assigned to the natural ecosystems in the County, inclusive of forests, riparian areas and wetlands. They are termed as breathing ecosystems due to the crucial ecological functions they play in the regulation of biological processes, prevention of soil erosion, control of floods, the sustenance of community livelihoods and as habitats for diverse species of flora and fauna.

Forests – Mukogodo Dry Forest, Rumuruti, Marmanet, Ol Arabel, Lariak and Lusoi as well as private woodlots contribute significantly to the sequestration and storage of atmospheric carbon, supporting natural wildlife habitats, beekeeping, research and eco-tourism. The concept pursues the exploitation of forests as sustainable low-cost alternatives for reducing the amount of greenhouse gases in the atmosphere, and ultimately contributing towards mitigation of climate change in the County.

The vegetation within and around wetlands and along riparian reserves forms a core component of this concept. These fragile ecosystems aid in flood control, act as livestock grazing fields, are irrigation areas, and wildlife habitats. This concept highlights the need for sustainable utilization, conservation and management of the natural ecosystems for the sustenance of their ecological benefits.

Map 12-6: Breathing Ecosystems Spatial Concept



The Plan proposes an environment and biodiversity conservation strategy to ensure the sustenance of the biological, socio-cultural and environmental values of natural ecosystems through the following interventions.

Strategic Interventions
▪ Protect and conserve ecologically fragile ecosystems – forests, riparian reserves and wetlands for sustainable maintenance of their ecological benefits. ▪ Fostering community involvement and responsibility in natural resource conservation measures and programmes ▪ Increasing tree coverage to achieve or contribute to the constitutional threshold of 10% of the county land mass

PART IV:

PLAN PROPOSALS

13 PLAN PROPOSALS

13.1 Overview

Critical synthesis of the County's landscape was fundamental in the formulation of spatial concepts on the basis of functional sub-regions. This chapter details the programmes and specific actions for each thematic strategy envisioned to unlock the development potential of the identified sub-regions. The Plan proposals are aimed at achieving the County's vision of ***'Sustainable and Integrated Land Use Management for Environmental and Socio-Economic Development'.***

13.2 Crop and Livestock Development Strategy

This strategy promotes agricultural production to ensure food and nutrition security in the productive food baskets. It also promotes livestock production for the sustenance of livelihoods in the pastoralists sub-region.

Crop Production:	
Programmes	**Actions**
Support irrigation farming	▪ Reviving and up-scaling existing irrigation schemes. ▪ Sand scooping community dams and pans to increase their water holding capacity. ▪ Excavation of additional community dams and pans. ▪ Rehabilitation of non-functional community water projects. ▪ Provision of dam liners for community dams and pans. ▪ Provision of irrigation support tools e.g. drip kits to farmers' groups and institutions. ▪ Regular desilting of irrigation farrows – e.g. in Rumuruti and Maundu-Ni-Meri areas. ▪ Educating farmers on the use of kitchen gardens and small-scale irrigation techniques at household level.
Promote agricultural diversification	▪ Encouraging mixed crop farming with livestock husbandry – rearing of poultry, goats, sheep, dairy cows, fish, pigs, beekeeping. ▪ Introducing and upscaling commercial farming of coffee, macadamia, avocado, apples, wheat, etc. ▪ Supporting contract farming of high-value crops such as macadamia, mangoes, French beans, avocado, etc. ▪ Encouraging greenhouse farming to boost horticulture and floriculture. ▪ Encouraging agro-forestry of various fruit trees within households and institutions.

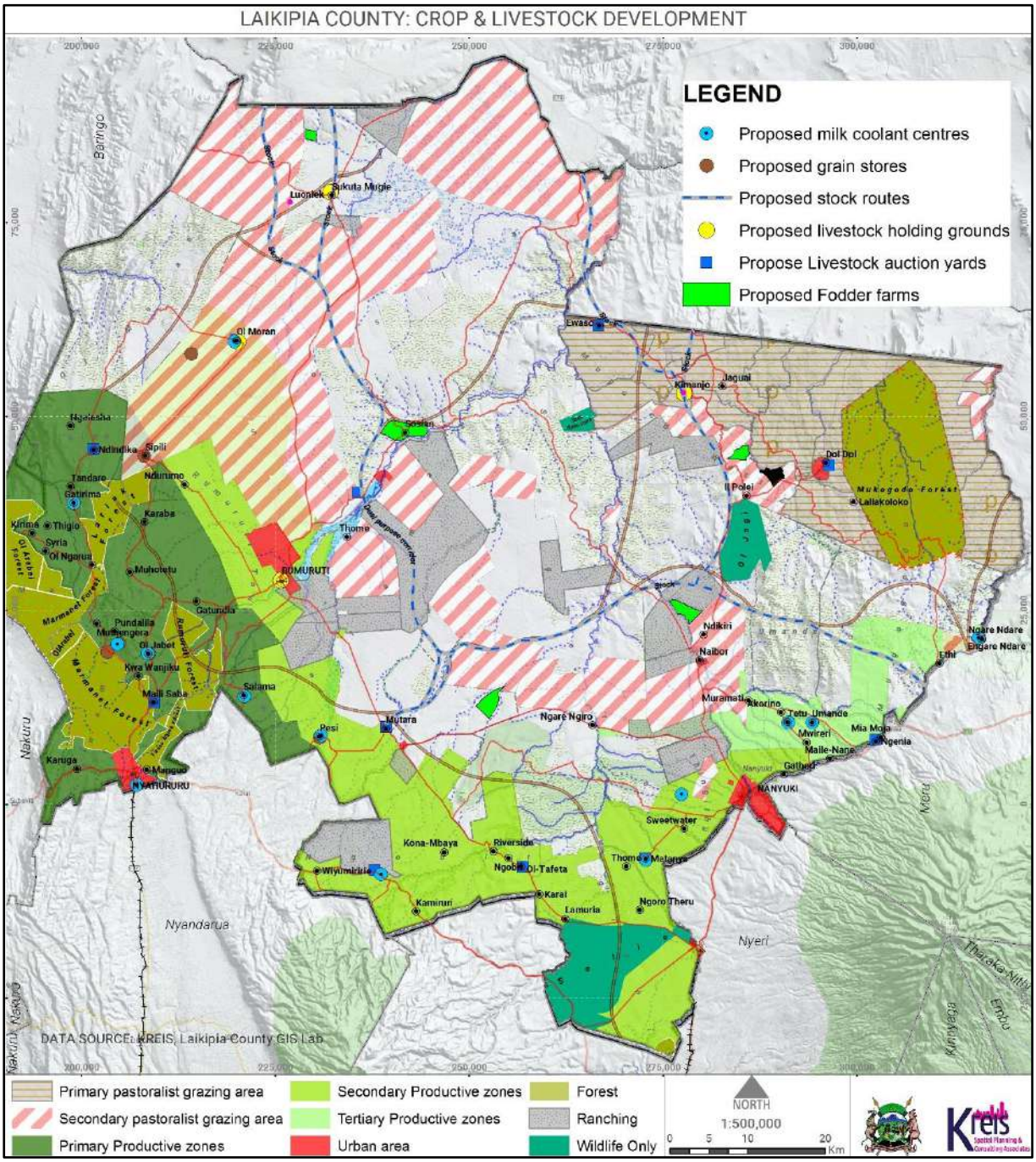
	▪ Establishing infrastructure to support fish farming – ponds, dam liners, cage systems and cold storage facilities. ▪ Stocking community dams and ponds with fish fingerlings. ▪ Establishment of a county fish multiplicaton centres ▪ Encourage poultry farming through introduction of County Hatchery, Poultry Feed Manufacturing Plant, Extension services and development of complete market and value chain ▪ Supporting apicultulture through construction and equipping of modern apiaries – e.g for Nandung'oru, Oltepes and Il Ngwesi Nashipa beekeepers in Mukogodo East. ▪ Providing certified seeds to farmers' groups to encourage commercial fodder/hay farming – in Tigithi, Salama, Marmanet, Githiga, Igwamiti and Ngobit wards.
Provide agricultural support infrastructure & services	▪ Construction of integrated value addition facilities (with cold rooms, milk coolants, chicken incubators, cereal aggregation facilities, modern storage facilites & agro-processing and packaging plants). • Igwamiti – Nyahururu & Karuga; • Marmanet – Ol Jabet; • Githiga – Kinamba; • Ol Moran – Sipili; • Rumuruti – Rumuruti Municipality & Thome; • Salama – Pesi, Mutara & Salama; • Sosian - Kinamba Sosian; • Ngobit – Wiyumiririe, Lamuria & Makutano; • Tigithi – Matanya, Solio village 4 & Castle; • Nanyuki & Thingithu – Nanyuki; • Umande – Kalalu & Umande; • Mukogodo East – Ethi & Chumvi. ▪ Construction of additional grain storage facilities – cereal boards. ▪ Encouraging public-private partnerships and private investments in setting up of value addition and agro-processing industries within urban centers. ▪ Renovation of existing market stalls, sheds and infrastructure for fresh farm products. ▪ Construction of additional market stalls and sheds in under-served areas. ▪ Improving rural access roads to create seamless rural-urban linkages and facilitate farmers' access to markets. ▪ Increasing mobile agricultural extention services and officers to the village level.

	▪ Establishing County Agricultural Training and Research Centre supported by model demonstration farm per ward. ▪ Farmers sensitization on drought-resistant seed varieties. ▪ Educating farmers on modern post-harvesting handling and storage techniques. ▪ Increasing awareness on conservation agriculture – use of organic manure, agroforestry and soil conservation practices to maintain soil fertility. ▪ Provision of regular soil sampling and testing services.
Create a favourable policy framework to support crop farming	▪ Regulating and subsidizing agricultural inputs – certified seeds, fertilizers and pesticides. ▪ Zoning of agricultural potential areas to safeguard them against uneconomical sub-division and fragmentation. ▪ Establishing minimum land sizes within the highly productive agricultural zones. ▪ Encouraging urban agriculture within the urban and peri-urban areas. ▪ Enforcement of development control regulations when changing the use of land within the agricultural productive zones. ▪ Preparing wetlands management plans to protect swamps from unsustainable utilization. ▪ Preparing water resources management and conservation plans for rehabilitation of riparian reserves and natural springs.
Livestock Production	
Programmes	**Actions**
Improve existing livestock infrastructure	▪ Regular desilting and sand scooping of community dams and pans within the community ranches. ▪ Regular maintenance and renovation of livestock markets, holding grounds, vaccination crushes and drinking troughs. ▪ Renovation of non-functional cattle dips – e.g in Arjiju, Sang'aa, Lukusero, Ntumoit, Shalom, Ol Moran, Nganoini, Muruku, Baraka, Mathingira, etc. ▪ Renovation and upgrading of slaughter slabs to modern abattoirs – e.g in Chumvi, Doldol, etc. ▪ Provision of adequate and appropriate infrastructure for the expansion of existing livestock markets in Kimanjo, Rumuruti, Ol Moran and Mouwarak. ▪ Renovation of County hay stores/barns in Mukogodo East and West. ▪ Demarcating and opening up blocked stock routes to reduce conflicts between farmers and pastoralists.

Establish modern livestock support infrastructure & services	▪ Construction of integrated livestock value-addition facilities in (with modern abattoirs, meat processors, leather tanneries, holding grounds, hides and skins bandas, and modern laboratories). ▪ Mukogodo West – Doldol, Il Polei & Kimanjo; ▪ Mukogodo East – Ethi & Chumvi; ▪ Sosian – Kinamba, Sosian, Mouwarak & Louniek; ▪ Segera – Naibor; ▪ Salama – Mutara; ▪ Githiga – Kinamba; ▪ Rumuruti – Rumuruti Municipality; ▪ Ol Moran – Sipili & Ol Moran; ▪ Marmanet – Ol Jabet; ▪ Igwamiti – Nyahururu & Karuga; ▪ Ngobit – Wiyumiririe, Lamuria & Makutano; ▪ Tigithi – Matanya, Solio Village 4 & Castle; ▪ Umande – Kalalu & Umande; ▪ Nanyuki & Thingithu – Nanyuki. ▪ Construction of livestock markets/modern sale yards in underserved areas – e.g. in Maili Saba, Muruai-Sang'a, Sieku, Bokish, Kairigire, Ngenia, Lotasha, Doldol, Sang'aa, Ewaso, Oltafeta, Marina, Withare, Kariguini, Makutano, Ol Moran, Mutara, Kisima-Suyan outspan, Kinamba-Sosian, Maundu-Ni-Meri, Kiambiriria, Matanya, etc. ▪ Construction of cattle dips in underserved areas – e.g. Gitugi, Muhonia, Karungu, Kianjogu, Kisima outspan, Mouwarak, Ngalemare dam, Mirera, Matanya, Kalalu, etc. ▪ Construction of modern slaughter slabs in Ngare Ndare, Musul, Il Polei, Pesi, Muruku, Tetu, Male, Kalalu, etc. ▪ Construction and maintenance of water troughs at community watering points. ▪ Increasing mobile veterinary services to village unit levels especially within the community ranches. ▪ Encouraging livestock breeds improvement through A.I services, disease and pest control, and proper veterinary services. ▪ Constructing modern livestock laboratories and testing facility.
Safeguard the livelihoods of pastoralists' communities in Laikipia North	▪ Establishment of County land banks for pasture/fodder production in designated areas along the dual-purpose migratory corridor – Kimanjo, Il Polei, Naibor, Mutara, Kinamba Sosian & Louniek. ▪ Expansion of the 200 acres hay production site at Tiemamut and development of the 100 acres Naiperere hay site.

	▪ Construction of County hay sheds/stores in the Laikipia North region. ▪ Encouraging grazing agreements between pastoralists and private ranch/conservancies owners during prolonged drought periods. ▪ Adopting alternative conflict resolution mechanisms to resolve resource-based conflicts between pastoralists, farmers, property owners and private ranches/conservancies.
Promote environmental conservation in community ranches	▪ Support reseeding programmes of degraded rangelands in community ranches. ▪ Encourage rangelands conservation partnerships between the County Government, local communites, research institutions and conservation organizations. ▪ Preparation of an Invasive Species Management Plan for the community-owned ranches. ▪ Educating local communities on sustainable livestock practices to reduce land degradation arising from overstocking and overgrazing. ▪ Preparation of community rotational grazing plans to allow for pasture regeneration in the community ranches. ▪ Setting aside portions of community land for pasture and hay production. ▪ Preparation of LPLUDPs for community ranches to promote sustainable and optimal utilization
Put in place comprehensive measures to end cattle rustling and insecurity	▪ Raising awareness of peaceful community relations and co-existence among the various local communities in Laikipia and within the neighbouring counties. ▪ Adopting alternative conflict resolution mechanisms to resolve resource-based conflicts. ▪ Encouraging coordinated resource sharing of pasture and water between pastoralists, farmers, and private ranch owners. ▪ Advocating for controlled grazing agreements between pastoralists and private conservancies during prolonged drought periods. ▪ Mapping out insecurity corridors, opening up security roads and establishing mobile security surveillance units in strategic locations within the insecurity-prone areas. ▪ Construction of ranger outposts in Seek, Nadungoro and Narasha-Lekuruki in Mukogodo West.

Map 13-1: Crop and Livestock Development Strategy



13.3 Transport, Infrastructure and Social Services Strategy

As the population of the County continues to increase, the need for additional and high-capacity infrastructure systems and social amenities is evident. This strategy seeks to enhance utilities and service provision within the great economic corridor, and the County at large.

Programme	Actions
Road Transport	
Improve road connectivity and accessibility	▪ Survey and demarcation of road reserves. ▪ Road re-classification and upgrading. ▪ Erection and maintenance of road signage along all roads. ▪ Tarmacking, cabro-paving, construction of drainage systems and NMT provision on urban roads and streets. ▪ Upgrading, gravelling, and culverting of rural access roads – e.g the Maundu Ni Meri-Kinamba Sosian-Mouwarak road in Sosian Ward; the Timau-Ethi-Ngare Ndare road in Mukogodo East; the Il Polei-Kimanjo-Kirimon road & the Il Polei-Musul-Oldonyiro road in Mukogodo West; etc. ▪ Opening up new access roads to enhance rural-urban linkages. ▪ Constructing additional access roads to open up remote areas in Laikipia North – e.g from Timau-Chumvi-Arjiju in Mukogodo East. ▪ Establishment of climate-resilient road infrastructure – stormwater drainage systems, culverts & bridges. ▪ Regular renovation of drainage systems, bridges and culverts. ▪ Construction and rehabilitation of bus parks, matatu termini and parking zones in urban centers. ▪ Undertaking greening projects on all urban roads. ▪ Construction of additional bodaboda sheds throughout the County.
Rail Transport	
Programme	**Actions**
Revamp and extend the existing railway lines	▪ Extend the railway lines: • From Nanyuki-Isiolo resort city; • From Nanyuki-Il Polei, Doldol and Kimanjo; • From Nyahururu-Rumuruti; • From Rumuruti-Maralal town; • From Rumuruti to Nanyuki.

Programme	Actions
	▪ Establish railway stations along the designated centers in Rumuruti, Maili Saba, Ol Jabet, Gatundia, Mouwarak, Mutara, Ngare Ngiro, Naibor, Il Polei, Doldol, Kimanjo, etc.
Air Transport	
Programme	**Actions**
Enhance regional air transport linkage	▪ Construction of the proposed Rumuruti airport in Rumuruti Municipality. ▪ Improve road and rail linkages to Isiolo resort city to tap infrastructure and socio-economic benefits of the LAPSSET corridor.
Water Access and Supply	
Programme	**Actions**
Increase water access and distribution	▪ Undertake feasibility studies for the construction of mega dams – e.g at the confluence of Likii and Nanyuki rivers; at Mt. Kenya Forest intake in Umande; in the Pesi-Mutara area in Salama Ward; in Shamanei Sublocation in Igwamiti; at the Crocodile Jaws Dam and Doldol in Mukogodo West; and Teleswan River in Mukogodo East, etc. ▪ Excavation of additional community dams – e.g downstream of Kaiti Dam in Igwamiti, at Loitanet and Kwa Ngeche spring, Kiamburi, Chumvi lagga, and Ndonyoruma, Koija and Pilili rivers, Lariak Lenkai, Tiamamut, Musul, Mikuri-iri, Naitoroshi, Waririu- Mutarakwa, Iyam, Mukuri, Marura, Kijito, Daraja, Bondeni, Salama, Kimondo, Tinga, Mayu Forest, Nyaga, Lchoro, etc. ▪ Construction of sub-surface dams at Sang'a, Lukusero A&B, Oltamam, Nandung'oru, Lolmolog, Ntantariani, Gatonga, Lariak, Lekodel, Lorkumei, and Ngiila laggas in Mukogodo East, etc. ▪ Expansion and desilting of community dams and pans – e.g. the following identified dams: Gataka, Nanok, Gikuni, Kaharati, Ndothua, Meja, Kiahiti, Mahianyu, Mukurueini, Kaiti, Maji Mbogo, Jigali Simotwo, Kaichakun spring, Rwathia, Lobere, Kamukunji, Gwa-Kahahi, Gataracha, Ndirithia, Warero, Ndindika, Kongoini, Njorua, Gachogu, Ndururu, Muigai green dam, Gwakure mega dam, Longomot, Mubia, Njoguini, Soilo, Kigata, Chunguti, Kangumo, Mastoi, Gatuimidire, Gatirima, Simit, Doldol, Lorien, Nkusero A&B, Ositat, Matangi, Mlango, Upper Sepeyo, Kingara, Lenkapiron, Ilngoswani, Nkando, Marura, Ex-Erok, Githima, Kona Mbaya, Nginyii, Kangawa,

Programme	Actions
	Imenya, Ruai, Ngurunga, Nguyo, Kariguini, Nyambugichi, Gichogoo, Ihigaini, Sinai, Suguroi, Gikaaga, Gikandi, Njaria central dam, Mugiko, Njumu, Nagum, Ratia, Rabuoni, Githima, Gathanji, Mikinge, Kongoni, Wangwachi, Ol Moran, Kauka, Ngare Narok, Muruai, Nklois, Loruko, Longatunyo, Muruai, Narok 1 and 2, Maundu-Ni-Meri, Namojong' 1, Ratia, Kimundu Muthini, Ndungu Village New Dam, Olmutunyi, Ngorio Ntito, Demu Njogu, Kahuho, Lalmatasia, Tetu, etc. ▪ Drilling of boreholes, construction of high-capacity storage tanks and equipping them with solar-powered pumps. ▪ Rehabilitation of decommissioned boreholes and non-functional water projects. ▪ Increasing the reticulation networks of NAWASCO and NYAHUWASCO to serve neighbouring proximity areas. ▪ Encouraging rainwater harvesting and storage at household and institutional levels. ▪ Increased exploration and tapping of groundwater sources. ▪ Construction of gabions and check-dams along river valleys (Ewaso Ng'iro and Ewaso Narok rivers) ▪ Strengthening and supporting the various Water Resources Users Associations. ▪ Construction, renovation and improvement of stormwater drainage systems in urban centers. ▪ Construction of water tanks and water points in bus parks and markets within urban centers. ▪ Upscaling community water projects and extending their reticulation networks – e.g installation of a water pipeline from Ngare Ndare Forest spring to Ngare Ndare centre storage tank; rehabilitating the water pipeline in Doldol, etc. ▪ Rehabilitation of existing rock water catchment projects in Laikipia North. ▪ Construction of Simangwa Hill rock catchment and harnessing the water to the main storage tank at Ngare Ndare center. ▪ Construction of rock catchments at Osupukiai, Losukunwa, Lempiro and Makurian in Mukogodo East and Parseelu in Mukogodo West.

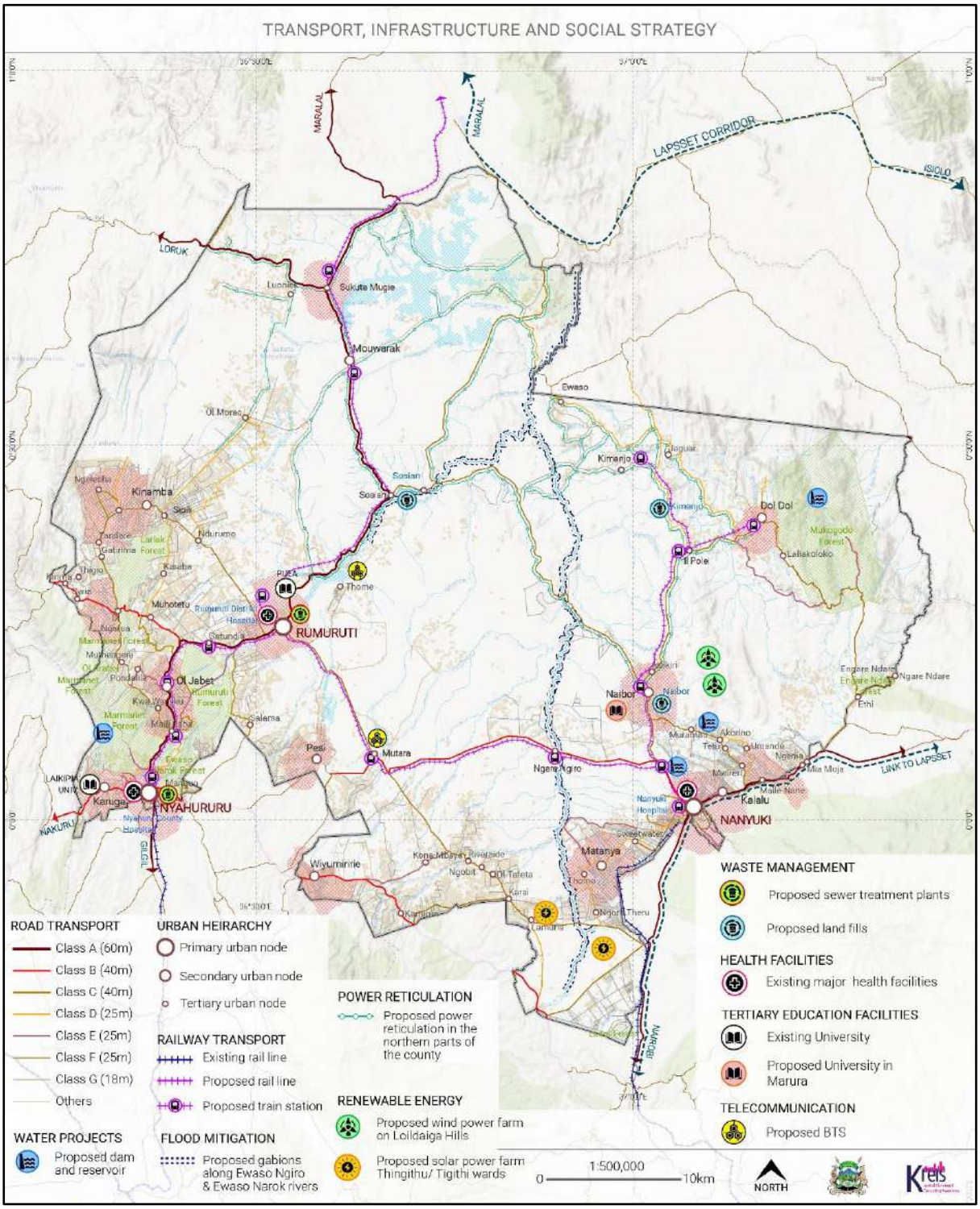
Programme	Actions
	▪ Provide measures toward protection of water resources
Waste Management	
Programme	**Actions**
Improve solid and liquid waste management in urban centers	▪ Establishment of a sewer treatment plant in Doldol and expansion of the existing sewer plants in Nanyuki, Nyahuhuru and Rumuruti towns. ▪ Establishment of landfills in the designated sites in Kimanjo, Naibor and Kinamba Sosian centers. ▪ Establishment of sewer systems and designated solid waste management sites in urban centers and in informal settlements through slum improvement projects. ▪ Provision of temporary waste-transfer stations in urban centers and within market facilities. ▪ Renovation and construction of public toilets/ ablution blocks within markets and in urban centers. ▪ Regular waste collection services in markets and urban centers by the County Government or private service providers. ▪ Encourage segregation of wastes at household and institutional levels for easy handling and disposal. ▪ Preparation of a comprehensive Integrated County Waste Management Strategy. ▪ Carry out intensive public awareness programs of to educate and inculcate the culture of sustainable waste management
Energy Access	
Programme	**Actions**
Increase access to affordable, reliable and sustainable energy	▪ Undertaking feasibility studies for the establishment of large-scale solar power farms in the designated sites in Lamuria and Solio in Tigithi Ward. ▪ Undertaking feasibility studies for the establishment of a large-scale wind power farm in the Lolldaiga Hills. ▪ Encouraging the installation of solar panels in homesteads and institutions. ▪ Equipping more community boreholes and water projects with solar-powered pumps. ▪ Installation of solar-powered floodlights and streetlights in urban centers, along roads and at road junctions.

Programme	Actions
	▪ Increasing electricity connectivity to households and institutions, especially in underserved areas e.g the Laikipia North region. ▪ Support the development of biogas production plants within institutions and fresh-produce markets. ▪ Preparation of a County Energy Master Plan.
Health Services	
Programmes	**Actions**
Provide adequate health infrastructure	▪ Construction of dispensaries in under-served areas – e.g Njoguini area in Thingithu; Mukuri, Kabiru & Nkando areas in Nanyuki; Mwireri & Mugumo areas in Umande; Thome, Caste, Solio villages, Mathingira, Mitero, Chuma, Riacho, Gituamba, & Mwakinya areas in Tigithi; Gatirima, Kiambogo, Siron, Chunguti areas in Marmanet; Maili Saba area in Igwamiti; Kieni, Kiamariga, Nganoine, Kianjogu areas in Salama, etc. ▪ Upgrading the existing dispensaries to health centers – e.g Kiruri, Salama, Nguu, Pesi, Muruku dispensaries in Salama; Ol Moran dispensary; Laria & Syria dispensaries in Marmanet; Tetu, Kihato, Matanya, Bahati dispensaries in Tigithi; Baraka dispensary in Thingithu; Nturukuma dispensary in Nanyuki, etc. ▪ Upgrading existing health centers to hospitals. ▪ Ugrading Lamuria hospital to a level 4 facility to serve Laikipia Central Sub- County. ▪ Construction of the County referral hospital in Rumuruti Municipality. ▪ Proper water and sanitation provision in health facilities. ▪ Regular renovation of buildings, structures and infrastructure utilities in health facilities. ▪ Establishment of specialized health units and facilities for the various categories of PLWDs.
Improve access and quality of health services	▪ Increasing mobile health clinics, services, ambulances and personell in the underserved remote areas. ▪ Provision of modern health facilities, specialized units & equipment, and adequate medical supplies. ▪ Employing additional staff and specialized personell in the various levels of health facilities. ▪ Regular gravelling and maintenance of rural access roads for ease of access to health facilities. ▪ Encouraging enrolment of the NHIF medical insurance cover.

Programme	Actions
	▪ Continuous training and capacity building of County medical personell and staff. ▪ Encouraging private investments in healthcare provision.
Educational Services	
Programme	**Actions**
Improve access and quality of education	▪ Construction of additional stand-alone ECDEs in underserved areas. ▪ Construction of primary, secondary and TVETs institutions in underserved areas. ▪ Construction of the proposed universities in Naibor and Rumuruti. ▪ Supporting school feeding programmes in schools. ▪ Renovation of buildings, structures and infrastructure utilities in existing educational facilities e.g classrooms and sanitation blocks. ▪ Ensuring water supply and electricity connectivity in all educational centers. ▪ Adequate staffing of educational centers. ▪ Provision of adequate learning and sporting equipment in schools. ▪ Continuous training and capacity building of teachers. ▪ Provision of PLWDs-friendly facilities and utilities in all educational centers. ▪ Establishment of adult literacy centers in Laikipia North.
Public Purpose Amenities	
Programme	**Actions**
Improve access to social amenities and utilities	▪ Renovation of community playgrounds and public stadia, and provision of indoor sporting facilities. ▪ Establishment of gender-based violence recovery/rescue centers in all sub-county headquarters i.e Rumuruti, Nanyuki, Nyahururu, Doldol and Lamuria. ▪ Construction of social halls and ICT centers urban centers. ▪ Prioritizing PLWDs-friendly facilities in all social amenities ▪ Provision of open spaces and green parks in all urban centres and markets. ▪ Renovation of existing open spaces and green parks. ▪ Establishment of a recreation park at the riparian reserve near Likii Hill Bridge.

Programme	Actions
	▪ Construction of the proposed fire station in Rumuruti Municipality and a sub-station in Kinamba. ▪ Ensuring reliable & mobile fire brigade response services. ▪ Installation of the National fibre optic cable infrastructure. ▪ Establishment of telecommunication BTS in the underserved areas in Laikipia North and Central regions. ▪ Implementation of the Nyumba Kumi Initiative in all villages.

Map 13-2: Transport, Infrastructure and Social Services Strategy



13.4 Trade, Tourism, Industry and Mining Strategy

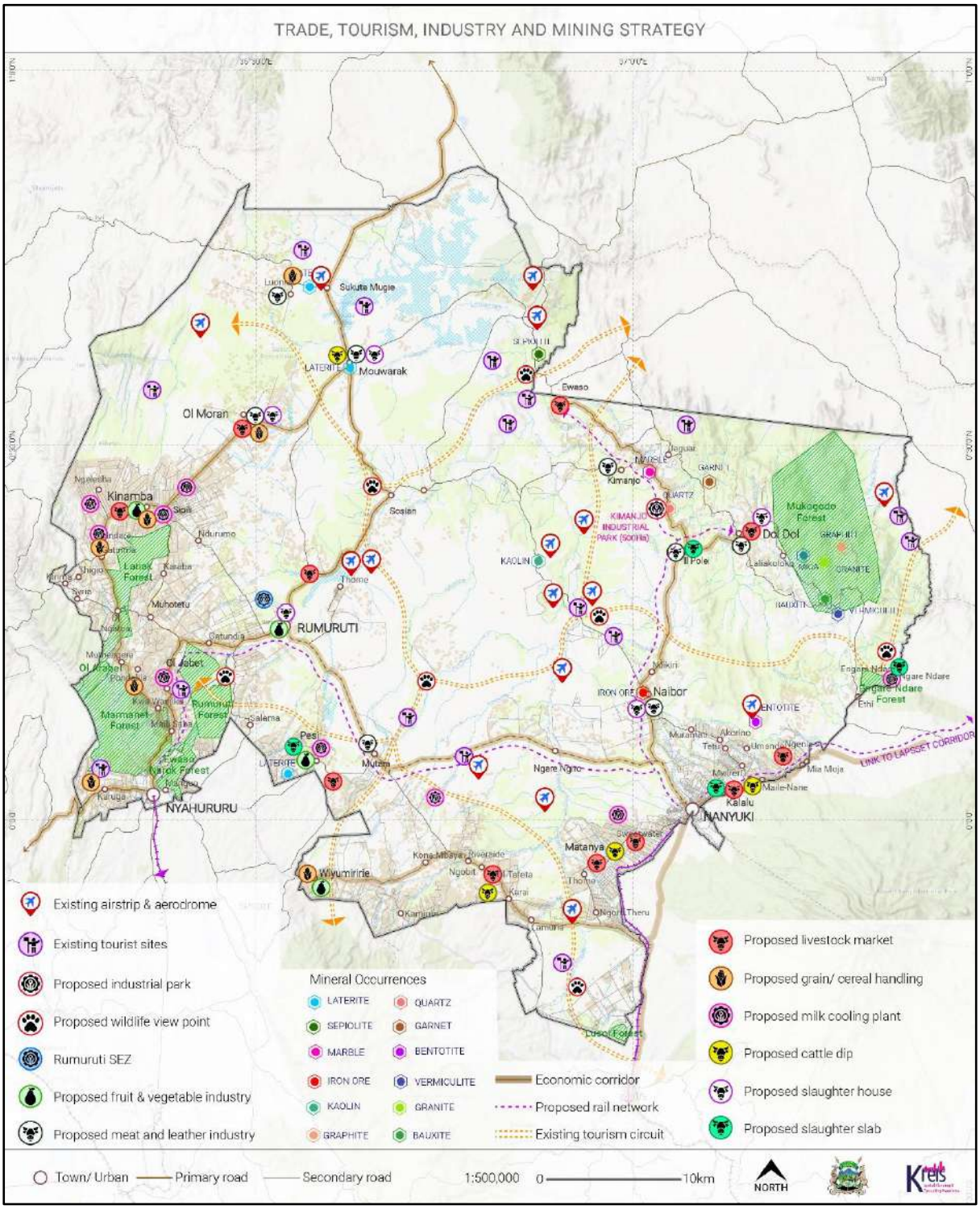
Economic activities involving investments in trade, tourism, manufacturing, innovation and quarrying activities offer employment and income generating opportunities. This strategy is intended to promote, provide for and induce investments for socio-economic development and prosperity.

Programmes	Actions
	Trade & Commerce
Boost trading activities	▪ Construction of fresh-produce markets, kiosks, stalls and jua kali sheds in all urban centers. ▪ Renovation of existing markets and market infrastructure. ▪ Operationalization of existing green produce and cereal markets. ▪ Provision of loading and off-loading zones in markets. ▪ Extensive trade promotion and marketing in e-commerce platforms. ▪ Establishment of business incubation centers to intensify training on entrepreneurial skills and management. ▪ Sourcing and facilitating market linkages for livestock, livestock products and fresh farm produce. ▪ Construction of hides and skins markets in Laikipia North. ▪ Increased access to formal credit facilities and services. ▪ Strengthening business cooperatives and SACCOs.
	Tourism
Market Laikipia County as an international safari-based tourist destination	▪ Upgrading and regular maintenance of roads & revitalization of commuter railway services to Nanyuki and Nyahururu. ▪ Publicizing tourist attraction sites, lodges, resorts and 'Destination Laikipia' in mainstream media and online platforms. ▪ Renovation of cultural heritage sites and community lodges to promote cultural tourism. ▪ Construction of cottages for Osuguroi Cultural Manyatta, Naramat Environmental CBO, Rapunye Cultural Manyatta, Naanyora CBO and Merinyo Women Group, in Mukogodo East; and Ntumutu Cultural Manyatta in Segera. ▪ Establish a cultural center in Doldol with a shanga market, eco-lodge & cultural manyatta. ▪ Establish a Beading centre and market at Naibor. ▪ Rehabilitate the eco-tourism center in Manguo community in Igwamiti. ▪ Conservation measures on Mukogodo Dry Forest to promote community-led eco-tourism. ▪ Holding annual local and national tourism fairs, exhibitions and promotional events in the County.

Programmes	Actions
	▪ Recognition of wildlife conservation as a significant land use in the County. ▪ Development of a tourism site at 'Elephants Salt-Licking site' next to Gikuni dam. ▪ Rehabilitation of the Mau Caves in Lariak Forest. ▪ Construction of a cultural manyatta at Nosirai in Mukogodo West. ▪ Renovation and equipping of the Yaaku Cultural Museum.
	Industrial Activities
Enhance industrial manufacturing and processing	▪ Mapping out all industrial parks in the County. ▪ Setting up cottage industries in all secondary urban centres. ▪ Establishment of food processing and value-addition industries in all urban centers: - Construction of a leather tannery at the Slaughterhouse in Nanyuki Town and in Rumuruti, Ol Moran, Doldol, Naibor and Mouwarak. - Construction/rehabilitation of milk coolers at Kundarila center in Igwamiti; Kisima in Githiga; Gatirima and Ol Jabet in Marmanet; Ngare Ndare in Mukogodo East; Withare in Ngobit; Ndaragwiti in Ol Moran; Karera, Pesi and Raya in Salama; Njoguini in Thingithu; Matanya, Tetu and Gituamba in Tigithi; and at Umande. - Construction of a warehouse/grain store at Gatero AP post land, Kundarila, Shamarnei, Ol Jabet, Sipili, Pesi, Gatwikira, Nganoini, and Githima. - Construction of a cereal aggregation facility at Tandare and Louniek centres. - Construction of maize milling factories in Kundarila, Ol Moran, and Sipili. - Reviving Ng'arua Millers Cooperative in Githiga Ward. - Establishment of Ng'arua coffee pulping facility. - Establishment of an avocado processing industry in Kinamba Town. - Establishment of a honey processing industry in Ol Jabet and Doldol. - Establishment of a honey refinery at Kiwanja Ndege and revamping Dupoto Bee cooperative society in Mukogodo East.

Programmes	Actions
	- Establishment of bandas for skins & hides collection and preservation in Laikipia North. - Establishment of a canning industry in Rumuruti Township. - Establishment of a fruits and vegetables cooperative in Pesi. ▪ Creating seamless road networks to promote rural-urban linkages and enhance access to agro-processing industries. ▪ Promoting PPPs in sourcing for the capital required for industrial development. ▪ Starting up business incubation and innovation centers in Nanyuki, Nyahururu and Rumuruti.
Mining	
Sustainable exploitation of mineral ores and deposits in the County	▪ Establishment of an industrial park in the designated site in Kimanjo to encourage investments in mineral exploration in Laikipia North. ▪ Establishing support infrastructure i.e. road and rail networks to create a favourable environment that attracts private mining investments. ▪ Incentivized investments in value addition of minerals. ▪ Enforcing zoning regulations for quarrying and mining activities to ensure environmental conservation. ▪ Encouraging CSR projects and rehabilitation of decommissioned mines/quarries. ▪ Regulating sand harvesting to designated areas along dry river banks.

Map 13-3: Trade, Industry and Mining Strategy



13.5 Environment and Biodiversity Conservation Strategy

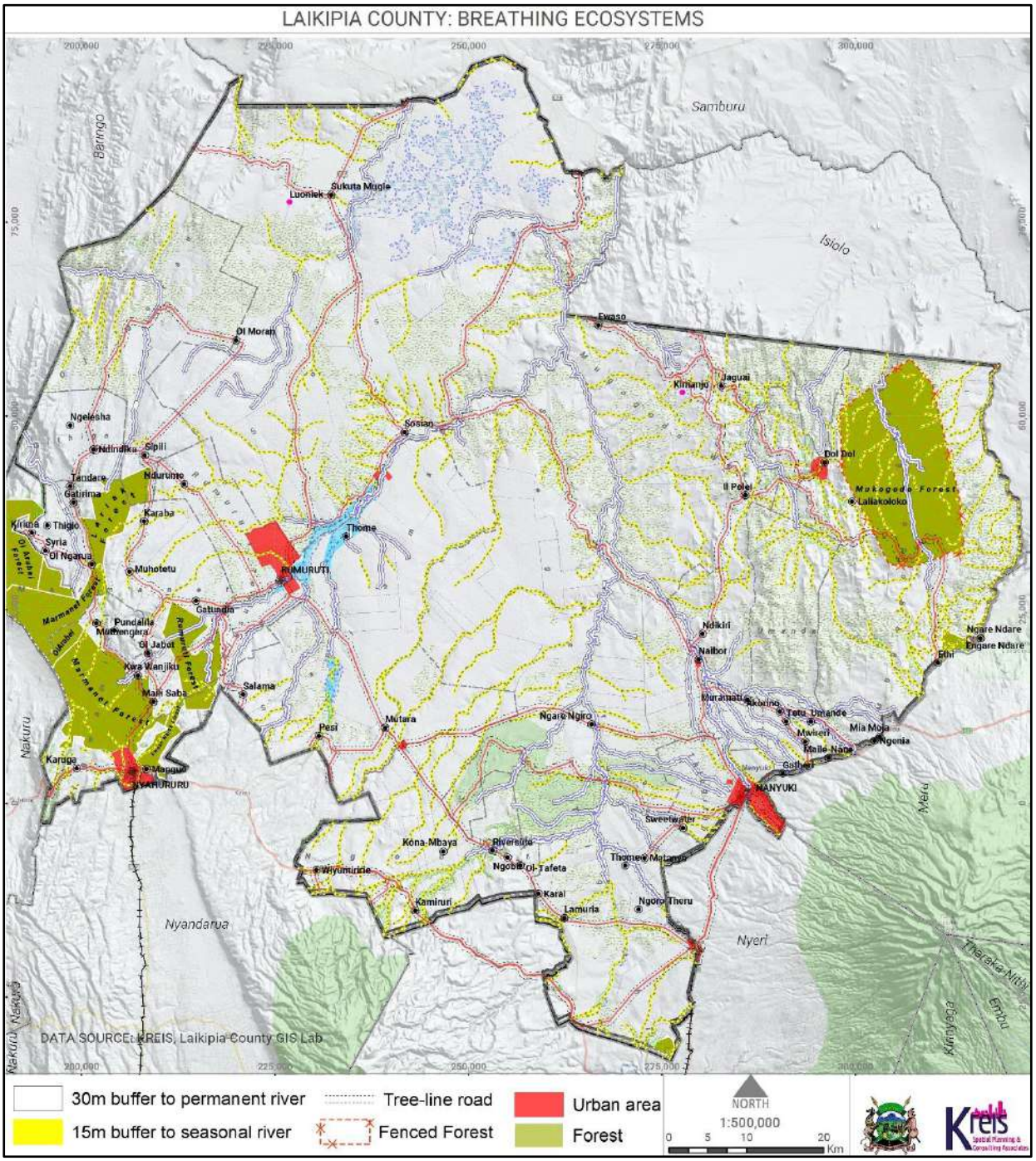
This strategy integrates conservation and sustainable utilization of the breathing ecosystems and wildlife habitats for the sustenance of their ecological, cultural and socio-economic values.

Programme	Actions
Forests	
Protect and conserve forested areas	▪ Carrying out remote sensing to determine the current status of the gazetted forests. ▪ Preparation of forest management plans for all gazetted forests. ▪ Fencing of Marmanet Forest to mitigate encroachment. ▪ Providing a game trench and fence to contain elephants in Marmanet and Lariak forests. ▪ Construction of electric fences around forests to mitigate human wildlife conflicts. ▪ Regular maintenance of fences around all gazetted forests. ▪ Encouraging conservation projects in forests such as tree planting, beekeeping and ecotourism. ▪ Undertaking annual Environmental Impact Assessments on eco-tourism activities within Mukogodo Dry Forest. ▪ Encouraging afforestation and agro-forestry in homesteads and institutions to increase tree cover. ▪ Vibrant community involvement in forest conservation and management.
Riparian Reserves	
Promote sustainable utilization and conservation of riparian ecosystems	▪ Enforcement of 30m buffer zones from the highest watermark on all riparian reserves. ▪ Identification and preparation of an inventory on degraded river banks. ▪ Rehabilitation of degraded river banks by constructing gabions, check dams, regulating sand harvesting and planting indigenous trees. ▪ Enforcing regulations on upstream water abstraction for irrigation purposes. ▪ Conducting annual Environmental Impact Assessments/Audits on irrigation farming along river banks. ▪ Excavation of dams and pans to store excess surface run-off along flood plains. ▪ Fencing and protection of springs with 100m buffer zones. ▪ Regular maintenance of protected springs i.e. Simangwa, Muharati, Mia Moja, Laitole, Oletepesi, Ololotunga and Ololera springs in Mukogodo East; Gathima and Gia-Tutu in Ngobit; Ainapmoi, Soumosop Delat, Karua and Abaaba in Rumuruti; SK at Ruai Village in Salama; Karandi Spring in Marmanet, among many others. ▪ Vibrant community participation in water resource management.

Programme	Actions
	▪ Offering support to WRUAs for water catchment protection & restoration programmes through the establishment of tree nurseries. ▪ Planting of Bamboo tree seedlings within steep and degraded riparian areas.
Wetlands	
Regulate encroachment on wetlands by settlements and farming activities	▪ Mapping and delineation of 30m buffer zones around all wetlands in the County. ▪ Preparation of a County Wetlands Management Plan. ▪ Conducting annual Environmental Impact Assessments/Audits on farming activities around and within wetlands. ▪ Declaration of the existing swamps as protected wetland areas (CITES).
Ensure sustainable use of wetlands for continued ecosystem services	▪ Construction of dams or pans downstream to store excess surface runoff/overflow. ▪ Encouraging the use of improved irrigation systems around wetlands (sprinklers and drips). ▪ Uprooting Eucalyptus trees growing in Moyok Swamp and planting tree species that consume less water. ▪ Uprooting Blue Gum trees in Marura Swamp. ▪ Holding annual community sensitization forums on the importance of sustainable utilization of wetlands.
Rangelands	
Promote sustainable management of rangelands	▪ Reseeding degraded rangelands (especially within community ranches). ▪ Increasing awareness of soil conservation practices among pastoralists in Laikipia North. ▪ Encouraging rotational grazing among pastoralists to reduce overgrazing. ▪ Preparation of a County Invasive Species Management Plan. ▪ Collaboration among various stakeholders working on projects related to the eradication of invasive plant species (*Opuntia stricta and Prosopis juliflora*). ▪ Implementation of land restoration programmes at Ngenia, Sang'a and Arjiju in Mukogodo East. ▪ Preparation of a Rangelands Management Policy. ▪ Awareness raising and training on rangelands health, restoration, and rehabilitation.
Wildlife	
Preserve the diversity of species (plants and wildlife)	▪ Conducting regular monitoring and reporting on the number, status and distribution of wildlife.

Programme	Actions
	▪ Protecting wildlife breeding and dispersal areas against intrusive infrastructure. ▪ Preparation of species-specific management plans. ▪ Supporting conservation partnerships between community and private conservancies.
Restore the connectivity of wildlife habitats and dispersal areas	▪ Identification and delineation of wildlife migratory corridors and dispersal areas. ▪ Reclamation of encroached wildlife migratory corridors. ▪ Prohibiting infrastructure and fencing projects across interconnected wildlife habitats. ▪ Construction of separate watering points for wildlife and community use to reduce water resource conflicts. ▪ Preparing a Wildlife Management Plan for interconnected community and private ranches. ▪ Formation of an integrated multi-sectoral ecosystem conservation and planning framework. ▪ Lobbying for elephant fencing for Nandung'oru, Lukusero A&B and Emurua Loiragai settlements. ▪ Installation of electric fences to control human-wildlife conflicts at ADC Mutara, Ol Pejeta, Kifuko, and Solio ranches.

Map 13-4: Environment and Biodiversity Conservation Strategy



13.6 Urban Development Strategy

This strategy aims to regulate urban growth and development by ensuring sustainable use and management of land. In line with the provisions of the Urban Areas and Cities (Amendment) Act of 2019, the Plan has proposed a hierarchy of urban centers in the County based on their current and projected urban populations.

Table 13-1: Proposed Urban Hierarchy

Municipality (At least 50,000)	Town (At least 10,000)	Market Center (At least 2,000)
Rumuruti Nanyuki Nyahururu	Kinamba Wiyumiririe Doldol Karuga Sipili Naibor	Pesi Matanya Ol Jabet Kalalu Umande Umande Ol Moran Mouwarak Kinamba Sosian Maili Saba Il Polei

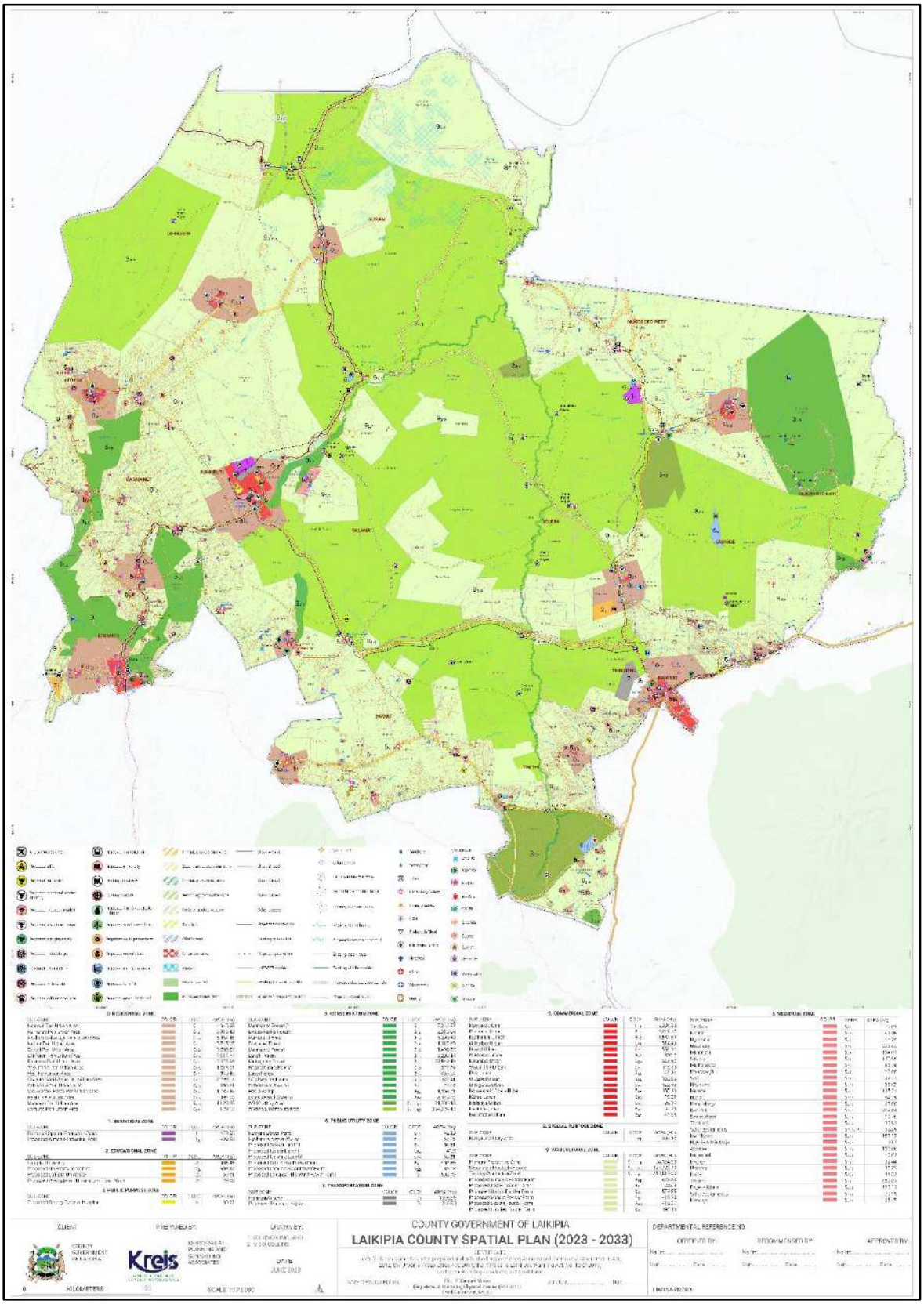
The Plan prioritizes the delineation of urban boundaries and reclassification of these centers, as well as the preparation of local physical and land use development plans.

Programme	Actions
Land Use	
Classify and operationalize urban areas in line with urban areas and cities act	▪ Confer Municipality status to Nanyuki and Nyahururu. ▪ Confer Town status to Kinamba, Wiyumiririe, Doldol, Karuga, Sipili and Naibor. ▪ Confer Market Centre Status to Pesi, Matanya, Ol Jabet, Kalalu, Umande, Umande, Ol Moran, Mouwarak, Kinamba Sosian, Maili Saba, and Il Polei. ▪ Operationalize proposed municipalities, towns and markets centre through establishment of management committee/boards, recruitment of personal and budgetary allocations. ▪ Provide requisite infrastructure, facilities and services as provided under the Urban Areas and Cities Act, 2011 (Amendment of 2019).

Programme	Actions
	▪ Localization of the National Urban Development Policy of 2016.
Contain urban development	▪ Demarcate urban extents countywide to protect prime agricultural land and reduce urban sprawl. ▪ Promote compact development, densification & infill development in built-up urban zones. ▪ Formulation of relevant development control regulations to discourage settlement in agricultural lands.
Ensure sustainable land use planning and management	▪ Implementation of Rumuruti Local Physical and Land Use Development Plan. ▪ Preparation of local physical and land use development plans for urban centers in the County. ▪ Development of a digital County Land Information System. ▪ Establishing minimum land sizes to regulate uneconomical land subdivisions. ▪ Speeding up the process of issuance of title deeds. ▪ Hastening issuance of allotment letters and leases. ▪ Vigilant enforcement of County zoning regulations. ▪ Fast-tracking land use planning processes to ensure timely approval of urban land use plans. ▪ Surveying, demarcation and reclamation of all public lands in the County.
Assigning urban functions	▪ Develop Nanyuki as a commercial, tourism and hospitality hub. ▪ Develop Rumuruti as an administrative, industrial and public purpose centre. ▪ Develop Nyahururu and Wiyumirire as commercial and agro-industrial centres. ▪ Establish Doldol as an industrial centre dealing in livestock and mineral value-addition.

Programme	Actions
Promote urban aesthetics	▪ Formulate Nanyuki, Rumuruti and Nyahururu Municipality urban design, greening and landscaping policy. ▪ Formulate a County painting policy to ensure frequent painting and maintenance of structures especially in urban areas. ▪ Formulate a County street addressing and advertisement policy. ▪ Provide a sustainable solid and liquid waste management systems. ▪ Promote walkability and cyclability in urban areas. ▪ Establish a hierarchy of green public spaces including tree-lined corridors, parks and others. ▪ Erect monuments and iconic structures to celebrate culture, history and heritage of the people.
Housing	
Programme	**Actions**
Improve existing housing conditions and provide affordable housing units	▪ Carrying out informal settlements upgrading and improvement projects. ▪ Redevelopment and densification of public housing estates in Nanyuki, Nyahururu and Rumuruti ▪ Acquisition of land for the establishment of affordable housing units in Nanyuki, Rumuruti and Nyahururu ▪ Sensitizing the public on modern housing technologies. ▪ Fast-tracking customization on policies and standards for building constructions. ▪ Upgrading of trunk infrastructure, facilities and services in existing residential zones to make them robust, mixed and complete ▪ Preparation of LPLUDP to designate and provide development guidelines for residential areas

Map 13-5: Laikipia County Spatial Plan (2023-2033)



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PART V:

COUNTY SPATIAL DEVELOPMENT FRAMEWORK

14 SPATIAL DEVELOPMENT FRAMEWORK

14.1 Overview

This chapter outlines the spatial development framework that is set to guide the overall distribution of existing and proposed land uses within the County's landscape. It presents a detailed land use plan that spells out the zoning guidelines that have been proposed to regulate the use of land or the change in the use of land. Arising from the development framework are thematic action areas that necessitate strategic interventions to achive sustainable land use management in the County.

14.2 Land Use/ Zoning Plan

This is a development control tool that ensures that land use changes and developments conform to a predetermined set of planning regulations and standards. The plan depicts the framework for optimal utilization of land within various zones and expounds on the permitted use and development regulations for each land use zone.

Table 14-1: Laikipia County Land Use/ Zoning Guideline

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
Residential/Human Settlements (0)	$0_{1.1}$ Nanyuki Peri-Urban area $0_{1.2}$ Rumuruti Peri-urban area $0_{1.3}$ Nyahururu-Karuga Peri-Urban area	Residential buildings within the radius of influence of the primary urban centers.	▪ Residential (High-rise apartments & mixed-use buildings) ▪ Commercial (Retail outlets/stores, offices, guest houses, restaurants, pubs etc) ▪ Educational (Schools, ICT centers, libraries) ▪ Public purpose	▪ High-density residential areas with multi-dwelling apartments on a minimum land size of 0.045Ha and a minimum height of four floors (Ground+3). ▪ Sufficient parking – preferably on the entire ground floor. ▪ Commercial stores and office suites shall be allowed strictly within the first and second floors.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
			(Health facilities, social halls, administration offices etc) ▪ Recreational (Open spaces/parks)	▪ Commercial recreational places like restaurants, pubs, hotels, and guest houses shall be allowed in buildings bordering major streets. ▪ Adherence to Kenya's Building Code on setbacks, plot ratio, plot coverage, facades, etc. ▪ Adherence to sustainable building materials to curb the growth of informal urban settlements. ▪ All residential apartments shall have septic tanks or connections to municipal sewers where possible. ▪ Regular solid waste collection is recommended via private service providers/ CBOs/ the County Government.
	$0_{2.1}$ Naibor Peri-Urban area	Residential buildings within the radius of influence of the secondary urban centers.	▪ Residential (Preferably apartments, maisonettes, bungalows & townhouses) ▪ Agricultural (Farming activities and livestock rearing) ▪ Commercial (Convenience stores, guest houses, resorts, restaurants etc)	▪ Medium-density residential areas with single-dwelling units and multi-dwelling apartments. ▪ Adherence to Kenya's Building Code on setbacks, plot ratio, plot coverage, facades, etc. ▪ The design of residential courts/neighborhoods shall incorporate recreational/open spaces/playgrounds, ECDE centers, commercial zones, and waste management sites.
	$0_{2.2}$ Doldol Peri-Urban area			
	$0_{2.3}$ Ol Moran Peri-Urban area			
	$0_{2.4}$ Kinamba Peri-Urban area			

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
	$0_{2.5}$ Wiyumiririe Peri-Urban area			▪ All residential plots must be accessible via at least a 9m wide road. ▪ Adherence to buffer zones around protected areas and ecologically fragile lands such as wetlands.
	$0_{3.1}$ Pesi Peri-Urban area	Residential buildings within the radius of influence of the tertiary urban centers.	▪ Residential (Preferably single-dwelling units, bungalows & maisonettes) ▪ Agricultural (Farming activities and livestock rearing) ▪ Commercial (Convenience stores, guest houses, resorts, restaurants etc)	▪ Low density residential areas. ▪ Clustering around/ proximity to rural or market centers is recommended for access to commercial services, social amenities and public utilities. ▪ All residential plots must be accessible via at least a 9m wide road. ▪ Adherence to buffer zones around protected areas and ecologically fragile lands such as wetlands.
	$0_{3.2}$ Ol Jabet-Maili Saba Peri-Urban area			
	$0_{3.3}$ Ol Ngarua Peri-Urban area			
	$0_{3.4}$ Mouwarak/Posta Peri-Urban area			
	$0_{3.5}$ Kalalu Peri-Urban area			
	$0_{3.6}$ Matanya Peri-Urban area			
	$0_{3.7}$ Lamuria Peri-Urban area			
Industrial (1)	1_1 Rumuruti Special Economic Zone	Special economic zone within Rumuruti Township	▪ Industrial (Export processing zone & Kenya Pipeline Company depot)	▪ Established on approximately 496.76 Hectares of land. ▪ Served by a proposed railway station, bus station and airport.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
	1_2 Proposed Kimanjo Industrial Park	Presence of exploitable mineral deposits and transport linkages.	▪ Industrial (Heavy mining & quarrying industries) ▪ Public Utilities (Landfill and sub-station)	▪ The industrial park shall be established on a minimum land size of 500 acres. ▪ The landfill shall be established on a minimum land size of 80 acres. ▪ A 10m green buffer zone is recommended around the landfill. ▪ A power substation is recommended within the industrial park. ▪ Adherence to EMCA regulations on solid and liquid waste disposal from the industries. ▪ Adherence to EMCA regulations on air and noise pollution. ▪ Mining companies shall undertake CSR projects within neighbouring communities. ▪ Rehabilitation of decommissioned mines is recommended.
	Agro-processing & Value Addition Industries	Presence of agricultural products, fresh produce markets and established rural-urban linkages.	Agro-processing & value addition industries	▪ Adherence to EMCA regulations on solid and liquid waste disposal. ▪ Regular solid waste collection is recommended via private service providers/ CBOs/ the County Government.
Educational (2)	2 Educational Institutions	Presence of proposed and existing educational	$2_{1\text{-}4}$ Universities & TVETs	▪ Establishment on at least 10 acres of land.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
		facilities and support infrastructure.		▪ All institutions must have Master plans that provide for staff and students accommodation facilities, recreational spaces/sports complexes, and waste management facilities. ▪ Provide adequate facilities for PLWDs.
			Secondary schools	▪ Establishment on at least 5 acres of land. ▪ At least two streams per class depending on the catchment population. ▪ Should have adequate Infrastructure facilities. ▪ Provide adequate facilities for PLWDs.
			Primary schools	▪ Establishment on at least 2 acres of land. ▪ At least two streams per class depending on the catchment population. ▪ Should have adequate Infrastructure facilities. ▪ Provide adequate facilities for PLWDs.
			ECDEs	▪ Establishment on at least 0.5 acres of land. ▪ Should have adequate Infrastructure facilities.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
				▪ Provide adequate facilities for PLWDs.
Conservational (3)	$3_{1\text{-}10}$ Protected Forest Reserves	Areas under forest cover (Gazetted & non-gazetted).	▪ Forest reserves ▪ Eco-tourism activities and conservation initiatives ▪ Wildlife conservation	▪ All forests shall be gazetted and properly fenced to mitigate encroachment. ▪ Logging and deforestation activities are prohibited. ▪ Eco-tourism and beekeeping activities within forests shall be allowed in designated zones. ▪ The extent of the human settlements in Mukogodo Dry Forest shall be within delimited areas to prevent unregulated lateral sprawl.
	$3_{2.1\text{-}2.3}$ Wetlands Ecosystems	Waterlogged areas (Swamps, flood plains and marshes).	▪ Conservation initiatives ▪ Agricultural (Regulated farming & irrigation activities)	▪ Existing swamps shall be declared as protected wetland areas (CITES). ▪ Enforcement of a 30m green buffer zone around the major swamps and a 15m green buffer zone around minor swamps. ▪ Human settlements are prohibited within the demarcated boundaries of wetlands. ▪ Irrigation farming shall employ either drip or sprinkler methods for regulated abstraction.
	Riparian Reserves	Areas of land along rivers and streams with or	▪ Conservation initiatives	▪ Strict enforcement of 30m buffers from the highest

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
		without riverine vegetation.	▪ Agricultural (Regulated farming & irrigation activities)	watermark on permanent rivers and 15m buffers from the highest watermark on seasonal rivers. ▪ Sand harvesting shall be done only in designated sites along rivers. ▪ Regular greening initiatives are recommended along rivers such as planting indigenous trees. ▪ Construction of gabions and check dams along major rivers is recommended.
	$3_{3.1-4.5}$ Wildlife Conservancies and Ranches	Areas covered by extensive rangelands and grasslands.	▪ Wildlife conservation ▪ Recreational (Eco-tourism centers, resorts, ecolodges, hotels, tented camps, viewpoints etc) ▪ Agricultural (Livestock ranching and farming activities)	▪ Wildlife migratory and dispersal corridors shall be delineated and restored. ▪ The design of infrastructure (roads, railway, pipeline, fences etc) shall be in a manner that causes minimum obstruction to wildlife corridors and the least intrusion on their breeding areas. ▪ Grazing agreements between pastoralists and ranch owners are recommended especially during prolonged drought periods. ▪ Conservation-based activities that allow for minimum disturbance of the natural landscape are recommended. ▪ Initiatives that support healthy rangelands through the

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
				eradication of invasive plant species are recommended.
	Proposed Dual-Purpose Corridor	A corridor proposed for both wildlife migration and livestock movement.	▪ Wildlife and livestock movement ▪ Fodder farms and watering points	▪ The County Government shall delineate a dual-purpose corridor of at least 200m in width. ▪ EIA shall be done before the commencement of any infrastructure project across the corridor. ▪ Any continuous and permanent obstructive infrastructure is prohibited. ▪ The erection of low fences is recommended.
	Recreational Parks/ Open Spaces	Green parks and grey public open spaces.	Recreational	▪ The County Government shall prepare an inventory of the state of all public open spaces. ▪ There shall be a green open space/park within urban boundaries. ▪ All existing green open spaces shall be rehabilitated.
Public Purpose (4)	Existing and Proposed Health Facilities	Presence of public health centers and support infrastructure.	Public purpose	▪ All health centers shall have adequate state-of-the-art equipment, maximum bed capacity, high public health & safety standards, and the recommended doctor-patient ratio.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
	Proposed Social Halls and ICT Centers	Public assembly areas and resource facilities.	Public purpose	▪ The County Government shall construct social halls and ICT centers in all major towns and urban centres.
Commercial (5)	$5_{1.1\text{-}1.3}$ Primary Economic Nodes	Major urban centers that serve as the County's key growth nucleus/ economic drivers. (Rumuruti Township, Nanyuki & Nyahururu)	▪ Commercial ▪ Residential (Urban housing) ▪ Recreational ▪ Educational ▪ Public purpose ▪ Public Utilities	▪ There shall be the delineation of the urban boundaries and reclassification of these centers. ▪ Nanyuki and Nyahururu towns shall be conferred municipality status upon meeting the UACA stipulated provisions. ▪ There shall be a review and updating of the existing Local Physical and Land Use Development Plans for Nanyuki and Nyahururu towns. ▪ Vertical multi-storey commercial buildings with a minimum of four floors (Ground+3) are recommended. ▪ One-way streets are recommended within the core business zones for efficient circulation. ▪ Angle on-street parking is recommended for maximum space utilization. ▪ Adherence to Kenya's Building Code on setbacks, plot ratio, plot coverage, facades, etc.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
				▪ There shall be an audit of all public lands within the boundaries of these towns.
	$5_{2.1\text{-}2.5}$ Secondary Economic Nodes	Secondary towns that have been identified as potential growth nodes. (Kinamba, Wiyumiririe, Doldol, Naibor, Ol Moran)		▪ There shall be the delineation of the urban boundaries. ▪ These centres shall be conferred town status upon meeting the UACA stipulated provisions. ▪ Land Use Plans shall be prepared for each of these urban centers. ▪ Vertical multi-storey buildings are recommended. ▪ Adherence to Kenya's Building Code on setbacks, plot ratio, plot coverage, facades, etc. ▪ There shall be an audit of all public lands within the boundaries of these towns.
	$5_{3.1\text{-}3.8}$ Tertiary Economic Nodes	Urban centres that spur economic activities within and around them. (Pesi, Ol Jabet, Ol Ngarua, Mouwarak/Posta, Kalalu, Matanya, Lamuria, Maili Saba, Karuga)		▪ Land Use Plans shall be prepared for each of these centres. ▪ Vertical multi-storey buildings are recommended. ▪ Adherence to Kenya's Building Code on setbacks, plot ratio, plot coverage, facades, etc. ▪ There shall be an audit of all public lands within the boundaries of these centres.
	Existing Market Facilities	Market structures and facilities that have been	▪ Commercial (Retail & wholesale activities)	▪ Vertical multi-storey market buildings with a minimum of

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
		established by the County Government.		three floors (Ground+2) are recommended. ▪ Green architecture designs are recommended for market structures (Translucent roofing for natural lighting and large windows for free air circulation & lighting). ▪ The construction of market buildings shall adhere to Kenya's Building Code on setbacks, plot ratio, plot coverage, facades, etc. ▪ All fresh produce markets shall have designated loading and off-loading zones. ▪ Temporary transfer stations (where possible) or skip bins are recommended for regular garbage collection.
Mixed-Use Zone (5)	5 4.1-4.30 Mixed-Use Settlements	Areas and centres that have a mix of uses ranging from residential, commercial, public purpose, recreational, Educational, industrial and public utility land uses.	▪ Residential ▪ Industrial ▪ Commercial ▪ Educational ▪ Public purpose ▪ Public utilities	▪ Medium-density residential areas with single-dwelling units and multi-dwelling apartments. ▪ Sufficient parking spaces within the commercial zones. ▪ Adherence to Kenya's Building Code on setbacks, plot ratio, plot coverage, facades, etc. ▪ Adherence to sustainable building materials to curb the growth of informal urban settlements.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
				▪ All residential apartments shall have septic tanks or connections to sewers where possible. ▪ Regular solid waste collection is recommended via private service providers/ CBOs/ the County Government. ▪ Adherence to EMCA regulations on solid and liquid waste disposal from the industries. ▪ Adherence to EMCA regulations on air and noise pollution. ▪ Adherence to buffer zones around protected areas and ecologically fragile lands such as wetlands.
Public Utility (6)	$6_{1.1\text{-}1.2}$ Nanyuki & Nyahururu Sewers	Established sewer treatment facilities in Nanyuki and Nyahuhuru towns.	Water and sewer treatment plant and related infrastructure	▪ The capacity of these treatment plans shall be increased commensurate with the service areas. ▪ The County Government shall establish sewer systems in all primary and secondary urban centers.
	$6_{2.1\text{-}2.3}$ Proposed Landfills (Kinamba osian, Naibor & Kimanjo)	Areas allocated for the siting of landfills.	Landfill and related infrastructure	▪ Shall be sited on at least 80 acres of land. ▪ Adherence to EMCA regulations on solid and liquid waste disposal. ▪ Shall be located away from ecologically fragile water sources and catchment areas.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
				▪ Shall be properly fenced.
	$6_{3.1\text{-}3.2}$ Proposed Solar Power Farms (Solio& Lamuria)	Potential areas with high solar insolation for the establishment of County solar power farms.	Solar panels and related infrastructure	▪ Shall be established on at least 100 acres of land. ▪ Feasibility studies shall be carried out before the commencement of the projects.
	6_4 Proposed Wind Power Farm (Loldaiga Hills)	A potential high-altitude area for the establishment of a County wind power farm.	Windmills and related infrastructure	▪ Shall be established on the Lolldaiga Hills as demarcated on the Plan. ▪ Feasibility studies shall be carried out before the commencement of the project.
	Proposed Dams/ Reservoirs	River confluences that have the potential for excavation of community dams/ reservoirs.	Dam/reservoir and related infrastructure	▪ ESIA shall be conducted before any excavation works commence.
	Proposed Base Transceiver Stations (BTS)	Human settlement areas that are currently underserved by telecommunication infrastructure.	BTS and related infrastructure	▪ A BTS shall be erected within a 5km range of dense human footprint areas.
Transportation (7)	7_1 Nanyuki Airbase	Presence of the Nanyuki Airbase.	Airbase related use	▪ No high-rise buildings shall be permitted within existing and demarcated flight paths (low rise - G+1 - allowed). ▪ Buildings with a maximum of 3 floors (Ground+2) shall be permitted within lands adjacent to the airbase.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
	7_2 Proposed Rumuruti Airport	Provision for the construction of an airport within Rumuruti Township as per the LP&LUDP for Rumuruti.	Airport related use	▪ No high-rise buildings shall be permitted within the proposed flight paths. ▪ Buildings with a maximum of 3 floors (Ground+2) shall be permitted within lands adjacent to the airport.
	Proposed Railway Stations	Urban centers along the proposed railway lines which are feasible for the location of train stations.	▪ Transportation ▪ Commercial (Convenience shops and restaurants)	▪ Railway reserves shall be free from human encroachment.
Special Purpose (8)	8_1 Nanyuki Military Area	-	-	-
Agricultural (9)	$9_{1.1\text{-}1.5}$ Primary Productive Sub-Region	Fertile soils and favourable climatic conditions which support rain-fed agriculture.	▪ Cultivation of food crops, cash crops, vegetables & fruits ▪ Diary & fish farming ▪ Agroforestry ▪ Value addition and agro-processing industries	▪ Conversion of high-potential croplands from agricultural use to other uses is greatly discouraged. ▪ Land subdivision shall be limited to a minimum of 0.8Ha (2 acres) for residential purposes. ▪ Agricultural production in less than 2Ha (4.9 acres) of land shall be deemed small-scale, while that in more than 2Ha of land shall be termed large-scale. ▪ Intensive agricultural techniques are recommended for small pieces of land. ▪ Encroachment on riparian reserves and wetlands ecosystems is prohibited.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
				▪ Forests within this sub-region shall be fenced to mitigate human-wildlife conflicts.
	$9_{2.1\text{-}2.5}$ Secondary Productive Sub-Region	Presence of rivers/streams and wetlands that support irrigation farming.	▪ Crops, vegetables & fruits farming ▪ Diary & fish farming ▪ Agroforestry ▪ Wildlife conservation & ranching ▪ Value addition and agro-processing industries	▪ Encroachment on riparian reserves and wetlands ecosystems is prohibited. ▪ The use of drip and sprinkler techniques is recommended for regulated abstraction. ▪ Land subdivision shall be limited to a minimum of 0.2Ha for residential purposes. ▪ Agricultural production in less than 2Ha (4.9 acres) of land shall be deemed small-scale, while that in more than 2Ha of land shall be termed large-scale.
	$9_{3.1\text{-}3.9}$ Tertiary Productive Sub-Region	Irrigation farming that is commonly done using water from boreholes.	▪ Crop farming ▪ Horticulture and floriculture ▪ Sisal farming ▪ Agroforestry ▪ Wildlife conservation & ranching ▪ Value addition and agro-processing industries	▪ Land subdivision shall be limited to a minimum of 0.2Ha for residential purposes. ▪ Agricultural production in less than 2Ha (4.9 acres) of land shall be deemed small-scale, while that in more than 2Ha of land shall be termed large-scale. ▪ Encroachment on riparian reserves and wetlands ecosystems is prohibited.
	Pastoralists' Sub-region	Presence of community-owned ranches in the	▪ Pastoralism and related support infrastructure	▪ Subdivision & fragmentation of group/community ranches is greatly discouraged.

Land Use	Zone Number & Classification	Key Defining Element of the Zone	Permitted Use	Land Use Regulations
		northeastern region of the County.	(Holding grounds/sale yards, cattle dips, livestock markets, slaughterhouses, hay stores, watering points, etc) ▪ Wildlife conservation ▪ Eco-tourism & cultural tourism activities	▪ Rotational grazing in the community ranches is recommended. ▪ Stocking of livestock shall be within a sustainable carrying capacity. ▪ Awareness creation & civic education programmes on soil conservation are encouraged. ▪ Mobile social services are recommended within this sub-region. ▪ Land use plans shall be prepared to ensure sustainable land use management within community ranches.
	$9_{4.1\text{-}4.6}$ Proposed Fodder Farms (Kimanjo, Ilpolei, Naibor, Mutara, Sosian, Louniek)	Areas that have been designated as County land banks.	▪ Agricultural (Large-scale mechanized hay and fodder production) ▪ Conservational (County land banks)	▪ Shall be established on at least 1000 acres of land. ▪ These farms shall be used as emergency grazing areas for pastoralists during prolonged drought periods.
	Existing Holding Grounds	Areas that currently act as livestock holding grounds/ sale yards.	Livestock related infrastructure (Fences, watering points, feeding troughs, hay stores, cattle dips etc)	▪ Regular maintenance, upgrading and rehabilitation is recommended.

PART VI:

PLAN IMPLEMENTATION

15 PLAN IMPLEMENTATION STRATEGY

15.1 Overview

The success of county spatial planning is determined by the plan's ability to achieve set objectives and realize the county's development vision. This chapter outlines the structure of the implementation framework which is defined by the nature of the County's political and institutional environment. It also summarizes the plan's thematic projects and outcomes against identified actors and timeframes. The implementation strategy includes a monitoring and evaluation framework that will be a tool for measuring the plan's progress against established indicators.

15.2 Political Structure

The County Executive Committee comprising of the Governor, Deputy Governor, County Executive Committee Members and the County Secretary, will be responsible for mobilizing resources for the implementation of the plan and will also coordinate implementation efforts by all stakeholders. Once the County Assembly approves the plan, it will exercise oversight authority over the implementation process and ensure the timely remittance of financial resources for proposed projects and programmes.

15.3 Implementation Structure

Given the thematic nature of the plan proposals, the implementation process will be undertaken through respective County departments, national government MDAs, municipal boards, development partners, CBOs, civil society groups, and the public.

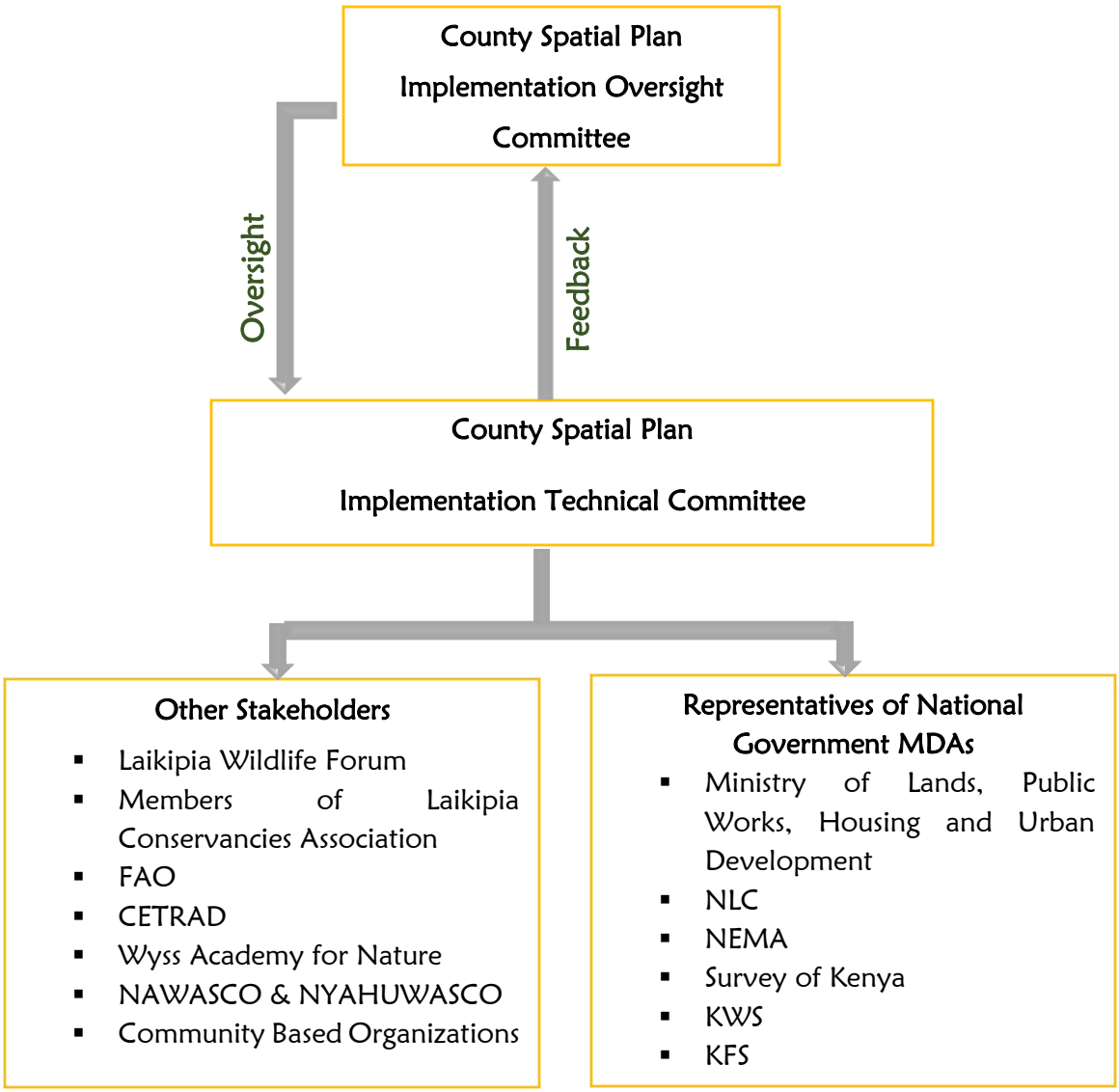
A County Spatial Plan Implementation Oversight Committee will be formed whose main function will be to oversee the overall implementation of prioritized projects and programmes. This committee will be chaired by the County Secretary as a delegate of the County Executive Committee. Members will comprise the Chief Officers of all county departments who are tasked with ensuring the implementation of laid-out policies and regulations.

A County Spatial Plan Implementation Technical Committee will be formed to ensure that projects and programmes are implemented within the specified timeframe. This Committee will comprise the County CSP Coordinator, all Directors of county departments, municipal managers, county physical planners and surveyors. It will be

tasked with submitting annual progress reports on the plan's implementation status to the CSP Implementation Oversight Committee.

The CSP Implementation Technical Committee will also ensure the mobilization and participation of representatives of national government MDAs and other stakeholders who are key actors in the implementation process. The plan's proposals are aligned with development programmes outlined in the County Integrated Development Plan (2023-2027). Therefore, the Laikipia County Annual Development Plan will be a significant tool for monitoring the implementation of the spatial plan.

Figure 15-1: Plan Implementation Structure



Source: KREIS, 2022

15.4 Implementation Matrix

The implementation timeframe of projects within the various development strategies has been split into three phases as detailed in the matrices below.

Crop and Livestock Production Strategy:

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
Support irrigation farming	Reviving and up-scaling existing irrigation schemes	←	-	-	-	-	-	→				- National Irrigation Authority - County Department of Agriculture, Livestock & Fisheries - County Department of Water, Environment & Natural Resources - Development Partners - NGOs & CBOs
	Increasing the number of acres under irrigation farming	←	-	-	-	-	-	→				- National Irrigation Authority - County Department of Agriculture, Livestock & Fisheries - County Department of Water, Environment & Natural Resources - Development Partners - NGOs & CBOs - Farmers' Groups & Cooperatives
	Sand-scooping community dams and pans to increase their water-holding capacity	←	-	→								- County Department of Infrastructure, Lands, Public Works & Urban Development - County Department of Water, Environment & Natural Resources - Development Partners - NGOs & CBOs
	Excavation of additional community dams and pans		←	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - County Department of Water, Environment & Natural Resources - Development Partners - NGOs & CBOs
	Rehabilitation of non-functional community water projects		←	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - County Department of Water, Environment & Natural Resources - Development Partners - NGOs & CBOs
	Provision of dam liners for community dams and pans		←	-	→							- County Department of Agriculture, Livestock & Fisheries - Development Partners - NGOs & CBOs
	Provision of irrigation support tools e.g. drip kits to farmers' groups and institutions		←	-	→							- County Department of Agriculture, Livestock & Fisheries - Development Partners - NGOs & CBOs
Promote agricultural diversification	Establishment of a County hatchery, poultry feed manufacturing plant, and development of a complete market and value chain		←	-	-	-	-	→				- County Department of Agriculture, Livestock & Fisheries - Development Partners - NGOs & CBOs
	Supply households and institutions with tree seedlings		←	-	→							- County Department of Agriculture, Livestock & Fisheries - Development Partners - NGOs & CBOs

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
												- Farmers' Groups & Cooperatives
	Establish County fish multiplication centers	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock & Fisheries - Development Partners - NGOs & CBOs
	Establishing the infrastructure to support fish farming – ponds, dam liners, cage systems, and cold storage facilities	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock & Fisheries - Development Partners - NGOs & CBOs - Farmers' Groups & Cooperatives
	Stocking community dams and ponds with fish fingerlings	←	-	→								- County Department of Agriculture, Livestock & Fisheries - Development Partners - NGOs & CBOs - Farmers' Groups & Cooperatives
	Supporting apiculture through the construction and equipping of modern apiaries	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock & Fisheries - Development Partners - NGOs & CBOs - Farmers' Groups and Cooperatives
Provide agricultural support infrastructure & services	Construction of integrated value-addition facilities (with cold rooms, milk coolants, chicken incubators, cereal aggregation facilities, modern storage facilities & agro-processing and packaging plants)	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock & Fisheries - Development Partners
	Construction of additional grain storage facilities – cereal boards	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock & Fisheries - Development Partners
	Renovation of existing market stalls, sheds and infrastructure for fresh farm products	←	-	→								- County Department of Agriculture, Livestock & Fisheries - County Department of Trade, Tourism, Cooperatives & Enterprise Development
	Construction of additional market stalls and sheds in underserved areas	←	-	→								- County Department of Agriculture, Livestock & Fisheries - County Department of Trade, Tourism, Cooperatives & Enterprise Development
	Improving rural access roads to create seamless rural-urban linkages and facilitate farmers' access to markets	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Establishing a County Agricultural Training and Research Center supported by a model demonstration farm per ward	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock & Fisheries - Development Partners
Create a favorable policy framework to support crop farming	Zoning of agricultural potential areas to safeguard them against uneconomical sub-division and fragmentation	←	-	→								- County Department of Infrastructure, Lands, Public Works & Urban Development - County Department of Agriculture, Livestock & Fisheries - County Physical Planners and Surveyors
	Establishing minimum land sizes within the highly productive agricultural zones	←	-	→								- County Department of Infrastructure, Lands, Public Works & Urban Development - County Physical Planners and Surveyors
	Enforcement of development control regulations when changing the use of land within the agricultural productive zones	←	-	→								- County Department of Infrastructure, Lands, Public Works & Urban Development - County Physical Planners and Surveyors

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
	Preparing wetlands management plans to protect swamps from unsustainable utilization	←	-	-	-	-	-	→				- County Department for Water, Environment & Natural Resources
	Preparing water resources management and conservation plans for the rehabilitation of riparian reserves and natural springs	←	-	-	-	-	-	→				- County Department for Water, Environment & Natural Resources
	Regulating land subdivision within the highly productive agricultural zones	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - County Physical Planners and Surveyors
	Zoning and establishment of value addition and agro-processing industries within urban centers	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries - County Physical Planners and Surveyors
Improve existing livestock infrastructure	Regular desilting and sand scooping of community dams and pans within the community ranches	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - County Department of Water, Environment & Natural Resources - Development Partners - NGOs & CBOs
	Regular maintenance and renovation of livestock markets, holding grounds, vaccination crushes and drinking troughs	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries - Development Partners
	Renovation of non-functional cattle dips	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries
	Renovation and upgrading of slaughter slabs to modern abattoirs	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries
	Provision of adequate and appropriate infrastructure for the expansion of existing livestock markets	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries - County Department of Infrastructure, Lands, Public Works & Urban Development
	Renovation of County hay stores/barns in Mukogodo East and West	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries
	Demarcating and opening up blocked stock routes to reduce conflicts between farmers and pastoralists	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries - County Physical Planners and Surveyors - Community Members
Establish modern livestock support infrastructure & services	Construction of integrated livestock value-addition facilities (with modern abattoirs, meat processors, leather tanneries, holding grounds, hides and skins bandas, and modern laboratories)	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries - Development Partners
	Construction of livestock markets/modern sale yards in underserved areas	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries
	Construction of cattle dips in underserved areas	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries
	Construction of modern slaughter slabs	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries
	Construction and maintenance of water troughs at community watering points	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries - Development Partners - NGOs & CBOs
	Constructing modern livestock laboratories and testing facility	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries - Development Partners
Safeguard the livelihoods of pastoralists'	Establishment of County land banks for pasture/fodder production in designated areas along the dual-purpose migratory corridor	←	-	-	-	-	-	→				- County Department of Agriculture, Livestock and Fisheries - Development Partners

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
communities in Laikipia North	Expansion of the 200 acres hay production site at Tiemamut and development of the 100 acres Naiperere hay site	←	-	→								- County Department of Agriculture, Livestock and Fisheries - Development Partners
	Construction of County hay sheds/stores in the Laikipia North region	←	-	→								- County Department of Agriculture, Livestock and Fisheries - Development Partners
Promote environmental conservation in community ranches	Support reseeding programmes of degraded rangelands in community ranches	←	-	-	-	-	-	→				- County Department of Water, Environment & Natural Resources - Private Conservancies/ Ranch Owners - Conservation Organizations - Community Members
	Encouraging rangelands conservation partnerships	←	-	-	-	-	-	→				- County Department of Water, Environment & Natural Resources - Research Institutions - Conservation Organizations - Laikipia Conservancies Association - Private Conservancies/ Ranch Owners - Community Members
	Preparation of an Invasive Species Management Plan for the community-owned ranches	←	-	→								- County Department of Water, Environment & Natural Resources - Members of Community Ranches - Research Institutions - Conservation Organizations - Laikipia Conservancies Association
	Preparation of community rotational grazing plans to allow for pasture regeneration in the community ranches	←	-	→								- County Department of Agriculture, Livestock and Fisheries - County Department of Water, Environment & Natural Resources - Members of Community Ranches
	Preparation of LP&LUDPs for community ranches to promote sustainable and optimal utilization	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - County Physical Planners
Put in place comprehensive measures to end cattle rustling and insecurity	Raising awareness of peaceful community relations and co-existence among the various local communities in Laikipia and within the neighbouring counties	←	-	→								- County Department of Agriculture, Livestock and Fisheries - Amaya Triangle Initiative - Local Administration
	Mapping out insecurity corridors, opening up security roads and establishing mobile security surveillance units in strategic locations within the insecurity-prone areas	←	-	→								- County Department of Infrastructure, Lands, Public Works & Urban Development - Local Administration
	Construction of ranger outposts and employment of National Police Reservists (NPR)	←	-	→								- National Government

Transport, Infrastructure and Social Services Strategy:

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
	Survey and demarcation of road reserves	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
Improve road connectivity and accessibility												- KeNHA, KURA & KERRA
	Tarmacking, cabro-paving, construction of drainage systems and NMT provision on urban roads and streets	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development - KURA - Development Partners
	Upgrading, gravelling, and culverting of rural access roads	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development - KERRA - Development Partners
	Establishing access roads to open up remote areas in Laikipia North	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development - KERRA - Development Partners
	Construction and rehabilitation of bus parks, matatu termini and parking zones in urban centers	←	-	-	-	-	→					- County Department of Infrastructure, Lands, Public Works & Urban Development
	Undertaking greening projects on all urban roads	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development - KURA
	Construction of additional boda-boda sheds	←	-	→								- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
Revamp and extend the existing railway lines	Extending existing railway lines along the great economic corridor	←	-	-	-	-	-	-	-	-	→	- Kenya Railways Corporation - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Establish railway stations along the designated centers	←	-	-	-	-	-	-	-	-	→	- Kenya Railways Corporation - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
Enhance regional air transport linkage	Construction of the proposed Rumuruti airport	←	-	-	-	-	-	-	-	-	→	- Kenya Airports Authority - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Improve road and rail linkages to Isiolo resort city to tap infrastructure and socio-economic benefits of the LAPSSET corridor	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development - KeNHA, KURA & KERRA - Kenya Railways Corporation - Development Partners
Increase water access and distribution	Undertake feasibility studies for the construction of mega dams	←	-	-	-	-	→					- County Department of Water, Environment & Natural Resources - Development Partners
	Excavation of additional community dams and pans	←	-	-	-	-	→					- County Department of Water, Environment & Natural Resources - Development Partners
	Excavation of sub-surface dams	←	-	→								- County Department of Water, Environment & Natural Resources - Development Partners

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
	Expansion and desilting of community dams and pans	←	-	→								- County Department of Water, Environment & Natural Resources - Development Partners
	Drilling of boreholes, construction of high-capacity storage tanks and equipping them with solar-powered pumps	←	-	-	-	-	-	→				- County Department of Water, Environment & Natural Resources - Development Partners
	Rehabilitation of decommissioned boreholes and non-functional water projects	←	-	→								- County Department of Water, Environment & Natural Resources - Development Partners
	Increasing the reticulation networks of water service providers to serve neighbouring proximity areas	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - NAWASCO & NYAHUWASCO
	Increased exploration and tapping of groundwater sources	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment & Natural Resources - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Construction of gabions along river valleys (Ewaso Ng'iro and Ewaso Narok rivers)	←	-	→								- County Department of Water, Environment & Natural Resources - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners - NGOs & CBOs
	Providing measures for the protection of water resources and strengthening and supporting the various Water Resources Users Associations	←	-	→								- County Department of Water, Environment & Natural Resources - Development Partners - NGOs & CBOs
	Construction, renovation and improvement of stormwater drainage systems in urban centers		←	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Construction of water tanks and water points in bus parks and markets within urban centers		←	-	→							- County Department of Water, Environment & Natural Resources - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Upscaling community water projects and extending their reticulation networks		←	-	-	-	-	→				- County Department of Water, Environment & Natural Resources - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners - NGOs & CBOs
	Rehabilitation of existing rock water catchment projects in Laikipia North		←	-	→							- County Department of Water, Environment & Natural Resources - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners - NGOs & CBOs
	Construction of additional rock catchment water projects and storage tanks		←	-	-	-	-	→				- County Department of Water, Environment & Natural Resources - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners - NGOs & CBOs

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
Improve solid and liquid waste management	Establishment of a sewer treatment plant in Doldol	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development - County Department of Water, Environment & Natural Resources - NEMA - Development Partners
	Expansion of the existing sewer plants in Nanyuki, Nyahuhuru and Rumuruti towns	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - County Department of Water, Environment & Natural Resources - Development Partners - NAWASCO & NYAHUWASCO
	Establishment of landfills in the designated sites in Kimanjo, Naibor and Kinamba Sosian centers	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development - County Department of Water, Environment & Natural Resources - NEMA - Development Partners
	Establishment of sewer systems and designated solid waste management sites in urban centers and in informal settlements through slum improvement projects	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - County Department of Water, Environment & Natural Resources - NEMA - Development Partners
	Provision of temporary waste-transfer stations in urban centers and within market facilities	←	-	→								- County Department of Water, Environment & Natural Resources
	Renovation and construction of public toilets/ ablution blocks within markets and in urban centers	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Preparation of a comprehensive Integrated County Waste Management Strategy	←	-	-	-	-	-	→				- County Department of Water, Environment & Natural Resources
Increase access to affordable, reliable, sustainable energy	Undertaking feasibility studies & the establishment of large-scale solar power farms in the designated sites in Lamuria and Solio in Tigithi Ward.	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Undertaking feasibility studies for the establishment of a large-scale wind power farm in the Lolldaiga Hills	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Equipping more community boreholes and water projects with solar-powered pumps	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners - NGOs & CBOs

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
	Installation of solar-powered floodlights and streetlights in urban centers, along roads and at road junctions	←	-	-	-	→						- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Increasing electricity connectivity to households and institutions, especially in underserved areas	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - KPLC
	Support the development of biogas production plants within institutions and fresh-produce markets	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners - NGOs & CBOs
	Preparation of a County Energy Master Plan	←	-	-	→							- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
Provide adequate health infrastructure	- Construction of dispensaries in under-served areas - Upgrading the existing dispensaries to health centers - Upgrading existing health centers to hospitals - Construction of the County referral hospital in Rumuruti Municipality	←	-	-	-	-	-	→				- Ministry of Health - County Department of Health - Development Partners
Improve access and quality of education	- Construction of the proposed universities in Naibor and Rumuruti - Construction of additional ECDEs in underserved areas - Construction of additional classrooms and facilities in ECDEs, primary schools, secondary schools & TVETs	←	-	-	-	-	-	→				- Ministry of Education - County Department of Education, Sports, Youth & Social Services - Development Partners
Improve access to social amenities and utilities	Establishment of gender-based violence recovery/rescue centers in all sub-county headquarters	←	-	-	-	-	-	→				- County Department of Education, Sports, Youth & Social Services - Development Partners
	Construction of social halls and ICT centers urban centers	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners
	Construction of the proposed fire station in Rumuruti Municipality and a sub-station in Kinamba	←	-	-	-	-	-	→				- County Department of Infrastructure, Lands, Public Works & Urban Development - Development Partners

Trade, Industry and Mining Strategy:

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
To boost trading activities in the County	Construction of new markets and market kiosks	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives - Development Partners
	Rehabilitation of existing markets and market infrastructure	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
	Strengthening business cooperatives and SACCOs	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives
	Increased access to formal credit facilities and services	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives - Financial Institutions/Banks - SACCOs
	Operationalization of all existing green produce and cereal markets	←	-	→								- County Department of Trade, Tourism, Creative Economy and Co-operatives
	Formulation of a Countywide marketing strategy to enhance trade promotion and marketing in the lines of industrial investments to unlock all industrial proposals qualified in the Plan. These include the SEZ areas in Rumuruti; the proposed mining industrial parks around Kimanju among others	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives
	Intensified training on entrepreneurial skills and management	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives - Institutions of Higher Learning
	Source and facilitate external markets linkages	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives
Enhance industrial manufacturing and processing	Mapping of all industrial parks	←	-	→								- County Department of Trade, Tourism, Creative Economy and Co-operatives - County Physical Planners, Surveyors and GIS Technical Team
	Setting up cottage industries in all urban centres	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives - Development Partners - NGOs and CBOs
	Establishment of food processing and value-addition industries in all urban centres	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives - Development Partners - NGOs and CBOs
	Creating seamless road networks to promote rural-urban linkages	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Housing and Urban Development -KURA -KeRRA - Development Partners
	Encouraging PPPs in sourcing the capital required for industrial development	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives - Development Partners
	Starting up business incubation and innovation centers in Nanyuki, Nyahururu and Rumuruti	←	-	-	-	-	-	→				- County Department of Trade, Tourism, Creative Economy and Co-operatives - Institutions of Higher Learning - Private Investors
Sustainable exploitation of mineral ores and deposits in the County	Attracting investors to undertake detailed mineral exploration	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives
	Incentivized investment into value addition of minerals	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives
	Formulating zoning regulations for quarrying and mining activities	←	-	→								- County Department of Trade, Tourism, Creative Economy and Co-operatives - County Department of Infrastructure, Lands, Public Works & Urban Development

Environment and Biodiversity Strategy:

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
Protect and conserve forested areas	Remote sensing to determine the current status of the gazetted forests	←	-	-	→							- KFS - County Physical Planners and Surveyors
	Preparation of forest management plans for all gazetted forests	←	-	-	→							- County Physical Planners and Surveyors - County Department of Water, Environment and Natural Resources
	Fencing of forests to mitigate encroachment and human-wildlife conflicts	←	-	-	→							- KFS - County Department of Water, Environment and Natural Resources
	Regular maintenance of fences around all gazetted forests	←	-	-	-	-	-	-	-	-	→	- KFS - County Department of Water, Environment and Natural Resources
	Conservation projects in forests such as beekeeping and ecotourism	←	-	-	-	-	-	-	-	-	→	- Community Forests Associations CBOs and NGOs - Local Communities
	Annual Environmental Impact Assessments on eco-tourism activities within Mukogodo Dry Forest	←	-	-	-	-	-	-	-	-	→	- County Physical Planners and Surveyors - County Department of Water, Environment and Natural Resources
	Afforestation and agro-forestry at the homestead level to increase tree cover	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - CBOs and NGOs - Local Communities
	Community involvement in forest conservation and management	←	-	-	-	-	-	-	-	-	→	- KFS - County Department of Water, Environment and Natural Resources Community Forests Associations - CBOs and NGOs - Local Communities
Promote sustainable utilization and conservation of riparian ecosystems	Enforcement of 30m buffer zones from the highest watermark on all riparian reserves	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - County Physical Planners and Surveyors - WRA -NEMA
	Identification and preparation of an inventory of degraded riverbanks	←	-	-	→							- County Department of Water, Environment and Natural Resources - County Physical Planners and Surveyors - WRA
	Rehabilitation of degraded river banks by constructing gabions, regulating sand harvesting and planting indigenous trees	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - WRA - NGOs and CBOs
	Enforcement of regulations on upstream water abstraction for irrigation purposes	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - WRA
	Annual Environmental Impact Assessments/Audits on human activities along riverbanks	←	-	-	-	-	-	-	-	-	→	- NEMA - County Physical Planners and Surveyors
	Excavation of dams and pans along floodplains	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - Development Partners
	Fencing and protection of springs with 100m buffer zones	←	-	-	-	-	-	-	→			- WRUAs
	Regular maintenance of protected springs	←	-	-	-	-	-	-	-	-	→	- WRUAs

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
	Community participation in water resources management	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - WRUAs - Local Communities
Regulate encroachment on wetlands by settlements and farming activities	Mapping and delineation of 30m buffer zones around all wetlands	←	-	-	-	-	-	-	→			- County Department of Water, Environment and Natural Resources - County Physical Planners and Surveyors
	Preparation of a County Wetlands Management Plan	←	-	-	→							- County Department of Water, Environment and Natural Resources - County Physical Planners and Surveyors
	Annual Environmental Impact Assessments on human activities around wetlands	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - County Physical Planners and Surveyors
	Declaration of the existing swamps as protected wetland areas (CITES).	←	-	-	-	-	-	-	→			- Ministry of Environment and Forestry - Survey of Kenya - NLC - County Department of Water, Environment and Natural Resources
Ensure sustainable use of wetlands for continued ecosystem services	Use of improved irrigation systems around wetlands	←	-	-	-	-	-	-	-	-	→	- County Department of Agriculture, Livestock and Fisheries - WRUAs
	Construction of dams or pans downstream to store run-off	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - Development Partners
	Uprooting Eucalyptus trees growing in Moyok Swamp and planting tree species that consume less water	←	-	-	-	-	-	-	→			- WRUAs - CBOs - Local Communities
	Uprooting Blue Gum trees in Marura Swamp and replacing them with appropriate tree species	←	-	-	-	-	-	-	→			- WRUAs - CBOs - Local Communities
	Community sensitization forums on sustainable utilization of wetlands	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - WRUAs
Promote sustainable management of rangelands	Reseeding degraded rangelands within community ranches	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources Laikipia Conservancies Association - Local Communities
	Increasing awareness of soil conservation practices among pastoralists in Laikipia North	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources County Department of Agriculture, Livestock and Fisheries - CBOs
	Encouraging rotational grazing among pastoralists to reduce overgrazing	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - County Department of Agriculture, Livestock and Fisheries - CBOs
	Formulation of a County invasive species management plan	←	-	-	→							- County Department of Water, Environment and Natural Resources - Laikipia Conservancies Association - Local Communities
	Collaboration among various stakeholders working on the eradication of invasive plant species	←	-	-	-	-	-	-	-	-	→	- County Department of Water, Environment and Natural Resources - Laikipia Conservancies Association
Preserve the diversity of plant and wildlife species	Regular monitoring and reporting on the number, status and distribution of wildlife	←	-	-	-	-	-	-	-	-	→	- KWS Laikipia Wildlife Forum - Laikipia Conservancies Association
	Protection of wildlife breeding and dispersal areas against intrusive infrastructure	←	-	-	-	-	-	-	-	-	→	- KWS Laikipia Wildlife Forum

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
												- Laikipia Conservancies Association
	Preparation of species-specific management plans	←	-	-	-	-	-	-	-	-	→	- KWS - Laikipia Wildlife Forum - Laikipia Conservancies Association
	Supporting conservation partnerships between community and private conservancies	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Co-operatives -KWS - Laikipia Wildlife Forum - Laikipia Conservancies Association
Restore the connectivity of wildlife habitats and dispersal areas	Identification and delineation of wildlife migratory corridors and dispersal areas	←	-	-	-	-	-	-	→			- KWS - Laikipia Wildlife Forum - Laikipia Conservancies Association - County Physical Planners and Surveyors
	Reclamation of encroached wildlife migratory corridors	←	-	-	-	-	-	-	→			- KWS - County Physical Planners and Surveyors
	Fencing projects and prohibition of infrastructure across interconnected wildlife habitats	←	-	-	-	-	-	-	-	-	→	- KWS
	Construction of separate watering points for wildlife and community use to reduce water resource conflicts	←	-	-	-	-	-	-	→			- KWS - Community and Private Ranch Owners
	Formulation of wildlife management plans for interconnected community and private ranches	←	-	-	-	-	-	-	→			- KWS - Laikipia Wildlife Forum - Laikipia Conservancies Association - County Physical Planners and Surveyors
	Formation of an integrated multi-sectoral wildlife ecosystem conservation framework	←	-	-	→							- KWS - Laikipia Wildlife Forum - Laikipia Conservancies Association - County Physical Planners and Surveyors
Market Laikipia County as an international safari-based tourist destination	Publicize tourist attraction sites, lodges, resorts and 'Destination Laikipia' in mainstream media and online platforms	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Cooperatives
	Rehabilitation of cultural heritage sites and community lodges to promote cultural tourism	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Cooperatives
	Conservation measures on Mukogodo Dry Forest to promote community-led eco-tourism	←	-	-	-	-	-	-	-	-	→	- KFS - County Department of Water, Environment and Natural Resources - Local Communities
	Annual local and national tourism fairs, exhibitions and promotional events	←	-	-	-	-	-	-	-	-	→	- County Department of Trade, Tourism, Creative Economy and Cooperatives
	Recognition of wildlife conservation as a significant land use in the County	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development

Land and Human Settlements Strategy:

PROGRAMMES	PROJECTS	TIMEFRAME										ACTORS
		Short-term (2023-2025)			Medium-term (2026-2029)				Long-term (2030-2032)			
		1	2	3	4	5	6	7	8	9	10	
Ensure sustainable land use planning and management	Categorization and delineation of urban areas	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development
	Implementation of Rumuruti Local Physical and Land Use Development Plan	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development
	Preparation of Local Physical and Land Use Development for all urban centres	←	-	-	-	-	-	→				- County Physical Planners, Surveyors and GIS Technical Team
	Development of a digital County Land Information System	←	-	→								- County Department of Infrastructure, Lands, Public Works & Urban Development
	Establishing minimum land sizes to regulate uneconomical land subdivision	←	-	→								- County Department of Infrastructure, Lands, Public Works & Urban Development
	Speeding up the process of issuance of title deeds	←	-	→								- NLC; County Department of Infrastructure, Lands, Public Works & Urban Development
	Formulation of an upto date development control policy; and Hastening issuance of allotment letters and leases	←	-	→								- NLC - County Department of Infrastructure, Lands, Public Works & Urban Development
	Enforcement of County zoning regulations	←	-	-	-	-	-	-	-	-	→	- County Physical Planners and Surveyors
	Fast-tracking land use planning processes to ensure timely approval of urban land use plans	←	-	-	-	-	-	-	-	-	→	- County Department of Infrastructure, Lands, Public Works & Urban Development
	Initiate a programme for audit of all public land in the County and undertake cadastral survey and/or resurvey to demarcate and issue titles to the County Government	←	-	→								- NLC; National Ministry of Lands, Public Works; Housing; and Urban Development; ounty Department of Infrastructure, Lands, Public Works & Urban Development
Improve existing housing conditions and provide affordable housing units	Carrying out informal settlements upgrading and improvement projects	←	-	-	-	-	-	-	-	-	→	- State Department for Housing and Urban Development - County Department of Infrastructure, Lands, Public Works & Urban Development; Development Partners
	Redevelopment and densification of public housing estates in Nanyuki, Nyahururu and Rumuruti	←	-	-	-	-	-	-	-	-	→	- NLC - State Department for Housing and Urban Development - County Department of Infrastructure, Lands, Public Works & Urban Development - Development Pattners

15.5 Capital Investment Plan (CIP)

The projected growth of Laikipia County creates a pressing demand for the investment and development of infrastructure and other assets to support economic and social development. Such investments require capital that often far exceeds available resources to the County. The unavailability of capital puts a premium on the need for the County to build capacity to appraise and prioritize its investment decisions. Hence, there is an increasing need to establish and maintain a process of planning and funding capital investment as a regular activity synergized through different actors and based on principles of good public management.

From the above perspective, investment is understood as the acquisition or building of new assets, or major repair and replacement of existing assets that have an economic life longer than one year and a value above a specified threshold. Capital Investment Planning by the County will include (or should include) enterprises/investments established and owned by the County for the provision of services within the County, interregional connectivity and beyond. CIPs may include investment by the private sector through various models of Public Private Partnerships (PPPs), or through grants and donor funds where necessary. As such, it is already clear from the trend analysis that the financial situation of the County is not capable of funding for delivery the proposed three-year CIPs for the various wards within the County. However, it would be prudent that the County aligns these development priorities with other National government programmes to unlock and tap into the funding streams that are available at the national level. This is considering their overall socio-economic impact and the potential they hold in improving the livelihoods of the people of Laikipia County.

Additionally, the County government may seek partnership with various investors and development partners to implement various projects so long as their sector objectives align. The matrices below outline the priority projects costs and the proposed implementation timelines. The project costs are not desirably actual but close estimates of the likely expenditure informed by various parameters and current market rates. As such, the costs can be adopted and used for purposes of budgeting.

PRIORITY PROJECTS FOR NGOBIT WARD

Specific Project / (Id): Ngbt1																
Project: Upgrading of Lamuria Hospital to a Level-4 Hospital.																
Project Location / Site: Ngobit Ward																
Project Unit / Quantity: Approx. 6,400 SQM (3,200 SQM for each building, about 800 sqm for every floor)																
Project Description / Detail: Phased construction of 2No. multi-level four floors building faclilities; outdoor furniture; landscaping & cabro works etc.																
Estimated Total Costs:																
Work Component / Project Works		Unit/Qty						Unit Cost (Kshs)	Total Cost (Kshs)		Source of Fund		Actors			
Construction of multi-level terminal complex		6,400 square meters for the two buildings						40,000/m²	256,000,000		Exchequer		LCG; MoH			
Implementation Schedule																
Project component	2023/24			2024/25				2025/26					2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4
Designs preparation																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Ngbt2
Project: Construction of an Integrated Livestock value addition facility (modern abattoir, meat processing, leather tanning and holding ground).
Project Location / Site: Ngobit Ward
Project Unit / Quantity: Approx. 8.08Ha
Project Description / Detail: Identification and acquisition of land for construction of a livestock value addition facility within 1km radius of Makutano shopping Centre

Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 8.08Ha (20 Acres)	1,000,000/acre	20,000,0000	Exchequer	LCG
Construction of the value addition facility	5% of the allocated land representing about 0.404Ha (4,040 sqm.)	15,000/m²	60,600,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Designs preparation															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Ngbt3
Project: Construction of an integrated value addition facility in Wiyumiririe (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants)
Project Location / Site: Ngobit Ward
Project Unit / Quantity: Approx. 4.04Ha of land within Wiyumiririe
Project Description / Detail: Identification and acquisition of land for construction of the integrated value addition facility

Estimated Total Costs:

Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 4.04Ha (10 Acres)	1,750,000/acre	21,794,500	Exchequer	LCG
Construction of assorted value addition facilities	50% of the allocated land representing 2.02Ha (20,200m²)	35,000/m²	707,000,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Designs preparation															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

PRIORITY PROJECTS FOR TIGITHI WARD

Specific Project / (Id): Tgt1
Project: Siting of solar power farms in identified sites
Project Location / Site: Tigithi Ward
Project Unit / Quantity: Approximately 407.86Ha of land mass
Project Description / Detail: identification and acquisition of land around Solio (within Solio ranch)

Estimated Total Costs:																	
Work Component / Project Works							Unit/Qty		Unit Cost		Total Cost		Source of Fund		Actors		
Acquisition of 407.86Ha of land for installation of solar panels for purposes of solar power generation and distribution							Approx.407.86Ha		1,000,000/acre		1,008,000,000		▪ LCG ▪ PPPs		▪ LCG ▪ PPPs		
Solar installation phase							-		-		-						
Implementation Schedule																	
Project component	2023/24			2024/25				2025/26				2026/27					
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
Identification of land																	
Compensation and acquisition																	
Solar installation Phase																	
Defects & Liability Period																	
Project M & E																	

Specific Project / (Id): Tgt2					
Project: Construct integrated value addition facilities in Matanya and Solio scheme (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants).					
Project Location / Site: Tigithi Ward					
Project Unit / Quantity: Approx. 4.04Ha of land within Solio settlement scheme					
Project Description / Detail: Construction of assorted value addition facilities (Public land available in Solio settlement scheme)					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Construction of assorted value addition facilities	50% of the allocated land representing 2.02Ha (20,200m²)	35,000/m²	707,000,000	Exchequer	LCG

Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Designs preparation																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Tgt3					
Project: Water reticulation project in Solio settlement scheme					
Project Location / Site: Tigithi Ward					
Project Unit / Quantity: Approx. 50 km					
Project Description / Detail: Reticulation of pipeline network (2-inch pipes)					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Installation of the pipeline network	Approx. 50 km	15,000,000/km	750,000,000	Exchequer ; Donor Funds	CGL; PPP

Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Procurement Processes																
Purchase and laying of pipeline network																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Tgt4					
Project: Upgrading to bitumen standard the road from Matanya-Thome-Pub-Hotline-Ngareng'iro.					
Project Location / Site: Tigithi Ward					
Project Unit / Quantity: Approx. 20 kilometers					
Project Description / Detail: Construction of the 20 kilometers of tarmac road					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Construction of the road	20 kilometers	50 million / km	100,000,000	Exchequer	LCG; KeRRA; and KURA

Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Procurement processes																
Road construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Tgt5					
Project: Construct an integrated livestock facility in Lamuria & Matanya (modern abattoir, meat processing, leather tanning, holding ground and veterinary laboratory)					
Project Location / Site: Tigithi Ward					
Project Unit / Quantity: Approx. 8.08Ha					
Project Description / Detail: Identification and acquisition of land for construction of a livestock value addition facility around Matanya trading centre					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 8.08Ha (20 Acres)	2,000,000/acre	40,000,0000	Exchequer	LCG
Construction of the value addition facility	5% of the allocated land representing about 0.404Ha (4,040 sqm.)	15,000/m^2	60,600,000	Exchequer	LCG

Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Designs preparation																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

PRIORITY PROJECTS FOR THINGITHU WARD

Specific Project / (Id): Tgth1															
Project: Construction of an integrated livestock facility in Nanyuki (modern abattoir, meat processing, leather tanning, holding ground and laboratory).															
Project Location / Site: Thingithu															
Project Unit / Quantity: Approx. 4.04Ha															
Project Description / Detail: Identification and acquisition of land for construction of a livestock value addition facility within Thingithu Ward.															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors					
Identification and acquisition of Land	Approx. 4.04Ha (10 Acres)			5,000,000/acre		50,000,0000		Exchequer		LCG					
Construction of the value addition facility	10% of the allocated land representing about 0.404Ha (4,040 sqm.)			15,000/m²		60,600,000		Exchequer		LCG					
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Designs preparation															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Tgth2															
Project: Construct an integrated value addition facility in Nanyuki (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants).															
Project Location / Site: Thinghithu Ward															
Project Unit / Quantity: Approx. 4.04Ha															
Project Description / Detail: Construction of assorted value addition facilities within Thingithu Ward															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors					
Identification and acquisition of Land	Approx. 4.04Ha (10 Acres)			5,000,000/acre		50,000,000		Exchequer		LCG					
Construction of assorted value addition facilities	50% of the allocated land representing 2.02Ha (20,200m²)			35,000/m²		707,000,000		Exchequer		LCG					
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Designs preparation															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Tgth3																
Project: Extend NAWASCO pipeline to serve Majengo and Ruai settlements.																
Project Location / Site: Thingithu Ward																
Project Unit / Quantity: Approx. 30 kilometers																
Project Description / Detail: Construction of30 kilometers of sewer and water pipelines.																
Estimated Total Costs:																
Work Component / Project Works			Unit/Qty				Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors			
Laying of water pipeline			30 kilometers				-		150,000,000		Exchequer		LCG			
Laying of sewer pipeline			30 kilometers				-		150,000,000		Exchequer		LCG			
Implementation Schedule																
Project component	2023/24			2024/25				2025/26					2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

PRIORITY PROJECTS FOR NANYUKI WARD

Specific Project / (Id): Nyk1																
Project: Construction of a mega dam at the confluence of Likii and Nanyuki rivers																
Project Location / Site: Nanyuki Ward																
Project Unit / Quantity: Approx. 20.23 Ha (50 acres)																
Project Description / Detail: Identification and acquisition of land for construction of the mega dam.																
Estimated Total Costs:																
Work Component / Project Works			Unit/Qty				Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors			
Identification and acquisition of Land			Approx. 20 Ha of land (50 acres)				5,000,000		250,000,0000		Exchequer		LCG			
Construction of the mega dam							-		50,000,000		Exchequer		LCG			
Implementation Schedule																
Project component	2023/24			2024/25				2025/26					2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4
Identification of land																
Compensation and acquisition																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Nyk2
Project: Extend the railway line from Nanyuki-Isiolo
Project Location / Site: Nanyuki Ward
Project Unit / Quantity: Approx. 70km of rail line
Project Description / Detail: Construction of 70km of meter gauge rail line etc.
Estimated Total Costs:

Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Feasibility study	Consultancy	-	Approx. 60 million	Exchequer	LCG
Construction of the meter gauge railway line	70km	-	-	Exchequer	Kenya Railways; NLC; LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasibility study of the project	■	■	■	■	■										
Identification, compensation and acquisition of the rail corridor						■	■	■	■	■	■	■			
Construction period													■	■	■
Defects & Liability Period															
Project M & E													- - -	- - -	- - -

Specific Project / (Id): Nyk3					
Project: Likii informal settlement upgrading & land tenure regularization					
Project Location / Site: Nanyuki Ward					
Project Unit / Quantity: Entire settlement					
Project Description / Detail: Land tenure regularization project and infrastructure upgrading.					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Land tenure regularization				Exchequer	LCG
Infrastructure upgrade				Exchequer	KISIP; KURA; LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Land tenure regularization (ongoing)	■	■	■	■	■	■	■								
Procurement processes for infrastructure upgrade								■	■						
Construction period										■	■	■	■	■	■
Defects & Liability Period													■	■	■
Project M & E	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

PRIORITY PROJECTS FOR UMANDE WARD

Specific Project / (Id): Umd1					
Project: Siting of a wind power farm in Lolldaiga Hills.					
Project Location / Site: Umande Ward					
Project Unit / Quantity: Approx. 508.75 Ha					
Project Description / Detail: Installation of wind power turbines.					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Feasibility study on the power project	Consultancy	-	Approx. 60 million	Exchequer	KENGEN; KeTRACCO; KPLC; LCG

Installation of the wind power turbines and reticulation	-	-	-	Exchequer	KENGEN; KeTRACCO; KPLC; LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasibility Study															
Implementation period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Umd2					
Project: Upgrade the access roads from Ngenia-Umande & from Muramati-Naibor.					
Project Location / Site: Umande Ward					
Project Unit / Quantity: Approx. 15km of tarmac road					
Project Description / Detail: Construction of 15km of tarmac road.					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Construction of the tarmac road	Approx. 15km	50,000,000/km	750,000,000	Exchequer	KURA; KeRRA; LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Road construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Umd3					
Project: Construct an integrated value addition facility in Kalalu (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants					
Project Location / Site: Umande Ward					
Project Unit / Quantity: Approx. 4.04Ha (10 Acres)					
Project Description / Detail: Construction of assorted value addition facilities within Umande shopping Centre					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 4.04Ha (10 Acres)	550,000/acre	5,500,000	Exchequer	LCG
Construction of assorted value addition facilities	10% of the allocated land representing 0.404Ha (4,040m^2)	40,000/m^2	161,600,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Procurement processes															
Construction period															
Defects & Liability Period															

Project M & E																

PRIORITY PROJECTS FOR OL MORAN WARD

Specific Project / (Id): OlM1					
Project: Construct an Integrated value addition facility in Sipili (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants					
Project Location / Site: Ol Moran Ward					
Project Unit / Quantity: Approx. 4.04Ha (10 Acres)					
Project Description / Detail: Construction of assorted value addition facilities within Ol Moran shopping Centre					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 4.04Ha (10 Acres)	550,000/acre	5,500,000	Exchequer	LCG
Construction of assorted value addition facilities	10% of the allocated land representing 0.404Ha (4,040m²)	40,000/m²	161,600,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land	■	■	■												
Compensation and acquisition				■	■										
Procurement processes						■	■								
Construction period								■	■	■	■	■	■	■	■
Defects & Liability Period												■	■	■	■
Project M & E															

Specific Project / (Id): OlM2					
Project: Construct an Integrated livestock facility in Ol Moran (modern abattoir, meat processing, leather tanning, holding ground and laboratory)					
Project Location / Site: Ol Moran Ward					
Project Unit / Quantity: Approx. 8.08Ha					
Project Description / Detail: Identification and acquisition of land for construction of the livestock development and value addition facilities.					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 8.08Ha (20 Acres)	550,000/acre	11,000,000	Exchequer	LCG
Construction of the value addition facilities	5% of the allocated land representing 0.404Ha (4,040m²)	40,000/m²	161,600,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land	■	■	■												
Compensation and acquisition				■	■										
Procurement processes						■	■								
Construction period								■	■	■	■	■	■	■	■
Defects & Liability Period												■	■	■	■
Project M & E															

Specific Project / (Id): OIM3															
Project: Rehabilitate and develop Mliza Meza tourist site in Sipili															
Project Location / Site: Ol Moran Ward															
Project Unit / Quantity: Touristic site															
Project Description / Detail: Rehabilitation of the site.															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors				
Rehabilitation, beautification, landscaping, and construction of associated amenities	-							-	10,000,000	Exchequer	LCG				
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): OIM4															
Project: Develop a cemetery in Ol Moran															
Project Location / Site: Ol Moran Ward															
Project Unit / Quantity: Approx. 2.02Ha															
Project Description / Detail: Identification and acquisition of land for use as a cemetery															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors				
Identification and acquisition of Land	Approx. 2.02 Ha (5 Acres)							550,000/acre	2,750,000	Exchequer	LCG				
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Project M & E															

Specific Project / (Id): OIM5															
Project: Completion of Dam Samaki mega dam															
Project Location / Site: Ol Moran Ward															
Project Unit / Quantity: Approx. 20.23 Ha (50 acres)															
Project Description / Detail: Construction works															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors				
Acquisition of land	Approx. 20.23 Ha (50 acres)							550,000/acre	27,500,000	Exchequer	LCG				
Construction works	-							-	30,000,000	Exchequer	LCG				
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Identification of land																
Compensation and acquisition																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): OlM6																
Project: Tarmac Mutamaiyo-Tumaini-Mukutan road																
Project Location / Site: Ol Moran Ward																
Project Unit / Quantity: Approx. 20km of tarmac road																
Project Description / Detail: Construction of the road																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors					
Construction of tarmac road	Approx. 20km							50,000,000/km	1,000,000,000	Exchequer	KeRRA; KURA; LCG					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

PRIORITY PROJECTS FOR RUMURUTI WARD

Specific Project / (Id): Rmrt1																
Project: Expansion of Rumuruti water and sewerage plant																
Project Location / Site: Rumuruti Ward																
Project Unit / Quantity: Approx. 4.3Ha																
Project Description / Detail: Expansion of the water and sewer treatment plant																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors					
Reticulation of pipeline infrastructure on all roads with road widths of 30m and above	47 Kilometers of 12 inches sewer pipeline							1400/ft	216Milion	▪ Exchequer ▪ Grants ▪ Donor Funds	▪ CGL ▪ NYAHUWASCO ▪ Development Partners					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Rmrt2																
Project: Extend the railway line from Rumuruti to Nanyuki																
Project Location / Site: Rumuruti Ward																
Project Unit / Quantity: Approx. 80Km of Railway line																
Project Description / Detail: Construction of 80Km of Meter gause railway line etc.																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)			Total Cost (Kshs)		Source of Fund		Actors					
Feasibility studies	Consultancy			-			Approx. 60,000,000		Exchequer		LCG					
Construction of the meter gauge railway line	-								Exchequer		Kenya Railways, NLC, LCG					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Feasibility studies of the project																
Identification, Compensation and acquisition of the railway corridor																
Construction period																
Project M & E																

Specific Project / (Id): Rmrt3																
Project: Construct an integrated value addition facility in Thome (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants																
Project Location / Site: Rumuruti Ward																
Project Unit / Quantity: Approx. 4.04Ha (10 acres)																
Project Description / Detail: Construction of assorted value addition facilities within Thome shopping centre																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)			Total Cost (Kshs)		Source of Fund		Actors					
Identification and acquisition of Land	Approx. 4.04Ha (10 Acres)			1,500,000/acre			15,000,000		Exchequer		LCG					
Construction of assorted value addition facilities within Thome shopping centre	10% of the allocated land representing 0.404Ha (4,040m²)			40,000/m²			161,600,000		Exchequer		LCG					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Rmrt4
Project: Fencing of Rumuruti forest
Project Location / Site: Rumuruti Ward
Project Unit / Quantity: Approx. 6290.89Ha (15545.13acres)
Project Description / Detail: Fencing works

Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors					
Fencing works	Approx. 6290.89Ha (15545.13acres)							600,000/acre	9,327,078,000	Exchequer	LCG; KFS					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Procurement processes																
Fencing period																
Project M & E																

Specific Project / (Id): Rmrt5																
Project: Construct an integrated livestock facility in Rumuruti (modern abattoir, meat processing, leather tanning, holding ground and laboratory																
Project Location / Site: Rumuruti Ward																
Project Unit / Quantity: Approx. 8.08Ha (Approx. 20 acres)																
Project Description / Detail: Identification and acquisition of land for construction of the livestock development and value addition facilities																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors					
Identification and acquisition of Land	Approx. 8.08Ha (20 Acres)							1,500,000/acre	30,000,000	Exchequer	LCG					
Construction of the value addition facility	5% of the allocated land representing 0.404Ha (4,040m²)							40,000/m²	161,600,000	Exchequer	LCG					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

PRIORITY PROJECTS FOR GITHIGA WARD

Specific Project / (Id): Gtg1																
Project: Establish a fire sub-station in Kinamba centre																
Project Location / Site: Githiga Ward																
Project Unit / Quantity: Approx. 0.405Ha (1acre)																
Project Description / Detail: Construction of the sub-station																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors					
Construction of the sub-station	5% of the allocated land representing 0.0203Ha (203m²)							35,000/m²	7,105,000	Exchequer	LCG					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Procurement processes																

Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Gtg2															
Project: Construct an integrated value addition facility in Kinamba (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants															
Project Location / Site: Githiga Ward															
Project Unit / Quantity: Approx. 4.04Ha (10 acres)															
Project Description / Detail: Construction of assorted value addition facilities within Kinamba shopping centre.															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)			Total Cost (Kshs)			Source of Fund		Actors			
Identification and acquisition of Land	Approx. 4.04Ha (10 Acres)			1,200,000/acre			12,000,000			Exchequer		LCG			
Construction of the assorted value addition facility	10% of the allocated land representing 0.404Ha (4,040m²)			40,000/m²			161,600,000			Exchequer		LCG			
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Gtg3															
Project: Construct an integrated livestock facility in Kinamba (modern abattoir, meat processing, leather tanning, holding ground and laboratory).															
Project Location / Site: Githiga Ward															
Project Unit / Quantity: Approx. 8.08Ha (Approx. 20 acres)															
Project Description / Detail: Identification and acquisition of land for construction of the livestock development and value addition facilities.															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)			Total Cost (Kshs)			Source of Fund		Actors			
Identification and acquisition of Land	Approx. 8.08Ha (Approx. 20 acres)			1,200,000/acre			24,000,000			Exchequer		LCG			
Construction of the value addition facility	5% of the allocated land representing 0.404Ha (4,040m²)			40,000/m²			166,600,000			Exchequer		LCG			
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Design Preparation															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

PRIORITY PROJECTS FOR MARMANET WARD

Specific Project / (Id): Mmt1						
Project: Fencing project for Marmanet, Lariak and Ol Arabel forests						
Project Location / Site: Marmanet Ward						
Project Unit / Quantity: Approx. 15,065.97Ha (37,228.82 acres)						
Project Description / Detail: Fencing works						
Estimated Total Costs:						
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors	
Fencing works	Approx. 15,065.97Ha (37,228.82 acres)	600,000/acre	22,337,292,000	Exchequer	LCG; KFS	

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Fencing period															
Project M & E															

Specific Project / (Id): Mmt12					
Project: Construct an integrated value addition facility in Ol Jabet (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants).					
Project Location / Site: Marmanet Ward					
Project Unit / Quantity: Approx. 4.04Ha (10 acres)					
Project Description / Detail: Construction of assorted value addition facilities within Ol jabet shopping centre.					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 4.04Ha (10 acres)	2,000,000/acre	20,000,000	Exchequer	LCG
Construction of the assorted value addition facility	10% of the allocated land representing 0.404Ha (4,040m^2)	40,000/m^2	166,600,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Mmt3					
Project: Completion of the ongoing NYAHUWASCO sewer works in Marmanet					
Project Location / Site: Marmanet Ward					
Project Unit / Quantity: Approx. 30Km					
Project Description / Detail: Completion of 30Km of sewer and water pipelines					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Laying of water pipeline	30km	-	150,000,000	Exchequer	LCG, NYAHUWASCO

Laying of sewer pipeline	30km	-	150,000,000	Exchequer	LCG, NYAHUWASCO	

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Mmt4					
Project: Slum upgrading of Kandutura informal settlement					
Project Location / Site: Marmanet Ward					
Project Unit / Quantity: Entire settlement					
Project Description / Detail: Land tenure regularization project and infrastructure upgrading					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Land tenure regularization	-	-	-	Exchequer	LCG
Infrastructure upgrade	-	-	-	Exchequer	KISIP; KURA; LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Land tenure regularization															
Procurement processes for infrastructure upgrade															
Construction period															
Defects & Liability Period															
Project M & E															

PRIORITY PROJECTS FOR IGWAMITI WARD

Specific Project / (Id): Igm1					
Project: Construct an integrated value addition facility in Karuga (cold rooms, milk coolants, chicken incubators, cereal aggregation facility & processing and packaging plants)					
Project Location / Site: Igwamiti Ward					
Project Unit / Quantity: Approx. 4.04Ha (10 acres)					
Project Description / Detail: Construction of assorted value addition facilities within Karuga shopping centre					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 4.04Ha (10 acres)	1,800,000/acre	18,000,000	Exchequer	LCG
Construction of the assorted value addition facility	10% of the allocated land representing 0.404Ha (4,040m^2)	40,000/m^2	166,600,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															

Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Igm2															
Project: Rehabilitate the eco-tourism center in Manguo community															
Project Location / Site: Igwamiti Ward															
Project Unit / Quantity: Entire eco-tourism centre															
Project Description / Detail: Rehabilitation of the eco-tourism centre															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)			Total Cost (Kshs)		Source of Fund		Actors				
Rehabilitation, beautification, landscaping, and construction of associated amenities.	-			-			10,000,000		Exchequer		LCG				
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Igm3															
Project: Extend the railway line from Nyahururu to Rumuruti															
Project Location / Site: Igwamiti Ward															
Project Unit / Quantity: Approx. 45Km of railway line															
Project Description / Detail: Construction of 45km of meter gauge railway line etc.															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)			Total Cost (Kshs)		Source of Fund		Actors				
Feasibility study	Consultancy			-			Approx. 60,000,000		Exchequer		LCG				
Construction of the meter gauge railway line	45km										Kenya Railways; NLC; LCG				
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasibility study of the project															
Identification, compensation and acquisition of the railway corridor															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Igm4															
Project: Extend reticulation of Nyahururu water and sewer treatment plant															
Project Location / Site: Igwamiti Ward															
Project Unit / Quantity: Approx. 30Km of sewer and water pipelines															
Project Description / Detail: Construction of 30Km of sewer and water pipelines.															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors					
Laying of the water pipeline	30km			-		150,000,000		Exchequer		LCG, NYAHUWASCO					
Laying of the sewer pipeline	30km			-		150,000,000		Exchequer		LCG, NYAHUWASCO					
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

PRIORITY PROJECTS FOR SALAMA WARD

Specific Project / (Id): Slm1															
Project: Establish a fodder farm in Mutara.															
Project Location / Site: Salama Ward															
Project Unit / Quantity: Approx. 404.69Ha (1000 acres)															
Project Description / Detail: Identification and acquisition of land for establishment of the fodder farm															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors					
Identification and acquisition of Land	Approx. 404.69Ha (1000 Acres)			1,500,000/acre		1,500,000,000		Exchequer		LCG; PPP					
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Project M & E															

Specific Project / (Id): Slm2						
Project: Tarmac Ngareng'iro-Mutara section of the B22 road						
Project Location / Site: Salama Ward						
Project Unit / Quantity: Tarmac approx. 30km of the road						
Project Description / Detail: Construction of 30km of tarmac road						
Estimated Total Costs:						
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors	
Construction of the road	30km	50,000,000/km	150,000,000	Exchequer	LCG; KeRRA; KURA	
Implementation Schedule						
Project component	2023/24	2024/25	2025/26	2026/27		

	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): SIm3					
Project: Construct an integrated value addition facility in Pesi (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants					
Project Location / Site: Salama Ward					
Project Unit / Quantity: Approx. 4.04Ha (10 acres)					
Project Description / Detail: Construction of assorted value addition facilities within Pesi shopping centre					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 4.04Ha (10 acres)	1,500,000/acre	15,000,000	Exchequer	LCG
Construction of the assorted value addition facility	10% of the allocated land representing 0.404Ha (4,040m^2)	40,000/m^2	166,600,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): SIm4					
Project: Construct an integrated livestock facility in Mutara (modern abattoir, meat processing, leather tanning, holding ground and laboratory).					
Project Location / Site: Salama Ward					
Project Unit / Quantity: Approx. 8.08Ha (Approx. 20 acres)					
Project Description / Detail: Identification and acquisition of land for construction of the livestock development and value addition facilities.					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 8.08Ha (Approx. 20 acres)	1,500,000/acre	15,000,000	Exchequer	LCG
Construction of the livestock facility	5% of the allocated land representing 0.404Ha (4,040m^2)	40,000/m^2	166,600,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Procurement processes															
Construction period															
Defects & Liability Period															

Project M & E															

PRIORITY PROJECTS FOR MUKOGODO EAST WARD

Specific Project / (Id): MkgE1															
Project: Rehabilitate the water pipeline in Doldol															
Project Location / Site: Mukogodo East															
Project Unit / Quantity: Approx. 15km of water pipeline															
Project Description / Detail:															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors					
Purchase of the pipes															
Laying of 15km of water pipeline	15km of water pipeline			-		100,000,000		Exchequer		LCG					
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Purchase and laying of the water pipeline															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): MkgE2															
Project: Establish a cultural center in Doldol (with a shanga market, eco-lodge & cultural manyatta)															
Project Location / Site: Mukogodo East															
Project Unit / Quantity: Approx. 2.02Ha (5 acres)															
Project Description / Detail: Identification and acquisition of land for establishment of the cultural centre															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors					
Identification and acquisition of Land	Approx. 2.02Ha (5 acres)			1,200,000/acre		6,000,000		Exchequer		LCG					
Construction of the cultural centre and associated facilities	30% of the allocated land representing 2.02Ha (6,060m²)			35,000/m²		212,100,000		Exchequer		LCG					
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): MkgE3
Project: Opening up a new road from Timau-Chumvi-Arjiju

Project Location / Site: Mukogodo East															
Project Unit / Quantity: Approx. 35km															
Project Description / Detail: Construction of 35km of access road															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)			Total Cost (Kshs)		Source of Fund		Actors				
Construction of the road	35km			30,000,000/Km			1,050,000,000		Exchequer		LCG; KeRRA				
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Road construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): MkgE4															
Project: Upgrade and tarmac Timau-Ethi-Ngare Ndare road															
Project Location / Site: Mukogodo East															
Project Unit / Quantity: Approx. 32km															
Project Description / Detail:															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)			Total Cost (Kshs)		Source of Fund		Actors				
Tarmacking of the road	32km			50,000,000/Km			1,600,000,000		Exchequer		LCG				
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Road construction and tarmacking period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): MkgE5															
Project: Construct an integrated livestock facility in Doldol (modern abattoir, meat processing, leather tanning, holding ground and laboratory).															
Project Location / Site: Mukogodo East															
Project Unit / Quantity: Approx. 8.08Ha (Approx. 20 acres)															
Project Description / Detail: Identification and acquisition of land for construction of the livestock development and value addition facilities.															
Estimated Total Costs:															
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)			Total Cost (Kshs)		Source of Fund		Actors				
Identification and acquisition of Land	Approx. 8.08Ha (Approx. 20 acres)			1,200,000/acre			24,000,000		Exchequer		LCG				
Construction of the livestock facility	5% of the allocated land representing 0.404Ha (4,040m^2)			40,000/m^2			166,600,000		Exchequer		LCG				
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Identification of land															
Compensation and acquisition															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

PRIORITY PROJECTS FOR MUKOGODO WEST WARD

Specific Project / (Id): MkgW1					
Project: Establish an industrial park in Kimanjo area					
Project Location / Site: Mukogodo West					
Project Unit / Quantity: Approx. 202.3Ha (500 acres)					
Project Description / Detail: Identification and acquisition of land for construction of an industrial park.					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Feasibility Study	Consultancy	-	Approx. 100,000,000	Exchequer; Donor funds	LCG
Identification and acquisition of Land	Approx. 202.3Ha (500 acres)	1,000,000/acre	50,000,000	Exchequer	LCG
Construction of an industrial park	50% of the allocated land representing 101.15Ha (1,011,500m^2)	40,000/m^2	40,460,000,000	Exchequer; PPP	LCG; PPP

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasibility study															
Identification, compensation and acquisition of land															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): MkgW3					
Project: Extend the railway line from Nanyuki-Il Polei, Doldol and Kimanjo					
Project Location / Site: Mukogodo West					
Project Unit / Quantity: Approx. 80km of rail line					
Project Description / Detail: Construction of 80km of meter gauge rail line etc.					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Feasibility study	Consultancy	-	Approx. 60 million		
Construction of the meter gauge railway line	-	-	-	-	Kenya Railways; NLC; LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Feasibility study of the project																
Identification, compensation and acquisition of the rail corridor																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): MkgW4																
Project: Construct an integrated livestock facility in Kimanjo (modern abattoir, meat processing, leather tanning, holding ground and laboratory).																
Project Location / Site: Mukogodo West																
Project Unit / Quantity: Approx. 8.08Ha (Approx. 20 acres)																
Project Description / Detail: Identification and acquisition of land for construction of the livestock development and value addition facilities.																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors		
Identification and acquisition of Land	Approx. 8.08Ha (Approx. 20 acres)							1,200,000/acre		24,000,000		Exchequer		LCG		
Construction of the livestock facility	5% of the allocated land representing 0.404Ha (4,040m²)							40,000/m²		166,600,000		Exchequer		LCG		
Implementation Schedule																
Project component	2023/24			2024/25				2025/26						2026/27		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): MkgW5																
Project: Upgrade the murram road from Il Polei-Kimanjo-Kirimon																
Project Location / Site: Mukogodo West																
Project Unit / Quantity: Approx. 40km																
Project Description / Detail: Construction of 40km of access road																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors		
Construction of the road	40km							20,000,000/Km		800,000,000		Exchequer		LCG; KeRRA		
Implementation Schedule																
Project component	2023/24			2024/25				2025/26						2026/27		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Procurement processes																
Road construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): MkgW6						
Project: Upgrade the murram road from Il Polei-Musul-Oldonyiro.						
Project Location / Site: Mukogodo West						
Project Unit / Quantity: Approx. 30km						
Project Description / Detail: Construction of 30km of access road						
Estimated Total Costs:						
Work Component / Project Works	Unit/Qty		Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Construction of the road	30km		20,000,000/Km	600,000,000	Exchequer	LCG; KeRRA

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Procurement processes															
Road construction period															
Defects & Liability Period															
Project M & E															

PRIORITY PROJECTS FOR SEGERA WARD

Specific Project / (Id): Seg1					
Project: Establish the proposed university in Naibor					
Project Location / Site: Segera Ward					
Project Unit / Quantity: Approx. 653.82Ha (1615.62 acres)					
Project Description / Detail: Phased construction of university facilities					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Construction of university facilities	80% of Approx. 653.82Ha (1615.62 acres) at 523.06Ha (5,230,600m^2)	35,000/m^2	183,071,000,000	Exchequer; Donor Funds; Grants	LCG, MoE, PPP

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasibility Study															
Design Preparation															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Seg2					
Project: Establish a fodder farm in Ndikir area.					
Project Location / Site: Segera Ward					
Project Unit / Quantity: Approx. 404.69Ha (1000 acres)					
Project Description / Detail: Identification and acquisition of land for establishment of the fodder farm					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 404.69Ha (1000 Acres)	2,000,000/acre	2,000,000,000	Exchequer	LCG; PPP

Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Project M & E																

Specific Project / (Id): Seg3					
Project: Construct an integrated livestock facility in Naibor (modern abattoir, meat processing, leather tanning, holding ground and laboratory).					
Project Location / Site: Segera					
Project Unit / Quantity: Approx. 8.08Ha (Approx. 20 acres)					
Project Description / Detail: Identification and acquisition of land for construction of the livestock development and value addition facilities.					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 8.08Ha (Approx. 20 acres)	2,000,000/acre	40,000,000	Exchequer	LCG
Construction of the livestock facility	5% of the allocated land representing 0.404Ha (4,040m²)	40,000/m²	166,600,000	Exchequer	LCG

Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Seg4					
Project: Construct an integrated value addition facility in Naibor (cold rooms, milk coolants, chicken incubators, cereal aggregation facility, cereal board & agro-processing and packaging plants					
Project Location / Site: Segera Ward					
Project Unit / Quantity: Approx. 4.04Ha (10 acres)					
Project Description / Detail: Construction of assorted value addition facilities within Pesi shopping centre					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 4.04Ha (10 acres)	2,000,000/acre	20,000,000	Exchequer	LCG
Construction of the assorted value addition facility	10% of the allocated land representing 0.404Ha (4,040m²)	40,000/m²	166,600,000	Exchequer	LCG

Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Procurement processes																
Construction period																

Defects & Liability Period															
Project M & E															

Specific Project / (Id): Seg5					
Project: Establish a Beading centre and market at Naibor					
Project Location / Site: Segera Ward					
Project Unit / Quantity: Approx. 0.4048Ha (1 acre)					
Project Description / Detail: Identification and acquisition of land for construction of beading centre					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 0.4048Ha (1 acre)	2,000,000/acre	2,000,000	Exchequer	LCG
Construction of beading centre and market	10% of the allocated land representing 0.04048Ha (3,800m²)	35,000/m²	133,000,000	Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Procurement processes															
Construction period															
Defects & Liability Period															
Project M & E															

Specific Project / (Id): Seg6					
Project: Establish a landfill in Naibor					
Project Location / Site: Sosian Ward					
Project Unit / Quantity: Approx. 41.8Ha (103.29 acres)					
Project Description / Detail: Identification and acquisition of land for establishment of a landfill					
Estimated Total Costs:					
Work Component / Project Works	Unit/Qty	Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors
Identification and acquisition of Land	Approx. 41.8Ha (103.29 acres)	2,000,000/acre	206,400,000	Exchequer	LCG; NEMA
Fencing of the landfill				Exchequer	LCG

Implementation Schedule

Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Identification of land															
Compensation and acquisition															
Procurement processes															
Fencing of the landfill															
Project M & E															

PRIORITY PROJECTS FOR SOSIAN WARD

Specific Project / (Id): Sos1
Project: Establish a fodder farm in Kinamba Sosian and Louniek.

Project Location / Site: Sosian Ward																
Project Unit / Quantity: Approx. 404.69Ha (1000 acres)																
Project Description / Detail: Identification and acquisition of land for establishment of the fodder farm																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors					
Identification and acquisition of Land	Approx. 404.69Ha (1000 Acres)							1,000,000/acre	1,000,000,000	Exchequer	LCG; PPP					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Project M & E																

Specific Project / (Id): Sos2																
Project: Upgrade the murram road from Maundu Ni Meri-Kinamba Sosian-Mouwarak.																
Project Location / Site: Sosian Ward																
Project Unit / Quantity: Approx. 40km																
Project Description / Detail: Construction of 40km of access road																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors					
Construction of the road	40km							20,000,000/Km	800,000,000	Exchequer	LCG; KeRRA					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Procurement processes																
Road construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Sos3																
Project: Opening up of new roads from Maundu Ni Meri-Ngalemare & Posta-Loisaba-Kirimon & Posta-Rabal.																
Project Location / Site: Sosian Ward																
Project Unit / Quantity: Approx. 55m																
Project Description / Detail: Construction of 55km of access road																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty							Unit Cost (Kshs)	Total Cost (Kshs)	Source of Fund	Actors					
Construction of the road	55km							20,000,000/Km	1,100,000,000	Exchequer	LCG; KeRRA					
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Procurement processes																
Road construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Sos4																
Project: Establish a landfill in Kinamba Sosian																
Project Location / Site: Sosian Ward																
Project Unit / Quantity: Approx. 54.61Ha (134.94 acres)																
Project Description / Detail: Identification and acquisition of land for establishment of a landfill																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)				Total Cost (Kshs)		Source of Fund		Actors				
Identification and acquisition of Land	Approx. 54.61Ha (134.94 acres)			1,000,000/acre				135,000,000		Exchequer		LCG; NEMA				
Fencing of the landfill										Exchequer		LCG				
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Procurement processes																
Fencing of the landfill																
Project M & E																

Specific Project / (Id): Sos5																
Project: Construct an integrated livestock facility in Mouwarak (modern abattoir, meat processing, leather tanning, holding ground and laboratory).																
Project Location / Site: Sosian Ward																
Project Unit / Quantity: Approx. 8.08Ha (Approx. 20 acres)																
Project Description / Detail: Identification and acquisition of land for construction of the livestock development and value addition facilities.																
Estimated Total Costs:																
Work Component / Project Works	Unit/Qty			Unit Cost (Kshs)				Total Cost (Kshs)		Source of Fund		Actors				
Identification and acquisition of Land	Approx. 8.08Ha (Approx. 20 acres)			1,000,000/acre				20,000,000		Exchequer		LCG				
Construction of the livestock facility	5% of the allocated land representing 0.404Ha (4,040m^2)			40,000/m^2				166,600,000		Exchequer		LCG				
Implementation Schedule																
Project component	2023/24			2024/25				2025/26				2026/27				
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Identification of land																
Compensation and acquisition																
Procurement processes																
Construction period																
Defects & Liability Period																
Project M & E																

Specific Project / (Id): Sos6
Project: Veterinary informal settlement upgrading & land tenure regularization
Project Location / Site: Nanyuki Ward
Project Unit / Quantity: Entire settlement

Project Description / Detail: Land tenure regularization project and infrastructure upgrading.															
Estimated Total Costs:															
Work Component / Project Works			Unit/Qty				Unit Cost (Kshs)		Total Cost (Kshs)		Source of Fund		Actors		
Land tenure regularization			-				-		-		Exchequer		LCG		
Infrastructure upgrade			-				-		-		Exchequer		KISIP; KURA; LCG		
Implementation Schedule															
Project component	2023/24			2024/25				2025/26				2026/27			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Land tenure regularization															
Procurement processes for infrastructure upgrade															
Construction period															
Defects & Liability Period															
Project M & E															

15.6 Summary of the Capital Costs

Table 15-1: Summary of the Project Capital Costs for Laikipia County Spatial Plan

NO.	SECTOR	2023/24 (Kshs)	2024/25 (Kshs)	2025/26 (Kshs)	2026/27(Kshs)	TOTAL (Kshs.)
1.	Land: Acquisition & Compensation	-	3,711,884,550	2,907,560,010	-	**6,619,444,560**
2.	Transportation Infrastructure: Central Terminal; Roads; Lighting and Storm drainage improvement	108,000,000	3,294,500,000	3,756,250,000	781,250,000	**7,940,000,000**
3.	Livelihoods & Socio-economic development (Market Development)	-	1,638,000,000	12,797,705,600	35,920,794,400	**50,356,500,000**
4.	Sanitation	-	189,857,150	254,142,850	172,000,000	**616,000,000**
5.	Infrastructure utilities (wind and solar power farms, landfills, & fire sub-station)	24,000,000	38,368,300	850,136,700	504,000,000	**1,416,505,000**
6.	Education Facility	-	-	78,459,000,000	104,612,000,000	**183,071,000,000**
7.	Biodiversity conservation	-	10,554,790,000	10,554,790,000	10,554,790,000	**31,664,370,000**
	TOTAL (Kshs.)	**132,000,000**	**19,427,400,000**	**109,579,585,160**	**152,544,834,400**	**281,683,819,560**

15.7 Monitoring and Evaluation

Spatial planning is a dynamic and iterative process that requires monitoring to provide feedback on the implementation progress and allows for timely modifications of the implementation log frame. A monitoring and evaluation committee will be established to evaluate the success of the CSP within the stated 10-year period. It will comprise of representatives from the Plan Implementation Technical team, the consultancy team, National Government MDAs, development partners, and community members. This committee will ensure that the implementation schedule is adhered to and that prioritized projects are completed.

- **Output Indicators**

Determination of the environmental, economic, spatial and social impacts of the County Spatial Plan is essential in tracking its implementation success. These impacts are summarized in the table below.

Impacts	Expected Outcomes	Indicators
Environmental Impacts	Protected and conserved forested areas	▪ Gazettement of forests. ▪ Increased forest cover in the County. ▪ Increased carbon trading revenue. ▪ Increased eco-tourism activities in Mukogodo Forest. ▪ Maintenance of the ecosystem services and cultural values of forests.
	Sustainably utilized and conserved riparian ecosystems	▪ Rehabilitated river banks. ▪ Green buffer zones along riparian reserves. ▪ Gabions constructed along rivers. ▪ Regulated abstraction by upstream users. ▪ EIA & EA reports on riparian ecosystems. ▪ Fenced and protected springs. ▪ Dams and pans constructed along river basins.
	Protected wetland ecosystems	▪ Declaration of the existing swamps as protected wetland areas (CITES). ▪ A County Wetlands Management Plan. ▪ Constructed dams or pans downstream to store excess surface runoff/overflow. ▪ EIA & EA reports on wetland ecosystems.

Impacts	Expected Outcomes	Indicators
		▪ Improved irrigation systems around wetlands (sprinklers and drips). ▪ Planted tree species that consume less water. ▪ Increased civil awareness of wetland ecosystem management.
	Sustainably managed rangelands	▪ Reseeded community rangelands. ▪ Control and eradication of invasive species. ▪ A County invasive species management plan. ▪ Controlled grazing in community ranches. ▪ Land Use Plans for community plans. ▪ Stakeholder collaboration efforts for the eradication of invasive species.
	Improved wildlife conservation	▪ Protected wildlife breeding and dispersal areas. ▪ Delineated dual-purpose wildlife migratory corridors and dispersal areas. ▪ Reclaimed wildlife migratory corridors. ▪ Continuous/interconnected wildlife habitats. ▪ Recognition of wildlife conservation as a significant land use in the County. ▪ Increased number of tourists visiting Laikipia County.
Economic Impacts	Increased investment opportunities in the County	▪ Newly contructed markets and rehabilitated market infrastructure. ▪ Operationalized green produce and cereal markets. ▪ Increased employment opportunities in the County. ▪ Increased number of investors in the County. ▪ Increased number of MSMEs in the County. ▪ Diversified economic activities. ▪ Increased agricultural production. ▪ Established cottage industries and integrated agro-processing facilities. ▪ Mapped and zoned industrial parks. ▪ Established business incubation and innovation centers in Nanyuki, Nyahururu and Rumuruti.

Impacts	Expected Outcomes	Indicators
Spatial Impacts	Sustainable and integrated land use management	▪ Delineated and re-classified urban centers. ▪ Local Physical and Land Use Plans for urban centres. ▪ Timely approval of Local Pysical and Land Use Development plans. ▪ Implementation of Rumuruti Local Physical and Land Use Development Plan. ▪ A digital County Land Information System. ▪ Fastened process of issuance of title deeds, allotment letters and leases.
	Improved connectivity and accessibility	▪ Reclassified roads in the County. ▪ Upgraded road networks. ▪ Paved streets in all urban centres. ▪ NMT provisions in streets and urban roads. ▪ Rehabilitated bus parks and parking zones.
Social Impacts	Improved access to social services and utilities for the people of Laikipia County	▪ Presence of mobile social services (mobile maternity clinics, veterinary services and water bowsers) to cater for the dispersed settlements of pastoralists in Laikipia North. ▪ Established gender-based violence recovery centers in all the sub-counties' headquarters. ▪ Constructed social halls, ICT centers and green parks in all urban centres. ▪ Increased water and sewer reticulation networks in the urban centers. ▪ A comprehensive County waste management strategy. ▪ Informal settlements upgrading and improvement projects.

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