GOVERNMENT OF KENYA

COUNTY GOVERNMENT OF KAJIADO

NGONG' MUNICIPALITY INTEGRATED STRATEGIC URBAN DEVELOPMENT PLAN

2020-2030

VISION

A well-planned livable 24-hour regional hub with quality, sustainable and affordable services

DECEMBER,2020

FOREWORD

I am pleased to introduce this 10-year plan which is a road map on how Ngong' Municipality is geared to develop. This is the first comprehensive Spatial Plan for Ngong' Municipality and it has been prepared at the time when the County is grappling with challenges of tackling rapid urbanisation in the three towns of Ngong', Ongata Rongai and Kiserian, which constitute Ngong' Municipality. I am happy to note that the preparation of the plan has been done in a participatory manner taking into account the contributions of various stakeholders whose role in the implementation of the plan proposals is fundamental.

Kajiado County has witnessed rapid urbanisation in the last few decades with people moving in to settle, setting up residential areas, businesses, industries, and other development activities. Ngong' Municipality has taken the bulk of urbanisation. With the onset of devolution, Ngong has witnessed high population growth and economic activities, resulting in a lot of development and change in three towns' characters.

However, most of this urbanisation is happening in the peri-urban areas with little or no planning taking place, which is characterised by piecemeal subdivision and change of user process due to absence of planning framework and development and Integrated Strategic Urban Development Plan (ISUDP) to guide and manage this rapid urbanisation trend, current development in these areas will suffer from uncoordinated growth, land use conflict, inadequate basic infrastructure facilities and services, poor housing and loss of agricultural lands amongst other challenges. The County Government is thus expected to commit more investments to cope with this rapid growth. More people need to be accommodated in a suitable environment with ease of movement, adequate physical and social infrastructure and create room for additional employment opportunities.

The Ngong's ISUDP; 2020 – 2030 is prepared within Kenya's global commitments, existing policy and legal framework, which includes inter-alia global commitments to sustainable development, Kenya's Vision 2030, Constitution of Kenya, 2010, County Government Act, 2012, Urban Areas and Cities Act, 2011, Physical and Land Use Planning Act, 2019, and other applicable statutes that form the legislative framework within, which the County will be able to implement it. This, therefore, gives the County and Municipal Board the necessary tools to correct and provide a framework of addressing the current development trends.

This Plan has taken into cognisance the resources and opportunities that potentially the Municipality can exploit in addressing these problems and unitising the resources sustainably. This Plan will, therefore, enable the County to direct development growth to the most appropriate locations and improve service delivery.

Some of the key components of this Plan are the sectoral programmes and projects whose objectives are to ensure integration and coordination of development priorities. Another key component is institutionalising the County Planning Unit (CPU) as provided under Clause 105 of the County Governments Act, which will ensure consistency across the entire planning and implementation cycles. This means that sectoral strategies will be implemented within a spatial framework and in turn, would reflect the socio-economic analysis across the entire Municipality. The Plan has also identified several action areas and quick-win projects, which will ensure fast-tracking of the implementation of the identified priorities, setting the pace for the realisation of the medium and long-term projects.

My administration acknowledges with appreciation the support of the World Bank for the support in preparing this Plan I commend the National Government through the Ministry of Transport, Infrastructure, Public Works, Housing and Urban Development and Directorate of Nairobi Metropolitan Development, for providing technical and supervisory roles. The County Department

of Land, Housing and Physical Planning led by CECM Mr Hamilton Parseina and his staff have played a pivotal role in steering the planning process thereby seeing the successful completion the preparation of this Plan.

I appreciate all other stakeholders namely; professional bodies, resident associations, the business community, community-based organisations, and wananchi, for their engagement and valuable-inputs during various preparation stages. My Government pledges to ensure during the course of implementation of this Plan that it will continue to involve and collaborate with all stakeholders to achieve the full realisation of the vision and objectives.

The implementation of this Plan will, without doubt, bring about positive change and improvement in our people's lives.

I welcome all to support this noble course in realizing the vision of this Plan.

Hon. Joseph Ole Lenku

Governor, Kajiado County

CERTIFICATION

This Plan has been prepared and published as per the requirements of the Physical and Land Use Act of 2019.

Paul G. Chege

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Signed Date

Registered Physical Planner

No. 0106

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Signed Date

County Director of Physical and Land Use Planning

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Signed Date

CEC in charge of Physical and Land Use Planning

APPROVAL

This Plan has been approved as per requirements of the County Governments Act No. 17 of 2012.

Recommended by:

Name: …….

…… ……..

Signed Date

County Director, Physical and Land Use Planning

Approved by:

Mr Hamilton Parseina

Name: ……

…… ……..

Signed Date

CECM, Lands, Physical Planning, Housing & Urban Development

Approved Plan

No……...…….

ACKNOWLEDGEMENTS

I wish to express my gratitude to everybody who has been instrumental in making this assignment a success. Special thanks go to the Ministry of Transport, Infrastructure, Public Works, Housing & Urban Development (MoTIPWH&UD) for the support in the preparation of this Integrated Strategic Urban Development Plan (ISUDP).

I further acknowledge the technical support provided by the Nairobi Metropolitan Service Improvement (NaMSIP) team led by Eng. Benjamin Njenga (Director), Plan. Ann Mugo (Project Supervisor) and Dr Anthony Moire (Deputy Project Supervisor) for their guidance, encouragement, and advice throughout the duration of preparation of this ISUDP.

In addition, deep gratitude is expressed to the County Government of Kajiado under the able leadership of Arch. Mugo (Chairman Municipal Board) Mr David Kobaai (Municipal Manager) Mr Parsimei Municipal Manager Kajiado, Director of Planning, Isaac Parashina and Planner Fred Swala and all the Technical Working Group members for their insightful and constructive critique of various reports produced in the course of the assignment.

The County is grateful to VisionRI and Urban Lines Consultants team led by Architect/Planner Requito Bellosillo (Team Leader), Planner Paul G. Chege (Deputy Team Leader), Mr Jitender Pal Singh Economist/Business Analyst, Dr Joseph K. Kurauka (Environmental Expert) Dr Luke Obala (Land Economist), Mr Elijah Kimani Mutuango Social Expert, Mr Imtiyaz Ahmed (Transport Planner); Dennis Wakaba and Robert Ndalo (Urban Designers). Special mention goes to all Cluster Planning team members Dr Silas Muketha, Daniel Kabiru, Grace Katheu, Johnson Maina, Vintage Wanjiku and Francis Muchiri (Communications) who worked diligently to produce this report.

Special thanks are extended to all respondents including the Municipal Board, different County Departments and agencies who patiently met the members of the planning team and provided useful information that was essential in carrying out this planning exercise.

I further register our gratitude to the various stakeholders, too many to mention individually, who took part in public consultations for their invaluable contribution and cooperation. Their input contributed enormously towards the successful completion of this ISUDP.

Mr Hamilton Parseina

CECM, Lands, Physical Planning, Housing & Urban Development

EXECUTIVE SUMMARY

Chapter 1: Planning Framework

The preparation of the Ngong Municipality Integrated Strategic Urban Development Plan (ISUDP) 2020 - 2030, meets a broader initiative that addresses key urban development issues in the three towns of Ngong, Ongata Rongai, and Kiserian. This ISUDP is part of the assignment 'Consulting Services for the Preparation of ISUDPs for 12 Towns in four Clusters within the Nairobi Metropolitan Region (NMR)". The four clusters and towns within include:

- Cluster 1: Juja, Ruiru, and Nairobi-Thika Transport Corridor in Kiambu County;
- Cluster 2: Kikuyu, Limuru, and Karuri in Kiambu County;
- Cluster 3: Ngong' and Kitengela in Kajiado County; and
- Cluster 4: Mavoko and Nairobi-Malili Transport Corridor in Machakos County.

This ISUDP has been prepared by the County Government of Kajiado with technical support from Nairobi Metropolitan Service Improvement Project (NaMSIP), the Ministry of Transport, Infrastructure, Public Works, Housing and Urban Development (MoTIPWH&UD), under the aegis of Directorate of Nairobi Metropolitan Development (DoNMED), with support from the World Bank. The Consultant VisionRI Connexion Service Private Limited of India was commissioned by the MoTIPWH&UD to provide consultancy services in the preparation of this ISUDP.

This ISUDP is part of NaMSIP's Component 1 whose aim is to support towns within the NMR in Institutional Reforms and Planning, dealing with infrastructure and governance capabilities in the metropolitan area.

It has been prepared through a participatory planning approach taking in account consultative engagements of key stakeholders involving Kajiado County Technical Working Group (CTWG), State Departments and agencies, private sector, local communities, and their associations, the World Bank and NaMSIP.

Geographical Coverage: Ngong' Municipality is in Kajiado County. The County is between longitudes 36° 36' 21" E, 36° 51' 0" E and latitudes 1° 18' 20" S, 1° 27' 35" S. Kajiado borders Kiambu County to the north and Nairobi County is 17 km to the northeast.

The Municipality lies within Kajiado North Sub-County and covers Ngong, Oloolua, Olkeri, Nkaimurunya, and Ongata Rongai Wards, and Kajiado West Sub-County covering southern regions of Ewuaso Oo Nkidong'I, and a part of Keekonyokie Ward.

Urbanisation Process of Ngong Municipality: Ngong Municipality consists of three major urban centres namely; Ngong, Ongata Rongai, and Kiserian. These towns are witnessing rapid urbanisation characterised by their distinct advantages indicating their potential for growth and development. Ngong is mainly an administrative and commercial town, while Ongata Rongai and Kiserian are service towns. All these towns serve as a major residential hub for NMR with a thriving real estate economy.

The Municipality presents budding opportunities for heritage conservation and tourism development, considering the wind farm with thirty wind turbines installed across Ngong' Hills, traditional colonial-style houses, and is viewed as a water tower in this region. This makes it both a residential hub and an industrial town for the cottage as well as light agro-industrial activities.

Objectives and scope of the ISUDP: The objectives and scope of the ISUDP are:

- To determine demographic changes in the last ten years and those expected over the life of the plan for the Municipality, and how these relate to economic changes, welfare, and administrative shifts;
- To identify development constraints and potentials (social, economic, environmental and infrastructure profiling) and propose strategies to address them;
- To provide a basis for infrastructure and service provision for present and planned population over the plan period;
- To allocate sufficient space for various land uses, including recreation and open spaces to ensure efficient function and convenience of users and accommodate future growth;
- To uphold innovative civic and urban design that enhances the character and form of the Municipality;
- To provide a basis for development control and investment decisions; and
- To develop a plan implementation and monitoring framework.

The Methodology: The development of this ISUDP underpinned the importance of invoking a participatory approach throughout the process. The process involved metropolitan-wide studies with the aim of contextualising the area's environmental setting, transportation linkages and functional role within the NMR. This is described in the following steps:

- **Planning approach:** The approach commences by defining the economic context of the ISUDP. It then identifies the economic strengths that form the identified clusters and their roles within the larger metropolitan area. Finally, the approach analyses the economics of identified towns and corridors against individual challenges and constraints. The entire approach is vetted in line with the NMR.
- **Planning model:** The ISUDP model ensures that the developmental inter-relationships within the planning area are sufficiently considered and that the identified development strategies are properly implemented. Thus, the model merges the planning context and situation analysis to form the basis for the preparation of this ISUDP, effectively guiding crafting of the Integrated Development Analysis, which informs the Spatial Planning Framework as developed. This provides the overall policy direction that guides development initiatives within the planning area against a clear timeframe.
- **Planning process:** This involves 11 steps i.e., organising the project planning team; developing the project design; stakeholder consultations; and conducting thematic studies, development of vision and objectives; formulation of development alternatives; draft plan preparation and development of proposals, amongst others.
- **Planning Framework:** The ISUDP was prepared within the context of Kenya Vision 2030, Nairobi Metro 2030 and the Spatial Planning Concept (SPC) for NMR. The Nairobi Metro 2030 provides policy direction for the development of the metropolis to support Kenya Vision 2030 while the SPC for NMR provides the physical direction for the region's development in line with Kenya Vision 2030 and Nairobi Metro 2030.
- Widely, the Ngong' ISUDP would fit within the context of international, regional (Eastern Africa) and national development trends, while taking cognisance of related local-level plans. this ISUDP seeks to achieve the goals of the New Urban Agenda for sustained, inclusive and sustainable economic growth.

Chapter 2: Contextual Analysis

This ISUDP has been prepared against the backdrop of the country's demographics and projected growth dynamics. It takes into account the development forecasts drawn from the national census. It further looks at a review of governance structures, infrastructure systems, and support, as well as general service provision resources, realigned, benchmarked against global best practice. It also identifies focus sectors for stirring the required growth in Ngong' Municipality.

Local Economy: The main economic sectors include commerce, real estate, hospitality, transportation, and light industrial activities. However, agriculture and livestock remain a major sector of the local economy. These sectors are the main catalysts of the economic growth in the Municipality. This ISUDP refines the parameters of growth of the Municipality by defining the growth trajectory into an administrative; tourism; service and commercial hubs.

Real estate development will continue to serve as a driver of the Municipality's economic development. The ISUD proposes eco-friendly industrial activities and sports opportunities, which will benefit from the diverse local environment. It recognises the relationship and influence of the urban areas to others in the hinterland from an environmental, economic, social and infrastructural perspective.

International, National, and Regional Development Trends: This ISUDP has analysed the definition of urbanisation, benchmarking against best practices from appropriate global cities and towns. It also reviews some of the merits and demerits of different development models used, based on factors such as population growth and expansion, urban services provision, housing availability, and global urbanisation protocols.

Regional Trends: The ISUDP analysed regional urban growth trends. It examines the country's demographics against period projections in order to guide effective plan modelling.

Long-term Development Strategy of the Government of Kenya: The ISUDP is aligned with the Government of Kenya's long-term development strategy known as 'Vision 2030'. It also bolsters the country's economic growth by planning along the priority themes for stimulated growth as per the national strategy.

Short-Term Development Strategy of the Government of Kenya: In the short-term, Kenya has launched a 5-Year Development Plan (2017-2022), dubbed 'the Big 4 Agenda' that focuses on four priority areas i) Ensuring food security, ii) Increasing affordable housing through constructing 500,000 affordable homes by 2020, iii) Enhancing the country's manufacturing capacity at all levels, and iv) Providing affordable healthcare universally to all Kenyans. The ISUDP puts emphasis on the priority areas.

Economy of NMR: The crafting of the ISDUP then looks at the aspects of the economy of the NMR in relation to macroeconomic growth factors and growth targets. The Economic Recovery Strategy (ERS) identifies the private sector in NMR as the engine of growth. This ISUDP has identified various sectors as useful in a bid to stir economic growth and development within the NMR. These sectors include agriculture, real estate, manufacturing and industry, service sector, tourism, employment creation, poverty reduction initiatives in order to bring down income inequality and spurring the growth and expansion of micro and small enterprises.

Bottlenecks of Economic Development of NMR: The ISUDP also summarises some of the impediments may slow the NMR's economic growth. As long as growth remains largely driven by private consumption and investment rather than a stable macro-economic environment that is not outpaced by production capacity, then the intended advancement will remain remote. It cites that as long as population growth remains unmatched by investment opportunities and unequalled service delivery, economic development in the NMR will be constrained.

Other Plans

Interdisciplinary Land-Use and Transport Metropolitan Analysis (ILUT) within the NMR: The sectoral economies of NMR will basically rely on agriculture, real estate, industry and manufacturing, service sector, tourism, employment, and micro and small enterprises.

The broad strategic and policy guidance for development in the NMR comes from the SPC for NMR, Integrated Urban Development Master Plan for the City of Nairobi (NIUPLAN), and the Mass Rapid Transit Harmonisation Study.

County Integrated Development Plan: The ISUDP refers to the Kajiado County Integrated Development Plan 2013 – 2017 in a bid to highlight the key development challenges in the County, identify the cross-cutting issues, define the immediate objectives and priority programme and projects being launched within the CIDP period. This ISUDP will inform future CIDP preparation in terms of recommended projects and will promote integrated planning.

Legal and Policy Framework

Legal Instruments: The ISUDP has been prepared within the relevant legal and policy frameworks of the Government of Kenya (GoK) including the Constitution of Kenya, 2010. Article 184 creates Urban Areas and Cities and provides for legislation that creates a mechanism for their classification, governance, and management. Furthermore, Article 166(1) allows the state to regulate for, amongst other purposes, land use planning.

County Governments Act 2012 mandates County Governments to prepare county plans which include "cities and urban areas plans," amongst others. The said Act provides that the "county planning framework shall integrate economic, physical, social, environmental and spatial planning" (Article 104(2)).

Urban Areas and Cities Act 2011 provides that Town Committees should "formulate and implement an integrated development plan" (Article 20(2-c)) as well as "control land use, land sub-division, land development and zoning…within the framework of the spatial and master plans for the (town) as may be delegated by the County Government (Article 20(2-d))." The Integrated Development Plan "shall bind, guide and inform all planning development and decisions and ensure comprehensive inclusion of all functions" (Article 36(2).

Physical Planning Act (PPA), Cap 286 provides for proper coordination between the different levels of government in the preparation and implementation of the various physical development plans. The preparation and implementation of Ngong ISUDP is anchored on Kajiado County government pursuant to section 29 of PPA Cap 286. Further, the overall objective of this ISUDP as a planning tool is to prohibit or control the use and development of land and buildings in the interests of proper and orderly development of Ngong Municipality; control or prohibit the subdivision of land or existing plots into smaller areas as well as to preserve and maintain all the land planned for open spaces, parks, urban forests and green belts in accordance with the approved physical development plan subject to Section 29 of PPA Cap 286.

Environmentally, this ISUDP seeks to ensure that every person has a clean and healthy environment and has the duty to safeguard and enhance the environment pursuant to Section 3 of Environment Management and Coordination (Amendment) Act of 2015. The entitlement to a clean and healthy environment in the ISUDP has included access by any person to various public elements or segments of the environment for recreational, educational, health, spiritual and cultural purposes.

Other regulations that stem from EMCA (Amendment) Act of 2015 which have been considered during the preparation of this ISUDP include Environmental (Impact Assessment and Audit) Regulations, 2003, Air Quality Regulations, 2013 (Legal Notice No. 34), Waste Management Regulations, 2006 (Legal Notice 121), Water Quality Regulations, 2006 (Legal Notice No. 120), Controlled Substances Regulations, 2007 (Legal Notice No.73), Wetlands, Riverbanks, Lake Shore and Sea Shore Management Regulations, 2009 (Legal Notice No. 19) and Noise and Excessive Vibration Pollution (Control) Regulations, 2009 (Legal Notice No. 25).

Other sectoral laws, which informs this plan, are explained below.

Legislation	Relevance
Agriculture, Fisheries and Food Authority Act, (2013)	Provides the confines within which to make proposals on agriculture promotion and conservation of soils and fertility for sustainable agriculture and optimisation of land use.
Water Act (2002)	Provide guidelines on plan proposals touching on management, conservation, use and control of water resources, water supply, and sewerage services.
Lands Act, 2012	Provides for sustainable administration and management of land and land-based resources nationally.
National Land Commission Act, 2012	Provides for County Land Management Boards which are critical in processing Development applications and allocation of public land as well as NLC that will monitor and have oversight responsibilities over land use planning throughout the country.
Public Health Act	To enhance effective management of noxious matter or wastewater discharged variously across the development area.

Source: VisionRI

Policy Instruments: In relation to Kenya's development blueprint for 2008-2030 (Vision 2030), Ngong Municipality's ISUDP seeks to increase the level of value addition of local agriculture products such as cereals, seedlings, livestock products, and horticulture products in support of the economic pillar of this vision.

Other policy instruments include:

i) **National Environment Policy, 2013:** This ISUDP recognises the importance of the link between development and sustainable environment, with regards to the provisions of National Environment Policy, 2013. This is by:

- Addressing environmental degradation issues and challenges facing the Municipality which include the high rate of population growth, inappropriate technology application, unsustainable consumption and production patterns, increased incidences of poverty and climate change;
- Providing a framework for an integrated approach to planning and sustainable management of Kenya's environment and natural resources;
- Ensuring sustainable management of the environment and natural resources, such as unique terrestrial and aquatic ecosystems, for both county and national economic growth and improved livelihoods; and
- Promoting and enhancing cooperation, collaboration, synergy, partnerships, and participation in the protection, conservation, sustainable management of the environment and natural resources.

ii) **Sessional Paper No. 3 of 2009 on National Land Policy:** This provides an overall framework and defines the key measures required to address, amongst others, the critical issues on land, land use planning, environmental degradation, conflicts and unplanned proliferation of informal urban settlements, outdated legal framework, institutional framework, and information management. In tandem with the provisions of this policy, the ISUDP has promoted and encouraged a multi-sectoral approach to land use, provision of social, economic and other incentives and put in place an enabling environment for investment, agriculture, livestock development and the exploitation of natural resources.

iii) **Sessional Paper No. 1 of 2017 on National Land Use Policy:** This policy emphasises the importance of land as a resource for the economic life of a majority of people in Kenya. The way people handle and use land resource is decisive for their social and economic well-being

as well as for the sustained quality of land resources. In keeping with this policy, this ISUDP seeks to strike a balance between satisfying the human livelihood needs and sustainable use of resources for posterity. This has been taken into consideration in the ISUDP through:

- Anchoring the Municipality's land development initiatives that will respond positively to the market demands;
- Environmental management and sustainable production initiatives in the utilisation of land resources;
- Coordination and integration of institutional linkages in planning at sectoral and cross-sectoral levels to foster collaboration and decision making among different land users; and
- Optimum utilisation of land resources to meet governance, social-economic, political and cultural obligations of the people of the county and Kenya at large.

iv) **Other relevant policies:** Other relevant policies that the ISUDP has considered and integrated are summarised below:

Policy	Relevance
Housing Policy Sessional Paper No. 3 of 2004	That comprehensively outlines land use planning as a major component of housing in facilitating provisions of adequate shelter and a healthy living environment, at an affordable cost to all socio-economic groups in Kenya in order to foster sustainable human settlements.
National Information and Communications Technology (ICT) policy, 2016	Seeks to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services.
National Climate Change Response Strategy, 2010	Seeks to strengthen and focus nationwide actions towards climate change adaptation and greenhouse gas (GHG) emission mitigation.

Source: VisionRI

Institutional Framework: The ISUDP has acknowledged the major actors and stakeholders who play a vital role in the growth and management of the County's development agenda. It looks at players who coordinate and manage the County and Sub-Counties' affairs and identifies those in charge of the Municipality with a view to creating a clear coordination framework. In this regard, the ISUDP's land administration aspects have been handled by the National Land Commission (NLC), Ministry of Lands and the County Land Management Boards.

In addition, the ISUDP defines the role and interrelationships of the National and County Governments, as well as the County Land Control Boards and the roles of National Land Commission (NLC) and the Land Courts.

Chapter 3: The Situational Analysis

This chapter provides a situational analysis of Ngong' Municipality. It identifies the administrative units involved, further clarifying the environment and natural resources of the planning area including the topography, geology and soils, available water resources, and other climate-related factors that influence the environment in the planning area, e.g., rainfall, wind, etc. It also identifies climatic vulnerabilities, amongst other natural elements.

The chapter also addresses the population and demographic aspects of the planning area, citing growth projections as the basis for the ISUDP. It also looks at the major economic activities of the urban residents that can be promoted to spur the intended economic growth and development of the

new Municipality. In line with the NMR's development, population growth is seen as an opportunity rather than a challenge and catalyst for increased development in the region. It specifically identifies the growth of sector-driven cooperative societies as one of the most important forces in increasing the Municipality's investment capacity.

On the other hand, the ISUDP also looks at urban growth and development trends; general land-use patterns; land market dynamics; and administration and management and reflects these against urban growth scenarios. This allowed the development of customised development models that fit the planning area.

The chapter also reviews the planning area's urban morphology in line with the prospects for urban design improvements e.g., improvements in pedestrian mobility; provision of adequate vehicle parking facilities; provision of publicly accessible amenities and enforcement of regulated architectural design standards. The ISUDP provides room for prospects of urban design improvements when they will be required.

Sectoral reviews were also done for the following:

- **Transportation:** This ISUDP deliberates the aspects involved in transportation and explores providing an efficient system by looking at the existing road types; road condition; surface types; and non-motorised transport components and modes. On-going and planned transportation infrastructure in the planning area were also considered. Currently, there has been a national rail transport infrastructure reform that has seen Phase 2 of the Standard Gauge Railway (Nairobi-Naivasha Rail line) passing through Ongata Rongai, Kibiko, Kandisi and Embulbul, where rail station construction is underway.

- **Physical Infrastructure:** The ISUDP discusses improvements in the planning area's physical infrastructure including i) Water supply through assessing the water demand and supply as well as the planned and on-going initiatives; ii) Energy provision in relation to existing sources and potential investment e.g. in biogas, solar and wind expansion; iii) ICT Infrastructure in line with the growing demand; iv) Solid Waste Management through an integrated and sustainable waste management plan; v) Wastewater disposal system; and vi) Stormwater drainage tackling recurrent flooding.

Currently, there is no sewerage system in Ongata Rongai and Kiserian. This has endangered the environment. Kiserian Dam has been totally polluted due to dumping of raw sludge from the slaughterhouse into the river that feeds into the dam. The ISUDP proposes an improvement of the dam by diverting the river and clearing the causes of the pollution. In addition, there are ongoing improvement initiatives in Ongata Rongai and Ngong' towns, to deal with stormwater and drainage systems.

- **Social Infrastructure:** The ISUDP addresses social infrastructure by looking at housing in relation to building materials, technology and planning; existing tenure types; and the overall housing stock and plans. This is with a view to accommodating the growing demographics against the background of an envisioned growing economy in the planning area. Thus, the ISUDP envisions strategic measures in the following key areas:

- **Education:** The ISUDP addresses the sector by examining the available Early Childhood Development Education (ECDE) facilities; primary schools and available public secondary schools in line with planned demand and supply; the intricacies of adult education – existing centres and capacity; higher education, i.e., Universities; Special Needs Schools; and Technical and Vocational Education Training Institutes (TVETS). The analysis showed that by the end of 2018, there was an overall deficit of 60 Primary

Schools and if this is not addressed, this will have grown to 126, against the growing demand and population. At the same time, there is no public university in the area and existing TVET institutes are under-resourced and with poor capacity.

- **Health:** The ISUDP addresses the sector this in terms of access; available and projected facilities in terms of numbers and types; and overall distribution across the planning area. It also looks at projected demand for the health service and where this applies, the resources required to make them functionally efficient. The ISUDP acknowledges that there are a few public health facilities in the planning area that are inadequate especially in the southern parts of Keekonyokie and Olkeri. This deficiency has catalysed a proliferation of private medical clinics, most of which are unregistered and do not meet the national health standards.

- **Community Facilities and Services:** It also looks at community facilities and services in relation to sports and recreation; availability of public parks and playgrounds; religious facilities; provision of cremation, cemeteries and burial grounds; and security centres. The ISUDP has outlined the need for a public cemetery in the Municipality as well as planning for recreation grounds, in line with planning standards.

- **Culture, Tourism, and Heritage:** The ISUDP tackles culture, tourism, and heritage by looking at the available indigenous Maasai culture, Ngong' Hills and the historical heritage in Ngong town e.g., old colonial houses and Finch Hutton Graveside. There are also local herbs and herbal medicines collected along the Mbagathi River. Globally, Maasai culture is revered and if this was invested in locally within the Municipality, then it would enhance the tourism potential of the area. The ISUDP also provides for a review of the Ngong' Hills as a tourist attraction.

- **Informal Settlements:** The ISUDP lays out an overall view of existing slums and informal settlements in the planning area e.g., Kisumu Ndogo; Kware; Mathare; Kariobangi (Embulbul), citing priority developmental aspects for each. It describes the situation in the slums and informal settlements in terms of access to basic services such as water, sanitation, housing, education, and proposes improvements and tenure security. Currently, the untethered expansion of these slums and informal settlements present a worrisome picture for future planning within the Municipality.

- **Governance:** The ISUDP has reviewed the planning area's institutional framework, against the intricacies of planning, implementation, and monitoring, creating room for amendment. In so doing, the existing gaps will be addressed through a concerted multi-stakeholder approach and public participation. The ISUDP provides a management framework and establishes links between the County Government of Kajiado and new Ngong' Municipality.

- **Disaster Risk Reduction & Management:** In relation to reducing and managing disasters across the planning area, the ISUDP outlines disasters associated with climate change and variability, flooding and deluge control, landslides, drought, and famine. It has identified areas that are prone to disasters and the prevailing types and set out mitigation measures. Proposals have been made to set aside funds for emergencies, and resource the Municipality's disaster protection units.

Chapter 4: Stakeholders Participation

The importance of stakeholder participation, engagement, contribution, methods, and management has been stressed in this chapter, following consultation sessions that build a feedback loop to increase and scale up ownership. This remains the foothold for which uniform development is anchored upon.

The section has identified the stakeholders' concerns and provided for a platform for deliberations and generating solutions.

SWOT Analysis: The ISUDP includes the area's SWOT analysis that helped develop perspectives on addressing sectoral development needs.

Chapter 5: Development Concept

The chapter deals with specific proposals in addressing the identified sectors, complete with the requisite investment action plans. It sets out an implementation plan and schedule with individualised strategies for each sector, highlighting the models to be used.

Chapter 6: Proposed Development Plan

This chapter concerns itself with addressing the land use patterns, development, and review of zoning plans; specific sectoral programs in all the identified sectors; and develops a clear map for the implementation of the proposed development plan.

Chapter 7: Sectoral Development Plan

This chapter provides sectoral strategies and a summary of the sectorial programmes and projects proposed for the implementation of the ISUDP. The strategic sector goals were established during the stakeholder's forum and created according to their aspirations. Sectoral strategies are essential in achieving the desired goals through sustainable utilisation of available resources.

Chapter 8: Action Area Plans

The chapter defines and expands the specific actions proposed in the ISUDP to be implemented in identified action areas. These include the construction of the 4.5 km Standard Gauge Railway (SGR) tunnel line that crosses from Embulbul through Kibiko towards Suswa; creation of a compact Ngong CBD; construction of a multi-story Ngong Bus Park; protection from pollution and restoration to the capacity of the Kiserian Dam; construction of the Ongata Rongai CBD; construction of the Kandisi SGR Station; and a redesign of the Kiserian CBD.

Chapter 9: Implementation Plan

The chapter concerns itself with the actual strategies for successful implementation of the ISUDP in each sector. It outlines the innovative approaches to be used, separating heavy capital investment programmes and identifies the financial leveraging sources. The Implementation Plan also describes methods enhancing revenue and income in the County providing fiscal reflections for previous investment years. It envisages promoting a solid foundation for future investment within the Municipality.

Chapter 10: Financing/Revenue Enhancement Strategies

This chapter concerns with County Revenue Sources, Fiscal Out Turn of 2013/2014-2017-2018 Financial Years and County Expenditure Analysis.

It institutes Financing/Revenue Enhancement Strategies in line with County Revenue sources, National Government allocations, Donor funding and local/Own Source Revenue (OSR) against the backdrop of Fiscal incomes for previous Financial Years (2013/2014 and 2017-2018). The County's OSR target for 2013/14 to 2017/2018 Financial Years amounted to KShs 4.7 Billion.

Chapter 11: Monitoring & Evaluation

This chapter delves into methods and tools and to enable tracking of impacts and assess the progress throughout the implementation process. This will inform the appropriate adjustment throughout the implementation period.

Priority Plans

This ISUDP has an Implementation Plan that will be executed in over a 10-year planning period. It outlines this within the different sectors while proposing the institutions responsible for various interventions. These sectors are Natural Resources and Environment; Physical Infrastructure; Social Infrastructure; Local Economy; Housing; Transportation; Informal Settlements; Disaster management; and Tourism.

Within the planning period (2020-2030), the ISUDP proposes the implementation of over 60 initiatives that cover the nine priority sectors as outlined. It proposes medium- and long-term projects. The priority projects have been summarised in Chapter 9 of this ISUDP.

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ABBREVIATIONS AND ACRONYMS

CBD	Central Business District
CIDP	County Integrated Development Plan
CoK	Constitution of Kenya 2010
CSP	County Spatial Plan
DoNMED	Directorate of Nairobi Metropolitan Development
ECDE	Early Childhood Development Education
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GIS	Geographic Information System
GoK	Government of Kenya
ICT	Information and Communications Technology
ISUDP	Integrated Strategic Urban Development Plan
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KNBS	Kenya National Bureau of Statistics
KPLC	Kenya Power and Lighting Company
Kshs	Kenyan Shilling
KUSP	Kenya Urban Support Programme
KWCL	Kiambu Water & Sewerage Company Ltd
MoTIHUD&PW	Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works
NaMSIP	Nairobi Metropolitan Service Improvement Project
NEMA	National Environment Management Authority
NLC	National Land Commission
NMR	Nairobi Metropolitan Region
NMT	Non-motorised Transport
PLUPA	The Physical and Land Use Planning Act, 2019
PPP	Public-Private Partnership

ROW	Right-of-Way
RUJWASCO	Ruiru/Juja Water and Sewerage Company
SPC	Spatial Planning Concept
SWOT	Strengths-Weaknesses-Opportunities-Threats
TOD	Transit-Oriented Development
TOR	Terms of Reference
TVET	Technical-Vocational, Education and Training
UACA	Urban Areas and Cities Act
WHO	World Health Organisation
WRA	Water Resources Authority

1. INTRODUCTION

1.1 Background

The Ngong' Municipality Integrated Strategic Urban Development Plan (ISUDP or the Plan) 2020 - 2030, was prepared by the County Government of Kajiado, with technical support from NaMSIP, the Ministry of Transport, Infrastructure, Public Works, Housing and Urban Development (MoTIPWH&UD), Directorate of Nairobi Metropolitan Development (DoNMED), and the World Bank.

The consulting group VisionRI Connexion Service Private Limited of India was commissioned by MoTIPWH&UD to provide technical consultancy services in the preparation of this Plan. This is a part of 'Component 1: Institutional Reform and Planning,' of the Nairobi Metropolitan Service Improvement Plan (NaMSIP), that deals with infrastructure and governance capabilities in the Metropolitan area. It meets a broader initiative that addresses key urban development issues in the three towns of Ngong', Ongata Rongai and Kiserian.

Ngong' Municipality ISUDP is amongst several other plans being prepared within Nairobi Metropolitan Area, i.e., Kiambu, Muranga, Machakos and Kajiado Counties. It has been prepared through a participatory approach taking into account consultative engagements of key stakeholders, County's Project Implementation Team (PIT) and the World Bank, amongst others.

1.2 ISUDP concept

The ISUDP concept is anchored on looking at urban development from a perspective that integrates physical, economic, social, cultural, and environmental as well as institutional aspects in urban planning" (ISUDP Terms of Reference (ToR)). It also seeks "to align urban development planning with the on-going socio-economic and political reforms and transformation in the county" and employs a "strategic planning approach that is more flexible and development-oriented that is desirable to catalyse the Government's economic recovery strategy for wealth and employment creation" (ToR).

The strategic planning approach mentioned above involves the identification of priority programmes and projects that can transform Ngong' into a vibrant well-planned satellite town of Nairobi that taps on the advantages of its proximity to the capital city.

The Plan aims at identifying means to improve living and working environments, generate more employment opportunities, enhance local government revenues, create efficient transport systems, exploit opportunities for industrial growth and urban linkages, and imbue the Municipality with a unique urban form and character through innovative urban design.

The key planning principles that underpinned the Plan's preparation are as follows:

- Consultative/participatory process - allowing public participation and ownership of plans as the basis for shared responsibility for implementation;
- Strategic process which requires a focused approach, and systematic search for the most appropriate and effective solution, keeping in mind given resources of the town, and overall policy guidelines and principles;
- An integrated approach, which requires thinking and acting holistically across the conventional sectorial boundaries. Functional integration with the purpose of improving availability and accessibility, reducing travel and transport needs, and improving

convenience for those with fewer resources. Integration as a tool for promoting sustainability;

- The Plan seeks to provide a) equal access to services and facilities; b) functional, socio-economic, cultural, and ethnic interaction; c) economic development and employment; d) institutional cooperation and encourage community participation;
- Create a balance between natural and physical environments, viable economic systems and greater integration, equity, and responsibility; and
- Promote gender mainstreaming to incorporate the needs and aspiration of men and women.

These approaches were underpinned by participatory planning processes oriented towards engaging stakeholders in problem identification and problem-solving at critical stages of Plan preparation. This will not only imbue ownership of the Plan to the stakeholders, but it will also contribute to improving the capacities of government implementers and other stakeholders in planning, implementation and monitoring.

1.3 Purposes of the Plan

In accordance with the Project's ToR, the purposes of the ISUDP are the following:

- Articulating the aims of the National and County Governments for the area together with strategies, policies and general proposals which are intended to achieve those aims;
- Providing a framework for detailed development policies and proposals for the Municipality;
- Indicating action areas for immediate development or re-development; and
- Providing a coordinated basis upon which various implementing agencies can develop their individual programs of work for which they have executive responsibility, for example, housing, transportation, water supply, electricity supply, sewerage development, etc.

1.4 Specific Planning Challenges

The key planning challenges facing Ngong' Sub-County are outlined below:

- Inefficient land use planning and implementation;
- Overexploitation of resources leading to excessive pressure on limited available resources;
- Slow economic growth within the rural areas such as Nachu which is characterised by inaccessible roads;
- Massive subdivision of land because of the growing population, which has led to the conversion of agricultural lands into residential land uses;
- Inadequate social and physical infrastructure;
- Encroachment into road reserves resulting in traffic congestion and accidents along the roads;
- Poor drainage systems, which lead to flooding during the rainy seasons;
- Poor solid and liquid waste disposal because of lack of proper planning resulting in poor sanitation; and
- Inadequate health facilities having a few understaffed health centres within the planning area.

1.5 Objectives of the Plan

The overall objective of the ISUDP is to prepare an integrated framework that will guide development for the next 10 years. The Plan will provide a basis for the long-term sustainable development of Ngong' Municipality.

The specific objectives of this Plan include:

- Determine the boundaries of the planning area considering projected requirements for urban land within the plan period;
- Analyse demographic changes in the last ten years and those expected over the life of the plan, and how these relate to economic changes, welfare and administrative shifts;
- Identify development constraints, potentials and challenges of the planning area (social, economic, infrastructure and environmental profiling) and propose strategies to address them;
- Identify environmental issues and propose strategies for effective environmental management including, amongst others, climate change adaptation and disaster risk reduction and management measures;
- Allocate sufficient space for various land uses, including recreation and open spaces, to ensure efficient function and convenience of users and accommodate future growth;
- Uphold innovative civic and urban design that enhances the character and form of the planning area;
- Provide a basis for development control and investment decisions; and
- Develop a plan implementation and monitoring framework.

1.6 Scope of the Plan

1.6.1 Geographical scope

The geographical scope of the ISUDP was agreed upon with the County Thematic Working Group after a series of discussions and site surveys. From an initial focus on the respective towns of Ngong' and Ongata Rongai, the scope now includes the whole of Kajiado North Sub-County as well as Kiserian, part of which lies within Kajiado West Sub-County. This delineation considers the physical and socio-economic interdependence of these urban areas with their hinterlands. Included in the Municipality are the following Wards and Sub-Locations:

Table 1-1: Administrative and Political Units and their Areas

Ward	Sub-Location	Area (hectares)		Share in %
		Ward	Sub-Location	
Ngong'		1,130.40		7.42%
	Ngong' Town		1,130.40	
Olkeri		5,485.03		36.02%
	Olkeri		787.46	
	Kahuho		688.58	
	Oloosurutia		369.94	
	Lower Nkoroi		685.44	
	Upper Matasia		1,790.49	
	Upper Nkoroi		525.67	

Ward	Sub-Location	Area (hectares)		Share in %
		Ward	Sub-Location	
	Lower Matasia		637.45	
Nkaimurunya		1,215.05		7.98%
	Kandisi		361.76	
	Empakasi		853.29	
Oloolua		1,790.76		11.76%
	Oloolua		1,030.37	
	Kerarapon		422.87	
	Bulbul		337.52	
Ongata-Rongai		1,681.21		11.04%
	Ongata Rongai		573.56	
	Lemelepo		1,107.65	
Ewuaso Oo Nkidong'i		2,830.55		18.59%
	Kibiko		2,830.55	
Keekonyokie		1,096.09		7.20%
	Kiserian		1,096.09	
Total		15,229.00		100.00%

Source: Kenya National Bureau of Statistics (KNBS)

1.6.2 Planning scope

With reference to the ToR, the preparation of this ISUDP involved the following tasks:

- Delineation of the Municipality boundaries as guided by the County Government of Kajiado;
- Preparation of base map showing the existing spatial structure of the Municipality to include, at the minimum, planning boundaries, existing road network, landmarks, major natural features and topography;
- Carrying out contextual analysis of the Municipality and its environs;
- Undertaking a land-use, socio-economic study and survey of the Municipality, indicating land-use changes that have occurred over time and future projections, and comparing how these changes compare in the metro region and County;
- Undertaking an assessment of transport, infrastructure and utility needs, housing and community services. This will include mapping of the transport, infrastructure and utility network of the Municipality;
- Development of a detailed study on the redevelopment of the central business districts (CBD);
- Identification of suitable land for residential, industrial, education, recreational, public purposes, commercial, public utilities, transportation and other uses applicable to the Municipality;
- Analyse administration and institutional requirements in planning and development;
- Preparing analysis reports indicating projected land use, infrastructure, and services requirement over the plan period;
- Preparation of a detailed short term, 10-year Land Use Plan for the Municipality;

- Preparation of a detailed 10-year Sectoral Development Plans in support of the land use plan for the Municipality. The sectors covered shall be those that are provided in the ToR;
- Preparation of individual implementation plans to include proposed requisite resource and institutional frameworks;
- Preparation of zoning plans for the Municipality with requisite development densities and guidelines; and
- Development of detailed studies of the existing infrastructure and services including, drainage patterns, sewer, opening of new roads and widening of existing ones with a view to providing a strategy for upgrading.

The ISUDP's planning period is ten years, i.e., from 2020 - 2030.

1.7 Deliverables of the Plan

In accordance with the terms of reference, this Plan has been prepared to realise the following key deliverables:

- Contextual analysis of Juja Sub-County and its environments as per thematic areas;
- Detailed base map showing existing spatial information;
- Legal and policy analysis informing the preparation of the Plan;
- Assessment of transport, physical and social infrastructure needs;
- Assessment of housing and community facility needs;
- Structure plan to guide the spatial development of Juja Sub-County for 10 years;
- Zoning plan indicating detailed development densities and guidelines;
- Area which requires action area plans;
- Central business district (CBD) re-development strategies and programmes and future growth limits;
- Sectoral programmes and projects within the Sub-County and their spatial distribution;
- Revenue and financial enhancing strategies for the Sub-County; and
- Implementation strategies and framework for proposed sectoral projects.

1.8 Vision and Mission

A participatory approach in the formulation in the shared vision for the Sub-County and mission statement of the County Government was informed by views of various stakeholders who were involved in the ISUDP preparation process. The community vision for the municipality is to have "**a safe, secure, competitive and sustainable urban environment/region**."

The mission of this County Government towards the realisation of this Plan is "**to develop a safe, secure, competitive and sustainable urban environment/region through urban management and efficient resource utilisation**."

1.9 Methodology

1.9.1 Preparatory Stage

The preparatory stage in the preparation of this Plan involved profiling, transect survey, and preparation of the Inception Report and Project Design Report. Profiling involved scanning general aspects of Ngong' for an understanding of its challenges and opportunities. The output was the refinement of the problems and objectives of the Plan. Transect surveys involved undertaking reconnaissance surveys of the planning area. The output at this stage was identification and

appreciation of Ngong's major planning issues, challenges, and opportunities in line with metropolitan spatial development plan; delineation of the planning area and consolidation of the base maps as provided for by DoNMED and the County; and preparation of the Inception Report. The Project Design Report involved fine-tuning of the scope and timeframe of the project and preparation of a detailed work plan.

1.9.2 Sensitisation

Sensitisation of key stakeholders was carried out through the publication of a Notice of Intention to Plan. This was done in collaboration with the DoNMED, Director of Physical Planning and the County. This was followed by stakeholders' engagement through direct interviews, focused groups discussions, which led to the first and second stakeholders' workshops where wider ranges of stakeholders took place to validate the situational analysis and later, the draft plan. The comments received during these forums have enriched the content of this Plan.

1.9.3 Data Collection

In order to capture all data required for planning in such a complex and diverse situation, a variety of methods were used. First, there were surveys to capture household characteristics, economic activities and so on to plan for. Second, focus group discussions (FGDs) especially in the slums, (but also in the towns, and corridors, peri-urban and rural areas) to capture data on expectations/fears, sacred places/heritage sites, infrastructure needs, social problems, etc. Third, key informant interviews with key actors were conducted to capture data on the status of social infrastructure, population patterns and related requirements, and infrastructure needs, amongst others. Fourth, data collection endeavoured to seek access to all existing secondary data on population size, density and trends, economic activities, access to social infrastructure, etc. The data capture tools used included interview schedules, FGDs guides, and key informant interview guides. These included consultations with stakeholders which were done through the following manner:

- **Focus Group Discussions (FGDs):** These involved stakeholders in the slums, towns, corridors, and peri-urban and rural areas to capture information on their expectations/challenges, infrastructure needs, and social problems, as well as to identify sacred places/heritage sites.
- **Key informant interviews (KIIs):** These were used to collect data on the historical as well as current socio-economic, environmental, land use and infrastructural information. They include officials from the Ministry of Lands, Housing and Urban Development, County Director of Physical Planning, Kenya Urban Roads Authority, Kenya National Highways Authority, Kenya Roads Board, Ministry of Energy and Petroleum, and Ministry of Transport and Infrastructure, amongst others.
- **Comprehensive Stakeholder Forums:** These included multi-sectorial consultations to establish the key development challenges on transport, access to amenities and community facilities and the challenges involved, amongst others. Some of the key meetings include the first stakeholders meeting to present key study findings, refinement of the town's problems, visioning and setting the specific objectives of the ISUDP**.** Other forums included the presentation of Alternative Development Proposals and draft plans for stakeholder's validation.
- **ISUDP Publication:** The ISUDP was publicised for two weeks to solicit and incorporate relevant public comments.

  Secondary data were collected through desk study from past reports and publications on the planning area. This was carried out before field visits were made with the objective of clearly identifying data gaps to be collected. Reports such as publications, topo-cadastral

maps, and land-use plans were reviewed to give clear insights into Ngong'. It also included reviews of existing plans, policies, and statutes. Some of the documents reviewed were Kenya Vision 2030 and its two Medium-Term Plans, County Integrated Development Plans for Kajiado County, the Nairobi Integrated Urban Development Masterplan (NIUPLAN) 2014-2030, Nairobi Metro Vision 2030 Strategy, the Kenya Power and Lighting Company Master Plan, and Konza City Master Plan, amongst others.

Field studies were carried out so as to fill any information gaps which were identified during the desk study. This involved collecting information about existing conditions to assess the adequacy and functioning of existing facilities. The field studies also assisted in verifying data collected from secondary sources, identification of planning issues, potential problem areas, and existing and future development potentials of the planning area. Some of the key techniques used to collect various types of data included:

- **Observations** were undertaken to provide information on traffic volumes by the day, hour, direction and type of vehicle, amongst other physical conditions affecting development.

- **Conducting Origin-Destination (O-D)** studies to determine the nature of traffic and the present volume of freight and passenger movements. The O-D studies were also used to establish the current traffic flow pattern, and data to forecast future patterns. Other information obtained included the number of trips into, within, and through a connection; and time of day, mode of travel and number of occupants in a vehicle during a trip; current travel patterns; areas that generate the most traffic; and adequacy of transport facilities; flow rates and road safety; and people's perception of the transport system.

- **Roads inventory and condition surveys:** These involved determining the surface type of the roads (e.g., paved or gravel), surface condition (e.g., good or fair), road classification (e.g., Class A), and their lengths. It also involved determining conditions of other utilities such as water, drainage and sewer systems.

- **Map preparation** was carried out using surveying and geographic information system (GIS) software and information were saved into distributable formats easily understood outside surveying and GIS profession. Field validation was carried out using a hand-held global positioning system (GPS) receiver pre-set to the national grid system. Gaps found in the supplied maps were filled using handheld GPS equipment or current high-resolution imagery covering. Spatial data acquired in hardcopy format were scanned, geo-referenced and digitised into vector maps on the same coordinate system as the base map. Datasets that were acquired in hardcopy format included Registry Index Maps (RIMs) showing land subdivisions, administrative maps, existing and proposed road networks, fibre optic cable network, power distribution network, etc.

1.9.4 ISUDP Formulation

Formulation of the ISUDP was based on thematic studies which involved detailed analysis of secondary and primary data, and the identification of critical planning issues. The findings of the thematic studies were presented to key stakeholders for validation. Based on validated situational analysis, a draft plan and development proposals were prepared, modelled, and presented in a spatial context showing desired outcomes, alternatives, strategies, and programmes. The output was presented to a stakeholders' forum for comments. This was followed by the formulation of alternative development proposals and selection of preferred alternative to inform land management and investment decisions. A stakeholders' meeting focussing on the presentations of the draft plan

proposal and preferred models was then organised to gain consensus on the preferred plans and strategies.

1.9.5 Approval

Approval of this ISUDP will be in line with provisions of Section 50 of the Physical and Land Use Planning Act 2019. This entails the presentation of the Plan to the County Assembly for approval and onward gazettement by the County Executive Committee Member in charge of Physical Planning and Land Use. The output will be a gazetted plan for implementation for the period 2020-2030.

2. CONTEXTUAL ANALYSIS

2.1 Introduction

The preparation of Ngong' ISUDP acknowledged the NMR context in relation to international, national and regional development trends. It was based on the development potential of the clusters and Ngong' Municipality within the NMR. During the preparation process, a review of urbanisation and globalisation cases was cited. These are briefly discussed below.

2.2 International Trends

2.1.1 Urbanisation and Globalisation

The world system structure is arranged according to global capitalism with a core and periphery[1]. The production processes that are advanced in this theoretical perspective require the massive concentration of capital and the highest level of skills[2]. On the other hand, the periphery is seen more in the developing countries, which lack capital, technologies, market power, wealth and other important factors of production, probably with the exception of land while cities are cores that are centres of civilisation, labour creation, and international financial exchanges. In this respect, present development dynamics require the creation of modern and competitive cities capable of connecting global actors and economies.

The global economic system shifted from one of the protected or closed national economies, to open, liberalisation and competitive one. The economy later progressively changed its nature from labour intensive in the 1960s to capital intensive in the 1970s, technology 1980s, and information in the 1990s.

According to the National Forum for Sustainable Urbanisation, almost no country can graduate from low-middle income status without reaching 50 per cent urbanisation. Kenya is presently at 27 per cent in terms of urbanisation and has to avoid the challenges of "premature urbanisation", before the urban infrastructure, economic intensity, and human capital necessary for agglomeration economies have been developed[3]. The situational analysis, therefore, focuses on the current development status of the Municipality, with a view of analysing it with respect to regional and global benchmarks.

2.1.2 Benchmarking Urbanisation with Best Practice

The best practice is equated to sustainable development. Ngong' Municipality can learn and draw lessons of best practice from the following five countries that have implemented similar urbanisation ventures while achieving acceptable levels of sustainable development[4].

i. **Case Study 1 - South Korea:** Rapid urbanisation in the 1950s damaged Seoul's high-density Metropolitan area. South Korea intervened using technology, modern science, green methods of urban development, landscape character assessment, green-belts/greeneries development around urban limits and eco-friendly waste management to evolve South Korea into a unique eco-friendly city model.

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[1] (Manirakiza, 2012)
[2] (Ibid, 2012)
[3] National Forum for Sustainable Urbanisation
[4] (Mosha, 1996; Kreimer and Gilbert, 1997:1; and Ellis and Roberts, 2016)

ii. **Case Study 2 - Singapore:** The city-state of Singapore has controlled urbanisation by focusing on economic growth, improving quality of life, clean and green environment through (i) a series of long-term goals and ten-year plans to reconcile rapid economic development and environmental sustainability, (ii) pursuing a vision of a clean, green city strong spatial planning; and (iii) a strategy of economic growth and good quality of life through a clean and green environment and best use of resources.

iii. **Case Study 3 - Malaysia:** Malaysia's Economic Planning Unit has developed weighted Malaysian Quality of Life Index (MQLI) using time series data in education; urban safety; income levels and distribution; culture and leisure; family life; environment; transport; and communication. These are further developed into a weighted central index to determine centrality of Malaysian urban settlements that include economic activities; social services and facilities; transport and communication; infrastructure and maintenance; personal services; community organisation; and other services. MQLI is a useful reference in policy development guidance, preparing and implementing urban land use plans and carrying out construction by the Government and local authorities.

iv. **Case Study 4 - City of Curitiba, State Parana, Brazil:** The 1966 "Plano director", i.e., Master Plan for the City of Curitiba provided for created parks and green spaces for recreation on the flood plains along rivers and business growth corridors (Barth, 2014). Only restricted urban development in the reconstructed and landscaped flood plains led to the evolution of key bus rapid transit (BRT) transportation routes with only a few tall buildings allowed to locate along the new system of bus routes. The Curitiba Case Study has inspired the implementation of other urban sustainable development initiatives in and outside Brazil (Kreimer, A. and Gilbert, R. (1997).

Curitiba is famous for its BRT system, which represents an iconic case of BRT development, which is being followed and adapted by numerous cities all over the world. The city bus started its BRT in 1974 and now has seven-bus priority corridor spanning 83 km and benefiting 561,000 passengers every day. It was initially conceived as a light rail transit system but was later replaced by a trunk and feeder bus system, which later evolved into a full BRT system. What distinguishes Curitiba's BRT system and others is that while it was initially developed as a cost-effective solution to a transport problem in a context of rapid urban growth, overcrowding and traffic congestion has been implemented as part of a wider vision and strategy of urban development that combined investments in transportation with land use development. Key tools and measures in planning and implementation of the corridor development include:

- Adoption of a comprehensive legal framework (master plan, zoning regulations and incentives) to promote dense, high-rise, and mixed land use development along the BRT corridor according to a primary road system;
- Car-free pedestrian malls near the BRT lines and clustering of services and shops promote walking; and
- A single flat fare enables cross-subsidization between short and long rides and promotes ridership. A national policy that mandates employers must subsidize a portion of their worker's transportation cost also promotes ridership, and State and federal funding have been important sources of finance of the capital cost.

Key enabling conditions of Curitiba's success include:

- High degree of political support and institutional coordination with implementation marked by a mix of political leadership, innovation, pragmatism, technocracy, and continuity;
- The city has a supportive institutional setting due to the central role of its planning

agency;

- Presence of an employment corridor in the city which was created in the 1990s to foster economic growth, social improvement, and employment opportunities through investment in urban, social, and industrial infrastructures and support and training for small scale businesses; and
- Presence of a green line in the city; legislation has altered zoning and land use along the green line to promote TOD by turning the area into a pedestrian-friendly mixed-use corridor.

Some of the setbacks that were experienced in Curitiba include the following:

- Demand for BRT has outweighed its supply hence slow service, overcrowding, increased operation cost, and rising fare prices;
- Failed to integrate its growing suburbs into a coherent regional plan thereby excluding suburban residents from access to the most liveable parts of the city; and
- Politically connected private investors are known to have gained profits by acquiring potential valuable land at lower prices in advance of major infrastructure projects, which increased the value of properties along the planned development axis.

Figure 2-1: Transit-Oriented Development in Curitiba, Brazil

Source: Internet Sources

v. **Case Study 5 - Botswana:** Botswana's case presented three components:

- The Self-Help Housing Program that had a two-pronged strategy: i) To manage the fast urbanisation resulting from rural-urban migration and development of informal settlements providing self-help squatter settlement upgrading, and a site service programme. This squatter settlement accounts for 60% of Botswana's urban population. (ii) As cost recovery, cross-subsidy and affordability considerations were introduced to secure replication and sustain the self-help housing program;
- It involved Government Actors. This met the Government's service provision aim enabling shelter provision. In line with this, Botswana Housing Corporation provides rental houses and for sale in towns and some urban villages; and
- In its overall strategy, the core principles were to continue supporting the social-cultural capabilities of households in their communities, in turn, positively impacting marginalised and disenfranchised groups in society living in towns and clusters/nucleated of rural settlements.

This strategy was supported through a tripartite partnership between the public, private and community sectors, with community participation, a focus on special interest groups (women,

indigenous people, the elderly and disables) being the key enablers and security in the long-term achievement of the goals of the objective.

2.1.3 Urbanisation & Housing trends

As the urban population increases in developing countries, the land occupied by the urban areas has increased at an even higher rate. It was observed that between 1990 and 2000, the population of urban cities in the world increased at a rate of 17%, and the area occupied by these cities increased by 28%. Although globally there has been a decline in built-up area densities, in Sub-Saharan Africa, the urban land cover is predicted to increase 7.5 times over the next fifteen years (2015-2030). It is also predicted that the area covered by the urban population will increase triple-fold. Moreover, the urban population of developing countries is expected to double (UN-Habitat, 2016). This increase will have an effect on the land and is envisioned to increase the amount of GHGs emissions while altering the ecological systems in many cities and towns.

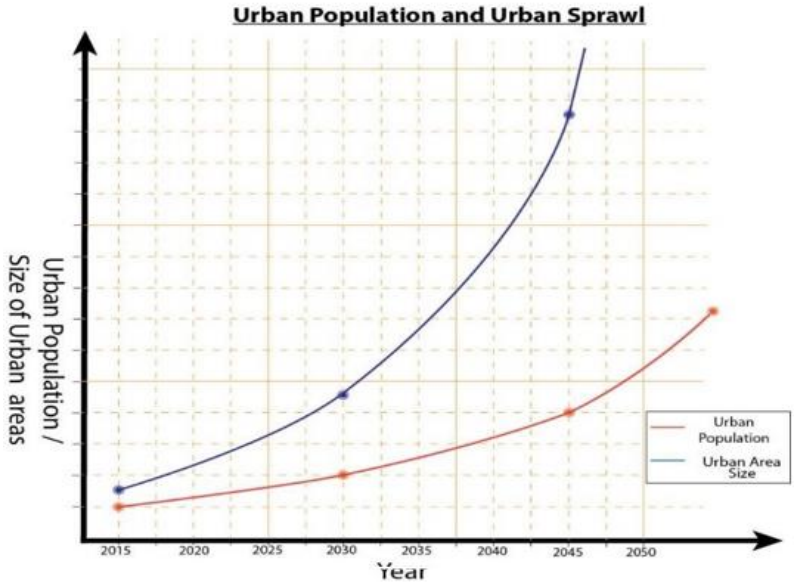


Figure 2-2: Urban Sprawl

Source: VisionRI

As illustrates above, urban sprawl will fill up urban regions and spread over to adjacent vacant areas if left unchecked. This results in wasteful, unmanageable, inaccessible, and unserved urban areas. This will have a bearing on the Ngong' Municipality. If left unchecked, the urban sprawl will fill up urban regions and spread over to adjacent vacant areas resulting in wasteful, unmanageable, inaccessible, and unserved urban areas in Kajiado County.

2.1.4 Development Trends of Urban Regions

Worldwide, both large and small cities continuously merge to create new urban settlements, city-regions, corridors, and mega-regions. The new configurations are spatially connected and functionally bound by their economic, socio-political, and environmental linkages.

In developing countries, peri-urban areas become divided cities, characterised by spatial segregation along socio-economic lines, with informal land-use patterns, accompanied by lack of infrastructure, poor or non-existent public services, with inferior quality housing and families living in poverty[5]. For instance, a city's physical form: its built environment characteristics; the extent and pattern of open

[5] UN-Habitat 2016

spaces; as well as the relationship of its population density; destinations and transportation corridors; all interact with natural and other urban characteristics.

The formed physical patterns of suburban development and car-dependent subdivisions become ineffective or inefficient systems in the long run. They constrain available transport options, energy use, drainage, and future patterns of growth. As a result, planning professionals continuously enhance new community design standards.

One of the approaches instituted is called smart growth that focuses on rejuvenating inner-city areas and older suburbs, remediating brown-fields and, where new suburbs are developed, designing them to be town-centred, transit and pedestrian-oriented, less automobile-dependent and with a mix of housing, commercial and retail uses drawing on cleaner energy and green technologies.

Urban planning can reduce sprawl and promote compact, contiguous development. Containment tools have proved quite successful in a variety of settings. Urban growth boundaries, greenbelts, urban service boundaries, and nodal location of economic activity centres are each approach to promoting compact city form. The Ngong' ISUDP proposed that while sustainable neighbourhood planning favours high densities, careful and proper coordination, location and design (including mixed uses) to reap the benefits more compact urban patterns can bring to the environment (such as reduced noxious emissions) and quality of life.

- **Urban Planning Trends:** There is a growing consensus that urban planning can reduce sprawl and promote compact, contiguous development; unplanned city extensions lead to sprawling city-regions. Containment tools have proved quite successful in a variety of settings. Urban growth boundaries, greenbelts, urban service boundaries, and nodal location of economic activity centres are each approach to promoting compact city form.

  A city's physical form, its built environment characteristics, the extent and pattern of open spaces together with the relationship of its density to destinations and transportation corridors, all interact with natural and other urban characteristics to constrain transport options, energy use, drainage, and future patterns of growth. Sustainable neighbourhood planning favour high densities. It, however, takes care of proper coordination, location, and design (including mixed uses) to reap the benefits more compact urban patterns can bring to the environment (such as reduced noxious emissions) and quality of life[6].

- **Sustainable Development Goals (SDG):** Also known as the Global Goals, the 17 Sustainable Development Goals are meant to be implemented by 2030. The SDGs informed the preparation of this Plan in line with land use and action plans. Although each of the SDGs has a bearing on the areas of sectoral development influence, the Plan has ensured that its implementation will contribute towards achieving these Global Goals, both locally and Municipality-wide.

[6] UN-Habitat, 2016

Figure 2-3: The UN Sustainable Development Goals

Source: United Nations

- **New Urban Agenda:** By 2050, the world's urban population is expected to nearly double, making urbanisation one of the twenty-first century's most transformative trends. Populations, economic activities, social and cultural interactions, as well as environmental and humanitarian impacts, are increasingly concentrated in cities, and this poses massive sustainability challenges in terms of housing, infrastructure, basic services, food security, health, education, decent jobs, safety, and natural resources, amongst others.
  The implementation of the New Urban Agenda contributes to the implementation and localisation of the 2030 Agenda for Sustainable Development in an integrated manner, and to the achievement of the Sustainable Development Goals and targets, including Goal 11 of making cities and human settlements inclusive, safe, resilient and sustainable. This ISUDP will actualise the New Urban Agenda for sustained, inclusive and sustainable economic growth through implementation of the development plan.

2.1.5 Regional Trends

Status in East Africa

This Plan analysed the current development status of urbanisation across East Africa. These are discussed as follows:

- **Urban Population Growth:** Kenya's population is estimated at 47.6 million with a growth rate of 1.69%. Table 2-1 illustrates the population demographics as of 2009.

Table 2-1: Projected Population Demographics of Kenya

Age Group	% of the Total Population	Total Number of Males	Total Number of Females
0-14	40.2	9,557,247	9,497,870
15-24	19.15	4,552,448	4,567,751
25-54	33.91	8,170,264	7,976,751
55-64	3.92	856,092	1,009,075
65 years and above	3	614,751	813,320

Source: Modified from Kenya National Census, 2009

At the same time, Kenya is urbanising at 26.56%, the highest rate within East Africa. Comparisons with other countries are shown in Figure 2-5. This is mainly attributed to rural-urban migration (a net migration of 0.2/1000 migrants) and geographical expansion of its towns and cities (annexation). Nairobi's urban population stands at 2,750,547 inhabitants.

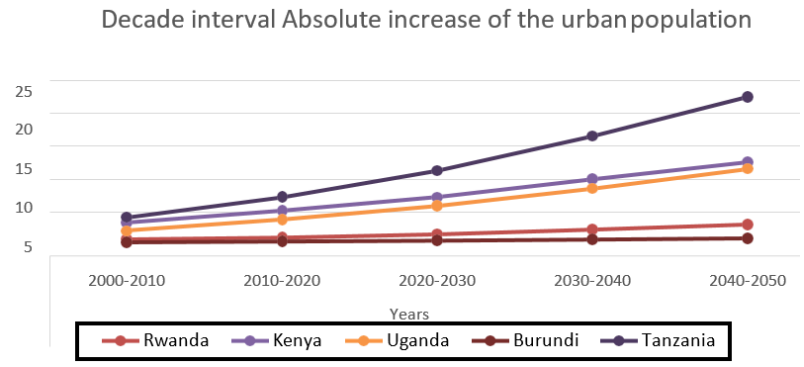


Figure 2-4: Urban Population Growth rate of Kenya in Comparison to other East African Countries

Source: Kajiado Inequality Index Report

- **Energy and Electricity Access:** In East Africa, Kenya, Tanzania, and Uganda are leading efforts to create an attractive enabling environment for energy access, energy efficiency, and renewable energy. Tanzania has the largest reported quantity of people without access to electricity at 71% of its population. Burundi has over 93% of its population without access to electricity. Rwanda has 34% of its population with access to electricity. Kenya leads with about 60% access and Uganda is least at 27%.

  Eastern African countries have set ambitious targets to increase access to electricity. For example, Tanzania has called for a 90% access rate by 2035 in its Power System Master Plan. Kenya targets connectivity to one million consumers a year in its Universal Access to Electricity by 2020. On the other hand, Uganda targets 51% coverage by 2040. Rwanda has set a plan for 70% access by 2018 and 100% access by 2020. Burundi seeks to increase from its current electrification rates to 25% by 2020 and 40% energy access by 2030.

  The energy sector in Kenya is largely dominated by petroleum at 22% and electricity at 9%. In this line, 68% rely on biomass fuels providing the basic energy needs of the urban poor, rural communities, and the informal sector. Despite the Government's ambitions to increase electricity connectivity from the current 15% to at least 65% by 2022, access in Kenya is low.

  Kenya has an installed electricity capacity of 2.3 GW. This comprises of a generation mix of 57% from hydropower, 32% from thermal and the rest comprises geothermal and emergency thermal power. Solar PV and Wind power contribute less than 1%. This reliance on hydropower fluctuates at between 38-76% due to poor rainfall, and so thermal energy sources have been used to make up for these shortfalls, varying at between 16-33% of the mix. The energy generation mix comprises 52.1% from Hydro, 32.5% from fossil fuels, 13.2% from geothermal, 1.8% from biogas cogeneration and 0.4% from wind, respectively. Kenya's current effective installed (grid-connected) electricity capacity is 1,429 MW while the electricity demand is 1,600 MW and projected to grow to 2,600-3600 MW by 2020.

  A holistic outlook of energy access must be addressed if the increasing demand in the expanding Ngong' Municipality is to be met. Practitioners acknowledge that defining

energy access at the household level only might assume interdependent aspects, for example, electricity connections translated to energy access. Yet, it is prudent to look at total energy access during the planning process in terms of:

- **Demand:** Energy access for community services, livelihood support, and income generation and energy access for communication.
- **Type:** Electricity as power, energy for heating and cooling and mechanical power.
- **Environment:** Providing room for reviewing the access environment in terms of the policy, capacity, and level of financial investment.

When discussing energy provision, there is a need to deliberately rethink access terms including, access to modern energy. This means segregating populations based on the energy tier, form, and source. The Plan sets out steps to establish minimum standards in meeting the energy demand in the settlement nodes as well as in the CBD taking cognisance of the economic activities in each region.

At the same time, it sets out to establish baseline demand and future projections across the Municipality. It identifies the existing sources and tiers of energy[7] and contextualises this at the regional level against the global figures. For example, while higher access to electricity is correlated with higher development and human welfare indicators, Kenya's electricity generation is higher compared to[8] other East African Countries[8] but still has a huge population living in poverty. Energy planning needs to put in place a multi-tier framework to ensure that it can scale reach to the residents of the entire Municipality. The Plan proposes an array of mini grids from different sources and meeting specific needs and requirements.

Table 2-2 below shows the hydropower potential of Kenya compared with other East African countries.

Table 2-2: Hydropower Potential for Selected Countries in East Africa

Country	Large-Scale Hydropower Installed Capacity	Large-Scale Hydropower Potential Capacity from Rivers	Small-Scale Hydropower Installed Capacity from Dams	Small-Scale Hydropower Potential Capacity from Rivers
Rwanda	33.3	100	1	-
Kenya	1,197	6,000	6.28	3,000
Tanzania	380	-	4	68.12

Source: HRAA (2008) Hydropower Resource Assessment of Africa

In 2014, Kenya had a higher urban electrification rate compared to other East African countries and lower than the world's average urban electrification rate. Some of the influencing factors include the following:

vi. **Policy environment:** In Kenya, high oil prices always stir emotions because of reliance on it in the transport sector, and this seems to affect the livelihood aspect. At the same time, oil prices seem to be the main flag of energy access especially, seen when there is a crisis. Recently there have been discussions around the need to increase overall energy per

[7] Energy Tiers represent the measure access for energy services, adequacy, quality, reliability, affordability, safety and availability when needed.
[8] UN Habitat, 2014

capita supply while seeking for development of alternative forms of energy. One of the main motivators of this discussion has been to achieve supply security, in turn, reducing its price with essential trickle-down effect on production costs and thereby leading to positive social-economic benefits to the country.

- **Energy Policies available:** Relevant policies available include the following:
    - Session Paper No. 4 on Energy of Kenya - Until 2004, Kenya did not have a comprehensive energy strategy. In 2015, new energy policy was mooted, awaiting adoption by the Parliament;
    - Electrical Power Act of 1997 currently under review;
    - Energy Act 2006;
    - Petroleum Act Cap 116 - regulates the importation, transportation, and storage;
    - Petroleum Exploration and Production Act - which, prior to the deregulation of the petroleum sub-sector, it was used by Government to control petroleum pricing;
    - Kenya Rural Electrification Master Plan;
    - Kenya Vision 2030; and
    - Kenya National Climate Change Response Strategy.

  In order to meet energy demand, other innovative sources need to be explored and scaled up. This includes ethanol (a product from sugar production), solar hybrid mini-grids, wind, biogas, coal and geothermal whose capacity in the country is up to 10000 Mw. Currently, Kenya generates about 576 Mw from geothermal sources. Table 2-3 presents access figures across Africa, showing Kenya's 36 million residents without electricity.

Table 2-3: Electricity Access in Africa

Region	Population Without Electricity Millions	National Electrification Rate %	Urban Electrification Rate %	Rural Electrification Rate %
Africa	634	45%	71%	28%
World	1,186	84%	95%	71%
Rwanda	8	27%	72%	9%
Tanzania	36	30%	57%	18%
Uganda	31	19%	52%	12%
Kenya	36	20%	60%	7%
Burundi	10	5%	28%	2%
Uganda	205	500	8	736
Burundi	43	300	14.5	-

Source: IEA, World Energy Outlook 2016

- **Water:** There are more than a billion people without safe water in the world. Almost 80 million[9] East Africans do not have access to clean drinking water. This means that they cannot get water fit for human consumption that does not require more than 30 minutes of travel time. People either source this water from ponds, streams, or unprotected wells. In fact, even those that have access must either treat or boil their water for it to be fit.

[9] https://theexchange.africa/access-to-basic-drinking-water-in-east-africa/

The United Nations Sustainable Development Goals require the provision of basic services, including access to safe and treated water to all citizens by 2030.

Regionally, Rwanda leads in providing safe water access at 61.3%, followed by Kenya at 59.1%, Burundi at 55.6%, and Tanzania at 49.2%, and Uganda at 37.8%. Although, for Kenya, there is good access to drinking water, compared to the global 91% which is still far from the global target.

Locally, the water demand in Nairobi is about 760,000 m^3per day while the city can only afford to supply 503,000 m^3 per day. The Government of Kenya's long-term solution to meeting the shortfall is focused on:

- Increasing the water supply across all urbanising areas;
- Prudent in innovation through various approaches;
- Identification and exploration of different water sources; and
- Investment in appropriate technologies.

To put this into perspective, Table 2-4 illustrates water access for countries in East Africa.

Table 2-4: Access to Improved Drinking Water for Selected Countries in East Africa

Country	% with Access to Improved Drinking-Water	% with no Access to Improved Drinking-Water	% with Access to an Improved Sanitation Facility	% with no Access to an Improved Sanitation Facility
Kenya	57	43	42	58
Uganda	65	35	11	89
Tanzania	54	46	13	87
South Sudan	68	32	13	87
Burundi	71	29	41	59
Rwanda	76.1	23.9	61.6	38.4

Source: UNICEF Progress on Drinking water and Sanitation

- **Sanitation:** Globally, 2.6 billion do not have functioning sanitation services. Only 30% of Kenyans have access to improved sanitation, that is, the use of sanitation facilities that hygienically separate excreta from human contact. The following need to be undertaken in order to achieve the nationally set targets for access:

  - Innovative sanitation technology options will have to be explored;
  - Options that provide the service while conserving water resources. For example, more than 47% of the water usage at the household level happens in the bathroom of which 24% is in the toilets. Conventional toilets use about 7 gallons of water per flush; and
  - A policy that will ensure that the toilets use not more than 1.6 gallons per flush as the current trend cannot be sustainably met over years.

Table 2-5: Access to Improved Drinking Water for Selected Countries in East Africa

Country	% With Access	% With No Access	% With Access to a Sanitation Facility	% With No Access to Sanitation
Kenya	57	43	42	58
Uganda	65	35	11	89
Tanzania	54	46	13	87
South Sudan	68	32	13	87
Burundi	71	29	41	59
Rwanda	76.1	23.9	61.6	38.4

Source: UNICEF Progress on Drinking Water and Sanitation

- **Waste Management:** More than 52% (over 3.5 billion) of the Earth's population in 2008 did not have access to the most elementary waste management services like e.g., a sound waste collection and removal out of the residential areas and at least a controlled disposal. (Association, 2012). In Eastern Africa, solid waste is not properly managed, and neither is it associated with income generation potential, coupled with the inefficient collection, management, disposal and reuse of solid waste.

  The main types of waste are organic/putrescible/biodegradable which makes approximately 60% of the total waste stream generated. This makes an average per capita waste generation of 0.7 kg/day. Recycling, recovery, reuse, and repurposing are concepts that are currently taking root in the region albeit still low (< 10% of total waste). From Table 2-6, it is evident that service provision is inadequate in most of the East African region.

Table 2-6: Access to Basic Urban Services for Selected Countries in East Africa

Country	City	Piped water	Sewerage	Mobile services
Rwanda	Kigali	20.5	8.4	39.4
Kenya	Nairobi	78.2	71.3	92.5
Uganda	Kampala	26	10.7	67.6
Tanzania	Dar-es-Salaam	62	10	-

Source: EAC

Kenya is working to contain incessant open disposal and manage its dumpsites with controlled landfills. There are also innovative concepts that are taking root including, organic composting, adoption of nascent technologies to convert waste into assets, fortification of organic compost to make fertiliser amongst other initiatives. This could be devolved to the County level, thus containing the errant situation in the upcoming Municipalities and neighbourhoods.

- **Education and Literacy:** Education plays a major role in increasing productivity and economic growth and reducing poverty and inequality. Kenya also ranks on top in terms of enrolment of students in higher education, followed by Uganda and Tanzania. The Global Competitiveness Index (GCI) 2013-2014 ranks Kenya 44th out of 148 countries in quality of education. According to the East Africa Community Database in 2012, Kenya ranked best overall in the Pupil-Teacher ratio at 56.57 (Primary School) and 41.13 pupils per teacher. These figures have changed since the introduction of free primary education in Kenya causing the numbers to tip over especially in public primary schools.

Table 2-7: Pupil-Teacher Ratio in Primary and Secondary

Country	Pupil-teacher ratio (primary)	Pupil-teacher ratio (secondary)
Rwanda	59.28 (2012)	22.91 (2012)
Kenya	56.57 (2012)	41.13 (2012)
Uganda	47.78 (2011)	25.42 (2011)
Burundi	47.10 (2012)	29.71 (2012)
Tanzania	45.57 (2012)	26.39 (2012)

Source: EAC

UNESCO puts Kenya's adult literacy rate at 78.73%, mainly dominated by male literacy at 83.78% and 74.01% for female. Kenya's adult literacy rate is 87% followed by Uganda at 73.2%, Tanzania at 72.9%, and Rwanda at 70.7% and Burundi at 66.6%.

In comparison to other East African countries, meanwhile, Kenya has the highest public expenditure on education at 17.7% between 2008-2009 and 2011-2012, compared to Uganda, which spends an average of 10%.

- **Access to Education:** The teacher-student ratio in Kenya in schools is below UNESCO's minimum of 1 teacher for every 33 pupils. Globally on this, Kenya still lags when compared with other developing countries. At the same time, Kenya ranks 72nd in the world in terms of access to education.

Table 2-8: Teacher - Student Ratio for Selected Countries in East Africa

Country	Teacher – Student Ratio
Kenya	1:26
Eritrea	1:51
S. Africa	1:29
Chile	1:23
Mexico	1:21
Uganda	1:19

Source: UNESCO

- **Health:** Kenya falls far below the World Health Organisation's (WHO) recommendations in terms of doctor to patient ratio. Kenya's demographics show that the ratio of doctors and patients was estimated at 1:16000, (Table 2-9) while in-patient hospital density was at 1.4 beds per 1,000. The country's health sector has been challenged by a limited number of health professionals, the number of hospital beds for in-patient services and poorly equipped facilities. This is way below the WHO recommended standard of one doctor for every 300 people, that translated means that Kenya requires 53 times the existing number of doctors to comply with the international standards. Table 2-10 below shows Kenya's comparison to with rest of Eastern Africa.

Table 2-9: Analysis of Health Status in Kenya

Particulars	Details
Projected population for Kenya	47,615,739
Number of doctors	6,271

Particulars	Details
Doctor: Population Ratio	1:16000
WHO Ratios	1:300

Source: WHO 2012

Table 2-10: Doctor-Patient Ratio for Selected Countries in East Africa

Country	Ratio per 100,000 people
Uganda	8
Sudan	22
Tanzania	2
Kenya	6
Burundi	3
Rwanda	5

Source: WHO 2012

2.1.6 Long-term Development Strategy of the Government of Kenya

Kenya Vision 2030

The Government of Kenya's long-term development strategy aims at making Kenya a newly industrialising, middle-income country providing a high-quality life for all its citizens by the year 2030. Known as 'Vision 2030', it defines the country's long-term development strategy that addresses economic, social, and political agenda as its pillars. It focuses on reconstruction, deepening structural reforms, and governance, improving infrastructure, reducing income inequality and employment creation.

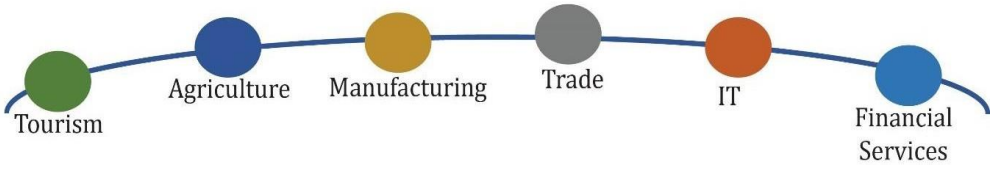


Figure 2-5: Economic Sectors Emphasised in Vision 2030

Source: Vision 2030

The economic pillar aims to maintain sustained economic growth of 10% per annum over the next 25 years and emphasises on six key sectors, including tourism, agriculture, manufacturing, trade, information technology, and financial services. The social pillar seeks to build a just and cohesive society enjoying equitable social developments in a clear and secure environment. The political pillar aims at realising an issues-based, people-centric, result-oriented and accountable democratic political system.

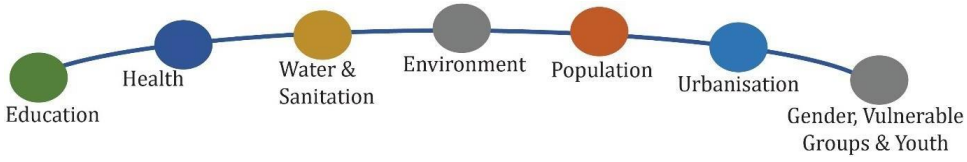


Figure 2-6: Social Aspects Emphasized in Vision 2030

Source: Vision 2030

Vision 2030 targets Kenya's Economic gross domestic product (GDP) growth rate of 10% per annum, which implies that NMR's gross regional domestic product (GRDP) would reach 15% per annum, doubling the income per capita of Kenya and NMR by 2018 and stimulated to grow by on an average of 15% per year by 2030. Such growth will have an impact on all sectors, including economic development demanding for strong infrastructure support. It is envisioned that with a 10% GDP growth rate, the development of the NMR would increase by 15% to 20%. This sustained growth will require a strategy that takes into account social concerns and inclusive planning.

2.1.7 Short-Term Development Strategy of the Government of Kenya

Kenya launched a 5-Year Development Plan (2017-2022), dubbed 'the Big 4 Agenda' that will focus on four priority areas:

- Ensuring food security by increasing food production especially for staple food;
- Increasing affordable housing by constructing 500,000 affordable homes in all major cities by 2020;
- Enhancing the country's manufacturing capacity at all levels; and
- Providing affordable healthcare universally to all Kenyans.

The sectoral economies of Nairobi Metropolitan Region will basically rely on agriculture, real estate, industry and manufacturing, service sector, tourism, employment, and micro and small enterprises.

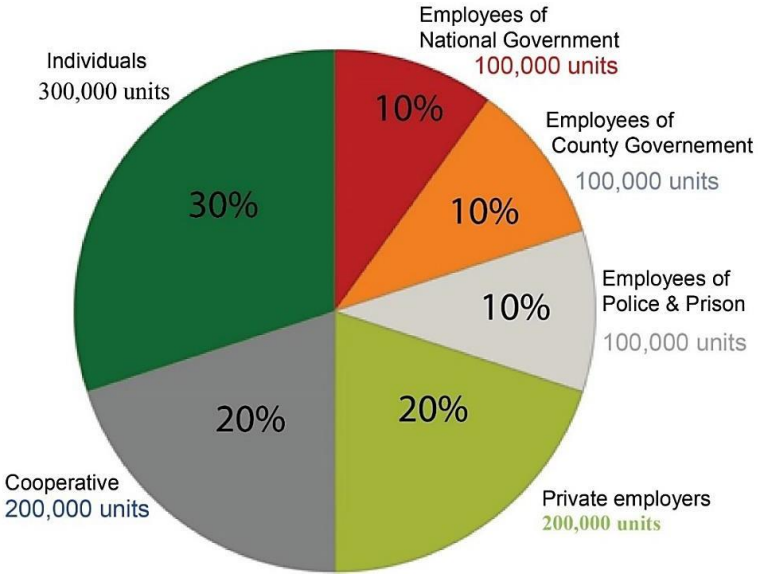


Figure 2-7: Proposed Housing Distribution to End-Users

Source: Government of Kenya Consolidated Big 4 Agenda

2.3 Kenyan Economy in the Global Context

The Kenyan Economy has made remarkable progress in institutions, integration, and infrastructure. Regional integration since the mooting of the East African Community (EAC) has seen fast-tracked progress in institutional reforms. Kenya's economy is the largest in the region and much more dynamic than economies of neighbouring countries.

Its economic dominance is illustrated in Intra-East African trade that averages 37% stemming from the diversification of its exports basket, which makes it less vulnerable to exogenous shocks; private sector growth and investment, that is the largest contributor to GDP growth; and embracing the freedom of enterprise, causing the growth of companies in different industries in Kenya e.g., textile

and apparel industry that exports finished products to the USA. As a result, it has attracted relatively high levels of foreign direct investment (FDI).

There are, however, challenges that the country still needs to address, above all poverty, inequality, and access to health services. The recent discovery of resources such as oil in Turkana and its extraction by Tullow Oil, base titanium, coal, and underground water, augur well for the country's future economic performance.

2.3.1 Economy of NMR

The NMR being a national, regional, and international strategic centre for education, commerce, transport, regional cooperation, and economic development, plays an important role in Kenya's economy. It connects eastern, central, and southern African countries. It plays a significant role in the global, regional, and local economy. It is the centre of international diplomacy, finance, banking, and commerce. In 2009, the population of Nairobi was 3,138,369 (CBS-2009) and NMR was 6,658,000 (CBS-2009).

2.3.2 Macroeconomic Performance of NMR and Economic Growth Target

- **Economic Growth:** Vision 2030 targets a GDP growth of 10% per annum, which implies that NMR's GRDP would reach 15% per annum. In addition, sustainable growth, as envisaged in the Vision, requires that the growth strategy takes into account social concerns (poverty and income inequality), especially inclusive planning.

- **Economic Targets for NMR:** NMR economy will have to be stimulated to grow by 15% a year on an average by 2030. In order to attain a growth rate of 15%, the per capita income should grow by about 10% per annum on an average. The estimated future economic growth assumption of NMR up to 2030 is given below in Table 2-11.

Table 2-11: Economic Growth Assumptions of NMR (2010-2030)

Parameters	Year	
	2010	2030
GRDP	KShs 899.7 billion	KShs. 14,725.2 billion
Per Capita	KShs. 81,957	KShs. 122,800
Employment	1,979,935	5,404,352
WFPR	29.74%	35.71%
Formal Employment	399,180	1,801,451
Informal Employment	1,580,755	3,602,90

Source: NMR Spatial Plan

The Economic Recovery Strategy (ERS) identifies the private sector in NMR as the engine of growth. Using the strategy, the Government seeks to maintain macroeconomic stability; improve investment climate; restructure public expenditure to support growth; ensure equity and poverty reduction measures; improve public service delivery; carry out financial sector reforms; and develop infrastructure and the productive sectors of the economy.

Analysis of the recent growth in the GRDP of NMR reveals that although there has been some increase in external demand for indigenous products, growth has largely been supported by the increase in domestic demand, especially private consumption and investment. The key challenges to growth in exports include lack of diversification, low-value exports and supply-side constraints related to the investment climate. Concomitant with the strong growth in aggregate demand is an emerging

trend of increasing savings-investment deficit, fiscal deficit, and current account deficit. This calls for balanced growth in aggregate demand and the potential or capacity of the regional economy to produce goods and services. In this regard, there is a need to refocus efforts towards the supply constraints in the different sectors of the regional economy and adopt policies that exploit and enhance domestic inter-linkages in the regional economy and further boost productivity growth.

Despite recent improvements in investment growth, Nairobi has one of the lowest investment rates amongst comparable metropolitan cities around the globe. The key challenges to improving the investment climate include insecurity, corruption, poor infrastructure (including roads and energy/ electricity), and limited access to credit by small and medium enterprises.

The key challenges for NMR economy relate to sustaining growth, enhancing the development of financial services, generating public savings and realising a demographic transition that reduces dependence on the working population.

2.3.3 The Sectoral Economies of Nairobi Metropolitan Region

Agriculture

Agriculture is the second largest contributor to NMR's GRDP, after the service sector. The areas around Nairobi are prime agricultural lands. The principal food crops are maize, sorghum, cassava, beans, and fruit. Small-scale farmers grow cash crops, such as coffee. Horticulture is a new sub-sector of agriculture that is witnessing high growth; flower exports are becoming an increasingly important source of foreign exchange.

Mostly smallholder farmers who farm mostly staple crops, cereals, fruits and vegetables and later trade the same at the local markets. They carry out agricultural Activities in Ngong' - Kiserian - Ongata Rongai at the catchment areas of the urban areas. Ngong' and Kiserian share a farming catchment area at the slopes of Ngong' hills (Upper Matasia) as well as the Olkeri and lower Matasia areas. Ongata Rongai on the other hand also has Olkeri as one of its farming catchment areas as well as Kandisi and Lemelepo areas. Other farming activities include the flower farming at Ngong' Roses at upper Matasia.

Real Estate

The real estate sector is a major contributor to the GDP in Kenya contributing about 8.4% after the manufacturing sector. The real estate market varies in terms of income, geography, and types. In the NMR, in particular, the key drivers include demographics, income, government policy, advertising, and changing lifestyles. The main property types in this region being a retail, office, residential and industrial properties. The retail sector has grown with several malls opening. This is driven by increased urbanisation, the enhanced purchasing power of the middle class and changing consumer patterns.

In the planning area, there has been a very high increase in the real estate economy, where the majority of developers are targeting new homeowners in Ongata Rongai where some new developments are coming up. However, the greatest growth in this sector for the entire planning area has been the development of multi-level residential apartments for rent. Other real estate developments include some tourist hotels and eateries along Magadi road in Kiserian and Kona Baridi areas, shopping malls in Ngong', Juanco and Matasia areas.

Industry and Manufacturing

Although Kenya is the most industrially developed country in East Africa, manufacturing still accounts for only 11% of GDP. Nairobi is also the largest industrial centre. Manufacturing accounts for only 22%t of GRDP of NMR. The principal products include processed food, beer, vehicles, soaps, construction material, engineering, textiles, and chemicals. Industrial activity, concentrated around the largest urban centres of NMR, is dominated by food- processing industries such as grain

milling, beer production, sugarcane crushing and the fabrication of consumer goods, e.g., vehicles from kits. There is a vibrant and fast-growing cement production industry around the Export Processing Zone (EPZ) in Athi River. In addition, a substantial and expanding informal sector engages in small-scale manufacturing of household goods, motor-vehicle parts, and farm implements. Other industries include forestry, fishing, and mining. The informal sector is increasingly becoming a very important contributor to the NMR economy. The sector is important in terms of its contribution to total output, export earnings and its employment creation capability.

Industry and manufacturing is a rather silent component in the planning area with the exception of quarry mining (stone and ballast). The only other industrial activities are light and cottage industries at a minimal scale. There is however the high potential for industry and manufacturing due to the high amounts of produce from farmlands at the hinterlands of the three towns. The slaughterhouse is also a vibrant sector and processing of some of the produce is possible.

Service Sector

NMR is the centre of economic activities in Kenya functioning as the lifeline of transport and communications. The concentric urban structure has been dominant for a long time where most working people are in the secondary and the tertiary sectors and commute to the CBD located in Nairobi and adjoining industrial areas. From the 2000s, however, urban functions are distributed along trunk roads and major transport points. The business activities taking place in NMR are summarised below:

- Industrial development is taking place along Mombasa Road in NMR, while service-oriented and residential developments are observed along Thika Road;
- EPZs as the strategic industrial footholds based on the National economic development policy are established along trunk roads and in the east of Nairobi City. Out of those EPZs, Athi River Town EPZ was developed on a large scale in combination with housing area development; and
- Small and Medium Enterprises have been located sporadically in the surrounding districts in the NMR. Especially food processing industries based on agricultural produce are located in the areas with high agricultural potential in Thika and Kiambu. Commercial cores have developed at nodal points of road transport outside the CBD of Nairobi City.

Tourism

Tourism is a key economic sector both for Kenya and NMR, and consequently, is recognised in Vision 2030 as a key sector in the transformation of the country into middle-income status. Nairobi's services sector, contributing a major chunk to Nairobi GRDP, is dominated by tourism. The tourism sector has exhibited steady growth since independence. Nairobi is not a prime tourist destination, but it does have several tourist attractions. With a well-developed system of hotels and top-rate tour companies and the country's spectacular game parks, tourism is an important part of NMR's economy. Nairobi is the centre for many tour companies and travel agencies.

Tourism activities are largely concentrated in NMR (80% of the tourism in Kenya). There is a need for concerted capacity building to improve business, entrepreneurial and labour skills, and avail concessional credit to get the local communities more involved in the sector.

NMR faces various challenges in realising the full potential of the tourism sector. These include low competitiveness; lack of an effective policy environment and lower number of developed heritage sites; slow issuance of work permits in the tourism industry; relatively high levels of taxation in the tourism industry; negative publicity due to insecurity; and environmental degradation and congestion.

Tourism in the region is concentrated along Ngong' hills area. Hiking activities are the main attraction for Ngong' hills accessed through Ngong' town. Kiserian is also frequented for the scenic views at Corner Baridi and eateries.

Employment

Nairobi is dominant in employment generation in Kenya for both the informal and formal sectors. Of the working population, about three-quarters are in the informal sector in Nairobi. As discussed in the Spatial Planning Concept, NMR faces under-employment, poor working conditions, and gender inequality in employment. Unemployment is highest within the age groups of 15-24 at about 25%. Unemployment amongst young women is even higher in this age group at about 27%. Youth unemployment in NMR is, therefore, over two times the national unemployment rate. The level of under-employment is also relatively high. The rate of under-employment to the labour force is 22%. This rate is higher in rural areas than in urban areas at 24% and 15%, respectively. The informal sector remains the major employer, accounting for over 75% of total employment in the region.

The services sector is the main source of employment followed by manufacturing. In terms of gender, formal sector employment is still male dominated, with women accounting for about 30% of total formal employment. Of female employees in the modern/formal sector, about 60% work in the community, social and personal services.

Poverty and Income Inequality

Nairobi's poverty levels are estimated to be on the decline, but there are significant differences within and across NMR. Although the proportion of the population living in poverty has declined, the number of those living below the poverty line is estimated to have increased. The incidence of poverty is higher in rural areas compared to urban areas.

There are also substantial differences in poverty within local areas (i.e., divisions in NMR). For instance, while overall Central Nairobi recorded improvements in poverty reduction, the levels of poverty in Kibera increased by 21% in 2009. In addition, although poverty levels increased in all other areas of NMR as a whole, there were notable reductions in poverty levels in the central division of NMR. Analysis of household consumption expenditure distribution reveals that the poorest 10% of rural households incur only 2% of the total expenditure, while the richest 10% incur 41% of the total household expenditure. Cumulatively, the top (richest) 30% of households incur 75% of the total household expenditure.

Micro and Small Enterprises

The micro and small enterprises (MSEs) sector contributes about 19% to Nairobi's GRDP. Further, the sector, accounting for 90% of all new jobs created, employs 80% of the total number of employees in the NMR.

Inaccessibility to financial services, deficiencies in technical and management skills, dilapidated infrastructure, and increasingly volatile input and output markets hinder the performance of the MSE sector. MSEs are crucial in economic development and form the bedrock of improving skills, incubation for creativity and innovation.

Further, due to low investment requirements, the sector has high potential to create employment and reduce poverty.

Economic Potential of NMR

NMR offers numerous investment opportunities in the manufacturing sector, infrastructural development, financial sector, agro-processing, agrochemicals, chemicals, pharmaceutical, mining, and mineral processing, electrical and electronics, metallurgy, engineering, and construction industry.

There is a big market in NMR for products such as industrial machinery and spares for agriculture, transport industry and workshop, pumps for irrigation, domestic waste handling material, equipment and hand tools for the building sector, metal, and woodworking machine tools. Investment opportunities exist in the tourism sector, financial services, textile sector, food industry, commercial dairy farming, LPG supply and distribution, and fertiliser sub-sector. In recent years, economic recovery has been spurred by the buoyantly performing hospitality industry (hotels and restaurants), transport and communication, as well as commerce (wholesale and retail trade), that have reported double-digit growth rates. The performance of the hospitality industry and to a certain extent, transport and communication, reflects the rapid growth of the tourism industry.

The on-going liberalisation and privatisation present enormous investment opportunities to private investors, particularly in the information technology and telecommunication sectors.

Cluster Potential

While pointing out to the lack of an integrated approach to development in the NMR, the SPC for NMR suggests that the region should consider using the cluster development strategy as an economic tool for enhancing competitiveness. Assessment of the likelihood and potential for adoption of cluster development strategy was considered. This assessment found that the defined four clusters in Consultant's ToR have economic relevant of which Ngong'-Ongata Rongai Kiserian were identified as part of cluster 3 together with Kitengela being within County Government of Kajiado. This is as indicated in Table 2-12 below.

Table 2-12: Assessment for Adopting Cluster-Based Planning Strategy

Cluster No.	Town/ Corridor	Existing Economic Activities	Identified Economic Planks	Economic Clustering Potential
Kitengela		Services, Real Estate, Agriculture, Transport Services, Tourism.	Real Estate, Industrial, Tourism	Real Estate Tourism Services
Three	Ngong'-	Services, Agriculture, Transport, Hospitality, Small -Scale Industry.	Real Estate, Tourism	
Ongata Rongai		Services, Agriculture, Transport, Industry.	Real Estate, Services	
	Kiserian	Services, Agriculture, Transport, Industry, Hospitality.	Real Estate, Services, Tourism	

Source: SPC for NMR

The key industry verticals within each of the four clusters fit in with the economic priorities of the NMR and fulfil specific economic roles essential to the growth and development of the entire region.

The economic activities and features of the four clusters complement instead of competing with one another. One cluster's development into an education hub, for instance, would support the economic growth of another region by providing high-skilled industrial and tertiary workforce, thus boosting productivity as well as the economic output of the latter. Similarly, 'dormitory clusters' which have seen a high real estate growth, provide residences and commercial services to hundreds of thousands of workforces employed in the Central Business District of Nairobi as well as in other urban centres of the NMR. The economic spillovers from one cluster too, if absorbed optimally, will have a major impact on the growth and development of others. The need to identify, develop and nurture such economic complementarities and externalities has been highlighted in this strategic report and is proposed as a key consideration in all NMR level strategic planning and policy design.

2.3.4 Bottlenecks of Economic Development of NMR

GDP Growth

High and rising living standards are key indicators of the successful utilisation of a region's competitiveness. Vision 2030 envisages a sustained average growth of 10 per cent per annum over the next two decades implying that the size of the economy should double every 7 years. An analysis of sources of recent growth reveals that growth has largely been driven by private consumption and investment. To sustain such growth within a stable macro-economic environment, aggregate expenditure should not outpace the production capacity of the economy.

Macroeconomic Stability

Macroeconomic stability refers to the stability of aggregate prices including inflation, interest rates, exchange rates, and sustainable fiscal balances. High inflation rates are driven by high negative real interest rates as well as rising food prices. Therefore, any attempt at realising overall price stability should address these two issues.

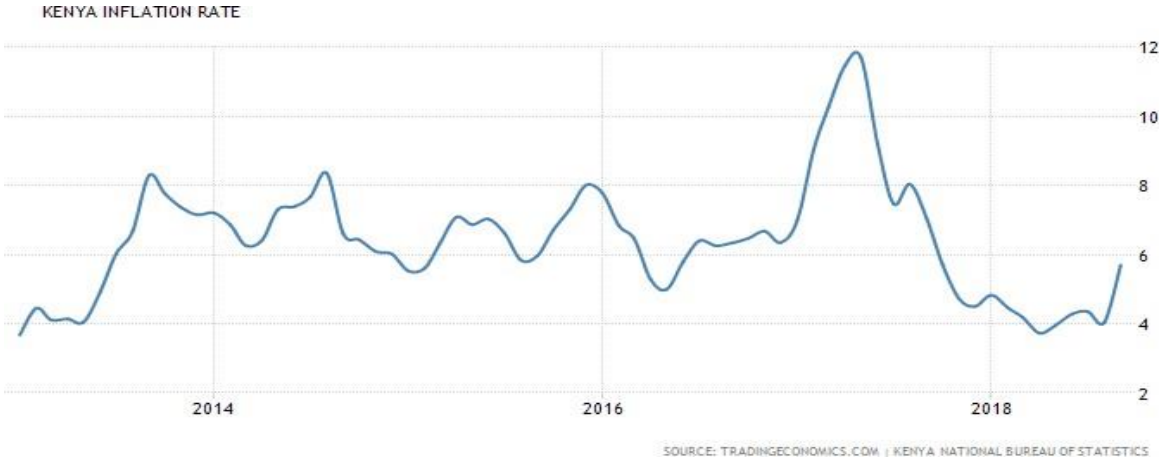


Figure 2-8: Kenya Inflation Rate (2013 – 2018)

Source: Tradingeconomics.com | KNBS

Labour Market

The efficiency and flexibility of labour market share is critical for ensuring that labour is allocated to its most efficient use in the economy and that labour as a factor of production is rewarded appropriately. The labour market in Kenya (ranked at 60) is less efficient compared to its neighbours. This low labour efficiency ranking may be explained by the structural problems traceable to the technical and vocational training system.

The Kenyan workforce is well educated but the level and quality of education and technical training is very low. The 2007 Global Competitiveness Index (GCI) report notes that the current Kenyan training curricula are obsolete and there are major deficiencies in the public training facilities and instructional capacities. These problems lead to a mismatch between the supply and quality of skills in the market and actual demands of the growth sectors of the economy.

Security and Enforcement of Contracts

A country cannot create wealth and prosperity if the safety of the workers, customers, entrepreneurs, and the property is not guaranteed because of conflicts, terrorism, and crime. The Government included maintenance of law and order, and an efficient and motivated police force as its goals in the Economic Recovery Strategy (ERS) and is part of Governance, Justice, Law and Order Sector (GJLOS) reforms.

In the business cost of terrorism category, South Africa, Uganda, and Tanzania are also poorly rated. On the business cost of crime and violence, Uganda, Egypt, and China were also almost at par with Kenya. The Asian Tigers, on the other hand, seemed to perform relatively well across all the security indicators. In particular, Singapore tops in the reliability of police services organised crime in public institutions and business costs of terrorism. Kenya also performs poorly in the judicial independence ranking and law and order index.

Infrastructure Development

Infrastructure bottlenecks constrain economic growth, competitiveness, and poverty reduction. The existence of high-quality infrastructure is critical in ensuring the efficient functioning of the economy. Kenya performs poorly in terms of physical infrastructure compared to some other developing countries. As with technology, this implies that NMR has to address infrastructural constraints. Kenya also compares unfavourably in terms of access to the communication system, port, and rail transport infrastructure, and electricity supply.

Rapid Population Growth

Nairobi's population has grown significantly from 350,000 in 1963 to 828,000, 1,325,000 and 2,137000 in 1979, 1989 and 1999, respectively. The population of Nairobi continues to increase at a very high rate of 4.5% per annum for the last three decades (UNEP and UN-Habitat) compared to the 1.2% average growth rate for the world. Notably important is that Nairobi's population represents about 21% of Kenya's urban population. Projections presented in the SPC for NMR indicate that this population is expected to hit the 8 million mark by the year 2030. About 29% of the population is living below the poverty line and 40% are categorised as living in informal settlements, mainly slums. This is further accelerated by the influx of people from rural areas where the poverty ratio is over 50%.

Informal Settlements and Poverty

The influx of population from rural and adjacent areas to the NMR is the prime reason for growing numbers of informal settlements such as slums and squatters in and outside Nairobi city. Providing public services such as water, electricity, sewerage, health and education facilities to such informal settlements is a key challenge in these informal settlements and slums.

Concentrated Economic Activity

The economic and commercial activities are concentrated in and around Nairobi City. Economic use of water, electricity, and power is one of the toughest problems to be dealt with for converting a metropolis like Nairobi into a world-class city. The growing population, expanding economic activities, construction of industrial belt within the city area, and increased commercial activities are responsible for further deterioration of the natural resources. There is a reduction in vegetation and open land, which have been playing an important role in the maintenance of the natural environment.

Lack of Integrated Approach to Development

A number of studies and plans have been formulated earlier for development of Nairobi and NMR. There is, however, no integration amongst these plans and studies. In respect of the business environment, the NMR faces the challenge of enhancing macroeconomic stability, especially with regard to lowering overall inflation. Further, despite NMR being identified as one of the top important places that is making it easier to do business, more concerted effort is required to elevate it to a middle-level economy.

2.4 National, Regional and Local Plans

The ISUDP is prepared within the context of the regional plans for NMR, namely; Vision 2030, Nairobi Metro 2030 and SPC for NMR.

Vision 2030

The social pillar under Vision 2030 recognises that in order to achieve widespread prosperity in Kenya there is a need to have a just and cohesive society through key social sectors specifically; Education and Training, Health, Water and Sanitation, Environment, Housing and Urbanisation as well as in Gender, Youth, Sports and Culture.

- **Education and Training sector:** Kenya identifies education as a fundamental sector in equipping citizens with understanding and knowledge that will enable them to make informed choices about their lives and those facing the Kenyan society.

- **Health Care:** Proper health care plays a great role in a country's economic growth and poverty eradication.

- **Water and Sanitation:** The policy aims to ensure availability and access to water and improved.

- **Environment:** The vision for the environmental sector is "a nation living in a clean, secure and sustainable environment through pollution and waste management and environmental planning and governance.

- **Housing and urbanisation:** The policy aims to provide the country's population with adequate and decent housing in a sustainable environment.

- **Gender, Youth and vulnerable groups:** Vision 2030 mainstreams gender equity in all aspects of society. In this regard, gender equity will be addressed by making fundamental changes in four key areas, namely; opportunity, empowerment, capabilities, and vulnerabilities stems having reforms in the health care to play a great role in the country's economic growth and poverty.

- **National Spatial Plan:** The National Spatial Plan (NSP) is a national spatial vision that guides the long-term spatial development of the country. It is a strategic vision that defines the general trend and direction of spatial development for the country. The NSP is a flagship project identified under Kenya Vision 2030 as one of the foundations for socio-economic transformation. It aims at achieving an organised, integrated, sustainable and balanced development of the country. NSP will inform the future use and distribution of activities by providing a framework for better national organisation and linkages between different activities within the national space.

  The objectives of the NSP are to create a spatial planning context to enhance economic efficiency and strengthen global competitiveness, promote balanced regional development for national integration and cohesion, optimise utilisation of land and natural resources for sustainable development, create liveable and functional human settlements both urban and rural and secure the natural environment for the high quality of life.

Nairobi Metro 2030

Nairobi Metro 2030 provides the policy direction for the development of the metropolis to support Kenya Vision 2030. The ISUDP is guided by these policies particularly in the course of determining the Municipality's overall development goals and the various strategies to achieve them.

Nairobi Metro 2030 envisions the NMR to become a "world-class African metropolis" characterised by a world-class working environment, living environment, business environment, and governance. Its key result areas are the following:

- Build an internationally competitive and inclusive economy for prosperity;
- Deploy world-class infrastructure and utilities for the region, enhance mobility and connectivity through effective transportation; and
- Enhance the quality of life in the region, delivering a unique image and identity through effective place branding, ensure a safe and secure region and build world-class governance.

Spatial Planning Concept for NMR

The SPC for NMR provides the physical direction for the region's development in support of Kenya Vision 2030 and Nairobi Metro 2030. It provides a holistic "conceptual framework" that defines the future spatial growth of the NMR and thus provides a guide in the preparation of local development plans. The concept promotes a land-use system intended to ensure the development of an "environmentally sustainable region" that will build an internationally competitive and inclusive economy for prosperity, deploy world-class infrastructure and utilities for the region, optimise mobility and accessibility through effective transportation, enhance the quality of life and inclusiveness in the region, deliver a unique image and identity through effective place branding, ensure a safe and secure Nairobi Metropolitan Region, and employ world-class metropolitan governance systems.

Key parameters that are provided in the SPC for NMR that guided the development of the ISUDP is its economic function as an industrial town. Consideration is likewise being given to its role of being a growth centre in the proposed settlement hierarchy for NMR, 2030.

Table 2-13: Economic Targets for Urban Centres

Spatial Units	Envisaged Function
Ngong'	Industrial Town
Ongata Rongai	Service Town
Kiserian	Service Town

Source: Spatial Planning Concept for NMR

Table 2-14: Proposed Settlement Hierarchy for NMR, 2030

Level	Settlement Hierarchy	Settlements	Characteristics
I	Regional Complex	Nairobi- Ngong'- Ongata Rongai	Highest administrative functions; and specialised and world-class facilities; and tertiary activities.

Level	Settlement Hierarchy	Settlements	Characteristics
IV	Market Centre	Gatundu, Githunguri, Kathiani, Kiserian, Namanga, Isinya, Bissil, and Sultan Hamud Magadi	Small towns having linkages with immediate rural hinterlands; and higher-order village having a central location and potential for development within its catchment area with relatively better services and facilities in terms of education, health, communication, accessibility and has the capacity to serve a group of basic villages.

Source: Spatial Planning Concept for NMR

Interdisciplinary Land-Use and Transport Metropolitan Analysis (ILUT) within the NMR

The broad strategic and policy guidance for development in the NMR comes from three main documents. The SPC for NMR, Integrated Urban Development Master Plan for the city of Nairobi (NIUPLAN) and Mass Rapid Transit Harmonisation Study. These three references together provide a broad growth, development and land-use framework and assumptions for the work of ILUT.

The purpose of the ILUT project was to produce concept land use plans and quick wins' infrastructure designs for selected commuter railway stations within the NMR. The key objectives are to prepare concept land-use plans for the commuter rail (CR) stations within one km radius-study areas and "Quick Win" CR station area infrastructure designs (QW) for 10 selected CR stations.

ILUT is an interdisciplinary study. The methodology was based on integrating information, overlapping layers and analysis from different experts to develop a harmonised integrated land-use and transportation concept. The concept was applied in three steps:

- Assessment of the current situation, mostly via site visits;
- Assessment of trends for 2030 and proposals by component; and
- Integration of all components to create an integrated land-use and transport concept with intermodal transport facilities.

The concept land-use plans developed in Phase I and Phase II were based on the Transit-Oriented Development (TOD) concept, which aims at creating an urban centrality next to the station, with high density, mixed-uses, and pedestrian-oriented developments. In total, 32 stations sites were studied. For 9 stations a more detailed analysis was done within the scope of Phase II report. These stations were selected through a process of multi-criteria analysis. The selected stations are Dandora, Ruiru, Mwiki, Githurai, Kahawa, Athi River, Limuru, Makuyu, and Kitengela.

The concept land-use plans focused on developing liveable centralities, pedestrian-oriented, with quality open spaces, green malls, and adequate institutions and public services. The road network is densified with better connectivity. Blocks should be less than 100 m wide to allow shorter direct trips for pedestrians and improve the walking experience. Main roads should be designed with large pedestrian sidewalks and a cycling lane separated from the vehicle carriageway in order to enhance non-motorised transportation (NMT).

County Integrated Development Plan

This ISUDP likewise makes reference to the County Government of Kajiado's Integrated Development Plan (CIDP) 2013 – 2017 which provides the guiding vision of "a prosperous, globally competitive County, offering the quality of life" and mission statement of "to promote equitable and sustainable socio-economic development through efficient resource utilisation and inclusive participation."

CIDP 2013-2017 highlighted the key development challenges in the County such as "inadequate water supply, poor physical infrastructure, high illiteracy level, low level of diversification, inadequate marketing channels, poor coordination of development activities and inaccessibility to health services". Crosscutting issues that were identified include "high population growth rate, high levels of poverty, HIV/AIDS, gender inequality, disaster management, environment, and sustainable development." Immediate objectives that are supported by a comprehensive and multi-sectorial set of strategies, priority programs and projects to address these challenges and issues were likewise provided in the CIDP. Priority programmes identified by the CIDP focused on the following:

- Agriculture and development sector;
- Energy, infrastructure, and IT;
- General economic, commercial, and labour affairs sector;
- Health sector;
- Education sector;
- Public administration and international relations;
- Social protection, culture, and recreation;
- Governance, justice, and law and order;
- Environmental protection, water, and natural resources;
- Urban development;
- Land use;
- Tourism and wildlife; and
- Sports and cultural development.

2.5 Legal and Policy Framework

The ISUDP is being prepared within the relevant legal and policy frameworks of the Government of Kenya (GoK) and in compliance with the following legal and policy instruments:

2.5.1 Legal Instruments

Constitution of Kenya, 2010

The Constitution of Kenya (CoK) (2010) is the overarching legislation that guided the preparation of this ISUDP. Amongst its other provisions, CoK (2010) provides that every person has the right to health care services, accessible and adequate housing, and reasonable standards of sanitation, clean and safe water in adequate quantities, social security, and education CoK (2010), Chapter 4 Bill of Rights, Part 2 Rights and Fundamental Freedoms).

Article 60(1) of CoK 2010 provides that land in Kenya shall be held, used and managed in a manner that is equitable, efficient, productive and sustainable. For these purposes, the use of land and property shall be regulated by the State "in the interest of defence, public safety, public order, public morality, public health, or land use planning" (Article 66(1)). Development planning is inextricably linked to the ownership, use, and management of land.

CoK 2010 also provides for the devolution of the Government. With regards to development planning, CoK 2010 laid down the objects of devolution as, amongst others, "to promote social and economic development and the provision of proximate, easily accessible services throughout Kenya" (Article 174(f)).

County Government Act

Following CoK 2010, the County Governments Act 2012 mandates County Governments to prepare County plans which include "cities and urban areas plans," amongst others. The said Act provides

that the "County planning framework shall integrate economic, physical, social, environmental and spatial planning" (Article 104(2)).

Physical and Land Use Planning Act, 2019

This Act, which commenced on 5th August 2019, repealed the Physical and Land Use Planning Act, 2019. The new Act regulates physical and land use-planning activities in Kenya. It empowers county governments to regulate development within their areas of jurisdiction. Further, it empowers the Director of Physical Planning to prepare various types of physical and land use development plans. In addition, the Director formulates National, Regional and Local Physical development policies, guidelines, and strategies.

Under Article 20, the County Director of Physical and Land Use Planning's responsibilities include: advising the County Government on physical and land use planning matters that impact the County; formulating County physical and land use planning policies, guidelines and standards, preparation of County physical and land use development plans; and preparation of local physical and land use development plans.

The Director also participates in the preparation of inter-county physical and land use development plans and carries out research on matters relating to physical, and land use development planning at the County level. In addition, the Director makes recommendations to the County Government on the establishment of planning units as may be necessary.

The Act also stipulates the responsibility of the Director's office in maintaining the County land information system to guide physical and use planning; communicate decisions of the County Government on development applications, and issue development permissions and other development control instruments under this Act with the approval of the County Executive Committee Member.

Article 36 mandates each county to develop a 10-year physical and land use development plan. The Plan should be in conformity with the National Physical and Land Use Development Plan and any relevant Inter-County Physical and Land Use Development Plan.

According to Article 37, the Plan should provide an overall physical and land use development framework for the County; guide rural development and settlement; provide a basis for infrastructure and services delivery and direct the use and management of natural resources. In addition, the Plan should enhance environmental protection and conservation; identify the proper zones for industrial, commercial, residential, and social developments; improve transport and communication networks and linkages, and promote the safeguarding of national security, amongst other purposes that may be determined by the planning authority.

This Act lends guidance to the development of the contents of structure plans, development plans, advisory plans, zoning plans, and subdivision plans, amongst other plans. The Act also stipulates the Plan's preparation and approval processes.

Article 56 empowers the County Government to prohibit or control the use and development of land and buildings in the interests of proper and orderly development of its area and to consider and approve all development applications and grant all development permissions.

Urban Area and Cities Act

The Urban Areas and Cities Act 2011 provides that the Town Committees should "formulate and implement an integrated development plan" (Article 20(2-c)) as well as "control land use, land sub-division, land development and zoning…within the framework of the spatial and master plans for the (town) as may be delegated by the County Government (Article 20(2-d))." The Integrated

Development Plan "shall bind, guide and inform all planning development and decisions and ensure comprehensive inclusion of all functions" (Article 36(2).

Environment Management and Coordination Act, (EMCA) 1999 (2002)

The Act entitles every person in Kenya to a clean and healthy environment and aims to safeguard and enhance the environment. Pursuant to the prevailing legal requirements as envisaged in this Act (EMCA, 1999) and to ensure sustainable environmental management, all planning activities aim to provide relevant information and environmental considerations on how to safeguard and enhance the environment during project implementation phases.

Public Health

The Act requires the ISUDP to enhance effective management of nuisance, i.e., noxious matter or wastewater as will be discharged from various uses of the development area. To achieve this, systems on the management of both solid and liquid waste (effluent) will be adopted as proposed in the ISUDP.

2.5.2 Policy Instruments

National Land Use Policy

The Land-Use Policy recognises the critical and central place of land in the production chain and addresses issues that relate directly to the use of land, its resources, and the perceptions held towards land. These issues include rapid urbanisation, inadequate land-use planning, unsustainable agricultural and industrial production methods, poor environmental management, poor cultural practices, inappropriate ecosystem protection, and management. These problems are commonplace and require appropriate policy responses.

The policy incorporates measures and principles to guide all activities, whether proposed or ongoing, that may have a direct or indirect impact on the use of land and its resources. The policy takes cognisance too, of the benefits of the planned use of land and its resources; and builds in measures for integrated, equitable and sustainable utilisation for optimal production. The policy puts in place 11 principles and values for land planning, management, and utilisation. The principles and values are:

- Efficient and sustainable land use management;
- Ecological sustainability;
- Integrity and adherence to the rule of law;
- Food security;
- Access to land use information;
- Amicable resolution of land-use conflicts;
- Equity in decision-making;
- Effective public participation;
- Elimination of discrimination in land use;
- Public benefit and interest; and
- Order and harmony in land use.

Urban Development Policy

The National Urban Development Policy aims to facilitate the implementation of the provisions on urban development contained in the Constitution, particularly in Article 176 and 184 dealing with devolution, classification, and management of urban areas, including popular participation. It is also in line with Kenya Vision 2030 - Kenya's development blueprint that envisages transition of the country to middle income with the majority of its population living in urban areas.

The policy identifies urban areas as the main contributors to the gross domestic product (GDP) accounting for about 70% of the GDP. Critical dimensions of the economy in urban areas identified include global competitiveness; local economic development; urban investment; rural-urban and intercity linkages; specialised urban areas and industrial development.

Planning is also identified as "the software for delivering urban development". It is seen to provide a structured framework for coordinating and integrating sectoral plans and Activities and supports the systematic implementation of urban development programs. In addition, it provides a platform for mobilization for public participation in urban development, while also seeking to optimise resource allocation and utilisation.

Sessional Paper No. 10 of 2012

Kenya as a nation begun to lay a foundation to build a globally competitive and prosperous economy in 2003. This was initiated through the economic recovery strategy (ERS) covering the 2003-2007 period. With the benefit of the historic achievements of the ERS, Kenya needed to continue accelerating her development from a low to a middle-income country, in an increasingly competitive global environment. The Sessional Paper Number 10 of 2012 aimed to take stock of the existing progress in the growth of the country as well as lay the foundation for the Vision 2030 but streamlining the transition between the strategy (ERS) and Vision 2030.

2.6 Institutional Framework

There are major actors and stakeholders who play a vital role in the growth and management of the Municipality. These actors are in the institutions highlighted which co-ordinate and manage the County, municipality and sub-counties, therefore, are key in the preparation of the ISUDP. Regarding land administration, the three key land management institutions in relation to the preparation of this ISUDP are the National Land Commission (NLC), Ministry of Lands and County Management Boards.

National Government

The National Government through the parliament plays a role in the provision of policies, legislation, and regulation to guide development. The National Government provides funds to the County Government through the Treasury and Constituencies Development Fund (CDF) kitty. They also facilitate seamless development in a sustainable equitable and integrated manner.

Through the Director of Physical Planning, the Ministry is in charge of foreseeing land use regulations and conformity with the physiographic characteristics of the area. The Ministry is also in charge of the approval of the Plan.

County Government

The function of land use planning and enforcement of approved development plans/controls are carried out by local authorities in line with the County Governments Act (CGA, 2012) and Physical and Land Use Planning Act, 2019. The County Government of Kajiado Government through its Planning Department and County Executive Member in charge of Land/Housing/Planning and Urban Development is in charge of the preparation of physical plans and general administration and management of land and land resource use. The Office of the President through the County Commissioner oversees the coordination of the National Government activities at the County level. These activities include security and general administrative services.

Land Control Boards

The County and Land Management Boards oversee overall policies and standards for land use planning and enforcement of development plans.

National Land Commission (NLC)

Established under Article 67 of the Constitution of Kenya, 2010, NLC has the mandate to carry out land administration and management sustainably, equitably, efficiently, and cost-effectively on behalf of the National and County Governments as well as have oversight responsibility for land use planning.

Land Courts

Under the Environment and Land Court Act of 2011, there is the establishment of a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and connected purposes. The Environment and Land Court under section 4 of the Act has the power to exercise jurisdiction throughout Kenya and pursuant to section 26, ensure reasonable and equitable access to its services in every county.

3. THE PLANNING AREA

3.1 Location & Land Area

The Municipality is in Kajiado County, Kenya and straddles between longitudes 36° 36' 21" E, 36° 51' 0" E and latitudes 1° 18' 20" S, 1° 27' 35" S. The area borders Kiambu County to the north and Nairobi County is 17 km to the northeast. Ngong Municipality, which straddles Kajiado North Sub-County, covers Ngong, Oloolua, Olkeri, Nkaimurunya, and Ongata Rongai Wards; and Kajiado West Sub-County covering southern regions of Ewuaso Oo Nkidong'i and a part of Keekonyokie Wards.

Ngong' Municipality has three major urban centres, namely; Ngong', Ongata Rongai and Kiserian. These towns are witnessing rapid urbanisation characterised by their distinct advantages indicating their potential for growth and development. Ngong' is mainly an administrative and commercial town, while Ongata Rongai and Kiserian are service towns. All these towns serve as a major residential hub for the NMR and have thriving real estate economies. Maps 3-1 to 3-4 shows the location of the Municipality in the national, regional and county contexts while Maps 3-4 and 3-5 show its sub-locations and base map, respectively.

3.2 Administrative Units

The Municipality covers approximately 15,229.00 hectares. The administrative area consists of seven wards as shown in Table 3-1 below. However, the planning area as shown in Table 6-1 in Section 6.2, covers 18,059 ha. as it extends beyond the administrative boundaries taking into account the need for a well-balanced rural-urban link.

Table 3-1: Administrative and Political Units and their Areas

Ward	Sub-Location	Area (hectares)		Share in %
		Ward	Sub-Location	
Ngong'		1,130.40		7.42%
	Ngong' Town		1,130.40	
Olkeri		5,485.03		36.02%
	Olkeri		787.46	
	Kahuho		688.58	
	Oloosurutia		369.94	
	Lower Nkoroi		685.44	
	Upper Matasia		1,790.49	
	Upper Nkoroi		525.67	
	Lower Matasia		637.45	
Nkaimurunya		1,215.05		7.98%
	Kandisi		361.76	
	Empakasi		853.29	
Oloolua		1,790.76		11.76%
	Oloolua		1,030.37	
	Kerarapon		422.87	
	Bulbul		337.52	
Ongata-Rongai		1,681.21		11.04%
	Ongata Rongai		573.56	

Ward	Sub-Location	Area (hectares)		Share in %
		Ward	Sub-Location	
	Lemelepo		1,107.65	
Ewuaso Oo Nkidong'i		2,830.55		18.59%
	Kibiko		2,830.55	
Keekonyokie		1,096.09		7.20%
	Kiserian		1,096.09	
Total		15,229.00		100.00%

Source: Kenya National Bureau of Statistics (KNBS)

3.3 Natural Resources & the Environment

3.3.1 Topography

The main physical features of the Municipality are spread across an altitude of 1,700m (a.s.l) at Kiserian to 2,460m (a.s.l) above sea level in Ngong' Hills. This is characterised by plains, valleys, and occasional volcanic hills. The hills afford a panoramic view of Nairobi City to the north, Nairobi National Park game reserve to the east and Great Rift Valley, dropping over 4,000 feet below, to the west. The region is rich in natural drainage channels that form rivers, and at times floods along the riparian areas as a result of stormwater flowing from the Ngong' Hills.

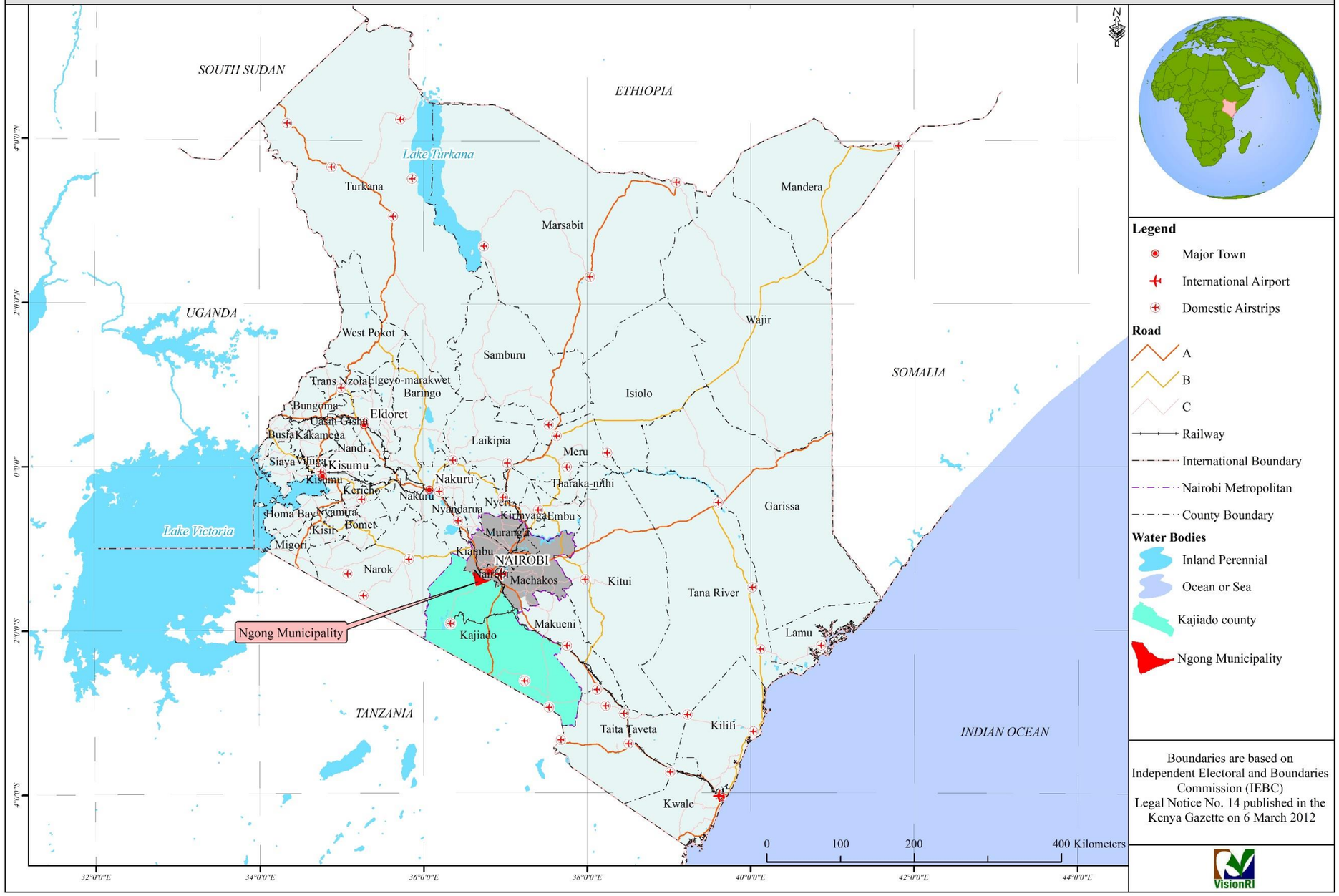
High elevations and steep slopes are found at Ngong' especially at the Ngong' Hills, therefore, constraining infrastructural developments on the hills. It, however, favours sporting activities taken advantage by Kenyan athletes for practice. There are also agricultural activities in the area.

Kiserian is located on a low elevation area at the foot of Ngong' Hills. As alluded to earlier, flash floods from Ngong' hills and parts of Magadi Road flow in to impeding mobility and deters investment in the town. Ongata Rongai is situated on relatively flat land with an undulating slope, which is suitable for development particularly in real estate.

3.3.2 Geology and Soils

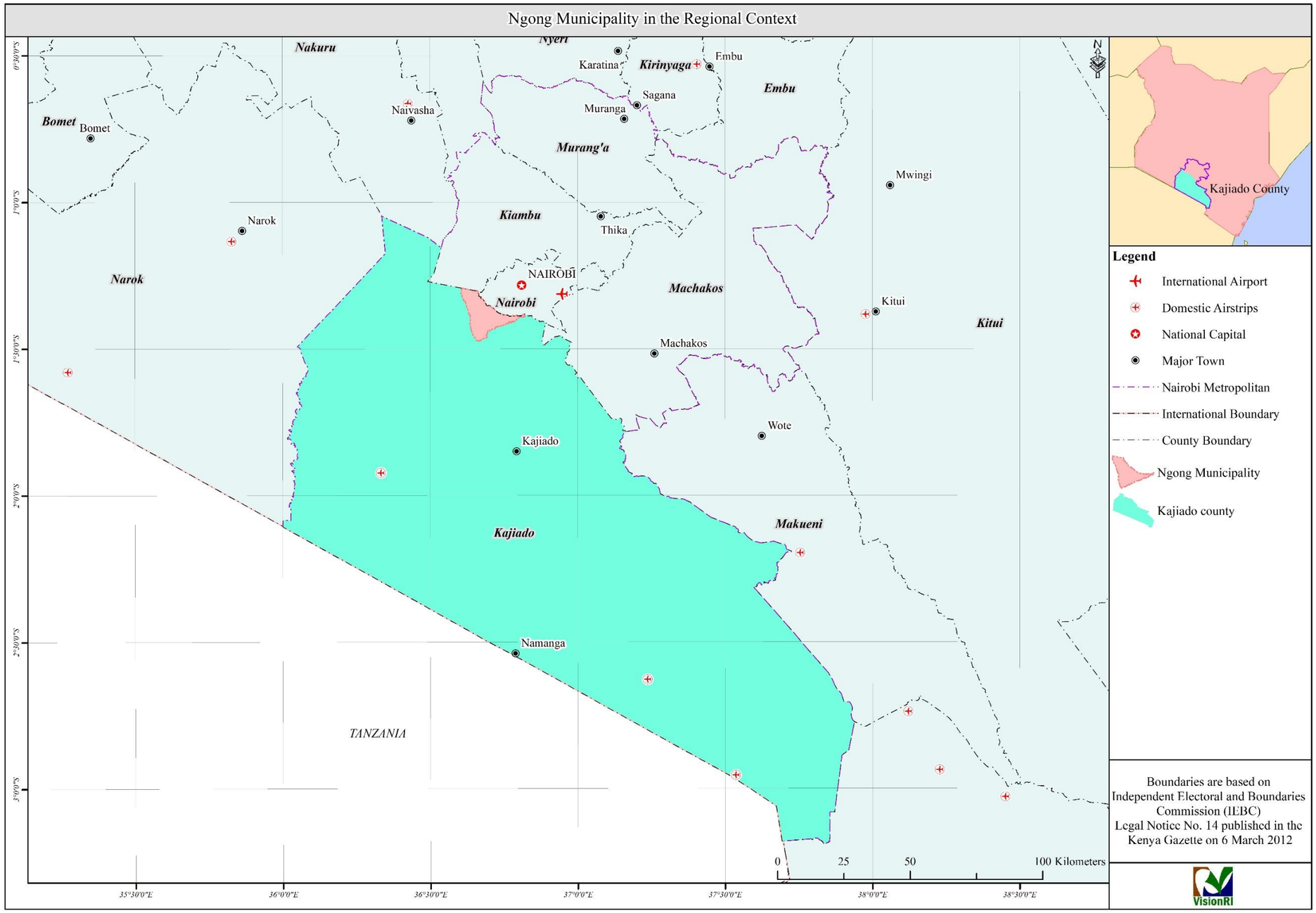
- **Geology:** The geology of the entire Municipality is mainly of tertiary formations. Ngong' area has a basement system rock, which comprises of various gneisses chists quartzite and crystalline limestone. These are mainly found along the river valleys and some part of the plains. The geological formation gives rise to minerals of economic importance such as gypsum, limestone, soda ash, and salt.

- **Soil Typology:** The soil in the Municipality is characterised as follows: Ngong' has a combination of black cotton and red soil that is favourable for agriculture practice. Due to the presence of the red soils, Ngong' is well-drained. In Kiserian, there are varied soil types characterised by black cotton soils, which are poorly drained and shallow, and some areas with well-drained soils of friable clays and loamy sands. Other regions in the area have sandy and light-textured soil. These soils are stony and rather shallow hence suitable for quarrying activities. Ongata Rongai has black cotton soils, which are waterlogged and damage stormwater drains. These soils require judicious construction of foundations for the stability of erected buildings since they expand when wet and contract when dry.



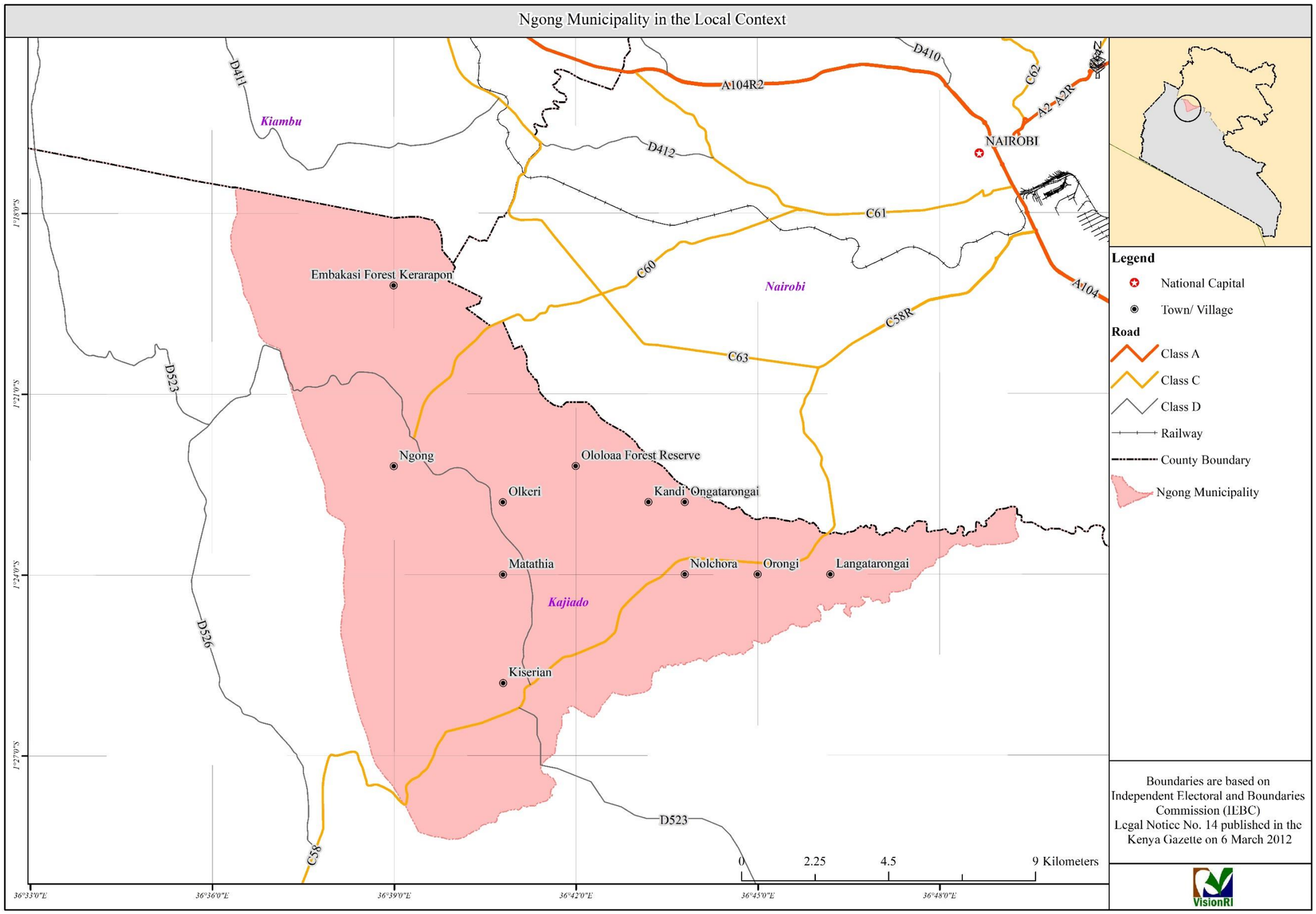
Map 3-1: Location of Municipality in the National Context

Source: VisionRI



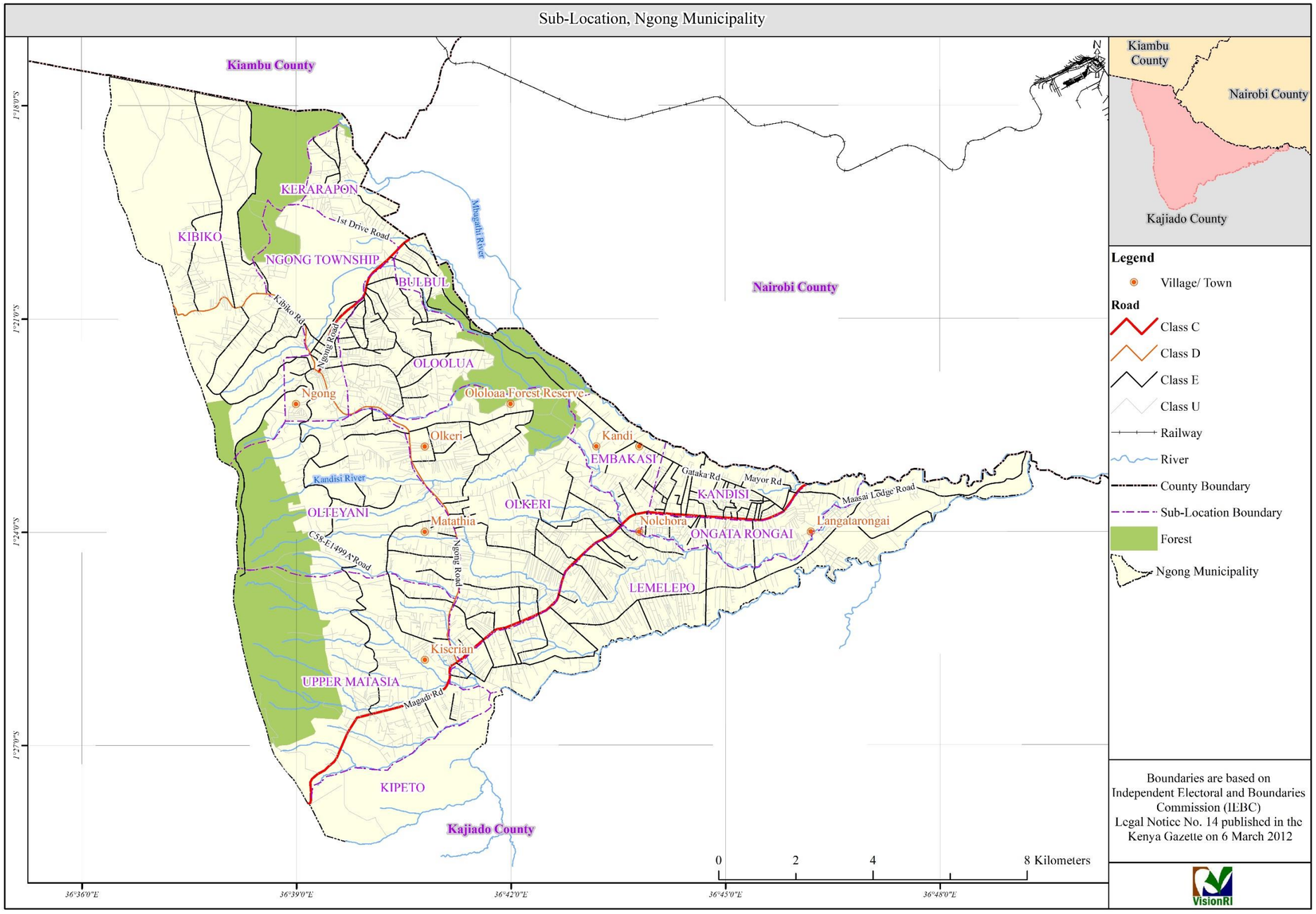
Map 3-2: Location of the Municipality in the Region

Source: VisionRI



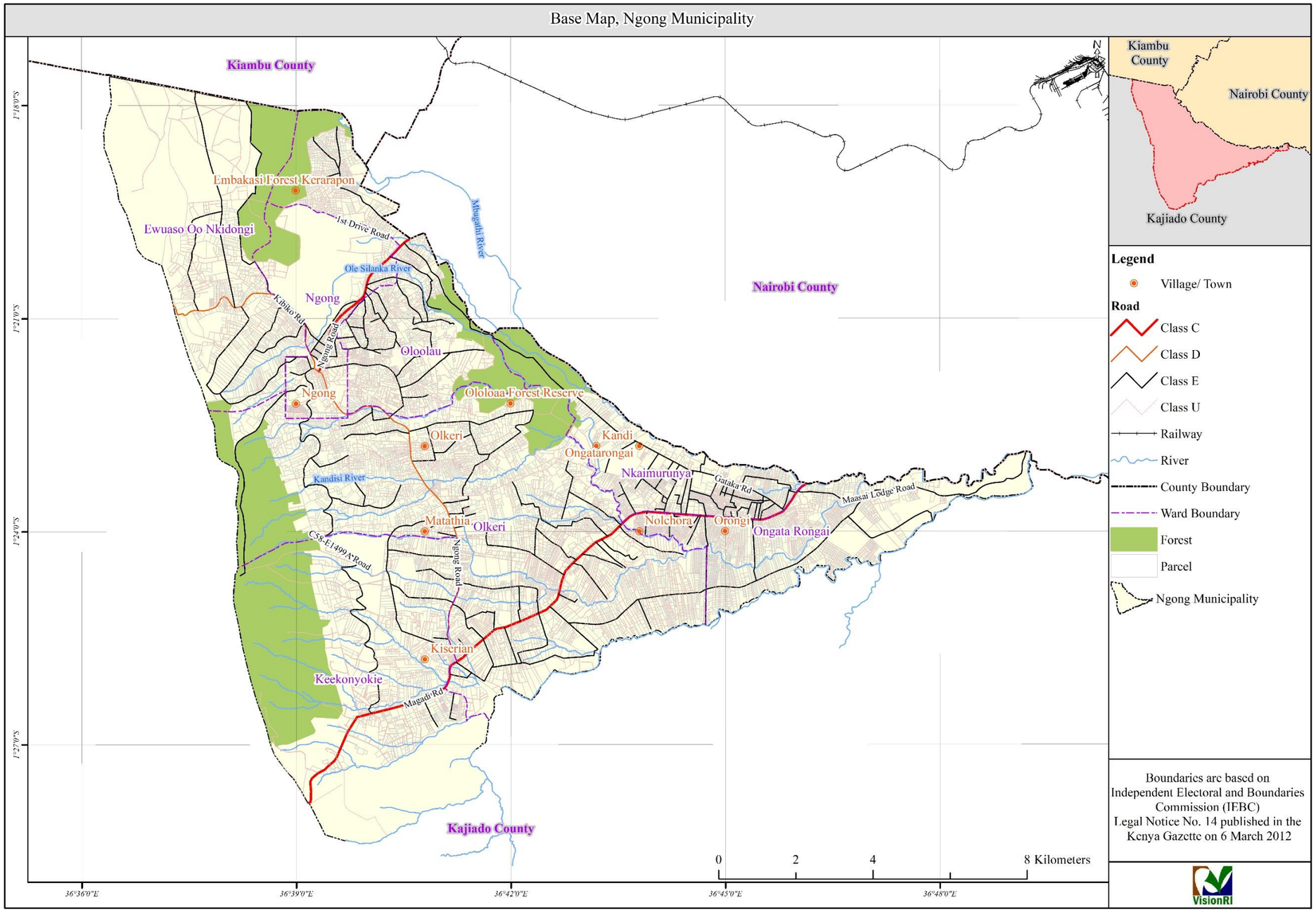
Map 3-3: Location of the Municipality in Local Context

Source: VisionRI



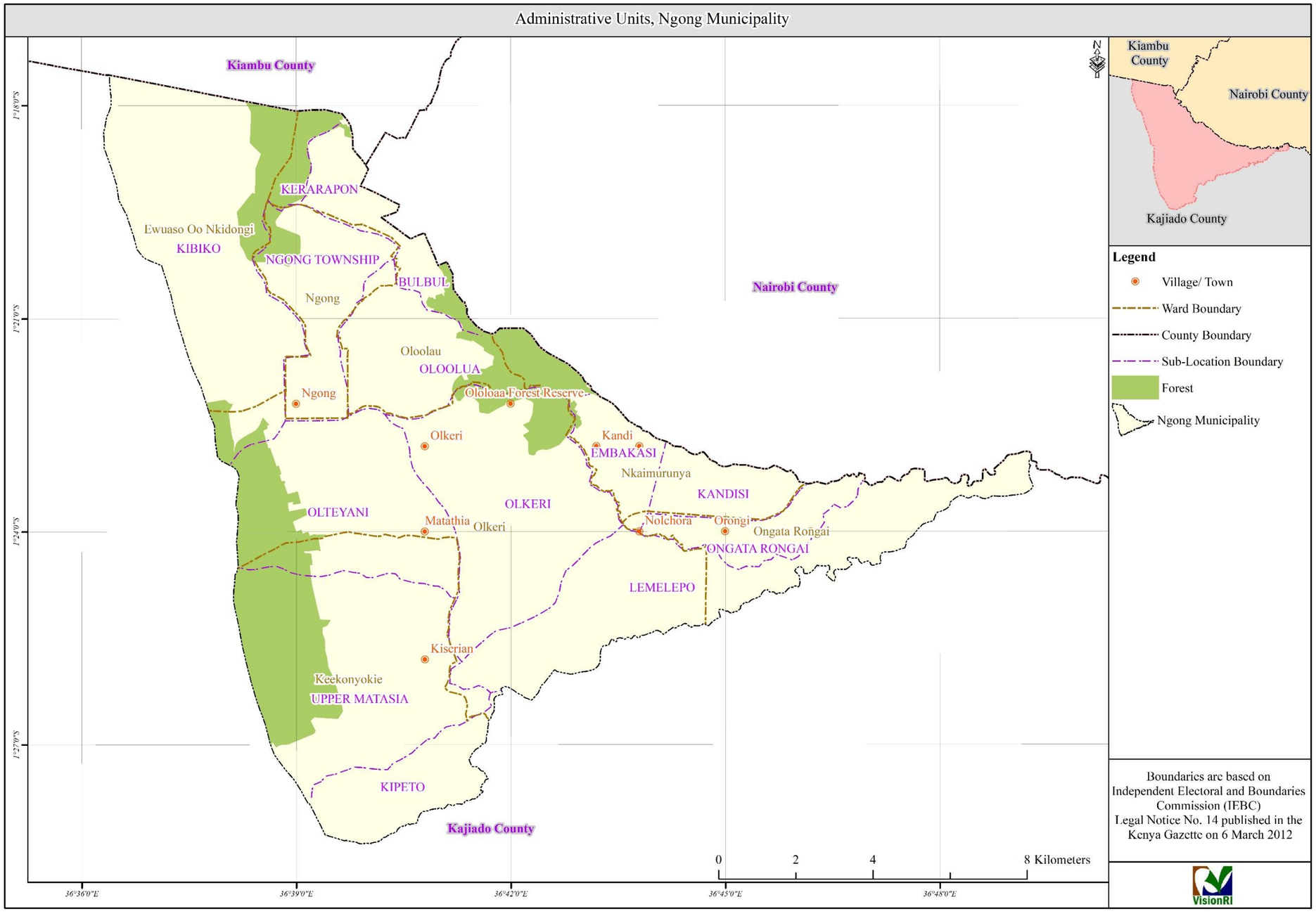
Map 3-4: Sub-Locations of Ngong Municipality

Source: VisionRI



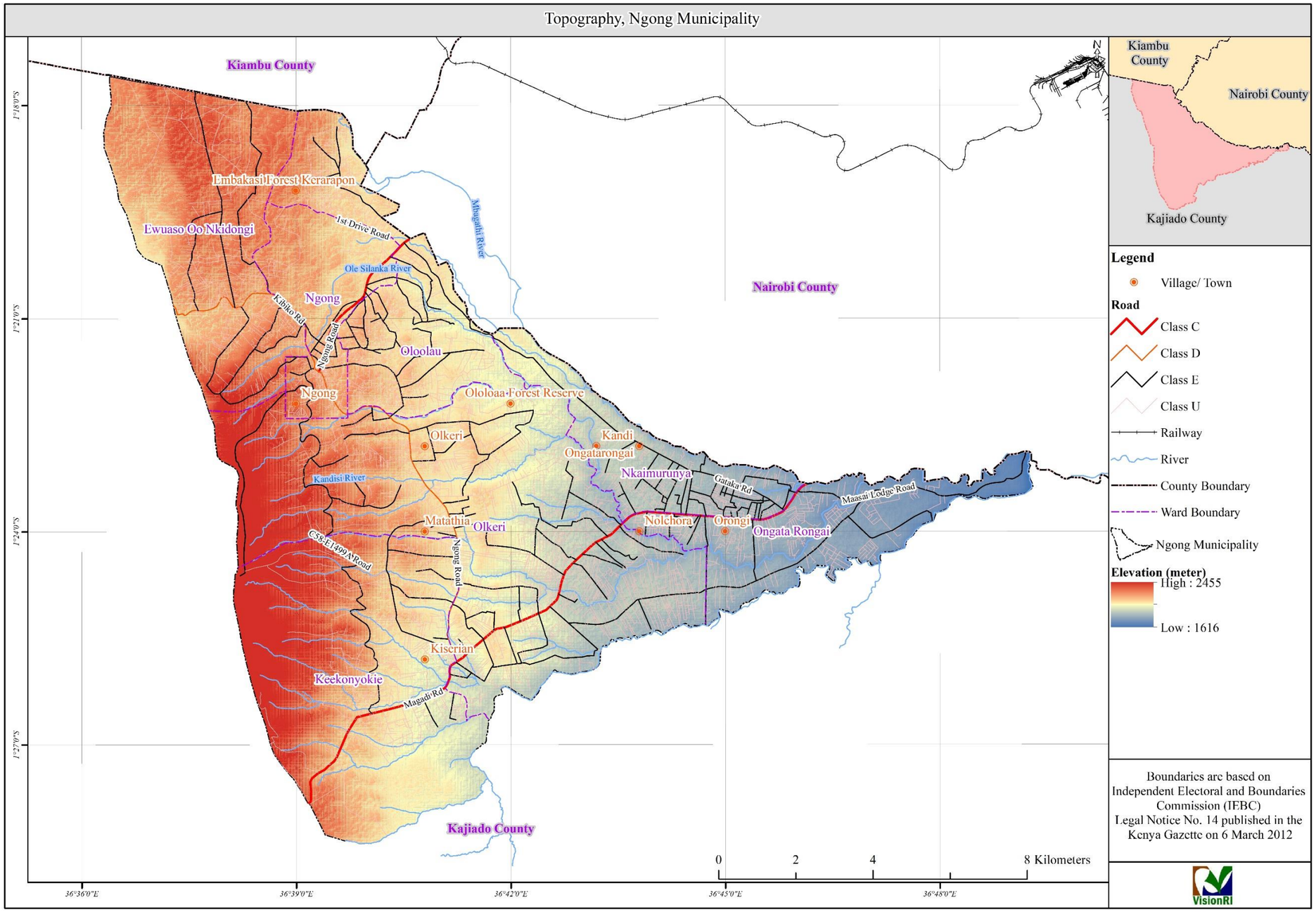
Map 3-5: Ngong' Municipality Base Map

Source: VisionRI



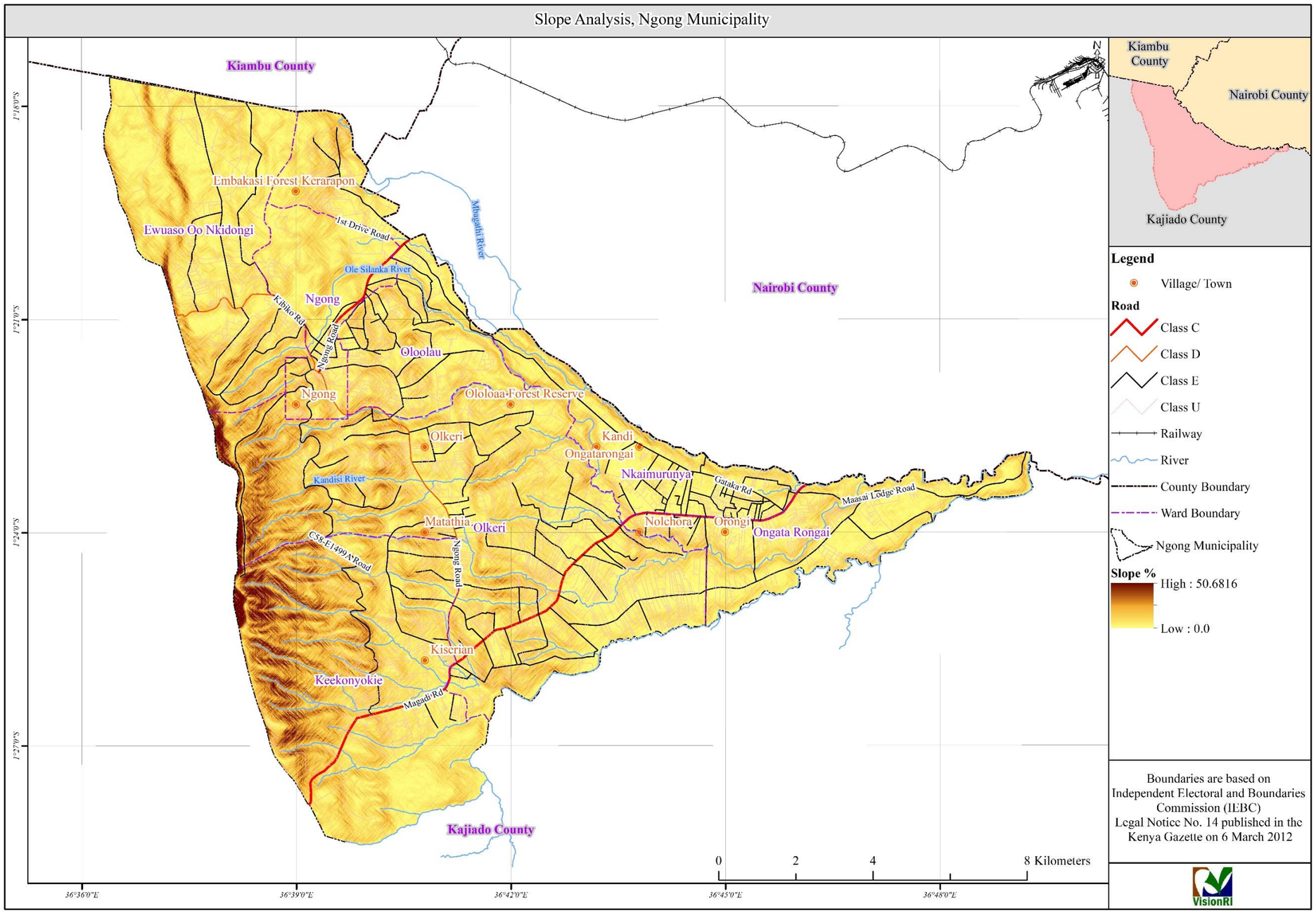
Map 3-6: Administrative Units of the Municipality

Source: VisionRI



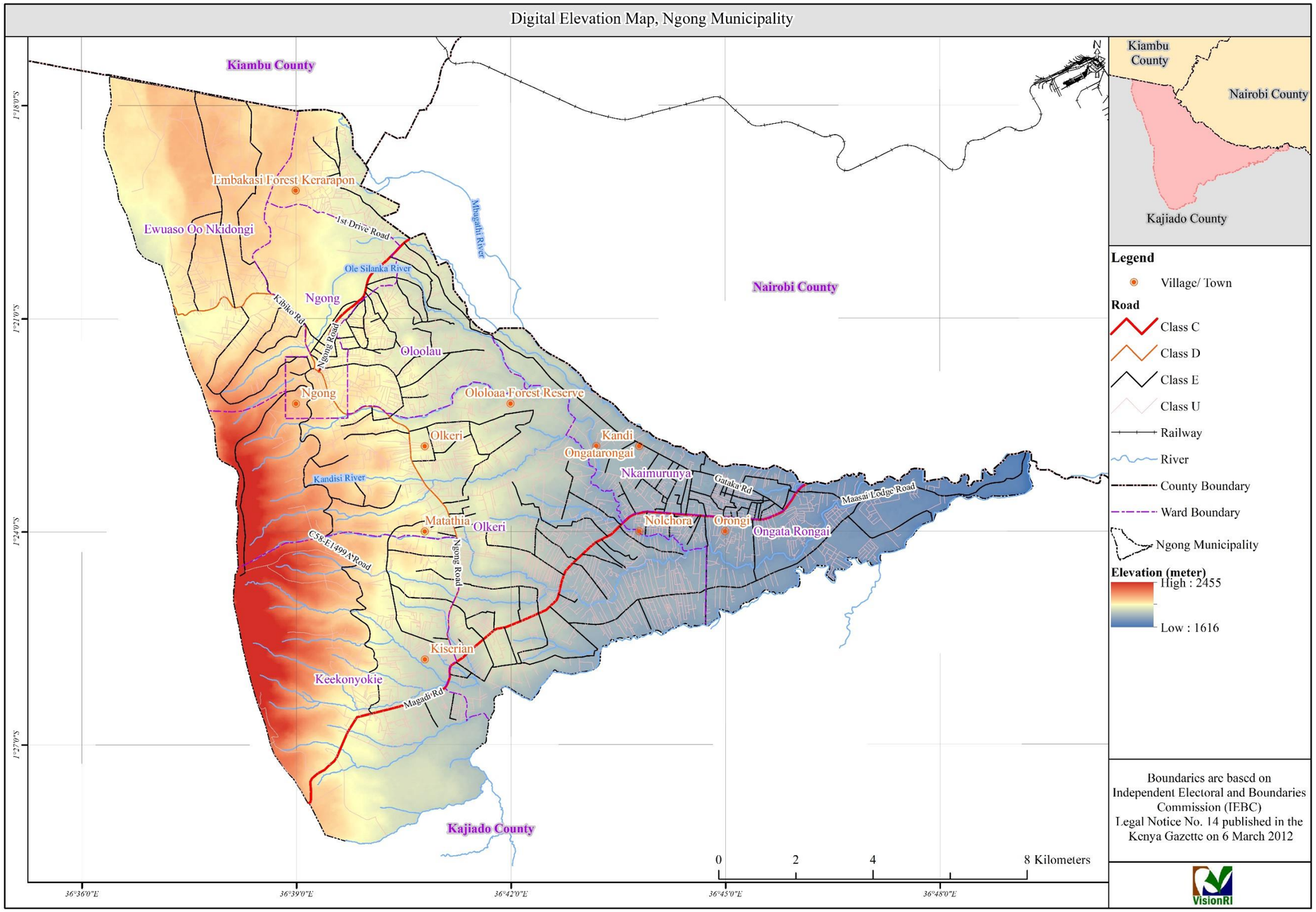
Map 3-7: Topography of the Municipality

Source: SRTM Data



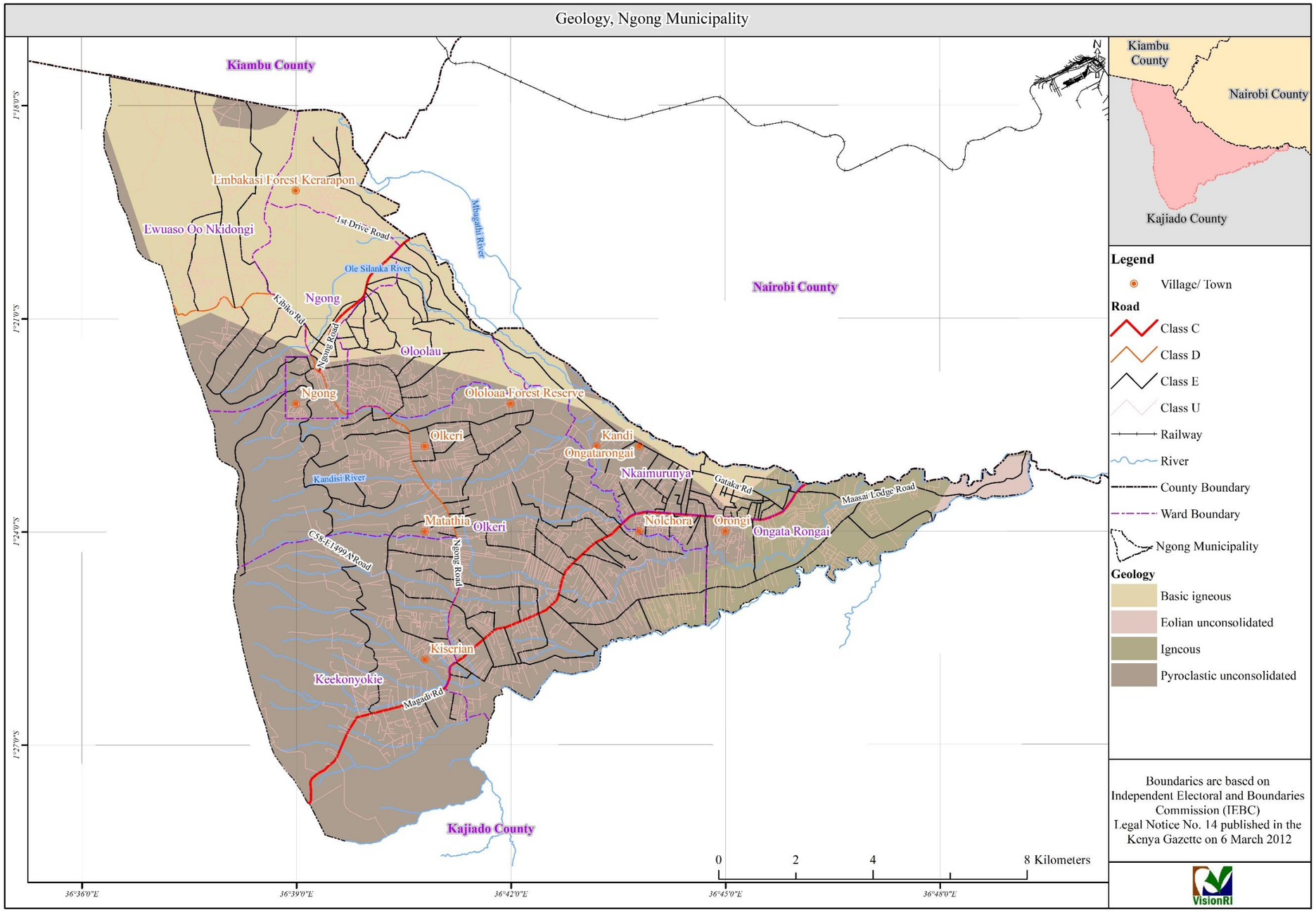
Map 3-8: Slope character of the Municipality

Source: SRTM Data



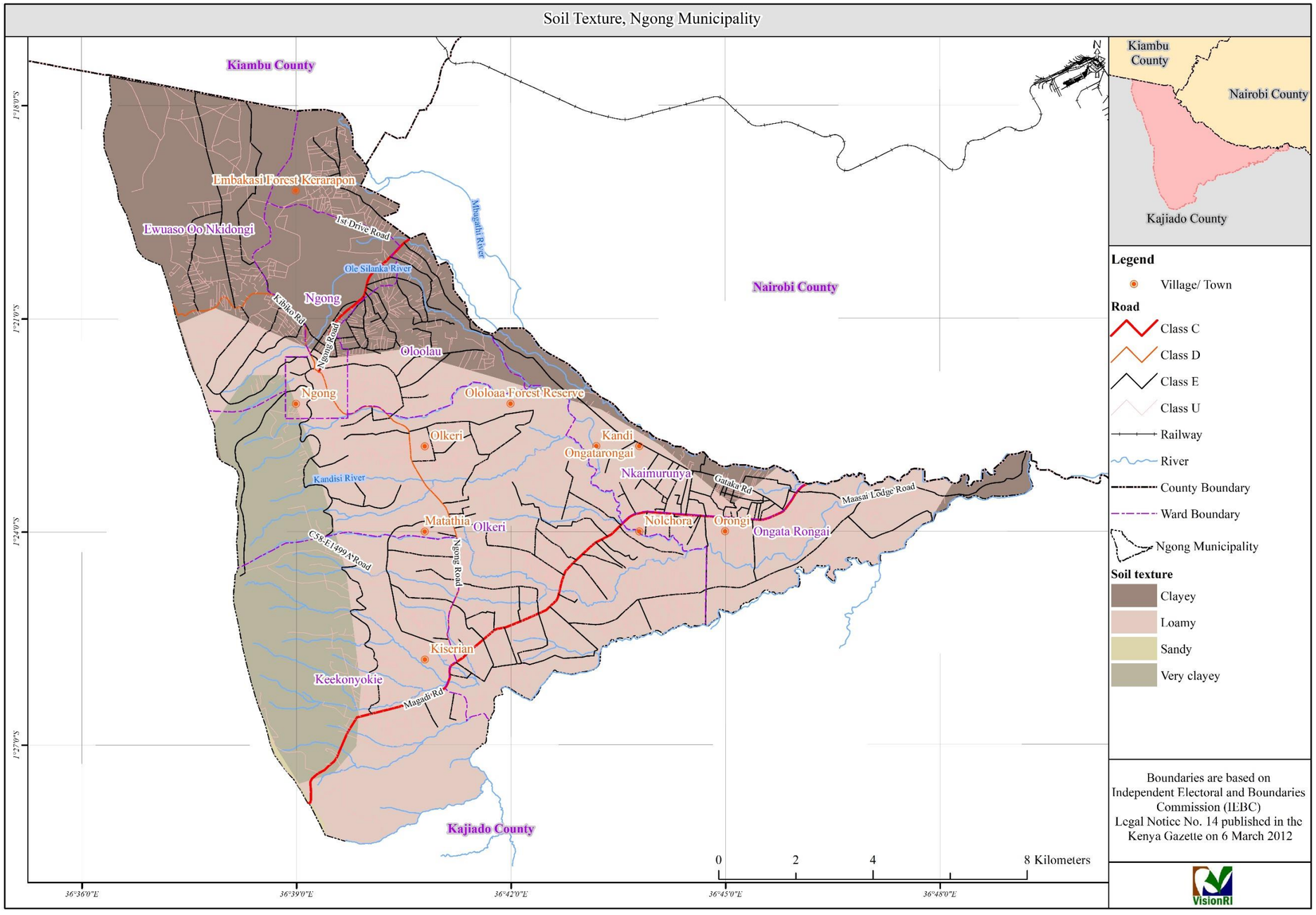
Map 3-9: Digital Elevation Model of the Municipality (DEM)

Source: SRTM Data



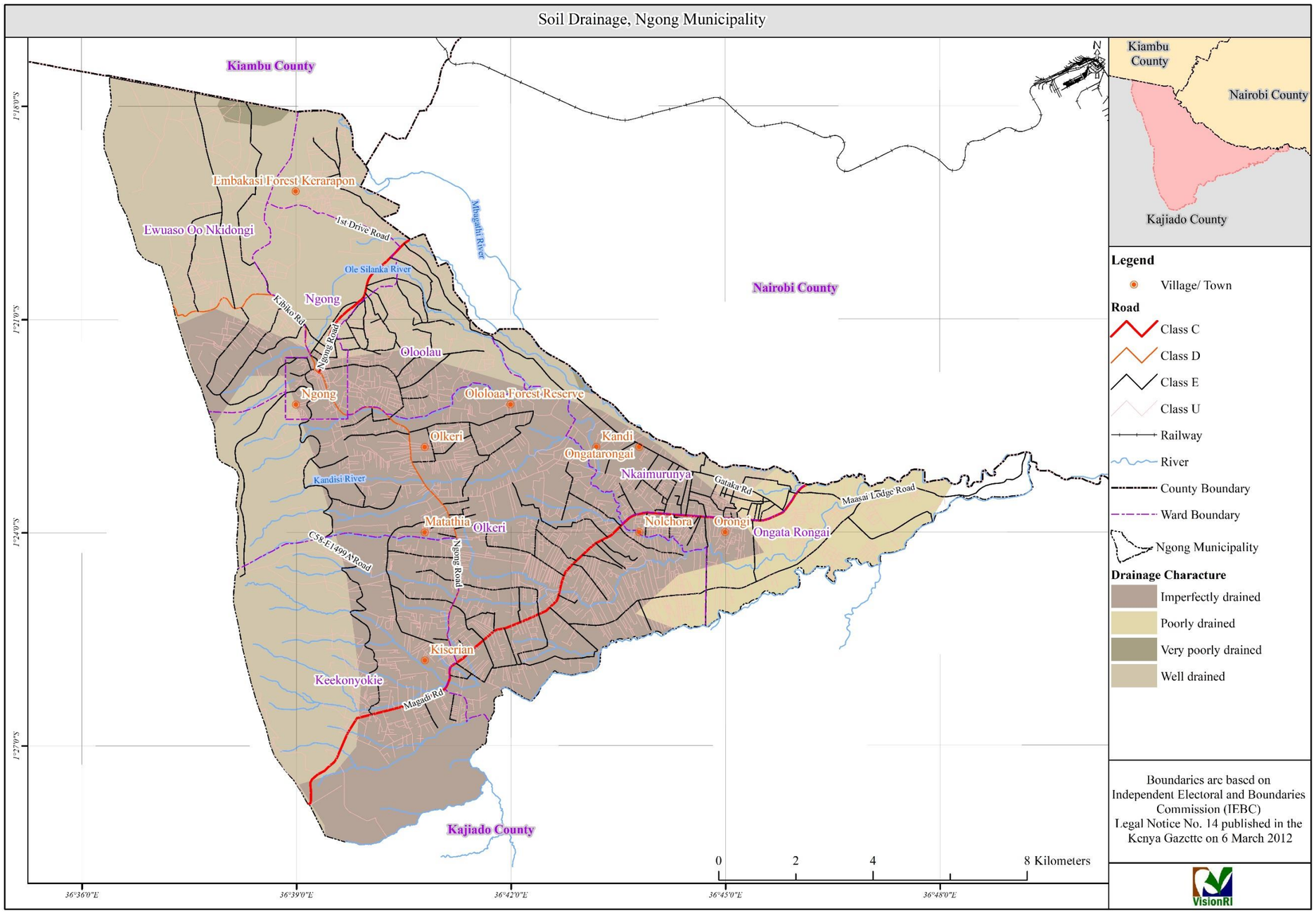
Map 3-10: Geology of the Municipality

Source: Survey of Kenya



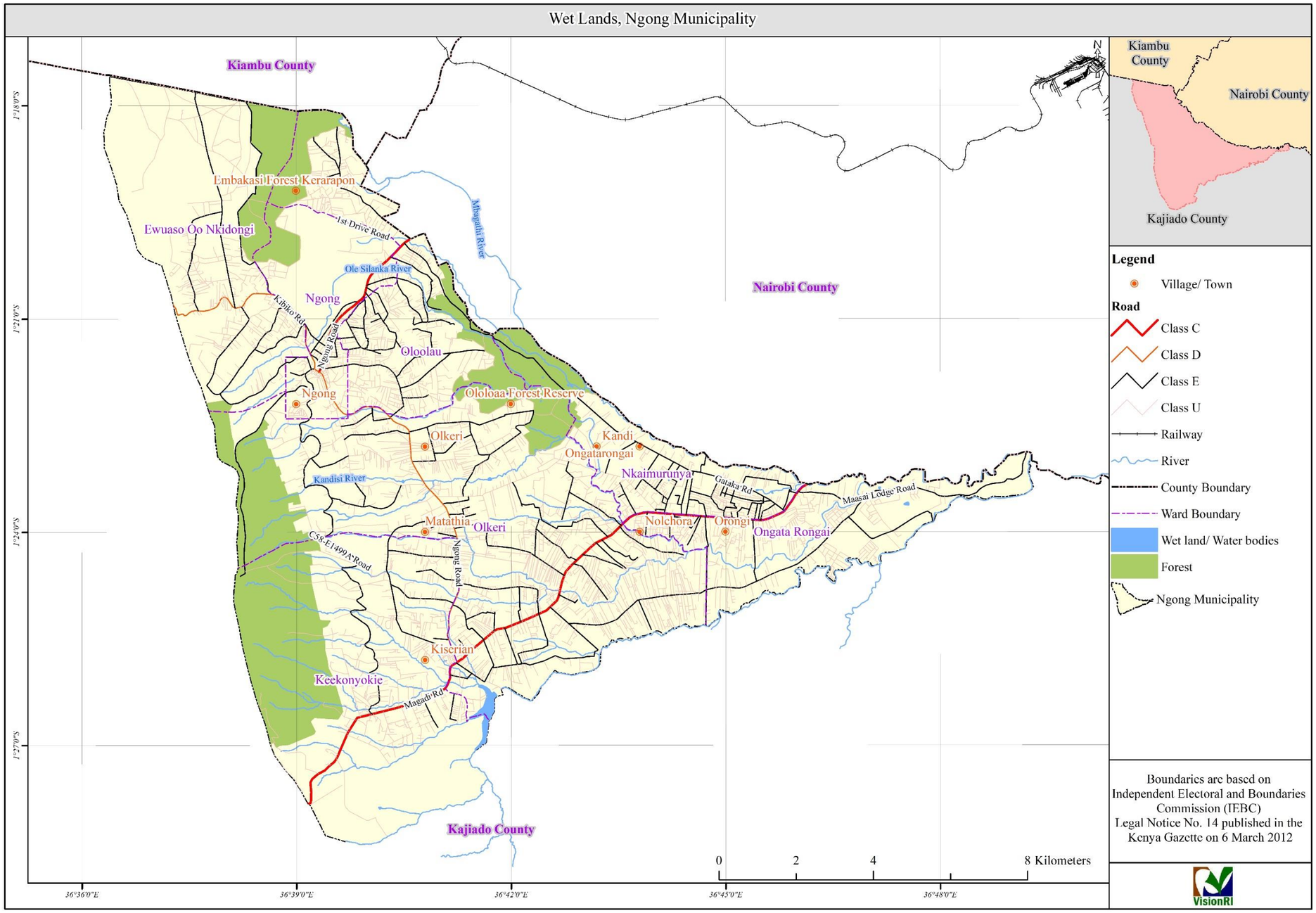
Map 3-11: Soil Texture in the Municipality

Source: Survey of Kenya



Map 3-12: Soil Drainage in the Municipality

Source: Survey of Kenya and SRTM Data



Map 3-13: Wetlands, rivers and water basins in the Municipality

Source: Survey of Kenya

Groundwater

The occurrence of the groundwater in the Municipality is mainly influenced by climate and topography as well as the origin of the underlying parent rocks. Groundwater is already overexploited, therefore, is not considered as a dependable source.

Surface water

The main sources of surface water in the Municipality include rivers such as Ngong', Mbagathi, Kiserian and Oloolua and also boreholes and wells. Kiserian dam also supplies water to residents of the Municipality. The area is connected to water supply network through Oloolaiser Water and Sewerage Company (OWSC) which also provide water to the Municipality.

According to the Kajiado Inequality Index Report, boreholes are the main sources of water in Ngong' with 35.4% of the population depending on this. In the town, 27.2% of the population depend on water vendors for the provision of water. Only 18.4% of the population is connected to piped water. Most of the population has access to water that is not piped and unprotected.

In Ongata Rongai, boreholes are the main sources of water for 38.1% of the people. About 19.5% rely on water vendors, while 22.1% of the population is connected to piped water. There is a small proportion of the population that relies on rainwater harvesting.

In Kiserian, the main sources of water are from boreholes for 22.1% of the population. About 8.7% rely on rivers and streams, and 8.1% source from water vendors. Those connected to piped water account for 22.3%, while 0.9% of the population depend on rainwater.

Water Pollution

The main causes of water pollution in Ngong' and Ongata Rongai are the open sewers and poor drainage system in the Municipality. In other cases, there is the use of undeveloped plots as garbage dumps within the Municipality. In addition, disposal of sewer water into the open drainage system is also another major challenge facing the Municipality. In Kiserian, hazardous waste from the slaughterhouse, i.e., animal blood and waste is disposed of directly to the river, which drains to the dam. Consequently, the water has been contaminated and is highly toxic. This poses health-threatening risks to the residents. Some individuals have diverted water from main rivers for agricultural activities.

The effects of water pollution include:

- Loss of aesthetic value of the river ecosystem;
- Poor water quality to levels unfit for human or animal consumption;
- Groundwater pollution;
- Soil pollution;
- Benthic organisms such as diatoms have also reduced in population; and
- Decrease in aquatic life population over the years.

Flora and Fauna

The Municipality is characterised by a variety of vegetation cover. Tree species reported to be dominant in both Ngong' are as follows: Azadirachta indica, Calliandra calothyrus, Senna siamea, Casuarina equisetifolia, Croton megatocepus (Mukinduri), Prunus africana (Muiri), Cupressus lusitanica, Eucalyptus species, Ficus species, Grevillea robusta, Mangifera indica, Moringa oleifera, Senna siamea, Sesbania sesban, Terminalia brownie, Schefflera Actinophylla, and Spathodea camulanata, amongst others.

The area has three indigenous forests as shown below in Table 3.2.

Table 3-2: Forests within the Municipality

Name	Area (Ha)	Type of forest	Status	Mode
Ngong' hills	3077	Indigenous/Exotic (with its large part being grassland)	Gazetted	Forest/Game
Embakasi/Kibiko	573	Indigenous/Exotic	Trust land	Forest/Game
Oloolua	667	Exotic/Indigenous	Trust land	Forest/Game

Source: (Kajiado DDP 2001-2008)

Image 3-1: Kibiko Forest in Ngong'

Source: Fieldwork 2018

These forests total up to 43.17 km^2 and account for about 24% of the Municipality's total area. The forests are, however, endangered due to encroachments by human settlements and activities like farming and charcoal burning. This has caused consequences such as:

- Drought, since the catchment is destroyed. This, in turn, results in poor agricultural yield in Ngong' and Kiserian. This has compromised food security and sustainability at the Municipality. The slopes of Ngong' Hills are no longer the food basket for the Municipality;
- Loss of vegetation because of deforestation, there is less underground infiltration at the forests, therefore, there is high water runoff to the town with sedimentary deposits. This is the key cause of flooding at the towns;
- Flooding and sedimentation of riverbeds and dams due to soil erosion;
- Degradation of riparian systems due to siltation from the deforested areas resulting in dangerous river meanders that have destroyed crop, property and at time lives; and
- Rivers and streams have consequently dried up due to this, which has further exacerbated the perennial droughts; and loss of wildlife in the area due to destruction of their habitat.

Figure 3-1: Nature of Ngong' Hills in 2010

Source: Google Earth Image 2010

Figure 3-2: Nature of Ngong' Hills in 2017

Source: Google Earth Image 2017

Figure 3-3: Municipality in the Year 1984

Source: Google Earth Image 1984

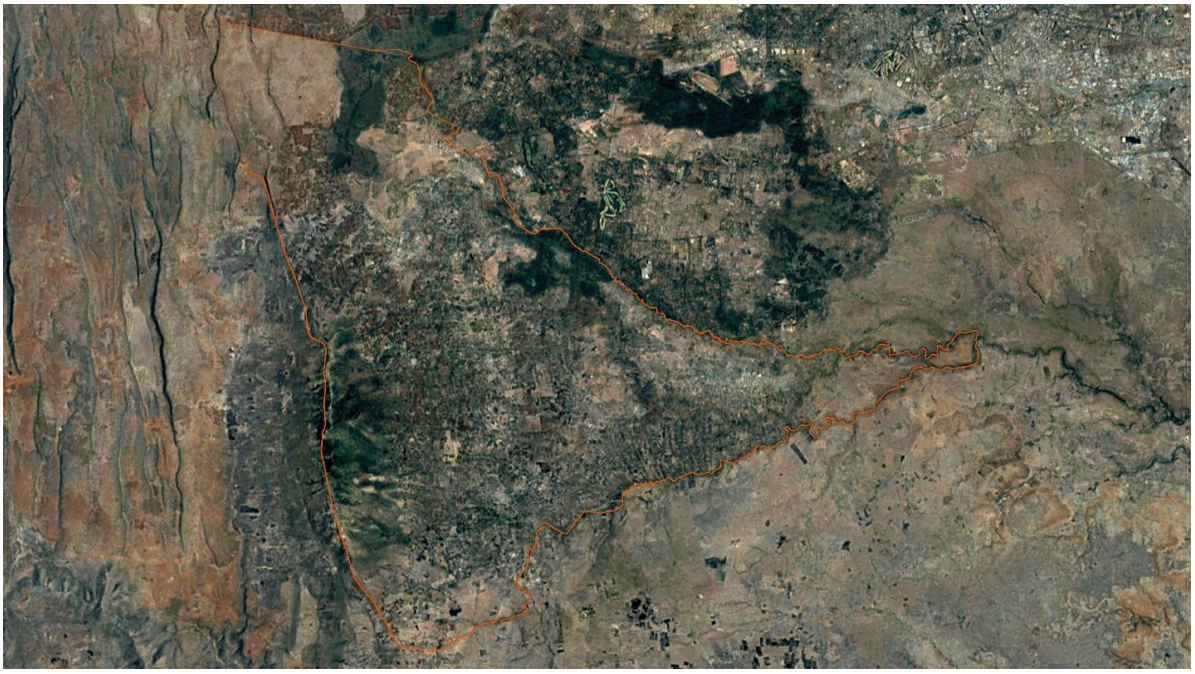


Figure 3-4: Municipality in the Year 2000

Source: Google Earth Image 2000

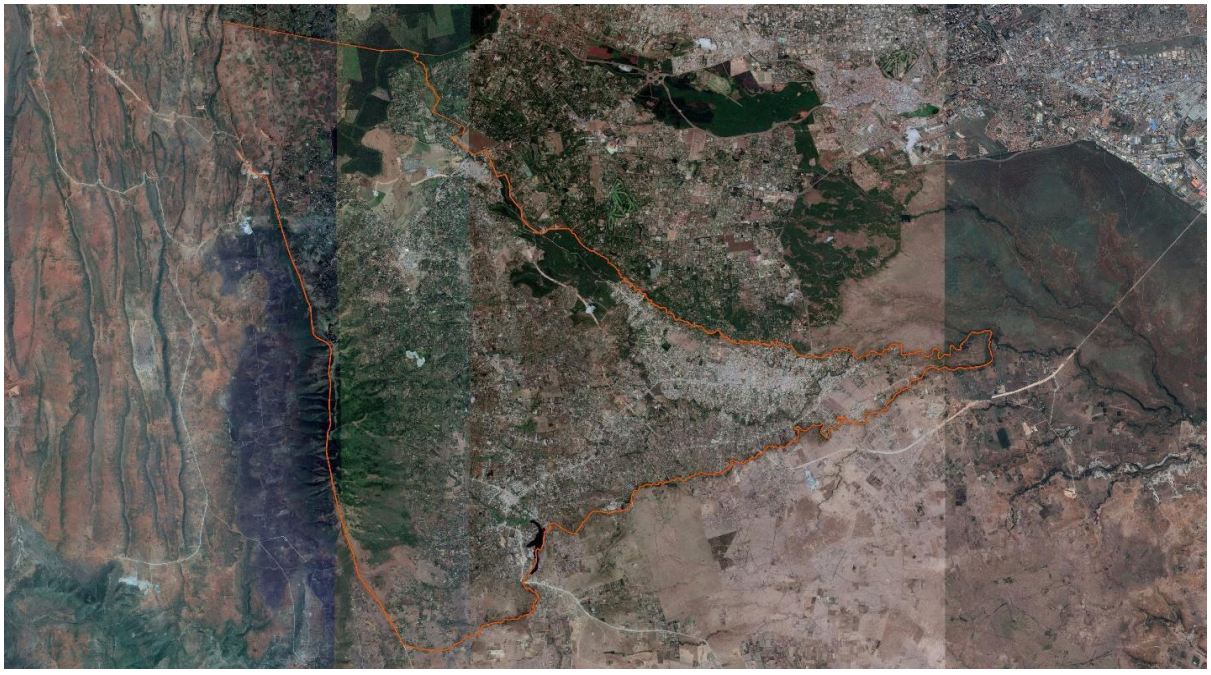


Figure 3-5: Municipality in the Year 2018

Source: Google Earth Image 2018

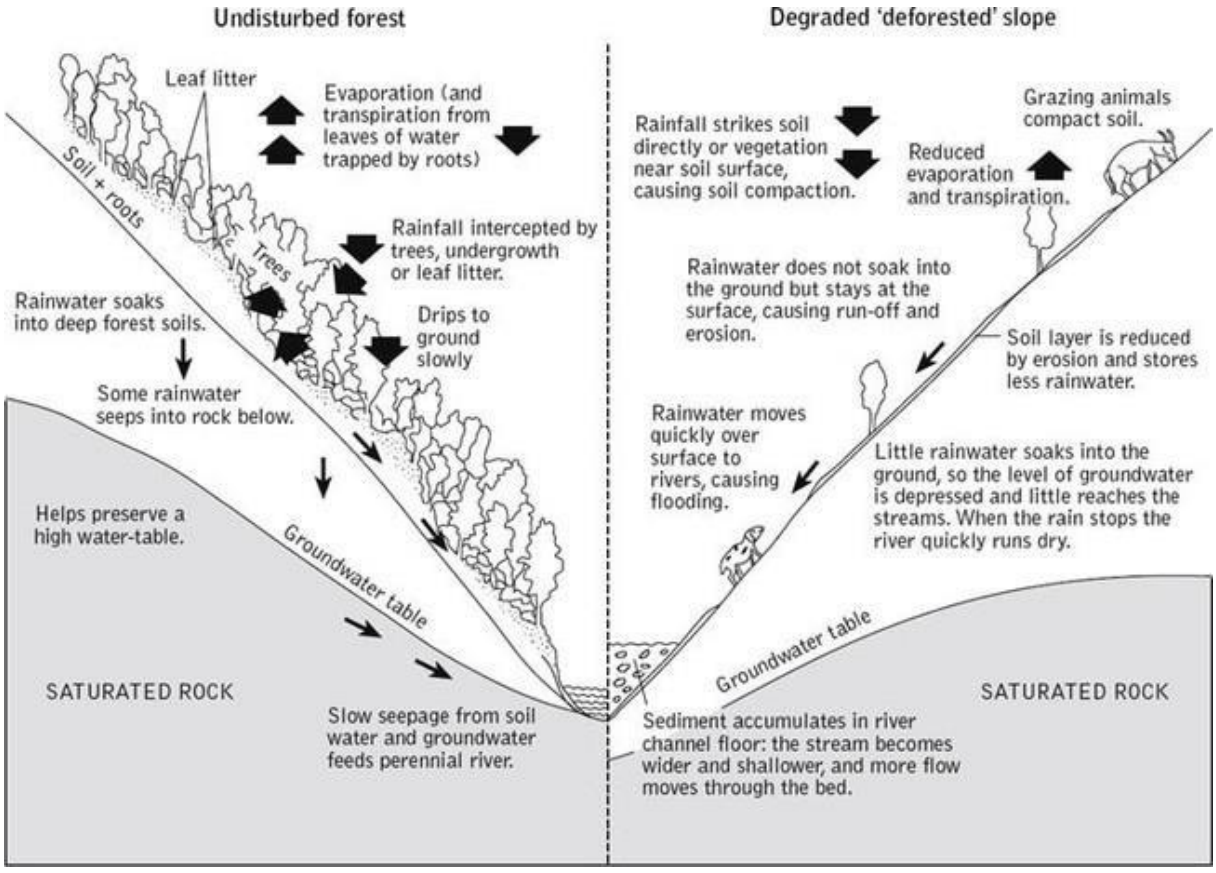


Figure 3-6: Relationship between Forest Cover and Flooding

Source: Internet Source

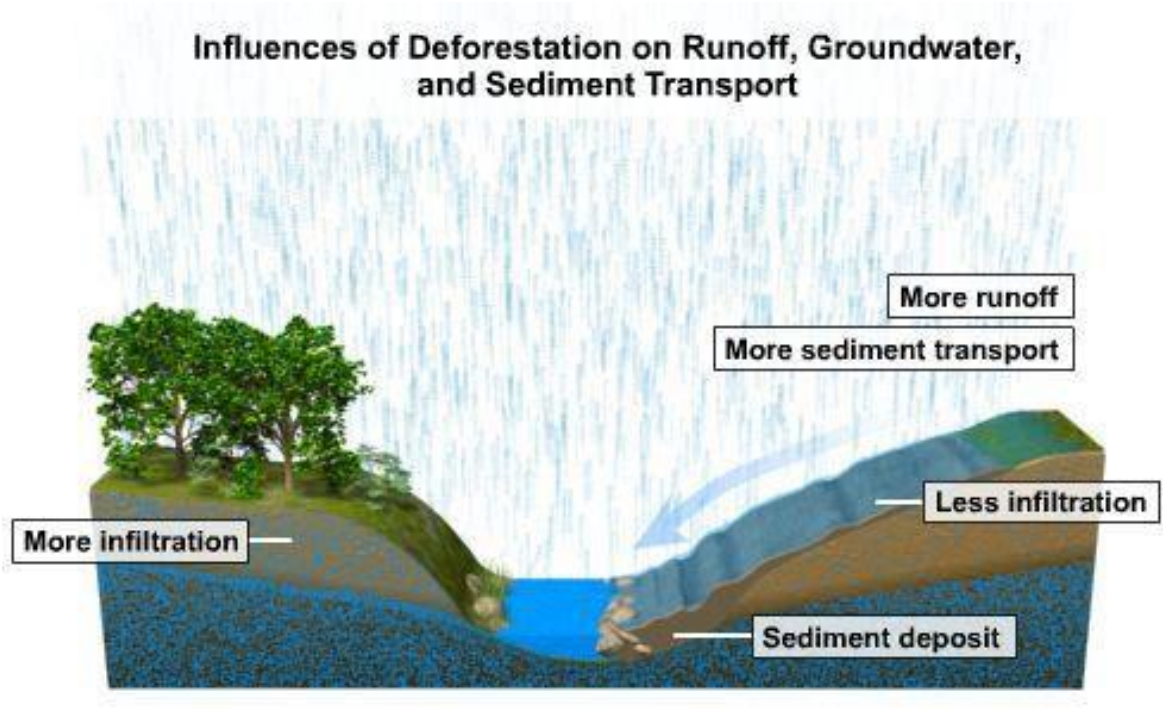


Figure 3-7: Influence of Deforestation on Runoff, Groundwater, and Sedimentation

Source: Internet Source

The Municipality is predominantly urban and agricultural. Although human activities have altered the natural habitat for wildlife over the years, this does not present a detriment to the future of the fauna once the proposed developments within the Municipality are implemented.

Air Quality

Air quality in the Municipality is generally within acceptable standards. It is, however, imperative that this is continuously monitored, and the necessary mitigations installed, to maintain these permissible levels. (National Environment Management Authority (NEMA) and the County Government).

Rainfall

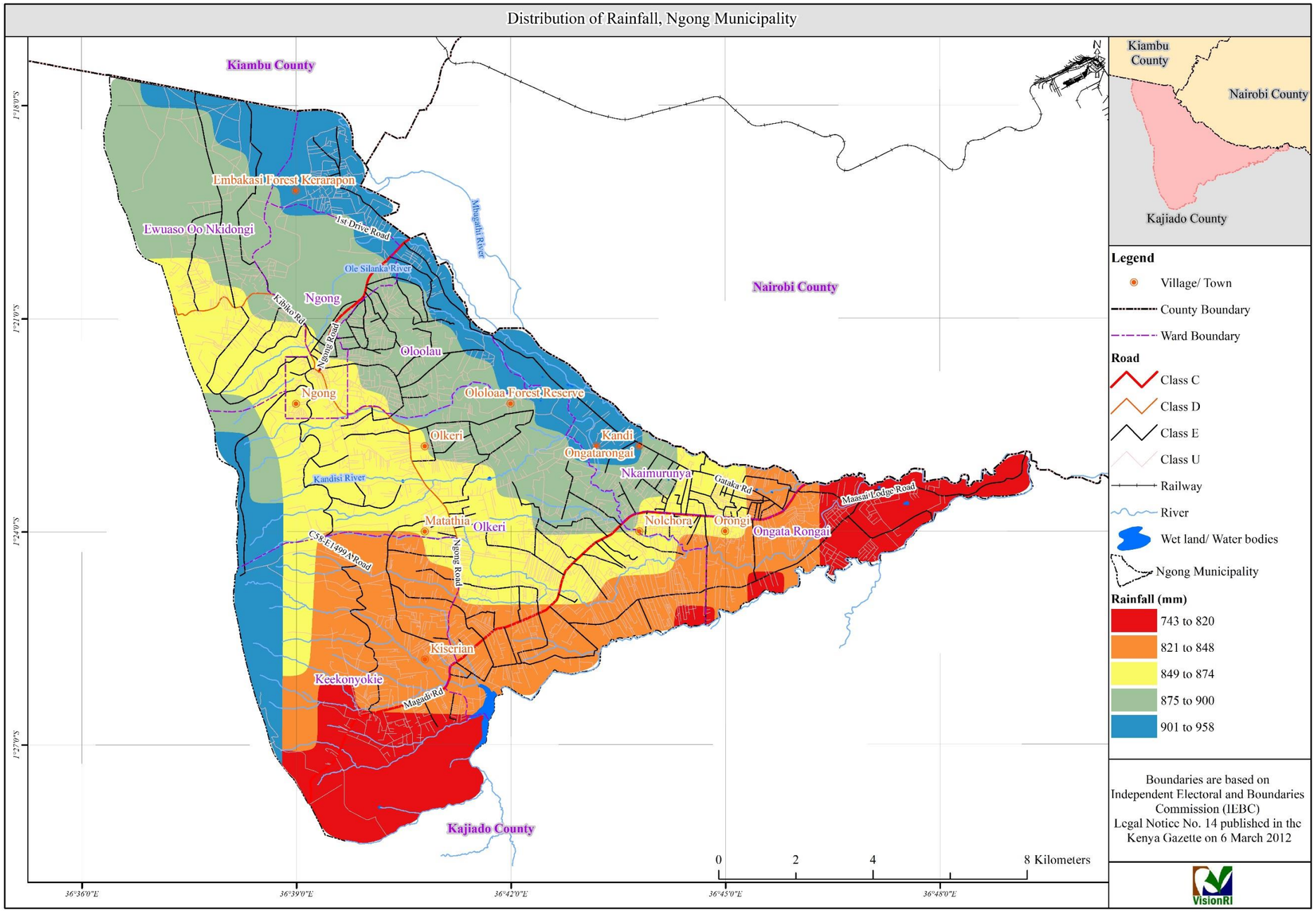
The rainfall pattern is bimodal, with long rains occurring in April and May and short rains during the months of October and November. The average annual rainfall is 1,500 mm. Ngong' receives the highest annual rainfall of 865 mm.

Temperature

The Municipality has a mean annual temperature of 26ºC, which ranges between 20.4ºC in the upper highlands to 34ºC in the midlands of the Municipality. Low temperatures are experienced in July and August while January, February, and March are the region's hottest months.

Wind

Strong winds are experienced during the dry areas mainly at Ngong' Hills. The average wind speed at Ngong' Hills moves at 25 meters per second. The wind turbines set up at Ngong' hills produce wind energy, however; the amount of wind energy produced cannot sustain the whole Municipality. However, average wind speeds have decreased.



Map 3-14: Precipitation in the Municipality

Source: Kenya Meteorological Department

3.3.3 Climate Change and Vulnerability

Due to climate change, the Ngong'- Ongata Rongai-Kiserian area was hit by severe drought and famine in 2017 whereby the Maasai (the indigenous community) lost most of their herds of cattle. In March 2018, the Municipality experienced flooding and loss of lives and property. This resulted in economic regression and loss of revenue within Kajiado County. Mitigation measures need to be put in place to alleviate the impacts of climate change.

3.4 Population and Demography

3.4.1 Population Growth

Ngong' Municipality covers three towns namely; Ngong', Ongata Rongai and Kiserian.

In 2009, the population in the current area covered by Ngong Municipality was 162,314 and in 2019, the population stood at 331,422 as shown in Table 3-3.

Table 3-3: Population in 2009 and 2019 in Ngong, Ongata Rongai and Kiserian

Towns	2009	2019
Ngong' Town	108,091	127,801
Ongata Rongai	40,178	178,795
Kiserian	14,045	24,826
Total	162,314	331,422

Source: 2019 Kenya Population and Housing Census

Table 3-4: Total Population of the Three Towns in Ngong' Municipality by Sex in 2019

Towns	Total	Male	Female
Ngong	127,801	62,804	64,992
Ongata Rongai	178,795	87,871	90,916
Kiserian	24,826	12,492	12,334

Source: 2019 Kenya Population and Housing Census

The population densities of the three towns that make up Ngong Municipality are shown below.

Table 3-5: Population Density as at 2019 Census

Towns	Total	Land Area Sq. Km	Density Persons per sq. Km
Ngong	127,801	71.1	1,799
Ongata Rongai	178,795	39.5	4,527
Kiserian	24,826	27	920

Source: KNBS 2019

3.4.2 Population Growth Projections

Ngong's population is expected to rapidly increase owing to the availability of land for expansion and investment, its proximity and connectedness with other growth nodes and the hinterlands. Using the town's annual growth rate of 5.1%, this plan projects that the population will increase to 539,850 by

the end of the planning period in 2030. Table 3-8 below presents the projections based on the current population census figures.

Table 3-6: Projected Population

Town	2019	2030
Ngong Town	127,801	208,174
Ongata Rongai	178,795	291,238
Kiserian	24,826	40,438
Total	331,422	539,850

Source: VisionRI

Fertility and Birth Rates

Fertility is defined by the total number of live births a woman can have during her productive years. It is influenced by factors including the age of sexual debut, access to education, social practices including FGM, teen pregnancy, health factors and access to contraceptives.

Kajiado County has the highest birth rate in the country at 41.2 births in every 1000, double the national average. The following table presents important demographics.

Table 3-7: Demographics

Total fertility	4.2
Mortality rate = infant mortality rate (per 1000 live births)	47.9
Mortality rate = under-five mortality rate (per 1000 live births)	80
Life expectancy = 63.5 Years	63.5
Ngong Age-sex ratio (Male to Female)	1:1.04
Children below 1 year = Ngong'	35,806

Source: KNBS 2019

Table 3-8: Challenges and Potentials within Demographic Feature

Challenges facing the demographic feature	Potentials within the demographic feature
• Increase in population does not match the provision of social amenities and infrastructure. With a population projection of 537,618by 2030, this calls for investments in these services to match their supply with increasing demand; • Unemployment amongst the youth; and • Ethnic strife arising due to land conflicts.	• High population of youth who can provide both skilled and unskilled labour; and • Being a cosmopolitan area, it promotes cultural integration amongst the people creating a conducive working environment thus attracting investors.

3.5 Local Economy

The economic sectors in the Municipality include the following:

3.5.1 Real Estate Sector

The comparative advantage the Municipality holds is the availability of suitable and affordable land that can be utilised for real estate and industrial development. The Nairobi Metropolitan Plan

proposes Ngong' as an industrial town and Ongata Rongai and Kiserian as service towns. Ngong' Municipality is the most urbanised region in County Government of Kajiado. As a result, the Municipality is undergoing rapid transformations that have led to large agricultural land parcels being subdivided to accommodate uneven/unplanned urban developments.

Land in the Municipality is either under private or trust land. Most of the land is privately owned (freehold titles) with the County controlling the remainder (trust land) in centres such as Ngong', Embulbul, Kware, Olekasasi, parts of Mosoi Range and Tumaini areas. Some of the trust lands have over the years been privately allocated except for designated public spaces like markets, cemetery and bus park. There are reported conflicts over these allocations especially in Embulbul and Ngong'. The main challenge is that the County Land Registry records are still in hardcopy/analogue format, limiting access to land information.

The Municipality's land administration and management issues fall under the County Government of Kajiado. Recently, the County established and gazetted land subdivision guidelines, meant to control development as well as protect agricultural lands.

3.5.2 Commercial Sector

The major commercial developments in the planning area include markets (in Ngong', Kiserian and Ongata Rongai); and shopping malls (Maasai Mall in Ongata Rongai and Milele Mall in Ngong' town. Currently, a four-storey market is under construction in Ngong' town. Ngong' Municipality has financial institutions such as Kenya Commercial Bank (KCB), Equity, Barclays, Faulu Kenya Bank as well as Mzeituni SACCO, and other small financial societies. The KCB Foundation in partnership with the County Government of Kajiado provides scholarships to the jua kali sector in order to transform these businesses from small to medium-sized enterprises, and even to larger businesses.

3.5.3 Agricultural Sector

The main agricultural activity in the Municipality is farming of herbaceous crops and livestock rearing. This serves both the local and regional markets; some traders coming from neighbouring wards and locations and as far as Tanzania.

- **Food crop farming:** Food crop farming forms a key local economic activity in Ngong', Kiserian and parts of Ongata Rongai. The other available crops include maize and beans, onions, sweet potatoes, and cassava. There are horticulture crops such as tomatoes, cabbage, kales, and spinach. Other agricultural activities include poultry, dairy cattle, and fish farming. Also, some have greenhouses hence maintaining the round-the-year supply of food crops.

- **Livestock farming:** Kiserian has a livestock market where livestock products and services are dealt with. It also has a slaughterhouse that supplies livestock products for the region and its environs. This has also attracted other commercial activities and ultimately the growth of the food and clothes market. It has attracted traders both locally and regionally as far as from Tanzania. It is the livestock market that holds the backbone of the town's economy. There are, however, no industries for adding value to animal products and by-products.

3.5.4 Entrepreneurship and Business

The main businesses in the Municipality are around small and medium enterprises (SMEs) such as groceries, wholesale, supermarkets, and retail shops. Big establishments house banks, supermarkets, and medical clinics. Other commercial establishments include water kiosks, bars, butchery shops, milk vendors, schools, artisan centres, and microfinance institutions. Real estate development employs many other individuals across the region.

3.5.5 Transportation and Hospitality

The transport business, mainly ferrying passengers to and from Nairobi, is popular and employs the substantive number of youths across the Municipality. Hotels and guesthouses are also available around the town because of weekend-tourism in the region. Boda-bodas, mostly operated by young men and women, are a common sight in the area.

3.5.6 Industry

There are locally manufactured Maasai artefacts such as beadwork, shukas/lesos, sandals and rungus available and in high demand for sale across the Municipality. The products also cater to an international market and are sold along the Nairobi-Arusha road, and at common tourist stopover centres.

3.5.7 Economies of major towns in the Municipality

Ngong' Town

Ngong' is currently classified as a commercial/administrative town. Ngong' Hills that are in close proximity to a town have a major wind farm and traditional colonial-styled houses thus presenting great opportunities for heritage conservation and tourism development.

The SPC for NMR puts 16.73% of Ngong' residents as employed. About a fifth of the people is formally employed. The employment ratio is expected to grow multiple times by the year 2030 in line with the growth of the economy and the increase in the population of the region.

While 53.5% of the people in Ngong' are engaged in the service sector, another 25.3% practice agriculture and the remaining (15%) are engaged in transport, construction, and manufacturing sectors.

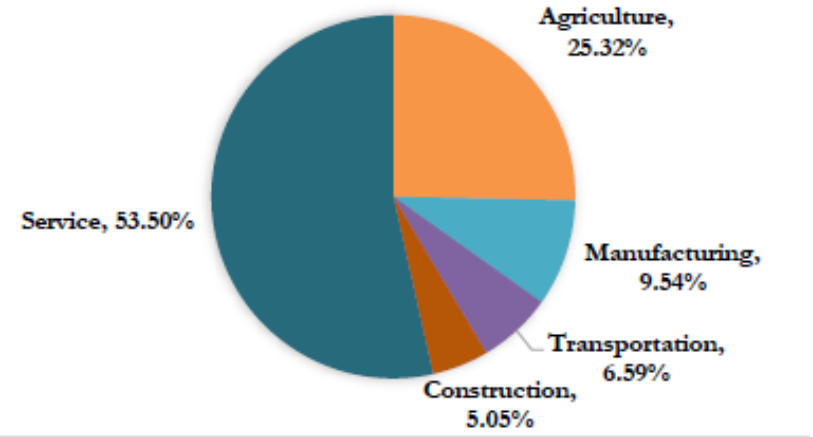


Figure 3-8: Economic Activities in Ngong' (2009)

Source: VisionRI

Ongata Rongai

Ongata Rongai is primarily a service town and fast-developing residential urban area. Due to its geographical proximity to Nairobi and its vast open spaces, Ongata Rongai has quickly grown into a residential complex.

The SPC for NMR mentions that over 23.5% of the residents of Ongata Rongai are economically employed. Less than 1/7th of these are employed in the formal sector. Both the population, as well as the employment ratio, is expected to grow multiple times by the year 2030.

Ongata Rongai has a high share of employed personnel working in the service sector which is at 53.8%. Another 35.3% is engaged in the agriculture sector while the remaining 11% is in construction, transport, and manufacturing.

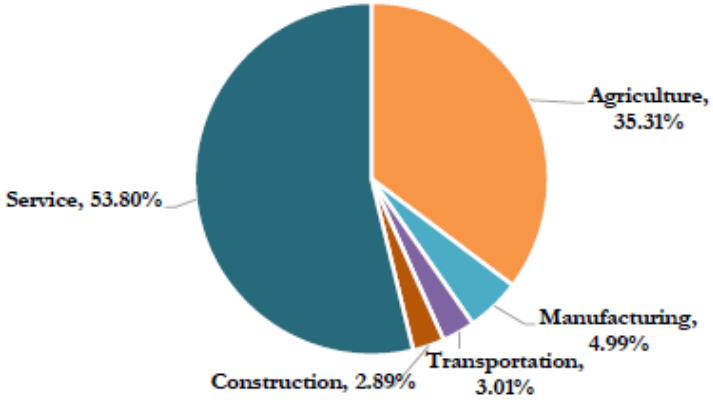


Figure 3-9: Economic Activities in Ongata Rongai (2009)

Source: VisionRI

Kiserian

Kiserian has a huge potential for developing as a 'junction town', which would incorporate commercial, industrial, and residential functions. Kiserian has a much smaller population of 18,096 (KNBS 2009), but a similar employment structure as Ongata Rongai.

According to the SPC for NMR, 21.43% of people in Kiserian are formally employed. Both the population, as well as the employment ratio, are expected to grow multiple times by the year 2030.

Kiserian's service sector employs 55.54%, agriculture 35.79% and 8.67% are in construction, transport, and manufacturing.

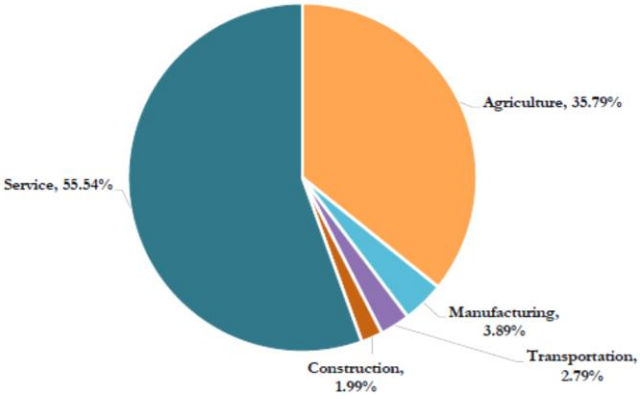


Figure 3-10: Economic Activities in Kiserian (2009)

Source: VisionRI

3.5.8 Economic Catalysts

The key economic catalysts that could spur Ngong's growth are as following:

- **Population Growth:** Residents of the Municipality are primarily from Nairobi and other parts of NMR. Due to substantive migration to the towns as well as a high birth rate, the Municipality is experiencing a growth in its population. As a result, the market size, as well as demand for industrial, agricultural products, residential space, and services, is going to increase, thus creating market opportunities for these goods and services.

- **Proximity to Nairobi:** The Municipality is considered one of the quieter residential areas close to Nairobi city, highly preferred by the middle and high-income earners. The area has good infrastructure, which includes a road network that easily connects it to the city centre. The land is cheaper than in Nairobi and available at a close distance to the capital, which attracts many businesses and industries to shift their base to the town.

- **Resource Endowments:** Other factors include the availability of building materials and water. Stone quarries provide both hard and soft stones - the hard stones are used for the construction of foundations while the soft ones are best for superstructure walling and decoration. Ngong' also has plenty of water from underground reservoirs. Individuals and organisations have sunk boreholes and already have existing water piping networks that serve the water to individual plots.

- **Livestock market:** Economic growth in Kiserian is spurred by the livestock market and slaughterhouses where livestock trade is undertaken. Consequently, other traders come to trade their goods.

3.5.9 Economic Planks

The major economic pillars for each of the three towns in Ngong' Municipality are explained as follows:

- **Ngong' Town:** Ngong' could become a central business district in Kajiado North Sub-County in line with the NMR vision. Real estate and tourism have been identified as key economic planks that are strategically placed to enhance the town's future economic growth and sustainability.

- **Ngong as a Residential Hub:** The area is likely to develop as a single-family residential area, especially with the Southern Bypass Road completed and providing improved private car access. It is also important to plan for the growth of Ngong' under the housing boom. Currently, the housing types are mostly maisonettes on small plots of land.

- **Ngong' as an Eco-Tourism Hub:** Located about 22 km southwest of Nairobi, Ngong' Hills are a popular weekend destination for local tourists. Its proximity to Nairobi should be leveraged upon in order to establish it as an eco-tourism hub. Some of the other factors include its accessibility, natural beauty, historical significance, wind farms, and picnic sites and general natural environment. Considerations should be set out on environmental conservation and management, infrastructural development of the hospitality industry, water and sanitation services, and the ultimate growth of commercial establishments and businesses.

- **Ongata Rongai:** The SPC for NMR envisions Ongata Rongai as a town with links to immediate rural hinterlands to develop as a central service centre for Kajiado North Sub-County. Its key economic planks, real estate and business services, are expected to enhance the town's future economic growth and sustainability.

- **Real Estate:** The town's becoming a satellite urban centre is due to its proximity to Nairobi, affordable land and good accessibility. Ongata Rongai's commercial hub has quickly grown with banks, supermarkets, banking and microfinance institutions and hotels coming up.

- **Service Hub:** Services that already exist in Ongata Rongai provide comparative advantages to support the towns' transformation into a service hub for the NMR. Some of these include education institutions, supermarkets, banks, health, and leisure facilities. Other existing tertiary sector businesses include barbershops, salons, water kiosks, bars, milk vendors, artisan centres and Saccos. For it to sustain the growth, these must be supported and formalised.

- **Kiserian:** Kiserian is anticipated to grow as a service town with links to its immediate rural hinterlands. Currently, the town's economic planks include the following:

    - **Real Estate:** Kiserian has a number of high-income houses and luxury villas, although the prices of land and residential homes in the town are higher than most of the surrounding areas, owing to the influx of demand from more affluent populations.

    - **Industrial Town:** Kiserian has a high potential for development into a meat/livestock processing town. This is in line with the various activities generated by the very busy slaughterhouse and high amount of farm produce brought by farmers to the local market there. Light industrial complexes can be developed to process the outputs from the slaughterhouses and the farmers.

    - **Service Hub:** Kiserian is linked to the vast pastoralist land at its southeast and farmlands in the slopes of Ngong' Hills at its eastern side. Its central location, and by having a growing residential urban community, Kiserian has a unique opportunity to establish itself as a commercial service hub. Centred on the slaughterhouse, Kiserian provides a focal point for business service facilities.

    - Kiserian can also serve as a key destination for business services and products for NMR residents providing facilities for education, health, communications, and infrastructure. It will be crucial that real estate development be environmentally controlled and green colonies planned to reduce the ecological pressure of economic growth.

3.5.10 Cooperative Societies and SMEs

The cooperative movement is the bedrock of the Kenyan economy. It forms the basis for pooling resources together to pursue bigger objectives and to provide affordable loans to members to improve their businesses or lives. In Ngong' Municipality, there are cooperatives operating in the transport, housing, agricultural, trade, financial and dairy sectors. These are shown in Table 3-11 below.

Table 3-9: Cooperative Societies in Ngong' Town

Type of Cooperative	Number	Status
Transport	6	Active
Dairy	2	Active
Agricultural	3	Active
Trade and Marketing	2	Active
Housing	7	Active
Financial	2	Active

Type of Cooperative	Number	Status
Religious/Business	4	Active
Total	25	Active

Source: Interviews and Focus Group Discussions, 2018

Of the 25 cooperatives, there are religious cooperatives that are run by Catholic and Anglican Church members as well as the Muslims in Ngong' town, respectively. One of the financial service cooperatives is for general membership although dominated by members of the Adventist Church around Ngong' Town. The agricultural cooperatives are organised around coffee production and marketing, poultry and livestock production and marketing. Also, there are cooperatives in Ongata Rongai operating in the transport, housing, and religious/business sectors. These are shown in the table below.

Table 3-10: Cooperative Societies in Ongata Rongai - Kiserian

Type of Cooperative	Number	Status
Transport	6	Active
Housing	1	Active
Religious/Business	2	Active

Source: Interviews and Focus Group Discussions, 2018

3.5.11 Challenges and potentials

The following table illustrates the challenges and potential opportunities that exist in Ngong', Ongata Rongai and Kiserian.

Table 3-11: Challenges and Potentials in Ngong', Ongata Rongai and Kiserian

Challenges	Potentials
• Poor road network; • Proliferation of slums; • Poor infrastructure to support development, i.e., lack sewer system, inadequate water supply, poor solid waste disposal; • Traffic congestion; • Flooding and erosion due to runoff from the hills; • Inadequate parking spaces; • Inadequate market spaces; • Lack of investment at the tourist industry; and • Increase in land prices.	• Existing industrial base; • Well-developed network of commercial, transport and other services; • Established banking industry providing financial support to investors; • The area can develop as an agro-industrial hub and eco-tourism destination through creation of nature trails at Oloolua forest; • Use of Halal land as an abattoir and animal value addition; • Growth of jua kali industries to cottages and large-scale industries; • Construction of markets at Ngong', Olekasasi, Matasia will enhance the local economy; and • Availability of space for expansion and creation of industries.

3.6 Land Use & Human Settlement Patterns

3.6.1 Urban Growth Trends

The high rate of urbanisation within Nairobi city has led to urban sprawl within Ngong' Municipality particularly Ngong Town, Ongata Rongai, and Kiserian Municipality. In addition, due to the availability of relatively cheap land, infrastructure, and the proximity of the Municipality to the Nairobi CBD, the rate of urban growth within the Municipality has grown immensely. The population's Cumulative Annual Growth Rate (CAGR) for the Municipality is 6.63%. This means that the population density will rise as well as the land area occupied. Hence, there will be more land and energy consumption, increase in gas emissions and alteration of ecological systems.

Urban growth in the Municipality is characterised by ribbon and leapfrog developments within the towns. Human settlements and developments are either developing along the major spine roads or sprawling to undeveloped and unplanned areas. Ribbon development whereby unorganised residential and commercial developments have taken a linear pattern along Magadi and Ngong' road is a result of poor land-use planning and weak institutional framework. This type of urban growth has led to traffic congestion and reduced carrying capacity of roads due to encroachment of the road reserves. On the other hand, interior areas have been left undeveloped causing wastage of valuable land.

Leapfrog development which is a characteristic of dispersed development is mainly found in Ngong'. Ngong' town has a dispersed settlement pattern where several satellite nodes have developed because of leapfrog development patterns. The occurrence of this development is mainly due to poor planning, private land ownership and lack of development control tools. This has led to the loss of agricultural land and land fragmentation.

Over a period of years, the Municipality has experienced unforeseen rapid urban growth. Without proper planning, this has caused depletion of resources like forests and rivers, overcrowding, inadequate infrastructure, land fragmentation, traffic congestion, erosion of Maasai culture and loss of agricultural land. It has been noted that the three major towns (Kiserian, Ngong' and Ongata Rongai) have different characters. While Ngong' has the highest population, it is more distributed and has resulted in the formation of satellite centres. However, the densities within Ngong' have also been the highest (181 persons per hectare (ppha)) resulting in Ngong' having the highest population figures. The growth of Ngong' has significantly increased in the last decade (17.87%) compared to the previous ones where it had stagnated. Ongata Rongai, on the other hand, has over the last decade started to stagnate with an average growth rate of only 1.14%.

The high rate of growth has been attributed to Ngong's absorption of Nairobi city's population overspill. Ngong' has oftentimes been called one of Nairobi's "dormitory towns" as it is a recipient of the residential demand from the primate city. This has been attributed to the town's proximity to Nairobi, good road access links and relatively lower cost of land.

The growth of the resident population has generated internal demands for related services such as retail, commercial banks, shopping centres, offices, etc. The emergence of these commercial centres consequently leads to the growth of satellite nodes. Ngong' town, for instance, has been dominated by low-density residential but recently, residential flats have been on the rise as outcrops in the low-density residential areas.

While urban growth has resulted to socio-economic benefits to the local and migrant population, it has also caused several challenges, which include, amongst others, inadequate solid waste and wastewater management systems, poor roads, environmental degradation, and loss of biodiversity.

Kiserian, while considered the smallest, has the highest densities averaging at 107 ppha as opposed to others such as Ongata Rongai at 31 ppha (2009 census). This high density in Kiserian is attributed to the centrality of the town coupled with physical constraints such as hills, rivers and the dam resulting in vertical exploration by developers. This is also influenced by its roles as brisk cattle trading area and being known as Kajiado's "meat centre" with its large capacity slaughterhouse. Urbanisation is also hemmed-in by Ngong' Hills, on the slopes of which may already be seen high-end residential developments capitalising on pristine locations and cool climates.

Kiserian has a compact development at the CBD with commercial and residential development. The interior area is dominated by scattered residential developments. Growth is spurred by the livestock market. Kiserian also faces similar growth challenges as in Ngong' and Ongata Rongai, albeit on still relatively smaller scales. Issues such as lack of wastewater management facilities in the urban centres, poor interior roads, environmental degradation, loss of biodiversity, etc. are also present in the area.

3.6.2 General Land Use Pattern

The Municipality was a major settler farming region during the colonial period particularly around Ngong' town, and many traditional colonial houses are still seen in the area. Today, since Ngong' has become more urbanised, it serves as a residential area for the working population in Nairobi.

The area was also a cattle market and mining town. Kiserian and a stone mining township (Kware and Gataka) spread linearly towards each other and led into a high-density urban aggregation making up what is now Ongata Rongai, covering around 16 square kilometres. As a local satellite urban centre, Ongata Rongai owes its existence to proximity to Nairobi.

A small settlement put up by casual labourers in Ongata Rongai who provided labour to neighbouring affluent Karen also led to the growth of the Municipality. Ongata Rongai functions as Nairobi's dormitory. Urban growth in the area has occurred without planning control, and haphazard developments occurred first coming along Magadi Road and then spread to the interior (Kazungu, Gitau, & Gichuru, 2011).

The presence of the Maasai community in the Municipality whose main economic activity is livestock-rearing created a livestock market in the area, which grew into what is now known as Kiserian town. Presently, the town is known for its slaughterhouse known as Keekonyokie. Meat from the slaughterhouse is transported to Nairobi and other neighbouring towns in Kenya.

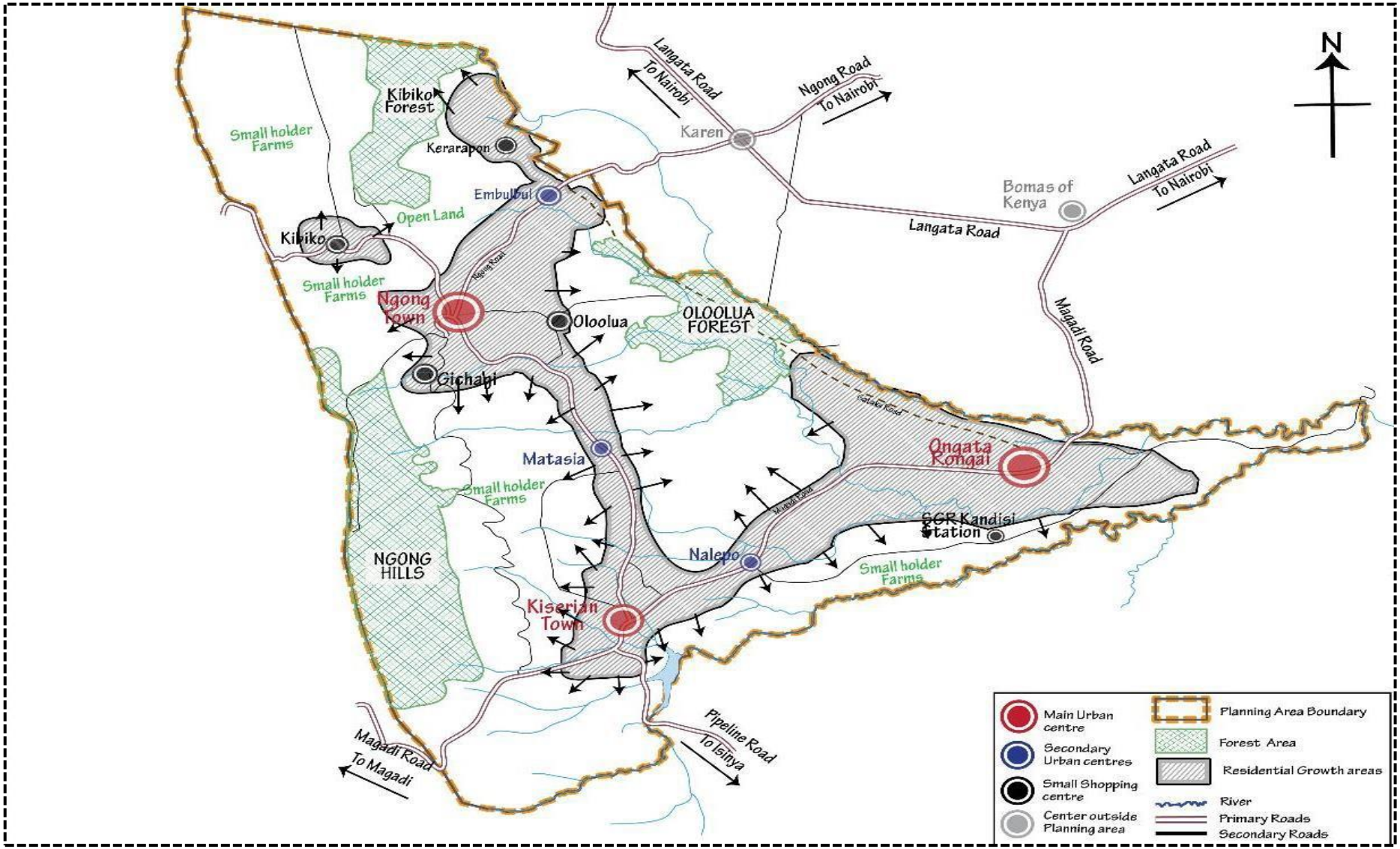


Figure 3-11: Urban Sprawl/Growth in Municipality

Source: VisionRI

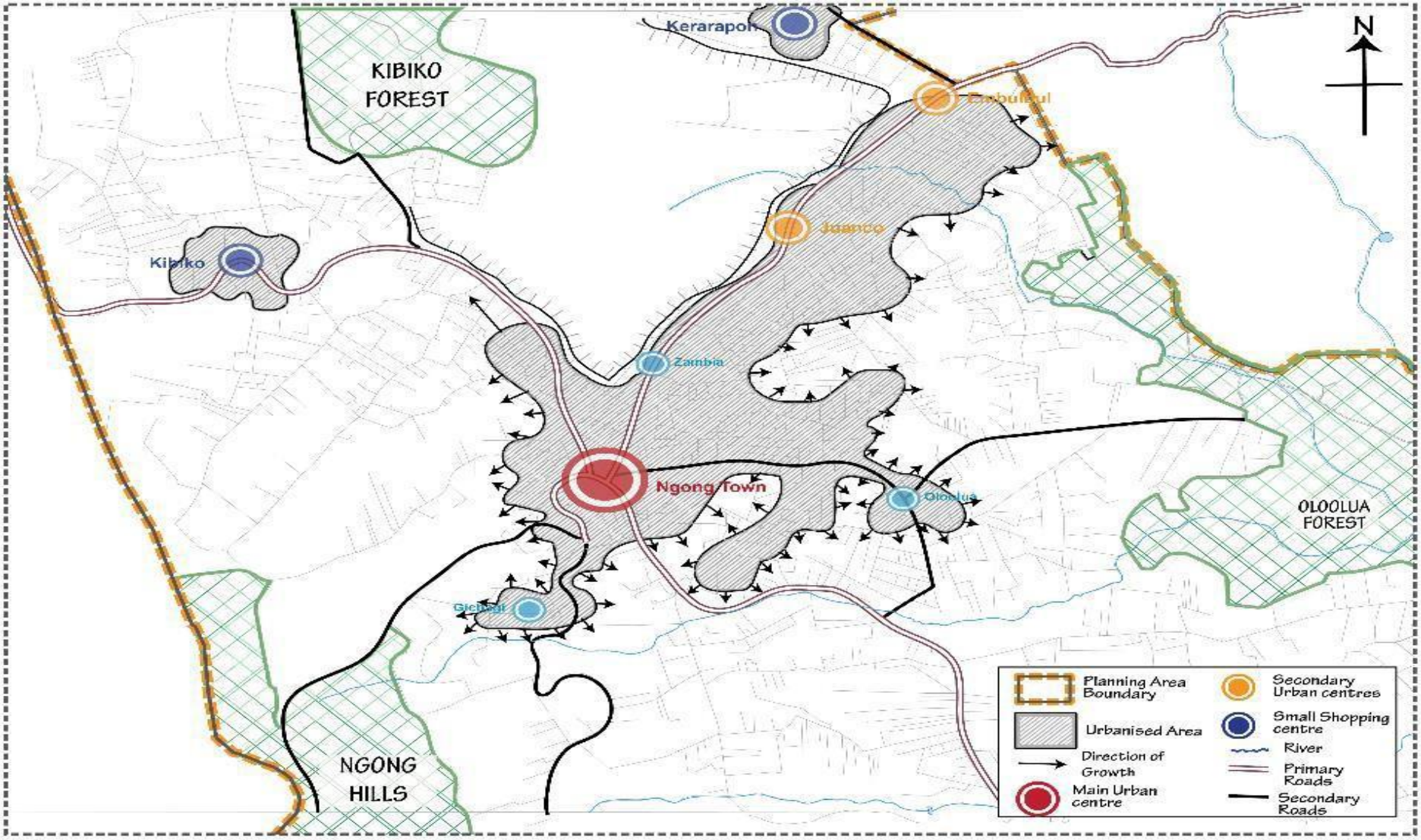


Figure 3-12: Urban Sprawl/Growth in Ngong' Town

Source: VisionRI

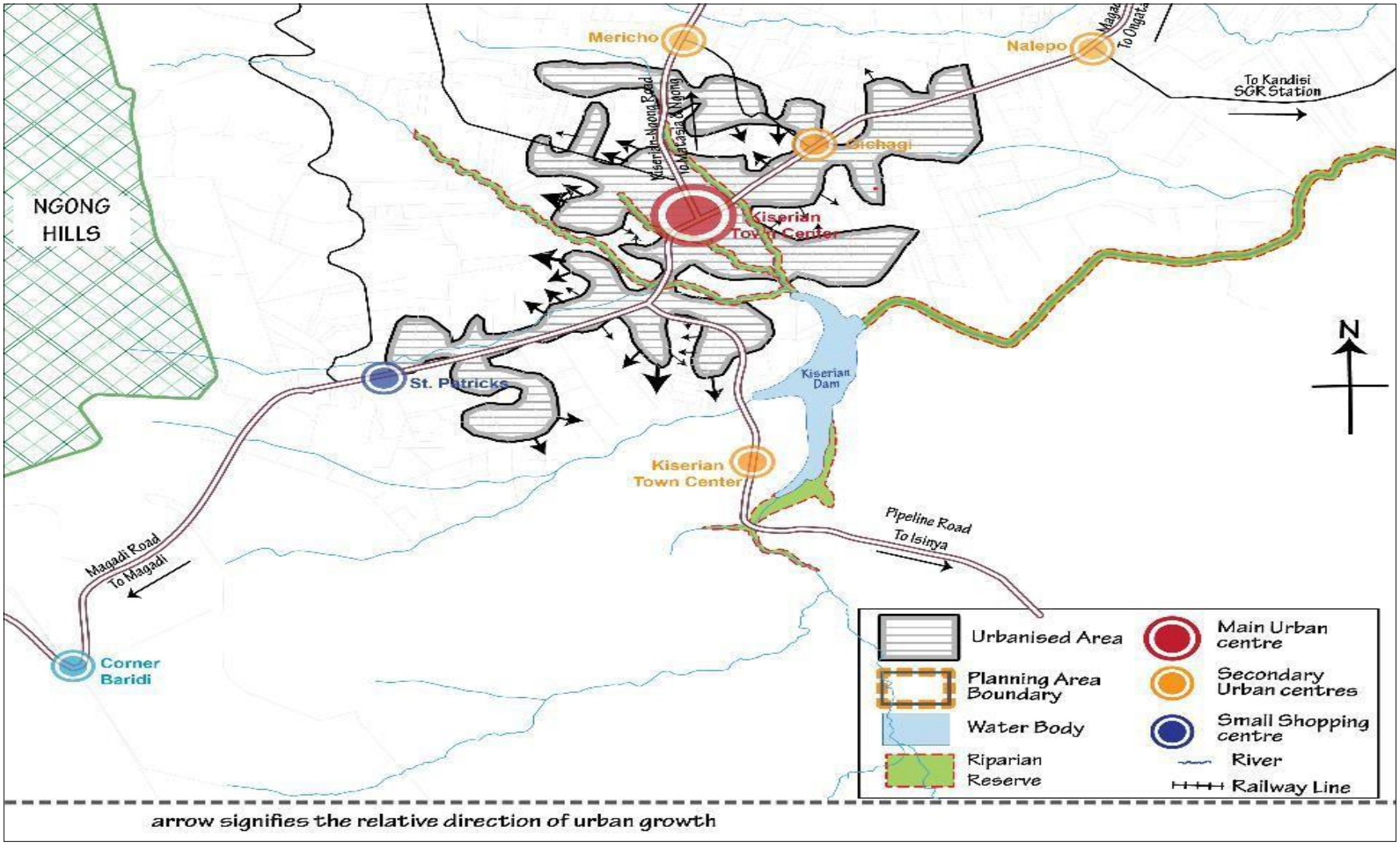


Figure 3-13: Growth of Kiserian Town

Source: VisionRI

Table 3-12: Existing areas and land use zones

Area	Location	Characteristics	Emerging issues	Mitigation
Oloolua/ Veterinary Farm Area	The area borders Mbagathi River to the north, Ngong' town to the south, veterinary farm to the west and Oloolua forest to the northeast. Nairobi- Ngong' road marks the boundary on the western side.	• Mostly medium-density developments. However, high-density developments are seen near Bulbul market centre. In addition, there are temporary structures (iron sheet houses) at Oloolua market centre; • Land fragmentation; • Agricultural practice at the forest and open quarries towards it; and • Encroachment of Gataka-Bulbul road.	• Encroachment of road reserves e.g., linear commercial developments along Gataka-Embulbul road and quarry activities along Kanagawa Road; • Narrow roads and poor connectivity; • Pollution of Mbagathi river due to discharge of sewage; and • Human-wildlife conflict.	• Plot sizes of 0.05 ha and 0.1 ha for single-family dwelling and multi-dwelling family; • Widen and upgrade the Gataka Embulbul road (spine roads to be 30 m and access roads to be 12m); • Formulate and enforce policy on the type of trees to be planted along the watercourses; • Complete and approve Bulbul Plan as well as develop an action plan for Kariobangi village and Oloolua market centre; • Control quarrying activities taking place in road reserves; and • Electric fencing along the forest to control the animals and to protect the forest.
Kerarapon Area	The area borders Veterinary Farm to the south and Nairobi to the north, Kibiko farm to the west and Oloolua and Embulbul to the east. It also borders Kiambu district to the northeast.	• Narrow roads; • Land fragmentation; • Water springs which supply water to Kibiko, Veterinary farm, and Kerarapon; • Community facilities e.g., police post, Chief's office, • Low-density residential (ha.); and • Agriculture is practised.	• Encroachment of wetlands and riparian reserves; • Squatter settlement encroaching on KBC land; • Pollution of the springs by pit latrines built near the springs; • Intense land subdivision; and • Poor road connectivity.	• Road widening; • Regulate and control the subdivision of land in the area; the minimum plot size being 0.1 ha to only allow single-family dwelling units in this area; • Develop a buffer around the springs; • Develop an action plan for Kerarapon market centre; and • Fencing of public land.

Area	Location	Characteristics	Emerging issues	Mitigation
Kibiko Area	The zone borders veterinary farm on the north, Ngong' town on the east, Keekonyokie and Kibiko farm on the south and west, respectively.	• Agriculture is the main practice; • Most of the area is semi-arid as one moves away from Ngong' town; and • Private ownership of some large-sized farms.	• Poaching of trees; • Wildlife/human conflict leading to the destruction of crops by wild animals; • Water shortage in some areas; • Roads are narrow and in poor condition; and • Inadequate development control.	• The minimum plot size should be 0.1 ha bordering Ngong' town; • Plot size be allowed a minimum of 1 acre due to the gradient of the area, soil type aesthetics, and flood control; • Open up and widen access; • Proposed for low-density residential; and • Agriculture should be encouraged and sustained.
Upper Matasia Zone	The zone borders Ngong' hills forest on the southern side, Kiserian to the south-east, Matasia centre to the north and Ngong' town on the western side.	• This is an agricultural cum residential area; • There are high-density residential developments near Ngong' town and along Ngong'- Kiserian road; • There is a water pan near Matasia centre; • Existence of flower farms; and • The area is of mixed development.	• Encroachment of riparian reserves and wetlands; • Land subdivision into narrow plots; • Linear commercial development near Matasia centre; • Narrow roads; • Temporary iron sheet residential structures near the flower farms; • Weak enforcement of development control; • Dangerous chemical used in the flower farms and greenhouses; • Lack of infrastructure and community facilities; and • Land fragmentation.	• Minimum plot size is 0.1 ha for low-density residential; • Riparian reserve to be observed 10 m on each side of the river and protection of fragile water pan; • Encourage food farming; • Annual Environmental Audits to ensure environmentally sound practices by the flower farms; • Sensitise people on consequences of encroaching on the road and riparian reserves; • Encourage rainwater harvesting; • Address issues of squatter settlement at Ngong' Hills; • Develop an Action plan for Matasia trading centre; and • Proper enforcement of building codes/development control to discourage temporary structures (iron sheet structures).

Area	Location	Characteristics	Emerging issues	Mitigation
Lower Matasia /Nkoroi Block	The zone borders river Kandisi to the north-eastern side and Gataka and Oloolua forest to the north. It extends from Olkeri road to the west and Kiserian - Ngong' town road marks the boundary on the southern side. It borders Magadi road to the east.	• Characterised by medium density area; • There are flower farms; and • Agriculture is practised in big farms.	• Poor road connectivity and conditions; • Narrow roads; and • Intense land fragmentation.	• Need for Nkoroi Action Plan; • The area recommended for low-density residential development; • Widen existing roads and open up access roads; • Provide land for community facilities; • Encourage agriculture; and • Minimum plot size 0.1 ha.
Kandisi	The zone extends to Rimpa trading centre on the southern side and Ole Kasasi on the eastern side and Ongata Rongai area on the northern side. Kitengela river marks the boundary on the south-eastern side.	• Oloolua forest, which forms part of the boundary; and • Agriculture is widely practised.	• Roads are narrow; • Encroachment of riparian reserve; • Characterised by medium density residential; • Linear commercial development along the Rimpa roads; and • Intense land fragmentation.	• Widening of narrow roads to the required standard; • Action plan for Rimpa junction and controlling the linear developments; • Encourage sustainable agriculture (Food crops and dairy); • Enforcement the existing laws to reclaim the riparian reserve and protect the riverbanks; and • Capacity building to sensitise the society on the need to safeguard water resources and water catchments areas.
Kiserian		• Slaughterhouses; • Residential development; • Agricultural activities; and • Animal holding ground/ market.	• Very intense land fragmentation to 1/32 of an acre e.g., Kamurangá scheme 20 by 30 ft.; • There are upcoming slums; • Encroachment of road reserves; • Encroachment of the riparian reserves;	• Widening of narrow roads; • Plot size 0.1 ha; • Amalgamation and re-planning of the small plots; • Policy to conserve the rivers and riparian reserve-10m for riparian reserves;

Area	Location	Characteristics	Emerging issues	Mitigation
		•	• Poor management of the waste from the slaughterhouses; • Poor sitting of the Kiserian dam making it prone to pollution from the town waste; and • Interference of the watercourses and underground water runoffs.	• Proper waste management. Enforcement of the waste management Act as well as the Public Health Act; • Provide a buffer zone for the dam 10m to protect to it from pollution; and • Re-site the animal holding ground/market.
Ongata Rongai/ Gataka Area	Borders Oloolua forest to the east; and Mbagathi River to the south.	• Abandoned and active quarries; and • High-density residential developments and many commercial activities along the road.	• Encroachment of Gataka-Embulbul road; • Narrow roads; • Linear commercial development; • Quarrying activities extended to road reserves; • Un-rehabilitated quarries, • Construction of houses in the un-rehabilitated quarries; • Lack of community facilities; • Human/wildlife conflict; and • Poaching of trees.	• Ensure a minimum allowance of 10 m as a riparian reserve for river Mbagathi; • Rehabilitate open quarries; • Need for an action plan for Ongata Rongai to include the Gataka area; • Development of community facilities; and • Sensitise the community to on the danger of settling in un-rehabilitated quarry areas and develop resettlement plan for them.
Ngong' Hills Forest	It is the biggest in Ngong' division covering 3077 hectares.	• The forest is bare, with the distribution of short shrubs and indigenous trees; • Public partnerships with Nairobi University, Kenya airways, Coca-Cola company, Roy motors, and KenGen to rehabilitate the forest; and	• Encroachment of forest reserve beyond 400 m; • Squatter settlement on the 400 m strip accommodating more than 1000 families; • Wildfires; • Persistent drought; • Overgrazing in the • Ngong' hills forest;	• Solve the water shortage; • Build water reservoirs to cater for water shortage; • Encourage rainwater harvesting; • Embrace proper forest husbandry to enhance sustainability; • Fence the whole forest to resolve wildlife-human conflict;

Area	Location	Characteristics	Emerging issues	Mitigation
		• Presence of telecommunication masts.	• Drying up of trees due to poor maintenance; • Encroachment of forest reserve; and • Poor road network.	• Avoid squatter settlement in the forest; and • Improvement of the roads.
Oloolua Forest	Covers 661.6 hectares. Natural forest covers 143.4 hectares and planted forest covers 429.6 hectares with most of the trees being eucalyptus trees.	• With schools such as Olkeri secondary school(25 acres) and Nkaimurunya Primary School (15acres); • Poaching; • Presence of both natural and planted trees; and • Part of the forest is international primate research managed by the National Museum of Kenya and Kenya; and • Forest Department.	• Encroachments of the forest; • Poaching of trees; • Human/wildlife conflicts- buffaloes and wild pigs a threat to farmers; and • Unclear forest boundary.	• Electric fencing to protect the forest from human activities and alleviate existing encroaching; • Digging of trenches can also be used to deny access to tree poachers and wild animals; • Research on the impact of the Eucalyptus trees; • Rehabilitation of quarries; • Enhance security; and • Delineate the forest.

Source: Ngong' Zoning Plan 2009

3.6.3 Land Market Dynamics

The Municipality has become an attractive location for real estate developers due to its proximity to Nairobi and relatively cheap land prices. Land sales in the Municipality started occurring in the 1990s with owners selling parts of their plots, as well as passing on plots to several inheritors. Urban sprawl has caused migration to Ngong', Kiserian and Ongata Rongai in search for cheaper land and a cleaner environment, in an effort to avoid the hustle and bustle of the city. The presence of major firms and parastatals has contributed to fuelling land price.

The prices of land have more than doubled because of increased interests. Nonetheless, it is apparent that the cost of land in the area has been purely on a speculative basis. As a result, many buyers have to struggle before getting their dream development even after spending a fortune to acquire land. In essence, the high market cost of land does not match its value.

For example, the Municipality has many limitations that would otherwise devalue the land; the area has black cotton soils, lacks sewerage systems, dependable water and infrastructure. Developers, therefore, have to incur the high cost of soil excavation, its disposal, and construction of a septic tank, sock pit, water storage tank, and access roads.

Table 3-13: Current Land Prices

Acreage	(KShs.)	Projected prices (KShs) 2023
1/4 acre	4,000,000 – 12,000,000	8,000,000 – 18,000,000
1/8 acre	2,500,000 – 7,000,000	3,750,000 – 10,500,000
1/2 acre	7,000,000 – 20,000,000	10,500, 000 – 30,000,000
1 acre	10,000,000 – 30,000,000	15,000,000 – 45,000,000

Source: VisionRI

3.6.4 Land Administration and Management

Land administration and management services have not yet been decentralised to the Municipality. Therefore, the County is charged with land administration and management issues relating to Ngong'. The land administration institutions are charged with the responsibility of establishing and managing land control boards, processing, and approval of development applications e.g., issuance of consents to charge, lease or transfer, alienation of land for development to public institutions and individuals. Other functions are processing of ownership documents such as titles/grants for both public and community, setting apart land for public use, generation and collation of revenue, documentation of public land and maintenance of land records and updating attributes on files and cards.

The existing land administration and land rights delivery systems are bureaucratic, expensive in terms of transaction costs, and prone to abuse. These have resulted in excessive delays in the administration of land and difficulties in accessing relevant information necessary in land transactions.

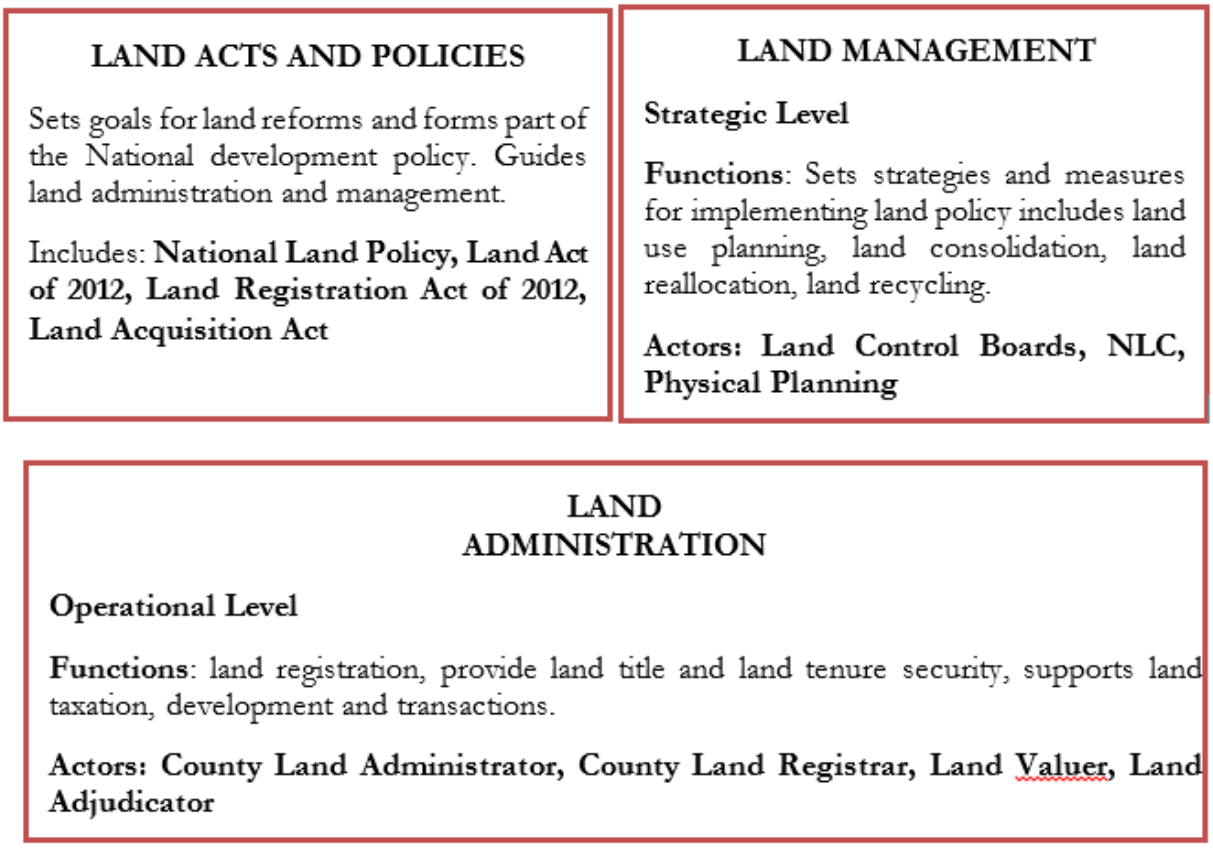


Figure 3-14: Land Administration Process

Source: VisionRI

3.6.5 Urban Growth Scenarios

The urban growth trends and patterns are analysed to determine the different growth scenarios. The growth scenarios of the Municipality are projected in the long term and short-term basis. The growth scenarios of the planning site are based on population size and density projection, land use requirement and distribution and transport network design and distribution. Table 3-16 below shows the urban population in 2009 and its projection in 2030.

Table 3-14: Projected Urban Population

Years	2009	2030
Ngong'	107,188	208,174
Rongai	40,178	291,238
Kiserian	18,096	40,438
Total	165,462	539,850

Source: Kajiado Inequality Index Report

Urban growth within the Municipality has been growing tremendously within the years. Previously, urban growth was higher in Ongata Rongai compared to Ngong'. Over the years, Ngong' has come to surpass all the others.

3.7 Urban Design

3.7.1 Urban Morphology

The Municipality observes a looped structure which was influenced by the presence of hills and forests. The major road network comprising Ngong' Road, Ngong' - Kiserian Road and Magadi Road define this main loop. The hills and forests provide a dominant open space backdrop to the Municipality. Major branches to this loop include the Rimpa Kasasi Road which leads to the interior portion of Lemelepo, Ngong' - Kibiko road which leads to the upland portion of Ngong' ward, and the Kiserian-Naru Moru Road.

The loop road, with the exception of Gataka Road, also defines the Municipality's urban corridor where developments have sprung up. Sharp density increases may be observed at the CBDs of the major towns in the Municipality along the loop road and to a lesser degree, as one approaches the secondary nodes such as Embulbul, Matasia, Nalepo, and Gataka.

A vast and leapfrogging pattern of settlement development characterises the interior portion of the Municipality. These are mostly composed of gated residential communities interspersed with patches of agricultural lands.

3.7.2 Prospects for Urban Design Improvements

The Municipality's urban centres should be developed to make them liveable and more economically vibrant. Some strategies that may be employed in upgrading the urban centres include:

- **Improve pedestrian mobility:** The CBDs be made pedestrian friendly. Pedestrian walks should be introduced and kept clear of encroachments along with appropriate street furniture such as pedestrian crossings, street signs, streetlights, etc. There should be a clear delineation of spaces for pedestrians and vehicles. Interior access roads should be expanded to enhance accessibility.

- **Provide adequate vehicle parking facilities:** Bus parks for public vehicles may be constructed and designed to become iconic structures for each town. Aside from a central bus park, there may be a boda-boda terminal at strategic junctions. Regarding private vehicle parking, the County Government should ensure that development applications include an appropriate number of parking slots determined according to the type of use of the facility.

- **Introduce publicly accessible amenities:** Amenities, such as pocket parks, may be introduced in the CBDs. These will give each town an identity as well as provide people therein with access to valuable recreational space.

- **Institute architectural design standards:** Considering the high-value environmental setting of the towns in the Municipality, it will be good if minimum architectural design standards are required for buildings in each CBD. These standards need not be too extraneous thus making their implementation difficult. They may pertain only colouring of building facades, such as requiring only earth-tone colours to match the environment or to use certain vernacular types of architecture. Over time, the implementation of such standards will imbue each town with distinct architectural characters, which will be useful from a tourism and heritage point of view.

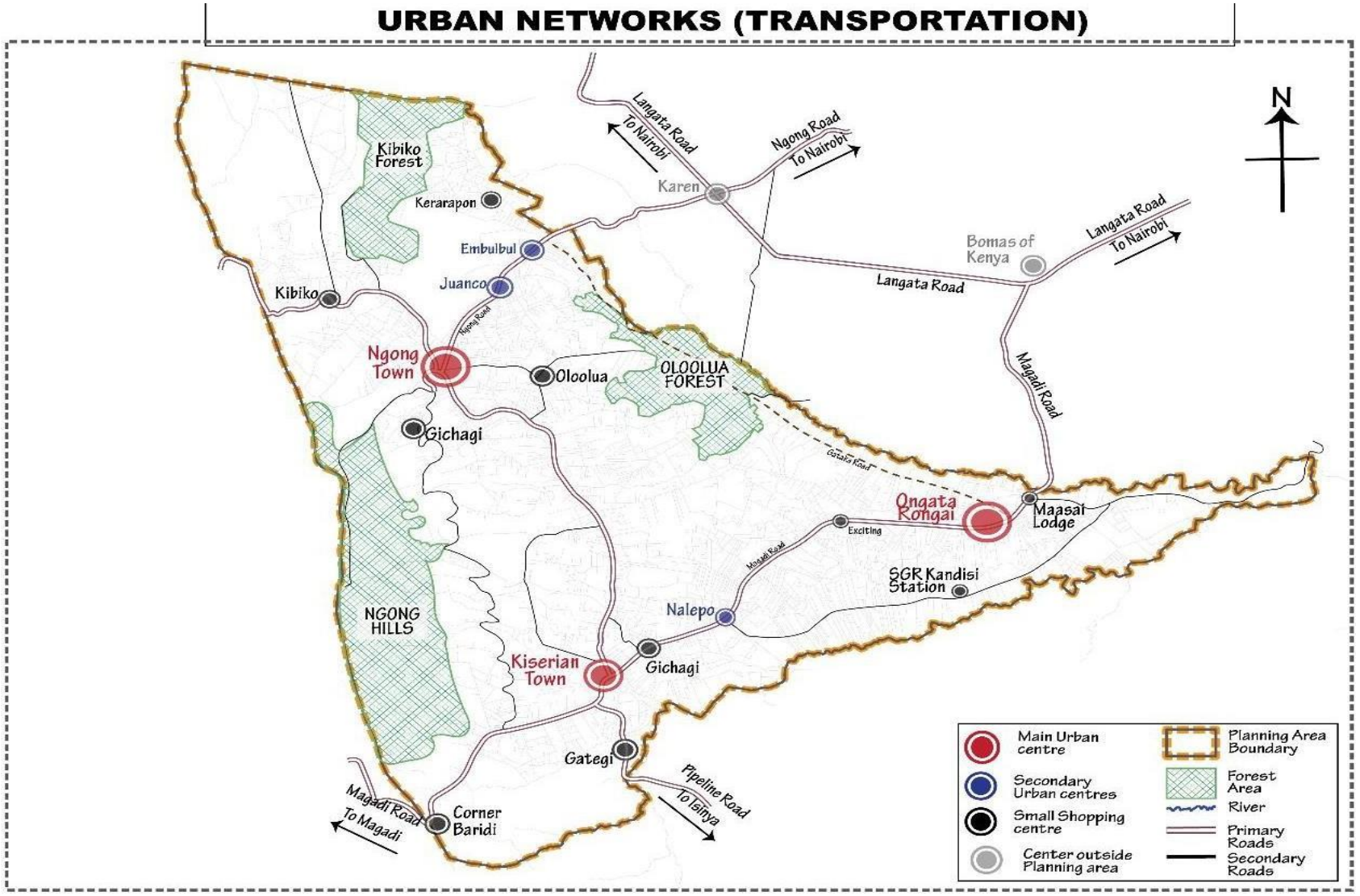


Figure 3-15: Urban Networks

Source: VisionRI

3.8 Transportation

3.8.1 Overview

An efficient transportation system attracts development, hence improving the quality of life in an area. However, if not properly planned for, transportation systems can lead to haphazard developments. This chapter discusses the components of transportation and the importance of an improved transportation system.

3.8.2 Road Transport

Roads in Kenya are categorised into two those that are classified and those that are not. The classified roads range from class 'A - E'. The unclassified roads are mainly the rural access roads, government access/special purpose roads, private roads, and others. Road conditions exist in three main types:

- Hard-top surface roads (concrete, bitumen/tarmac);
- Loose pebbles surface roads (gravel/murram); and
- Loose/earth surface roads (earth roads).

Road is the main mode of transport in the Municipality. The Municipality has existing roads that can facilitate intra- and inter-connectivity within the areas e.g., Gataka Road that links up Ongata Rongai with Ngong'. These roads can spur both economic and urban growth of the Municipality. However, most of the roads are in poor repair and inaccessible during the rainy seasons.

Image 3-2: Poor Road Condition at Gataka road

Source: Field Study 2018

The Municipality also lacks non-motorised transport (NMT) facilities for pedestrians and cyclists. The roads have also been encroached by informal land uses hence creating land-use conflicts in the area.

Due to inefficient sub-divisions, provision of sufficient space for access roads is often ignored; access roads within the estates are very narrow with a provision of 4m-6m width, especially within Ongata Rongai. As a result, two-way mobility in most roads is hampered which has resulted in traffic congestion. In addition, motorists access the residential areas through the main arterial road, i.e., Magadi Road hence creating more traffic congestion within the town.

The road reserves have been encroached by buildings and kiosks thereby constraining accessibility resulting in impaired traffic flow along Magadi Road. Kiserian is located at the junction of Magadi Road and Kiserian-Ngong' Road. The Kiserian/Ngong' Road intersection experiences heavy traffic gridlock.

Image 3-3: Traders at Kware Road

Source: Field Study 2018

Road Conditions

Of the roads surveyed, 73.43% were found to be of poor quality while 22.01% were of fair quality. Only a mere 3.35% of the roads were found to be of good quality.

Table 3-15: Road Conditions in Municipality

Condition	Length	%
Good	4.17 km	3.35%
Fair	27.43 km	22.01%
Poor	91.50 km	73.43%
Very Poor	1.50 km	1.20%

Source: VisionRI

Of the 26 main roads surveyed, the majority were observed to be of gravel surface type (57.69 %). The second most common surface type was bitumen roads with 26.92% and the remaining 15.38% being paved either with cabro or with other paving materials.

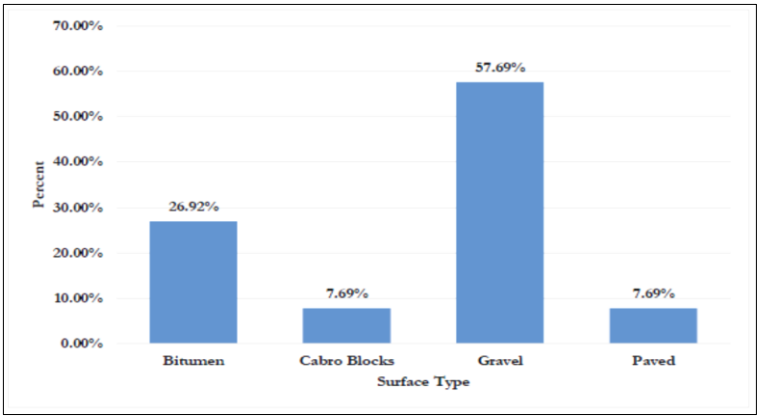


Figure 3-16: Road Types by Number of Roads (percentage)

Source: VisionRI

Of the roads in the Municipality, 54 kilometres are tarmacked (bitumen), 65.43 kilometres are gravel, 1.1 kilometres are paved with cabro and 4.07 kilometres paved with other materials.

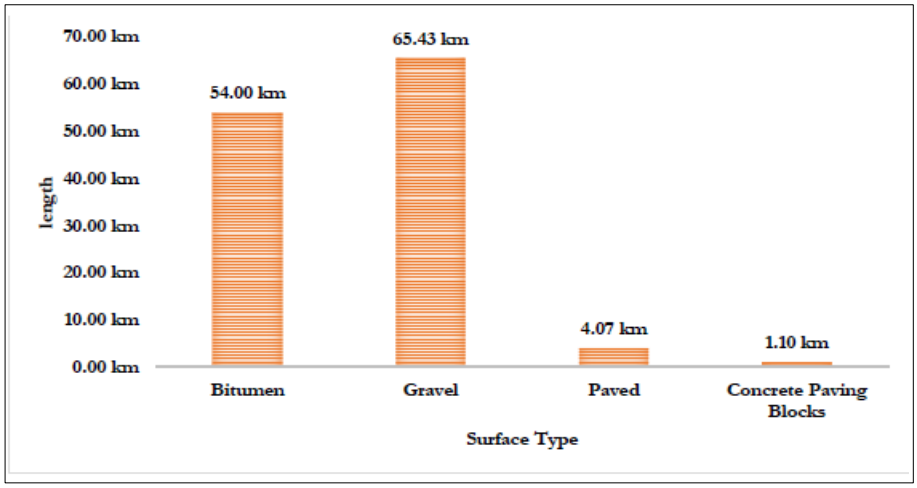


Figure 3-17: Road Types by the Length of Surface (kilometres)

Source: VisionRI

Non-Motorised Transport

With the exception of the bitumen (tarmacked) roads, all the other type of roads shows a dominance of the NMT modes. This provides a unique challenge for the roads in the Municipality since none of the roads has been designed to cater for NMT.

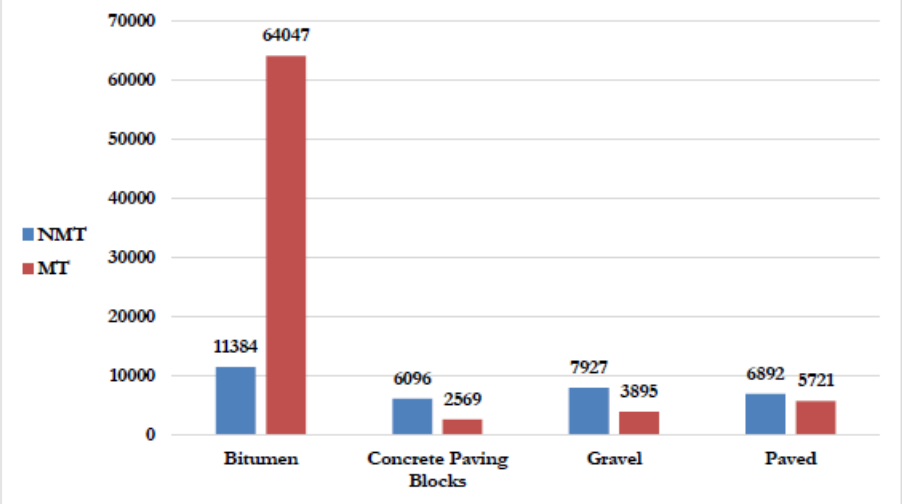


Figure 3-18: Distribution of NMT on Different Road Types

Source: VisionRI

The distribution of NMT traffic is such that the highest amount (35.25%) is on bitumen standard roads, which are the main roads while 24.54% are on gravel roads. The paved roads and cabro roads carry 21.34% and 18.87% of the traffic generated by NMT. For motorised transport (MT) on the other hand, there is a very high bias towards the tarmacked roads at 84.02%. The rest of the motorised transport (15.98%) is shared amongst paved, gravel and cabro roads.

The result of this distribution of traffic is that majority of the motorised and non-motorised transport ends up in the main tarmac roads, which results in confusing traffic flows especially due to the fact that there is no provision for non-motorised transport.

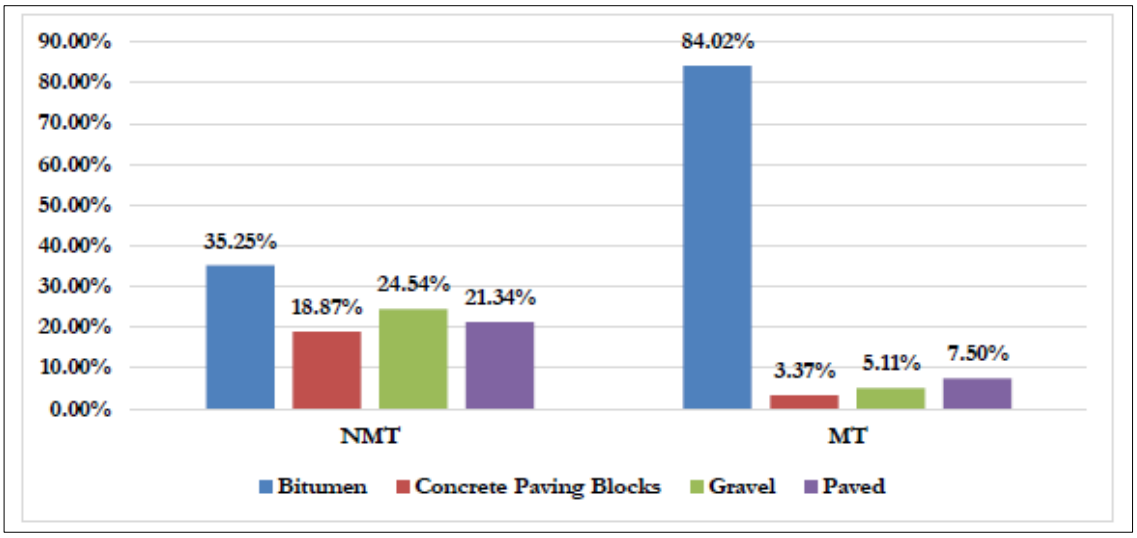


Figure 3-19: Distribution of NMT and MT

Source: VisionRI

Modal Split

- **Ngong' Modal Split:** There is high dominance in the main roads for private cars in Ngong' town followed by minibuses (public transport). This is because these are the two main modes of transport from other regions to the town. Ngong' Road has, however, a higher degree of personal vehicles than Kiserian Road.

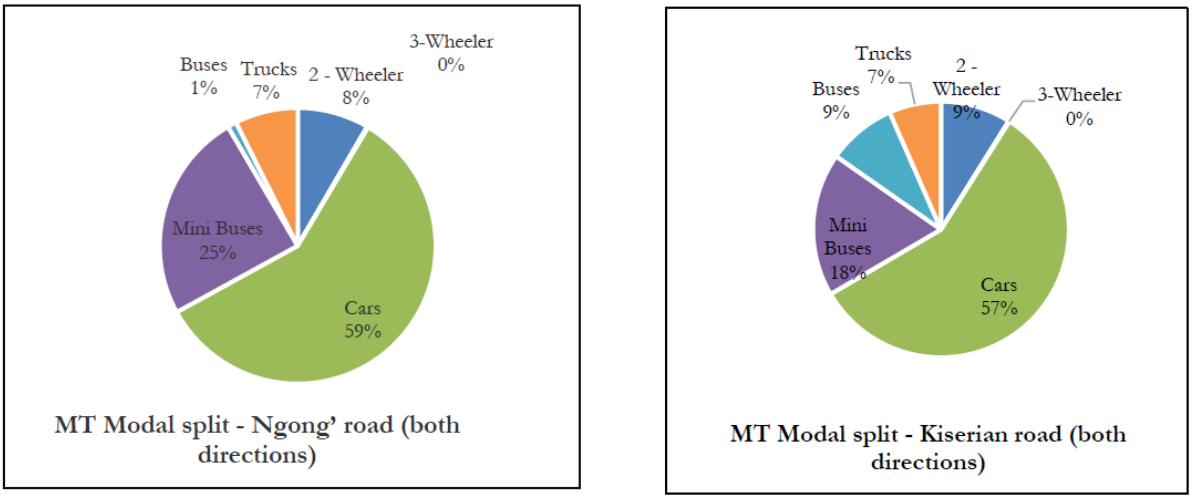


Figure 3-20: Modal Split for Ngong' Road and Ngong'-Kiserian Road at Ngong' Town

Source: VisionRI

Secondary roads, on the other hand, have a high dominance of two-wheelers such as bicycles and motorbikes since more people rely on these to ferry them to areas where public transport does not service. Private vehicles are also abundant in these roads since they are the roads leading to residential estates distributed throughout Ngong'.

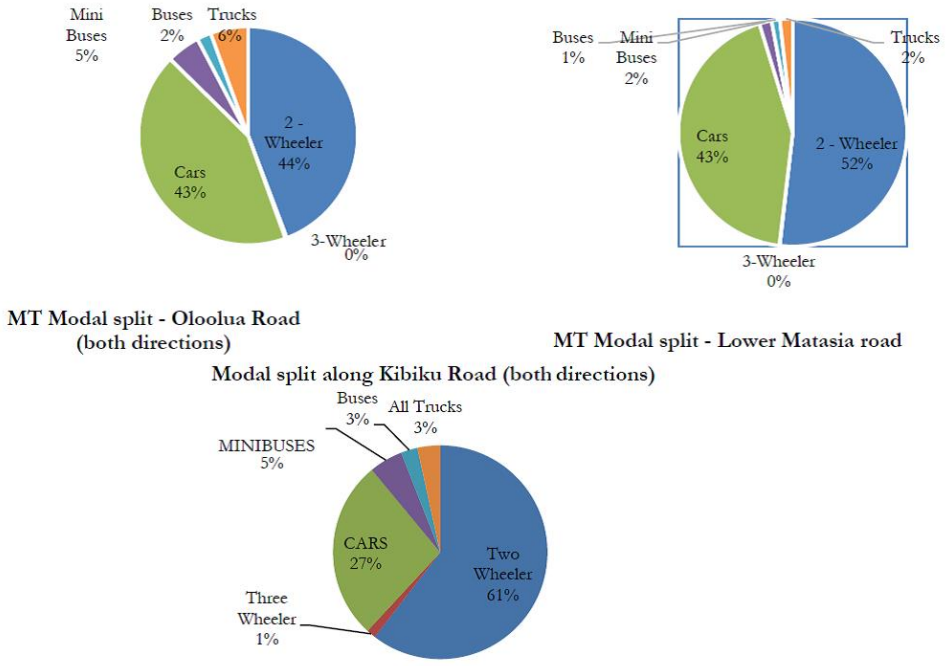


Figure 3-21: Modal Split for Lower Matasia Road, Kibiko Road and Oloolua Road at Ngong' Town

Source: VisionRI

- **Ongata Rongai Modal Split:** Magadi Road being the main trunk road for Ongata Rongai exhibits a character dominated by personal vehicles followed by minibuses. This is because these are the main modes of transport to Nairobi and for through traffic in the town.

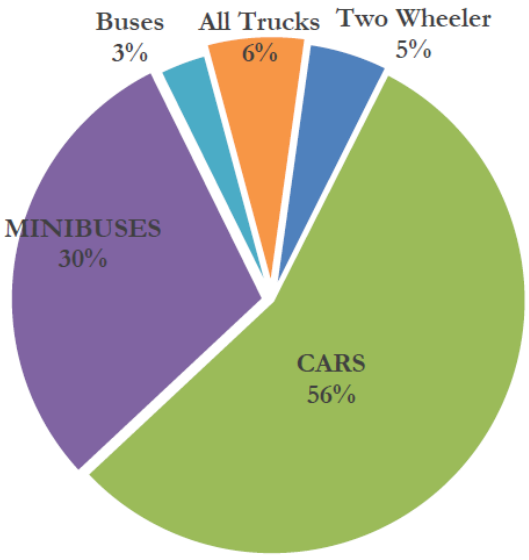
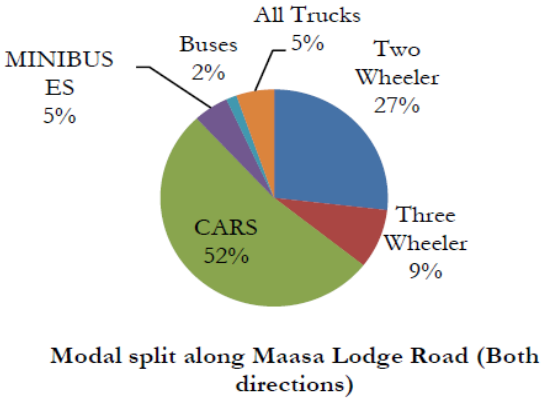


Figure 3-22: Modal Split for Magadi Road at Ongata Rongai

Source: VisionRI

Secondary roads such as Maasai Lodge and Gataka Road have a high reliance on two-wheelers, which are mostly motorbikes due to the lack of public transport. This is followed by personal vehicles which use these roads to residential areas. Buses and minibuses are minimal on these roads.



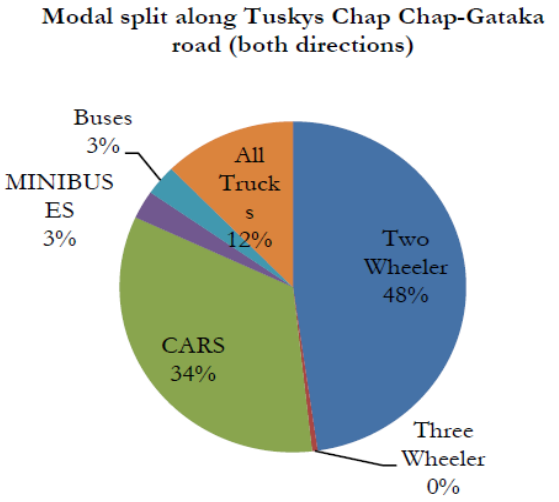


Figure 3-23: Modal Split for Maasai Lodge Road and Gataka Road at Ongata Rongai

Source: VisionRI

Public Transport

Public transport in the Municipality is provided by matatus. They range from 14-seater to 52-seater minibuses. Matatus operate under savings and credit cooperatives (SACCO). There are several bus parks in the Municipality. One is in Ngong' Town and has only 45 parking spaces. During peak season, the utilisation percentage is 320% meaning there are serious cases of double parking.

Table 3-16: Bus Stops in Rongai Town

Bus Stop Name	Number of parking spaces	Vehicles During Peak Hours	Maximum Utilisation (%)
Maasai Mall Bus Park	40	96	238 %
Tuskys Bus Park	64	116	180 %
Kware Bus Park	20	106	530 %
Ngong' Town	45	144	320 %

Source: VisionRI

This deficiency in parking spaces during peak hours results in traffic bottlenecks at the bus parks. This is the main reason for the traffic jams that lasts hours during rush hour periods.

Taxis are an important mode of transport in the Municipality due to convenience, safety, and social class factors. However, they lack designated parking areas hence most of them are parked at road intersections.

Boda-boda transport or motorcycle taxi is the most common intermediate mode of transport within the Municipality especially along Ngong' Road and Lower Matasia Road. Regardless of the growing number of demand and use, this mode has not been well provided for. It lacks adequate designated areas for parking, unfavourable weather protection mechanisms and general facilitation. This has led to their operations near junctions, shoulders and road reserves, amongst other inappropriate sites. They are used for both the transport of passengers and goods.

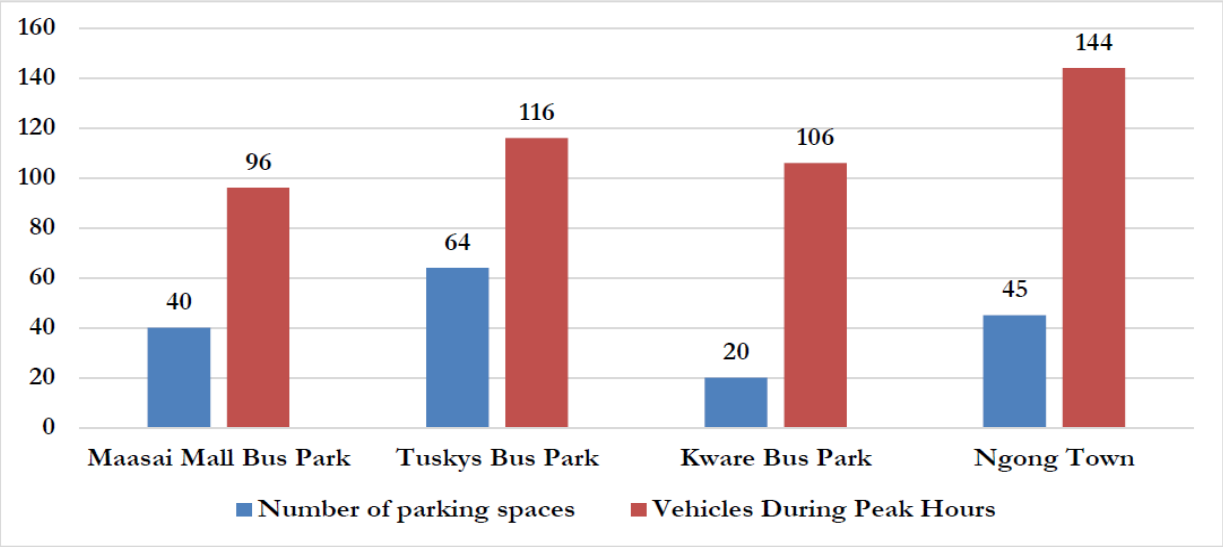


Figure 3-24: Bus Park Spaces versus Demand in the Municipality

Source: VisionRI

Freight Transport

There are many freight vehicles in the Municipality that transport solid waste to the dumpsite, clean water, goods to the quarry, etc. However, the Municipality has inadequate freight transport facilities, therefore, leading to roadside parking.

Currently, the construction of the SGR station is underway in Kandisi. This will greatly support freight transport within the town with goods from Kandisi station to environs.

Also, the freight vehicles from Nairobi's industrial area that pass through Magadi Road bring supplies such as hardware and retail goods. Others are vehicles from the Pipeline Road from Keekonyokie and Bissil that pass through Isinya bring construction materials such as quarry stones, ballast, and sand.

Parking

Parking is a big challenge as there are few parking spaces available within the Municipality. Ngong' Road has 100 parking spaces (between the Bus Park and Barclays). Just like Kiserian Road, most parking spaces are occupied during lunch hour with the highest utilisation percentage being 70%.

Magadi Road, which is the main arterial serving both flow and local access functions, has 39 parking spaces (in the CBD). However, these parking spaces are inadequate as evidenced by the high utilisation percentage (over 100% from 12; 30 pm-6:30 pm). The situation gets worse around 6:00 pm when the utilisation percentage shoots to 238%. Cases of double parking and parking in undesignated areas are therefore common.

There is widespread on-street parking along Kiserian Road. Kiserian Road has 140 parking spaces. Throughout the day, the utilisation of the parking spaces is above 82% with lunch hour (12.00- 3.00 pm) having the highest number (100%) of vehicles parked.

3.8.3 Rail Transport

Phase two of SGR, i.e., Nairobi - Naivasha railway is passing through the parts of County Government of Kajiado. The SGR will include a total of 12 railway stations including five in Kajiado County namely; Station, Ongata Rongai Station, Ngong' South Station, and Ngong' West Station. Currently, the Kandisi and Embulbul stations are underway.

Image 3-4: Construction of the Kandisi and Ongata Rongai SGR stations (2018)

Source: VisionRI

Due to accessibility brought by the SGR in the Municipality, the area is expected to further urbanise, as it will attract, high populations, commercial and residential developments, amongst others.

3.8.4 Challenges and Potentials

Table 3-17: Challenges and Potentials on Transportation

Challenges facing Transportation	Potentials within Transportation
• Encroachment of the road reserve by street traders and parked vehicles; • Increased car ownership and use within and through the town, uncontrolled motorcycles that drop and pick-up passengers everywhere within the town, and lack of designated waiting areas that contribute to traffic congestion; • Many roads are in poor condition (i.e., with potholes), and narrow and cannot accommodate NMT users and on-street parking;	• The existing road network can be upgraded and used to link the towns e.g., upgrade of by- Gataka road will link Ngong' to Ongata Rongai. The Silanga road on the western side of the town can be developed as a bypass to link to Kiserian; • Construction of underpasses and overpasses to enhance intra-connectivity; • Dedicated budgets for provision and maintenance of transport facilities available at the County; • Due to the presence of major roads, the area

Challenges facing Transportation	Potentials within Transportation
• Use of main roads for through access to the residential areas; and • Inadequate designated bus parks.	can transform into a transport hub with appropriate transfer terminals; and • Ongoing construction of SGR intended to pass at Ngong' and Ongata Rongai will enhance rail commuter interconnectivity.

Source: VisionRI

3.9 Physical Infrastructure

3.9.1 Water Supply

Main Sources of Water

The Municipality has two principal water sources, i.e., both surface and groundwater. Most of the households get their water from protected and unprotected water springs and boreholes. The percentage of the households in the County getting water from protected wells is 17.5% and from the borehole is 11.2%. About 33.1% of households have access to piped water. Domestic water supply has recorded a noticeable growth over the last five years with 63% of the population having access to potable water. About 49.8% of the households take between one and four minutes one-way to fetch drinking water while only about 0.3% take 60 minutes and above (NEMA, 2015).

The main sources of water in Ngong' Town are boreholes (average yield of 12m^3/hr.), a spring located in Ngong' Hills (402m^3/hr.) and rainwater. There are private and community projects water suppliers (piped water), i.e., Oloolua, Kibiko, and Kerarapon water projects as well as water vendors (Feasibility Study and Master Plan for Developing New Water Sources for Nairobi and Satellite Towns - Master Plan Report). Up to 72.2% of residents in Ngong' used improved sources of water (2009 Housing and Population census).

Image 3-5: Kibiko Water Project, Ngong'

Source: Field Survey 2018

In Ongata Rongai, the main source of water is boreholes. The other sources are Mbagathi River, Kiserian Dam (supplies 18%) and rainwater.

The main water service provider is Oloolaiser Water and Sewerage Company (OWSC). There are also private and community projects water suppliers such as Nalepo Water Project. The Water Project contributes significantly towards reducing water shortage since most of the people depend on them as well as water vendors for water supply. Up to 79.6% of the population has access to improved water sources (2009 KNBS).

Kiserian dam is a water source capable of supplying the entire planning area. Currently, it supplies water only to Kiserian town.

Water Demand and Supply Assessment

Water demand estimation has been made based on per capita supply rate and population figures. The demand for water for a community is dynamic and changes with time to match the growth pattern of the community. The demand of water for a community is the quantity of water required to meet its needs against the various categories of consumptions that include domestic demand that includes car washing, gardening and livestock; commercial and institutional demand for schools, hospitals, office complexes, houses, shopping and commercial complexes; and industrial demand. The following are the required amount of water for an urban area:

- High-class housing 250 L/person/day;
- Medium class housing 150 L/person/day; and
- Low-class housing 75 L/person/day.

The water demand in 2009 for Ngong' as per the SDC for NMR was 25,185 m^3 per day, Ongata Rongai was 9,440m^3 per day and Kiserian was 4,252 m^3 per day. Ngong' has the highest water demand due to the high-income residential component of the town compared to the other uses. Ongata Rongai, while having a residential component, is skewed towards the lower middle- and lower-income brackets resulting lower water demand.

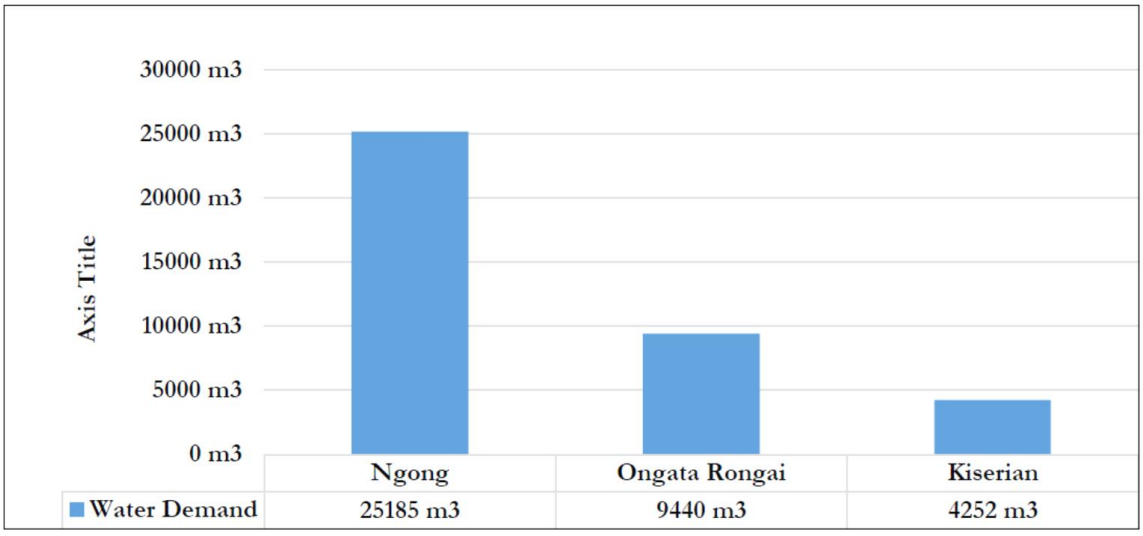


Figure 3-25: Water Demand for Ngong' Municipality in 2009

Source: SPC for NMR

The following presents the projected water demand for the Municipality.

Table 3-18: Projected Water Demand in the Municipality in m^3/day

Town	2009	2018	2020	2023	2028
Ngong'	25185	43270	54950	71379	93924
Ongata Rongai	9440	16219	20597	71379	93924
Kiserian	4252	72305	9277	12051	15857

Source: Spatial Planning Concept for Nairobi Metropolitan Region

Access to the water supply for residents is quite expensive. They purchase water from water vendors where they use approximately Kshs 100 per day resulting in expenses of up to Kshs 3,000 a month on water.

Rivers and streams have dried up reducing the amount of water supply in the area. Lack of allocation of way leaves hinders setting up water pipes and with increased urban growth and developments; water supply has become a major issue of concern. Water harvesting mechanisms are not utilised by the County Government and the residents.

Kiserian dam has the potential of solving the issue of inadequate water supply since it can produce (10,000m^3) of water per day hence meeting water demand. However, the dam is highly polluted. One of the rivers that drain into the dam passes by Keekonyokie slaughterhouse and all animal waste and blood are directed into the river, which then drains to the dam. This is further exacerbated by the fact that liquid waste from Kiserian town and destabilised ground materials (due to quarrying at the dam) find their way into the dam.

Image 3-6: Wastewater from Slaughterhouse and Quarrying Polluting the Dam

Source: Field Survey 2018

Planned and On-Going Projects

There are plans to make Kiserian Dam operational and provide water not only to Ongata Rongai but also to the surrounding towns (Kiserian, Rimpa, Ole Kasasi, and Nkoroi).

Image 3-7: Kiserian Dam

Source: Field Survey, July 2018

Challenges and Potentials

Table 3-19: Challenges and Potentials in Water Supply

Challenges	Potentials
• Degradation of water catchment areas; • Limited funding by the County Government; • Limited coverage by Oloolaiser Water and Sewerage Company; • Water pollution; • High cost of water connection and treatment; and • Vandalism and illegal connections of water.	• Availability of water resources; • Tapping of rainwater through proper harvesting mechanism for instance by use of water pans and sand dams; and • Proposed construction of a dam at Birika (Kiserian-Pipeline road).

Source: VisionRI

3.9.2 Energy Infrastructure

Main Sources of Energy

Energy sources used in the Municipality include electricity, wood/firewood, solar, wind, charcoal, LPG and kerosene. These are used for cooking, lighting, heating, and powering machines and equipment.

Table 3-20: Source of Energy for Cooking and Lighting

Cooking	Lighting
Gas	Electricity
Charcoal	Kerosene
Kerosene	Solar Panels

Source: KNBS

Lack of access to clean sources of energy is a major impediment to development as it may cause air pollution which is detrimental to public health. The type of cooking or lighting fuel used by households is related to socioeconomic status. Cleaner energy sources cost more and are used by

households with higher levels of income; less costly sources of fuel like firewood are mainly used by households with a lower socio-economic profile.

The most common source of cooking energy in the Municipality is paraffin followed by LPG and charcoal as shown in Figure 3-27.

About 71% of the residents have electricity connection in their homes while 15.3% use lantern lamps and 11.5% use tin lamps.

Kenya Power is the main supplier of electricity in the area. The electricity supply network covers most sections of the Municipality. Ngong' town has one sub-station at Church Road near Mathare slums and another one at Nkoroi road that serves both Ongata Rongai and Kiserian. Ngong' Power Station currently produces 5.1MW from the six Vestas V52-850kW Wind Turbines and is the only wind farm that is connected to the national grid.

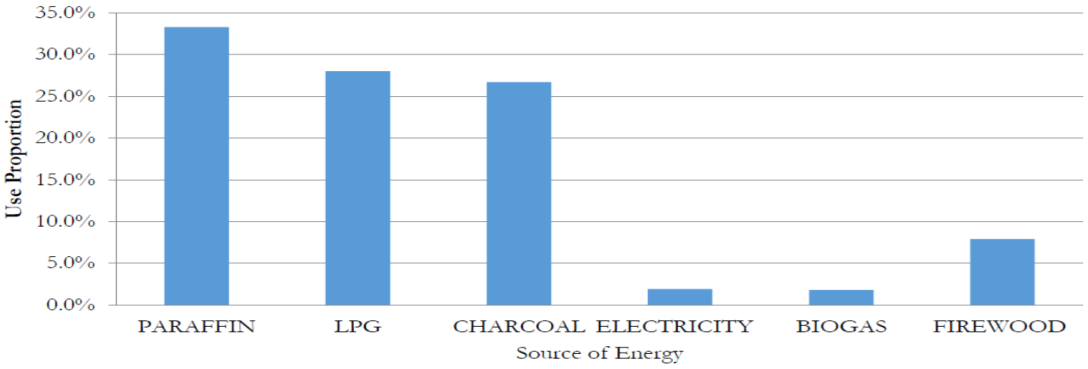


Figure 3-26: Sources of Energy for Cooking

Source: KNBS; Kajiado Inequality Index Report

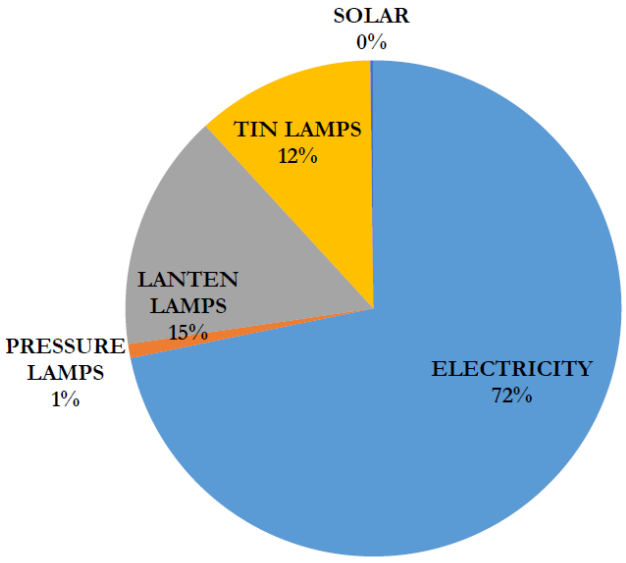


Figure 3-27: Energy Sources for Lighting

Source: KNBS; Kajiado Inequality Index Report

Rapid population growth and expected higher per capita income will lead to an increase in demand for power. By 2030, the expected demand for power is estimated to be 245MW and 118 MW in Ngong' and Ongata Rongai, respectively according to the SPC for NMR. To meet the load demand, enhancing of energy resources and adapting of energy-efficient measures need to be undertaken. As far as higher energy generation is concerned, it should be complemented with other renewable energy

sources like solar, biomass and waste energy (recycling). Both conventional and non-conventional energy sources such as geothermal, wind, hydro, solar, natural gas, biomass and coal should be utilised.

The existing power generation will not be sufficient to cater to the estimated expected future demand. To reduce this gap, generating stations at Ngong' with a 220/132 kV and Ongata Rongai with a 132/66 kV transmission lines have been proposed in the SPC for NMR.

Image 3-8: Ngong' Hills Wind Farm

Source: Field Survey, 2018

On-Going and Planned Projects

The Nairobi Ring Project will expand the transmission network around Nairobi to reduce technical losses and improve voltage conditions to cope with a growing demand on the local system. The project includes the following components: 45km 220kv double circuit line and associated substations at Ngong' that will increase transfer capacity to meet the city of Nairobi's rising demand and enhance power security by providing alternative electricity paths. At the same time Ngong' Power Station, will be expanded to 25.5MW capacity.

Development Needs

Investing in biogas energy and solar energy, which are economical and easily accessible, is imperative to allow for maximisation of benefits in the energy sector.

Challenges and Potentials

Table 3-21: Challenges and Potentials in Energy Infrastructure

Challenges	Potentials
• There are frequent power blackouts and surges; • Streets are poorly lit with few floodlights; • The wind turbines at the Ngong' Hills contribute a small amount of electricity to the main grid due to fluctuations in wind energy; and • Under-utilisation of other sources of energy like solar and biogas.	• Electricity connection to every household owing to the presence of wind farms, solar energy, and bio-waste.

Source: VisionRI

3.9.3 ICT Infrastructure

There is a presence of all mobile phone operators in Kenya including, Safaricom, Airtel, Telkom, and Equitel. Network reception in the Municipality is generally good. However, in Gichagi slums, the network is unstable due to the wind farm in Ngong' Hills.

Various television stations are broadcasted in the area. TV and radio signal reception in the Municipality is good. Internet use is evident in the numerous cybercafés and local internet service providers. The main internet service providers include Zuku, Access Kenya, Safaricom, Airtel, and Telkom.

Postal services offered in Municipality include Posta Kenya and EMS. However, the postal service is underutilised due to modern forms of communication that are fast and efficient.

Development Needs

Establishment of an ICT control centre that will integrate associated services across the NMR e.g., parking, rent, traffic, security, etc.

Challenges and Potentials

Table 3-22: Challenges and Potentials in ICT Infrastructure

Challenges	Potentials
• Under-utilisation of ICT infrastructure; • Inadequately trained government office personnel in the use of ICT; and • Disruption of fibre-optic cable and other ICT infrastructure during road maintenance and/or upgrading.	• High elevation points for installation of communication masts; and • Presence fibre-optics will enhance the use of ICT in both Government and private institutions thus enhancing service delivery.

Source: VisionRI

3.9.4 Solid Waste Management

The solid waste generated in the Municipality includes domestic, bio-medical, industrial hazardous and organic waste. There is a dumpsite at Ngong' that accommodates all the solid waste in the Municipality. However, it does not have a licensed solid waste treatment facility. All the waste generated in the Municipality is supposed to be taken to the main Dandora Dumpsite located in Nairobi City County. However, due to the distance, all the waste is dumped in the Ngong' dumpsite.

Image 3-9: Ngong' Dumpsite

Source: Field Survey 2018

Over time, this dumpsite has been an eyesore and an environmental hazard. It used to be a small heap of the waste but with time, the site expanded and became a threat to the neighbouring church compound and school. On a windy day, plastic papers from the dumpsite are strewn all over the area. Animals such as goats, dogs, and donkeys scavenge freely in the dumpsite. Scavengers or recyclers retrieve valuable waste products from the waste delivered to the dumpsite. These people carry out this activity in unhygienic conditions without personal protective gear and under the scorching sun. The valuable products include plastics, glass, metals clothes and organic waste for feeding the pigs. The plastics and glass collected are sold to brokers who sell to other recyclers companies.

Waste generation in the Municipality is expected to grow with population and economic growth. If not managed well, it can lead to both environmental and health problems. Some residents in Ongata Rongai indicated that they contract private waste handlers to dispose of solid waste to the dumpsite or they simply dispose of wastes in open spaces, riparian areas, and along roadsides.

Image 3-10: Waste along Gataka Road in Ongata Rongai

Source: Field Survey 2018

Table 3-23: Challenges and Potentials in Solid Waste Management

Challenges	Potential
• The waste delivered to the dumpsite is not sorted; • Dumpsite sited within incompatible land areas, i.e., commercial and residential areas; • There is no storage for the sorted products; • The road to the dumpsite is impassable during the rainy days; and • Uncertainty about the land ownership of the dumpsite.	• Available lands that can be acquired by the County Government to construct a landfill for the County; • Development of industries for waste re-use and recycling; • Construction of bio-centres especially in the informal settlements and institutions to mitigate human waste; and • Employment generation at waste collection and recycling centres.

Source: VisionRI

On-Going and Planned Projects

The County Government of Kajiado is planning to relocate the existing dumpsite to a 36 acres' piece of land secured at the Veterinary Farm in Ngong'. The dumpsite shall be able to accommodate all the waste within the Municipality and from Kajiado. Kshs 2 billion has been earmarked to fund the project and ensure that it is operational.

3.9.5 Wastewater Disposal System

Wastewater management in the Municipality is a major challenge since there are inadequate public sewerage systems. Used household dirty water is discharged on the roads, most commercial and high and middle-income residential areas use septic tanks and soak pits while low-income residential areas use pit latrines. In addition, pipes connected from various facilities to discharge wastewater are connected alongside pipes supplying clean water.

Ngong' Town had a sewer system which is no longer in operation. At present, the modes of wastewater/sewage disposal in the area is through pit latrines, septic tanks, and compost pits, amongst others.

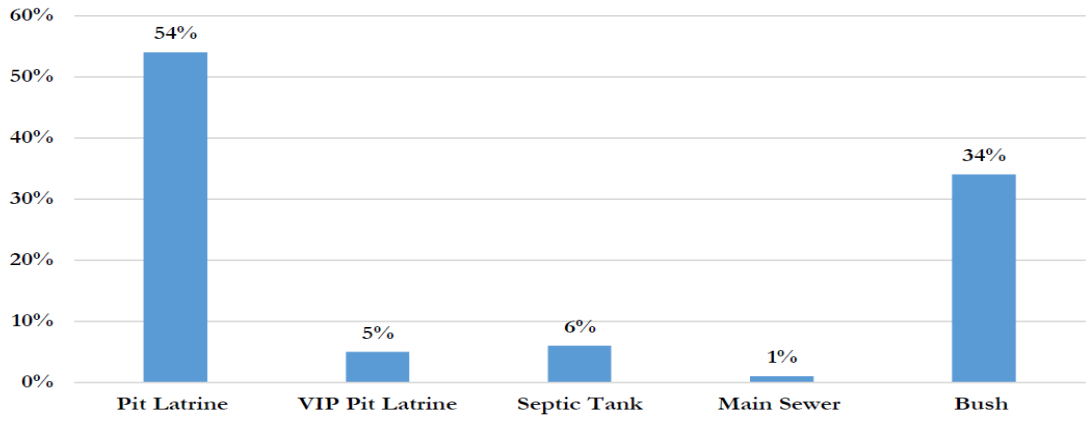


Figure 3-28: Mode of Human Waste Disposal in Kajiado North Sub-County

Source: KNBS, 2009 Census Report

There is a high reliance on pit latrines; coupled with the use of boreholes and wells for water supply, this results in high incidences of contamination of water sources. Mathare slums in Ngong' Town sit on land that was earlier set aside for sewage treatment (lagoon). The town, therefore, does not have a sewage treatment plant and raw sewage is released into open drains, which then drain to rivers. Waterborne diseases have been reported in towns that are downstream including Ongata Rongai.

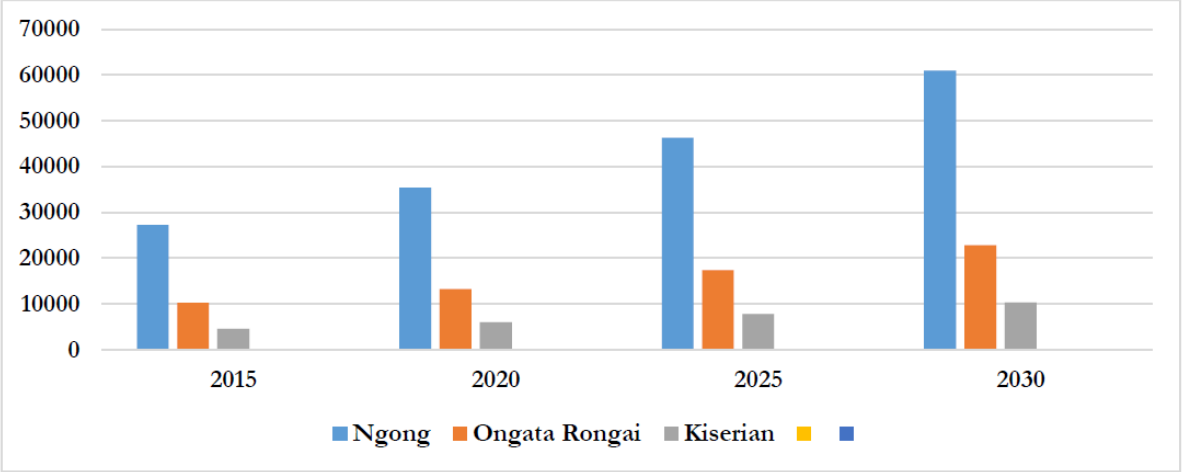


Figure 3-29: Sewerage Generation in the Municipality

Source: SPC for NMR, 2012

Image 3-11: An Open Drain Running through Mathare Slums, Ngong'

Source: Field Survey, 2018

A large quantity of sewage generated within the Municipality can be utilized for various other purposes after it is treated. Re-use of sewage or treated sewage will help conserve natural water resources and reduce raw water demand through recycling water for other purposes.

There is also no sewer system in Ongata Rongai. Septic tanks and soak pits are the most commonly used method of liquid waste disposal. In most cases, untreated sewage is released into the rivers such as Mbagathi River and rivers draining Kiserian dam. In addition, there is wastewater flowing in most drainage channels within the town. During rainy seasons, this water is washed into the Mbagathi River causing water pollution downstream.

A sewer system in Kiserian is currently being installed. Although the sewer line is underway, most of the residents will not benefit from it since it will cover less than % of the population.

Image 3-12: Wastewater Flowing to a River, Kiserian

Source: Field Survey 2018

Septic tanks and soak pits remain to be the most commonly used method of liquid waste disposal. In most cases, untreated sewage waste is released into the rivers and Kiserian dam.

Ongoing and Planned Projects

To mitigate liquid waste management challenges, the County Government has engaged an expert to prepare designs of a sewerage system that will serve Ngong' Town. The sewerage collection and conveyance system has been designed to carry municipal sewage is mainly composed of:

- Domestic wastewater (includes residential, commercial and institutional wastewater);
- Industrial wastewater; and
- Unauthorised but unavoidable groundwater infiltration and stormwater inflows.

There are also plans to put up a sewer treatment plant in Ole Kasasi and Kiserian.

3.9.6 Storm Drainage

There is an existing common drainage system which drains the Municipality. However, the culverts have been blocked by solid waste obstructing water flow.

Areas that are poorly drained and are prone to flooding are Ngong' Town, Mathare informal settlement area and Kiserian Town. Due to deforestation at Ngong' Hills' forest and encroachment of developments on riparian reserves, the town is prone to flooding.

Image 3-13: Polluted Drain in Gataka, Ongata Rongai

Source: Field Survey 2018

Challenges and Potentials

Table 3-24: Challenges and potentials in wastewater management

Challenges	Potentials
• Expansion of the wastewater disposal system is limited due to inadequate funds.	• Construction of more treatment plants/systems through budgetary allocation to manage; and promote re-use of wastewater.

Source: VisionRI

3.10 Social Infrastructure

3.10.1 Housing

The high rate of urbanisation and escalation of housing costs and prices have made the provision of housing, infrastructure, and community facilities one of the daunting challenges in socio-economic development. The housing sector is a critical component of any development agenda because it consumes the highest amount of space within urban areas. For this reason, most of the challenges in the urban areas revolve around the sector. There are a number of formal documents that acknowledge the inadequacy of decent housing for households and other related challenges. Kenya draws its housing policy from these formal documents in the form of statutes, written policy, International agreements, and policies specific to the sector.

SDG number 11 aims to "make cities and human settlements inclusive, safe, resilient and sustainable". This goal is informed by the fact that at least 50% of the world's population in 2015 lived in urban settlements and that urbanisation is growing in many developing countries. Target 1 of Goal 11 urges Governments to "ensure for all adequate, safe and affordable housing and basic services and upgrade slums."

Article 43 (1) b of Kenya's Constitution provides that, every Kenyan has a "…right to accessible and adequate housing and reasonable standards of sanitation". Supporting the Constitution's call for adequate housing is Vision 2030, which is Kenya's long-term plan for economic and social transformation. Specifically, Vision 2030 aims for adequate and decent housing for all Kenyans and justifies why housing policy and construction would be an important part of providing employment and meeting the country's goals for development.

Preceding the Constitution of Kenya and Vision 2030 is the National Housing Policy (NHP) contained in Sessional Paper No. 3 of 2004. The NHP established the goals that were reflected in both Vision 2030 and the Constitution by reiterating the need for decent and affordable housing for all Kenyans. The primary purpose of the NHP is to achieve a state where all Kenyan households live in "decent and affordable housing". Vision 2030 also states that Kenya's housing sector could be a growth driver in the absorption of labour in the quest to meet the shortage of 150,000 housing units annually. Thus, housing is important both for social purposes and as a mechanism for industrial growth and employment provision.

The Kenyan Government has drawn the Big Four Agenda, one of them being affordable housing. Under this agenda, the President intends to have over 500,000 Kenyans owning their own homes by 2022. According to the President, this will be done by reducing the cost of mortgages, raising low-cost funds in both private and public for investment in large-scale house construction and cutting the cost of construction by use of innovative ways and materials. The President further promised to continue issuing more title deeds adding that this plan will ensure that more people are employed.

The World Bank Report (World Bank Group, 2018) indicated that the main cause of housing deficit in Kenya is the high rate of rural-urban migration and population growth versus few housing units that are built annually. "The 50,000 housing units built in Kenya annually are far below the required amount of 250,000 units annually to cope with the high population growth in urban centres," it noted. The cause of this low turnover of new housing units, according to the report, is affordability, lack of finances for developers, prohibitive land rates, laws that make foreign investors shy away and lack of prioritisation by the Government in ensuring that its citizens live in comfortable houses.

Housing Situation

Ngong' has been termed as the dormitory town of Nairobi due to several factors. Firstly, the proximity to Kenya's Capital City makes it ideal for people to reside in Ngong' and work in Nairobi. Secondly,

the construction of the Southern Bypass Road has changed the landscape of the Municipality with increased access from the capital city making more people live in the area.

The housing situation in the Municipality is dominated by owner-occupiers especially in Nkaimurunya, Kiserian, Ngong' and Oloolua Wards which are mainly characterised by bungalows and apartments for the middle class. However, in the rural parts of the Municipality such as in Keekonyokie, Olkeri, and most of Ewuaso Oo Nkidong'i Wards, majority of the houses are mainly low cost. The housing typology in the area is usually affected by lack of basic infrastructures such as the sewerage system and water.

Building Materials and Construction Sub-sector

Housing condition is a key social welfare indicator. Materials used in the construction of the floor, roof and walls of a dwelling unit are also indicative of the extent to which they protect occupants from the elements and other environmental hazards. The conditions have implications for the provision of other services such as connections to water supply, electricity, and waste disposal. Low provision of these essential services leads to the higher incidence of diseases, fewer opportunities for business services, and lack of a conducive environment for learning.

Housing standards are influenced by several factors such as the availability of materials and technology, costs, weather, and cultural conditions.

The construction industry drives other sub-sectors such as warehouse businesses, power supply, and financial services, amongst others. The Municipality has ample supply of quarry stones as the main building materials. Timber is the most expensive of the required building materials as it is ferried from other counties such as Meru, Nyeri, and Kisii. Some of the hardwood timber is also imported from DRC Congo. Sand is ferried from neighbouring Kajiado Central Sub- County. The quality of sand from Kajiado Central is considered as good quality as that from neighbouring Machakos County, which supplies greater amounts. Quarry stone mining was observed to pose serious environmental challenges particularly with regard to the presence of stagnant water in the open borrow pits that may cause mosquito infestation. The borrow pits and open quarry sites may cause accidents for livestock, wild animals and humans, and negatively affect the scenic beauty of the Municipality.

Image 3-14: Women Working in a Quarry in Kiserian

Source: Field Survey 2018

Table 3-25: Sources of Selected Building Materials in Municipality

Material	Source	Remarks
Quarry Stones	Mainly Olkeri and Oloolua Wards	Large amounts in the Sub-County
Sand	Kajiado and Machakos	Large deposits in the Sub-County

Material	Source	Remarks
Timber	Western and Central Kenya	Expensive some imported
Steel	Nairobi	30 – 40 km away
Galvanised Iron Sheet	Local hardware shops	Locally available

Source: Focus Group Discussions and Key Informant Interviews, 2015

Types of Housing

The housing typology varies in the Municipality with rural areas having pockets of traditional Maasai housing units known as manyatta especially in Olkeri, Oloolua, Keekonyokie, and Ewuaso Oo Nkidong'i Wards. However, the major parts of the Municipality are characterised by modern houses. The old colonial houses are still in existence and most noticeable in Ngong' Hills. In Gichagi and Mathare Slums, the main types of houses are the iron-sheet houses.

- **High-income housing:** High-income housing is characterised by low-density houses and the housing typology is comprised of maisonettes and bungalows, which are attractive and aesthetically appealing. Most plot sizes are 0.2 ha and 0.1 ha. The high-income housing is mainly found at Acacia, Nalepo, Kerarapon, Rimpa, and Matasia.

- **Middle-income housing:** Middle-income housing is mainly found at the CBD of the three towns. They comprise of high-rise apartments. Most houses have not adhered to building by-laws due to lack of enforcement of building standards. This is complicated by the fact that the land is still freehold.

- **Low-income housing:** Low-income housing is mainly found at the informal settlements at Kware, Mathare, Embulbul, and Gichagi. The plot sizes are 0.045 ha, and the housing typology is characterised by iron sheets.

Type of Housing by Roofing and Walling Materials

The roofing materials used varies across the Municipality. There is a direct inference between the quality of building materials and income levels of the households. In low-income areas with low-income workers, the main roofing material was observed to be poor-gauge corrugated iron sheets. In both middle and high-income areas, the main roofing materials are high-quality corrugated iron sheets, concrete and clay tiles. Corrugated iron sheet remains to be the main roofing material followed by concrete.

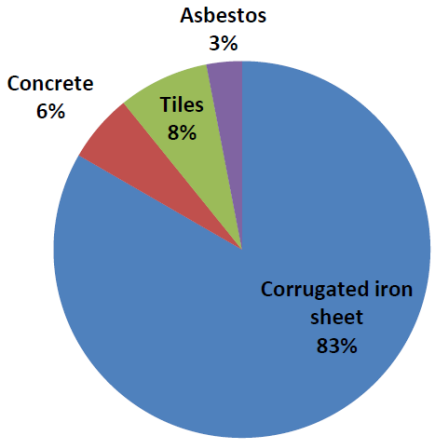


Figure 3-30: Types of Roofing Materials Used

Source: KNBS; Kajiado Inequality Index Report

- **Wall material:** The main material for wall construction in the Municipality is stone with 52.4%, followed by corrugated iron sheets stones with 35.3%, and brick and wood at 4.8% and 1.6%, respectively.

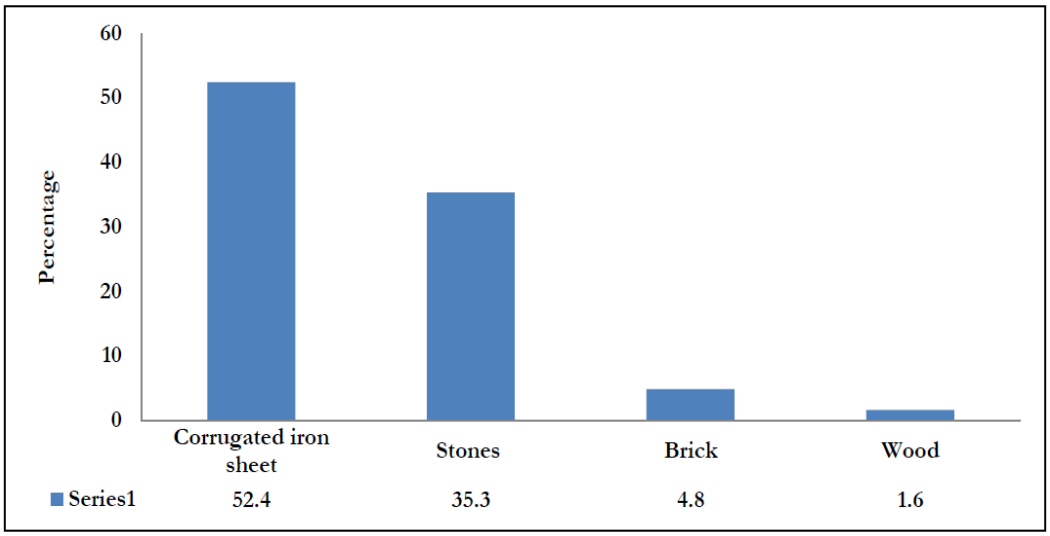


Figure 3-31: Types of Wall Materials

Source: KNBS; Kajiado Inequality Index Report

In low-income areas, walls are mainly made of timber and corrugated iron sheets. In the rest of the Municipality, walls are made of quarry stone. A few houses are walled with blocks made of sand and cement. There are a few low-income housing units with walls made wholly of timber.

- **Housing Tenure:** Majority of the people, especially at the outskirts of the CBD live in houses they own. The main residential areas are found in Oloolua, Kibiko, Kiserian, Rimpa, Nkoroi Upper Matasia and the CBD where there are many tenants. Those who own the houses and tenants alike mostly commute to Nairobi to work or are in business in town.

- **Housing Stock and Projections:** The housing stock derived from the 2009 Population and Housing Census Report Volume 2 page 304 indicates that about 47% of the households in Kajiado North Sub-County (which cover the Municipality) had permanent houses. The projections into 2030 are shown in Table 3-29.

Table 3-26: Housing Stock and Projections into 2030

Ward	2009	2016	2018	2021	2030
Oloolua	3,172	4,585	4,911	5,411	6,108
Ngong'	1,700	8,555	9,163	10,096	11,397
Ongata Rongai	4,199	11,323	12,128	13,363	15,084
Nkaimurunya	5,208	14,043	15,041	16,573	18,707
Total	21,835	38,506	41,243	45,443	51,296

Source: 2009 Population and Housing Census Report Vol. II

The table above shows that majority of the housing units are in Nkaimurunya followed by Ongata Rongai, Ngong' and Oloolua in that succession. The housing stock as of 2009 represents a 53% deficit given the population levels at that time. Subsequent projections are based on the total required housing units given the projected population and number of households.

If the 53% deficit in housing production persists into the end of the planning period, that deficit is estimated to reach be about 29,461 units. This calls for watertight plans to produce housing units in the Municipality to the tune of about 2,455 new units per year from 2018 to 2030.

Challenges and Potentials

Table 3-27: Challenges and Potentials in the Housing Sector

Challenges	Potential
• Construction of houses does not conform to the set standards of housing, i.e., plot sizes, setbacks, coverage and plot ratios; • Rapid construction of houses has outstripped provision of social amenities; • Designs do not incorporate the needs of the physically challenged; • Construction of houses is relatively expensive due to the nature of the black cotton soils; • There is an uncontrolled and haphazard housing development; and • Poorly planned housing layout designs with lack of neighbourhood cohesion.	• Abundant supplies of sand and construction stones which makes it relatively cheap to construct good and quality houses; and • Availability of land for the development of adequate housing units.

Source: VisionRI

3.10.2 Education

The thrust of the education policy in Kenya is based on the Constitution of Kenya 2010, which promises access to education for all. This is in line with SDG to ensure that by 2030 all girls and boys acquire free, equitable and quality primary and secondary education.

Kenya has a national adult literacy rate of 61.5% and a numeracy rate of 64.5%, indicating that more people are knowledgeable in computation than reading. Urban areas have higher rates than rural areas. For example, Nairobi, the capital city, has an adult literacy rate of 87.1% while North Eastern Province had an adult literacy of 9.1%.

According to the Exploring Kajiado Inequality Report, 11.2 % per cent of the population in Ngong' have no education, while 39.8 and 49% have primary and secondary education, respectively.

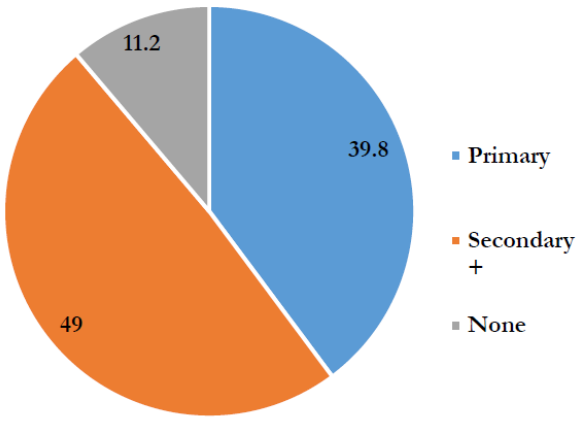


Figure 3-32: Education Levels in the Municipality

Source: KNBS; Kajiado Inequality Index Report

The regional disparities confirm the trend where areas that are economically well off have a head start in terms of academic achievements compared to poor areas.

Early Childhood Development Education (ECDE) Facilities

Quality education is an education that works for every child and enables all children to achieve their full potential. UNICEF's manual for child-friendly schools emphasises on the design, construction, and maintenance of child-friendly schools as safe, welcoming environments in which children can learn, emphasising links with the community, the influence of pedagogic considerations, cost-effectiveness and sustainability (United Nation Children's Fund (UNICEF), 2009).

The safety and environment of an ECDE facility is important because young children are vulnerable to many risks; the location of the institution and distance from their homes is a key determinant of access. The distance between schools and home affects the advancement of education by young children because parents are always afraid to let the young ones especially girls walk alone, and they may be kept out of school unless there was someone to accompany them. According to the Physical Planning Handbook, the recommended distance from home to ECDE facility is 300-500 meters and 1 ECDE centre per 2500 people.

The Municipality has several ECDE facilities mainly in the three towns, (Ngong', Kiserian, and Ongata Rongai). There are 35 public ECDE centres in Ngong' area. About 87% of the ECDE teachers at Ngong' and Ongata Rongai are trained. Using the population projection, Ngong' area will require 53 ECDE institutions by 2030 representing a deficit of 18 centres, which have to be built in the next 10 years.

In Ongata Rongai, there are 38 ECDE centres. Using the population projection, the area will require 82 ECDE centres.

Primary School Facilities

Access to education is a key factor in the quality of the service. The distance a child covers from home to school has a direct relation with the enrolment, performance, retention, and therefore transition from primary to secondary school. The Physical Planning Handbook guides that primary school should serve a catchment of the population of 4000 and should be between 500 m-2 km as shown in Table 3-31 below. While the handbook recommends that a single school occupy at least 3.9 ha, it encourages the schools to build storied buildings to economise on space.

Table 3-28: Planning Standards for Allocating a Primary School

Catchment population	No. of primary school	Area (ha)	Walking distance
4000	1	3.9	500m-2km

Source: Physical Planning Handbook

There are 14 public primary schools in the Municipality with an enrolment of 16,263 pupils. The number of enrolled girls is slightly higher than boys.

With the government's Free Primary Education Programme, the school's population and enrolment rates have increased. High population in the public schools has overstretched the existing infrastructure which compromises the quality of education. The class size is approximately 50 pupils per class per teacher, which is strenuous to the teacher. This situation has caused the proliferation of private schools to fill the gap.

Most of these private schools are located within walking distance of approximately 300 m - 2 km from homes while some have organised transport to and from school. However, situation analysis indicated

that some of these private schools lack major facilities such as playgrounds, therefore, denying the children their right to play.

Table 3-29: List of Primary Schools in the Municipality

S. No.	School	Students		Grand Total
		Boys	Girls	
1	Arap Moi Primary	893	913	1806
2	Embulbul Primary	553	542	1095
3	Enoomatasian Primary	354	353	707
4	Kerarapon Primary	183	143	326
5	Kiserian Primary	918	797	1715
6	Nakeel Primary	893	988	1881
7	Nalepo Primary	128	125	253
8	Ngong' Township	783	907	1690
9	Nkaimurunya Primary	525	485	1010
10	Olekasasi Primary	473	590	1063
11	Olkeri Primary	350	278	628
12	Ongata Ronkai Primary	918	887	1805
13	Oloolua Primary	940	957	1897
14	Upper Matasia Primary	208	179	387
	Total	8119	8144	16263

Source: KNBS; Kajiado Inequality Index Report

According to the map below showing the distribution of primary schools in the Municipality, Ol Keri sub-location has a deficit in the number of public schools.

Projected Demand and Supply of Primary schools

There are 110 private primary schools, which are adequate to serve the population. This is in comparison to the 14 public schools in the area. The public primary schools offer free primary education while private schools are at a premium. This, therefore, means that education for most residents of the Municipality is at a premium.

With the population of 294,734 in 2018, the area requires 74 public primary schools (1:4000 people) meaning that there is a deficit of 60 institutions. However, by 2030, 140 more schools will be required, representing a deficit of 126 schools, which should be built by the end of the planning period.

Table 3-30: Primary School Demand for the Municipality

Parameter	2009	2018	2023	2030
Population	165,462	294,734	406,190	539,850
Current Schools	14	14	14	14
Schools required	42	74	102	140

Source: VisionRI

With the recommendation of the Physical Planning Handbook of a single school to occupy at least 3.9 ha, this Plan proposes the new institutions to take advantage of the vertical space and build storied buildings.

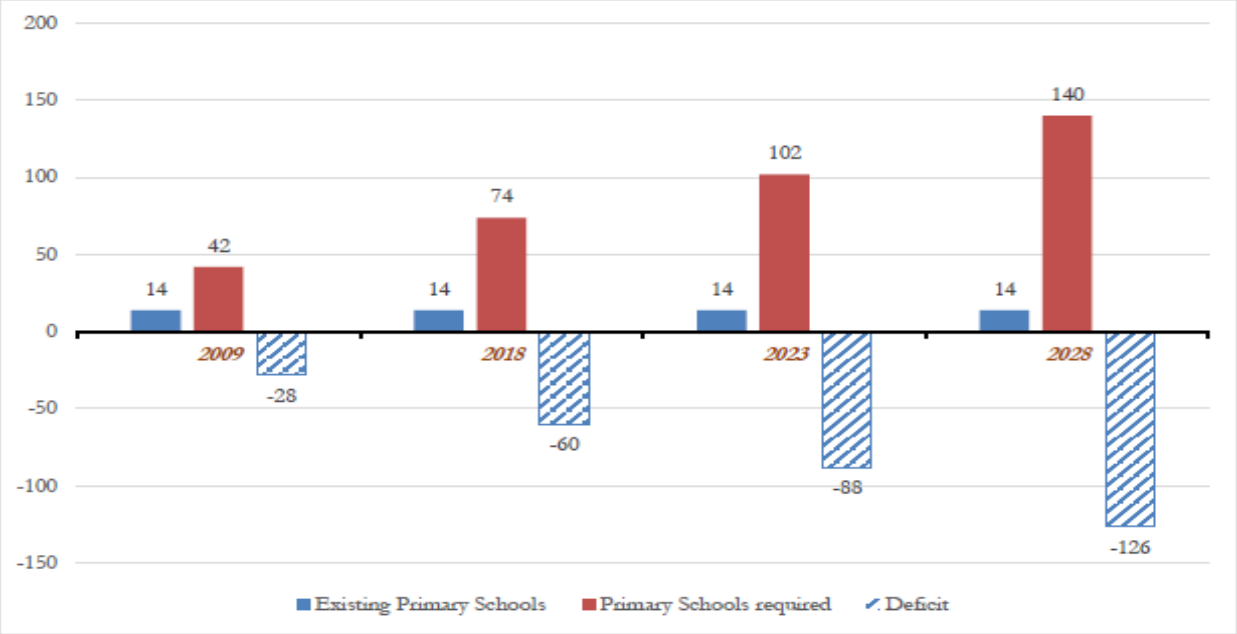


Figure 3-33: Existing Primary Schools and Demand in the Municipality

Source: VisionRI

Public Secondary Schools

Though primary education is important for individual welfare, it is nevertheless an insufficient condition for national economic growth and poverty reduction. The Government has put emphasis on the transition from primary to secondary education.

Ngong' Municipality has 16 public secondary schools with an enrolment of 5767 students. The transition rate of girls to secondary schools is, however, low with 39% being girls and 61% being boys.

While the number of public secondary schools is important, their location determines access to education. According to the Physical Planning Handbook, a secondary school should serve a population of 8000 within a radius of 3 km. From the map below showing the distribution of public secondary schools, and the buffer of 3 km as per the Physical Planning Handbook, and Table 3-32 below, there is a deficit in various parts of Ngong' especially, in Keekonyokie area.

Table 3-31: List of Secondary Schools within the Municipality

School	Total		Grand Total
	Boys	Girls	
Embulbul Mixed Sec	128	123	251
Empakasi Mixed Sec	67	79	146
Enoomatasian Girls Sec	0	503	503
Enoomatasian Mixed	212	206	418
Kerarapon Mixed Sec	83	89	172
Kiserian Mixed Sec	265	188	453
Nakeel Boys High	597	0	597

School	Total		Grand Total
	Boys	Girls	
Ngong' Township Mixed	116	126	242
Nkaimurunya Mixed Sec	220	159	379
Nkoroi Mixed Sec	111	114	225
Olekasasi Mixed Day	198	173	371
Olkeri Mixed Sec	133	112	245
Oloolaiser High	841	0	841
Oloolua Secondary	213	143	356
Presbyterian Church of East Africa (PCEA) Ngong' Hills Sec	217	135	352
PCEA Upper Matasia Sec	116	100	216
Total	3517	2250	5767

Source: Kajiado Inequality Index Report

Table 3-32: Planning Standards for Allocating a Secondary School

Catchment Population	No. of Primary School	No of Streams	Area (Ha)	Walking Distance
8000	1	1 2 3	3.4 3.5 4.5	500 m – 3 km

Source: Physical Planning Handbook

With the current estimated population of 294,734, the area requires 36 public secondary schools (1: 8000 people) therefore there is a deficit of 20 institutions. However, by 2030 the demand for secondary schools will reach 70 schools showing a deficit of 54 schools. There is thus a need for the construction of more secondary schools.

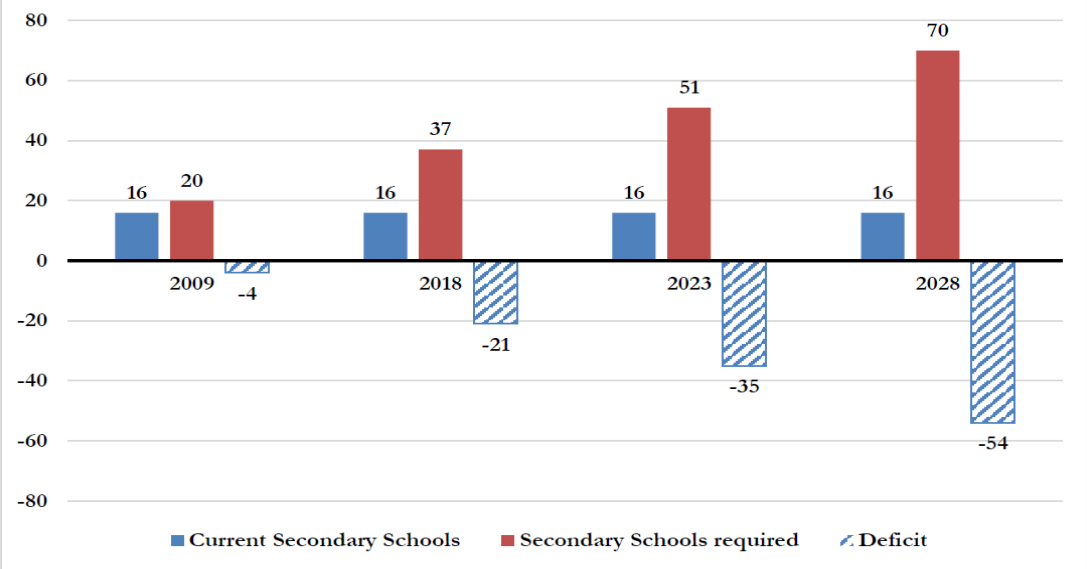
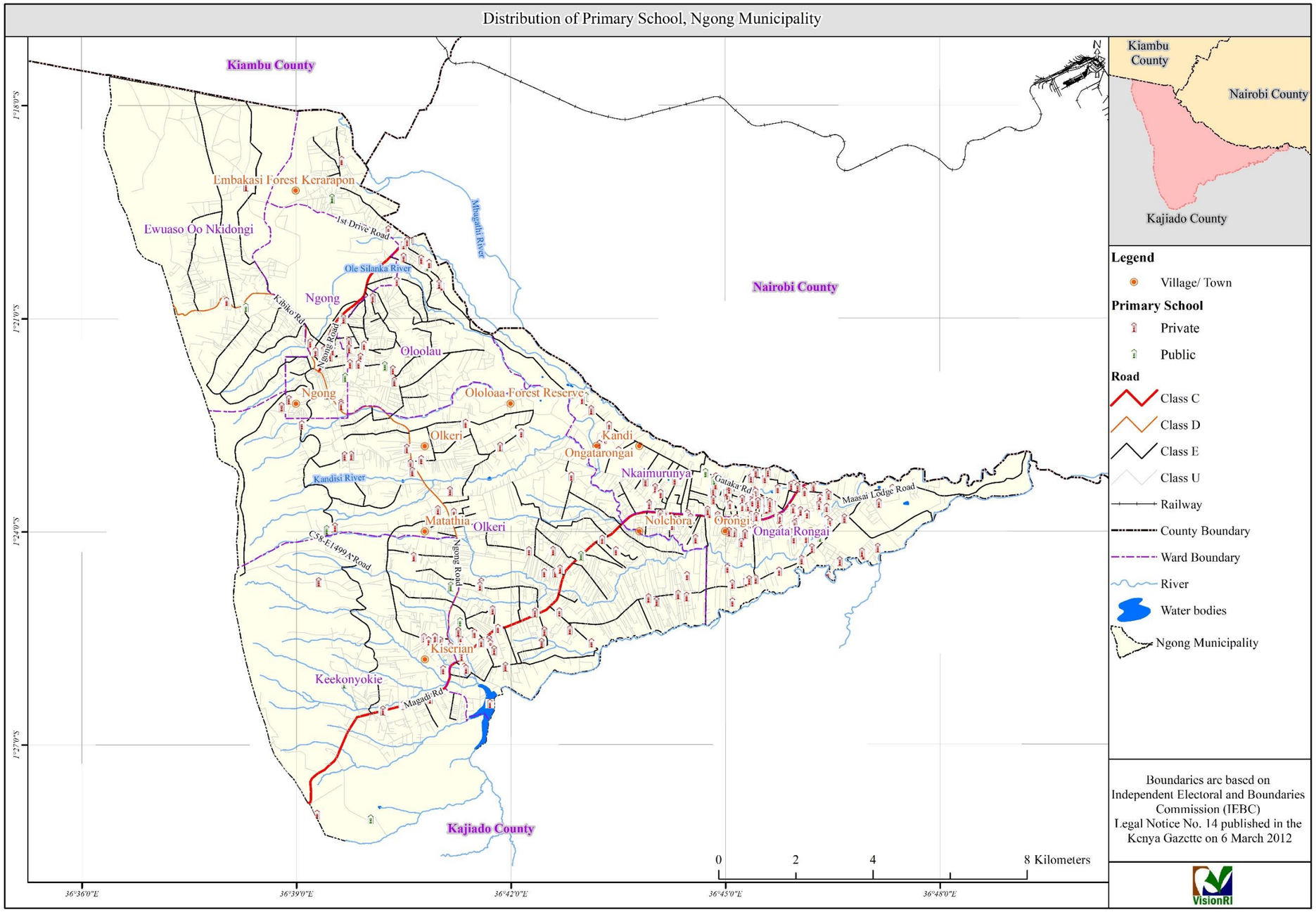


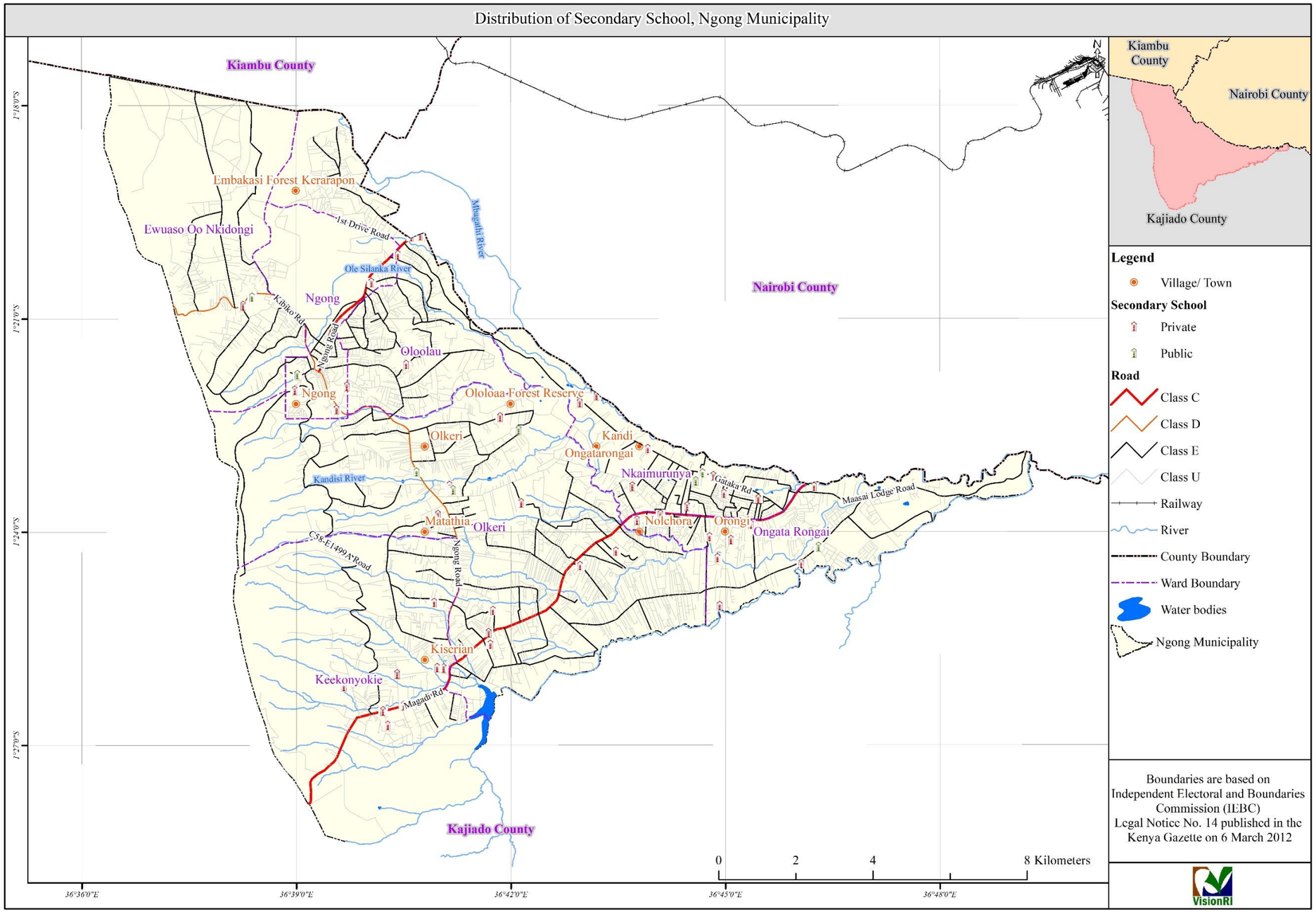
Figure 3-34: Existing Secondary Schools and Demand in the Municipality

Source: VisionRI



Map 3-15: Primary Schools within the Municipality

Source: VisionRI Field Survey



Map 3-16: Distribution of Secondary Schools

Source: VisionRI Field Survey

Adult Education Centres

The planning area has several Adult Education Centres. Ngong' Town has four adult learning centres and a total enrolment of 248 learners enrolled. The distribution of the centres definitely makes it difficult for learners to access the service. This is especially the case for Oloolua Ward that does not have any adult learning centres.

In order to improve access to adult education centres, the distance covered to reach them can be reduced by setting them up in all existing public primary schools. This means that the centres would be increased from the current four to about 38 by 2030. This accompanied with sensitisation on the importance of adult learning should improve the service sufficiently.

Ongata Rongai, in turn, has five adult learning centres and a total enrolment of 310 learners enrolled. The distribution of the centres also makes it difficult for learners to access the service. This is especially the case for Keekonyokie Ward that is expansive and has only three adult learning centres.

Table 3-33: Adult Learning Centres and Enrolment by Sex, Ongata Rongai

Ward/Zone	Centres	Enrolment			Teachers
		Male	Female	Total	
Kiserian	3	55	48	103	3
Nkaimurunya	4	136	149	285	5
Ongata Rongai	1	7	18	25	1
Total	8	198	215	413	9

Source: County Government of Kajiado Directorate of Adult and Continuing Education Office

The uneven distribution of adult education centres poses a hindrance to adults especially women who would want to acquire basic knowledge. This is because women have responsibilities, which range from childbearing to management of their family home/farms, which leave them with little time to walk for long distances to access institutions outside the Municipality. On the other hand, adult learning can bring the much-needed solution for basic education in poor neighbourhoods such as informal settlements where literacy levels are low.

This Plan proposes the establishment of adult education centres in each ward and mainly within the informal settlements within the Municipality. There should also be a sustained campaign on the importance of adult learning.

Universities

The Municipality has only one chartered private university in Ongata Rongai namely; African Nazarene. There is, however, no public university. During the stakeholder engagement forums, the community did not propose for a university in the area.

Special needs schools

The Municipality has few schools for physically challenged persons like Kibiko School for the Handicapped. Most public primary and secondary schools lack the necessary facilities and equipment for special needs education. However, Oloolaiser Boys High School in Ngong' and Fanaka Junior Integrated School in Rimpa has incorporated the special needs unit and offer education for deaf children.

Technical and Vocational Education Training Institutes (TVETS)

Kenya's focus under Technical and Vocational Education and Training is on providing skills that meet the needs of the workplace as well as self-employment. There are TVETs in the Sub-County offering certificate and diploma courses in technical skills. The goal of TVET is to provide relevant and adequate skills and competencies in strategic disciplines for spurring industrial and economic development.

The Kenya TVET Policy, which has a target of gross enrolment rate of 30% by the year 2030, emphasise enhancing access to tertiary education. This target might not be achieved because the Municipality has only two TVET institute, i.e., Olekasasi and Oloolua TVETs. Evidently, many young people who clear their secondary education and are unable to join colleges and universities end up in the informal sector such as motorcycle riders (boda-boda).

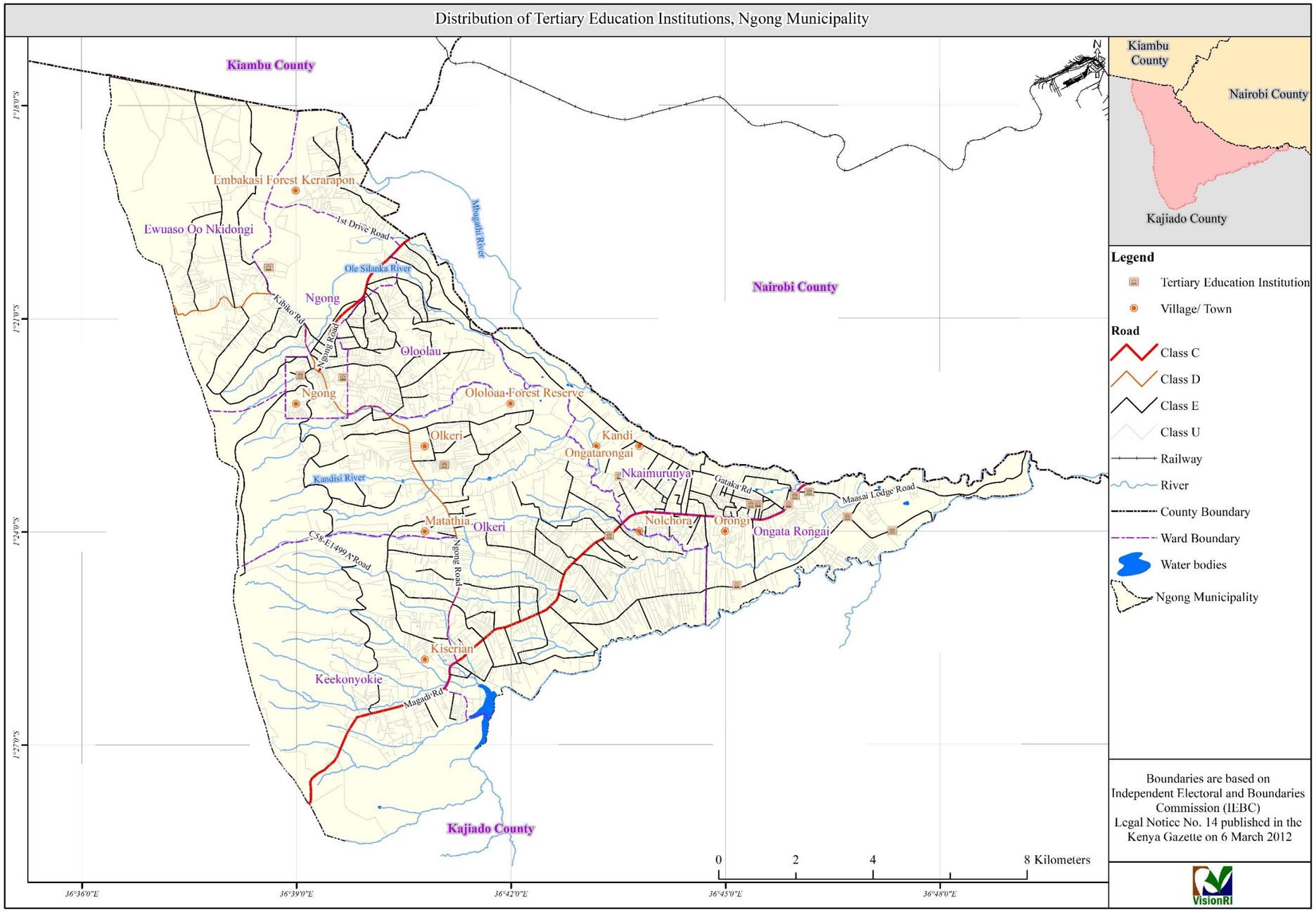
Though this sector has created employment, it is male-dominated and young women are often disadvantaged. In worst cases, due to their lack of competitiveness in the job market for lack of skill, youths engage in criminal activities which affects security and therefore economic growth of the Municipality.

This Plan proposes for the development of TVETs in the Municipality as a transition platform for students who did not qualify to join higher education learning institutions. This will benefit young people especially women who are in most cases disadvantaged by available options in the jua kali sector such as boda-boda and casual labour and construction sites. TVETs will enhance the development of both technical and entrepreneurial skills.

Table 3-34: Vocational Training Institute within the Municipality

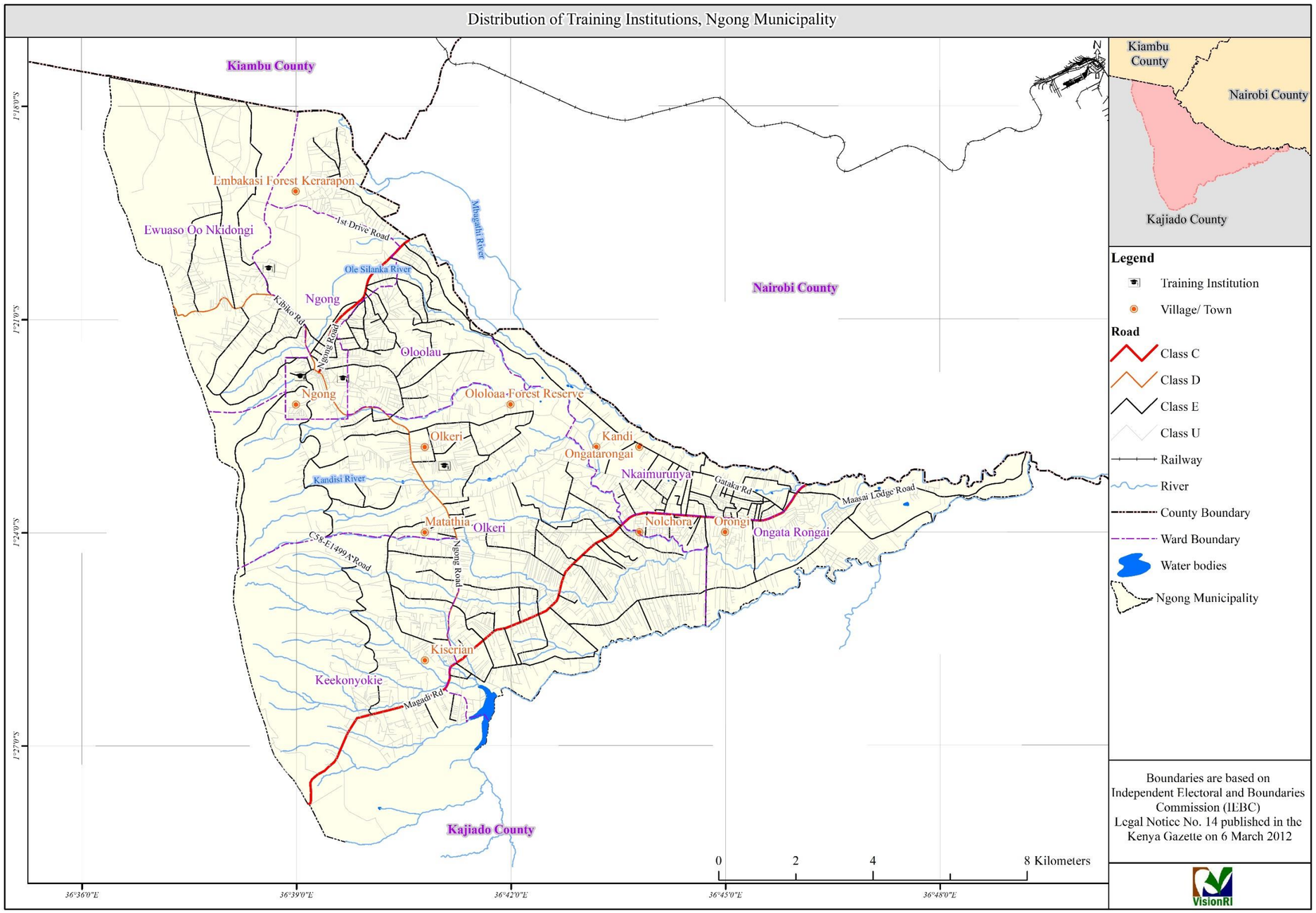
Name	Ward	Enrolment		Total	Staff		Dorms	Classes	ICT Lab	Remarks
		M	F		M	F				
Olekasasi Vocational Training Institute	Ongata Rongai	41	39	80	4	2	0	5	1	Operational
Oloolua Vocational Training Institute	Oloolua							2	0	Not operational

Source: County Government of Kajiado Education Office



Map 3-17: Distribution of Tertiary Education Institutions

Source: VisionRI Field Survey



Map 3-18: Distribution of Training Institutions

Source: VisionRI Field Survey

Challenges and Potentials

Table 3-35: Challenges and Potentials in the Education Sector

Challenges	Potentials
• Inadequate water and poor sanitary facilities in schools; • Some schools are inaccessible because of the poor condition of roads; • There are inadequate public schools in the area; • Public schools have limited classroom; • High ratio of pupils to teachers in public schools; • A lot of private schools have inadequate or no playgrounds; and • Poor land administration practice leading to failure to set aside land for school facilities.	• Population structure, which includes a rising number of school-age children; and • Readily available land, which can be acquired by the Government for the construction of more schools.

Source: VisionRI

3.10.3 Health

The Right to Health is a fundamental human right guaranteed in the Constitution of Kenya. Article 43 (1) (a) of the Constitution provides that every person has the right to the highest attainable standard of health, which includes the right to health care services, including reproductive health care.

The Kenya Health Policy, 2014 - 2030 sets out standards of access to health care. Key to these standards is the requirement for a hierarchy of health facilities of Levels 2, 3 and 4 in a Sub-County in order to facilitate referrals. It is also the practice around the country for Sub-counties to have at least one public hospital of Level 4 status to manage referrals from dispensaries and health centres. The World Health Organisation (WHO), on the other hand, in its World Health Report 2010 set out the standard of 34.5 skilled health professionals per 10,000 people. These national and international standards of practice require a combination of staffing and facility development.

There are different types of health care services in the Municipality just as there are throughout the country. This includes public providers, private not-for-profit organisations (including faith-based and mission hospitals, local and international NGOs) and private for-profit health care providers. These are spatially distributed in different towns within the Municipality in regard to their level of classification as per the first schedule of the Kenya Health Act No.21 of 2017.

Access to Health

Distance to the health facility is a key determinant of access to the services. The Kenya Health Policy, 2014 - 2030 sets out standards of access to health care. The Policy proposes that residents travel no more than 5 kilometres to a health facility. The data collected on the location of the health facilities in the Municipality is presented in a map below.

According to the map, there are three public health facilities in the Municipality, i.e., Ongata Rongai Health Centre, Ngong' Health Centre and Ngong' Sub-County Health Centre. According to The Kenya Health Policy, 2014 - 2030, the facilities are inadequate especially in the southern parts of Keekonyokie and Olkeri. The deficiency has acted as a catalyst for the proliferation of private medical clinics in the area most of them unregistered and not meeting the standards. This is evidenced by the numerous private health facilities, which are main service providers in the area.

This Plan proposes additional public health facility to be located in the Keekonyokie in Kiserian.

Health Facilities

As shown in the descriptive map above, the insufficient number of public health facilities in the area has acted as a catalyst for the proliferation of private service providers. Figure 3-412 below shows that the Municipality has 3 public health facilities and 45 private registered facilities, with many more unregistered.

Compared against the WHO (World Health Report, 2010) standard of 34.5 skilled health professionals per 10,000 people, the Municipality fares badly; the three public facilities are not adequate to meet the required 276 health professionals. The distribution of the health facilities is also poor as the maximum travel distance of 5 km is not met.

Major urban areas like Kiserian and Ongata Rongai demand certain basic health facilities. Each of the two towns has a population of more than 5,000 people and thus qualify as an urban centre as per the Physical Planning Handbook. As such, each should have a dispensary, health centre and hospital. Figure 3-41 shows the coverage and distribution of health facilities in Ngong' Municipality.

However, most of the health facilities are privately owned, hence there is a need to provide more public health facilities, to ensure better coverage, affordability, and access.

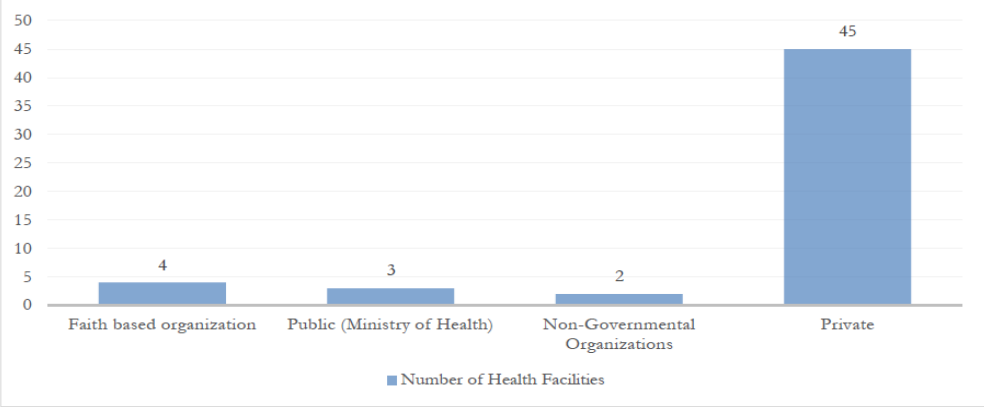


Figure 3-35: Ownership and Management of Health facilities in the Municipality

Source: Kajiado Inequality Index Report

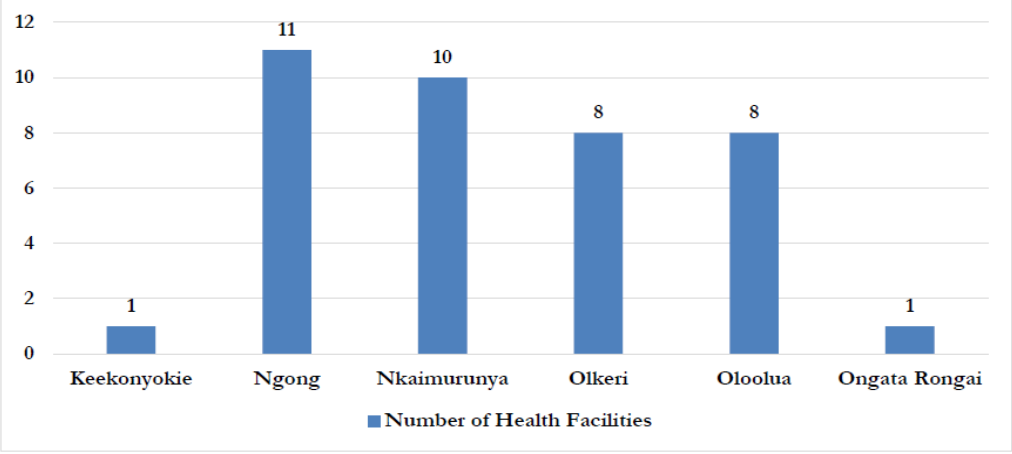


Figure 3-36: Distribution of Health Facilities

Source: Kajiado Inequality Index Report

Planning standards prescribe one health centre and one district hospital for every 20,000 and 50,000 people, respectively. Table 3-39 shows the expected growth rates and hospital demand vis-à-vis the current number of government facilities.

Table 3-36: Demand and deficit of Health Centres in Municipality

Particulars	2009	2018	2023	2030
Population	165,462	294,734	406,190	559,789
Current Health Centres	2	2	2	2
Health Centres required	8	15	20	28
Health Centres deficit	-6	-13	-18	-26
Current District/Sub district Hospitals	1	1	1	1
District/Sub district Hospitals required	3	6	8	11
District/Sub district Hospitals deficit	-2	-5	-7	-10

Source: VisionRI

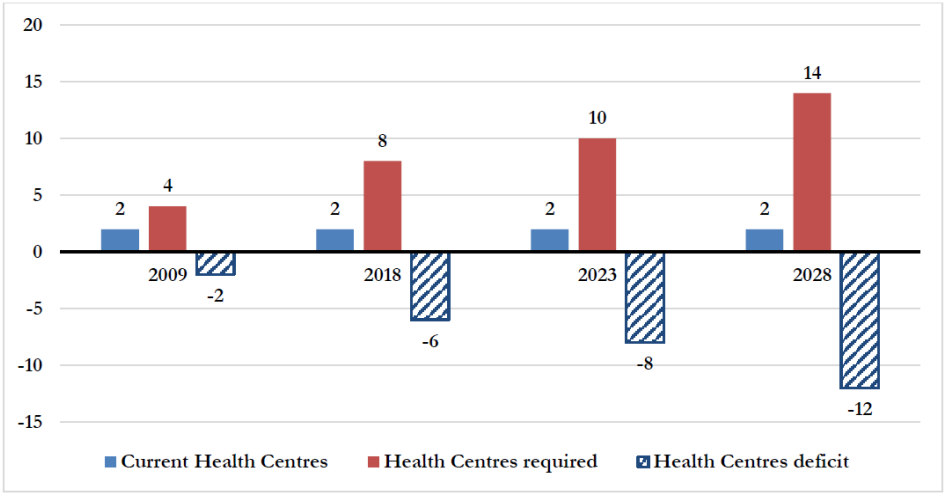


Figure 3-37: Health Centre Demand in Planning Area

Source: VisionRI

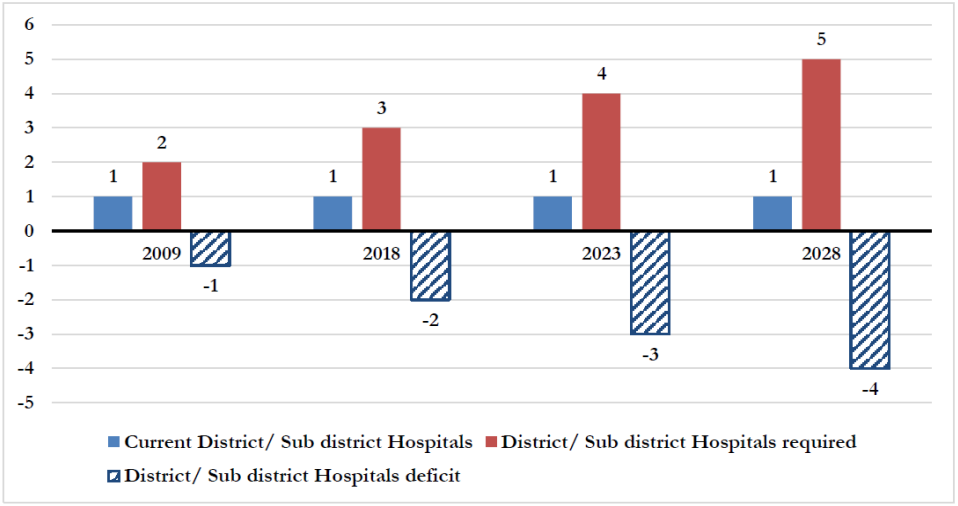
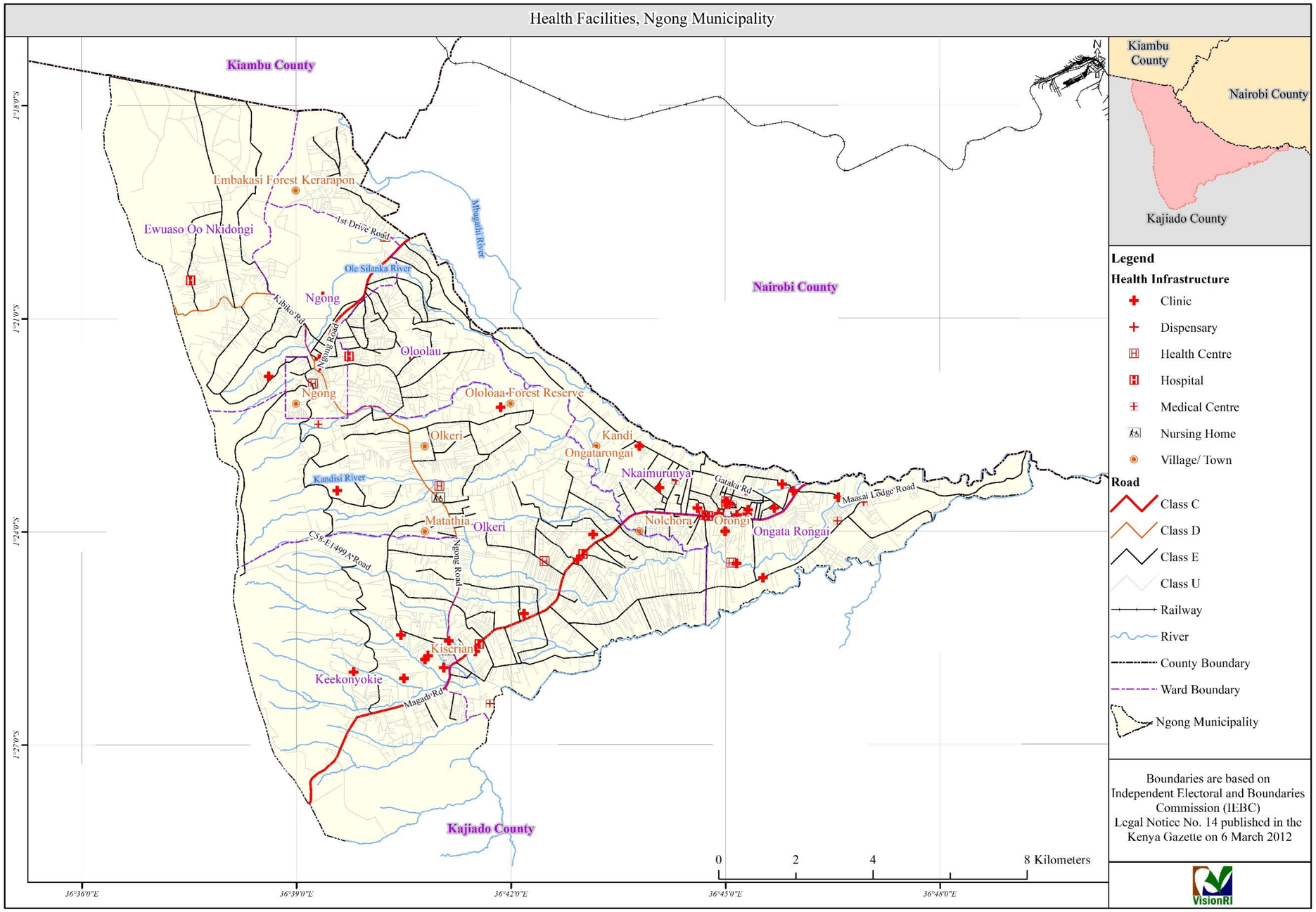


Figure 3-38: Sub District Hospitals Demand in Planning Area

Source: VisionRI



Map 3-19: Coverage of Health Facilities

Source: VisionRI Field Survey

Challenges and Potentials

Table 3-37: Challenges and Potentials in the Health Sector

Challenges	Opportunities
• Inadequately staffed/resourced public health facilities; • Inadequate health personnel; and • Lack of a referral hospital.	• Availability of land for construction of health facilities; and • Devolution of health services offers an opportunity for the employment of health workers.

Source: VisionRI

3.10.4 Community Facilities and Services

Sports and Recreation

Sports have become a major occupation in Kenya. Kajiado North's relatively high altitude presents interesting sites for athletics training of International standards. In any day, there are renowned athletes training on the roads around Ngong' Hills. Therefore, stadia and other recreational facilities are critical in the Municipality.

There is an open ground in Ngong' Town designated as a stadium but that continues to be encroached and hived away by private developers. The rest of the Municipality has no stadia or significant playground except for those in educational institutions. This calls for the various stakeholders to intervene. Ongata Rongai, despite its population, does not have any available public open spaces or stadia. There is need for stadia as well as a social hall in Ongata Rongai and emerging centres such as Rimpa and Nkoroi.

Public Parks and Playgrounds

Open spaces are critical in urban areas to provide air circulation and greenery. Planning standards recommends a stadium of eight hectares for 10,000 to 20,000 people. The stadium should have sufficient parking facilities and a football pitch. The population within the Municipality qualifies to have playgrounds and recreational parks. However, there are no public parks or playgrounds in the area or available land set aside for these facilities.

Religious Facilities

Ngong' is a cosmopolitan area with various religious practices. While Christianity is the predominant religion, Muslims and traditionalists are also present. The field study showed that there are many churches some of which are located in makeshift buildings within residential areas while some have well-planned buildings. There are mosques in the Municipality, and most are located in the residential areas.

Planning standards recommend three churches per 500 residential units. Each church should be 0.2 ha approximately. The number of churches in the Municipality has surpassed this requirement.

Cemeteries and Burial Grounds

Cemeteries and burial grounds are critical in any human settlement. Urban residents with no rural property interests must find public land in which to bury their family members. There is no usable public cemetery in the Municipality. There were two e formerly used public cemeteries in Ngong' and Ongata Rongai. They were, however, filled up and are now in disuse one being next to Ngong' dumping site and the other at Makaburini in Kware informal settlement, Ongata Rongai.

Security Centres

The Municipality has enhanced security with several police posts and stations. The Kenya Defence Forces have their base in the area. The increased vigilance has boosted investor confidence, which has translated to more businesses being set up. The area has most parts with streetlights and high mast security lights, therefore, increasing the sense of security.

Map 3-20 illustrates the distribution of various community facilities and services across the Municipality.

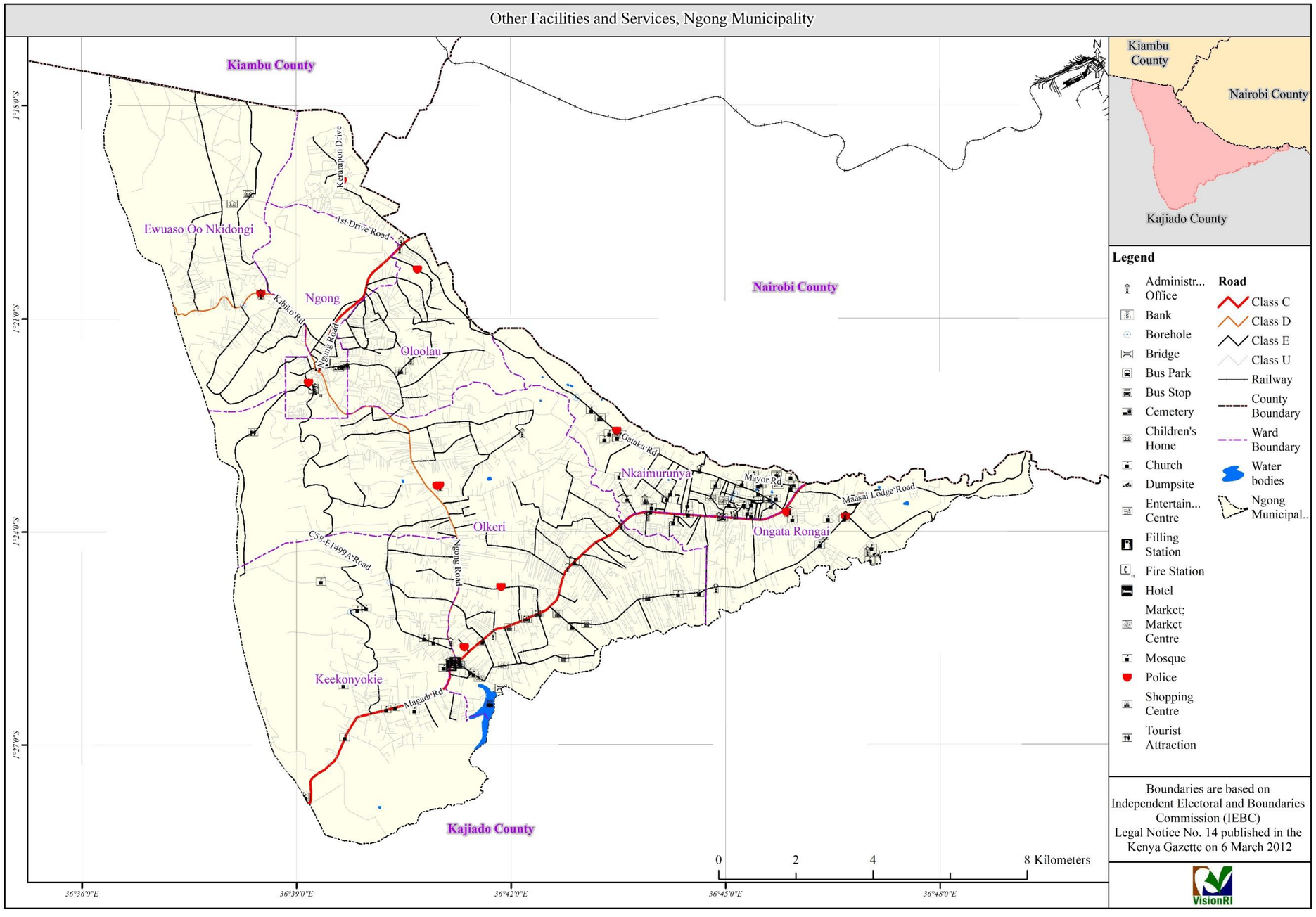
3.10.5 Culture, Tourism and Heritage

Heritage constitutes a people's history, artefacts, and sites values by current generations. This heritage may include buildings of unique local or historical architecture. The majority of the population in the Municipality is the indigenous Maasai community with a rich cultural heritage. They are a tourist attraction though the terrain is changing with more people from other parts of the country settling in the area. Ngong' Hills form the main historical heritage in Ngong'. Other historical sites are the old colonial houses and Finch Hutton Graveside, which has a rich cultural heritage.

Some key informants said that some people from various ethnic groups go to Ngong' Hills/Forest to pray, collect herbal medicines, and others often climb the hills as an adventure. Herbal medicines are also collected along the Mbagathi River.

Image 3-15: Historical Monument

Source: Field Survey



Map 3-20: Distribution of Community Facilities and Services

Source: VisionRI Field Survey

3.10.6 Informal Settlements

Existing Slums and informal settlements in the Municipality

According to the UN-HABITAT, informal settlements are residential areas where:

- Inhabitants have no security of tenure vis-à-vis the land or dwellings they inhabit, with modalities ranging from squatting to informal rental housing;
- The neighbourhoods usually lack, or are cut off from, basic services and city infrastructure; and
- The housing may not comply with current planning and building regulations and is often situated in geographically and environmentally hazardous areas[10]; and
- According to this definition, there are five informal settlements in the Municipality.

The situation of slums and informal settlements

- The informal settlements are characterised by narrow streets, poorly constructed structures that are for the most part temporary and semi-permanent. Solid waste and foul water open drains are everywhere on the streets, and social and physical facilities lacking.

Land tenure

- Land tenure is a major issue for informal settlements of Gichagi and Mathare informal settlements. This is seen as the main cause of the low standards of structures in these informal settlements since most individuals are reluctant to invest in permanent structures in the land that they are not sure of ownership;
- For Kware and Kariobangi informal settlement, the informality is seen to be caused by the nature of ownership documents. These areas were noted to be under allotment letters from the County Government and to be the areas suffering from double allocation of properties. This has resulted in a similar reluctance in investment due to uncertainty on the security of tenure. However, over time this problem is being resolved and more permanent structures have been noted to be coming up; and
- For settlements mushrooming in Matasia and Kiserian, the size of lots is seen to be the main cause of informality. This is where people come together in SACCOs, buy land and subdivide amongst themselves informally to very small units with some lots being as small as 1/32 of an acre. Development here is then congested since in each of these plots individuals focus on trying to develop living quarters, septic tanks and water storage. The result is hazardously compacted settlements. This is especially evident in Kamuranga, in Gategi Area off the Pipeline Road in Kiserian.

Kisumu Ndogo

The informal settlement is located on a 5-acre area of land, which have 300 plots with approximately 1500 persons. The area was initially a quarry site and the residents have share certificates. The area is characterised by the inadequate waste management system and the residents mainly use pit latrines. Other features of the area are:

- Pollution from dust and use of charcoal, lack of storm drainage, waterborne disease, inadequate open spaces, illicit brews, and insecurity; and
- The two main sources of water for the local residents include water from a borehole (managed by PCEA Church), and Oloolaiser Wate, and Sewerage Company.

[10] UN Habitat definition of informal settlements

The residents of Kisumu Ndogo informal settlement identified their needed priority interventions to be security, sewerage system, storm drainage, title deeds, health facility, open space, and wayleaves.

Kware

The informal settlement is located on a 7-acre piece of land which was initially a quarry. When the quarry was decommissioned in the 1970s, people settled in the area. The residents have share certificates and the titles are being processed. The area is characterised by:

- Inadequate waste (solid and liquid) management system: Most residents use pit latrines, lack of development controls, encroachments on public land, lack of designated disposal sites, pollution, lack of adequate open space, quarrying activities, illicit brews, unreliable energy supply, high rate of unemployment, insecurity and degradation of vegetation cover; and
- The main source of water for the local residents is from the Oloolaiser Water and Sewerage Company.

The residents mentioned that they need priority interventions in aspects of title deeds, sewerage system, storm drainage, schools, security, health facility, open space, and way leaves.

Mathare

The informal settlement is located on a 12-acre piece of public land which was earmarked for the construction of lagoons. The land hosting approximately 5000 persons is disputed by Barclays Bank who also claim ownership.

The area is characterised by an inadequate waste (solid and liquid) management system, lack of development controls, encroachment on public land, lack of designated disposal sites, pollution, lack of adequate open space, quarrying activities, illicit brew, unreliable energy supply, high rate of unemployment, insecurity, and degradation of vegetation cover.

The main sources of water for the local residents is from the Oloolaiser Water and Sewerage Company and two boreholes.

Priority interventions include sewerage system, storm drainage, schools, security, and health facility.

Image 3-16: Mathare Informal Settlement in Ngong'

Source: Field Survey 2018

Kariobangi (Embulbul)

The informal settlement is located on a private land having plots measuring approximately eighth-acre plots (50ft x 100ft). The residents have share certificates for their pieces of land and titles are being processed.

The area is characterised by an inadequate waste (solid and liquid) management system, lack of development controls, encroachment on public land, lack of designated disposal sites, pollution, lack of adequate open space, quarrying activities, illicit brew, unreliable energy supply, high rate of unemployment, insecurity, and degradation of vegetation cover.

The main sources of water for the residents are from the Oloolaiser Water and Sewerage Company and one borehole.

Challenges and Potentials

Table 3-38: Challenges and Potentials in the Informal Sector

Challenges	Potentials
• Poor drainage and water reticulation systems; • Poor access roads; • Lack of social infrastructure; • Pollution by solid waste and liquid waste; • Insecurity of tenure; and • Small property sizes.	• Semi-permanent structures give an opportunity for restructuring initiatives; and • Low-income residential population provides the impetus for new urban growth centres/neighbourhood.

Source: VisionRI

3.10.7 Disaster Risk Reduction and Management

Interaction of human activities with the natural environment increases the risks of natural hazards. As the Municipality advances in economic development, the focus is needed on the integration of Disaster Risk Reduction strategies in development planning.

Disasters associated with climate change and variability

Climate change and disaster risk reduction are closely linked. More extreme weather events in future are likely to increase the number and scale of disasters, while at the same time, the existing methods and tools of disaster risk reduction provide powerful capacities for adaptation to climate change. The IPCC Fourth Assessment Report of the Working Group II "Impacts, Adaptation and Vulnerability" describes the likely effects of climate change, including from increases in extreme events as summarised below:

- **Water:** Drought-affected areas will likely become more widely distributed. Heavier precipitation events are very likely to increase in frequency leading to higher flood risks. By mid-century, water availability will likely decrease in mid-latitudes, in the dry tropics and other regions supplied by meltwater from mountain ranges. More than one-sixth of the world's population is currently dependent on meltwater from mountain ranges.

- **Food:** While some mid-latitude and high-latitude areas will initially benefit from higher agricultural production, for many others at lower latitudes, especially in seasonally dry and tropical regions, the increases in temperature and the frequency of droughts and floods are likely to affect crop production negatively, which could increase the number of people at risk from hunger and increased levels of displacement and migration.

- **Industry, settlement, and society:** The most vulnerable industries, settlements, and societies are generally those located in coastal areas and river flood plains, and those whose economies are closely linked with climate-sensitive resources. This applies particularly to locations already prone to extreme weather events, and especially areas undergoing rapid urbanisation. Where extreme weather events become more intense or more frequent, the economic and social costs of those events will increase.

- **Health:** The projected changes in climate are likely to alter the health status of millions of people, including through increased deaths, disease, and injury due to heatwaves, floods, storms, fires, and droughts. Increased malnutrition, diarrhoeal disease, and malaria in some areas will increase vulnerability to extreme public health and development goals will be threatened by longer-term damage to health systems from disasters.

  In view of this, the Government of Kenya approved the National Disaster Risk Management, which emphasizes preparedness on the part of the Government, communities, and other stakeholders in Disaster Risk Reduction activities. The policy also sets out the establishment and strengthening of Disaster Management institutions, partnerships, networking, and mainstreaming Disaster Risk Reduction in the development process so as to strengthen the resilience of vulnerable groups to cope with potential disasters.

  In this regard, the Government has initiated some measures through the media in reaching out to the Kenyan citizens and giving early notice and warning to the people within the disaster-prone areas to vacate and move to higher secure grounds as precautionary measures. Such awareness campaigns are also intended to ensure the citizens are well prepared and that farmers take care of their produce in making early harvests to avoid losses during the heavy rains.

  Additionally, the Public Finance Management (National Drought Emergency Fund) Regulations, approved in 2018 gives a guide for the operations of the National Drought Emergency Fund which is to be established for the purpose of improving the effectiveness and efficiency of drought risk management systems in the country as well as to provide a common basket of emergency funds for drought risk management.

- **Flooding:** Flooding is a major challenge for Ngong' and Kiserian due to the deforestation at Ngong' hills, which has increased the surface runoff over time. This runoff flows to the direction of Ngong' and Kiserian causing damage during periods of the heavy downpour. This may result to flash floods, which are more common in densely populated areas compared to rural areas. Floods cause devastating impacts on agriculture, infrastructure, and human and animal life. Challenges facing flooding preparedness and response in the Municipality include:

  - Inadequate disaster preparedness partly due to lack of early warning systems;
  - Inadequate training in new techniques for handling humanitarian relief;
  - Poor coordination of disaster response bodies;
  - Lack of sufficient time to prepare for disasters that are associated with the climatic impacts, such as flooding;
  - Inadequate information regarding the magnitude of the climatic impacts of the rains;
  - Cynical attitudes towards weather and climate forecasts;
  - Inadequate medical supplies at Sub-County level;
  - Inadequate financial resources due to the poor state of the national economy; and
  - Inadequate community participation due to mistrust of government coordination.

Flood control requires the integration of measures aimed at:

- **Prevention:** Steps that can be taken to mitigate flood risks ahead of time and prevent floods from developing into large-scale emergencies. This includes actions at the municipal level, such as integrating green building and infrastructure design to build resiliency, as well as larger county and national efforts to coordinate the management of natural resources, restore natural flood plains, and support structural adaptation measures.

- **Preparedness:** Flood preparation measures can include initiatives to improve flood risk awareness, public engagement on risk management, and efforts to minimise flood damage and mitigate health risks. More broadly, it should include individual protection (regarding personal safety and property) and how to prepare for hazards both at home and regional level.

- **Response and health effects:** Establishing measures to respond to effects of flooding such as drinking water contamination (and supply), sewage backup and gastroenteric outcomes, as well as short-term dangers and safety issues. This also describes the actions to take to build awareness around these risks, and recommendations for addressing some of these health effects.

- **Recovery:** This focuses on post-flood effects and actions to take after a flood has ended. Much of the work on recovery focuses on physical elements of remediation (such as dealing with mould, structural issues, and using appropriate protective equipment in the process of remediating), and the social and mental aspects of recovery.

- **Landslides:** Landslide is a general term for movements of rock, debris, and soils of various origin, volumes and speed. The term encompasses events such as rock falls, slides, and flows, such as mudflows or mudslides. There is potential for landslides disasters in the Ngong' and Ongata Rongai-Kiserian due to encroachment of riparian areas and steep slopes. In addition, quarrying activities in the Municipality may lead to landslide disasters.

- **Drought and famine:** Global effects of climate change have affected the country and the area has also suffered these effects through increased drought and famine. This has resulted in decreased livestock production and loss of the vegetation cover. Drought also affects other aspects of human life through the massive displacement of families, impact on education due to high school dropout rate, and increased risk of violence, abuse and exploitation; and rise of children living on the streets.

  The challenges associated with drought and famine include the following:
  - Inadequate disaster preparedness;
  - Poor coordination of disaster response bodies;
  - Inadequate information regarding the magnitude of the disaster;
  - Inadequate financial resources; and
  - Inadequate community participation.

Setting aside funds for emergencies

In line with the Public Finance Management (National Drought Emergency Fund) Regulations, the Government has set aside funds to get 200 household dams to boost the County's food security preparedness. This move will help in the long term to eradicate food insecurity brought about by drought.

3.10.8 Governance

Institutional Framework

The ISUDP is being prepared within the framework of the recently devolved system of Government as provided in the Constitution of Kenya (COK), 2010. A key provision of the new Constitution is the creation of County Governments whose functions include county planning and development (Fourth Schedule), amongst others.

The County Governments Act 2012 was then enacted to give effect to the devolution provisions of COK 2010. The said Act further defined the functions and powers of County Governments, which include the preparation of the following plans:

- County Integrated Development Plan;
- County Sectoral Plans;
- County Spatial Plan; and
- Cities and Urban Areas Plan as provided for under the Urban Areas and Cities Act (No. 13 of 2011).

The County Governments Act 2012 also provided that the above plans shall be prepared using a framework that integrates "economic, physical, social, environmental and spatial planning." It underscores the importance of development planning by further providing that the mandated plan "shall be the basis for all budgeting and spending in a County." The executive branch of the County Government has the responsibility for preparing these plans. In turn, their approval resides with the County Assembly.

Citizen participation in ISUDP preparation and implementation is also enshrined in the County Governments Act 2012. The Act provides that the County Government shall provide citizens with "reasonable access to the process of formulating and implementing policies, laws and regulations, including the approval of development proposals, projects, and budgets, the granting of permits and the establishment of specific performance standards." Citizen participation shall be ensured through several modalities including the "establishment of citizen fora."

Planning

The County Government, through its Department of Lands, Housing and Physical Planning - Directorate of Physical Planning, in coordination with the Offices of the Sub-County Administrator as well as concerned Ward and Village Administrators, are the offices that are directly responsible for the preparation of the ISUDP. The County Executive Committee is, in turn, in charge of monitoring all stages of ISUDP preparation, from formulation, adoption, and review (County Governments Act 2012).

Implementation

All offices of the County Government will be involved in the implementation of the ISUDP since it addresses the County's multi-sectoral challenges. These include the County's various decentralised units such as the concerned Sub-County, Wards, and villages. The specific roles of the various offices and units shall be identified upon the identification of the various policies, programs, and projects that will comprise this ISUDP.

The coordination of the various actions during the implementation of this ISUDP shall be undertaken by the County Inter-Governmental Forum comprising the following:

- The heads of all departments of the National Government rendering services in the County; and

- The County Executive Committee members or their appointed nominees.

Monitoring

Monitoring shall, in turn, be through the County Executive Committee through its performance management plan, which will evaluate the "performance of the County public service and implementation of the County policies." Following the requirements of the County Governments Act 2012, this ISUDP shall be reviewed every five years.

Plan Amendments

Amendments to this ISUDP may be introduced, through a resolution of the County Executive Committee and duly approved by the County Assembly.

4. STAKEHOLDERS PARTICIPATION

4.1 Introduction

This chapter highlights the various stakeholder engagement sessions and methods that were used in the development of this ISUDP. Stakeholders were involved at the county level where the leadership and planning officers were engaged at two levels. The first level was at the county technical working group level where proposals and the report were presented to technical experts within the County before proceeding. The second level involved the engagement of the county leadership with the reports before engagement with institutions.

The general public, the business community, local leadership, institutions, and opinion shapers were involved through stakeholder forums done at the grassroots level. Profiling was done at this stage to ensure representation was across the board on all sections of the community.

4.2 Stakeholders Profiling

The identification of stakeholders invited to the workshops was guided by the initial Stakeholder's Identification Matrix provided in the Consultant's Project Design Report. The final lists of Project Stakeholders to be invited to the Strategic Planning Workshops were later identified through several discussions between the Consultant and County Planners. The list involved individuals from the National Government; State corporations/parastatals, Regional authorities and others; County Government; Legislators; Educational Institutions; Business community; Public health and environment; Informal Businesses; Non-Government Organisations; Transport Sector Associations; Religious Institutions; Community Based Organisations; Farmers; Professional Bodies; Minority and Marginalised groups; Persons with disabilities; Youth; and Women.

4.2.1 Mode and level of engagement

The consultant's team developed a workshop mechanics, which provided the type, manner and sequence of Activities intended to elicit optimal participation and results from the stakeholders. It includes the designation of direct roles of various stakeholder participants intended to initiate plan ownership. The Consultant's roles were confined to the provision of technical inputs and facilitation of workshop Activities. The workshop mechanics involved an introduction to NaMSIP; Presentation of the objectives of the ISUDP; introduction to the workshop and presentation of situation analysis; and identification of sectoral strengths, weaknesses, opportunities and threats (SWOT) and formulation of development vision, mission statement and goals and objectives.

4.2.2 Stakeholder's issues and concerns

The Nairobi Metropolitan area has 24 urban centres. Ngong' Municipality has three main ones: Ngong', Ongata Rongai and Kiserian towns. Ngong' is known internationally because of its panoramic view of Nairobi National Park, proximity to the main city, being close to international trade-airports, etc. Ngong' is the third fastest-growing urban centre and has the third-highest population density in the NMR. This poses a great challenge in terms of the environment-stress in water supply, drainage, sewerage, solid waste, etc. The Plan looks at what we have, what we do not have and what we expect in the next 10 years.

4.2.3 Issues Raised During Ngong' Stakeholders Meeting

The issues that were raised in the stakeholder meeting included identifying that there was a need for proper management of resources to eliminate threats, Effects of the NMR and how Nairobi city has exerted pressure to the Municipality hence the need for it to adapt to the changes.

There was also concern that planning was necessary to anticipate the unprecedented growth of the area. The plan should also be developed as part of the wider effort by the Government and within the framework of Vision 2030.

4.2.4 Reactions from stakeholders(Ngong' ISUDP forum)

The key reactions that were shared by the stakeholders during the ISUDP forum include the following:

- There was concern that there were so many plans being prepared at the National, County and Municipal levels. These plans require to be integrated/harmonised to avoid confusion and duplication of effort; Ngong' was noted to be a town that would do well if developed as tourism and not an industrial area;
- The Plan should also address the issues of service delivery to the various towns where the current level of services in each of the centres and regions required to be indicating and planning for;
- Economic linkages, if any, should be highlighted and the polycentric model would best link the towns;
- On population, it was also raised that with effective planning and implementation, there would be an increase in migration to the area. The Plan would, therefore, require responding to population increase;
- There is a need to indicate the various development indices through the Plan such as the poverty indices vis-à-vis the settlements, water demand and supply, teacher-student ratio, patient-doctor ratio, and WHO-ENESCO benchmarks;
- There is also needed to consider the development and growth of the youth since over 50% of the population was seen to be the youth;
- Public land was also noted to be a critical issue that needed to be mapped and any use on it be made public;
- It was mentioned that poor implementation of projects was crippling the area and there was a need for a very specific plan on implementation. Effective communication on what to expect was necessary to separate politics from development.
- Food security and opportunities for housing need to be addressed by the Plan since the majority worked in Nairobi and required food and housing which is not adequate in the County. However, that being the case there was a need to get that appropriate comparative advantage of the Municipality vis-à-vis other areas since some areas were best suited for some activities such as agriculture;
- Infrastructure emerged as a critical component of the Municipality. If well done, it would open up the area to new opportunities and investors. The municipality was noted to require adequate access and drainage. Solid waste management required proper attention in the area and a central place will be ideal for the area;
- Sports activities were seen to be a neglected component in the Municipality and sports complexes, where designed, should include complementary spaces such as parking;
- The representation of people with disabilities was also noted to be wanting in the forum. This required to be remedied and the plan implementation and designs required considering people with disabilities including new developments and institutional grounds; and

- On ICT, it was proposed that the Municipality required an ICT platform to follow up on revenues of the County.

4.2.5 Key Concerns

The stakeholders also raised the following key concerns:

- Issues of sustainable agriculture;
- Centralised solid waste management;
- People living with disabilities;
- Adequate and affordable housing for low-income zones;
- Efficient transportation, i.e., less commuter time and effective public means of transport;
- Duplication of roles between the County and National Government;
- The competitive advantage in the Municipality;
- Engagement of all sectors during planning;
- How can planning change the mind-set of the people;
- Integrate our planning systems with technology;
- Need for political goodwill to implement the plan; and
- Benefits of having a Municipality.

4.3 SWOT Analysis

This section discusses a synthesis of the Municipality's key strengths and opportunities as well as its key weaknesses and threats based on the foregoing identification of its challenges and potentials. This synthesis will serve as the platform for the next step in the planning process, which is to the formulation of the Municipality's Strategic Direction in the form of a collective Development Vision, Goals and Objectives.

4.3.1 Strengths and Opportunities

The Municipality's strategic advantages and potentials should be fully utilized to chart its future growth and development. These include:

- **Residential Hub:** Ngong' and Ongata Rongai will be instrumental in helping reduce the housing deficit in the NMR. The towns are reasonably well positioned to attract further residential developments to propel their economy. Its potential lies in the presence of majestic Ngong' Hills, available land, good accessibility to Nairobi and already established community service establishments such as banks, shops, supermarkets, petrol stations, etc.
- **Tourist Hub:** Ngong' is already an established popular weekend tourist destination from Nairobi and beyond and is reasonably expected to maintain this role. Factors and comparative advantages which the planning area have to include accessibility, natural beauty, heritage, the wind farm, Maasai villages and currently infantile tourism industry which can easily be nurtured to grow.

4.3.2 Weaknesses and Threats

The Municipality challenges must be hurdled in order for it to attain its full development potentials. The challenges include the following:

- **Administrative challenges:** The Municipality has to address key administrative challenges that include encroachment of roads, traffic congestion, very high rates of crime, market congestion, and the emergence of slums. These challenges arise largely

from gaps in public administration such as development control, traffic control, and security, amongst others.

- **Infrastructural gaps:** The Municipality is significantly challenged by inadequate public infrastructures such as poor roads, lack of solid waste management and wastewater disposal systems, inadequate water supply, storm drainage facilities, and parking spaces. The Municipality also lacks economic infrastructure such as an appropriate market.

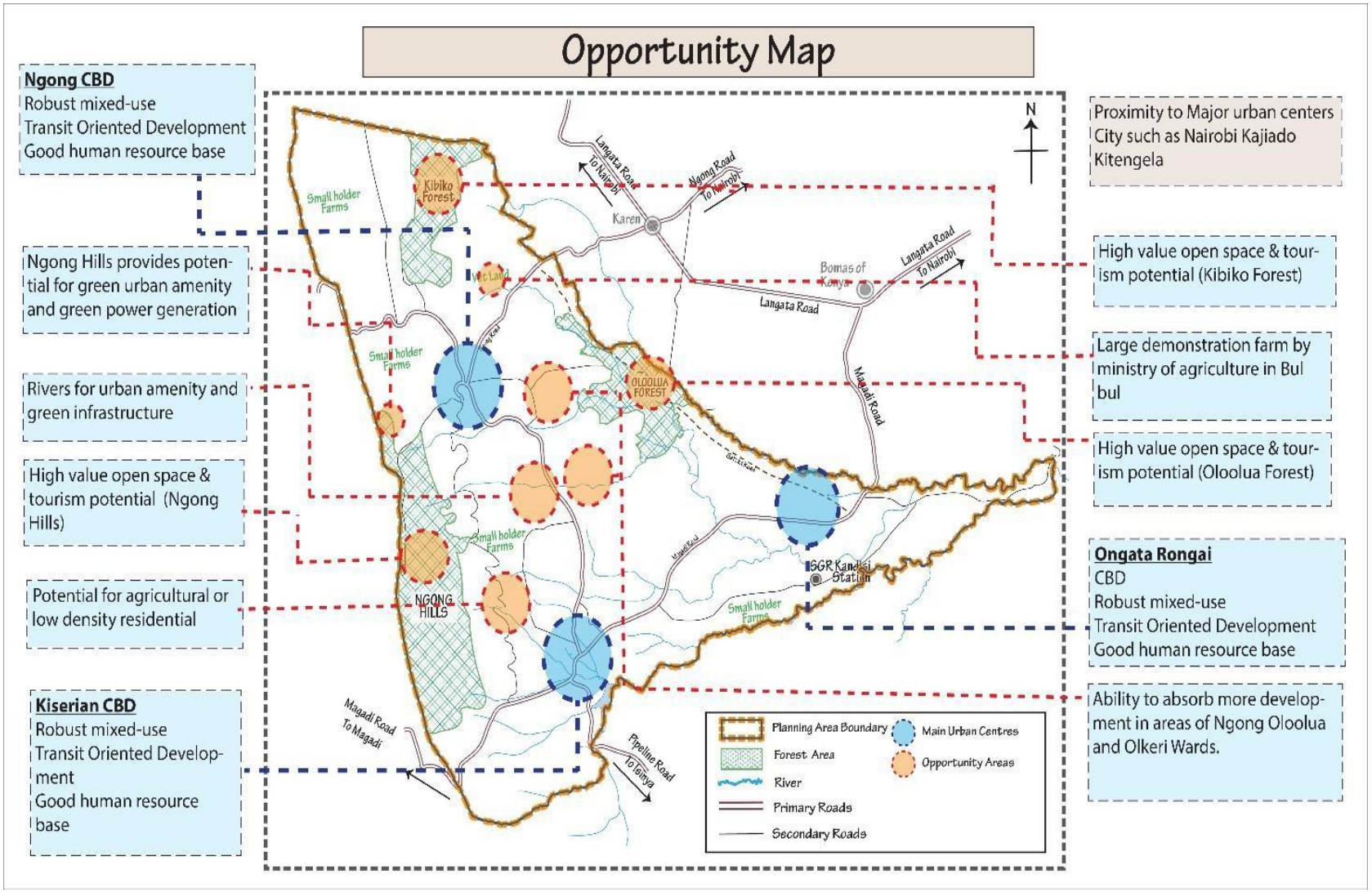


Figure 4-1: Opportunity Map

Source: VisionRI

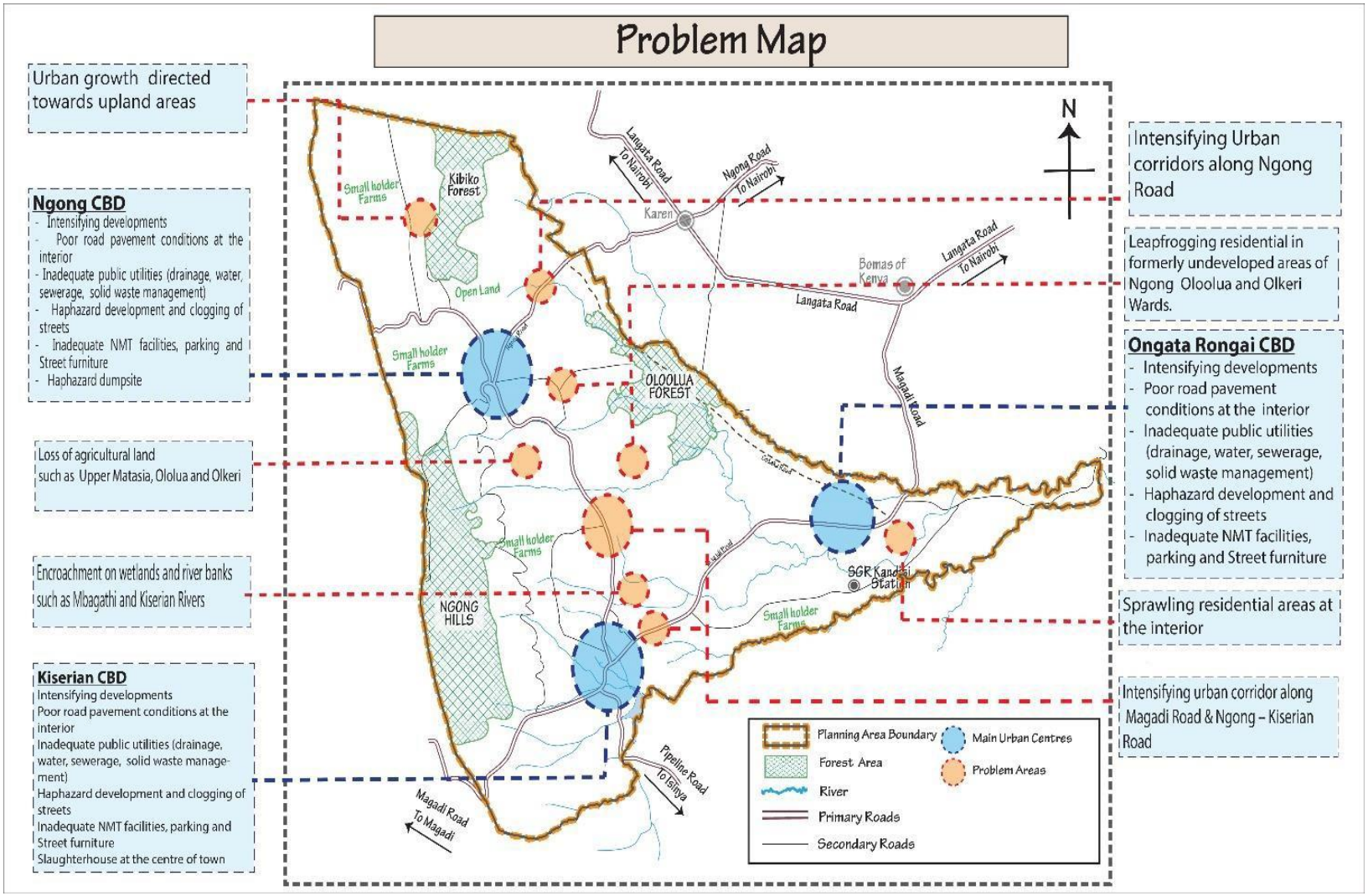


Figure 4-2: Problem Map

Source: VisionRI

5. DEVELOPMENT CONCEPTS

5.1 Introduction

This chapter examines the overall vision, mission, and objectives of the Municipality. It then seeks to understand the development trends and structuring elements within the Municipality. This is then followed by an examination of possible development models that can be adopted for the Municipality and a preferred model selected from the alternatives.

5.2 Development Vision, Mission, Goals, and Objectives

5.2.1 Vision

The vision statement to guide the development of the alternative models for the Municipality is **"a safe, secure, competitive and sustainable urban environment/region."**

5.2.2 Mission

The mission for the Municipality as developed by the stakeholders was **"to develop a safe, secure, competitive and sustainable urban environment/region through urban management and efficient resource utilisation."**

5.2.3 Goals and Objectives

The goals and objectives of the development strategy were as follows:

Table 5-1: Development Goals and Objectives

Goals	Objectives
• Encourage conservationism within the Municipality; • Encourage investment through Agro-Industrial Activities and SME development; • Decongest town centres (transport lines and social infrastructure); • Encourage road user safety and interconnectivity of all modes of transport; and • Enhanced security, equitable access to utility services and promote sanitary conditions of urban areas.	• To conserve water bodies and other environmental resources from encroachment and pollution; • To empower the youth, women and vulnerable groups through capacity building; • To encourage the deployment of ICT in the management of the Municipality; • To promote adequate, efficient, affordable and accessible social facilities in the Municipality; • To develop equitable, efficient and safe utility services and infrastructure; • To advance the use and production of renewable resources and energy; • To promote solid and liquid waste manage for sanitisation of towns; and • To provide efficient, accessible, equitable, transparent and participatory Government services.

Source: VisionRI

5.3 Structuring Elements

The structuring elements of the Municipality include Ngong' Hills, the rivers, Kiserian dam, relief, administrative boundaries, and gazetted forests. These structuring elements are briefly described below and have been applied to the proposed land use plan.

5.3.1 Resource Base

- **Ngong' Hills:** Ngong' Hills are located to the west of the Municipality. Ngong' Hills being rugged in nature provide a physical barrier to development. This is because slopes tend to get extreme towards the peak. The weather is also very cold at the top and hence people prefer its foothills. The forest reserve at the peak is also seen to limit development to the east of the hills. The hills are the main attraction features that can promote tourism in the Municipality through the conservancy, hiking, medicinal, and religious purposes. It is possible to view the JKIA International Airport and the Rift Valley from the hills. The hills, therefore, are considered in this Plan as key to structuring both existing and proposed land uses.

- **Rivers:** Rivers are natural boundaries and are also seen to form buffers between major land uses or administrative boundaries and limit the growth of urban centres of the Municipality. These include Mbagathi River to the east, Kandisi River to the south and the internal rivers which are boundaries to the various centres within the Municipality. They are also the most sought out areas for farming hence agricultural use forms along the main rivers.

- **Gazetted Forests:** Gazetted Forests form part of the undevelopable land and form a development boundary of the Municipality. Adjacent developments to forested areas are also zoned as low-density developments so as to mitigate and minimise any environmental degradation that may occur to the forest as a result of the developments.

- **Relief:** Terrain in the Municipality is seen to be a major structuring element as most developments avoid very rugged terrain because of financial implications and difficulty of access. Higher grounds provide opportunities for developing water facilities like dams and intake weirs. The relatively lower or gentle grounds are good for industries and development of sewer treatment works.

Kiserian has exhibited high densities due to constraints on all sides; on the west by the slopes of Ngong' Hills, Kiserian Dam and its rivers on the south and a steep slope to the east. The sudden change of slope from Kibiko into the Great Rift Valley shows the attenuation of the urban settlement with the sudden change of gradient being a constraint to settlements. This leaves the Kedong' areas sparsely populated.

5.3.2 Demographic characteristics

The demographic characteristics of the towns dictate the rate of urban sprawl and leapfrog developments. The three towns Ngong', Kiserian and Ongata Rongai are mainly composed of people who commute to work in Nairobi and live in the towns. The population is mainly concentrated close to the CBDs due to economic activities and service provision. The population density is highest in Oloolua Ward which covers residential estates adjacent to the CBD followed by Ngong' Ward which covers part of the CBD as well. The lowest density is in Keekonyokie Ward which touches some residential areas like Kibiko but is otherwise largely rangeland. The sub-locations, on the other hand, show that Ongata Rongai and Embulbul have the highest densities being in CBD proper of their respective towns followed by Ngong' Town, Oloosurutia, Empakasi, and Kandisi. This is then followed by Kiserian sub-location.

5.3.3 Economy

The Municipality's economy benefits largely from its proximity to Nairobi as it provides suitable neighbourhoods for real estate development in the NMR. The Municipality's main economic centres are along the Embulbul - Ngong' - Kiserian - Ongata Rongai corridor. These centres tend to attract economic activities and in turn human settlements.

5.3.4 Existing Infrastructure and transportation

- **Major transportation channels:** Major transportation channels in the Municipality include the SGR that is currently under construction, main roads and highways. These channels are key structuring elements as developments tend to occur where there is improved road transport and efficient transportation systems.

- **Kiserian Dam:** Kiserian dam is a key structuring element that has a pull factor on various land uses. Waterfront activities and future recreational facilities can be developed along the dam to complement tourism in the Municipality.

- **Governance Structure:** The National and County Government structure, as well as the policy and legal framework, are key structuring elements as they determine the location of administrative offices in the towns, which determine the settlement of the population. The policy and legal framework determine the conferment of the status of the town hence is vital in the preparation of plans for the towns.

5.4 Spatial Development Models

There are three main types of spatial structures from which urban development is modelled in this plan. These are:

- **Monocentric:** This is a singular node of growth which dominates a Municipality and draws all its resources from the immediate neighbourhood.

- **Polycentric Model:** This involves a multiplicity of centres with no dominant centre and resources. Opportunities in this model are distributed uniformly within the centres.

- **Composite/Integrated Model:** This is the most common model where a multiplicity of centres exists in an urban space with dominant centres competing amongst themselves and sub-centres on resource and exerting their influence on their hinterlands as per their areas of influence.

5.5 Alternative Models

The key structuring elements discussed in this Plan guided the design/formulation of alternative growth models of Ngong', Ongata Rongai and Kiserian areas. The development trends, the vision, mission, objectives of the Municipality as well as transport oriented and smart growth principles guided the design. It was observed from the above principles and items that there are three feasible models for the development of the Municipality. The models are as follows:

- Monocentric (Compact City) Model;
- Polycentric Model; and
- Integrated Model.

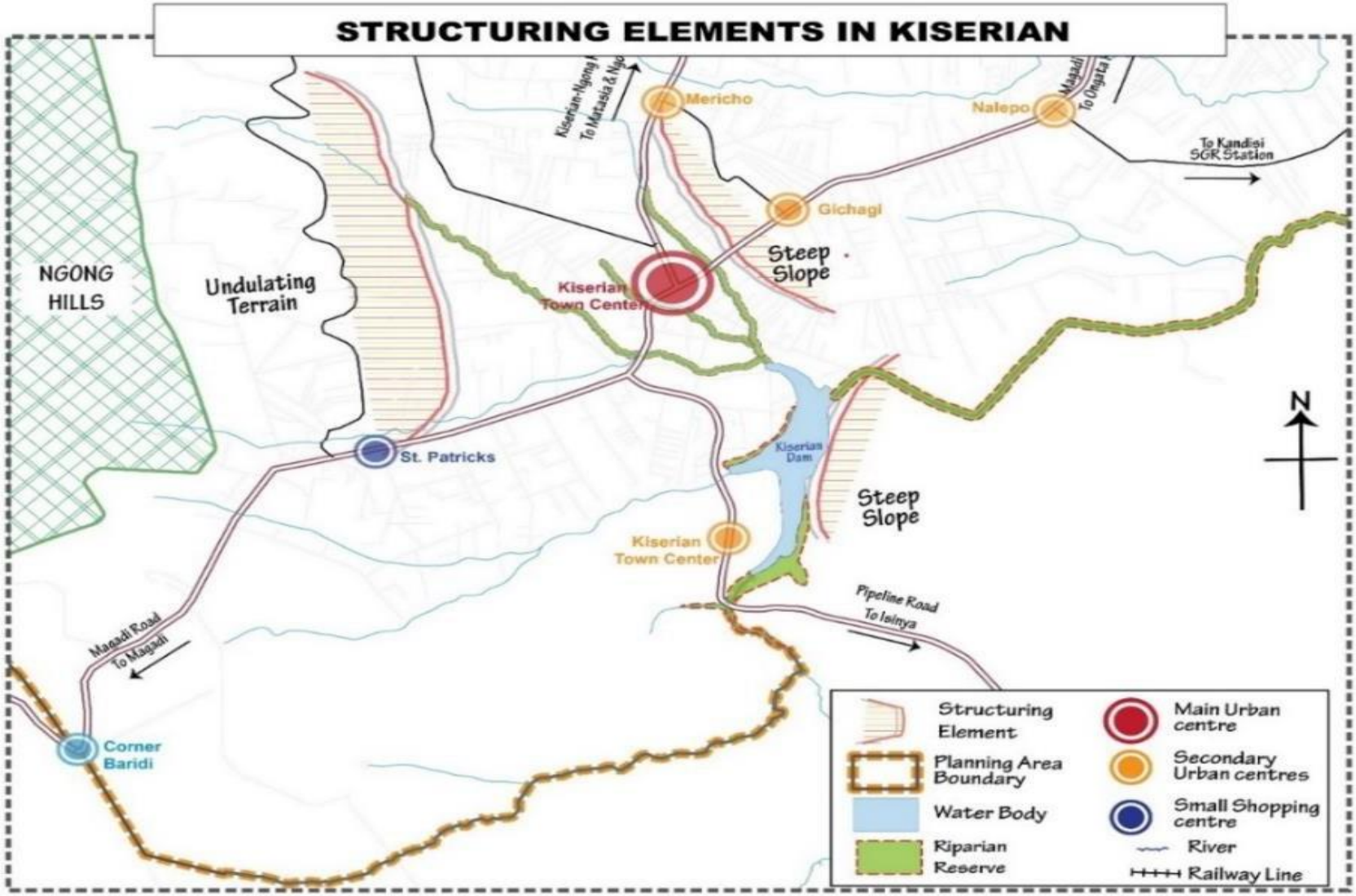


Figure 5-1: Example of Structuring elements in Kiserian

Source: VisionRI

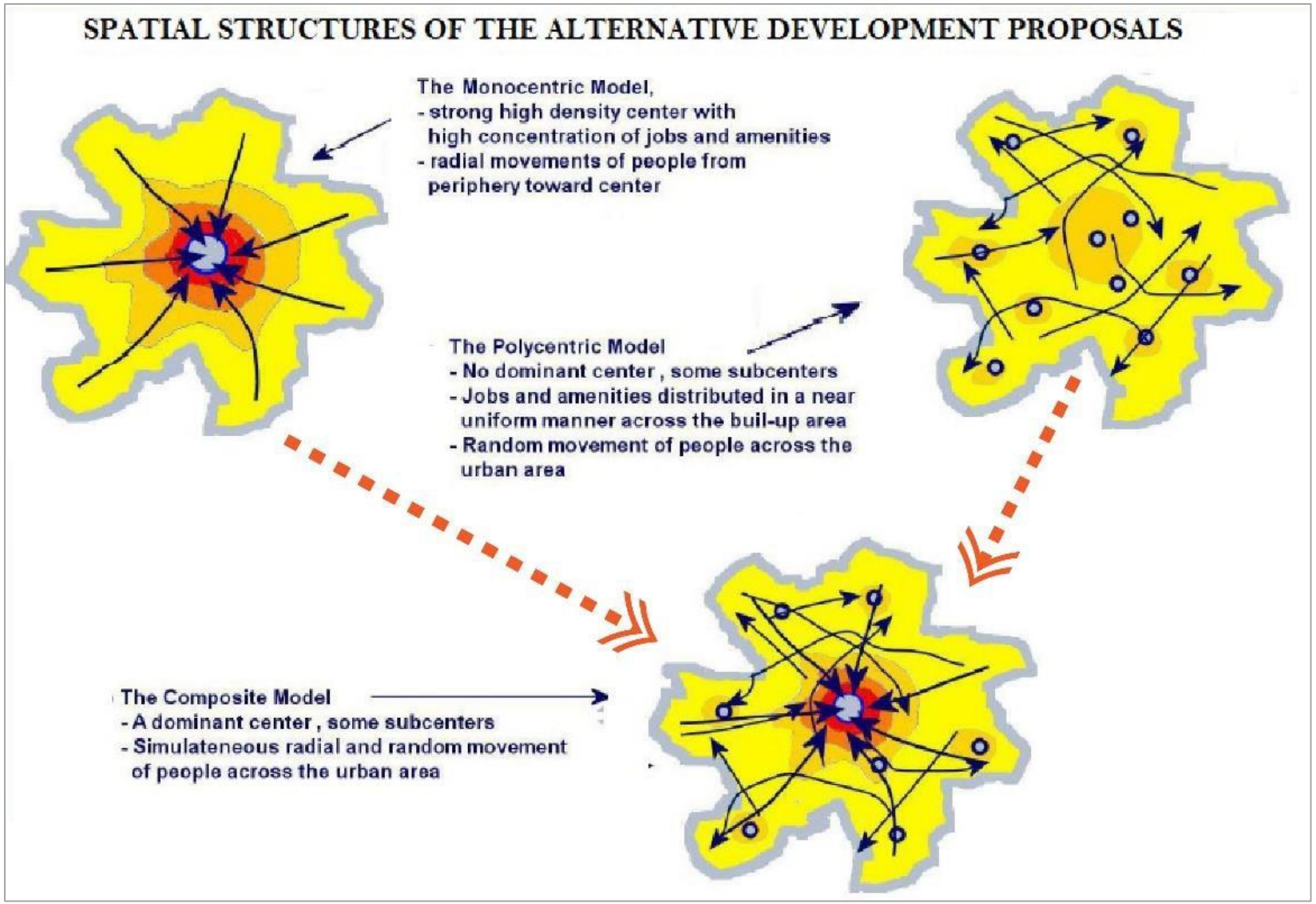


Figure 5-2: Spatial Structures of the Alternative Development Models

5.5.1 Model 1: Monocentric with Transit-Oriented-Design (TOD) Model

The Monocentric model will include primary towns with a high-density mixed-use concentrated along the major transport routes. Mixed land use enables a range of land uses to be located in an integrated way that supports sustainable forms of transport such as public transport, walking, and cycling. Ngong', Ongata Rongai and Kiserian towns appear to follow a monocentric growth model with concentration of a large population and urban land use activities in these three towns. The peripheries of these towns have largely remained agricultural with intermittent growth of urban centres to serve the rural population. There are also pockets of residential developments at places like Matasia, but the market centres have mainly depended on the three towns and the city of Nairobi.

The Monocentric model is based on the following principles:

- High-density mixed-use concentrated land uses on the major transport routes;
- Back access to developments;
- Preservation of hinterlands; and
- Zoning of land uses.

Advantages and Disadvantages of the Monocentric Model

The advantages and disadvantages of the Monocentric model include the following:

Table 5-2: Advantages and Disadvantages of the Monocentric model

Advantages	Disadvantages
• Increased densities will reduce pressure on land hence reduced urban sprawl and leapfrog developments; • Reduce carbon emissions; • Maintains the existing urban fabric, functionality, image/character of the towns; • Easier access to social services; and • Protection of hinterlands.	• Increased traffic congestion; • Increased pressure on existing infrastructure; • Concentration of infrastructure at the Monocentric towns leaving other areas unattended; • Increased pollution; and • Encourages congestion in human settlements.

Source: VisionRI

The effectiveness of the Monocentric model can be enhanced through the implementation of transit-oriented development to solve its major drawback that relates mainly to transportation.

Transit-Oriented Development (ToD)

The TOD model attempts to maximise mixed-use, walkable, and location-efficient development that balances the need for sufficient density to support convenient transit service. TOD makes better use of transport infrastructure to backfill high-capacity transport corridors and support regional public transport links.

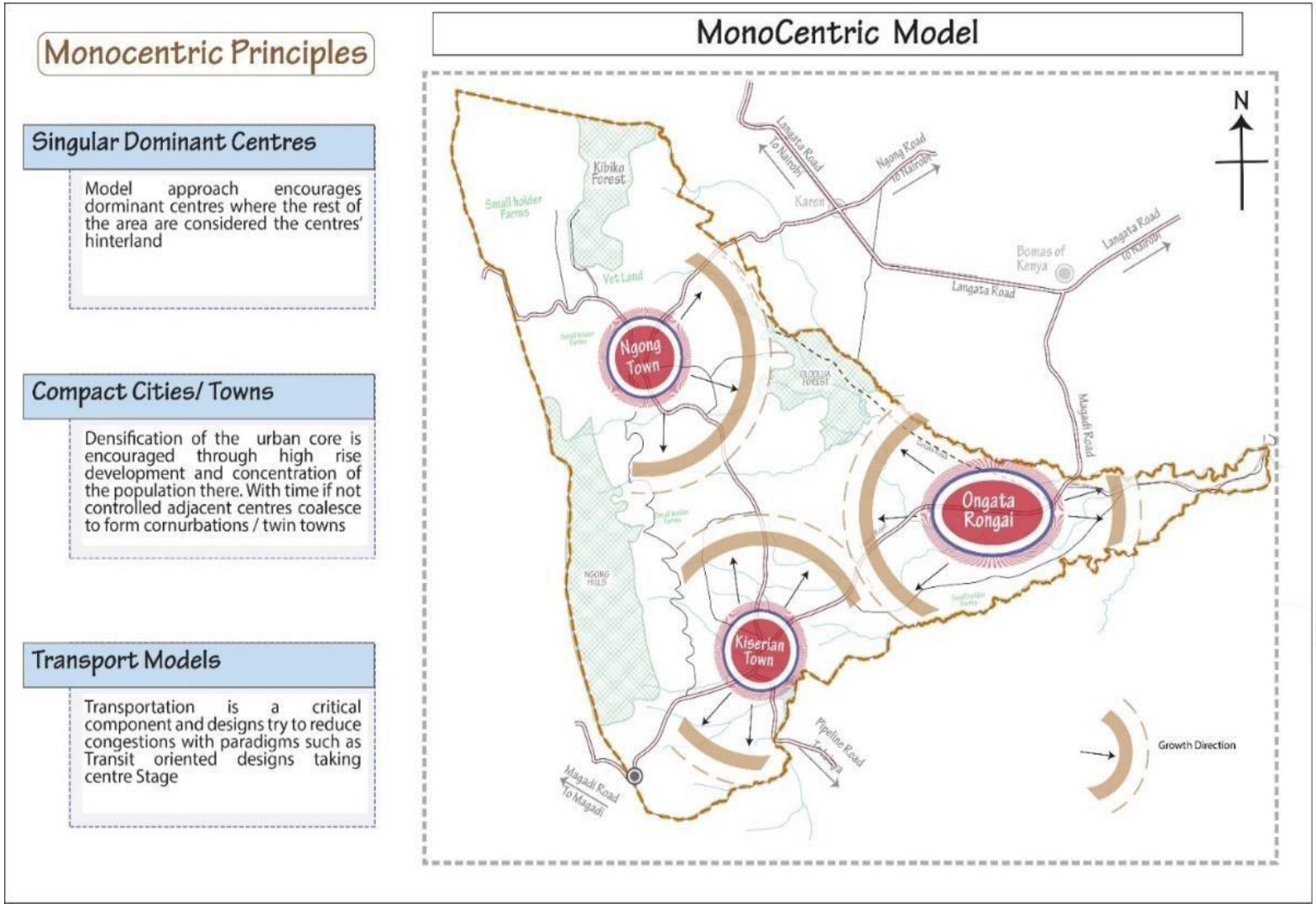


Figure 5-3: Monocentric Model

Source: VisionRI

Application of TOD

TOD aims at increasing the efficiency of public transport and reducing the use of private cars thus promoting sustainable urban growth. The TOD in the Municipality will be based on the following principles:

- **Public transport management:** Public transport is created to encourage high-capacity vehicles through:
    - Design of bus rapid transit (BRT) and the use of the articulated buses and bi-articulated buses at the main arterial roads increase carriage capacity, reliability, and speed and reduce traffic congestion while the mini-buses make use of secondary trunk lines;
    - Design of designated bus parks for public transport to discourage on-street parking, loading and off-loading of passengers; and
    - Private vehicles are facilitated to use a park and a riding facility. Access to the core of the centres is limited to public service vehicles (PSV) and freight vehicles.
- **Road transport design:** The road design encourages public mobility through:
    - Construction of service lanes;
    - Construction of non-motorised transport facilities and BRT lanes for the buses;
    - Construction of parallel transport routes for entry and exit of vehicles to deter in through access at the major transport corridor;
    - Construction of underpasses and overpasses to distribute traffic; and
    - Use of road hierarchy systems.
- **Primary towns:** The primary towns along the TOD are compact towns with high densification and high mixed land uses to deter sprawl.
- **Development control:** Development of comprehensive legal framework, i.e., zoning regulations allow the high rise and mixed land development of at least four levels with the two lower levels being exclusively commercial with arcades between them along the transport corridor and Enforcement regulations to curb access of residential areas through the major transport routes. (Figure 5-4)

Advantages and Disadvantages of the Monocentric TOD model

The advantages and disadvantages of the Monocentric TOD model in the Municipality include the following:

Table 5-3: Advantages and Disadvantages of the Monocentric TOD model

Advantages	Disadvantages
• Reduction of traffic congestion; • Revitalisation of the economic growth of the towns through enhanced access; • Enhanced regional accessibility and connectivity; • Encourages pedestrian walking and • allocation of NMTs; • Increased densities will reduce pressure on land hence reduced urban sprawl; • Reduce carbon emissions; • Maintains the existing urban fabric, functionality,	• Requires a high level of management; and • Implementation of TOD's is hampered • by the lack of parallel transport routes.

Advantages	Disadvantages
image/character of the towns; and • Easier access to social services.	

Source: VisionRI

5.5.2 Model 2: Polycentric with TOD Model

Polycentric urban development within the Municipality involves organising the area around several administrative, social or economic centres (secondary centres) instead of few primary and dominating centres as it is currently.

The secondary centres are proposed to be upgraded into increasingly independent and self-sufficient centres beyond the core towns. These urban entities will not only hold a rising share of the population of the Municipality but also accommodate increasing major economic activities, employment, social, educational, cultural and entertainment services.

The model proposes four types of nodes, i.e:

- Primary towns, i.e., Ngong', Ongata Rongai and Kiserian;
- Secondary towns, i.e., Embulbul, Nalepo, and Matasia;
- Local centres, i.e., Kerarapon, Kibiko, Gichagi, Upper Matasia, Olkeri, and Corner Baridi; and
- High growth local centres, i.e., Oloolua, Zambia, Juanco, Nkoroi, and Gategi.

Advantages and Disadvantages of the Polycentric Model in the Municipality

The advantages and disadvantages of the polycentric model in the Municipality include the following:

Table 5-4: Advantages and Disadvantages of the Polycentric Model in the Municipality

Advantages	Disadvantages
• Reduction of traffic congestion; • Employment opportunities will be dispersed across the various multiple centres; • Controls urban sprawl and ribbon development; • Reduction in the strain on the infrastructure; • Creates new opportunities for investment and development; • Leads to an easier way of transition from unplanned to planned development; and • The model will also correct the negative externalities such as air pollution that arise from carbon emitted by vehicles to the atmosphere.	• Decentralising residential development to polycentric centres will contribute to the increased use of cars if the new designated residential areas are far from the centres; and • Inflation of land and housing prices.

Source: VisionRI

5.5.3 Model 3: Integrated Model: The Preferred Model

This model integrates the monocentric/TOD and polycentric/TOD model. However, these two models do not consider the non-urban areas. The integrated model proposes development in both the urban and rural areas. The multi-nodal centres are proposed to be interconnected by efficient multiple transport routes thereby enhancing mobility and accessibility.

The guiding principles for the integrated model are as follows:

- Compactizd dispersal.

The advantages and disadvantages of this model are outlined in Table 5-5 below:

Table 5-5: Advantages and Disadvantages of the Integrated Model

Advantages	Disadvantages
• Reduction of traffic congestion; • Dispersed employment opportunities; • Controls urban sprawl and ribbon development; • Reduction in the strain on the infrastructure; • Creates new opportunities for investment and development; • Economic growth of the towns through enhanced access; • Enhanced regional accessibility and connectivity within the polycentric centres; • Infrastructure development in all the nodes; and • Reduces dependency on the major towns.	• Inflation of land and housing prices.

Source: VisionRI

The integrated model is the preferred model of development as it integrates the polycentric model with the transit-oriented Model. This model also incorporates the already existing compact city model for the urban core areas. The implementation of this model would factor in the following:

- **Polycentric Node Component:** The polycentric node component first acknowledges the existence of multiple nodes of development with different functions in the Municipality. Several centres will be developed/upgraded from their current status in an aim to develop alternate destinations for residents. The centres are to be thematic and their functions create unique pull factors in the Municipality.
- **Transport Component:** Major transit roads will be upgraded to encourage the smooth flow of traffic. Grid separation will be advocated for at major urban centres to separate internal traffic from through traffic. Main entrances to towns will be redesigned so as to disperse traffic to the different sides of the towns.
- **Compact City with TOD Component:** Congested sections of the Municipality will be developed with TOD models in mind. The purpose of this will be to ensure densification through higher plot rations. The development will be to allow mobility at lower levels while at the same time encourage mixed-use developments that encourage people to be able to live, shop and work in the same building. Structures fronting the main spine roads will be developed with arcades to ensure maximum pedestrian circulation and parallel alternative development corridors and roads developed to minimise congestion on one side of the towns. The public transportation system will be encouraged for smooth flow. Design and location of bus termini will be with a bias to minimised creating bottlenecks on the main spine roads.

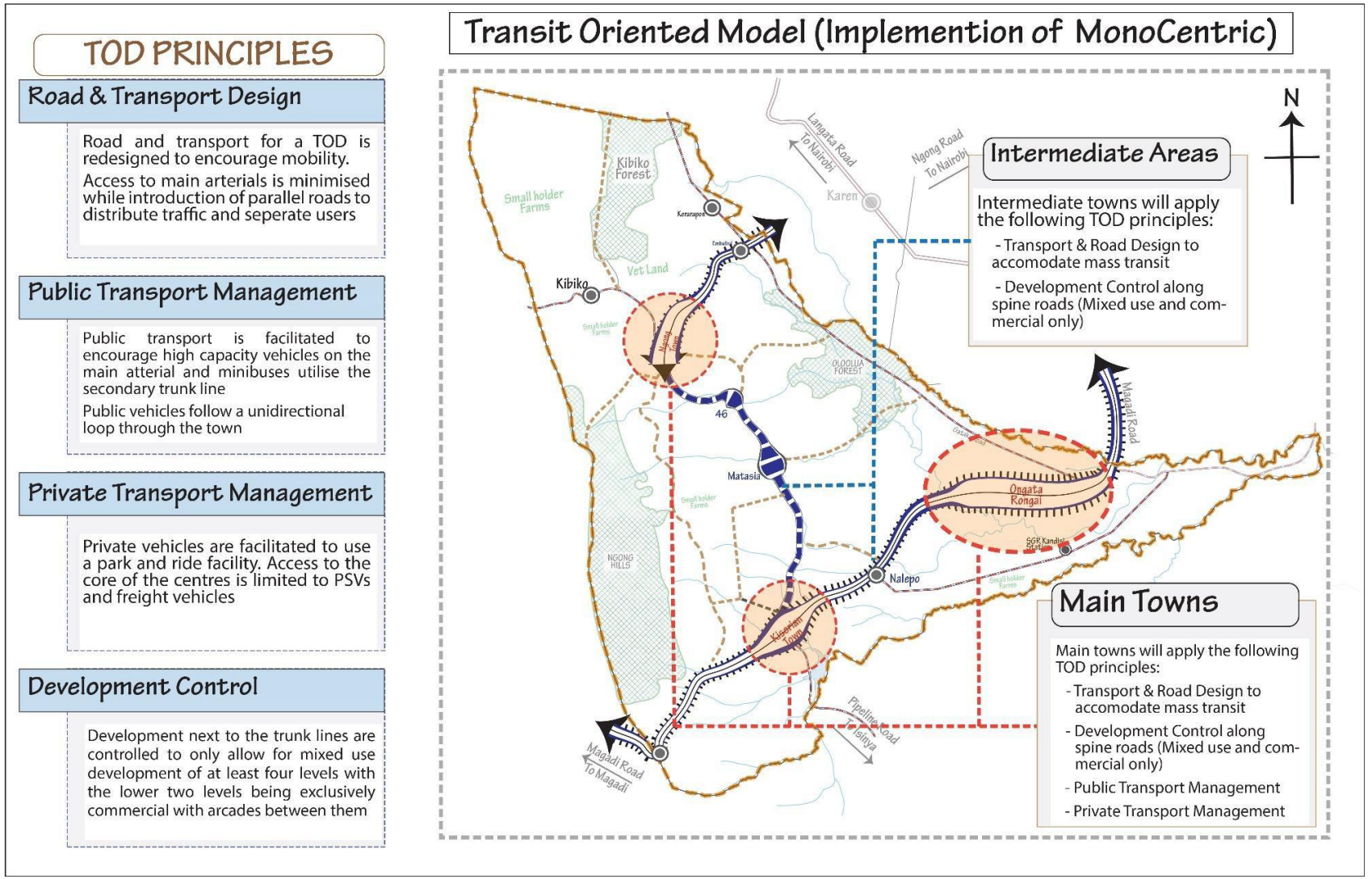


Figure 5-4: Transit-Oriented Model as an Implementation of the Monocentric Model

Source: VisionRI

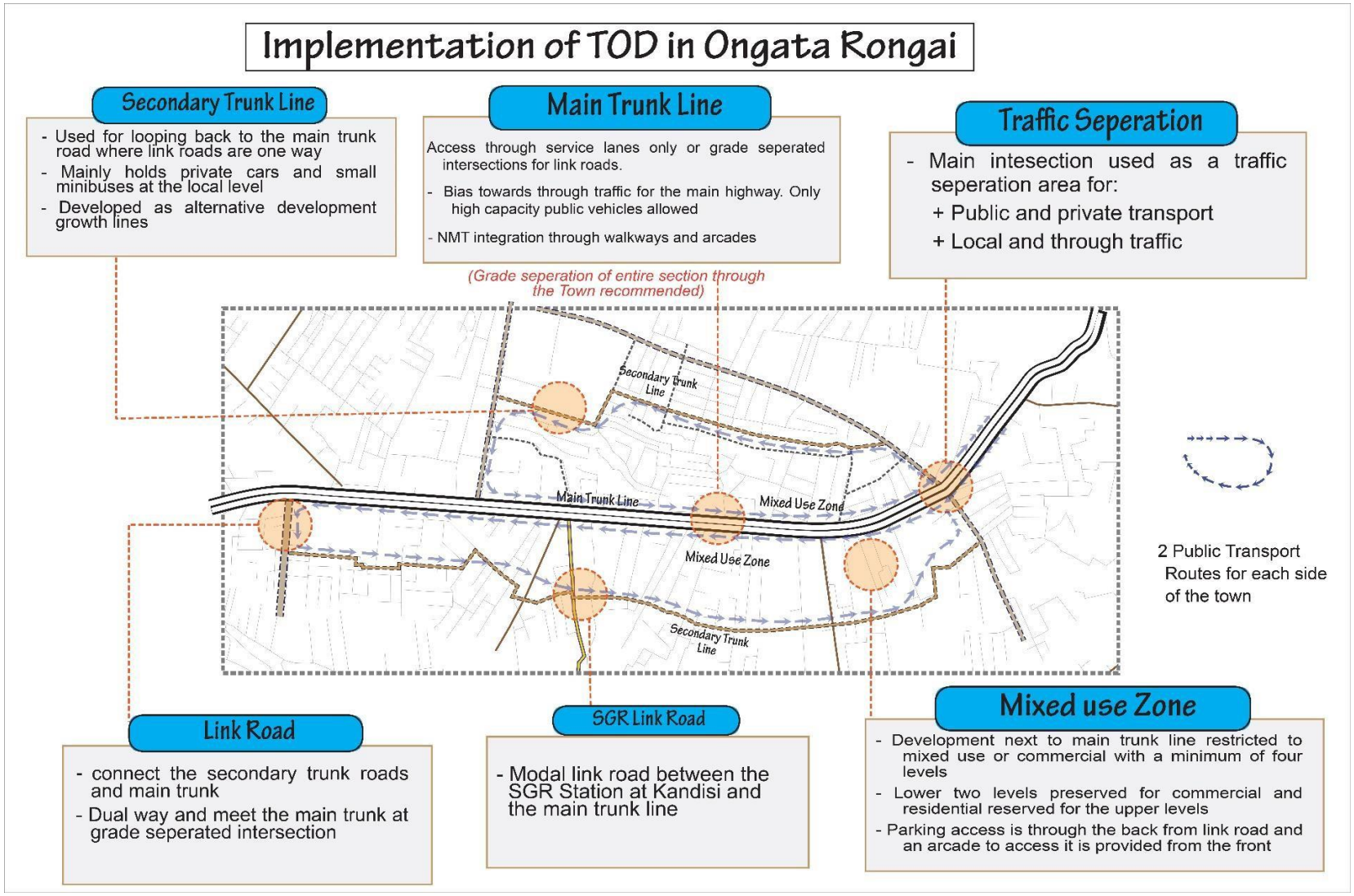


Figure 5-5: Possible implementation of TOD in Ongata Rongai

Source: VisionRI

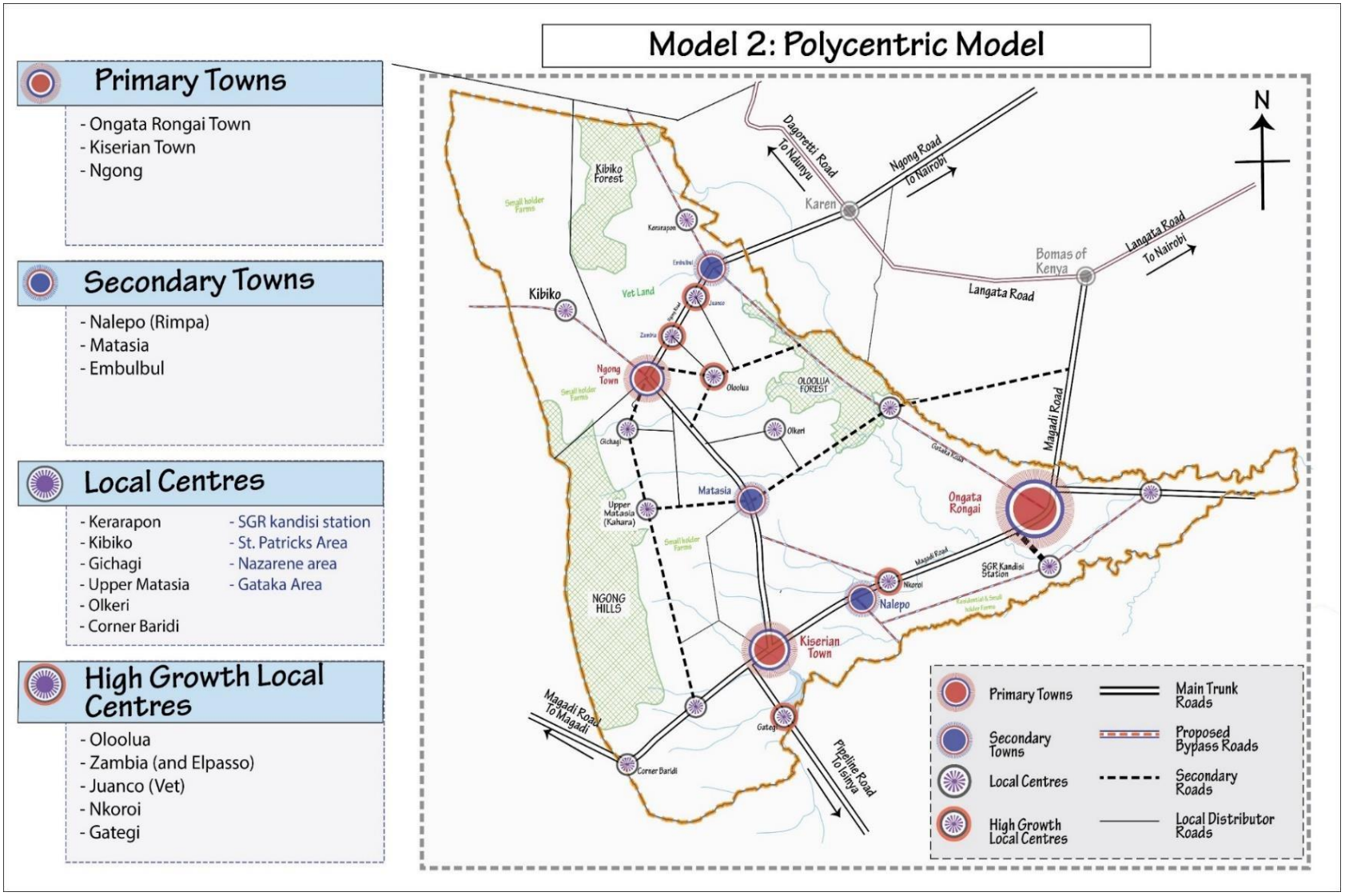


Figure 5-6: Polycentric model

Source: VisionRI

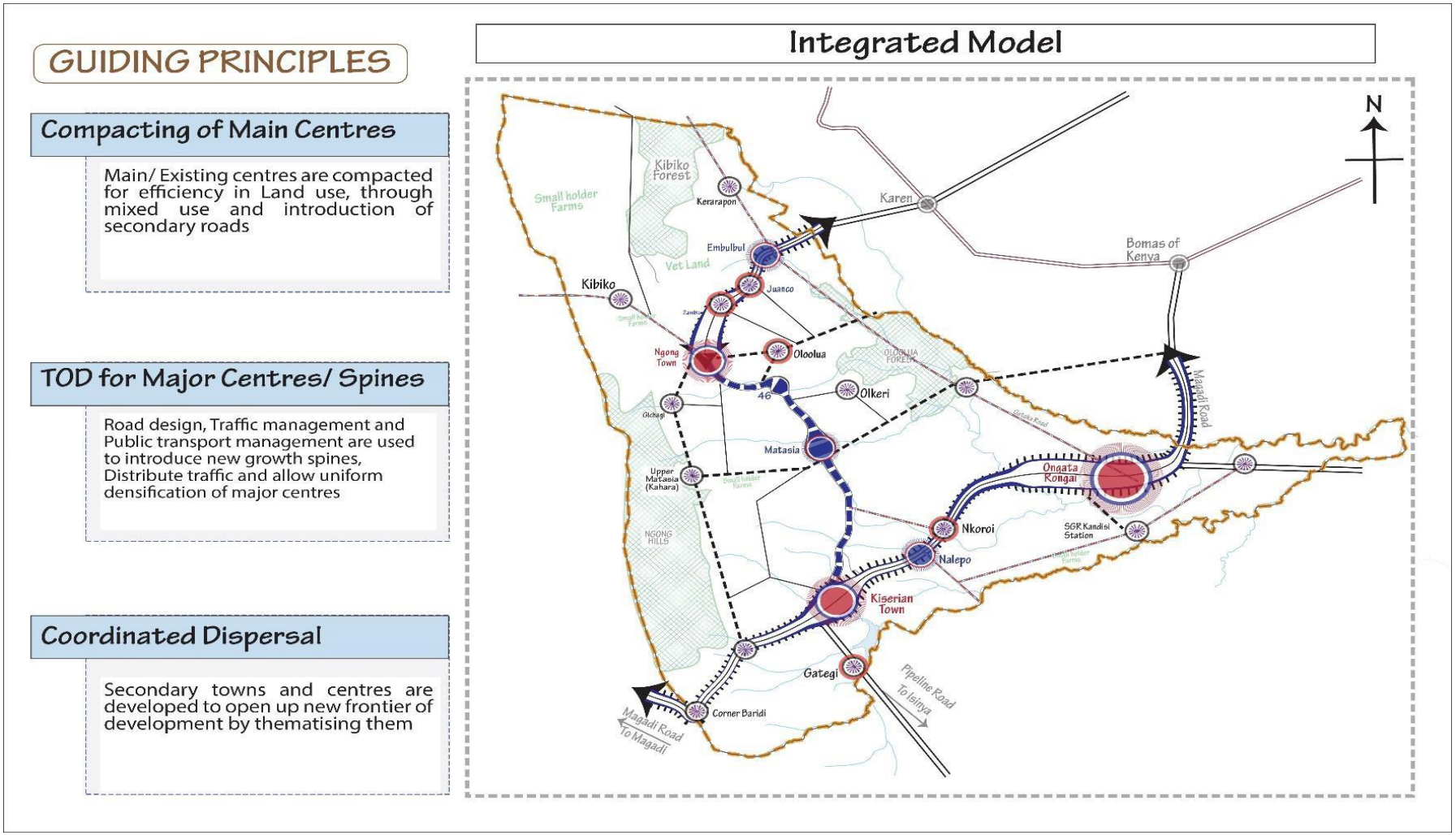


Figure 5-7: Integrated model

Source: VisionRI

6. PROPOSED DEVELOPMENT PLAN

6.1 Introduction

This chapter deals with existing and proposed land use, proposed land use zones and zoning regulation as well as the development control tools and the sectoral plans and policies. It has been prepared after analysing the existing situation of land use, environmental sensitivity, regional setting, demographics, and provision of services, amongst others.

Map 6-1 shows the existing land use in the Municipality. The current land-use patterns show linear development, uncoordinated land uses and lack of a clear delineation of urban areas and growth nodes.

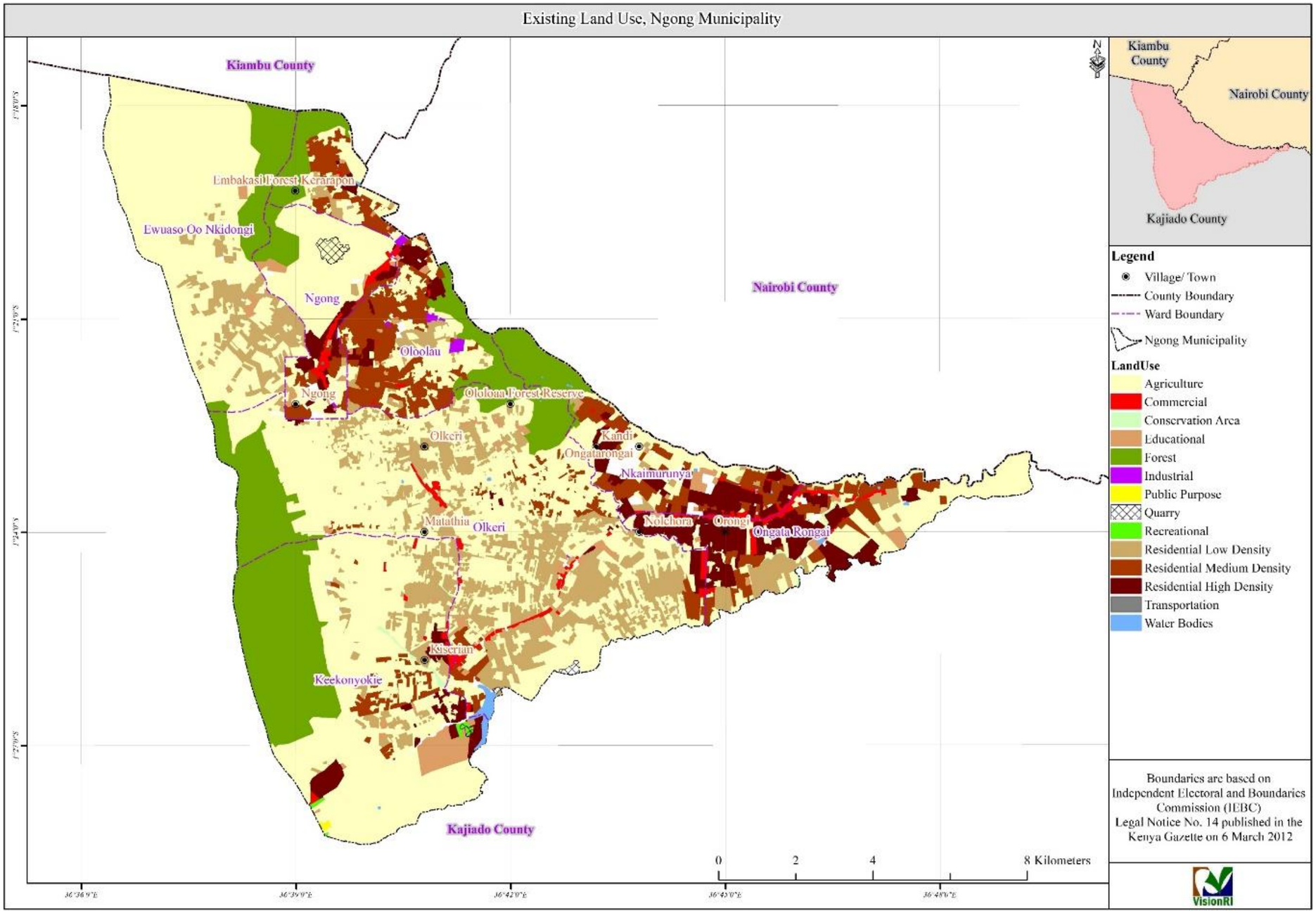
6.2 Proposed Land Uses

The categorisation of the entire Municipality's land uses into the prescribed land uses is important. Urban planning involves the management of space; therefore, the land is an important element in planning. Ngong' Municipality is experiencing high growth to accommodate people, their activities and related infrastructure. This Plan ensures that there is equitable distribution of facilities without disturbance of the ecological balance. A good transportation network, green character, and protection of sensitive areas were considered when proposing the structure plan of Ngong' Municipality. Activity nodes already exist at the satellite towns of the Municipality and provide a balance in the physical, social and economic character of the region.

The existing land uses as proposed should be in harmony and with the clear interrelationship between various activities under the proposed uses. The proposed land uses are fundamentally linked up with an improved and efficient transport system that will be able to cater to future demand.

The integrated model with multiple activities in the multiple nodes is proposed to minimise the number of trips and trip length brought about by a mono-centric model.

The long-term development framework for Ngong' is presented by indicating broad land use classifications, transportation corridors in relation to land uses, and location of utilities and services. It also illustrates that there is no change in the Municipal limit. Therefore, the total area of Ngong' Municipality remains the same.



Map 6-1: Existing Land Use Map

Source: VisionRI

Table 6-1: Land Use Proposals

Land Use	Area (Ha)	Percentage (%)	Proposed area (km²)	Percentage (%)
Agricultural Land	3,784.00	20.95%	6207.13	34.37%
Commercial	207	1.15%	265.51	1.47%
Conservation Area	118	0.65%	220	1.22%
Educational	295	1.63%	567.4	3.14%
Forest	2,694.00	14.92%	2694	14.92%
Industrial	36	0.20%	53.4	0.30%
Public Purpose	46	0.25%	100	0.55%
Public Utility	1	0.01%	1.6	0.01%
Quarry	66	0.37%	0	0.00%
Residential-High-Density	982	5.44%	1,497.47	8.29%
Residential-Low-Density	2,505.00	13.87%	2,505.00	13.87%
Residential-Medium-Density	1,450.00	8.03%	1,870.22	10.36%
Residential-Special-Density	0.00	0.00%	108.47	0.60%
Transportation	705	3.90%	854	4.73%
Undeveloped Land	5,154.00	28.54%	975	5.40%
Water	11	0.06%	33.8	0.19%
Recreational	5	0.03%	106	0.59%
Total	18,059	100.00%	18,059	100.00%

Source: VisionRI

- **Residential land use:** Residential land is the basic unit for projecting and budgeting for the future land requirement. The current residential land use has surpassed the projected residential land use. Consequently, this Plan proposes densification in residential land use and in-fill development to curb leapfrog development commonly depicted through residential establishments in Ngong'. The Plan complements previous plans for Ngong' that earmarked areas for high, medium, and low-density housing areas responding to various housing needs of diverse socio-economic groups. However, the Plan proposes for mixed residential land use at the town centres. The house distribution by typology shall remain as earlier articulated, thus 75% for low income; 25% for middle income; 5% for high income.

- High-Density Residential: The existing high-density residential areas include: Embulbul, Ngong' CBD and Kariobangi in Ngong'; Kware, Tumaini area, Ongata Rongai CBD and Gataka area in Ongata Rongai; and Kiserian CBD in Kiserian town. The high-density residential use has been reduced from 5.44% (982 ha) to 1.85% (334.6 ha) to mitigate sprawl and encourage densification within the urban cores of the towns within the Municipality.

- **Medium Density Residential:** The existing medium density residential areas include: Juanco, Zambia and Oloolua in Ngong'; Olekasasi area; and existing area in Ongata Rongai. The medium density residential area has also been reduced from 8.13% (1450 ha) to 6.26% (1131 ha). This is to ensure that the areas classified as such attain the plot

coverages and ratios stipulated through densification since there is a tendency in the Municipality for development to fall below the proposed ratios.

- **Low-Density Residential:** Low-density residential developments include Kerarapon, Upper Matasia, Nkoroi, and Acacia. The low-density zone has been increased from the existing 13.87% (2505 ha) to 24.53% (4291 ha) to accommodate the increasing demand for single dwelling units. These units will, however, be clustered at specific zones to avoid the sporadic development of units all over the Municipality.

- **Industrial Use:** The current industrial area in Ngong' is 0.20% (36 ha) of the total developed area. This Plan proposes to increase the total percentage to 0.3% (53.4 ha). The only major industrial zone is the Halal Meat Zone and quarrying around Nkaimurunya area. Agro-based industries to support agriculture, horticulture, and floriculture are proposed at Ngong' and Matasia. The proposed increase is in line with the increased need for more processing capacity of the existing light industries. These are industries such as furniture and shoemaking, consumer electronics, home appliances repairing, Jua kali and flour milling amongst others. Light industries have been proposed in at Ngong', Ongata Rongai and Kiserian CBDs as well as Kandisi area. The Plan also proposes compatible light industrial activities such as wood and metal workshops, dry cleaners and printing amongst others within residential areas. The minimum plot size proposed under light industries is 0.05 ha.

- **Commercial Use:** High density and compact commercial areas are proposed at the CBDs and along the proposed TOD at Ngong' road and Magadi road. The existing commercial area is 1.15% of the total developable areas within the Municipality. This area is proposed to decrease to about 0.54% of the total developable area by 2030. This is as a result of the proposed densification of the urban areas to include cluster level shopping areas, neighbourhood shopping, and service centres, sub-sectorial commercial centres, sub-CBDs, and wholesale markets amongst others.

- **Education Use:** The total land occupied by educational facilities is 1.64% of the Municipality's land area. Educational facilities are proposed within the residential areas and the CBD which will comprise of mixed land uses. Most of the educational facilities are accommodated within residential and commercial land use zones. Any major subdivision scheme of 10 acres and above will be required to provide public facilities of at least 8% of the total area. These public facilities will include but not limited to educational facilities.

- **Public Purpose:** The current area under public purpose is 0.26% and is expected to rise to 0.55% by the year 2030. The Plan aims to improve wellbeing to create strong, inclusive communities. Growing communities will have better access to jobs and economic opportunities, good transport, and social infrastructure, healthy natural and built environments and will find it easy to get to services, the arts, cultural and recreational activities. The provision of various social services will also be upgraded to meet the demands of the growing population. This will include various social services such as health facilities, social halls, and vocational centres. The public purpose of land use will be integrated with residential and commercial developments.

- **Public Utility Use:** New proposed facilities such as sewer treatment plants, solid waste recycling centres amongst others will cause the land under public utilities to increase from the current provision. The increase will, however, be based on the surveyed areas on the ground that are best suited for the provision of these services.

- **Transportation Use:** The hierarchy of the road network system in the Municipality is composed of major arterials, minor/secondary/principal arterials, major collectors, minor collectors, and local streets. The roads of all classes, arterials, collectors and local streets, are to be fully integrated with NMT facilities. Given the type of soil and the windy conditions in the Municipality, it is proposed that all roads, as well as the NMT facilities, be paved. Indigenous trees that are adaptable to the soil and climatic conditions in the area should also be planted in all open spaces, especially next to the roads and transport facilities to the heavy dust pollution. The major junctions should have roundabouts which are useful in preserving land for future expansion, to facilitate the efficient flow of traffic. The total area occupied by transportation will thus increase from the current 3.9% to 4.73 % by the year 2030 to cater for the rapid growth in road transport and expansion of existing roads.

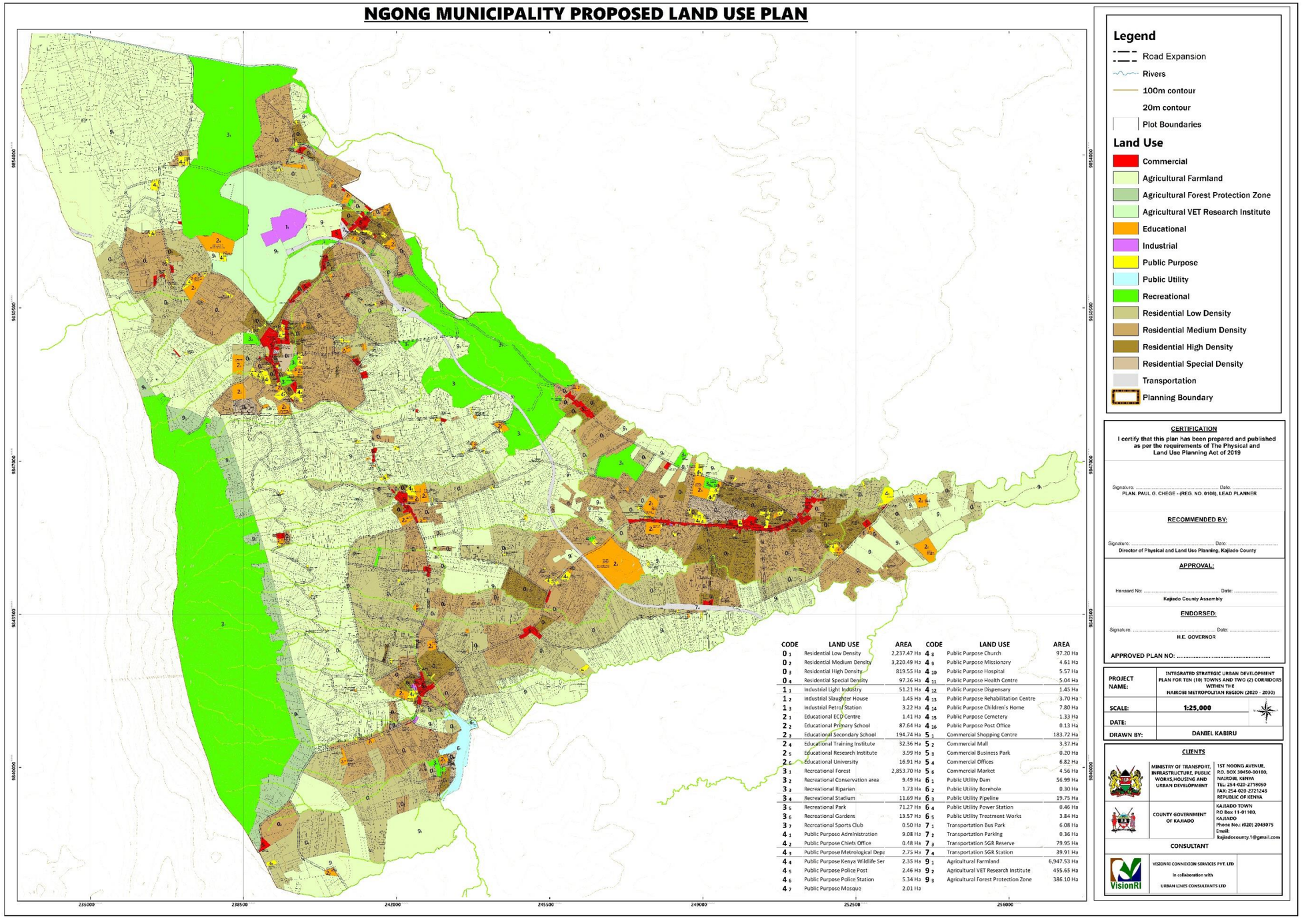
- **Recreational Use:** Recreational facilities account for 0.03% (5 ha) of developable area. The existing recreational facilities are mostly used for relaxing, hiking and games. The level of demand for recreational facilities is thus very high. For sufficient provision of recreational facilities by the year 2030, this Plan has provided 0.59% (106 ha) of developable land.

- **Agriculture Use:** This Plan proposes agricultural land uses at Kibiko, Kiserian, and Matasia areas. The agricultural land has been expanded to include areas normally perceived as residential areas. These are areas with plot coverages as low as 0.05%.

  These areas are highly underutilised and would perform much optimally if supported as agricultural zones. This has resulted in the growth of agricultural zones from 20.95% (3784 ha) to 39.34% (7105 ha). Support facilities including training will be provided within the neighbouring centres of each agricultural zone. The agricultural zones will be restricted to not less than half an acre in subdivision schemes and structures will be limited to two levels (ground plus one). The plot coverages of these zones shall not exceed 50%.

- **Land for Future Development:** The ISUDP proposes to reserve land for future development, which accounts for 5.4% of the total proposed developable land. It has, however, been reduced from the previous 28.54% undeveloped land, the majority of which has gone to the agricultural land mostly in areas of Kibiko.

- **Non-developable Land:** The ISUDP proposes that there shall be no developments in forested areas, riparian reserves, and dam areas. This will include the three forests (Ngong', Kibiko and Oloolua) as well as Kiserian dam. Of special consideration will be the forested areas which are conservation areas and as such should be surveyed, fenced off and allow only for non-destructive recreational activities such as hiking and camping.



Map 6-2: Proposed Land Use Plan

Source: VisionRI

6.3 Proposed Land Use Zones

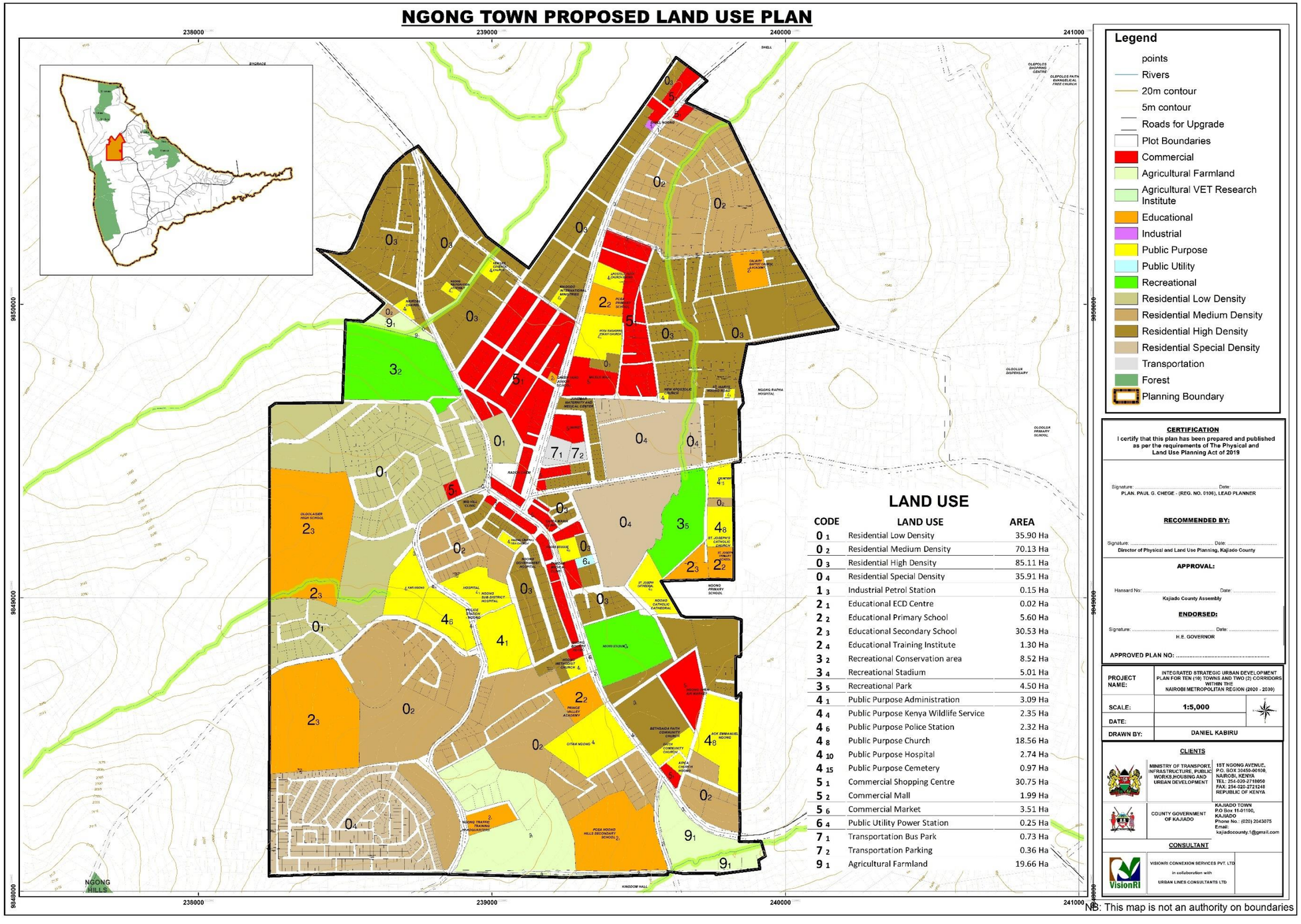
Table 6-2: Proposed Land Use Zones and Regulation

Area	Location	Land use zones	Minimum land size
Oloolua/Veterinary Farm Area	Borders Mbagathi River to the north, Ngong' town to the south, veterinary farm to the west and Oloolua forest to the northeast.	Commercial land use (Oloolua Market Centre); Agricultural; Quarries; Residential (high density); and Public purpose.	0.025 ha - High residential density; 0.045 ha - Medium residential density; and 0.2 ha- Agricultural.
Kerarapon	Borders veterinary farm to the south and Nairobi to the north, Kibiko farm to the west, Oloolua, and Bulbul to the east. It also borders Kiambu County to the northeast.	Public purpose (police post, chief camps); Agricultural; Residential (Low density); Commercial (Kerarapon trading centre); and Public Utility (Kerarapon Water Dam and spring).	0.2 ha – Low residential; and 0.2 ha- Agricultural.
Kibiko	Borders Veterinary Farm on the north, Ngong' town on the east, Keekonyokie and Kibiko farm on the south and west, respectively.	Agricultural; and Residential (low density).	0.2 ha - Low residential; and 0.2 ha- Agricultural.
Upper Matasia	Borders Ngong' hills forest on the southern side, Kiserian to the south-east, Matasia centre to the north and Ngong' town on the western side.	Agricultural; Residential - High density; along Ngong'-Kiserian; Low density; and Commercial (Matasia market centre). Industrial (Agro-based Industries).	0.045 ha - Medium residential density; 0.2 ha - Low residential; 0.025 ha- High residential density; and 0.2 ha- Agricultural.
Lower Matasia/ Nkoroi	Borders river Kandisi to the Northeastern side and Gataka and Oloolua forest to the North, it extends from Olkeri road to the west and Kiserian- Ngong' town road marks the boundary on the southern side. It borders Magadi road to the east.	Residential - Medium density; Low density; Agricultural - Floriculture; and industrial (Agro-based Industries).	0.045 ha - Medium residential density; and 0.2 ha - Low residential.
Kandisi	Extends to Rimpa trading centre on the southern side and Ole Kasasi on the eastern side and Ongata Rongai area on the northern	Residential - Medium density; and Agricultural – Dairy and crop farming.	0.2 ha – Low residential; 0.1 ha- Medium density; and 0.2 ha- Agricultural.

Area	Location	Land use zones	Minimum land size
	side.		
Kiserian	Located on the western foot of the Ngong' Hills.	Residential - Medium density; Agricultural - Livestock; Commercial - (Kiserian; Livestock Market centre); and Industrial (Meat Industry).	0.2 ha - Low residential; and 0.2 ha- Agricultural.
Gataka	Borders Oloolua forest to the east, and Mbagathi River to the south.	Quarries; Residential - High density; Commercial; and Transportation.	0.03 ha- High residential density.
Ngong' Town		Commercial; Conservation; Residential and Public purpose.	0.2 ha - Low residential; 0.1 ha - Medium density; and 0.2 ha - Agricultural.

Source: VisionRI

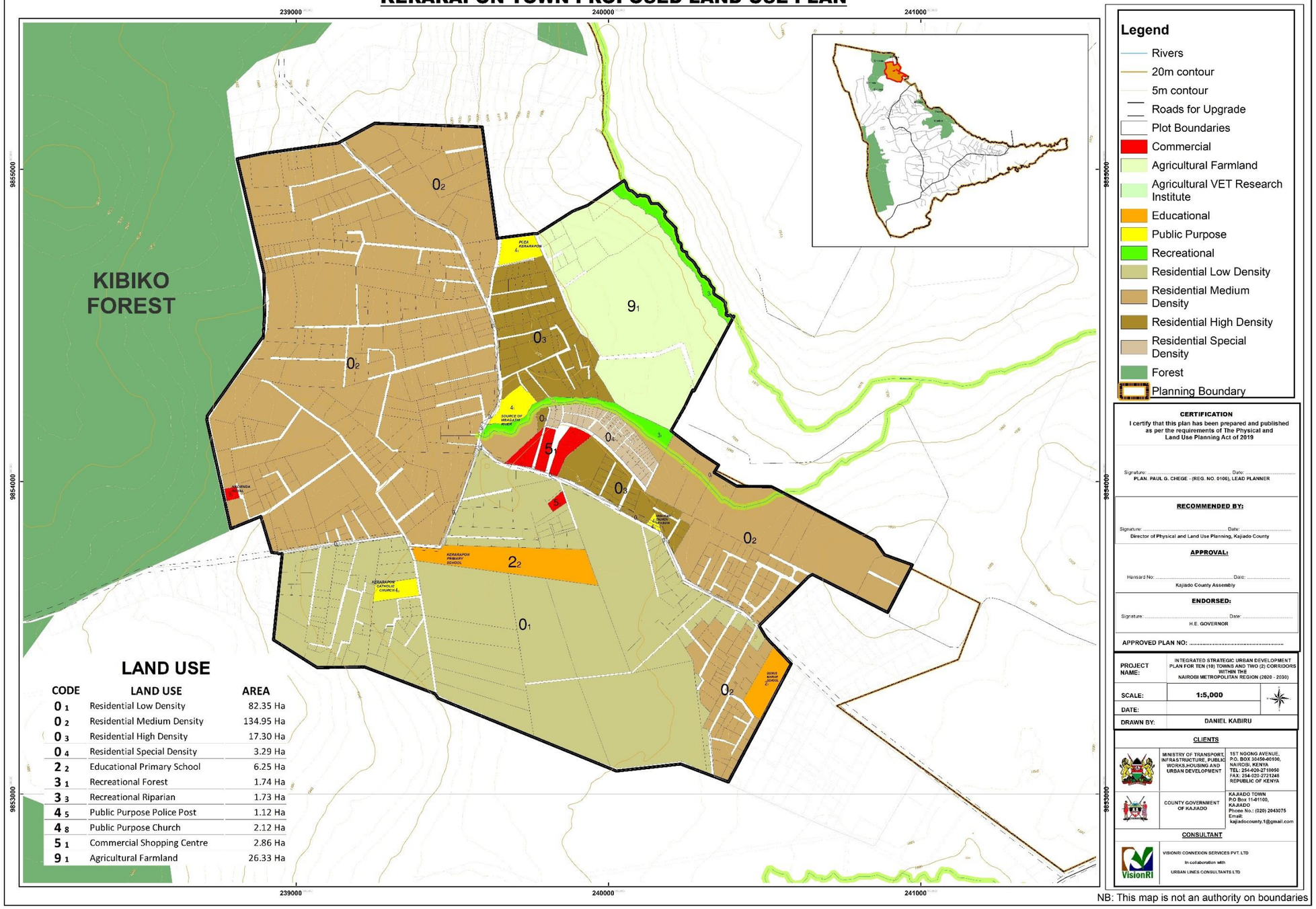
(see attached detailed land use plans for the areas mentioned above in Table 6.2)



Map 6-3: Ngong' Town Proposed Land Use Plan

Source: VisionRI

KERARAPON TOWN PROPOSED LAND USE PLAN



LAND USE

CODE	LAND USE	AREA
0_1	Residential Low Density	82.35 Ha
0_2	Residential Medium Density	134.95 Ha
0_3	Residential High Density	17.30 Ha
0_4	Residential Special Density	3.29 Ha
2_2	Educational Primary School	6.25 Ha
3_1	Recreational Forest	1.74 Ha
3_3	Recreational Riparian	1.73 Ha
4_5	Public Purpose Police Post	1.12 Ha
4_8	Public Purpose Church	2.12 Ha
5_1	Commercial Shopping Centre	2.86 Ha
9_1	Agricultural Farmland	26.33 Ha

CERTIFICATION
I certify that this plan has been prepared and published as per the requirements of The Physical and Land Use Planning Act of 2019

Signature: ..... Date: .....
PLAN. PAUL G. CHEGE - (REG. NO. 0106), LEAD PLANNER

RECOMMENDED BY:

Signature: ..... Date: .....
Director of Physical and Land Use Planning, Kajiado County

APPROVAL:

Hansard No: ..... Date: .....
Kajiado County Assembly

ENDORSED:

Signature: ..... Date: .....
H.E. GOVERNOR

APPROVED PLAN NO: .....

PROJECT NAME:	INTEGRATED STRATEGIC URBAN DEVELOPMENT PLAN FOR TEN (10) TOWNS AND TWO (2) CORRIDORS WITHIN THE NAIROBI METROPOLITAN REGION (2020 - 2030)
SCALE:	1:5,000
DATE:	
DRAWN BY:	DANIEL KABIRU

CLIENTS

MINISTRY OF TRANSPORT, INFRASTRUCTURE, PUBLIC WORKS,HOUSING AND URBAN DEVELOPMENT	1ST NGONG AVENUE, P.O. BOX 30450-00100, NAIROBI, KENYA TEL: 254-020-2719050 FAX: 254-020-2721246 REPUBLIC OF KENYA
COUNTY GOVERNMENT OF KAJIADO	KAJIADO TOWN P.O Box 11-01100, KAJIADO Phone No.: (020) 2043075 Email: kajiadocounty.t@gmail.com

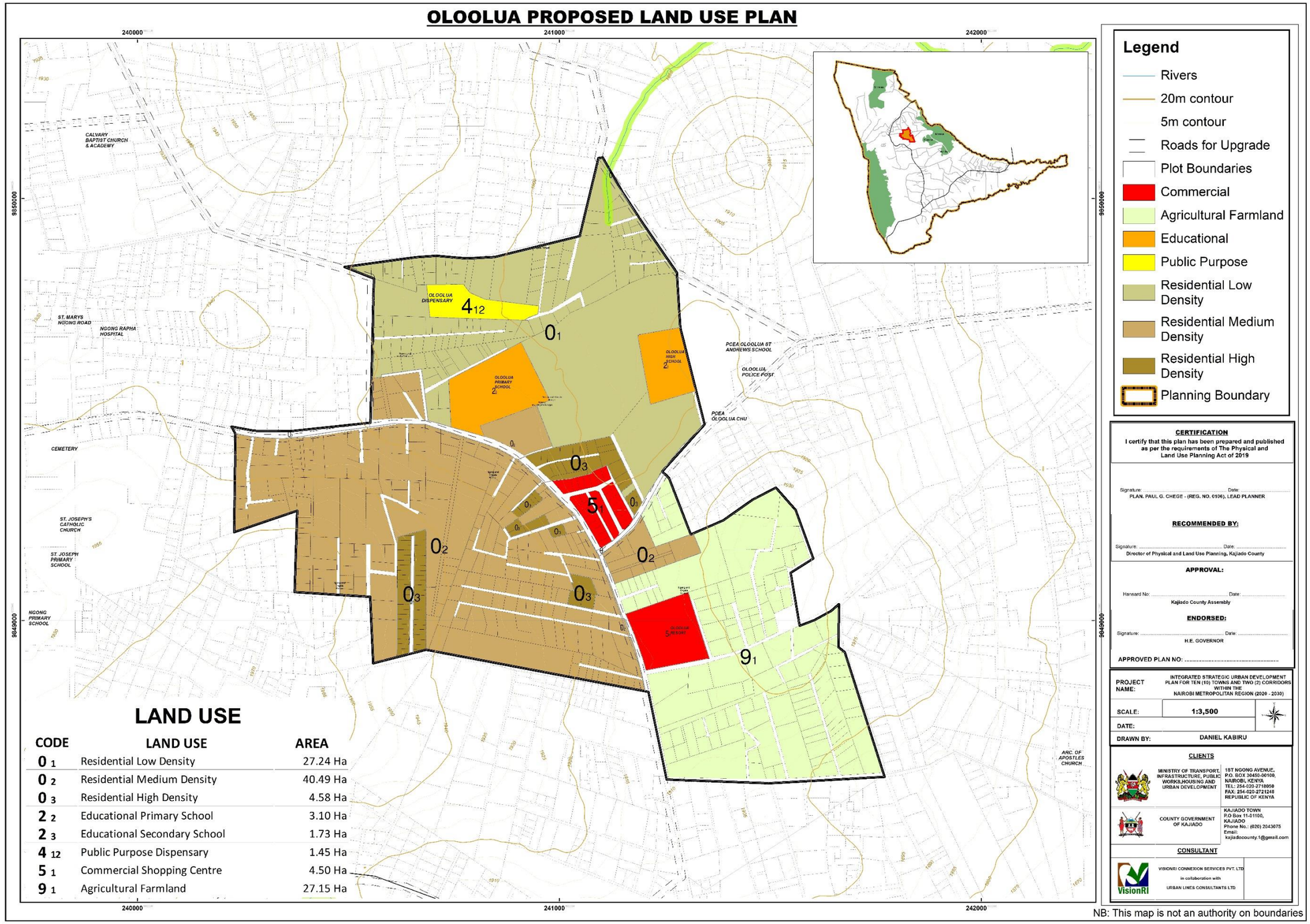
CONSULTANT

VISIONRI CONNEXION SERVICES PVT. LTD
In collaboration with
URBAN LINES CONSULTANTS LTD

NB: This map is not an authority on boundaries

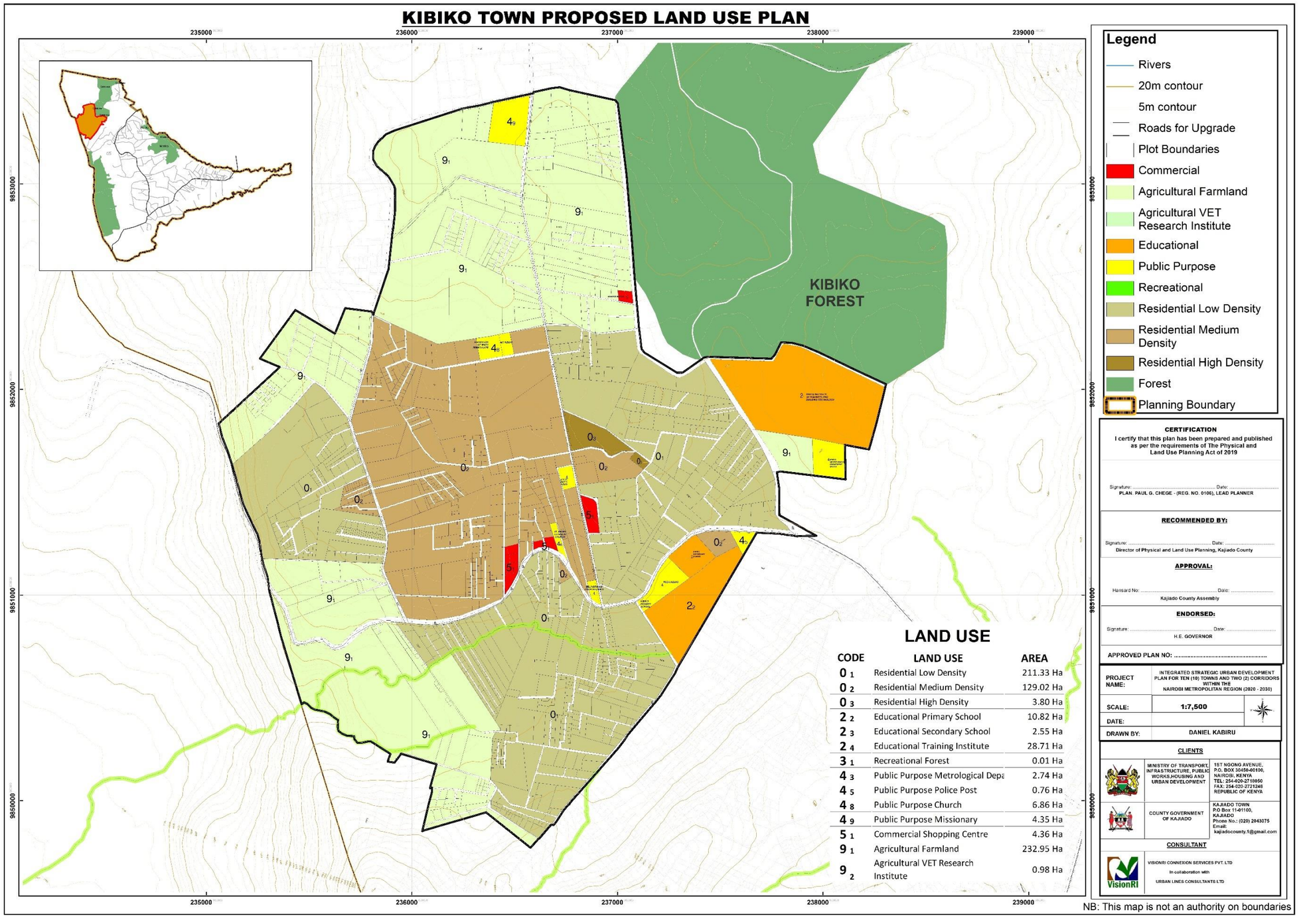
Map 6-4: Kerarapon Town Proposed Land Use Plan

Source: VisionRI



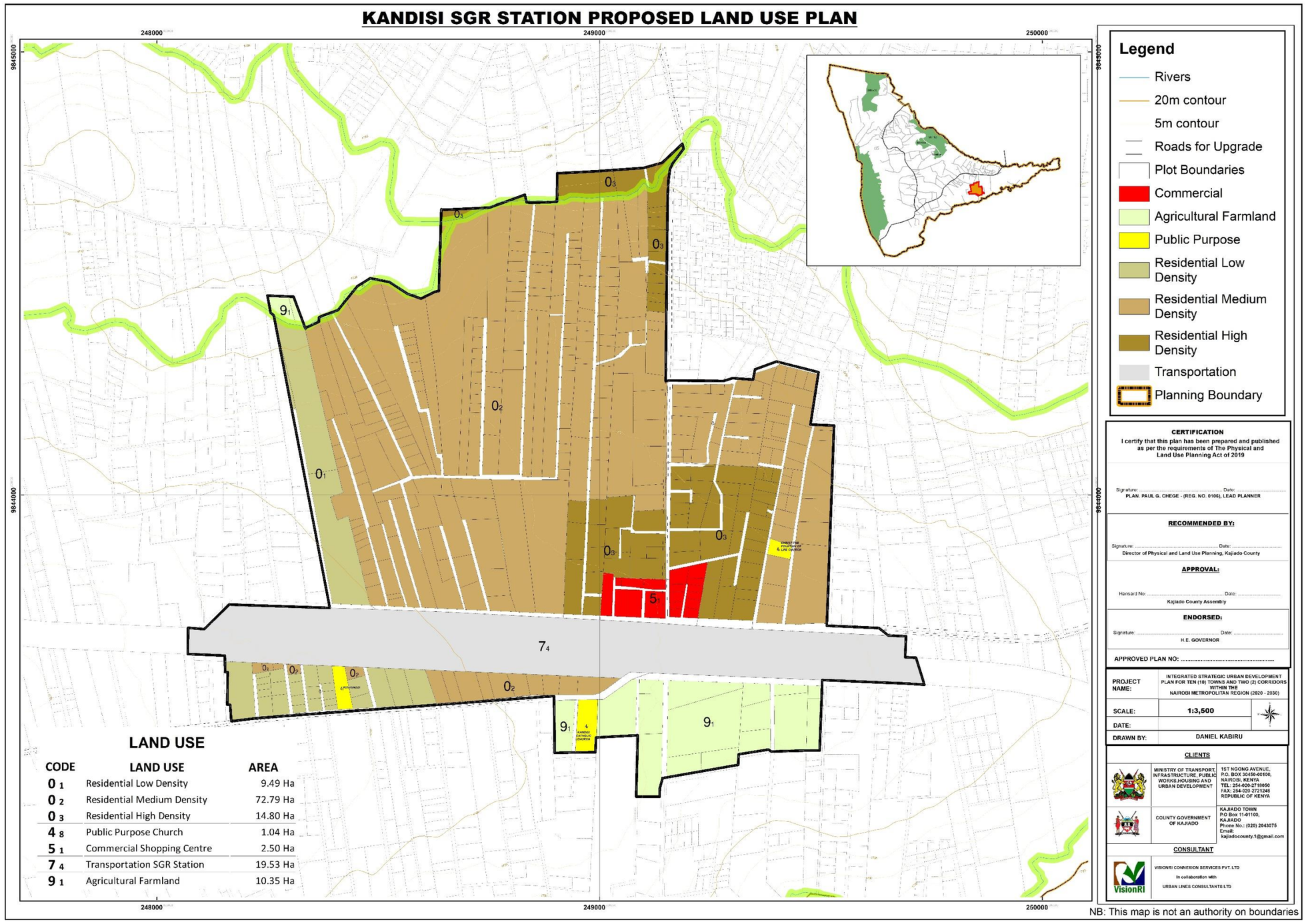
Map 6-5: Oloolua Proposed Land Use Plan

Source: VisionRI



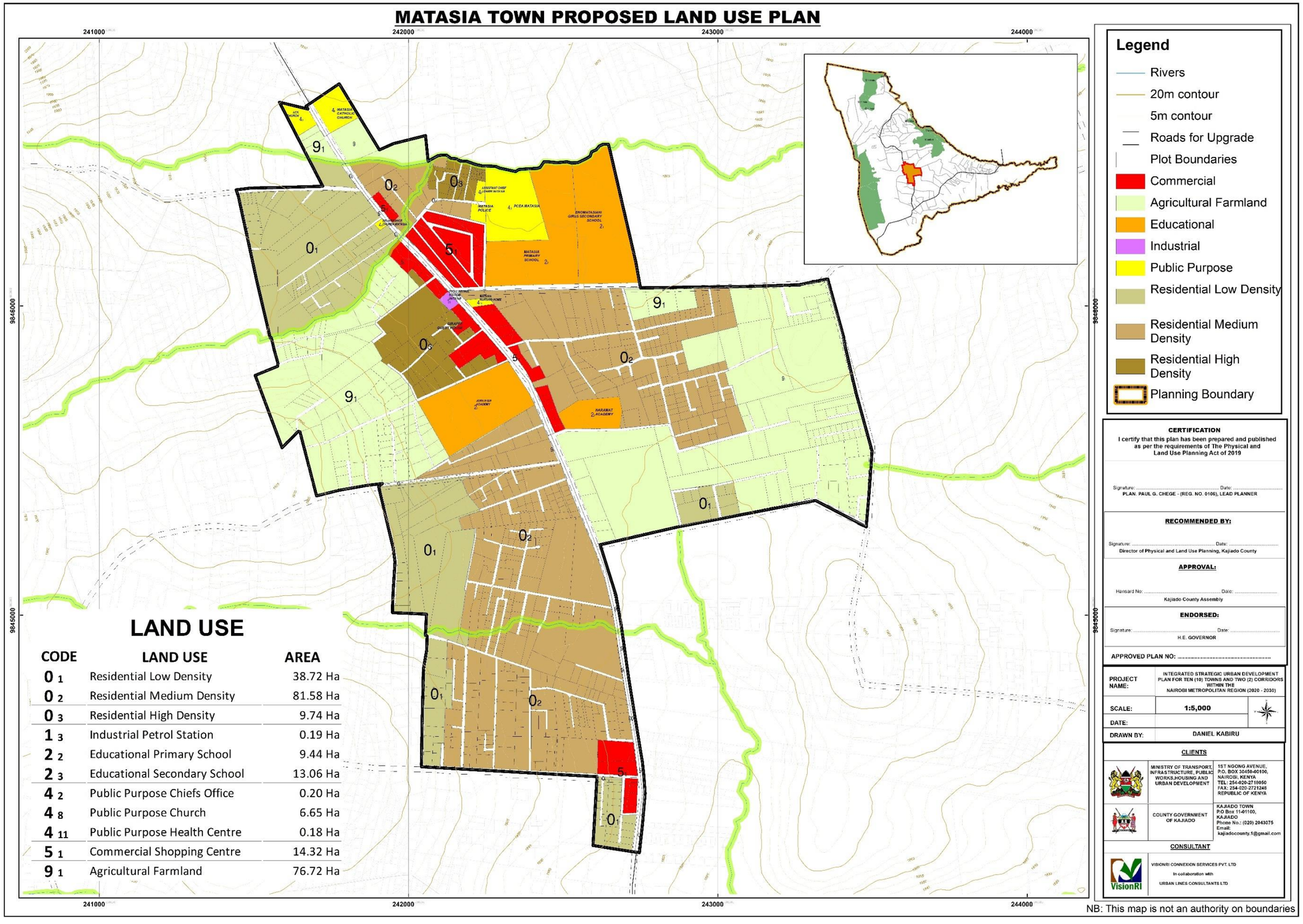
Map 6-6: Kibiko Town Proposed Land Use Plan

Source: VisionRI



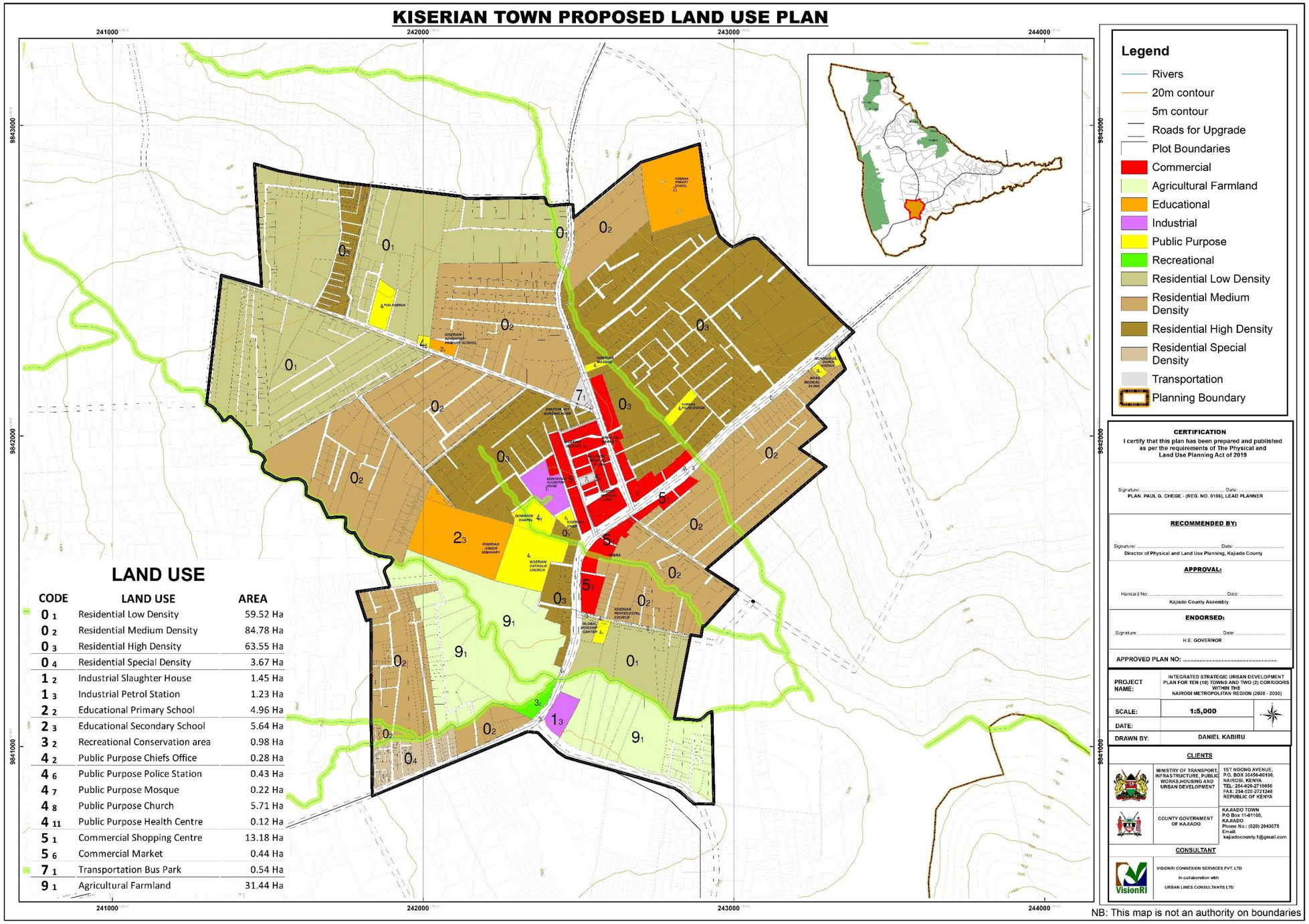
Map 6-7 Kandisi SGR Station Proposed Land Use Plan

Source: VisionRI



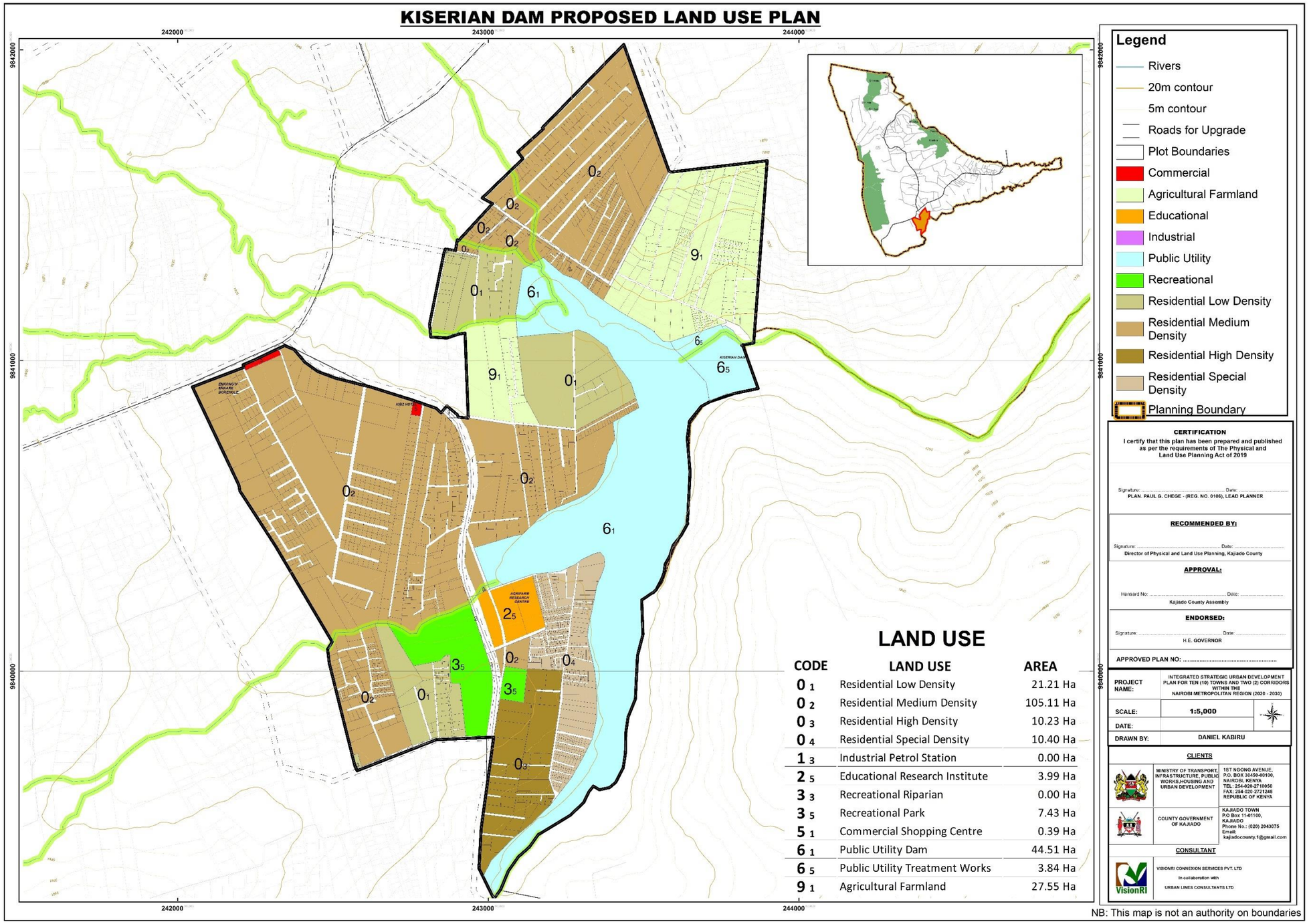
Map 6-8: Matasia Town Proposed Land Use Plan

Source: VisionRI



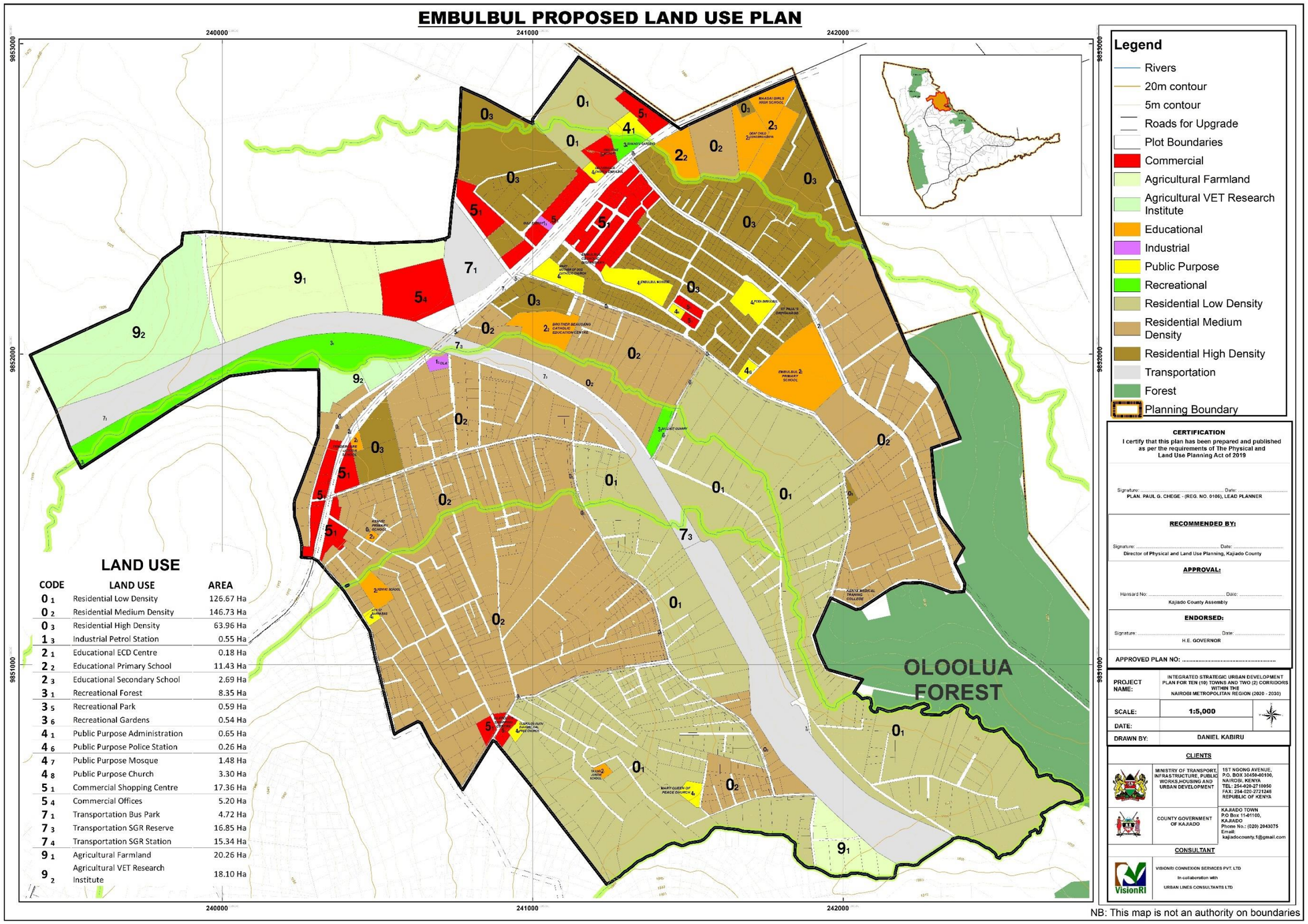
Map 6-9: Kiserian Town Proposed Land Use Plan

Source: VisionRI



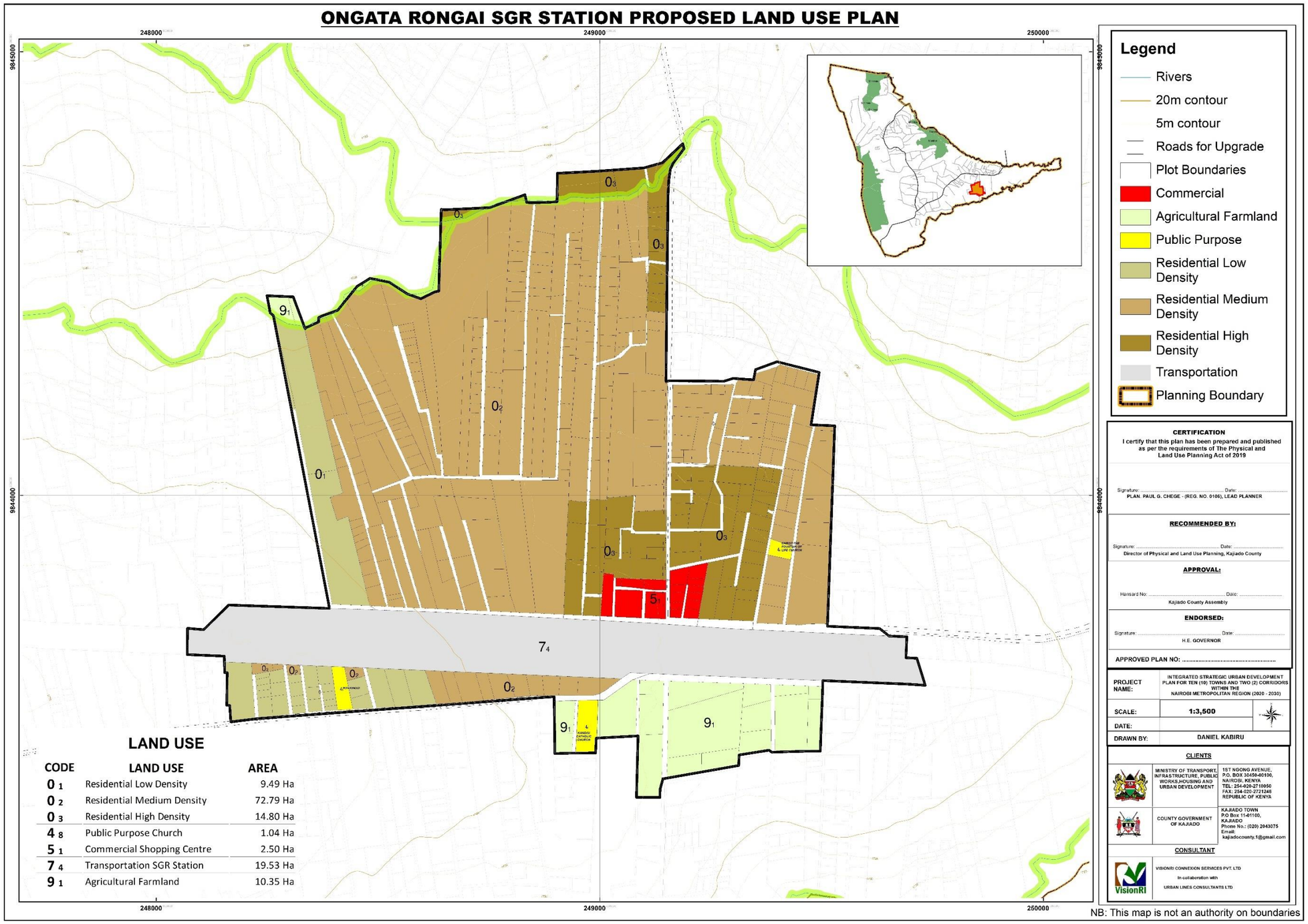
Map 6-10: Kiserian Dam Proposed Land Use Plan

Source: VisionRI



Map 6-11: Embulbul Proposed Land Use Plan

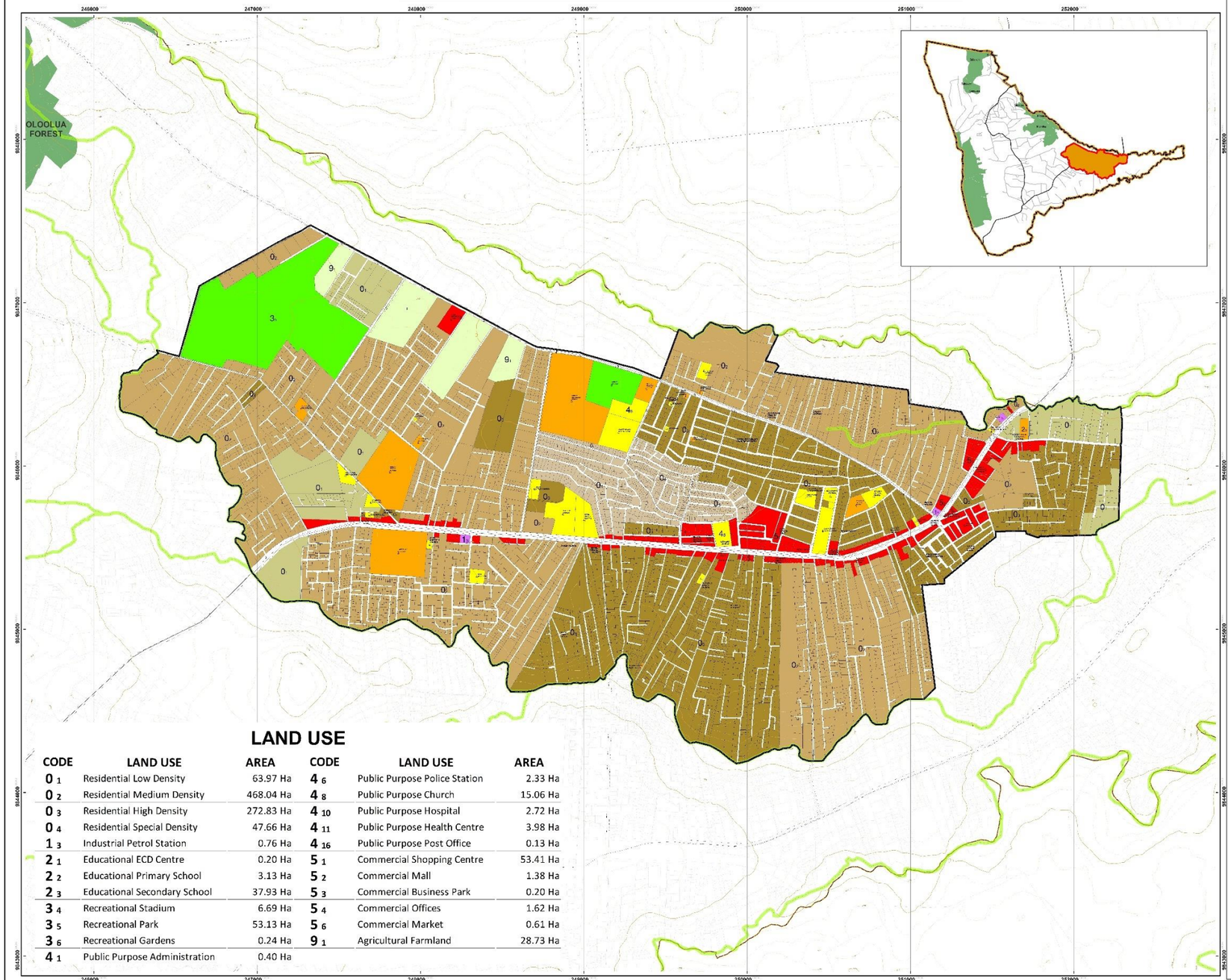
Source: VisionRI



Map 6-12: Ongata Rongai SGR Station Proposed Land Use Plan

Source: VisionRI

ONGATA RONGAI TOWN PROPOSED LAND USE PLAN



LAND USE

CODE	LAND USE	AREA	CODE	LAND USE	AREA
0 1	Residential Low Density	63.97 Ha	4 6	Public Purpose Police Station	2.33 Ha
0 2	Residential Medium Density	468.04 Ha	4 8	Public Purpose Church	15.06 Ha
0 3	Residential High Density	272.83 Ha	4 10	Public Purpose Hospital	2.72 Ha
0 4	Residential Special Density	47.66 Ha	4 11	Public Purpose Health Centre	3.98 Ha
1 3	Industrial Petrol Station	0.76 Ha	4 16	Public Purpose Post Office	0.13 Ha
2 1	Educational ECD Centre	0.20 Ha	5 1	Commercial Shopping Centre	53.41 Ha
2 2	Educational Primary School	3.13 Ha	5 2	Commercial Mall	1.38 Ha
2 3	Educational Secondary School	37.93 Ha	5 3	Commercial Business Park	0.20 Ha
3 4	Recreational Stadium	6.69 Ha	5 4	Commercial Offices	1.62 Ha
3 5	Recreational Park	53.13 Ha	5 6	Commercial Market	0.61 Ha
3 6	Recreational Gardens	0.24 Ha	9 1	Agricultural Farmland	28.73 Ha
4 1	Public Purpose Administration	0.40 Ha			

Legend

- Rivers
- 20m contour
- 5m contour
- Roads for Upgrade
- Plot Boundaries
- Commercial
- Agricultural Farmland
- Educational
- Industrial
- Public Purpose
- Recreational
- Residential Low Density
- Residential Medium Density
- Residential High Density
- Residential Special Density
- Forest
- Planning Boundary

CERTIFICATION

I certify that this plan has been prepared and published as per the requirements of The Physical and Land Use Planning Act of 2019

Signature:..... Date:.....

PLAN. PAUL O. CHEGE - (REG. NO. 0196), LEAD PLANNER

RECOMMENDED BY:

Signature:..... Date:.....

Director of Physical and Land Use Planning, Kajiado County

APPROVAL:

Hansard No:..... Date:.....

Kajiado County Assembly

ENDORSED:

Signature:..... Date:.....

H.E. GOVERNOR

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SCALE:	1:7,500
DATE:	
DRAWN BY:	DANIEL KABIRU

CLIENTS

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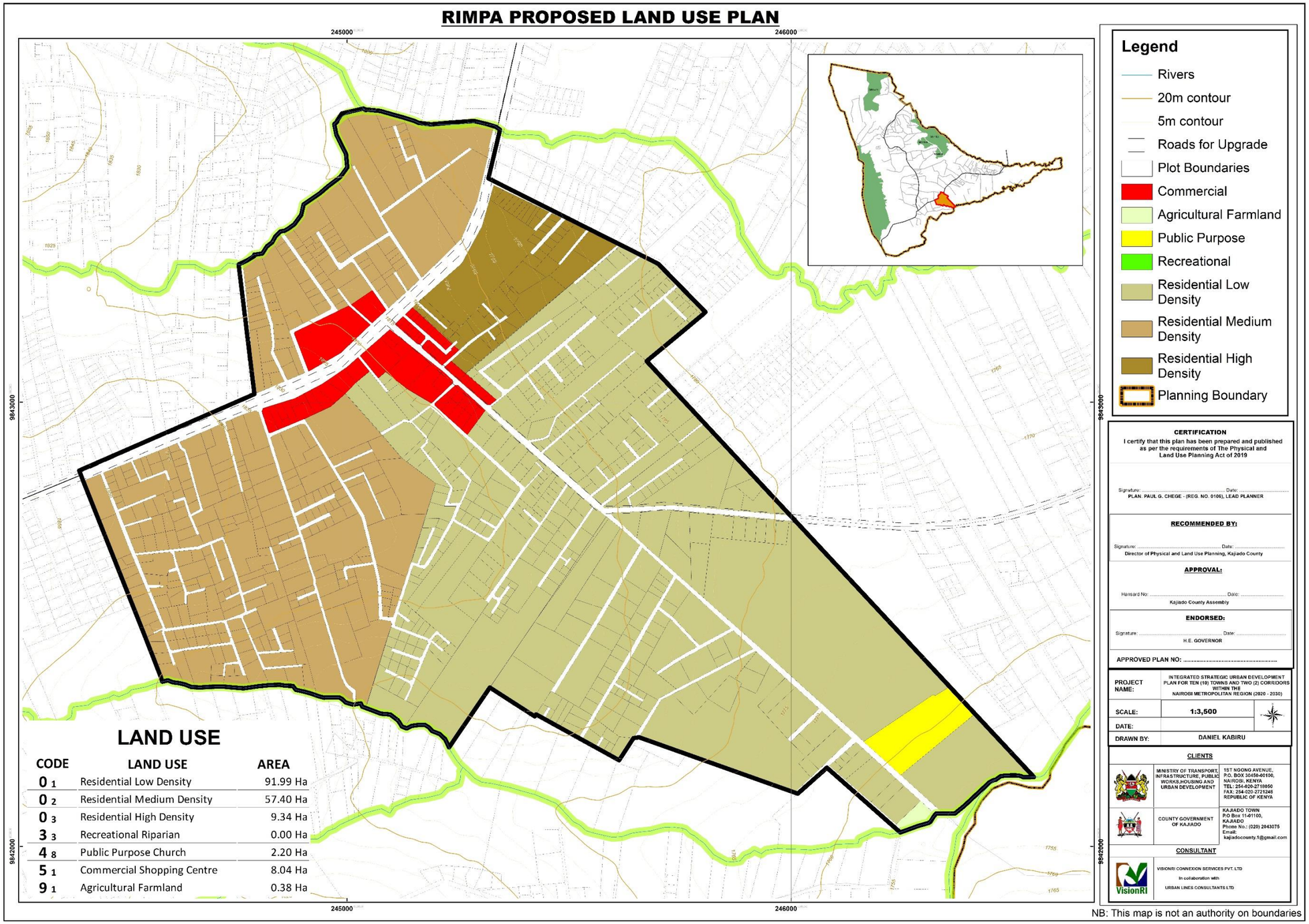
CONSULTANT

VISIONRI CONNEXION SERVICES PVT. LTD
in collaboration with
URBAN LINES CONSULTANTS LTD

NB: This map is not an authority on boundaries

Map 6-13: Ongata Rongai Town Proposed Land Use Plan

Source: VisionRI



Map 6-14: Rimpa Proposed Land Use Plan

Source: VisionRI

6.4 Land Use Zoning Regulations

6.4.1 Permitted, conditional and prohibited land use

Table 6-3: Permitted, Conditional and Prohibited Land Use

Land Use Zone	Permitted use	Prohibited land use	Conditional land use
Residential	• Residential dwellings such as bungalows, maisonette, multi-family dwellings (multi-storey flats/apartments), townhouses (detached, semi-detached); • residential-cum-commercial; • Daycare centres and kindergartens Hostels, old age homes, community halls, police posts, guesthouses (not exceeding 200 square meters in floor area); • Educational centres and libraries; • Corner shops and shopping centres; • Health facilities (dispensaries, nursing home, etc.); • Religious institutions; • Gymnasium, recreational grounds and playgrounds; • Bus stops and boda-boda sheds; • ATMs; and • Exhibition and art galleries.	• Sewage treatment plant and water treatment plant; • Solid waste dumpsites; • Slaughterhouses; • Heavy, large and extensive industries, i.e., noxious and hazardous industries; • Warehousing, storage go-downs of perishables, hazardous and inflammable goods; • Workshops/garages for motor vehicles-Matatus/Boda-Boda/buses; • Hospitals treating contagious diseases (e.g., tuberculosis); and • Prisons and garrison barracks.	• Cemeteries; • Clubs, hotels, and restaurants; • Petrol pumps; • Garages; • Bakeries; • Storage of LPG gas cylinders; • Informal and weekly markets (if not obstructing traffic circulation and open during non-working hours); • Mobile towers; • Fire stations; • Printing presses and auditoriums; and • Public utility buildings like electrical distribution depot, water/sewerage pumping stations, waterworks.
Commercial	• Wholesale and retail shops and stores, markets, advertisements, and	• All commercial business uses and manufacturing establishments obnoxious or hazardous nature by reason of odour, effluent, dust smoke,	• Sale of explosive obnoxious products and other materials likely to cause health hazards; and

Land Use Zone	Permitted use	Prohibited land use	Conditional land use
	merchandise, excluding not exceeding an area of 1000 m^2; • Assembly halls, colleges, reading rooms, higher educational technology and research institutions; • Petrol filling stations and service stations Business offices, banks and other commercial and financial institutions occupying a floor area not exceeding 1000 m^2; • Service establishments and commercial uses using electric motors not exceeding 20 H.P and/or employing not more than 20 workers; • Automobile showrooms and workshops with permission of parking vehicles occupying a site area not exceeding 200 m^2; and • Warehouses, repositories, and other uses connected with storage or wholesale trade occupying a floor area not exceeding 1000 m^2 but excluding storage of explosive or products, which are either obnoxious or likely to cause health hazards.	gas, vibration, noise, etc. or otherwise likely to cause danger or nuisance to public health or amenity; • Government offices, business offices, and other financial institutions without limitations of floor area; • Commercial and entertainment centres, sports stadium, recreation complexes, research experimental or testing laboratories not involving danger of fire explosive, or health hazards; • Organised parking, tot lots, multi-storey parking, bus terminal and depot, transport terminals, motor garage, and workshops; • Educational, technical and research institutions; and • Garment industries irrespective of the number of persons employed where authority is satisfied with its non-objectionable nature based on its performance characteristics.	• Convention centres, trade centres, market centre, travel agencies, agro - tourist centres.
Industrial	• Manufacturing and processing industries; • Slaughterhouses; • Storage warehouse and go-downs; • Sewerage treatment plants; • Industrial research centres;	• Storage of petroleum, timber, explosive, inflammable, and dangerous materials; and • All industries up to 200 H.P where sufficient precautions have been taken to the satisfaction of the Authority to	• All uses not specifically permitted in this zone shall be prohibited; and • All industries of obnoxious and hazardous nature by reasons or odour, effluent,

Land Use Zone	Permitted use	Prohibited land use	Conditional land use
	• Agro-based industry; • All uses permissible in the Commercial Use Zone with the special sanction of the Authority except residential uses; • Residential buildings for security and other essential staff required to be maintained in the premises; and • All industries using electrical power utilizing machinery not exceeding • 100 H.P.	eliminate noxious or dangerous effluents.	dust, smoke, gas, vibration, etc. or otherwise likely to cause danger or nuisance to public health or amenity.
Educational	• Assembly halls, colleges, reading rooms, higher educational technology and research institutions.		• All uses not specifically permitted in this zone shall be prohibited.
Recreational	• Parks and open spaces and playgrounds; • Zoological and botanical gardens, nurseries; • Waterfront's development, museums, and memorials; • Open-air theatres, exhibition, circus, fairs, and festival ground; and • Gymnasium, water sports training centre and swimming pool.	• Installation of electric motors not exceeding 5 H.P. may be permitted for pumping water, and gardening purposes; • Transportation terminals, restaurants, motels, auditoriums; and public utilities; • Incidental residential uses for essential staff required to be maintained in the area; • All agricultural uses outside the municipal area; • Cemeteries and crematorium; and • Police post.	• Buildings structures can be permitted but not more than 2% of the total area.

Land Use Zone	Permitted use	Prohibited land use	Conditional land use
Transportation	• Roads, goods shed terminals, bus stops, bus depot, bus terminals, and truck terminals; • Airport, airstrip, and helipad stations; • Cruise landing port, docks, shipping and ferry stations; • Fishing port, Yards, railways and railway stations; • warehouses, storage and container freight stations; and • Petrol filling and service station.	• Hotels, exhibition ground and convention centre; and • All related to the development of the roads and other transport modes including essential housing.	• All uses not specifically permitted in this zone shall be prohibited.
Agriculture	• All agriculture uses such as dairy and cattle farms, fish farms, poultry farms, and stud farms; • Forestry; • Farmhouse, buildings for agricultural activities; and • Storing and drying of fertilisers.	• Residential buildings for growing rural populations or the urban population living below poverty lines; • Parks and playground, camping sites and other recreational uses; • Sewage farms and garbage dumps; • Burial grounds; • Temporary touring cinemas; and • Utility services may be permitted without spoiling the natural features.	• All uses not specifically permitted in this zone shall be prohibited.

Source: Study Team, VisionRI

6.4.2 Building Control Regulations/Standards

The Land Use Zone controls volume, the height of buildings as well as its use under provisions of the Building Standards. These regulations are designed to prevent a mixture of buildings used for different purposes in one area and to ensure a suitable environment for the specific type of land use. The following section presents the building control standards:

- **Residential use:** Residential development shall be guided by the size of the plot, number of dwelling units on each plot, setbacks, plot ratio and the number of storeys/height of the building. The table below shows indicative dwelling unit sizes.

Table 6-4: Building Control Regulations/Standards for Residential Land Use

Number of Rooms	Dwelling Units Size (sqm)
One Bedroom	40-50 (45)
Two Bedroom	60-70 (65)
Three Bedroom	80-120 (100)
Four Bedroom	130-180 (160)
Five Bedroom	190-240 (220)

Source: Physical Planning Handbook

- **Density of Development:** Density in development may be defined by population size, plot coverage and the number of dwelling units. The level of density is determined by the availability of services such as water, sewerage, size of roads, etc and the zoning recommended. In recommending gross residential densities care should be taken that they create in spatial and functional meaning an independent system of the built-up area (both multi-family and one-family dwelling units) well provided with day-to-day services, recreation, and communication network for controlling the intensity of development. The table below presents a range of densities as per Physical Planning Handbook 2009, which can be adopted. These may be varied depending on the type of waste disposal, availability of piped water, and the level of building technology to be applied.

Table 6-5: Density of Development in the Residential Land Use

Type of dwelling	No. of dwelling per hectare	Space allocation dwelling (m2)
Bungalow detached		
(i) Low density	10	1000
(ii) Medium density	16	500
(iii) High density	35	285
Semi-Detached and Row Housing		
(i) Low density	20	417
(ii) Medium density	32	333
(iii) High density	70	250
Multi-Family Dwellings		
(i) Low density	50	200
(ii) Medium density	60	167.6
(iii) High density	70	142.8
(iv) Special Density	133	75

Source: Physical Planning Handbook

- **Building Lines (set back lines):** This is the minimum distance of a house from the plot boundary. The purpose of building lines is either to achieve a visual effect or reserve certain access to the area of ground. Due to the nature of limited space in informal settlements, a minimum setback of 1.5m is recommended on all sides while a minimum of 2m is recommended for the low-cost housing and 3m for normal housing development.

Table 6-6: Building Lines for Residential Land Use

Type of Residential Development	Minimum Set back of Dwelling from Plot Line (m)		
	Front	Side	Rear
Slum rehabilitation and upgrading schemes	1.5	1.5	1.5
Low-cost housing	2	1.5	1.5
Normal housing development	3	1.5	3.0

Source: Physical Planning Handbook

- **Distance between Buildings:** The distance between any two dwellings, front to front, across a street, walk or common area shall be not less than equal to the total height of the taller building. The number of dwelling units or plots to be served by a street shall determine the street width where one to 30 plots will have 9m street width, 31 to 60 a 12m street width. The minimum street width for a given number of plots may be indicated as shown in the table below.

Table 6-7: Minimum Street Width Per Given Number of Plots

Number of Plots	Street Width
1 to 30	9 m
31 to 60	12 m
Or	
Up to 500 m length	9 m
501 to 750 m length	12 m
751 to 1000 m length	18 m
1001 m or more length	24/30 m

Source: Physical Planning Handbook

- **Plot Coverage and Plot Ratios:** The essence of fixing plot coverage is to ensure a healthy environment and allow for expansion and improvement of infrastructural facilities and social amenities. The recommended plot size, coverage and ratio are shown in the table below.

Table 6-8: Plot Ratios and Plot Coverage

Particulars	Minimum Plot size (Ha)	Maximum Plot Coverage %	Plot Ratio
Low density bungalow	0.2	50	1.3
Low density mansionette	0.2	50	1.3
Medium-density bungalow and mansionette Multi-family	0.045	65	1:3

Particulars	Minimum Plot size (Ha)	Maximum Plot Coverage %	Plot Ratio
dwelling		65	1.4-1.6
High density	0.03	70	1:4 -1.6
Multi-family dwelling	0.025	70	1:4- 1.6

Source: Physical Planning Handbook

- **Residential Apartments:** Construction of Apartments on a plot having five or more Apartments in number with common services shall be permitted on the following conditions:

  - The minimum plot size shall be 1500 m^2;
  - The road shall not be less than 12 metres abutting the plot and in case of existing plot in built-up areas 9-meter road shall be the minimum requirement;
  - The minimum coverage of the plot shall not be more than 40%; and
  - The minimum space for the recreational purpose shall not be less than 10 % of the plot area.

- **Industrial development:** The following controls shall guide the development of industries:

  - The industrial area should have an access/approach from major roads;
  - The industrial estate shall have minimum 20-25% of the area reserved for the following facilities;
  - Sub fire station, banks, petrol pump, restaurants;
  - Police station, waste disposal dumping yard, truck terminal, parking area, taxi stand, etc.;
  - Industrial area centre (the commercial centre) to accommodate commercial and other facilities, showrooms, etc.;
  - Electric substation, water supply tank, common effluent treatment plant, etc.;
  - Other facilities such as recreational club, associations, community hall, medical centre, Administrative block, and other allied common facilities;
  - New industrial estate should be located on the main roads or secondary roads;
  - Heavy industries shall not be located within the residential areas;
  - No road within the industrial estate shall be less than 9 to12 m wide;
  - There should be a minimum 10-15% of the area for landscaping and developed as park and buffers (organised open space);
  - Minimum 10m wide buffer should be provided all along the industrial area with tree plantation; and
  - One car space parking per 100 m^2 floor area be provided.

  The size of plots, plot ratio and setbacks permissible in industrial estates are given in the table below.

Table 6-9: Requirements of Industrial Plots

Type	Existing Development	Min Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. of floors allowed	Minimum Setback		
						Front	Side	Rear
Light Industry	Light industries and/or vacant	0.05	75	1:1	2.00	6	3	3
Medium Industry	Medium industries and/or vacant	2	50	1:1	2.00	9	6	4.5
Heavy Industry	Large industries and/or vacant	20	30	1:0.6	2.00	12	6	9
Slaughterhouse	Existing slaughterhouse and/or vacant	2	40	1:0.8	2.00	9	9	4.5

Source: Physical Planning Handbook

- **Educational use:** The size of plots, plot ratio and setbacks permissible in educational plots are given in the table below. The primary schools are proposed to have a minimum plot size of 1.2 ha, secondary schools 3.4 ha while special schools and youth polytechnic will have 3.5 ha. The university will have the largest plot size under educational land use at 50 ha.

Table 6-10: Requirements of Educational Plots

Type of use proposed	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. of floors allowed
Primary schools	1.2	25	1: 0.5	Ground Plus 1
Secondary schools	3.4	30	1: 0.9	Ground Plus 2
Special schools	3.5	30	1: 0.6	Ground Plus 1
Youth polytechnic	3.5	30	1: 0.6	Ground Plus 1
Research institute	10	20	1: 0.8	Ground Plus 3
University	50	10	1: 0.4	Ground Plus 3
Engineering College, National Polytechnic	10	20	1: 0.8	Ground Plus 3
Medical training college	10	20	1: 0.8	Ground Plus 3
Management training/ teachers training institute	5	30	1: 1.2	Ground Plus 3

Source: Physical Planning Handbook

- **Health facilities:** The existing and proposed health facilities will have minimum plot sizes, plot ratio and setbacks as given in the table below. The minimum plot size of a Sub-County referral hospital will be 8 ha and 4 ha for a district-level hospital. The dispensary will occupy the least plot size under health facilities at 0.5 ha however there will be several of these.

Table 6-11: Requirements of Plots under Health Services

Type of use proposed	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. of floors allowed
Sub-County Level -Referral Hospital	8	25	1: 1	4
District level hospital	4	25	1: 0.75	3
Health Centre	2	30	1:0.9	3
Basic health sub-centre/nursing home	1	30	1:0.9	3
Communicable disease hospital	4	25	1:1	4
Dispensary	0.5	40	1:0.8	2
Veterinary hospital	5	30	1:0.6	2

Source: Physical Planning Handbook

- **Public purpose:** Proposed public purpose facilities include an integrated office complex, convention centre, socio-cultural centre, fire station, prison, juvenile home, police station, community centre, and community hall. The size of plots, plot ratio and setbacks permissible in plots under public purpose use are given in the table below.

Table 6-12: Requirements of Plots under Public Purpose

Public Purpose Facility	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. of floors allowed
Integrated office complex	20	25	1:1.5	4-8
Convention centre	10	20	1: 0.8	4
Socio – Cultural centre/ Exhibition cum fair ground	15	10	1:0.2	2
Fire station	0.5	20	1:0.4	2
Prison	16	10	1:0.3	3
Juvenile home	2	25	1:0.75	3
Police station	2	30	1:1.2	4
Rehabilitation centre	0.5	25	1:0.75	3
Sub- Sector level community centre	1	25	1:1.0	4
Community hall	0.3	25	1:1.0	4
Orphanage	1	25	1:0.5	2

Source: Physical Planning Handbook

- **Recreational facilities:** Proposed recreational facilities include a municipal park, amusement park, zoo, sports centres and playgrounds at different levels. The size of plots, plot ratio and setbacks permissible in plots under recreational facilities are given in the table below.

Table 6-13: Requirements of Plots in Recreational Use

Public Purpose Facility	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. of floors allowed
Municipal park	10	1.5	1:0.015	1 (Ground)
Amusement park	10	10	1: 0.2	2 (Ground Plus One)

Public Purpose Facility	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. of floors allowed
Zoo	10	5	1:0.5	1 (Ground)
Integrated sports centre – Municipal Level	30	10	1:0.2	2 (Ground Plus One)
Integrated sports centre –Sector Level	10	10	1:0.2	2 (Ground Plus One)
Sector park	5	1.0	1:0.01	1 (Ground)
Sector playground	5	1.0	1:1.01	1 (Ground)
Stadium	5	10	1:0.2	2 (Ground Plus One)
Cluster park	1	1.0	1:1.01	1 (Ground)
Sub-Sector park hall	2	1.0	1:1.01	1 (Ground)
Sub-Sec playground	2	1.0	1:0.01	1 (Ground)
Cluster playground	1	1.0	1:0.01	1 (Ground)

Source: Physical Planning Handbook

7. SECTORAL PROGRAMMES AND PROJECTS

7.1 Introduction

This chapter provides a summary of the sectorial programmes and projects proposed for the implementation of the Plan. The strategic sector goals were established during the stakeholder's forum and were created according to their aspirations. Sectoral strategies are essential in achieving the desired goals through sustainable utilisation of available resources.

The implementation of the Plan requires the collective efforts of various agencies. The key institutions include County Government of Kajiado Government, various Government ministries, departments and parastatal organisations, neighbourhood associations, other local community groups, landowners and the public.

A timeframe for each Action has been given indicating the expected implementation time, i.e., short term, medium-term or long term:

- Short Term – Short-term Actions are those that are to be implemented zero to two years;
- Medium Term – Medium-term projects and programmes are intended to be achieved between three to five years. In this plan, medium-term actions are set to have been achieved by the year 2023; and
- Long Term – Finally, long-term projects and programmes are those expected to be achieved between six years to ten years.

7.2 Natural Resources and the Environment

The major environmental issues from the situational analysis were water and air pollution, degradation of environmentally sensitive areas, the encroachment of riparian reserves, flooding, deforestation and quarrying Activities at the riverbanks, etc. These challenges will be addressed through the following detailed strategies.

7.2.1 Strategies

Protection of environmentally sensitive areas. The protection of environmentally sensitive areas would be through the following strategies:

- **Protection of riparian reserves:** Riparian reserves in Ngong' have been encroached by buildings and human activities like farming and therefore contribute to the flooding experienced mostly in Kiserian. This strategy involves the creation of a 15 m riparian reserve along Kandisi and Mbagathi rivers that will deter human settlements, farming activities, and developments. The use of riparian reserves for public green spaces and should be approved under special conditions. In areas where soil erosion on riverbanks has already occurred, bank stabilisation measures, such as gabions should be considered.

- **Community sensitisation:** Communities that live within the proximity of the river, and amongst those who have already encroached into the riparian reserves should be sensitised on the significance of observing a riparian distance as stipulated by the Water Resources Authority (WRA). An acceptable distance ranges from 6m – 30m; what determines the width of the riparian belt is the topography of the land (i.e., where banks are steep smaller riparian distances are observed; in flatter land, a wider riparian is recommended).

- **Planting trees along the riverbanks:** Planting bamboo trees as buffers zones will also protect the riparian effectively, stabilise soils and restore the natural vegetation and the forest cover at Ngong' Hills, which is diminishing. However, it is important to avoid planting Eucalyptus trees.

- **Land suitability analysis:** Three areas should be identified during the analysis i.e., land suitable for development with intervention, land suitable for development with no intervention and land not suitable for development. Areas with a slope of less than 100 should be considered for development while areas with a slope of 100-150 should be considered with interventions while development with a slope of more than 150 should be considered not suitable for development.

- **Enhance enforcement of environmental laws:** Enforcement of Physical Planning Act and related regulations on observation of riparian reserves. This would ensure that riparian reserves are protected from encroachment. Enforcement orders should also be issued out to any new projects without NEMA license. This would discourage the operationalisation of environmentally negative projects.

- **Forestry development:** This would be through reforestation programmes in the deforested areas of Ngong', Oloolua and Kibiko forest. The Kenya Forestry Service has a strong presence in Ongata Rongai. Possibilities of them collaborating with the Ngong' Municipal Council should be explored with the aim of protecting and improving the riverine forests.

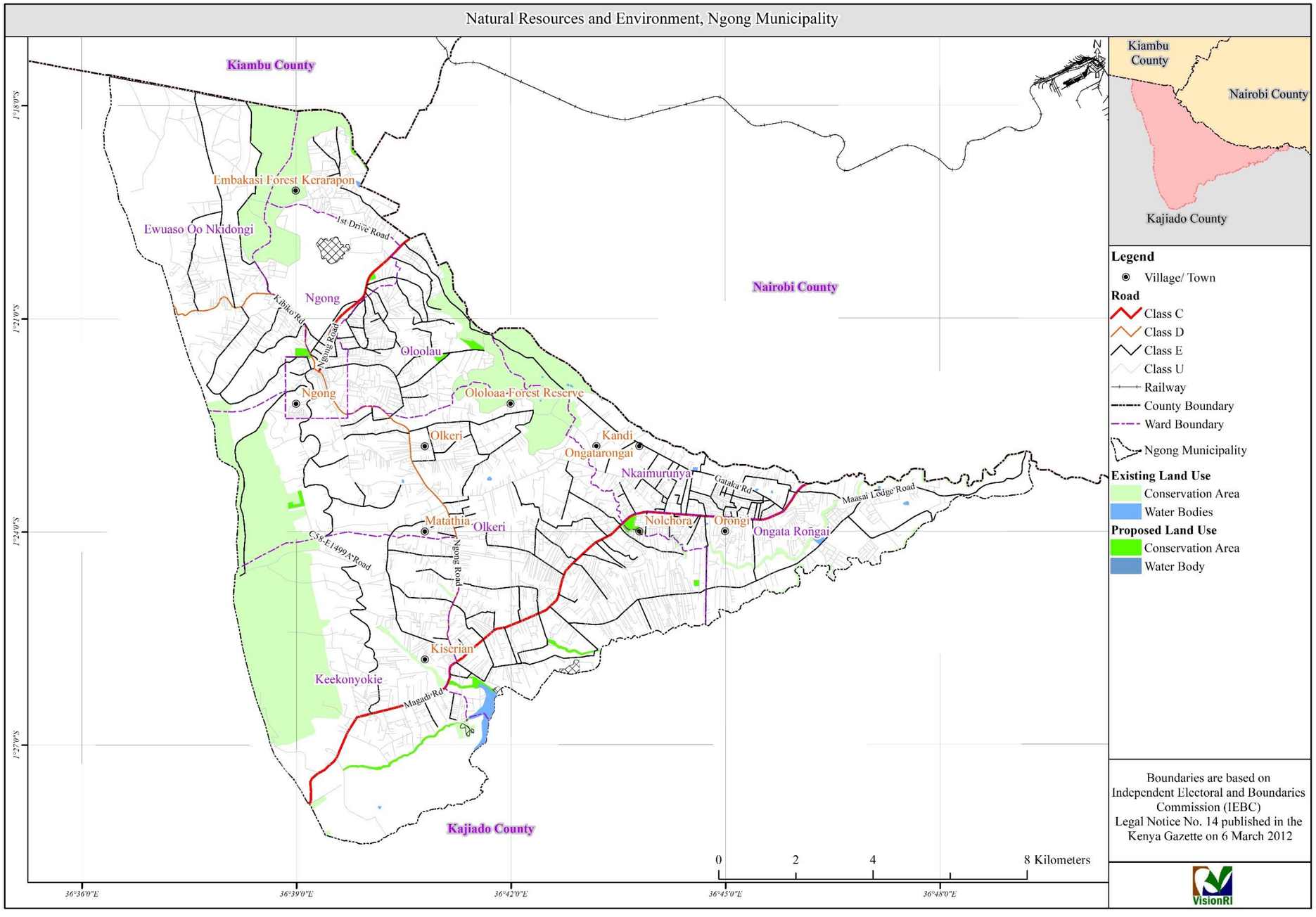
- **Demarcation of water catchment areas:** Water catchment areas will be mapped out and the sensitive areas of these zones mapped and protected to ensure the sustainability of water sources and the environment.

- **Rehabilitation of abandoned quarries:** This would be through the formulation of quarrying by-laws by County Government of Kajiado Government to regulate and manage quarrying activities. Abandoned quarries should be properly decommissioned to prevent the occurrence of accidents. Annual environmental audits should also be conducted to ensure that the quarries comply with the environmental management plans.

- **Prevent flooding from Ngong' Hills' rivers:** Ngong' Hills forest should be fenced and the developments in the forest relocated to other areas. This will help in restoring the natural vegetation and reduce water runoff during heavy rains.

- **Increasing awareness of environmental conservation:** This would be a continuous process with the help of various stakeholders to ensure that the strategy is met. Awareness on the importance of trees, afforestation and reforestation practices in Ngong' Hills amongst other forests should be done.

- **Restoration of Kiserian dam:** The dam is highly polluted due to quarrying activities and human settlements on its banks. Rivers draining the dam pass under the Keekonyokie slaughterhouse, and as a result, animal waste and blood is disposed directly into the river. Consequently, the river is polluted with toxic waste making it unsuitable for human consumption. Fencing of the dam and relocation of human settlements to another area will help in restoring the dam. The Keekonyokie slaughterhouse should as well be relocated to an alternative site. A water treatment plant should also be established to treat polluted water.



Map 7-1: Proposed Natural Resources and Environment Plan

Source: VisionRI

7.3 Physical Infrastructure

7.3.1 Liquid waste

Ngong' area lacks a proper functional sewer system and a liquid waste treatment plant. Liquid waste is channelled into the water bodies hence resulting in water contamination and spread of water-borne diseases. These challenges will be solved through the following strategies.

- **Establishment of a sewer system and a water treatment plant within the Municipality:** The water treatment plant will be located at the lowest points in the Municipality for proper wastewater reticulation. This will reduce the over-extraction of groundwater and enhance the utilisation of the existing water resources. Local sewerage treatment and reticulation systems will be considered and installed for all the smaller towns where reticulation to a singular sewerage treatment system is not possible. The degree of access to the sewerage reticulation system will determine development control standards applied for a zone where densification will be discouraging for areas not connected to a sewer line.

7.3.2 Solid waste

There is a lack of proper solid waste in the area. Solid waste is mainly dumped long the roads, in drainage systems and water bodies. Collection of solid waste is untimely while Ngong' dumpsite is facing ownership dispute. This can be addressed through the following strategies.

- **Construction of a waste recycling centre**: Feasibility studies will be conducted to both site and develop a recycling plant. This is where the waste will be collected from various parts of the Municipality and recycled. This would also ensure that employment is generated at waste collection and recycling centres. This recycling plant will not allow any form of dumping, all waste to the site will be adequately managed for recycling or otherwise directed to landfills that will employ the requisite landfill processes. No dumping will be allowed within the municipality.

- **Construction of incineration facilities**: An incineration facility should be developed at Ngong' sub-County hospital and all Level 3 hospitals within the Municipality. Other proposals are creating composting sites for biodegradable waste at the installation of bins and waste collection facilities.

- **Setting up waste bins:** Waste bins will be put up along the roads and at the CBD to encourage cleanliness and prevent blockage of the drains and dumping of solid waste into the rivers. The bins will also be categorised in terms of biodegradable waste, plastics, and organic waste.

- **Construction of waste to energy incineration centre:** The wastes to energy incineration centre will save precious space, generate electricity, prevent the release of toxic chemicals into groundwater, and reduces the release of methane a potent greenhouse gas generated in landfills into the atmosphere.

- **Formulation of County policies on solid waste management**: NEMA should formulate a policy framework for solid waste management in collaboration with the Ministry of environment, public health and physical planning to guide management of waste. Rules and regulations formulated by the policy should also be implemented by the Municipal management.

- **Provision of sanitation utilities:** A sewer line will be developed in all the informal

settlements and urban centres and all houses connected to the sewer line. Through Public-Private Partnerships, construction of public toilets and construction of sewer lines will improve sanitation and reduce disease prevalence. Stormwater drains should also be put into place as a means of mitigating flooding which is prevalent. Public toilets will also be constructed in both the informal settlements and the urban centres and markets within the towns. A feasibility analysis will be done to determine the number and location within the towns and informal settlements.

7.3.3 Water supply

Major challenges facing water supply include limited coverage by Oloolaiser water and Sewerage Company, vandalism of water pipes, salinisation at Kiserian dam, inadequate water supply. These can be addressed through the following strategies.

- **Rainwater harvesting:** Rainwater harvesting will be useful for domestic purposes, gardening, industrial/commercial applications that have heavy water requirements. It will be suitable to promote and construct a rainfall harvesting technology that will enhance the amount of water available. It is expected to meet at least 5% to 10% of the non-potable water demand of Ngong' by 2030.

- **Desalination:** Kiserian Dam is highly salinised; however, it can still make up the deficit of natural water resources through desalination. Desalination plants can be established at the water supply centres. However high energy cost and inadequate energy supply could be a major constraint for the establishment of this plant.

- **Encourage water recycling:** Water recycling will ensure that water is used minimally thereby reducing wastage. Recycled water could be used only for non-portable commercial use including gardening, car wash, etc. This will reduce the total urban water demand.

- **Improve the distribution system:** Informal settlements face a major challenge of water shortage. However, this could be improved by increasing the number of community water points in these settlements and public places.

- **Improve the transmission system:** Oloolaiser's coverage is limited, therefore, it can lay out new pipes to transmit water as a way of increasing its coverage. In addition, it can phase out the old pipes and install new ones.

- **Creation of more dams:** Feasibility studies can be conducted for the development of a dam at Birika area, which has a natural valley. This can be utilised to create a dam by pumping water into the valley. If the development is viable, it will greatly help in reducing treatment cost for the current dam.

7.3.4 Stormwater drainage

From the analysis, it is apparent that Ngong' area has poor stormwater drainage. Existing drainage systems are clogged with waste, hence causing flooding. This can be addressed through the following strategies.

- **Development of a surface drainage master plan:** A master plan will be developed to guide and focus resources towards minimising the high rate of surface runoff in the Municipality as well as design surface drainage that will attain rapid evacuation of surface water runoff.

- **Establishment of surface drainage network:** Surface drainage network will be

established through the construction of drains along existing and proposed roads. This will help mitigate flooding occurrences on the roads alongside the removal of all encroachments along the drains, regular cleaning of existing drains and improvement of existing stormwater drains. Such drain will be protected from the elements by use of lining of drains, gabions along drains, covering drains as well as retainer walls as the case may be.

- **Construction of new drains and missing links:** The construction of new drains and missing links will be through the following ways:
  - De-silting and alignment;
  - Lining and covering of major stormwater drains;
  - Construction of primary and secondary drains;
  - Improve/repair existing primary and secondary drains; and
  - Plantations along natural drains.

7.3.5 Energy

There are frequent power blackouts and surges whereas the streets are poorly lit. The wind turbines on Ngong' Hills contribute a small amount of electricity to the main grid due to fluctuations in wind energy. Other sources of energy like solar and biogas are under-utilised. The following strategies aim to solve these challenges:

- The existing energy supply will be supplemented with solar energy; and
- A feasibility study may be conducted to assess the viability of having an incineration centre at the veterinary farm whereby all the waste will be burned, and the waste converted to steam energy hence increasing the energy supply and managing the environment simultaneously.

7.3.6 Ongoing and planned projects

- **Water:** Kiserian Dam is planned to supply water to Rongai, Kiserian, Rimpa, Ole Kasasi, and Nkoroi. In addition, there is a plan to extend the trunk line from Karen to Ongata Rongai by AWSB.

- **Energy:** The Nairobi Ring project plans to expand the transmission network to reduce technical losses and improve voltage conditions. The project includes 45km 220kv double circuit Line and associated substations at Ngong' that will increase transfer capacity to meet the city of Nairobi's rising demand and enhance power security by providing alternative electricity paths. With the increased demand for energy in the Municipality, this will be able to better manage the increasing energy demand. In line with these all-new structures, undertaking approval will require to be fitted with solar water heating equipment before issuance of occupation licenses. This will aim at reducing the energy footprint of the area. Structures exceeding four levels will also be required to install solar systems for the purpose of backup energy and subsidising power supply.

- **Solid Waste Management**: The County Government of Kajiado is planning to relocate the existing dumpsite to a 36 acres' piece of land secured at the Veterinary farm in Ngong' for waste recycling. The dumpsite shall be able to accommodate all the waste within the Municipality and from Kajiado Kshs. 2 billion have been disbursed to fund the project and to ensure that it is operational. Any dumpsite within the Municipality will yield its activities to the recycling plants. Any other dumpsite will be subjected to rehabilitation where recreational and green spaces will be created to further complement the existing green spaces of the Municipality. Buffers will be created around the recreational facilities

in form of roads to dissuade encroachment. Open dumping will be allowed within the Municipality outside a properly functioning landfill and/or the recycling plant.

- **Liquid Waste Disposal:** To mitigate liquid waste management challenges from the households and other facilities; the County Government has engaged an expert to carry designs of a sewerage system that will serve Ngong' Town. The sewerage collection and conveyance system has been designed to carry municipal sewage mainly composed of: Domestic wastewater (includes residential, commercial and institutional wastewater), Industrial wastewater, and unauthorised but unavoidable groundwater infiltration and stormwater inflows. There are plans to put up a sewer treatment plant in Ole Kasasi and a sewer treatment plant at Kiserian.

7.4 Social Infrastructure

The following challenges are being experienced within the social infrastructure component, inadequate public primary and secondary schools with limited classrooms, high teacher-student ratio, poor sanitary facilities in schools, and lack of playgrounds in private schools, inadequate health facilities, and health personnel, inadequate recreational areas and cultural heritage. The area also lacks cemeteries and a crematorium. These challenges will be addressed through the following strategies.

- **Increase the number of educational facilities:** The number of public primary and secondary schools, as well as the Adult Learning Centres and special needs schools, shall be increased. Tertiary institutions, youth empowerment centres, and modern resource centres, amongst others, shall be established within the Municipality.

- **Upgrade existing educational facilities:** This will be by ensuring an adequate number of classrooms are constructed to meet the student/pupil population as well as ensuring all the sanitary facilities, recreational facilities are adequately provided for including the requisite equipment and installation. This will also bring all these facilities and classrooms to the required minimum standards.

- **Upgrade and construct health facilities:** The Sub-County Hospital should be upgraded to a Referral Hospital and construction of Level 4 hospitals at Ongata Rongai and Matasia as well with a modern rehabilitation centre for persons affected by drug and substance abuse. Government clinics will be constructed in all urban centres that lack any government health facilities.

- **Equipping existing health facilities:** This will be done by ensuring health facilities are regularly restocked with supplies as well as having a quarterly review and repair of equipment to ensure that all equipment are operational.

- **Promotion of cultural heritage**: The Municipality is endowed with rich Maasai culture, which could be of great benefit in terms of tourism in the area. The promotion of cultural heritage will be through the construction of a cultural centre, modern social halls, and stadia.

- **Designation and provision of recreational areas:** The need for recreational areas can be enhanced through the designation of areas for public parks and playgrounds in the Municipality and public stadiums. Every town will have a designated playground/ stadium as well as a central park for purposes of recreation. Areas of degradation and pollution will be rehabilitated to protected green spaces. This will include spaces such as the current dumping site in Ngong and the quarry zones in Ongata Rongai and Kiserian after decommissioning.

- **Equipping of recreational areas:** The utility of recreational areas will be enhanced by ensuring that the facilities are well designed, planned and constructed to include facilities as possible to include the playing pitch for soccer, basketball, tennis, volleyball, running tracks, seating area, dressing rooms, washrooms, perimeter walls and gates. Similarly, all the requisite equipment is to be provided to ensure the facilities are running optimally.

- **Management of recreational centres:** Recreational centres are to be managed such as to ensure that misuse and destruction of facilities and equipment do not happen. As such heavy equipment, vehicles and trucks will be restricted to the designated parking spaces and not allowed to other areas except for when delivering supplies or equipment relevant to the proper use of the recreational area. The recreational areas will also be limited to their designated purposes and social gatherings.

- **Designation of areas for cemeteries and burials:** There is a need for areas for cemeteries and burial grounds in the Municipality. There should then be areas designated for public cemeteries and burial grounds for Christians and Muslims in the Municipality.

- **Management of bars and clubs:** Bars and clubs will be managed to control the proliferation of second-generation liquor in the Municipality. This will include regular patrolling and inspection of these facilities to ensure that the national health and safety standards are being followed.

- **Police stations:** A feasibility analysis will be done to appraise the current number of police posts and police stations. This will be to identify where additional police posts and stations are required including all the small centres. Similarly, some police posts will be upgraded to police stations.

- **Huduma Centre:** Given the population size of Ngong Municipality, there is a need for the provision of Huduma Centre in Ngong Town. This will be done at the current market site (opposite CITAM Ngong) after the market relocates back to the completed market along Ngong road.

- **Library:** Adjacent to the Huduma Centre is proposed a municipal library serve the entire Municipality. This will work to enhance the public utility of the site.

7.5 Local Economy

Challenges facing the economy include poor infrastructure to support development i.e., lack of sewer system, inadequate water supply, and poor solid waste disposal, flooding and erosion due to runoff from the hills, inadequate parking spaces, inadequate market spaces, lack of investment at the tourist industry and an increase in land prices.

- **Expansion and creation of industries**: This will be through encouraging small-scale service industries and discouraging heavy industry to avoid pollution in the numerous rivers and land-use conflicts within the predominantly residential area. This will also be through the growth of Jua kali industries to cottages and large-scale industries.

- **Utilise location advantage of the Municipality:** The Municipality has the locational advantage with regard to proximity to Nairobi and other counties to attract investments.

- **Construction and relocation of slaughterhouses:** The Halal land in Ngong' will be used as an abattoir and animal value addition to enable the growth of the livestock and slaughterhouse industry.

- **Encourage local farming at the rural zones:** The Municipality will encourage the farming sector in the rural areas by providing support services to farmers, enhancing markets in the urban areas, providing facilities for farming such as farm implements and inputs at subsidised costs as well as educate of optimal farming practices and provide water for irrigation purposes.

- **Construction of markets:** The Ngong' market is already under construction and new ones will be constructed in Olekasasi, and Matasia which will enhance the local economy A new meat industry should be established in Kiserian town to cater for animals sold in the livestock market and slaughterhouses.

- **Management of urban areas to minimise hawking:** Urban areas will be a no-hawking zone and stalls outside the market areas will require approvals. The Municipality will develop a universal low-cost standard design of stalls to be used. Such a design will be implemented not only outside the market areas but also within the market itself to maximise the utility of spaces. Food stands and stall designs once standardised will aim to reduce the effect of stalls being an eyesore in the urban landscape. This will also aid in the optimal location of stalls in the urban areas and minimise clutter.

- **Develop thematic urban areas:** Each urban centre will be developed and given support facilities according to its strength. For example, Ngong/Oloolua area may be developed as a market hub, Kiserian Olkeri Keekonyokie as a beef industries hub and Nkaimurunya Rongai as a service industry hub.

7.6 Housing Development

Based on the situational analysis and the stakeholder's forum, the major issues facing the housing sector include a rapid increase in land values due to increased demand, mushrooming housing estates without the necessary infrastructure and services, the procedure for getting land titles is very difficult, and expensive and time-consuming and delays in all approvals related to construction. These will be addressed through the following strategies.

- **Establishing urban limits:** This is by directing urban growth to suitable locations and away from environmentally sensitive locations such as the rivers, forests and the hills. Urban limits will be created within a radius of 5 kms from Ngong' and Ongata Rongai CBDs. This will encourage compact cities and defer land for future expansion.

- **Densification:** Densification is required to make more effective use of existing infrastructure. Policy guidelines and procedures should be developed for densification. In addition, charging higher rates can act as a way of preventing low densities and land speculations. Densification is also needed for Government Offices as currently a lot of space is occupied by these offices in low-rise mostly single-storey buildings. Other ways that will encourage densification include high density along the major roads and re-densification of areas with low densities.

- **High rise Housing:** Where possible, high-rise and other forms of high-density housing should be encouraged. The plot ratios of the houses should be increased in order to promote effective utilisation of land through vertical growth.

- **In-fill development:** Vacant and underutilised land shall be used for future demand for housing and infrastructure.

- **Establishing small neighbourhood centres at strategic locations:** This will be in the vast settlement areas with an aim to discourage the extensive movement of vehicles and

encourage pedestrian activities.

- **Reviewing existing regulations:** These are regulations on development permissions for land subdivision and development particularly where subdivided land will be sold for residential, industrial or commercial uses.

- **Security of land tenure**: Lack of security of tenure has encouraged the growth of informal settlements in Ngong'. The issue will need to be addressed through enhancing the processes of obtaining lease title deeds through reduction of charges and eradication of bureaucratic processes in land transactions.

7.7 Transportation Sector

The main challenges facing the transport sector include traffic congestion, narrow access roads, lack of NMT facilities, and encroachment of road reserves by traders, poor road condition, and inadequate parking spaces and bus parks. The strategies below aim at developing an efficient transportation system.

7.7.1 Strategies

- **Proper traffic management of on-street parking, and matatu/bus terminal:** This will be through the construction of a bus terminal, which will be away from the main roads to ensure that traffic congestion to and from the terminal is reduced. The relocation of hawkers from the road reserve to designated market areas will also be done. The County Government should ensure traffic impact assessments are undertaken for consideration as part of development approval.

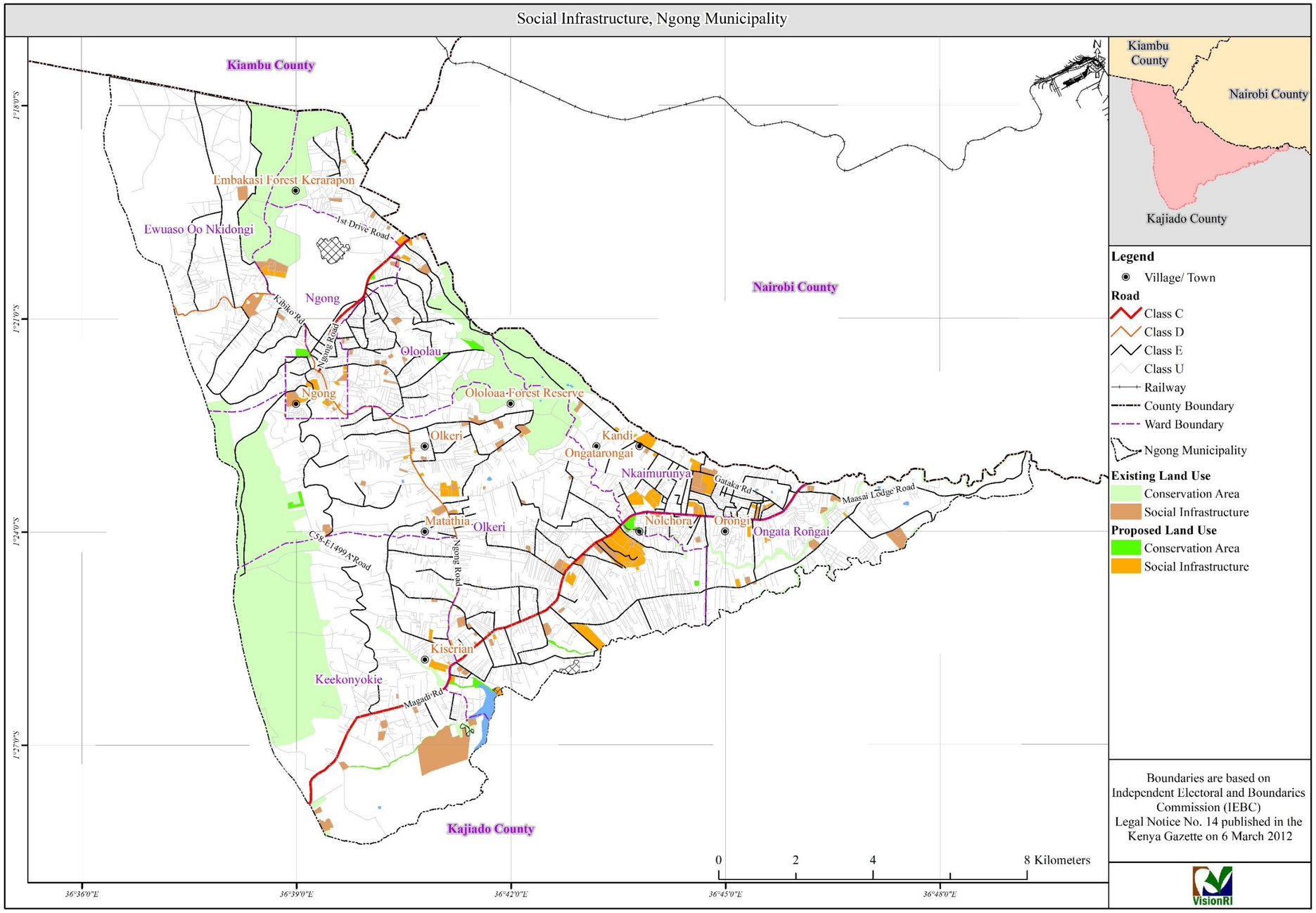
- **Improvement of road network system:** The road network system will be improved through the classification of road hierarchy, road upgrading, creation of grid and radial road networks increase the width size for access roads, which will relieve congestion on the major roads.

- **Classification of road hierarchy:** Road classification in terms of the hierarchy is essential during identification of facilities required for each category of roads.

- **Road upgrading of internal roads** to address traffic volume and projected traffic.

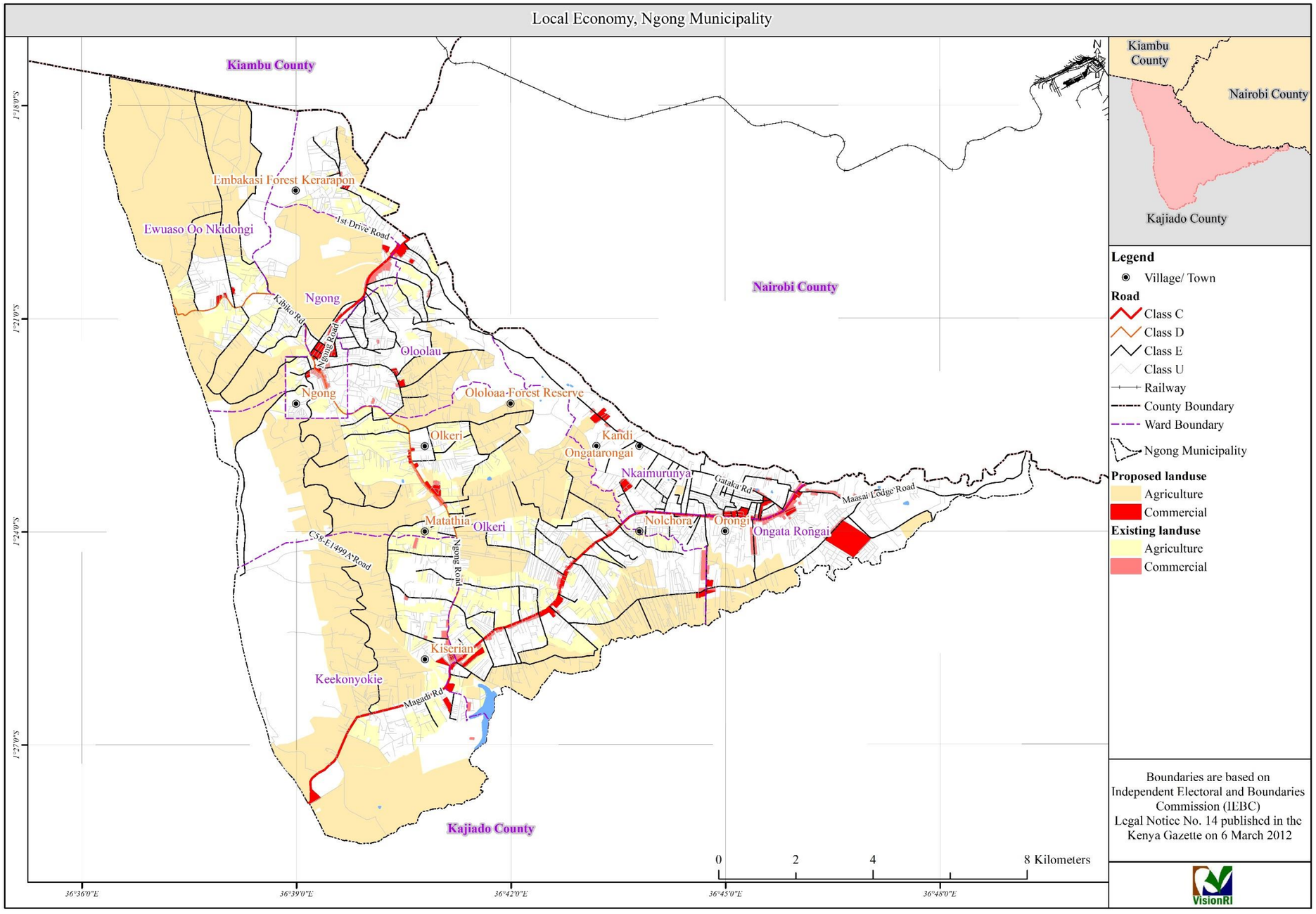
- **Improved Road networks:** In the Municipality, the pattern is irregular therefore posing a challenge in terms of access to the residential areas especially in Ongata Rongai. A grid pattern in the residential areas is proposed as it will ensure that there is the provision of access roads, thus one can access the neighbourhood from any side. In the towns, the circular or ring road will be connected to radial roads. The radial system will present the most natural growth of the Municipality, as it will grow in the form of concentric ring roads around the hub of the towns so that each growth or part is as near to the centre.

- **Relieving congestion on the major roads:** This will be through the construction of a ring road (Rimpa road) to relieve congestion on Magadi Road; and construction of service roads along the Magadi road to eliminate many accesses, which contribute to congestion. Tarmacking of the Gataka road linking it to Kware road to relieve congestion on Magadi Road and eliminate access on the main arterial road. In addition, construction of a by-pass at Gataka road linking Ongata Rongai to Ngong' via Oloolua will relieve traffic along Magadi and Ngong' road.



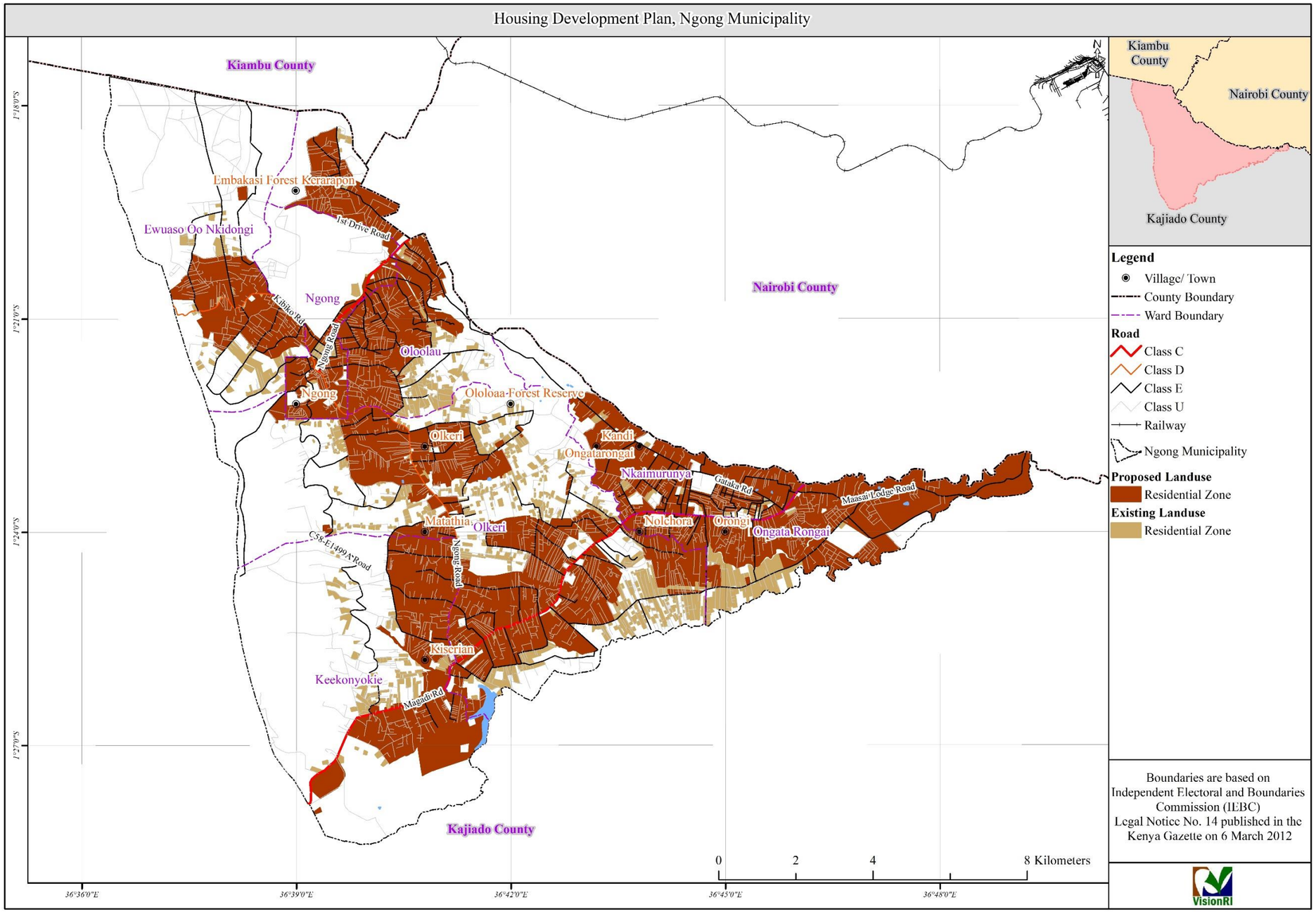
Map 7-2: Proposed Social Infrastructure Plan

Source: VisionRI



Map 7-3: Proposed Local Economy Plan

Source: VisionRI



Map 7-4: Proposed Housing Development Plan

Source: VisionRI

- **Increase the width of access roads:** The width of local access roads should be increased to 9m from the existing 4m and 6m. All subsequent land subdivisions should provide for adequate road access with the minimum road size of 9m serving an estate.

- **Creation of high-capacity public transport system:** In order for the transportation system to be efficient high-capacity public transport system could be offered through the following ways:

    - **Introduction of a commuter rail/BRT network**: Buses ply through dedicated BRT lanes and passengers access the buses at the BRT bus stops. The BRT operations are controlled from a central system and bus route and timing related information are circulated through public address systems at the bus stops and terminals. BRT system can carry 10,000 to 15,000-passenger volume. Use of BRT has been successful in countries like Brazil. The BRT network can be introduced along the main/primary trunk roads. Use of BRT is proposed at Ngong' road, Gataka road, Magadi road, and Ngong' Kiserian roads.

    - **Introduction of city bus service:** A city bus system can be introduced as a new public transport system in Ngong'. It could be designed in a way to provide high quality, reliable, comfortable, accessible and affordable public transport system. The city bus service can play at the secondary trunk roads.

    - **Light rail system:** Several cities of Africa including Addis Ababa and Lagos have successfully introduced the LRT system. Operating speeds and frequency of an LRT system is higher than other road-based transit systems. LRT system can carry 20,000 to 30,000 passengers during peak hours. With the construction of the SGR stations at Ongata Rongai and Ngong', LRT system can be used for rail transport within the region. This will reduce travel time, traffic and cost of transportation within the Municipality.

    - **SGR Articulation strategy:** To better take advantage of the SGR stations in the Municipality, an articulation strategy will be done to ensure that there are adequate transfer stations. This will involve expansion of roads to the stations as well as the redesign of access routes to ensure that the roads are adequate drained and are to bitumen standards. All roads will have their drainage channels well-articulated and protected.

    - **Transit-oriented development on main trunk roads**: To reduce the traffic congestion experienced along the major roads in the region, a TOD is proposed. The TOD will be promoted along the public transport network. A bus/transit station should be made the nucleus of the centre of various activities like housing, schools, commercial and public places, etc. It will help to increase the bus/transit system. TOD Corridor is proposed to be developed along the main trunk roads connecting Ngong', Kiserian and Ongata Rongai. Mixed-use development has also proposed both sides of the corridor with a proposed density of 400 persons per hectare. A TOD could be developed based on bus-based or rail-based transit system. A minimum 60 metre right of way (ROW) is proposed for the TOD corridor. Bus/matatu stop will be limited to less than 3 minutes for any stop made by a public transport vehicle outside the designated bus stations. Laybys will be developed for each spot along the roads where bus stops are allowed.

    - **Increase parking facilities:** Due to inadequate parking facilities in Ngong', a multi-storey car parking is proposed to be developed at the Ngong' bus park and commercial developments. Tuk-tuks and boda-boda parking will be at the ground

floor level while matatus and private vehicles will use the upper levels. Establishment of the multi-storey level parking will be actualised through PPPs. New developments at the CBD should be encouraged to incorporate the multi-storey parking designs. Parking will be discouraged along the main arterials of the municipality (Magadi Road, Ngong' Road and Ngong' Kiserian Road). Developments requiring parking facilities will be required to develop the same within their areas. Access to the main arterials will also be limited where indirect access through secondary arterials and collector streets will be preferred.

- **On-street parking** will be minimised by the creation of off-street parking zones in each town within walkable distance to the main town activity centres. The area next to the stadium will also host a high-capacity multi-level parking facility for use by private vehicles exclusively. This is since it will border the Huduma centre and library. Adequate noise buffers will be done in form of berms and trees from the other facilities.

- **Create pedestrian facilities:** From the situational analysis, it is clear that most of the pedestrian activities happen along the tarmac roads, i.e., Magadi road, Maasai Lodge Road and Ngong' road. The pedestrian trips include work, business, and school trips. Pedestrian pathways on both sides with a width of 2m is recommended. Landscaping and planting of trees should also be planted along the pedestrian pathways to promote pedestrian Activities. Each town within the municipality will also identify a major street for the purposes of pedestrianization. This will allow for walkability within the towns. All streets will be designed to encourage walkability, which will include placement of adequate pavements as per the population, street furniture, and urban greening.

- **Construction of waiting bays and NMT facilities:** NMT include handcarts, bicycles, and animal-drawn handcarts. 35.25% of NMT traffic is on bitumen standard roads, which are the main roads while 24.54% is on gravel roads. Motorcycle taxis waiting for bays in the Municipality as well as provisions for NMT users will be constructed, especially on the bitumen and gravel roads.

- **Put up road signage road safety measures, and a street addressing system:** Road signage and safety measures play a critical part in preventing road carnage through guiding road users. The street addressing system gives directions of a particular place, which helps pedestrians reach the desired location without any help of enquiry from the people. Proposals are made for monitoring of road safety features in road design as per road safety audit during or post-construction period.

- **Creation of a stormwater drainage system**: Due to lack of proper stormwater drainage systems, roads flood during the heavy rains impeding mobility around the region. Therefore, the construction of internal drains and kerbs is encouraged as a way of managing stormwater.

7.8 Informal Settlements Upgrading

From the situational analysis, it emerged that because of poor planning, most government and private land which is freehold and owned by "absentee landlords" living elsewhere have been transformed into informal settlements. These informal settlements are built on unplanned areas that lack formal planning approval. Lack of security of tenure, low-quality houses and inadequate infrastructure and social services were some of the challenges experienced in the informal settlements. Other social challenges faced in these settlements include crime and robbery, immorality, HIV prevalence, drug

abuse, high school dropouts amongst others. These challenges may be addressed through the following strategies.

- **Provision of land tenure security:** The County Government in collaboration with the National Government should issue title deeds especially in Gichagi, Embulbul, Kware and Mathare informal settlement. The title deeds will empower the residents to build good quality houses. Moreover, they can be able to acquire loans from banks and SACCOs which will enable them to construct better houses and improve their living standards. Preparation of local physical development plans and delineation of boundaries of the informal settlements will improve land tenure in these settlements.

- **Improve and provide affordable infrastructural services**: Residents in these settlements have inadequate access to infrastructure for instance roads, water, and electricity, sanitation, health care hence increased poor living conditions. Provision of adequate infrastructure i.e., schools, health facilities, water supply, sewer system, etc. will enhance better living standards eventually eradicating poverty. The County Government should prepare slum up-grading plans and support their implementation at the community level. Provision of trunk infrastructures like water and toilets will ensure increased access to services by residents. The following infrastructural services are proposed:

  - **Provision of water:** Supply of water can be done at several points and the household levels. Through public and private Partnerships, water connection projects can be rolled out in different phases to ensure that all the residents have access to water.

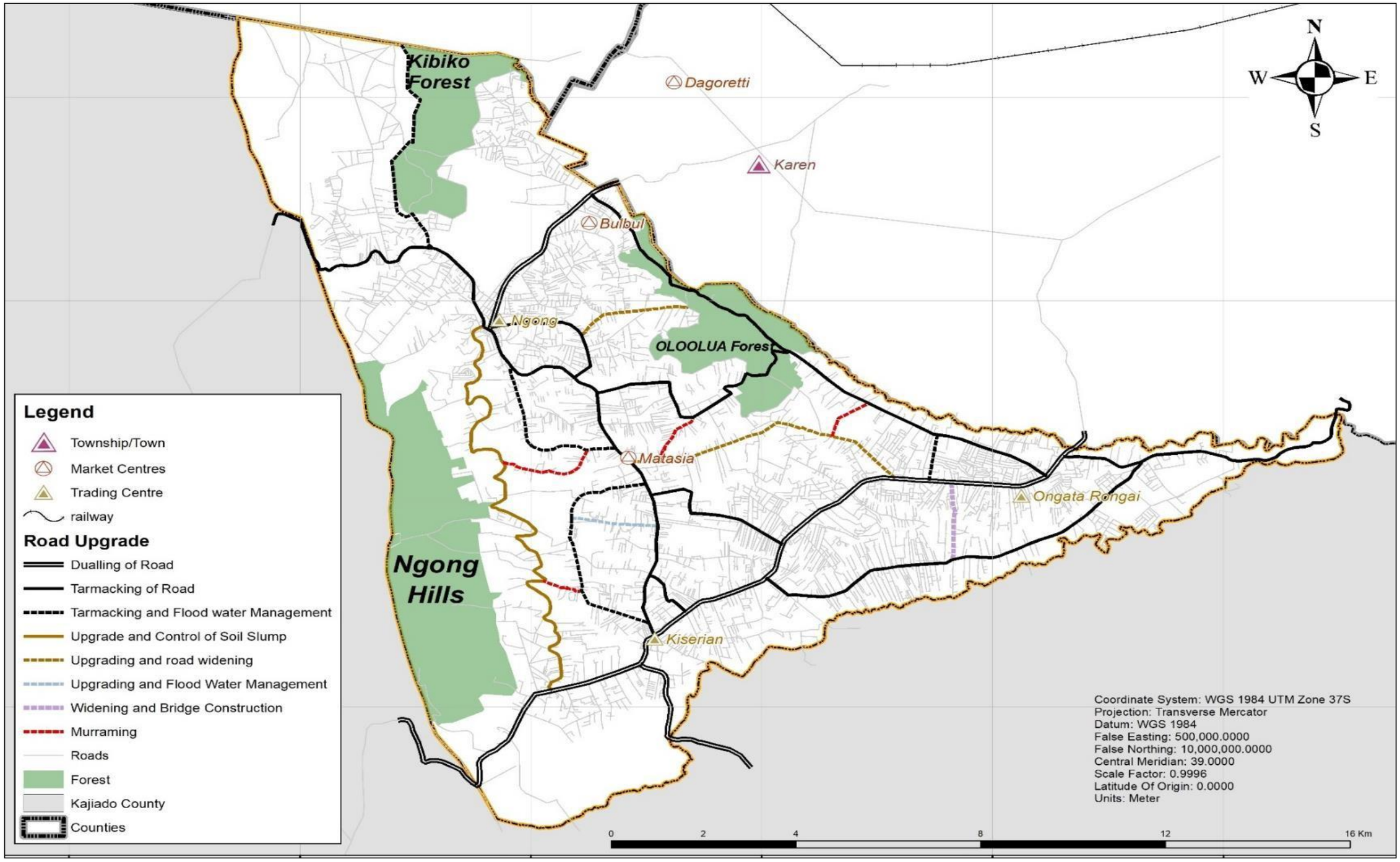
  - **Road accessibility**: Access roads should be opened up with the minimum road sizes being 9m to ease movement and ease disaster response in case of fire outbreaks.

- **Community facilities:** Access to community facilities within the Municipality is limited. The following facilities are therefore proposed:

  - **Public primary and secondary schools**: There should be 1 primary and secondary school for every catchment population of 4,000 and 8,000 people, respectively. The County Government could roll out feeding programmes and provision of sanitary wears to girls as a way of curbing high school dropout rates.

  - **Playgrounds:** Playground should be provided for 5,000-catchment population. The playgrounds will be used to nature talents in sports amongst the youths hence overcoming crime and drug abuse, which is a common social ill in the informal settlements.

  - **Markets and Jua kali shades:** Provision of well-structured markets and Jua kali shades will reduce unemployment and increase income generation amongst the people. Consequently, the residents will be empowered to live in better housing standards because of increased incomes;



Map 7-5: Roads Proposed for Development/Upgrading

Source: VisionRI

- Improve housing standards in the informal settlements;
- Provision of housing materials at very subsidised prices will encourage better housing standards;
- Development of industries for waste re-use and recycling;
- Construction of bio-centres in the informal settlements and institutions to mitigate human waste will provide employment hence reducing poverty levels and poor sanitation; and
- Slum upgrading in informal settlements.

This Plan proposes slum upgrading through the in-situ upgrading process. This will be through the provision of infrastructure and services and upgrading of services by the County Government to improve the living standards of the people. Incremental housing through the provision of small loans with very low interest rates will also be used in this process of slum upgrading. Thereby, residents can access loans or even building materials with a long-term payment period and construct their own better houses. Selective replacement of temporary structures is also proposed whereby the County Government periodically builds better houses for the people in phases eventually eradicating all the poor-quality houses.

7.9 Tourism and Heritage

The Municipality is considered a tourist destination and a weekend gateway in the NMR. Tourists visit sites like Oloolua, Osoita, and Maasai Lodge which have been established and there is still potential for more owing to natural sceneries. For instance, a town like Ngong' is already an established popular weekend tourist destination from Nairobi and beyond and is reasonably expected to maintain this role. Factors and comparative advantages which the town have to include; accessibility, natural beauty, heritage, the wind farm, Maasai villages and currently infantile tourism industry, which can easily be nurtured to grow.

Heritage constitutes a people's history, artefacts and sites values by current generations. While the Maasai who constitute the indigenous people of the entire Municipality generally have a rich heritage, migration from the area may have affected their heritage there. Ngong' Hills form the main historical heritage in Ngong'. Other historical sites are the old colonial houses.

- **Protection of identified heritage sites in the Municipality**: These include Ngong' Hills which form the main historical heritage in Ngong'. Other historical sites are the old colonial houses at Gichagi and Barclay's plaza at Ngong' CBD. These houses give the area a distinct urban design character.

- **Eco-tourism destination**: Ngong' is popularly known as a tourist town due to the presence of Ngong' Hills, cool climate, and forests. Tourism can be further promoted through the creation of nature trails at Oloolua forest and zip lines at Ngong' Hills. Sports Activities like Kiserian Dam marathon can be established to promote eco-tourism and increase revenue generation. Furthermore, these activities are friendly to the environment with minimum negative impacts.

- **Publicising and marketing to boost tourism:** Maasai history and culture can be used to boost tourism in the Municipality through the establishment of a museum that will display the Maasai artefacts and cultural heritage. In addition, a Maasai market similar to the one in Nairobi can be established at Maasai mall whereby Maasai beadwork in can be displayed and sold to the tourists and locals as well. This will create employment opportunities and revenue generation to the County. A tourist information centre through the creation of a tourism website is proposed. The website will contain travel information i.e., the tourist sites, location of the sites, charges, services offered, travel

time, accommodation and security.

- **Development of tourist infrastructure**: This will be through the construction of hotels and guesthouses within the proposed commercial areas. In addition, roads leading to the tourist's sites should be improved through tarmacking. Security too should be enhanced in these tourist sites by establishing a police post at the tourist site and setting up of street lighting programme.

- **Develop a tourism circuit**: A tourism circuit should be developed to link Amboseli and Maasai Mara National park with the tourist sites in the area. To realise this, a tourist circuit map will be developed showing the tourist routes that will link Ngong' tourist site with Amboseli and Maasai Mara.

7.9.1 Ongoing and Planned Projects

Identification and development of tourism area as well as of a tourism circuit to link the Amboseli and Maasai Mara ecosystems.

7.10 Disaster Risk Management

Disasters experienced in the Municipality mainly include flooding, quarrying accidents, diseases, and epidemics. These can be mitigated through the following strategies.

7.10.1 Flooding

Flooding in the Municipality is mostly experienced at Ngong', Ongata Rongai and Kiserian CBD areas, around bounty hotel and AFC bank Gichagi settlements in Ngong'. Strategies to address the flooding issue include:

- Mapping out areas prone to flooding;
- Constructing stormwater drainage systems;
- Quarrying accidents;
- Quarrying accidents can be reduced through training of workers on accidents prevention and management. Safe quarrying procedures can be drafted by NEMA. Implementation of occupation health procedures;
- Other strategies for disaster risk management;
- Acquire firefighting equipment;
- To develop better coordination amongst institutions responding to disaster incidences;
- To create Town Disaster Management Authority;
- To identify indicators of disaster risks and disaster-prone areas in town;
- To develop an early warning system including guidance on how to act upon warnings;
- To enhance the capacity of human resource, equipment, and infrastructure;
- To reduce response time for any disasters within the town;
- To decentralise and equip disaster management units; and
- To integrate disaster risk reduction in building approvals and other development policies.

8. ACTION AREA PLANS

8.1 Introduction

Action Area Plans are action-oriented plans for specific areas with specific interventions designed based on problem areas and objectives. The general purpose of Action Area Plans is to ensure that development is undertaken in a sustainable and integrated manner. The Action Area Plans will address the specific challenges and issues of an area; provide details of road networks, facilities to be provided and measures to be taken for implementation. More so the Action Area Plans will be used to explicitly define the boundaries of the urban areas within the Municipality. They will also be used to establish localised levels of development control. Four areas have been identified for action planning. Urban design interventions for the Actions Area Plans have also been prepared.

8.2 Action Area 1: Revitalization of Ngong' Town CBD and Bus Park Area

The Ngong' CBD is characterised by ribbon development, dominated by commercial and residential uses, along Ngong' road. As a result, the area is experiencing sprawling growth, which leads to ineffective utilization of land. This trend is unsustainable, and it indicates a threat to future development.

There is a lot of traffic congestion experienced due to narrow roads, intersections, the encroachment of the road reserve and overreliance on Ngong' Road for access. In addition, there are inadequate off-street parking spaces, which also contribute to traffic congestion.

Due to poor drainage system, the area is prone to flooding during the rainy season, hence inhibiting transportation. Lastly, Mathare informal settlement and Ngong' dumpsite is located at the CBD and this destroys the image of CBD.

8.2.1 Goal

The goal of this Action Plan is to create a compact CBD, which will promote economic viability, liveability, and social equity. The Action Plan promotes high-density mixed-use development, better public transport services, and revitalisation of the administrative area.

8.2.2 Objectives

The objectives of the Action Plan are:

- To promote densification;
- To curb flooding;
- To enhance efficient transportation;
- To provide more pedestrian facilities;
- To improve bus park and parking facilities; and
- To relocate the Ngong' dumpsite.

Traffic Management

Strategy 1: Revitalization of CBD

The main aim of the revitalization of CBD is to improve ease of movement, compacting the CBD through densification and improve environmental sustainability. To realize this aim, the following interventions are proposed.

- Carry out a detailed design study to inform densification and redevelopment of the CBD as illustrated in figure 8-1 below;
- Rehabilitation and extension of the physical infrastructure to support increased densities;
- Improvement of the central market zone to improve its functionality and minimise conflicts in the CBD and provide other satellite markets in Kiserian, Ongata Rongai and other urban centres to decongest the Ngong Central Market;
- Improve walkability by making the CBD pedestrian-friendly;
- Improve urban streetscape and beautification through urban design components like street furniture and building façade;
- Incorporate active building frontages with shops, restaurants and convenience facilities;
- Relocate Ngong dumpsite and construct sanitary landfill at the Veterinary Farm;
- Rehabilitate the current dumpsite into a recreational park and a cultural centre; and
- Adopt the "Sponge City" concept that utilise green rooftop infrastructure and sustainable drainage, and permeable pavements, sidewalks, and gardens as shown in image 8-1 below.

Image 8-1: Permeable Pavement with Grass

Source: https://bit.ly/2Zda7VG

Figures 8-1 and 8-2 below shows the various interventions to be undertaken to revitalize the CBD.

Figure 8-1: Proposed Ngong' CBD Improvement Plan

Source: VisionRI

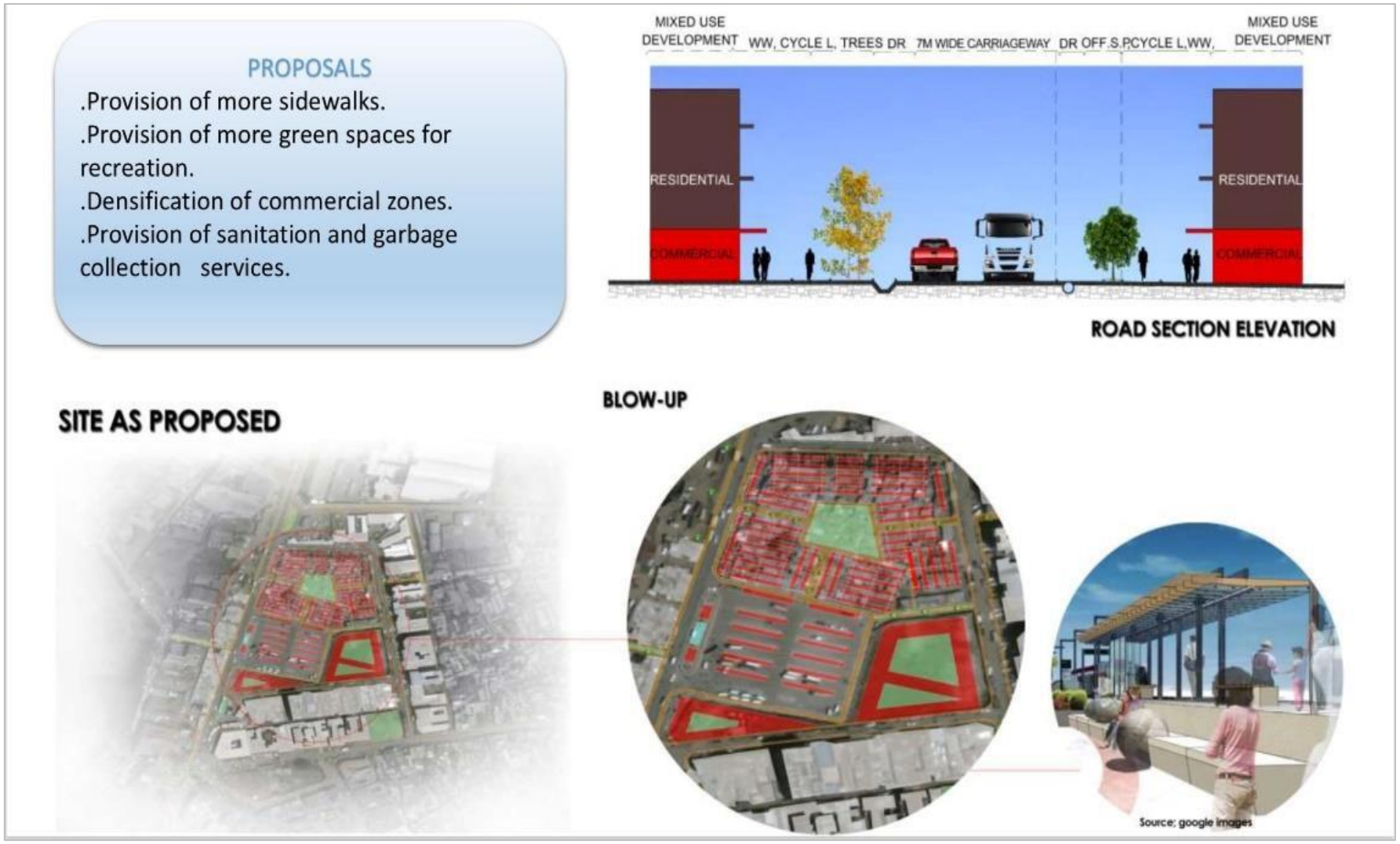


Figure 8-2: Details of Proposed Ngong' CBD Improvement Plan

Source: VisionRI

Strategy 2: Transportation Intervention

The proposed interventions to improve the transportation system in the Ngong town include the following:

- Carry out a detailed transportation plan that will accommodate the following proposals;
- A public transport system that integrates BRT and LRT systems. The BRT station to be at the Veterinary Farm and LRT system linked to the SGR station and the wider Nairobi Metropolitan commuter railway system;
- Redesign Ngong road into a dual carriage with service lanes to reduce traffic snarl-up;
- Carry out a feasibility study to inform design and construction a ring road for through traffic to bypass the CBD;
- Pedestrianize CBD with adequate walkways, traffic calming measures, streetlights to enhance security, vending zones, landscaping, and beautification with trees and provide street furniture to facilitate a good walking experience; and
- Increase current parking spaces by the construction of a multi-storey car park and new buildings to include underground parking spaces.

Image 8-2: Use of permeable Pavements and Green Rooftops

Source: https://bit.ly/2SFX2S7

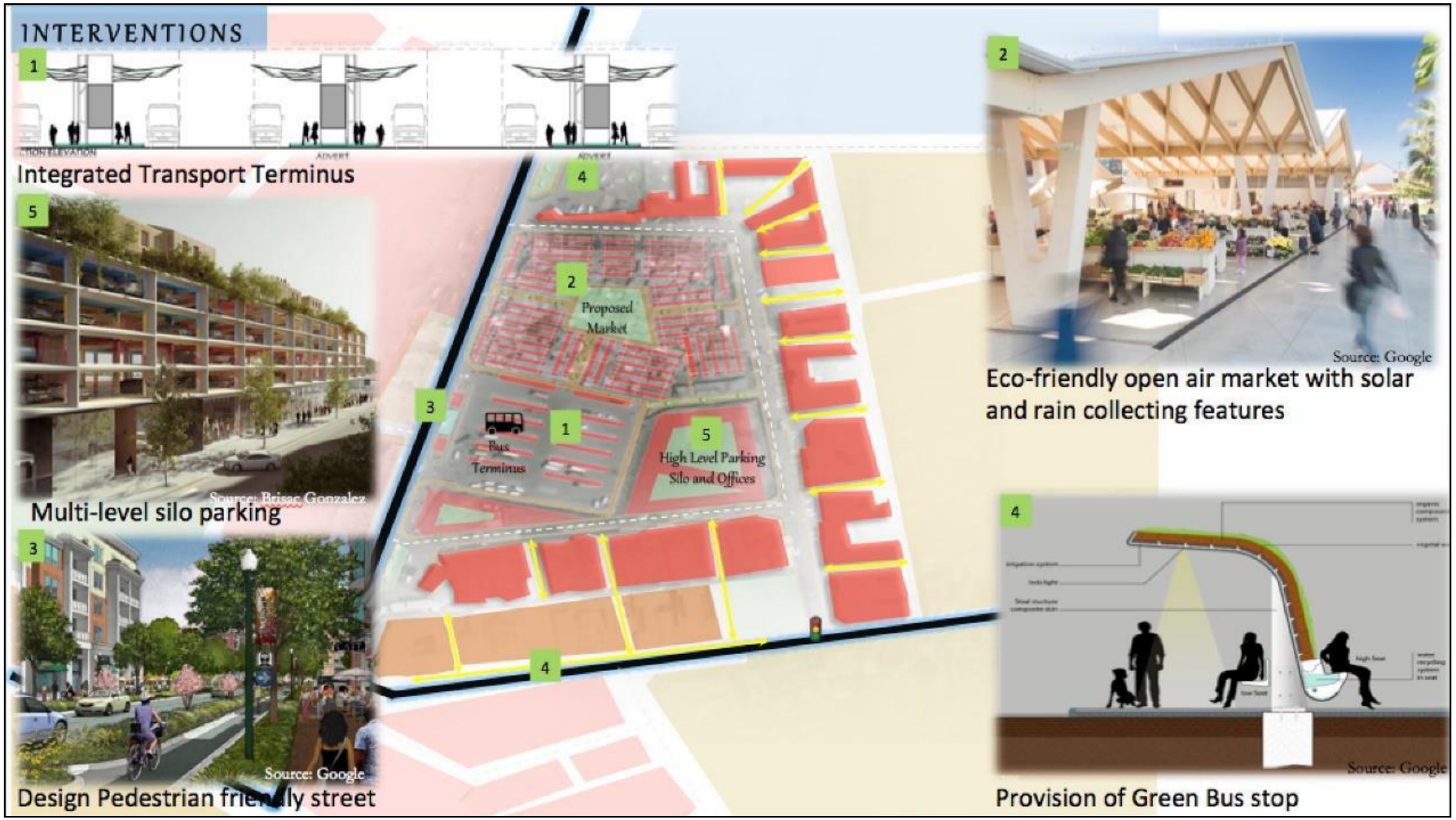


Figure 8-3: Proposed Ngong' Bus Park Improvement Plan

Source: VisionRI

8.3 Action Area 2: Kiserian Dam

Kiserian dam has a capacity of 1.8 million litres and a daily capacity of 15,700 m^3. It relies on three seasonal rivers containing highly polluted water.

Due to human and quarrying activities occurring at the banks of the dam, the soil is dumped to the unfenced dam resulting in siltation. During the rainy seasons, water is lost through spill off as the depth of the dam has been lost. The dam is also at threat of drying up due to severe siltation.

Rivers draining the dam are highly polluted with animal waste and blood from Keekonyoike slaughterhouse as well as wastewater from the sewer systems. In addition, quarrying activities and human settlements are located at the banks of the dam. Consequently, water is highly toxic and unfit for human consumption. Since the dam is unfenced, there are several accidents that arise as people fetch water and feed their animals.

8.3.1 Goal

The Action Plan proposes to protect the dam from pollution and restore its capacity.

8.3.2 Objectives

The objectives of the Action Plan are:

- To increase the water supplied by the dam;
- To reduce siltation;
- To treat the water;
- To protect the dam from pollution; and
- To rehabilitate the quarries at the dam.

8.3.3 Strategies

- Explore the feasibility of realigning the river course away from the dam: One of the rivers draining the dam is highly polluted with animal blood and waste from the slaughterhouse. In addition, the raw sewer is also discharged into the river. Consequently, the water highly in the dam is polluted and has changed its colour and produces a foul smell. The river may be realigned by constructing a buffer wall to prevent toxic water from draining into the dam. This concept requires a feasibility study to be conducted.
- Relocate the residential areas from the dam: Through land acquisition, human settlements should be compensated and relocated to other areas away from the dam. This land will be reclaimed and used for the development of a tourism and retail waterfront.
- Develop a desalination plant: A desalination plant is proposed to increase the water capacity of the dam by separating the mineral components from the water through distillation. Desalination plants are commonly used at the United Arab Emirates, Japan, and China. However, this process is quite expensive and thus feasibility studies need to be conducted to determine its viability.
- Water treatment plant: A water treatment plant should be located next to the dam since it's a low-lying area and it will be easier to release the water to the treatment plant. Secondly, the treatment plant will be able to discharge the treated water into the dam easily;
- The waste system of informal settlements near the dam shall be directed away from the dam to mitigate pollution;
- Fencing the dam/create a buffer zone: Planting of trees, as a buffer zone will protect the banks of the dam from the effects of human settlements and quarrying activities. Tree

trail walkways shall be of permeable paving and shall be provided with appropriate trash bins;

- Provision of warning signs and symbols and have gatekeeper post to protect the dam from further encroachment; and
- County Government to enhance interaction, and exchange of ideas and experiences with adjoining communities on the best way to restore and conserve the dam.

8.4 Action Area 3: Ongata Rongai CBD

The key planning issues in the Ongata Rongai CBD are:

- Urban sprawl that is manifested through linear growth development along Magadi road;
- Inadequate parking spaces;
- Poor accessibility due to narrow access roads;
- Poor drainage system;
- Encroachment of road reserve by the market; and
- Traffic congestion.

8.4.1 Goal

The goal of this Action Plan is to enhance ease of movement and encourage densification.

8.4.2 Objectives

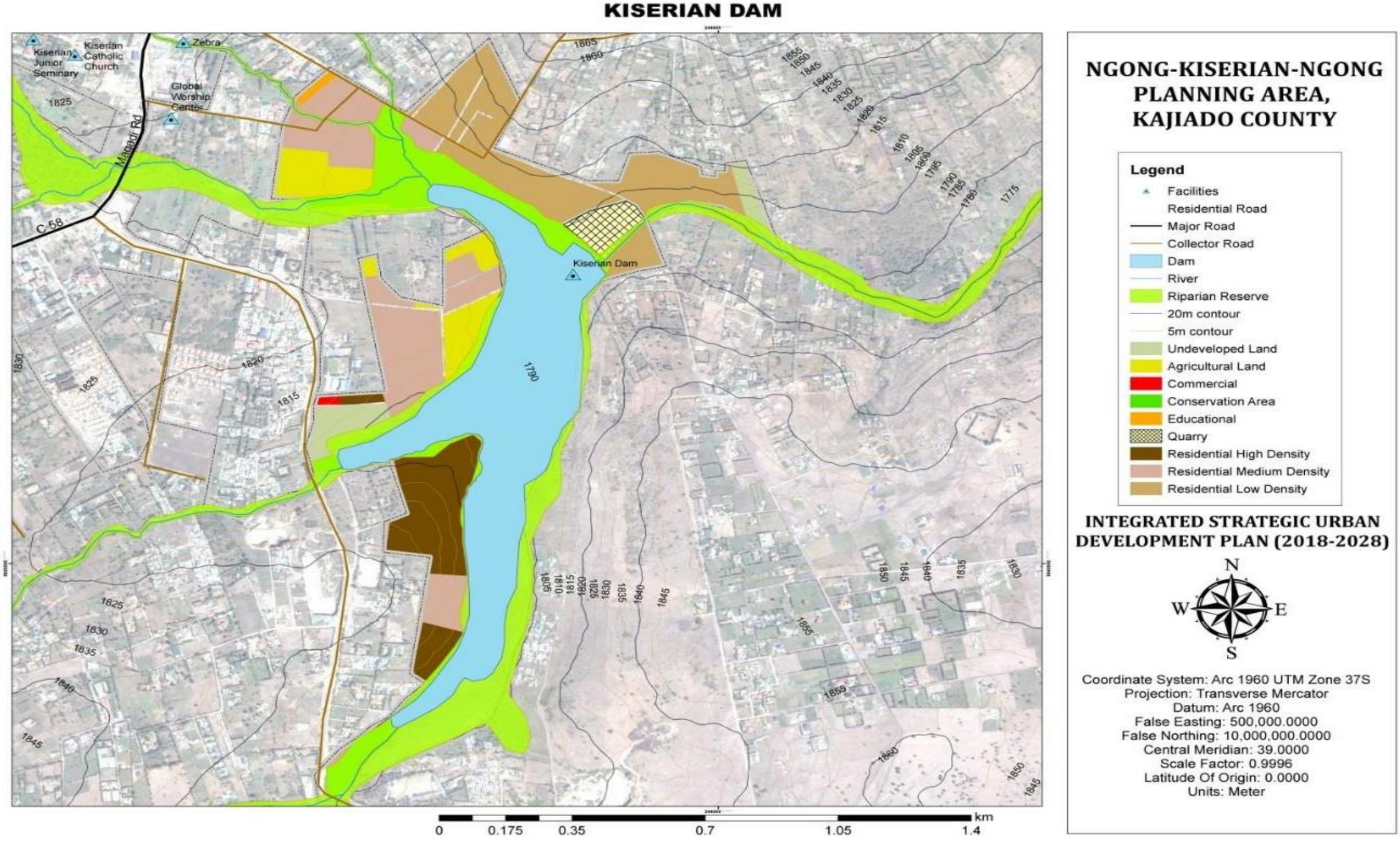
The objectives of the Action Plan are:

- To create an efficient transport system within the main transport corridor;
- To promote an integrated transport system;
- To spur economic growth within Ongata Rongai and its environs; and
- To promote a sustainable environment within the town.

8.6.3 Strategies

The proposed strategies are:

- Promote an integrated public transport system and NMT;
- Create a multi-storey parking facility;
- Enhance road network;
- Create a multi-storey market facility;
- Delineate the Ongata Rongai CBD and urban boundary with a radius of 5 km^2; and
- Densification of the market area.



Map 8-1: Proposed Kiserian Dam Improvement Plan

Source: VisionRI

Figure 8-4: Proposed Kiserian Dam Improvement Plan

Source: VisionRI

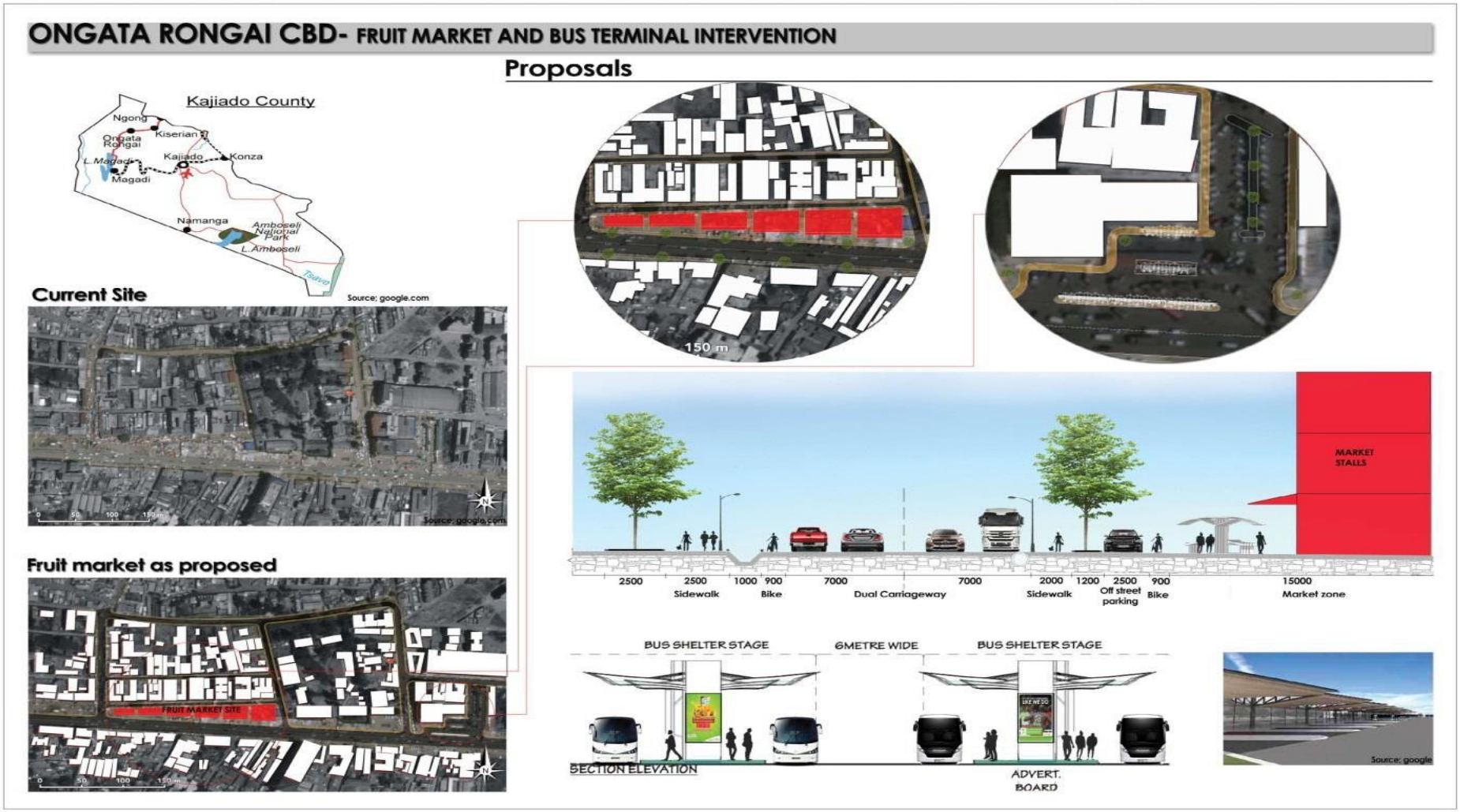


Figure 8-5: Ongata Rongai Improvement Plan Proposal

Source: VisionRI

8.5 Action Area 4: Kiserian CBD

Overview: Kiserian town is situated at the foot of Ngong' Hills. Magadi road (C58) traverses this town and has had a great influence on its growth and development. The road links Kiserian town to Ongata Rongai and onwards to Nairobi city. Kiserian is liked via Ngong road to Ngong Town and Nairobi City. The town has flourished from being a livestock market to a mixed hub of activities such as commercial enterprises, schools, religious institutions, slaughterhouse, transportation, residential district, and quarrying.

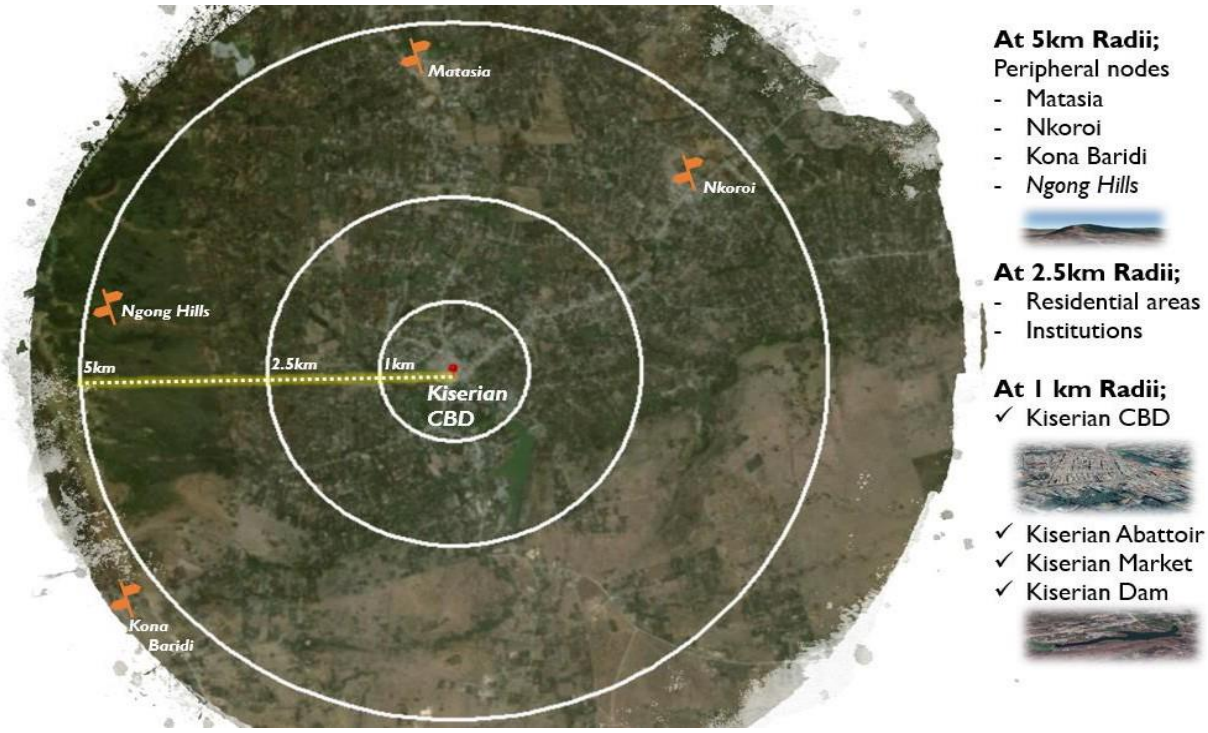


Figure 8-6: Representation of the Urban Extent

Source: VisionRI

The key issues in Kiserian include the following:

- Flooding which is caused by stormwater flowing from the hills down to the valley consequently affecting mobility and leads to loss of property and lives;
- Traffic congestion at Magadi road and Kiserian-Ngong' road junction. Encroachment of the road reserve by the market and matatus also contributes to traffic congestion. Moreover, a significant amount of traffic is generated during the market days by traders and livestock;
- Poor road condition and connectivity, and lack of NMT facilities. Consequently, road user conflicts are experienced between pedestrians and motorists. The existing bus park has inadequate parking capacity to hold the current number of vehicles hence use of on-street parking; and
- Air and water pollution by the slaughterhouse.

To address the above key issues, the goal and objectives are described below.

8.5.1 Goal

To spur economic growth and enhance environmental sustainability.

8.5.2 Objectives

The key objectives are:

- To rehabilitate the market;
- To enhance the road network; connectivity, parking, and NMT facilities;
- To curb flooding incidences;
- To mitigate air and pollution;
- To regenerate the core area; and
- To rehabilitate the quarries to recreational use.

8.5.3 Interventions

The following interventions will be carried out:

- **Construction of a new market:**
    - The proposed market to accommodate 3000 traders under a 15000m^2 of floor space based on the UN FAO guidelines[11];
    - A transit stop be incorporated to the market to facilitate future integration with the Ngong road BRT service once extended to Kiserian town;
    - Provide crossing points along Ngong road to aid the pedestrians' ease to the market; and
    - Provide basement parking and loading zones.

- **Enhancing transportation facilities:**
    - Provide NMT facilities on all roads within Kiserian town;
    - Prepare a transportation masterplan to identify suitable ring roads and bypasses;
    - Improving the drainage along all roads and use of permeable material to reduce flooding;
    - Provision of sheltered and secure lay bays for public service vehicles;
    - Promote tree planting along the roads to curb dust and improve carbon sin; and
    - Mitigate corridor development by promoting TOD and densification.

- **To Curb Flooding Incidences:** Kiserian has an undulating landscape. Therefore, due to the variation in gradient, run-off speeds are high, especially during the long rains period. Certain strategies can be employed to reduce the amount and impact of flooding in Kiserian town. This includes:
    - Application of setback to allow for an increased percolation/infiltration surface area;
    - Rainwater harvesting as most other the waters emanate from the house roofing;
    - Installing a series of check dams or weirs to hold run-off;
    - Construction of efficient drainage channels based on run-off computations;

[11] http://www.fao.org/3/y4851e07.htm & http://www.fao.org/3/x4026e/x4026e06.htm Estimating trading spaces for basic markets.

- Ensuring that drains are debris-free/not clogged; having a maintenance schedule;
- Planting trees and undergrowth such as grass and other landscaping plants to slow down run-off; and
- Application of highly permeable materials as paving fabric or roads surfaces such as stone block or cabro.

- **Mitigating Air and Water Pollution:**

  - Developing a wastewater management strategy;
  - Establish a public sewer system for Kiserian town;
  - Locating effluent sources away from rivers; e.g., car wash, abattoir, hotels, and dense residential areas;
  - Planting trees to reduce pollutants and enhance purification of the air; and
  - Public sensitisation on safeguarding water and air quality.

- **Regenerating the CBD:**

  - Improving the legibility of the town through concise interlinkage of neighbourhoods within it commensurate with their functions. Public transport routes and provision of NMT facilities should be facilitated;
  - Zoning or applying functions to various nodes/neighbourhoods; and
  - Improving the service provision of public facilities; school, community centres, and recreation areas amongst others.

- **Rehabilitate the Quarries to Recreational Use:** Quarries are eyesores to the landscape of any town or city. Once a quarry has been decommissioned, there ought to be a rehabilitation plan to usher the spaces to a newer user. Kiserian town has several quarries within its core area. Therefore, certain plans to rehabilitate these quarries must be put in place. Below are some of the action plan ideas that can be applied to rehabilitate such quarries.

  - Building in quarries - hotels, warehouses, residential dwellings, and commercial.
  - Recreational facilities - parks, amphitheatre, rope bridges, Luna parks, dirt bike tracks.

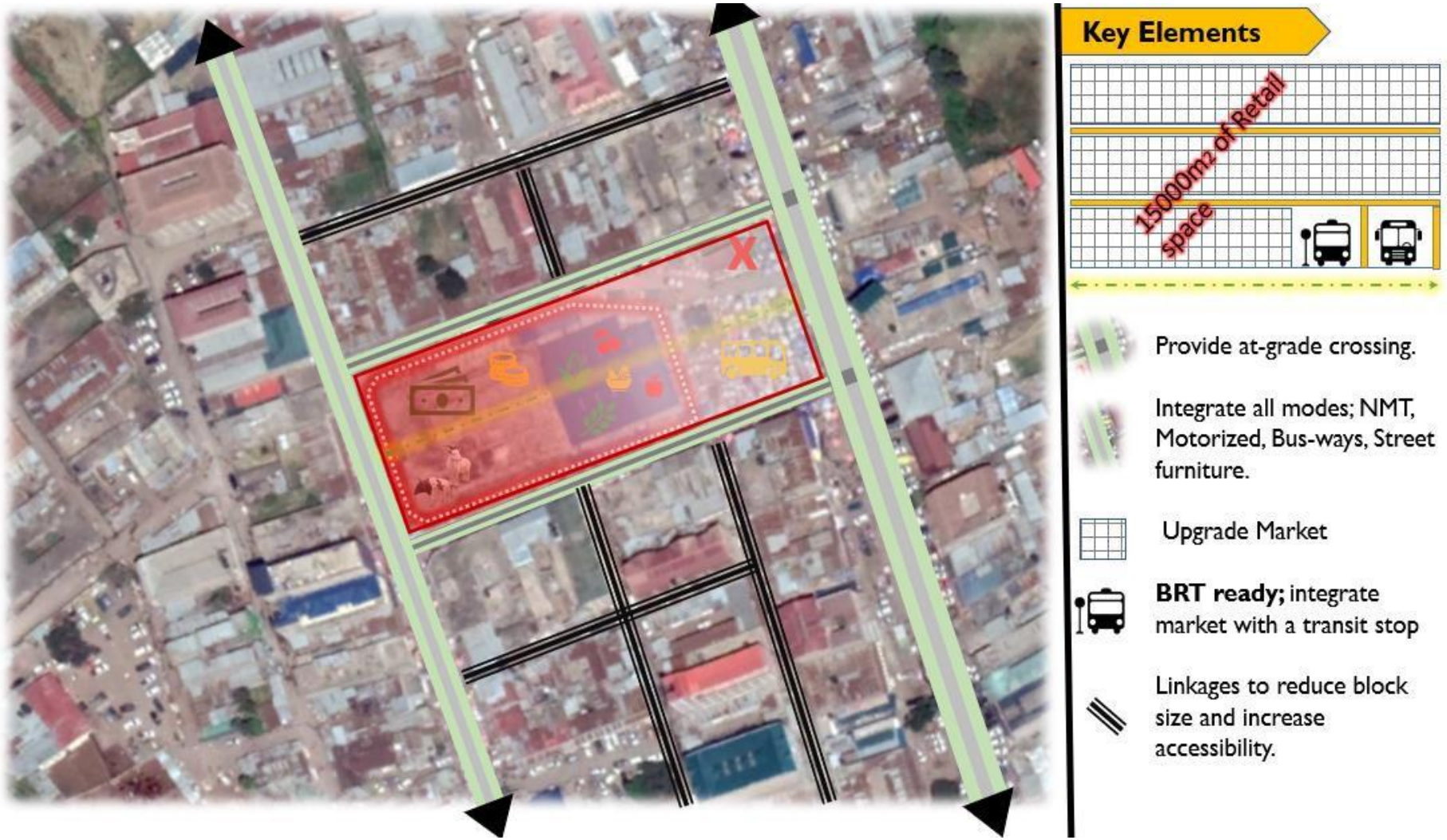


Figure 8-7: Market Rehabilitation Proposal

Source: VisionRI

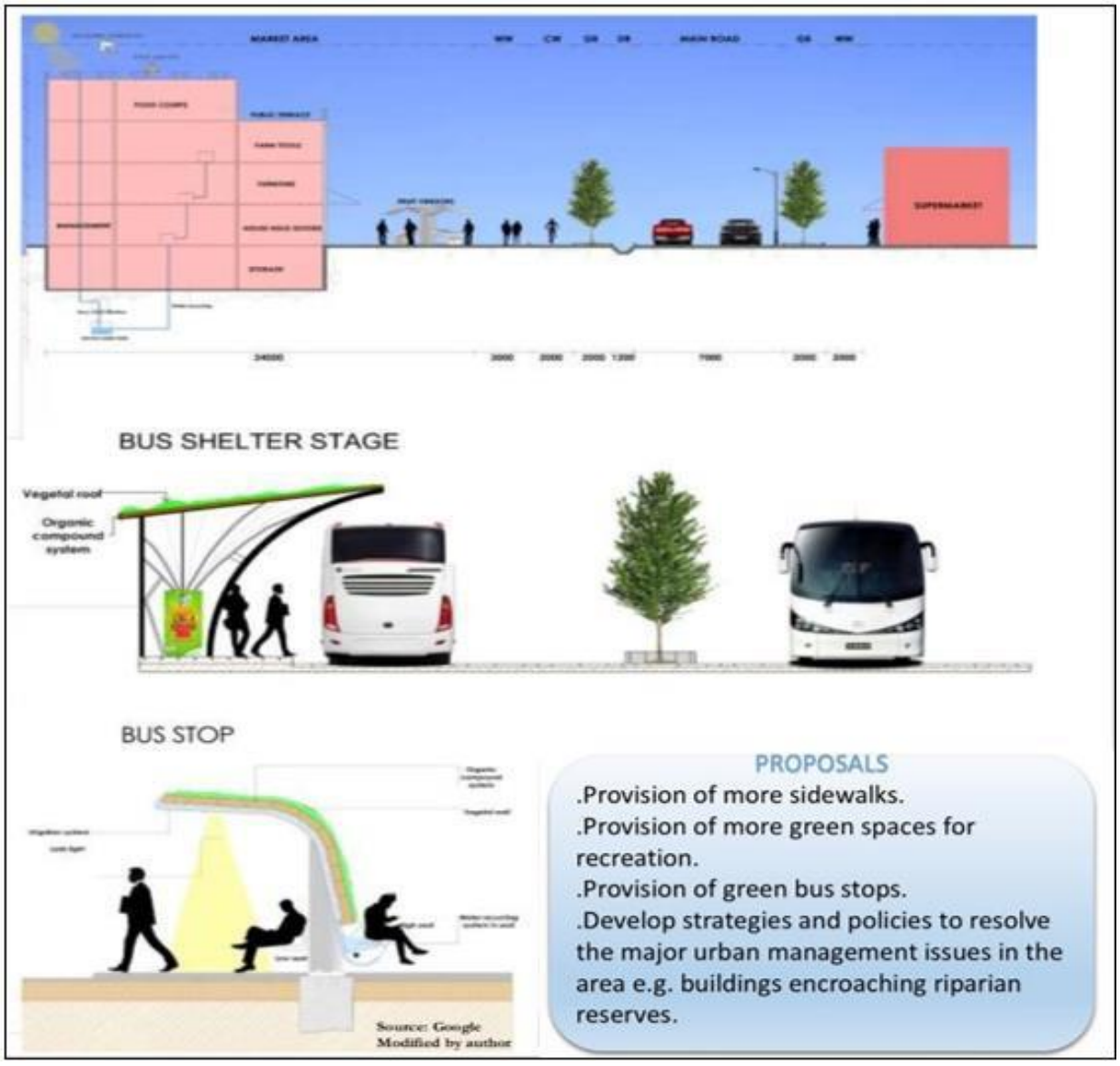
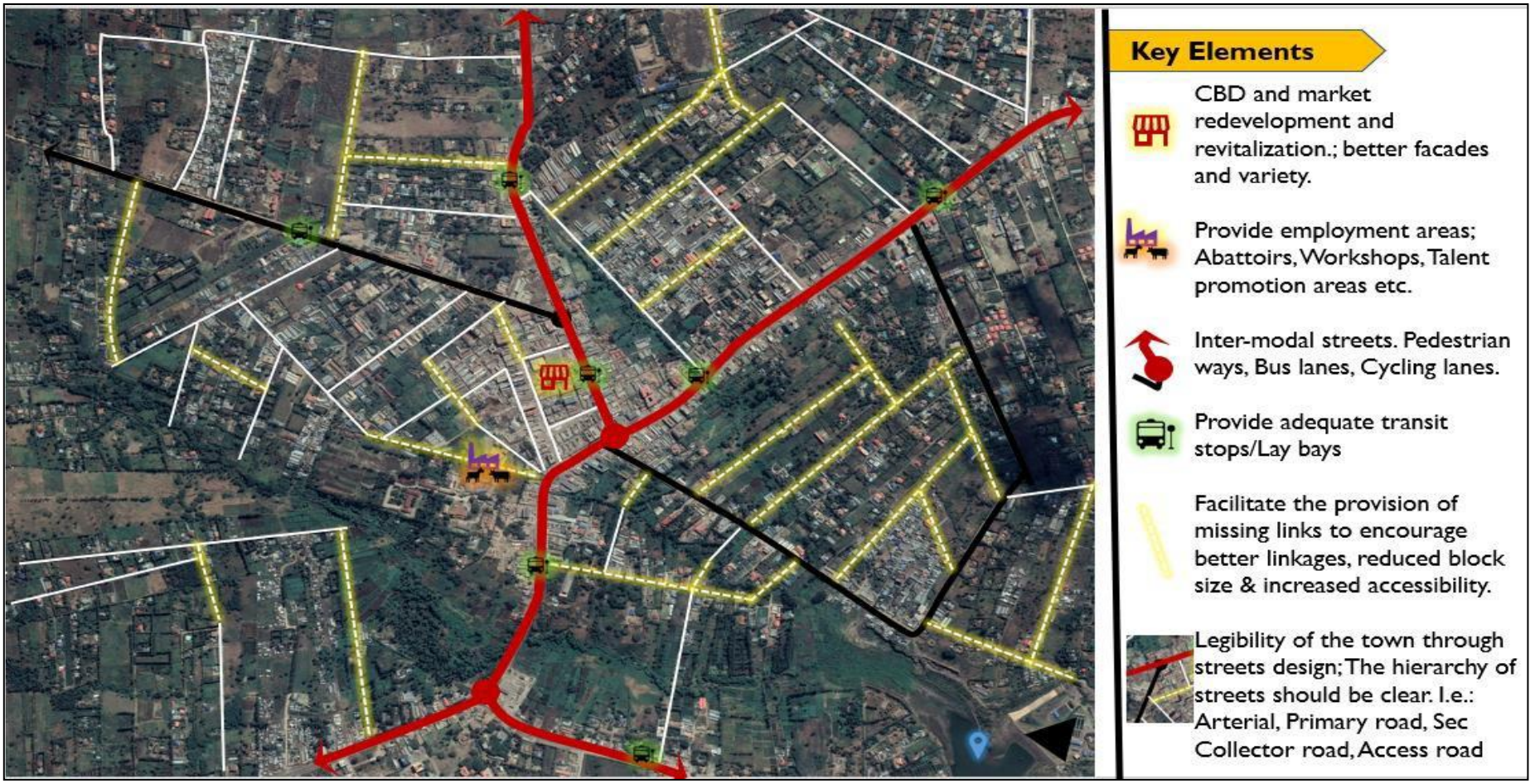


Figure 8-8 Kiserian Town Improvement Plan Proposal

Source: VisionRI



Map 8-2: Kiserian Town Improvement Plan Proposal

Source: VisionRI

Figure 8-9: Example of a Hotel Development on a Rehabilitated Disused Quarry in China

Source: VisionRI

Figure 8-10: Visual Presentation of Recreational Uses of Rehabilitated Disused Quarries

Source: VisionRI

9. INTEGRATION OF STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT

The preparation of this ISUDP was done together with the Strategic Environmental and Social Assessment (SESA). The purpose of SESA is to integrate environmental and social considerations into policies, plans, and programmes. It involves an evaluation of the environmental and social consequences of a proposed policy, plan or programme initiative in order to ensure that they are fully included and appropriately addressed at the earliest appropriate stage of decision making in line with economic and social considerations. Section 57A of Environment Management and Coordination Act (EMCA) (amendments) 2015, all policies, plans, and programmes for implementation shall subject to Strategic Environmental Assessment.

In this light, this ISUDP has included a SESA assessment on the potential impacts from the strategies, formulated alternatives, and develop mitigation strategies. SESA is complemented by an Environmental and Social Management Framework (ESMF), which establishes the principles, guidelines, and procedures for reducing, mitigating, and/or offsetting potential adverse environmental and social impacts, enhancing positive impacts and opportunities, and otherwise guiding potential investments towards compliance with relevant safeguards.

The SESA shall integrate social and environmental considerations into planning, leading to more sustainability of the expected outcomes of this Plan. The table below summarises the key social and environmental impacts on various projects identified in the Plan.

Table 9-1: Summary of impacts, mitigation measures and interventions

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Implementation Strategies
1.	Solid Waste Generation	All the proposed developments and land uses will generate a substantial amount of solid and liquid waste. During development phase spoil materials (soil, rocks, vegetation) packaging materials (e.g., paper, polythene, plastic and metallic packaging), reject materials (including damaged bricks, concrete and mortar, plastics), wastewater, used oil among others will be generated.	✓ Adequate waste management measures are required since dumping/careless disposal both on-site and off-site will cause environmental pollution, interfere with aesthetics and lead to the creation of breeding grounds for vermin.	✓ Solid waste management strategies such as sanitary landfills and waste collection points; ✓ The County is in the process of identifying suitable land for a sanitary landfill; ✓ Increase waste collection services to cover all urbanising centres such as Ngong' and Ongata Rongai areas; ✓ Each urban centre and residential areas to put in place appropriate waste collection points; ✓ Final disposal should be at designated well-designed dumpsites or landfills approved by NEMA; ✓ Some dumpsites need to be decommissioned such as those in Ngong'; and ✓ Construction of dumpsites at an appropriate site after detailed feasibility studies.
2.	Liquid waste disposal	• Residential and urban centres due to poor drainage and sewerage systems.	✓ Construction of sewer lines in urban areas such as Ngong'; ✓ Construction of public sanitation facilities in urban centres; ✓ Expand waste treatment plants; for example, wastewater stabilisation ponds; wetlands with appropriate macrophytes species for further treatment of the	✓ Promote the use of affordable and sustainable sanitation management technologies at both household and commercial areas for example bio-digesters to manage household effluent; and ✓ Comply with Quality Standards for Effluent Discharge into the Public Sewers.

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Implementation Strategies
			wastewater before discharging into the open environment; ✓ Planting of trees in riparian areas and other ecologically fragile areas; ✓ Resettlement of residents living in ecologically fragile areas especially along the Mbagathi River, Kandisi River, Kiserian River, and Olulua River; ✓ In Kitengela, there is need to resettle residents living Kisaju, Green valley, and Ilkeek Lemedungi; and ✓ Comply with statutory environmental regulations as per the LN No. 161 on Water Quality Guidelines.	
3.	Impacts on Air Quality (Emissions expected at construction sites)	Land-based farming; industrial uses, chemicals, mineral extractives, quarries especially around Ngong' town, Ongata Rongai, Kiserian and Gataka areas, improper waste management, automobiles, construction sites, etc.	✓ SESA has indicated that the ESMP has provided adequate mitigation measures; ✓ The ISUDPs should ensure maintenance and enhancement of green zones to sequester carbon from emissions; and ✓ Furthermore, the ISUDPs can develop an air quality policy that binds developments within all planning areas (such as the industrial sector) to control pollution and adhere to present air quality regulations.	✓ The proposed measures do not affect the structure of the ISUDPs; ✓ Strategic proposals including preparation of ESIAs during project implementation; and development of /adherence to air quality policy provisions at counties level; and ✓ Monitoring will be carried out by NEMA, National Government Relevant Ministries, and County Government.
4.	Stormwater drainage	✓ Flooding of roads, commercial, and residential areas; and ✓ Katani, Mlolongo, Athi River and Lukenya areas have poor stormwater drainage.	✓ Construction of drainage channels along major roads such as Mlolongo-Athi River-Malili road; ✓ Design and construct a dam for water surface runoff water; and ✓ Regular maintenance and dredging of the stormwater drainage network.	✓ Designs to manage stormwater management in partnership with KeNHA, KURA, KeRRA, NCA, National Government Relevant Ministries, NEMA, and County Government.

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Implementation Strategies
5.	Noise and Vibrations Impact on activity sites	Excavators, mixers, delivery trucks and other machinery.	✓ Land-use planning should encourage the location of noisier activities (such as industrial and commercial uses) near main roads or peripheral areas, and the residential/recreational/educational uses inwards in the more serene areas, noise impacts can be mitigated; ✓ Establishment of buffer zones between different land uses will attenuate noise, further reducing the potential impacts; and ✓ Adherence to noise ordinances such as the Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009 and employment of noise attenuation mechanisms for point sources will mitigate the impact.	✓ The plans proposed environmental management measures that are stipulated under strategic development directions; ✓ Plan proposes compliance on proposed measures; and ✓ Environmental Management Plan included in the strategic development proposal.
6.	Impact on Energy Resources	The proposed development projects and project activities will result in higher demand for energy resources both during the execution of the planned developments and operation phases.	✓ Institute energy conservation measures in proposed developments while at the same time taking advantage of the renewable energy opportunities that the site and proposed developments provide, including solar energy, green buildings, etc. ✓ Encourage investors to carry out feasibility studies to identify suitable locations for wind power projects.	✓ Renewable energy development under spatial development proposals and in the plan's implementation matrix; ✓ Exploration of various renewable energy sources in the two planning areas such as solar, micro-hydro, wind, biofuels, and biomass; ✓ Compulsory installation of solar panels for every new building; ✓ Construction of a solar farm through the private sector; ✓ Promotion of solar and wind energy for street lighting along A109/A104 interchange and other streets within

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Implementation Strategies
				markets such as Ngong' town, Ongata Rongai, Kiserian and Gataka areas; and ✓ Fast track the last mile power connection in remote areas in around Ngong' town, Ongata Rongai, Kiserian and Gataka areas.
7.	Impact on Soils and Geology	– Activities such as landscape, excavation, quarrying, and carting away spoil will lead to soil degradation from compaction and soil sealing leading to increased surface runoff and soil erosion; and – Spillage of materials (such as oils, fuel, grease, paints, solvents, curing compounds, adhesives, acids, soil stabilizers and binders etc.) may also lead to soil contamination while the importation of soil in landscaping and fill activities may lead to the introduction of invasive species/noxious weeds and pathogens such as bacteria, fungi and nematodes.	✓ It is considered that these impacts can be mitigated and should be adequately addressed in the Environmental and Social Management Plans (ESMPs) developed; ✓ Impact on soils and geology is expected to be moderate. This is because the planners have taken adequate measures to ensure re-vegetation and management of stormwater in all cleared sites, landscaped areas and farmlands; ✓ Ensure all quarry sites have ESIA licences acquired as well as NEMA approvals after decommissioning in Ngong', Ongata Rongai, and Gataka areas; ✓ Ensure written agreements are in place with the quarry owners; ✓ Impacts during the construction of the following roads: ▪ Expansion/widening of access roads to 9m through land acquisition; ▪ Upgrading of: ▪ Ongata Rongai Tuskys Chapchap – Gataka road; ▪ Maasai lodge – Rimpa road;	✓ The SESA report has recognized that the ISUDPs have taken note of this in the ESMP; and ✓ The ISUDP to take note of the proposals with a view of integrating them in the land use proposals and implementation plan.

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Implementation Strategies
			▪ Kamura–Oloika–Matasia road; ▪ Kandisi–Mericho–Matasia road; ▪ Kware–AIC–Gataka road; ▪ Ngong'–Upper Matasia– Corner Baridi Road (Kahara Road); ▪ Ngong'–Kiserian–Isinya road; ▪ Corner slope – Vet/Suswa road; ▪ Cooperative – Olkeri – 46 road; ▪ Beacon of Hope – Kisumu Ndogo Shell road; ▪ Construction of bypass at Gataka road linking Ongata Rongai to Ngong' via Oloolua; ▪ Construction of a ring road (Rimpa Road) to relieve congestion on Magadi Road; and ▪ Construction of service roads along Magadi.	
8.	Impact on Water Resources	✓ The development is likely to lead to increased demand on water resources both for all the land uses; and ✓ Generation and disposal of wastewater/effluent from the proposed developments in the planning area has the potential to cause ground/surface water pollution and health hazards to human and aquatic life.	✓ Measures to ensure adequate water supplies for the envisioned developments by the proposed ISUDPs need to be established in the project/site-specific ESMPs to ensure the conservation of water resources; ✓ Management of construction wastewater, spill control mechanisms, and treatment of effluent will be required to ensure the protection of water resources; ✓ Develop a Water Resource Master Plan; ✓ Promote water harvesting designs during building approval;	✓ Water Resources development strategies.

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Implementation Strategies
			✓ Construction of a water dam at Birika area; ✓ Construction of water pans in Kandisi, Nkoroi, Kiserian, and other appropriate areas; ✓ Promote water recycling technologies system at all levels; ✓ Set up new transmission pipes/reticulation in the planning areas; and ✓ Establish communal water points in the informal settlements of Kariobangi, Mathare, and Kware.	
9.	Impact on habitats of flora and fauna especially wildlife migratory corridors	✓ An upsurge in catchment degradation within the planning areas through the clearing of vegetation may lead to loss of economically significant flora and degradation of environmentally important areas; ✓ Habitat alteration may include fragmentation of forested habitat and other wildlife habitat through bush clearing, disruption of watercourses, the establishment of non-native invasive plant species, creation of barriers to wildlife movement and visual and auditory disturbance due to the presence of machinery,	✓ Some of the key management strategies include carrying out landscaping of different zones and maintaining the proposed green spaces as per the Plans; ✓ The Plans should also ensure the protection of the riparian environment and establishment of a Riparian Reserve Management Plan. Based on the precautionary measures to be put in place, this impact is expected to be moderate; ✓ Application of mapping and spatial analyses in creating models to help understand the conservationists in establishing effective conflicts resolution for example in Ngong', Rongai and Kiserian areas; ✓ Ensure provision of wildlife crossing zone and promote private or	✓ Fencing or erection of barriers of the conservancies to reduce human and wildlife conflicts; ✓ Proper zoning of conservancies; ✓ The mitigations measures to address conversions of key agricultural lands to built-up; ✓ ISUDP has provided broad strategies on the protection of environmentally sensitive areas; and ✓ Strategic mitigation measures such as rehabilitation of natural forests.

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Implementation Strategies
		construction workers, associated equipment and development operations; and ✓ Environmental degradation on change of land use from agricultural land to a built environment was identified as a concern by the stakeholders.	community-based conservancies in the planning areas especially connecting Ngong' forest and Nairobi National Park; and ✓ Comply with the Forest Act, 2016 to conserve Ngong' forest.	
10.	Impacts on Fauna	✓ There would be visual and auditory disturbance due to the presence of machinery, construction workers, and associated equipment. There is also the likely loss and fragmentation of wildlife habitats. Some of the natural forests which act as habitat for wildlife are likely to be cleared to pave way for the proposed development. This will result in habitat loss and fragmentation. Changes that may alter the existing natural conditions are known to impact negatively on wildlife.	✓ A wildlife management plan can be developed in collaboration with the Kenya Wildlife Service (KWS) to determine the carrying capacity of the conservation areas around Malili and Lukenya areas, translocations and/or the introduction of any new wildlife species; ✓ Since the ISUDPs have recommended preservation of areas ecosystems, this impact will be moderate; ✓ Prevent further encroachment of development; and ✓ Protection of ecologically fragile areas such as Oloolua and Ngong' forest, wetlands, and rivers such as Mbagathi River, Kandisi River, Kiserian River, and Olulua River; Kisaju, Green valley, and Ilkeek Lemedungi rivers.	✓ Collaboration with KWS to manage wildlife areas of migration corridors.
11.	Impacts on the Socio-Economic Environment	Positive impacts: ✓ Employment/business opportunities; ✓ Increased land value; ✓ Increased land rents and standard of living;	• Mapping of all the illegally acquired public land and open spaces; • Reclaiming/repossessing illegally acquired public land and open spaces; • Rehabilitation of the sites;	✓ The implementation of the plan will enhance positive impacts and mitigation of the negative impacts through sectoral strategic interventions.

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Implementation Strategies
		✓ Attraction of investors; ✓ Better health care, etc. <u>Negative impacts:</u> • There is a potential of increasing pressure on existing infrastructure such as roads, water supply system, waste handling facilities, electricity, etc.; • Interference with already existing infrastructure such as the pipeline, water pipes, power lines, roads and thus causing inconveniences; • Displacement of the local people mostly neighbours of the transport corridors; and • Fears also emerged that locals may not be able to afford the cost of living brought about by accelerated urbanization.	• Community sensitisation; • Ensure land adjudication and survey the riparian areas; • Ensure proper demarcation of access roads to riparian areas; • Prevent further encroachment of development; • Protection of environmentally sensitive areas Ngong' and Kisaju Rivers; • All affected persons to be given relocation assistance (cash or kind) to enable them to move their properties to new locations in accordance with the Resettlement Policy Framework (RPF); • Resettlement Plans will be required. If a site is acquired, the State may relocate persons and their families as well as community facilities to be affected; • The affected families should not be made to incur any cost during the relocation period; • A resettlement plan should be prepared with the RPF as a guide; • All affected persons to be given relocation assistance (cash or kind) to enable them to move their properties to new locations in accordance with the Resettlement Policy Framework (RPF); • A Resettlement Plan should be prepared with the RPF as a guide;	

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Implementation Strategies
			• If a site is acquired, the State or Kajiado County Government may relocate persons and their families as well as community facilities to be affected; and • The affected families should not be made to incur any cost during the relocation period.	

10. PLAN IMPLEMENTATION FRAMEWORK

10.1 Introduction

The new planning approach under the devolved system of government provides counties with the statutory duty to prepare development plans and establish structures and networks to guide their implementation.

This chapter addresses the need for the concerned authorities and agencies with functions in the County to ensure conformity to this Plan through appropriate coordination. Their joint efforts will enhance opportunities to promote the economic, social and environmental well-being of the County and the achievement of sustainable development in Kenya.

Overall, spatial planning, under the county governance institutional context, is a tool for coordinating spatial equity and integrating balanced redistribution of resources through an explicit and agreed policy framework.

10.2 Role of County Planning Unit (CPU)

At the core of demonstrating key dimensions of planning processes in the County is the County Planning Unit (CPU) provided under Clause 105 of the County Government Act. This Unit has the strategic role and duty of integrating and coordination of all County sectors and provide a degree of certainty and consistency across the entire planning and implementation cycles. From the guidelines provided by the National Land Commission, the establishments of the CPU relies on the knowledge and skills OF key County Government departments that consider all likely significant social, environmental, and economic factors, amongst others. The head of the CPU is the County Director of Physical/Land Use Planning; the idea is that sectoral strategies would operate within a spatial framework, and in turn, this would reflect the socio-economic analysis across the entire County.

Figure 10-1 below provides a detailed understanding and translating the role of the CPU from institutional and governance structures and their power relations.

In broad terms, the 10-year County spatial plans tend to deal with aspects such as the perceived role of planners and the interpretation of spatiality and the methods of engagement and spatial organising principles. For modes of implementation, the 10- year County sectoral plans provide a clear understanding of programmes and projects, and their budgetary implications. Through the programme-planning-and projects execution cycles, each County sector can break down the plans into the five-year County Integrated Development Plans (CIDP) and performance/results-based annual action plans.

10.3 Plan Implementation at the Decentralised Units

The objectives of devolution essentially outline the sovereign reasons for transfer authority for decision-making, finance, and management to quasi-autonomous units. Part VI of the County Government Act classifies the units as urban areas (City or Municipality), Sub-County, wards, and village units.

Both the executive and legislative arms of the County Government have complementary roles in executing the recommendations of the County plans. Figure 10-2 below provides a snapshot of the two main decentralised units with the greatest burden of the identified programmes and projects and the delivery of defined services.

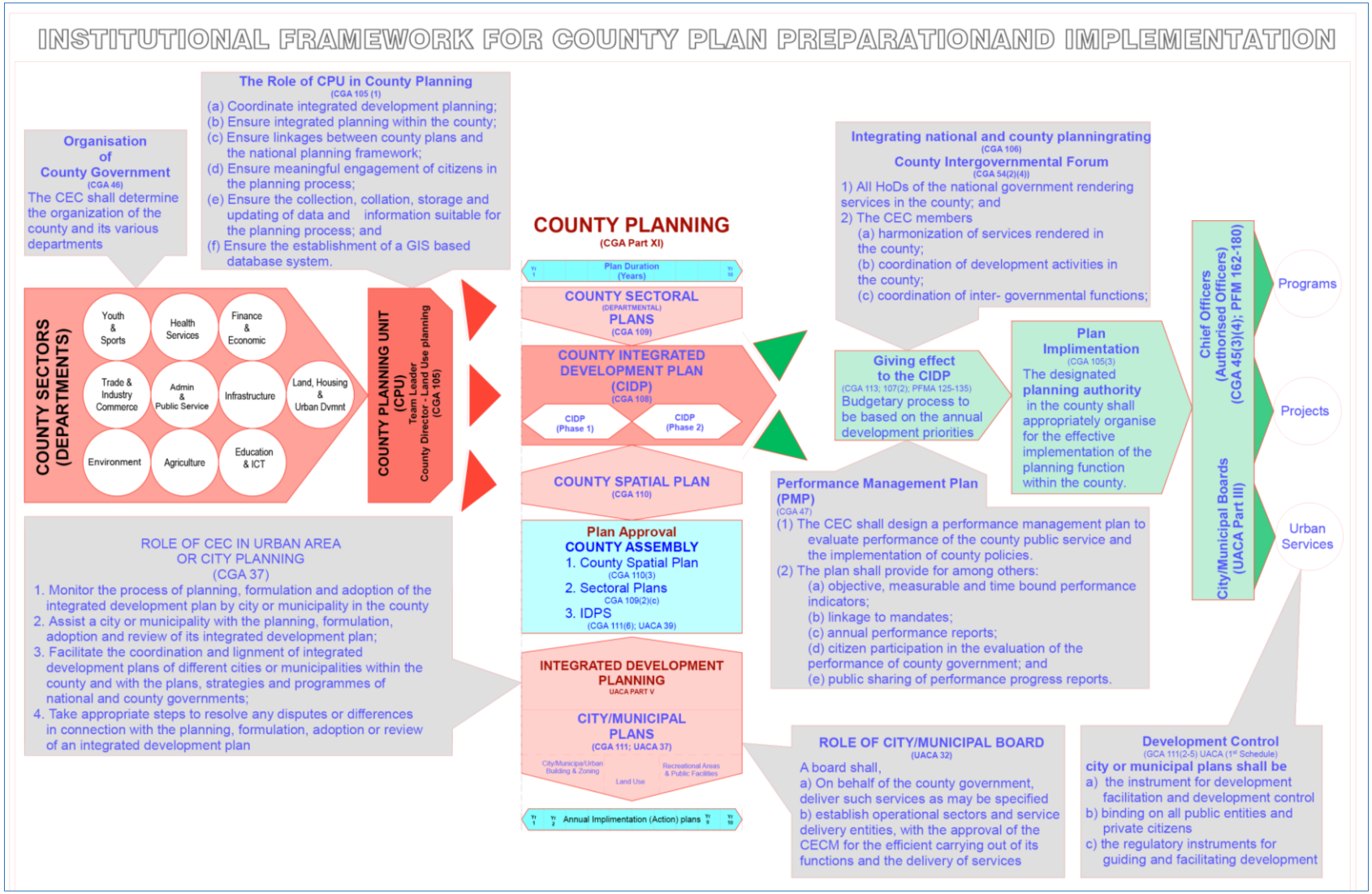


Figure 10-1: Institutional Framework for County Plan Preparation and Implementation

Source: Urban Planning for City Leaders Handbook

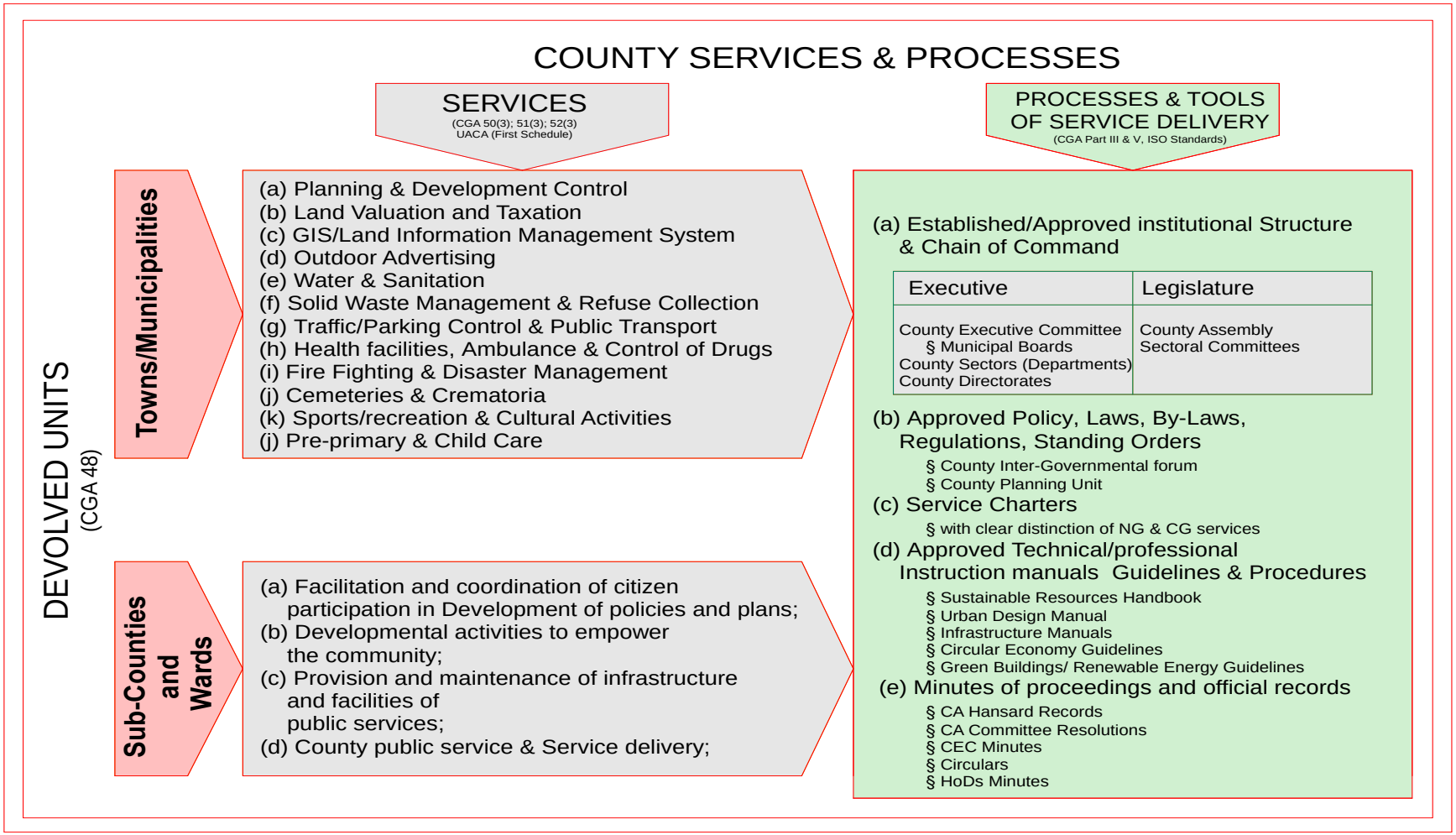


Figure 10-2: County Services and Processes

Source: Urban Planning for City Leaders Handbook

It is important to mention that some functions handled by the national Government must translate into the County planning and implementation framework through the County Inter-Governmental Forum (County Governments Act section 54) chaired by the County Governor.

As the head of the County Government, the Governor occupies the pivotal role of executive authority through the County Executive Committee and as the symbol of political sovereignty in the County Assembly for the execution of County functions and oversight, respectively. Both arms of the Government must operate within established processes and deploy the tools of performance appraisal. The implementation mechanisms should be sufficiently flexible to adapt to rapid change without adverse impacts.

10.4 Priority Programmes Framework

10.4.1 Core Pillars of the Framework

From the planning responsibilities stated in the County Governments Act 105(1) to the designated implementing planning authority 105(2), the CPU should set into motion the translation of the 'abstract concepts' to 'real development' through an implementation plan with clear outcomes, provisions for monitoring and evaluation and clear reporting mechanisms. Figure 10-3 illustrates the three fundamental plan implementation framework processes listed here below.

- Internal governance mechanism through capacity building that ensures better inter-and intra-sector engagement so that public, private and third sector service providers can work together for optimum solutions;
- Aligned programmes that address the different needs of different people and places informed by the Plan; and
- Specific projects and service that ensure public investment is made at the relevant places and services where most needed.

10.4.2 Institutional and Human Resource Capacity Building

This will require the structuring, recruiting, training and retaining of professionals in all technical and managerial skills capable of setting up and running ICT systems, including a Land Information Management System, exercise a clear chain of command and reporting methods and active stakeholder engagement, partnerships, and feedback.

10.5 Capital Investment Programme

The Capital Investment Programme (CIP) consolidates the identified projects. It is a Plan implementation tool which guides investment into capital asset, in which the Government must invest through public funds. The CIP includes locally prioritised capital projects that are financially realistic and feasible that were identified by the stakeholders during the stakeholders' forums. The CIP includes estimated costs and responsibilities for the implementation of agreed investments, as well as a financing plan.

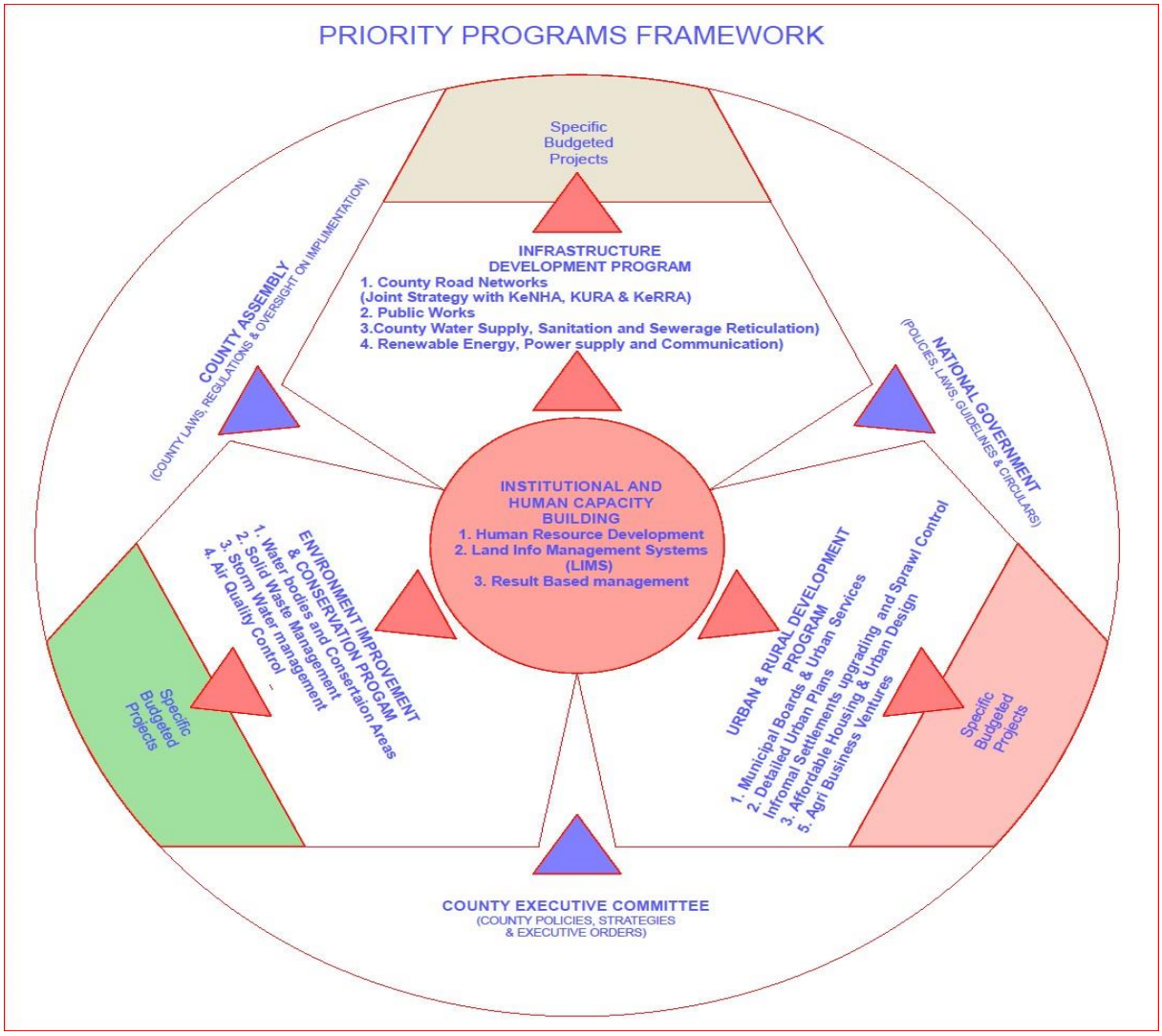


Figure 10-3: Priority Programmes and Projects Framework

Source: Urban Planning for City Leaders Handbook

Table 10-1: Capital Investment Programme

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
Natural Resources and the Environment						
Rivers	Protection of riparian reserves	Delineate riparian reserves according to WRA Standards.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	NEMA	2M
		Construct gabions along the riverbanks to prevent soil erosion.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	NEMA	Kshs 2 M
		Community sensitisation programmes on the importance of riparian reserves.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	NEMA	Kshs 3M
		Enhance the capacity of enforcement officers through training.	Short Term	Department of Public service, Administration and Citizen Participation.		Kshs 2M
Forests	Conservation of forests	Survey and fencing of the forests to discourage encroachment.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	Kenya Forest Service	Kshs 2M per forest
		Reforestation at Ngong' Hills, Oloolua, and Kibiko forests to restore the forest cover.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	Kenya Forest Service	Kshs 10M per forest
Quarries	Sustainable extraction of resources	Request environmental impact assessments for new quarrying projects.	Short Term	NEMA	NEMA	Developer to bear the cost
		Formulation of quarrying by-laws.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	Department of Lands, Physical Planning and Urban Development Ministry of Natural Resources	Kshs 1M

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Reclaim the abandoned quarries and develop agricultural or sporting activities.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	NEMA	Kshs 10M
Physical Infrastructure						
Sewer and non – sewer system	Carry out a feasibility study for a centralised sewer system.	Develop a centralised sewer plant for Ngong municipality, Kitengela and Kajiado town.	Medium Term	Department of Roads, Public Works, Housing and Energy.	Department of Health Services and Public health	Kshs 3M
	Prepare a sewer master plan for the Municipality and other towns sewer system	Construct a sewer network, i.e., trunk sewer and household connection.		Department of Roads, Public Works, Housing and Energy.	Oloolaiser Water and Sewerage Company partnerships and Donor Funding	
		Promote on-site sanitation technology for areas not served by a public sewer system.	Short Term	Department of Health Services and Public Health.		
		Creation of way leaves during subdivisions.	Short Term	Department of Lands, Physical Planning and Urban Development.		
		Undertake topographical surveys for establishment sewer systems.	Short Term	Department of Lands, Physical Planning and Urban Development.		Kshs 50M
Solid waste	Carry out a feasibility study on the location and construction of a sanitary landfill	Construct a sanitary landfill at either the Veterinary Farm or another centralised location to serve Kajiado North, East, and Central.	Medium Term	Department of Water, Irrigation Environment and Natural Resources.	NEMA, NG Departments, Funding Agencies	Kshs 300M
		Set up waste dustbins along the streets and at the CBD.	Short Term	Department of Water, Irrigation Environment and Natural Resources.	NEMA	Kshs 3M

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Prepare environmental bill to promote licensing of small-scale waste enterprises to serve areas not covered by the municipal services.	Short Term	Department of Water, Irrigation Environment and Natural Resources.	Department of Trade, Cooperative and Enterprise Development NEMA	
		Feasibility study of waste to energy incineration centre at Veterinary Farm through build – own – operate – transfer partnership. The energy produced may be channelled into the national grid.	Long Term	Department of Water, Irrigation, Environment, and Natural Resources.	KENGEN	Kshs 2M
		Construction of incineration facilities in health facilities to manage medical waste.	Medium Term	Department of Health Services and Public Health.		Kshs 3M per hospital
		Promote reuse biodegradable waste that can be converted into fertilisers and energy fuels like briquettes etc.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	Department of Agriculture, Livestock, Veterinary Services, and Fisheries	Kshs 1M
Water Supply	Prepare Water Master Plan for the planning area and its environs	Water resources master plan.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	TANATHI Water Services Board, WRA	Kshs 10
	Promote water harvesting	Compulsory provision of water harvesting designs during building approvals.	Short Term	Department of Lands, Physical Planning, and Urban Development.	WRA	

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Construction of a water dam at Birika area.	Medium Term	Department of Water, Irrigation Environment, and Natural Resources.	WRA, NEMA, Department of Roads, Public works, Housing and Energy	Kshs 200M
		Creations of water pans along Kandisi, Nkoroi, Kiserian, and other appropriate areas.	Short Term	Department of Water, Irrigation Environment, and Natural Resources.	NGO's WRA NEMA	Kshs 200,000 – 300,000 per pan
	Water recycling	Promote water recycling technologies system at all levels.	Medium Term	Department of Water, Irrigation Environment, and Natural Resources.	Department of Health Services and Public Health	Kshs 300 M
	Enhance water distribution	Set up new transmission pipes/reticulation in the municipality.	Medium Term	Department of Water, Irrigation Environment, and Natural Resources.	Tanathi Water Board Oloolaiser Water and Sewerage Company Department of Roads, Public Works, Housing and Energy	Kshs 100m
		Establish communal water points in the informal settlements of Mathare, Kariobangi, and Kware.	Short Term	Department of Water, Irrigation Environment and Natural Resources.	KISP	Kshs 5M per scheme
Stormwater		Lining and covering of major roads with stormwater drains.	Medium Term	Department of Roads and Public Works.		Kshs 500M
		Improve/repair existing primary and secondary drains.	Short Term	Department of Roads, Public Works, Housing and Energy.		Kshs 800,000
Energy	Utilisation of renewable energy	Compulsory installation of solar panels for every new building.	Medium Term	Ministry of Energy and Petroleum.	KENGEN	
		Construction of a solar farm through the private sector.	Long Term	Department of Roads, Public Works, Housing and Energy.	Ministry of Energy and Petroleum	Kshs 150M

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
Transportation						
Transportation	Improvement of the road network system	Classification of the road into hierarchies.	Short Term	Department of Roads, Public Works, Housing and Energy.	Kenya Urban Roads Authority (KURA)	Kshs 3M
		Creation of radial and grid road system to distribute traffic Effectively.	Medium Term	Department of Roads, Public Works, Housing and Energy.	KURA, KeRRA	Kshs 300M
		Expansion/widening of access roads to 9m through land acquisition.	Long Term	Department of Roads, Public Works, Housing and Energy.	NLC, KURA	Kshs 50M
	Upgrading of gravel roads to bitumen standards	Upgrading of Kware – AIC – Gataka road.	Medium Term	Department of Roads, Public Works, Housing and Energy.	KURA	Kshs 700,000 per Km
		Upgrading of Kandisi – Mericho – Matasia road.				
		Upgrading of Kamura – Oloika – Matasia road.				
		Upgrading of Maasai lodge – Rimpa road.				
		Upgrading of Ongata Rongai Tuskys Chapchap – Gataka road.				
		Upgrading of beacon of hope – Kisumu Ndogo shell road.				
		Upgrading of cooperative – Olkeri – 46 road.				
		Upgrading of corner slope – Vet/Suswa road.				
		Upgrading of Ngong' – Kiserian – Isinya road.				

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Upgrading of Ngong' – Upper Matasia – Corner Baridi Road (Kahara Road.				
	Development of high-capacity public transport system	Develop a BRT system along Magadi and Ngong Roads.	Long Term	Department of Roads, Public Works, Housing and Energy.	Kenya National Highway Authority (KeNHA)	Kshs 1M per km
		Develop an LRT system to link Municipality with Nairobi LRT network and the SGR.	Long Term	Department of Roads, Public Works, Housing and Energy.	Kenya Railways Corporation (KRC)	Approx. Kshs 50M per km
		Construct modern bus parks at Ongata Rongai and Kiserian.	Medium Term	Department of Roads, Public Works, Housing and Energy.	KURA	Kshs 200M
	Pedestrianisation	Create pedestrian pathways of minimum 2m wide along the streets in the Municipality.	Short Term	Department of Roads, Public Works, Housing and Energy.	KURA	Kshs 50M
		Landscaping, planting of trees and street lighting at the pedestrian pathways.	Short Term	Department of Roads, Public Works, Housing and Energy.		Kshs 200000
	Road safety creation	Put road signage and traffic lights at all roads.	Medium Term	Department of Roads, Public Works, Housing and Energy.		Kshs 1M
		Establish a street addressing system for all the streets.	Short Term	Department of Roads, Public Works, Housing and Energy.		Kshs 1M
	Easing traffic congestion	Construction of bypass at Gataka road linking Ongata Rongai to Ngong' via Oloolua.	Medium Term	Department of Roads, Public Works, Housing and Energy.	KENHA	Kshs 500M

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Construction of a ring road (Rimpa Road) to relieve congestion on Magadi Road; and construction of service roads along Magadi Road.	Medium Term	Department of Roads, Public Works, Housing and Energy.	KURA	Kshs 500M
	Enhance the parking system	Construction of multi-storey parking facilities at the Ngong' bus park and in the commercial building at the CBD's.	Medium Term	Department of Roads, Public Works, Housing and Energy.		Kshs 10M
		Construction of motorcycle taxis waiting for bays.	Short Term	Department of Roads, Public Works, Housing and Energy.		Kshs– 200,000
		Formulate proper traffic management policies of on-street parking and matatus/bus terminal.	Short Term	Department of Roads, Public Works, Housing and Energy.		Kshs 500,000
Informal Settlements						
Informal Settlements	In Situ Slum upgrading	Preparation of local physical development plans and delineation of boundaries of the informal settlements.	Short Term	Department of Lands, Physical Planning and Urban Development.	KISP, NLC, Ministry of Lands Physical Planning	Kshs 20M
		Provision of title deeds especially in Gichagi, Embulbul, Kware and Mathare informal settlements.	Medium Term	Department of Lands, Physical Planning and Urban Development.	NLC, Ministry of Lands and Physical Planning.	Kshs.10M
		Acquisition of land at the informal settlements for public facilities.	Short Term	Department of Lands, Physical Planning and Urban Development.	NLC	

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Provision of infrastructural and sanitation services in informal settlements.	Long Term	Department of Lands, Physical Planning and Urban Development.		Kshs 50M
	Housing improvement	Phasing improvement of temporary housing structures in Mathare, Kware, and Embulbul.	Long Term	Department of Roads, Public Works, Housing and Energy.	KISIP, State Department of Housing,	Kshs 850m
		Increase access to small loans and building materials for the construction of better housing.	Medium Term	Department of Roads, Public Works, Housing and Energy.	Department of Trade, Cooperatives, and Enterprise Development, Bank, MFIs, SACCOs,	
	Economic Empowerment	Creation of SMEs, cottages industries in the informal settlements.	Medium Term	Department of Trade, Cooperatives, and Enterprise Development.	Banks, MFIs, SACCOs, Uwezo Funds, etc.	Kshs 200M
Tourism						
Tourism	Development of ecotourism	Protection and creation of nature trails at Oloolua forest.	Short Term	Department of Gender, Social Services, Culture, Tourism, and Wildlife.	Kenya Wildlife Service (KWS)	Kshs 3M
		Creation of zip lining at Ngong' Hills.	Short Term	Department of Gender, Social Services, Culture, Tourism, and Wildlife.	KWS	Kshs 1M
		Establishment of Ngong Hills and Kiserian Dam Marathon to promote conservation.	Short Term	Department of Education, Vocational Training, Youth and Sports.	Department of Gender, Social Services, Culture, Tourism, and Wildlife Ministry of Sports, Culture and The Arts	Kshs 1M
	Promotion of Maasai cultural heritage	Construction of museum and a Maasai market.	Medium Term	Department of Gender, Social Services, Culture, Tourism, and Sports.	Ministry of Tourism	Kshs 10M

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Conservation of Ngong Hills and Colonial heritage sites.	Short Term		Ministry of Sports, Culture and The Arts	Kshs 1M
	Tourist infrastructure development	Construction of modern hotels tourists at Ngong and Rongai.	Medium Term			Kshs 150M
		Upgrade and tarmac roads leading to the tourist various destinations.	Medium Term	Department of Roads, Public Works, Housing and Energy.	KURA	Kshs 700,000 per Km
		Establishment of police posts at the tourist sites.	Short Term	Department of Public Service, Administration, and Citizen Participation.	Ministry of Interior and Coordination of National Government	Kshs 200,00
	Development of a tourist circuit.	Develop a tourist circuit map showing the routes linking the tourist sites.	Short Term	Department of Gender, Social Services, Culture, Tourism, and Sports.	State Department of Tourism	Kshs 300,00
Disaster Management						
Disaster Management	Effective disaster response management	Mapping disaster-prone areas.	Short Term	Department of Water, Irrigation, Environment, and Natural Resources.	State Department of Meteorology	Kshs 2M
				Department Lands, Physical and Urban Development.	Ministry of Interior and Coordination of National Government Government	
		Establish a disaster warning information system.	Medium Term	Department of Finance, Public Planning and ICT.		Kshs 1M
		Establish the Disaster Management Unit.	Short Term	County Executive.	–	Kshs 3M

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Construction of stormwater drains to control flooding.	Short Term	Department of Roads, Public Works, Housing and Energy.	KURA, KeRRA	Kshs 1M per metre
		Enhance the capacity of human resource, equipment, and infrastructure to cope with disasters.	Medium Term	Department of Public Service, Administration, and Citizen Participation.		Kshs 2M
		Equip disaster management units with equipment like firefighting, ambulances, etc.	Short Term	Department of Finance, Public Planning and ICT.	Department of Health Services and Public Health	Kshs 100M
		Integrate disaster risk reduction in building plan approvals/ occupation certificates and other relevant development policies.	Short Term	Department of Lands, Physical Planning and Urban Development.	State Department of Housing	
Housing						
	Promote densification and compact development	Delineation of 5km2 radius urban limits/boundary from the CBD.	Short Term	Department of Lands, Physical Planning and Urban Development.	Ministry of Lands and Physical Planning	Kshs 10M
		Formulation zoning plan and policies.	Short Term	Department of Lands, Physical Planning and Urban Development.		
		Increase plot ratios to 4 and the number of floors at the CBD.	Short Term	Department of Lands, Physical Planning and Urban Development.		
		Issuing of title deeds.	Long Term	Department of Lands, Physical Planning and Urban Development.	NLC	Kshs 20M

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Enrol a digital approval system for land and housing approvals.	Medium Term	Department of Finance, Public Planning and ICT.	Department of Roads, Public Works, Housing and Energy	Kshs 20M
		Development of County to meet housing demand (Agenda 4).	Medium Term	Department of Roads, Public Works, Housing and Energy.	Private Sector	500M
		Promote low-cost building technologies.	Short Term			
Local Economy						
Local Economy	Enhance economic growth in the Municipality	Construction of markets at Ngong', Rongai, Kiserian and Matasia towns.	Short Term	Department of Trade, Cooperatives, and Enterprise Development.	Department of Finance, Public Planning and ICT	Kshs 20M per market
		Construction of an abattoir and animal value addition industry at Halal land.	Medium Term	Department of Trade, Cooperatives, and Enterprise Development.		Kshs 20M
		Construction of Jua kali industries and cottages in Ngong, Kiserian, Matasia and Ongata Rongai.	Medium Term	Department of Trade, Cooperatives, and Enterprise Development.		Kshs 200M
		Development of horticultural/Agro-based industries and greenhouses at Ngong and Kibiko.	Medium Term	Department of Trade, Cooperatives, and Enterprise Development.		Kshs 200M
Social Infrastructure						
Health	Health Social facilities/services	Upgrading the Sub – County hospital to Level 4.	Medium Term	Department of Health Services and Public Health.	State Department of Health	Kshs 250M

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Upgrade and construct one hospital at each ward.	Medium Term	Department of Health Services and Public Health.		Kshs 100M
		Hire qualified staff.	Short Term	Department of Health Services and Public Health.		
		Construction of a modern rehabilitation centre at Ngong for persons affected by drug and substance abuse through land acquisition.	Long Term	Department of Health Services and Public Health.		Kshs 50M
		Construction of modern social halls at Ngong, Kiserian, Matasia, Oloolua, Kibiko, Embulbul and Rimpa.	Medium Term	Department of Gender, Social Services, Culture, Tourism, and Sports.		Kshs 10MM
		Construction of a public cemetery at Ongata Rongai and Ngong.	Short Term	Department of Gender, Social Services, Culture, Tourism, and Sports.		Kshs 20M
		Construction of one Public park, playgrounds and public stadium in each town.	Medium Term	Department of Gender, Social Services, Culture, Tourism, and Sports.		Kshs 15M
		Establishment of a modern resource centre at Nazarene University.	Long Term	Department of Education and Vocational Training.		Kshs 3M
Education	Education	Construction of Adult Learning Centres at each of the three Towns through land acquisition.	Long Term	Department of Education and Vocational Training.	Ministry of Education Department of Education and Vocational Training	Kshs 2Mper centre

Sectors	Programme	Projects	Timeframe	Driving Sector (Department)	Other Implementing Actors	Estimated cost
		Construction of one special needs school at each of the three towns through land acquisition.	Medium Term	Department of Education and Vocational Training.		Kshs 50MPer school

Source: VisionRI

11. FINANCING AND REVENUE ENHANCEMENT STRATEGIES

11.1 Introduction

The Kenya Constitution (2010) under Article 209 (5), provides for the County Governments to exercise their taxation power to generate own revenue to supplement the allocation from the National Government.

According to the Constitution, the main sources to fund the devolved form of Government include:

- Equitable share of at least 15 per cent of most-recently audited revenue raised Nationally (Article 202(1) and 203(2));
- Additional conditional and unconditional grants from the National Government's share of revenue (Article 202(2));
- Equalisation Fund based on half of one per cent of the revenue raised Nationally (Article 204),
- Local revenues in form of taxes, charges, and fees collected by the Counties; and
- Loans and grants to the counties: However, this has to be approved by the National Treasury.

According to the Draft National Policy to Support Enhancement of County Governments' Own Source of Revenue, it was noted that many County Governments are experiencing financial challenges in meeting their devolved functions as envisaged in the constitution hence the need to explore new ways to generate more revenue.

11.2 County Revenue Sources

The County Government of Kajiado's Government resources are mainly sourced from the equitable share, grants and County own source revenue, which includes property rates, natural resources royalties, cess, various service charges, and fees.

- **National Government allocation:** Funds are allocated by the National Government out of the country's share of National tax revenue through the Commission on Revenue Allocation (CRA). The County Government of Kajiado received KShs 5.7 billion from the National Government in the financial year 2017/2018. The funds were then allocated to the sub-counties for development. Performance of the equitable share over the plan period (2013/14 - 2017/18) was progressive and within the targeted amount of KShs 22 Billion.

- **Donor funding:** Donor funding during the period 2013/14-2017/18 totalled to KShs 734 million reflecting 3% of the budget financing.

- **Own source revenue (OSR):** The County raises revenue arising from property taxes, fees, levies, charges, and other revenue sources. The County collected Kshs 680M in the financial year 2017/2018 from its Source Revenue. The main sources of the County own source revenue include the followings:

- **Single Business Permit (SBP):** The County Government of Kajiado is empowered to control the conduct, location, and operation of certain businesses, trades, and

occupations within its area, through the issuance of licences and permits. It is also empowered to levy fees on licences and permits it issues to raise funds to pay costs associated with control of the business. For ease of collection, the National policy to enhance County own revenue generation encourages consolidation of fees payable on all business activities of an individual entity into one single business permit (SBP). Businesses licensing is the major source of revenue for the County. Revenue generated through SBP in the financial year 2017/2018 was KShs 183,838,255.

- **Natural resources fees:** Sand fees, limestone/royalties, and ballast fees are charged on the companies and individuals extracting the minerals within the County. The County received KShs 91,273, 811 in the financial year 2017/2018.

- **Development application approvals:** The development applications include building plans, change of user applications, building plans resubmission and renewal and occupation certificates. Revenue generated was KShs 60,623,396 within the 2017/2018 financial year.

- **Land Rates and Plot Rent Revenue:** Property taxes (or land rates) and land-based charges are levied on the owners or users of land situated within the town area. The County generated KShs 48,725,436 in the 2017/2018 financial year.

- **General hospital fee:** The County generated revenue from the hospital fee was KShs 34,056,565 in the 2017/2018 financial year.

- **User fees and charges:** The County Government of Kajiado Government raises revenue through the following fees and charges for financing costs of providing related services to residents of the town:

    - **Motor vehicle parking:** A parking fee is charged depending on the size and registered users of the vehicles. The County generated KShs 44,954,780 in the 2017/2018 financial year.

    - **Market fees:** Traders are charged a daily fee for display and sale of goods at designated marketplaces in the town. Market stall rents are paid monthly for the occupation of the County's built-up market spaces for public display and sale of consumer goods. Revenue generated through market fees in the 2017/2018 financial year was KShs 25,716,034.

    - **Outdoor Adverts:** Levies charged on the billboards and adverts amounted to KShs 34, 056,565.

Other sources of revenue for the County in the 2017/2018 financial year include:

- Slaughter fee and livestock Cess- KShs 22, 340,890;
- Public health inspection fee- KShs 21,087,270;
- Agricultural produce- KShs 10,399,173;
- Liquor license fee- KShs 2,565,500;
- Social services fee- KShs 1,250,300; and
- Registration of institutions fee - KShs 337,980.

11.3 Fiscal out Turn of 2013/2014 – 2017 - 2018 Financial Years

The County demonstrated a high dependency on the equitable share as a source of revenue to finance the budget at an average of 12% in the last five financial years. In the 2014/15 Financial Year, local

revenue performance was the highest, contributing 17% to the total resources for that year. The least performing financial year was 2016/17 reflecting 10% of the total resources for the financial year.

Figure 11-1 below illustrates the comparison of local revenue performance to the equitable share.

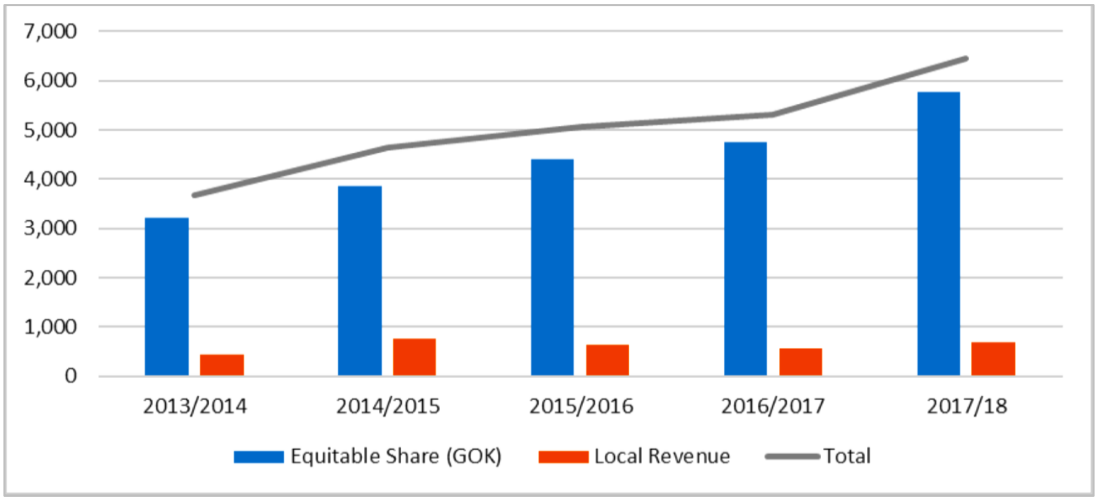


Figure 11-1: Comparison of Local Revenue Performance to the Equitable Share

Source: Kajiado CIDP 2018 - 2022

The County's Source Revenue target for 2013/14 to 2017/2018 Financial Years amounts to KShs.4.7 Billion. During the period, the County mobilised KShs.3 billion reflecting 65.4 per cent of the target.

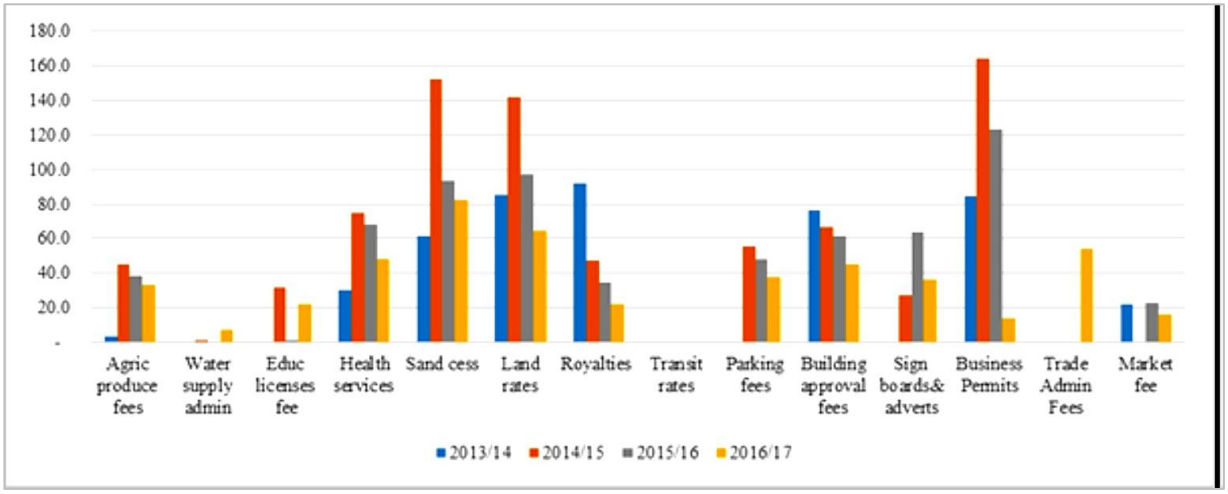


Figure 11-2: Analysis of County Own Source Revenue per Streams

Source: Kajiado CIDP 2018 - 2022

The main sources of own-source revenue during 2013/14 to 2017/2018 Financial Years include the Business Permit (20.4%), Sand Cess (15.3%), Land rates (15.3%), Building plans (10%), Royalties (8.4) and general hospital fees at 8.2% as shown above.

The shortfall in collection of local revenue is attributed to factors such as pilferage of revenue and fraud, laxity in compliance amongst the taxpayers, overreliance on the manual system of revenue collection, under exploitation of the main revenue sources, weak enforcement of the Finance Act, inadequate capacity in terms of personnel, equipment and funds and structural inefficiencies in revenue administration.

There have been efforts by the County Government to ensure improvement in revenue collection by putting in place a revenue collection system that ensures maximum collection and minimal losses of revenue. This entails:

- Automation of the revenue collection system by use of ZIZI information system;
- Restructuring of the finance and revenue system. The County Government has established the following departments each with its director overseeing its operation:
    - Permits and Licenses Department;
    - User Fee Revenue Department;
    - Compliance Department;
    - Natural Resource Department; and
    - Formation of a full ICT unit to enhance the automation of systems.

11.4 County Expenditure Analysis

During the period under review, the County Government implemented annual budgets amounting to KShs.17.6 billion out of the allocated budget of KShs.23.2 billion. This reflects a 75% absorption of the allocated resources. The shortfall in expenditure is mainly attributed to the under-collection of the County Own Source Revenue. The sectors' resource allocation versus utilisation for the period 2013/14 to 2016/17 is as shown in Table 11-1.

Table 11-1: Sectors' Total Resource Allocation versus Utilization (FY 2013/14 - 2016/17)

Sector	Total Allocation	Total Expenditure	Per cent Allocation	Absorption Rate
Office of the Governor	680,000,102.00	629,238,328.00	4	93
County Public Service Board	297,481,473.00	275,912,122.00	2	93
Education, Youth, Sports and Culture	2,681,486,355.00	1,604,167,021.00	9	60
Health Services	4,322,912,475.00	3,523,139,638.10	20	81
ICT, Gender and Social Services	506,032,191.00	343,107,572.55	2	68
Agriculture, Livestock Production and Fisheries	917,082,315.00	762,708,416.15	4	83
Water and Irrigation	1,608,325,679.00	895,879,726.25	5	56
Public Works, Roads, Energy and Transport	2,775,386,634.00	1,725,791,209.75	10	62
Finance and Economic Planning	1,840,517,306.00	1,553,725,910.80	9	84
Industrialisation and Enterprise Development	875,505,401.00	546,041,623.50	3	62
Lands, Physical Planning, Environment, Wildlife and Natural Resources	732,085,290.00	511,808,946.25	3	70
County Assembly	2,811,473,447.00	2,159,948,633.05	12	77
Public Service, Administration and Citizen Participation	3,215,299,827.00	3,098,217,337.55	18	96
Total	23,263,588,495.00	17,629,686,484.95	100.00	76

Source: Kajiado CIDP 2018 - 2022

Table 11-2: Revenue Projection Versus Revenue Received by Streams (2013/14 - 2017/18)

Funding		Approved Estimates (KShs)				Revenue Received/Collected				
Source	2013/14	201/15	2015/16	2016/17	2017/18	2013/14	2014/15	2015/16	2016/17	2017/18
Equitable Share (GoK)	3,525,736,420	3,878,310,062	4,412,625,800	4,761,279,539	5,768,200,000	3,227,409,859	3,865,164,568	4,412,625,800	4,761,279,539	5,768,200,000
Local Revenue	516,826,526	959,045,150	984,801,354	1,248,371,716	1,040,784,334	435,532,193	772,577,000	650,928,888	557,094,069	680,000,000
Development Partners	0	0	0	0	0	0	0	0	0	0
Total	4,042,562,946	4,837,355,212	5,397,427,154	6,009,651,255	6,758,984,334	3,662,942,052	4,637,741,568	5,063,554,688	5,318,373,608	6,448,200,000

Source: Kajiado CIDP 2018- 2022

11.5 Revenue Enhancement Strategy

This Plan proposes several strategic measures to enhance and stabilise revenue collection at both the County and Town level. These measures will help the County run sustainably. This means making it possible for the public to honour their financial obligations to the County via electronic means and online platforms. Examples include mobile applications, web-based applications, and unstructured supplementary service data (USSD). USSD is a real-time mobile phone communication protocol that makes it possible for users to communicate with the mobile network computer/server.

- **Incentives:** Incentives are measures that governments can undertake to encourage members of the public to do in order to stimulate greater output. The County can offer incentives to the public to encourage them to comply. Some of the incentives that the County can effect include a waiver on penalties imposed on land rate defaulters to encourage them to pay up, and discounts to those who comply before a specified period.

- **Enforcement:** The County can enhance revenue collection by ensuring compliance through the following:

    - Conducting regular and random checks;
    - Impose penalties on defaulters;
    - Increase the human and capital capacity for enforcement; and
    - Outsource enforcement to the private sector.

- **Create awareness to the public:** A good number of the members of the public are not properly sensitised on matters of revenue within the County. Some are not aware of their financial obligations to the County. There is thus needed to create awareness on the need to honour their financial obligations regularly and in time. Some of the ways the County can achieve this are: adopting an electronic system e.g., SMS to notify people on impending charges; advertise on media, public forums and churches on the existing revenue streams and financial obligations; and hold regular public forums/barazas to notify people of their fiscal obligations.

- **Better fiscal management:** This calls for prudent measures to manage the funds that have been collected. These measures can be rolled out at the point of collection, accounting, auditing, and allocation to various expenditures. Some of these measures include: analysing budgets and expenditure to check on affordability; ensure value for money for goods and services rendered; monitor spending habits by only spending allocated funds for intended and priority purposes; ensuring transparency and tight spending controls; avoiding unnecessary wastage on expenditure; regular and consistent auditing of financial records; reduce the handling of money by officers by encouraging online payment; and encourage compliance by those living or working in the counties to fulfil their financial obligations regularly and in time.

- **Introduction of development levy:** These are fees, which can be imposed on those intending to put up developments. The charges may vary depending on the size, location, and type of development. The funds collected can then be channelled to servicing upcoming developments and upgrading of the existing physical infrastructure including roads, sewer trunks, drainage channels and extension of water services.

- **Other sources:** Other sources include introducing charges on the use of County parks, and tourist sites. The funds collected can then be channelled to maintaining these facilities.

11.6 Finance and Investment Strategies

The Kenya Constitution 2010 and the Public Finance and Management Act empowers County Governments to use other measures to supplement the national allocation and their own sources of revenue to fund devolved functions. Counties can borrow money under the authorisation of the National Treasury and approval by the County Assemblies. Counties can also enter into a joint agreement with other counties or state corporations to enhance their financial capacity.

The County Government may explore the following finance and investment strategies:

i. **Public-Private Partnerships (PPP):** PPPs are joint ventures between Government agencies and the private sector which come together to offer services while at the same time-share the risk involved. In Kenya, PPPs are governed by the Public-Private Partnership Act of 2013 and the Public Procurement and Disposal Regulations of 2009.

Types of Public-Private Partnerships:

- **Management Contracts:** This is a form of partnership in which the public authority enters into an agreement with private companies to provide management services in return for a fee. In this arrangement, the county will retain the ownership and control of the assets.

  The County Government can engage in management contracts to outsource private companies and investors in the following areas: billing and collection of parking fees, land rates, recreational use fees, public toilets, and garbage collection, amongst others. The joint venture will result in efficiency in services provided and an increase in revenue generated.

- **Leasing:** This is a form of arrangement in which the county leases its assets to a private investor for an agreed rental sum for a specified timeline. According to the World Bank, leasing is also a form of agreement in which the private sector is given the mandate to operate and maintain a certain facility.

  The County Government will provide land and facilities for approval processes while the private investors will provide professional services such as engineering, design and construction. Other areas where the County can explore leasing include stadia, schools, and health facilities as well as leasing machinery for road maintenance, amongst others.

- **Concessions:** This is a joint partnership venture between a public entity and the private sector. In this case, the county leases its assets to private investors at a fee and share the profit and the risks involved. The concession period should not exceed 30 years. The private investors are mandated to maintain and enhance the asset.

- **Build-Own-Operate Transfer (BOOT):** This is a type of partnership where the private investors invest, build, operate, own and later transfer the property back to the County Government. This type of partnership mostly involves capital intensive infrastructural development. The private investors operate the infrastructure until it recovers its fees. Under this arrangement, the County can explore this form of partnership in the provision of major infrastructural development such as sewer truck in the rapidly urbanising areas and exploring solar and wind energy generation plants.

- **Build-Own-Operate (BOO):** This is a form of a public-private partnership model

where the private sector invests, builds and permanently owns an asset on public land under contractual terms that secure public interest under county supervision. The County Government can encourage this mode of investment through financial incentives such as tax exemption.

The County Government can use this model such as in the provision of recreational facilities in a residential neighbourhood, fire station and kindergartens, amongst others. At a higher level, the County can employ the model to promote foreign direct investment in areas such as industrial development.

Key considerations for an efficient public-private partnership:

- Undertake thorough screening for suitable projects to be considered for PPP arrangement by assessing value for money and risks involved;
- Outlining project milestones, responsibilities of actors involved, quality indicators and economic rebalancing methods;
- Well-structured legal framework and institutional guidelines to ensure transparency and fairness; and
- Public participation/awareness that will bring about political goodwill, transparency and ownership of the project which will in the long run build trust.

ii. **Development Partners:** Development partners refer to international development organisations that partner with the National and County Government to aid in the development in various sectors such as WASH, energy, health, food security, and urbanisation, amongst others.

The major development partners in Kenya which the County can source funding from include the World Bank, UK Department for International Development, Africa Development Bank, UNICEF, and International Monetary Fund (IMF), amongst others. The development partners can fund the County Government through the following channels:

- **Grants/Donations:** Grants these refer to financial aid given to the County Governments that do not require to be repaid. The grants are mostly need-based. According to the Public Finance Management Act of 2012, the county can enter into an agreement to third parties or any entities and obtain grants. The agreement must be approved by the County Executive Member for finance.

  The World Bank has collaborated with the Government of Kenya through the Kenya Devolution Support Programme to give grants to County Governments to improve their human resource and performance, civil education, public participation, and development plans, amongst others.

  The county has managed to develop municipalities under the support of WB through KUSP. Under this arrangement, the County will get approximately Ksh 1.6 billion per year for the next 5 years to support the provision of infrastructure facilities and services in the six municipalities.

  The county can also partner with Kenya Informal Settlement Improvement Programme (KISIP) to upgrade the existing informal settlement in Kiambu. The KISIP projects are funded by the Swedish International Development Cooperation Agency (SIDA).

- **Loans/Borrowing:** The County Government can borrow/loan money for

development purposes from development partners. The county is supposed to get approval for borrowing from the County Assemblies and the Cabinet Secretary of Finance under Section 50 of Public Management and Finance Act. A good example is where the World Bank through the Ministry of Transport, Infrastructure, Public Works, and Housing and Urban Development has loaned counties within the Nairobi Metropolitan to prepare Integrated Strategic Urban Development Plans.

iii. **State Corporations:** State Corporations are non-profit organisations established by an Act of Parliament. The National Government controls the majority of all the shares in state corporations/parastatals. The County Governments can engage or enter into an agreement with State Corporations for finances and management services. For example, the County Government of Kiambu has engaged the Kenya Revenue Authority to assist in revenue collection in the county such as property taxes and single business permits.

iv. **Joint Agreements:** The Kenya Constitution 2010 under Article 189 (2) provides for cooperation between the national government and the county government. It also provides for cooperation between different counties in endeavours to meet their obligated mandates. The County can exploit this opportunity to enter into an agreement with neighbouring counties within NMR to provide services, which cut across counties such as public transport.

v. **County Government:** After the devolved form of governance came into effect, all local bodies within previous local authorities were transferred to the management of county governments. The County Government can establish its specialised corporations, which can then generate revenue through offering services and can get funding from external sources.

12. MONITORING, EVALUATION, AND REPORTING

12.1 Introduction

The purpose of monitoring and evaluation is to assess the effectiveness of the implementation of the Plan. A fully functional M&E system is important for the implementation and review of the Plan to ensure it delivers the intended results.

An effective M&E requires an inter-agency/departmental coordination to ensure inclusiveness, which reflects the multisectoral framework of the plan. This means that all the departments and agencies need to be engaged.

CoK 2010 requires all county governments to plan and budget for the delivery of goods and services under their mandate. The Constitution requires counties to prepare the following plans to guide expenditure and investment programmes within their areas. These include:

- County Integrated Development Plan (CIDP);
- County Sectoral Plans;
- County Performance Management Plans;
- County Spatial Plan; and
- Cities and urban area plans.

Annual budgets are based on the approved plans by the respective county assemblies. Related guidelines are mainly directed to the monitoring and implementation of programmes and projects outline the CIDP, Constituency Development Fund (CDF) and other devolved funds as well as priority government and private sector priority investment programmes being undertaken within the county[12].

It verifies whether the activities of each county's priority project or programme are happening according to planning timelines and targets presented in the County Integrated Development Plan (CIDP); and whether resources are being used in a correct and efficient manner.

On the matters of physical and land use planning, the CoK (2010) requires the Department of Physical Planning and the National Land Commission (NLC) are expected to work in concert on matters of physical and land use planning. The National Spatial Plan has spelt out the need to develop performance indicators to facilitate the monitoring of the plan[13].

NLC has developed the Urban Land Use Planning Monitoring and Oversight Guidelines to "provide a lawful basis for engagement between the County Governments as planning authorities responsible for preparing, approving, implementing and reviewing Urban Land Use Plans and the National Land Commission as a monitoring and oversight agency over land-use planning"[14].

The guidelines provide for:

- Systematic, purposeful, and regular checking of the plans;
- Documenting and providing feedback on land use planning activities undertaken by planning authorities;

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[12] Kenya's County Integrated Monitoring and Evaluation System (CIMES 2016)
[13] Government of Kenya, 2016:254
[14] Republic of Kenya (2016), Urban Land Use Planning: Monitoring and Oversight Guidelines - National Land Commission

- Ensure the quality of the planning outputs and outcomes;
- Adherence to the Constitution, relevant policies, legislation, planning standards and guidelines;
- Take remedial actions to mitigate inappropriate practices;
- Hold the planning authorities accountable for their actions so as to enhance performance; and
- Guide and systematise the practise of preparing, implementing and reviewing urban land use plans in the country.

12.2 Existing M&E Situation

The M&E system in the Urban Land Use Planning recognizes the present veracities, which include

- Lack of an effective M&E system – Currently the system is mainly used on how funds are used and not in programme/project planning;
- M&E activities at County level are limited due to lack of capacity and backstopping role from NLC, National Physical Planning Department;
- Lack of clear indicators and tools to guide tracking of changes at all levels;
- Most sectoral (infrastructure, social and economic) plans are not synchronised with the physical development plans;
- Most of the planning activities are on development control with little emphasis on plan preparation and reviews, leading to development happening in unplanned areas;
- Low appreciation of physical and land use planning by policymakers; and
- Inadequate resources availed for land use planning at the county level.

12.3 Suggested M&E Proposals

An effective physical and land use planning M&E system should be domiciled within:

- National policies such as Vision 2030, National Land Use Policy, Urban Policy, Housing policy, etc.;
- County planning and development framework as provided in the County Government Act, 2012, UACA, Physical Planning, and Land Use Act 2019, etc.;
- Public participation with the emphasis on grassroots aspirations; and
- Effective partnerships to ensure inclusivity, resource mobilisation and timely delivery of programmes and projects.

Table 12-1 below defines the physical planning indicators.

Table 12-1: Physical Planning Indicators

Physical Planning Indicators	Means of verification
Targets Indicators	
Legal and Policy Compliance	Compliance with ISUDP and Urban Dev. Sector with Vision 2030.
	Compliance with Urban Agenda, National Spatial Plan.
	Compliance with the relevant legislation.
	Compliance with the relevant policies.

Physical Planning Indicators	Means of verification
	Compliance with the NLC guidelines.
	Compliance with other national agenda.
Physical Planning process	% of entities using the ISUDP.
	% of applications in compliance with the plan.
	% of planning areas defined as problem areas.
	Number of reviews of the ISUDP.
	Number of projects/initiatives completed per year.
	% of functional planning committees in accordance with the Act.
	Integration with other plans.
Institutional framework	Effectiveness of Municipal Boards in plan implementation.
	Effectiveness of the relationship between the Municipal Board and County.
	The functionality of the physical planning liaison committee.
	Technical staff capacity of the Sub-County/Municipality.
	Technical equipment capacity at the Sub-County/Municipality.
	No. of committees constituted as per the legal requirements.
Community participation	Level of resident consultation on physical and land use planning issues.
	Number of neighbourhood associations engaged in planning issues.
	Number of planning clinics on awareness held per year.
	Responses on public notices on plans and planning intention adverts.
	% of participation in planning forums.
Monitoring and evaluation	Number of Departments/Units reporting well functional M&E.
	Number of annual physical planning needs assessments carried out.
	Number of staff trained and applying M&E tools.
	Availability of M&E tools.
Resource Mobilisation	Number of partners/agencies supporting ISUDP implementation.
	Revenue generated by physical planning activities.

Source: VisionRI

The implementation of programmes and projects shall be monitored and reviewed annually. This shall be done through annual accomplishment reports to be submitted by concerned County Government Departments to the CPU. The list of programmes and projects shall be updated annually and amended along with the full review of the ISUDP.

12.4 Institutionalisation of the M&E

As described in earlier, the role of M&E will be anchored within the County Planning Unit (CPU) whose core mandate as stipulated in Clause 105 of the County Governments Act is to integrate and coordinate all the County sectors in planning and implementation of the various plans.

The County Director of Physical/Land Use Planning who is a member of the CPU will ensure that the ideals of this ISUDP are integrated across the entire County planning process.

12.5 Financial Monitoring

CoK 2010 requires all county governments to plan and budget for the delivery of goods and services under their mandate. The constitution requires counties to prepare the following plans to guide expenditure and investment programmes within their areas. These include:

- County Integrated Development Plan (CIDP);
- County Sectoral Plans;
- County Performance Management Plans;
- County Spatial Plan; and
- Cities and urban area plans.

Annual budgets are based on the approved plans by the respective county assemblies. Related guidelines are mainly directed to the monitoring and implementation of programmes and projects outline the CIDP, Constituency Development Fund (CDF) and other devolved funds as well as priority government and private sector priority investment programmes being undertaken within the county.

13 RECOMMENDATIONS AND CONCLUSIONS

Ngong' Municipality has huge potential by tapping from its internal resources, Kajiado County and by exploiting its strategic location within the NMR. The socio-economic potential as outlined in Chapter 3 above, place Ngong' Municipality at a strategic position to thrive. For the successful implementation of the Plan, the following aspects must be considered:

- Implementation of this Plan's vision should be done within the National, NMR, and Kajiado County planning frameworks;
- Need for cohesive coordination between the County Spatial Plan, CIDP and other plans and initiatives across the NMR – this will improve matching similar development models along and across inter-county boundaries and regions;
- Improvement of infrastructure including roads, water and sanitation, sewerage expansion, energy supply, solid waste management, and ICT to support the envisaged development programmes in the Municipality;
- Development of comprehensive transport master plan including BRT and commuter rail that integrates urban, peri-urban and rural roads across the Municipality and incorporates and traffic management systems;
- Capacity development (human and technical) of CPU and implementing agencies/entities at all levels on urban planning development and management to ensure effective implementation of this Plan;
- Awareness creation through identification and utilisation of effective communication systems and modes on the importance of land use planning and management at all levels;
- Integrating intra and inter-region learning to help in scaling best practice across the Municipality through effective monitoring and evaluation;
- Strengthening of the implementing institutions at both the County and Municipality levels – this will streamline the operations and symbiosis of all strategies and deliverables within the Plan's timeframe;
- Continuous monitoring and evaluation of interventions – in relation to identifying and strengthening the working of each intervention process and system. An unremitting M&E framework provides a consistent forecast of failure and emerging opportunities; and
- Revenue enhancement through different sources – beyond County allocations from the national government, mooting strategic partnerships and ensuring delivery of each agreement will see the Municipality improve its planning delivery within the proposed timeframe.

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