



GOVERNMENT
OF KENYA



COUNTY GOVERNMENT
OF KAJIADO

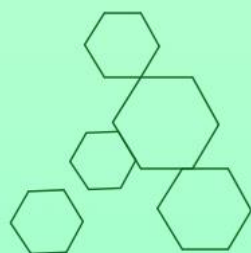
KITENGELA TOWN INTEGRATED STRATEGIC URBAN DEVELOPMENT PLAN

2020-2030



VISION

A Well-Planned and Secure
Town with a 24-Hour
Economy



SEPTEMBER, 2020

FOREWORD

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

Kajiado County has witnessed rapid urbanisation in the last few decades with people moving in to settle in this County, set up industries and undertake other development activities. Kajiado North where Kitengela Town is located has taken the bulk of urbanisation. It has also witnessed high population growth and economic activities and over the last ten years since the beginning of devolved governance, bringing with it a lot of development changing our towns' characters.

Due to this rapid growth as a County, we are expected to commit more investments to cope with this expansion. 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.

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 events. Due to the absence of planning tools like this 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 land amongst other challenges.

This Integrated Strategic Urban Development Plan (ISUDP) 2020 – 2030 has been prepared within Kenya's global commitments on sustainable development, and existing policy and legal framework which includes Kenya's Vision 2030, Constitution of Kenya, 2010, County Government Act, 2012, Urban Areas and Cities Act, 2011, Physical Planning Act, 1996 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 Town the necessary tools to correct and provide a context of addressing the current development trends.

The plan has taken into cognisance the many opportunities and resources that the Town can exploit in addressing these problems and utilising its resources sustainably. This Plan will therefore enable the County to direct development growth to the most appropriate locations and improve service delivery.

The key components of this Plan are the sectoral programmes and projects whose objective is to ensure integration and co-ordination 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 would reflect the socio-economic analysis across the entire Town. 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 pace for realisation of the medium and long-term projects.

My administration acknowledges with appreciation the support of the World Bank for the financial support in preparing this plan. I recommend 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 CEC Mr. Hamilton Parsimei 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, 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 full realisation of the plan.

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 realising the vision of this plan.

H.E Governor, Kajiado County

Hon. Joseph Ole Lenku

CERTIFICATION

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

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Signed Date

Registered Physical Planner

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Signed Date

County Director of Physical Planning

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Signed Date

CEC in charge of Physical Planning

APPROVAL

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

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Signed Date

County Assembly Speaker

.....

.....

Signed Date

Governor

Approved Plan No.....

ACKNOWLEDGEMENTS

I wish to express their gratitude to everybody who has been instrumental in making this assignment a success. Special thanks go to our esteemed Client, the Ministry of Transport, Infrastructure, Public Works, Housing & Urban Development (MTIPWH&UD) for awarding us the opportunity to carry out the preparation of this Integrated Strategic Urban Development Plan.

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Mr. Hamilton Parsimei

CECM Department of Lands, Physical Planning and Urban Development

Kajiado County

EXECUTIVE SUMMARY

Chapter 1: Planning Framework

The Kitengela Integrated Strategic Urban Development Plan (ISUDP) 2020 – 2030 is the County Government of Kajiado's tool that will support it to meet its key urban development strategy. It is the first component dealing with institutional reform and planning the will guide infrastructure and governance capabilities to meet the Nairobi Metropolitan Service Improvement Project's (NaMSIP) central agenda.

This Project is being implemented by the Ministry of Transport, Infrastructure, Public Works, Housing & Urban Development (MoTIPWH&UD), Directorate of Nairobi Metropolitan Development (DoNMED), with the support of the World Bank. The consulting group comprising VisionRI Connexion Service Private Limited of India was commissioned by the MoTIPWH&UD to provide technical consultancy services.

Objectives of the Project: The objectives of the ISUDP are -

- i) To determine demographic changes in the last ten years and those expected over the life of the plan for each town, and how these relate to economic changes, welfare, and administrative shifts;
- ii) To identify development constraints and potentials (social, economic, environmental and infrastructure profiling) and propose strategies to address them;
- iii) To provide a basis for infrastructure and service provision for present and projected population over the plan period;
- iv) 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;
- v) To uphold innovative civic and urban design that enhances the character and form of the town;
- vi) To provide a basis for development control and investment decisions; and
- vii) To develop a plan implementation and monitoring framework.

Purpose of the Project: In accordance with the Project's Terms of Reference (TOR), the general purpose of the ISUDP meets the following:

- i) 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;
- ii) Providing a framework for detailed development policies and proposals;
- iii) Indicating Action areas for immediate development or re-development; and
- iv) Providing a coordinated basis upon which various implementing agencies can develop their individual Programmes of work for which they have executive responsibility, for example, housing, transportation, water supply, electricity supply, sewerage development, etc.

Geographical Scope of the Project: Kitengela covers approximately 7,439.52 hectares and is composed of 2 wards with 2 sub-locations. The wards and sub-locations include Kitengela and Kaputei wards; precisely, Kitengela and Kisaju sub-locations.

Planning Scope of the Project: The Terms of Reference of the Project has outlined the exact tasks that will be employed in delivering the assignment. This includes:

- Delineation of Kitengela’s boundaries as guided by the county Government of Kajiado;
- Carrying out a contextual analysis of Kitengela and its environs;
- Undertaking an assessment of transport, infrastructure and utility needs, housing and community services;
- Analyse administration and institutional requirements in planning and development;
- Preparation of individual implementation plans to include proposed requisite resource and institutional frameworks; and
- Preparation of zoning plans for Kitengela with requisite development densities and guidelines, amongst others.

Project Products: The products of the assignment will be as follows:

- i) **The Situational Analysis:** covering a summary of Kitengela’s demographics; environment; infrastructure and utilities; local economy; land use and urban design; governance; and SWOT Analysis. Other components of the plan include GIS maps; investment strategy; resource mobilisation and revenue enhancement strategy; and action area plans; and
- ii) **The ISUDP Proposals Document:** complete with the development vision and objectives; refined thematic studies; alternative and preferred development proposals; infrastructure plans; and land use and zoning plans.

Methodology: The methodology used in the planning process was underpinned by participatory approaches. This is especially evident in the Metropolitan-wide studies performed to contextualise Kitengela’s environmental and natural resources setting, transportation linkages, and functional role with regards to the Nairobi Metropolitan Region (NMR). In addition, the methodology took cognisance of the unique relationship between urban areas and its hinterland from an environmental, economic, social and infrastructural perspective in line with the determination of well-placed relationships of various sectoral projects. Moreover, the methodology analyses the economic context under which the ISUDP would be prepared through:

- i) Identifying the key economic planks and role of Kitengela to contribute to the economic development priorities of NMR, and in turn, the economy of Kenya; and
- ii) Identifying the key challenges and constraints that Kitengela faces in the process of fulfilling its role in the NMR and Kenyan economy as well as how these challenges and constraints can be managed through strategic urban planning.

Planning Model: The plan has introduced a planning model that ensures that the inter-relationships affecting the planning area’s development are adequately identified and considered with succinct implementable development strategies.

Further, it presents a methodological framework that speaks to the specific context, situation, integrated development, land use planning, and the implementation cycle. In the end, a defined process for delivering the plan is then proposed. This involves 11 steps that start with 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.

Chapter 2: Contextual Analysis

This Chapter is on contextual analysis situates the preparation of the plan bearing cognisance of international, national and regional development context and trends, as well as development potentials of the clusters within the NMR at the national, regional and local levels.

Against the background of rapidly expanding urban areas, it behoves a review of sectoral governance structures, infrastructure systems, and support and general service provision resources to be realigned benchmarked against global best practice.

The sectors focused on in this ISUDP include energy supply; water and sanitation; waste management; education vis-à-vis the literacy rate; and health service provision. It also looks at housing and road infrastructure from a historical and present framework with a view to growing its potentials to compose future development. The plan uses urbanisation case studies from South Korea, Singapore, Malaysia, Brazil, and Botswana to validate the functionality and success to models that could be implemented.

The plan is keen to review varied urban planning and development trends locally and internationally, urban planning trends in line with sustainable development goals, in order to comprehensively delivery required services to the increasing population. It also aligns itself to the urban agenda, which has focussed on improving the living environments of world's growing urban population an integrated and coordinated manner at the global, regional, national, subnational and local levels, with the participation of all relevant actors.

The plan also explores the possibilities alluded to the Kenyan economy vis-à-vis the East African region and the global context, bearing that Kenya has consistently attracted high levels of foreign direct investment (FDI) and as the main source of FDI to its neighbours. For example, it increased its FDI from \$9 million in 2011 to \$16 million in 2012 and this growth has continued to expand. The Sectoral Economies of Nairobi Metropolitan Region will basically rely on Agriculture; Real Estate; Industry and Manufacturing; Service Sector; Tourism; Employment; Poverty and Income Inequality; and Micro and Small Enterprises.

The ISUDP has aligned its delivery to Kenya's long-term Vision 2030, Nairobi Metro 2030 and Spatial Planning Concept for NMR. The plan also reviewed the sectoral economies of the NMR which include agriculture, industry and manufacturing, service sector, tourism, employment, and income generation activities in the formal, small, and micro-enterprises. The plan explores this against the backdrop of poverty and income inequality in the County. In the end, it looks at the bottlenecks that can hinder the development of the NMR, which include gross regional domestic product (GRDP) growth, macroeconomic stability, labour market, security and enforcement of contracts, infrastructure development, and rapid population growth, amongst others.

At the national level, the plan invokes the Nairobi Metro 2030, in providing policy direction for the development of the metropolis in order to support Kenya Vision 2030, and Spatial Planning Concept in line with the Nairobi Metropolitan Region (NMR). Its delivery will support the National Spatial Plan and the National Spatial Planning Concept for the NMR and the Kajiado County Integrated Development Plan 2013-2017.

This ISUDP has been prepared within the relevant legal and policy frameworks of the Government of Kenya including the Constitution of Kenya, 2010; County Government Act, 2012; Physical and Land Use Planning Act, 2019; Urban Area and Cities Act, 2011; Environment Management Act, 1999; and the Public Health Act. The relevant policy instruments besought National Land Use Policy; Urban Development Policy; and the Sessional Paper No. 10 of 2012.

Chapter 3: The Planning Area

This chapter deals with the planning area. Kitengela lies within Kajiado County and has an area of 7,439.52 hectares. According to Kenya's Bureau of Statistics Population Census of 2009, Kitengela had a population of 60,652. It is one of the major towns in the Southern Metropolitan region, in addition to Ngong, Ongata Rongai, and Kiserian towns.

Kitengela is part of a larger rangeland ecosystem called the Athi-Kaputei Plains, which has undulating slopes that roll towards Ngong Hills and is characterised by gentle slopes.

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

The NMR offers abundant investment opportunities in manufacturing, infrastructure development, financial, agro-processing, chemical, pharmaceutical, mining, and mineral processing sectors as well as in the engineering and construction industry. The recent economic performance of the hospitality industry and to an extent, transport and communication, reflects the rapid growth of the tourism industry.

The ISUDP also looks at the urban growth and development trends; general land-use patterns; land market dynamics, administration and management and reflects this against urban growth scenarios. It reviews the planning areas 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.

This plan also explores providing an efficient transport system by looking at the existing road types; road condition; surface types; and non-motorised transport components and modes. It also discusses improvements in the planning area's physical infrastructure including water supply – through assessing the water demand and supply as well as the planned and on-going initiatives; energy provision – in relation to existing sources and potential investment e.g. in biogas, solar and wind expansion; ICT infrastructure in line with the growing demand; solid waste management through an integrated and sustainable waste management plan; wastewater disposal system; and stormwater drainage tackling recurrent flooding.

The plan further assesses the current state and projected needs of social infrastructure – in relation to housing, health, community facilities such as recreation and public parks; playgrounds; religious facilities; cemeteries; and security centres.

The report addresses governance by reviewing the planning area's institutional framework, with the intricacies of planning, implementation, and monitoring, creating room for amendment of the plan.

In relation to reducing and managing disasters across the planning area, the report outlines disasters associated with climate change and variability, flooding and deluge control, landslides, drought and famine and the need to set aside funds for emergencies.

Chapter 4: Stakeholders Participation

This chapter deals with the importance of stakeholder participation, engagement, contribution, methods, and management has been stressed, following consultation sessions and stakeholders planning workshops and forums that provided opportunities for feedback to increase ownership.

Chapter 5: Development Plan

This chapter provides the overall vision which is to be a well-planned and secure town with a 24-hour economy; mission based on the vision through providing an efficient and reliable infrastructure network; and goals and objectives. The plan reviews the structuring elements, land use trends, transport system and the physiographical factors such as rivers and valleys surrounding the town.

In addition, the plan analyses three spatial development models that are: the nil intervention; concentric zone model; and multiple nuclei model. The three models are analysed against the desired development paradigm and a combination of the concentric and multi-nuclei models is mooted to come up with an integrated model. This mode promotes compact development, which curbs urban sprawl and ribbon development hence leaving undeveloped land for future expansion. Under this model, Kitengela will serve as the main administration centre, commercial, and transport hub, while other nodes such as Saitoti, Yukos, and Reteti will become the residential hubs. Noonkopir will be a sub-administrative centre with some commercial activities.

Chapter 6: The Land Use Plan

This chapter presents the long-term development framework for Kitengela by indicating land use classifications, transportation corridors, and location of utilities and services. The integrated model has been considered most suitable in Kitengela as it blends multiple activities within multiple nodes, minimising the number of trips and trip length brought about by a mono-centric model. This plan will ensure equitable distribution of facilities, a good transportation network, green character, and protection of sensitive areas.

The plan categorises the proposed land uses into the following: residential (high, medium and low densities); industrial; commercial; public purpose and utilities; transportation; and agriculture. The plan also proposes land for future development.

This chapter also provides for building control regulations for the different zones in accordance with the provisions of the approved national standards.

Chapter 7: Sectoral Programmes and Projects

This chapter provides sectoral strategies and a summary of the short, medium and long-term sectoral programmes and projects proposed for implementation, which are essential in achieving the desired goals as articulated during the stakeholder's forum.

The implementation of the plan requires the collective efforts of various agencies. The key institutions include Kajiado County government, various government ministries, departments and parastatal organisations, neighbourhood associations, other local community groups, landowners and the public. The period for each action has been given indicating the expected implementation time, i.e. short term, medium-term or long term. The sectors include environment and natural resources; physical and social infrastructure; energy; local economy; housing; transportation; informal settlements upgrading; tourism and heritage; disaster risk management; and finance and revenue enhancement.

Chapter 8: Action Area Plans

This chapter covers action-oriented plans for specific areas with targeted interventions designed to intervene in problem areas and objectives. The purpose of Action Area Plans is to address key challenges and issues. In Kitengela, three action areas are proposed. These are Kitengela central business district (CBD); the bus park and market; and the quarry located near the CBD. The three interventions are meant to provide immediate action for development or re-development.

Chapter 9: Finance and Revenue Enhancement

This chapter analyses financing and revenue enhancement strategies. It identifies the current sources of county finance and proposes new opportunities for enhancing revenue and financing. The main sources of revenue include national government allocation; donor funding; own source revenue; single business permit; natural resources fees; development application approvals; land rates and rent; motor vehicle parking and market fees.

The plan proposes the following as the opportunities for revenue enhancement: automation; effective public participation; formulation of tariffs and pricing policy; improving revenue administration; determining an appropriate structure for revenue administration; better fiscal management; public-private partnerships; loans/borrowing; grants/donations; and royalty payments.

The chapter concludes that in order to create a conducive policy for engagement to enhance revenue the following need to be put in place:

- Formulation and implementation of policies to support the growth of businesses in the County;
- Engagement with the private sector in round table sessions to address issues affecting them;
- Enforce fair trade practices within the County;
- Conducting feasibility studies to determine the viability of new business opportunities and shared with potential investors; and
- Improving social and physical infrastructure to support business operations.

Chapter 10: Implementation Plan

This chapter addresses the mechanisms of delivering the plan and its implementation. It offers a comprehensive structure for the action plans. It identifies the roles of the different actors involved in actualising the plan. The key driver for the implementation of the plan will be the County Planning Unit (CPU), charged with the role of coordinating different departments and agencies. The chapter also shows how the plan is anchored within the CPU; and provides lists the priority projects under each programme.

Chapter 11: Monitoring & Evaluation

This chapter provides a performance-based monitoring framework for plan implementation. It identifies economic, spatial, social, environmental and governance impacts, and identifies expected outcomes and success indicators.

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ABBREVIATIONS & ACRONYMS

CAGR	Compound Annual Growth Rate.
CBD	Central Business District
CIDP	County Integrated Development Plan
CoK	Constitution of Kenya 2010
CSF	County Spatial Framework
DoNMED	Directorate of Nairobi Metropolitan Development
ECDE	Early Childhood Development Education
EPZ	Export Processing Zone
FDI	Foreign Direct Investment
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GDRP	Gross Region Domestic Product
ICT	Information Communication Technology
ILRI	International Livestock Research Institute
ISUDP	Integrated Strategic Urban Development Plan
KPLC	Kenya Power and Lighting Company
Kshs	Kenyan Shilling
MAVOWASCO	Mavoko Water and Sewerage Company
MoLH&UD	Ministry of Land, Housing and Urban Development
MRTS	Mass Rapid Transit System
MT	Motorised Transport
MTP	Medium-Term Plan

NaMSIP	Nairobi Metropolitan Service Improvement Project
NCWSC	Nairobi City Water and Sewerage Company
NEMA	National Environmental Management Authority
NLC	National Land Commission
NMR	Nairobi Metropolitan Region
NMT	Non-motorised Transport
NSDI	National Spatial Data Infrastructure
ODF	Open Defecation Free
OVC	Orphans and Vulnerable Children
PCEA	Presbyterian Church of East Africa
PPP	Public-Private Partnership
PSV	Public Service Vehicle
PWD	Persons with Disabilities
ROW	Right-of-Way
SACCO	Savings and Credit Cooperative
SME	Small & Medium-size Enterprises
STI	Science, Technology & Innovation
SWOT	Strengths-Weaknesses-Opportunities-Threats
TOR	Terms of Reference
TWG	Technical Working Group
WRMA	Water Resources Management Authority

1. PLANNING FRAMEWORK

1.1 Introduction

The Kitengela Integrated Strategic Urban Development Plan (ISUDP) **herein referred as the Plan** 2020–2030, is being implemented 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), with support from the World Bank.

The consulting group VisionRI Connexion Service Private Limited of India supported by Urban Lines Consultants Ltd (Kenya) provided the technical consultancy services in the preparation of the Plan. The Project was implemented under the institutional reform and programme of the Nairobi Metropolitan Service Improvement Plan's (NaMSIP), aimed at supporting infrastructure and governance capabilities of Counties within Nairobi Metropolitan Region. This Plan meets a specific initiative of supporting urban development issues in Kitengela Town.

Kitengela Plan amongst several other plans being prepared within Nairobi Metropolitan Area i.e. Kiambu, Murang'a, Machakos and Kajiado Counties. It was prepared through a participatory approach taking in to account consultative engagements of key stakeholders, the County's Project Implementation Team (PIT) and the World Bank (WB), 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". 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 own economic recovery strategy for wealth and employment creation

The strategic planning approach mentioned above in turn involves the identification of priority programmes and projects that can transform the targeted towns into vibrant well-planned satellite towns of Nairobi that tap on the advantages of their 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 towns with unique urban form and character through innovative urban design.

The key planning principles that underpinned this Plan preparation are:

- 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 a systematic search for the most appropriate and effective solution, keeping in mind given municipal resources, and overall policy guidelines and principles;
- An integrated approach, which requires thinking and acting holistically across the conventional sectorial boundaries. Functional integration with 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 should provide equal access to services and facilities; provide for functional, socio-economic, cultural and ethnic interaction; provide for economic development and employment; facilitate 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 plans to the stakeholders, it will also contribute to improving the capacities of government implementers and other stakeholders in planning, implementation and monitoring.

Terms of Reference

Detailed Tasks in Preparation of this Plan, involve the following tasks: -

- Carry out contextual analysis of the towns and their environs;
- Undertake a land-use and socio-economic study and survey of the towns, accommodating all the changes that have occurred over time and projecting future changes, and comparing how these changes compare in the metro region;
- Prepare an elaborate base map showing the existing spatial structure of the towns;
- Undertake 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 towns;
- Analyse administration and institutional requirements in planning and development;
- Prepare analysis reports indicating projected land use, infrastructure and services requirement over the plan period;
- Prepare a detailed short term, 10-year plan;
- Detailed study on the redevelopment of the CBDs;
- 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;
- Identify suitable land for both public purpose and utilities and address security issues in the town;
- Prepare implementation plans and propose requisite resource and institutional framework;
- Prepare zoning plans with requisite development densities and guidelines.

Purpose of Plan

The purpose of the plan include:

- Articulating the aims of the National and County government 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 Kitengela;
- Indicating action areas for immediate development or re-development; and

- Providing a coordinated basis upon which various implementing agencies can develop their individual programmes of work for which they have executive responsibility, for example, housing, transportation, water supply, electricity supply, sewerage development, etc.

Planning Challenges Kitengela includes:

- Unplanned and uncoordinated urban growth;
- Inadequate serviced land to accommodate urban growth;
- Inadequate infrastructure services and facilities (i.e. narrow roads, lack of sewer, and water supply, waste disposal, storm water drainage etc.);
- Poor quality housing and inadequate community services such as schools, health facilities, community halls and recreation areas;
- Unemployment and declining employment opportunities especially leading to high rate of youth unemployment;
- Uncontrolled land subdivisions;
- Urban sprawl and uncoordinated corridor development along the main roads;
- Lack of updated development plans that could form the basis for planning decisions;
- Proliferation of informal settlements;
- High crime levels;
- Poor coordination amongst relevant government authorities and other agencies,
- Ineffective participation in planning and development by local communities and the private sector;
- Environmental degradation and encroachment on riparian reserves and other fragile areas;
- High incidence of urban poverty.

Objectives of the Plan

In turn, the objectives and scope of the planning process are:

- To determine demographic changes in the last ten years and those expected over the life of the plan for each town, 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 projected 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 Kitengela town;
- To provide a basis for development control and investment decisions; and
- To develop a plan implementation and monitoring framework

Scope of Work

Geographical Scope

The geographical scope of the Plan was agreed upon after consultations with the County TWG after site visits and mapping work. Kitengela covers approximately 7,439.52 hectares and is composed of two wards with two sub-locations. The wards and sub-locations include:

Table 1-1: Wards & Sub-locations covered by the Kitengela ISUDP

Wards	Sub-location
Kitengela	Kitengela
Kaputei North	Kisaju(Isinya)

The Specific Tasks

The preparation of this Plan will involve the following tasks:

- Delineation of the boundaries of Kitengela;
- Preparation of base map showing the existing spatial structure to include, at the minimum, planning boundaries, existing road network, landmarks, major natural features and topography;
- Carry out contextual analysis of Kitengela and its environs;
- Undertake a land-use, socio-economic study and survey of Kitengela, indicating land use changes that have occurred over time and future projections, and comparing how these changes compare in the metro region and in the County;
- Undertake an assessment of transport, infrastructure and utility needs, housing and community services. This will include mapping of the transport, infrastructure and utility network of Kitengela;
- Carry out a detailed study on the redevelopment of the CBD;
- Identify suitable land for residential, industrial, education, recreational, public purposes, commercial, public utilities, transportation and other uses applicable to Kitengela;
- Analyse administration and institutional requirements in planning and development;
- Analyse reports indicating projected land use, infrastructure, and services requirement over the plan period;
- Prepare a sectoral development plans in support of the land use plan;
- Prepare individual implementation plans to include proposed requisite resource and institutional frameworks; and
- Prepare zoning plans for Kitengela with requisite development densities and guidelines.

Methodology

Planning Approach

Integrated and strategic planning approaches that are underpinned by participatory processes were utilized in preparing the plan. The integrated approach includes Metropolitan-wide studies that contextualize the Municipality's environmental setting, transportation linkages and functional role in the Nairobi Metropolitan Region (NMR), in particular, and Kenya, in general.

The integrated approach is further characterised by recognizing the relationship of urban areas to its hinterland from an environmental, economic, social and infrastructural perspective. Likewise, it entails the determination of well-placed relationships of various sectoral projects such as, for example, promoting forest conservation while promoting eco-tourism and sustainable livelihood.

The strategic approach was applied in determining the functional role of Kitengela within the NMR. It was also used in determining key interventions that would yield the most benefits such as putting forward transit-oriented development proposals to improve the efficiency of land use as well as the viability of transportation systems.

In line with this, an analytical framework was adopted and is summarised in the Figure below.

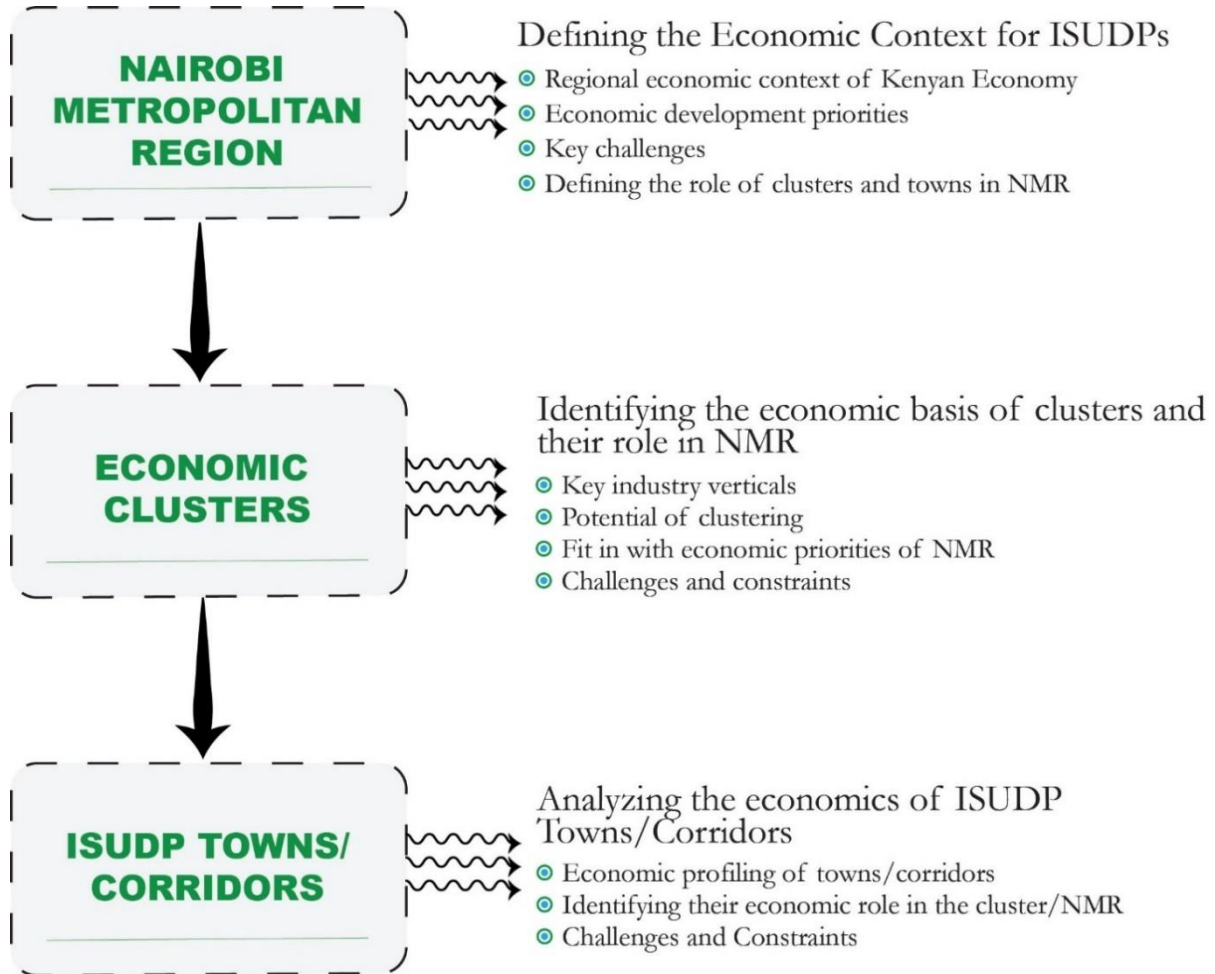


Figure 1-1: Analytical Framework for Economic Analysis

Source: VisionRI

In this context, special reference was made to Metro 2030 and Spatial Planning Concept for NMR. The ToRs for the consultant's cluster the planning areas (10 towns and 2 road corridors) as four clusters. Discussions with the client revealed that the basis of such clustering was the geographical proximity of planning areas. However, due to the proximity of the clusters, there was homogenous interdependence within the clusters necessitating the treatment of each cluster as an economic unit.

The analysis of planning area economies and transport corridors involved economic profiling of each planning area, identifying their role in the cluster economy as well as NMR, key challenges and constraints. Strategic urban planning was used in addressing challenges and constraints.

The above approaches are underpinned by participatory planning processes oriented towards engaging stakeholders in problem identification and problem solving at critical stages of the Plan preparation. The aims of this was to encourage stakeholder ownership of the plans developed as

well as contribute to improving the capacities of government implementers and other stakeholders in planning, implementation, and monitoring.

Planning Model

A Planning Model (Figure 1-2) that ensures that the inter-relationship of factors attendant to the planning area’s development are adequately considered and that the identified development strategies are properly implemented guided the Plan preparation.

The model provides that the Plan be framed within Kitengela’s context. It considers aspects that have a bearing on legislation and policies, economics, urban development contexts and transportation linkages amongst others. Contextual analysis also considers related plans and Programmes at the National, Regional and County levels that will likely affect strategy formulation and implementation.

Thus, the Plan is based on Kitengela’s Situation Analysis. This entails a review and analysis of the current state of various development sectors in relations to demographic, economic, land use patterns and types, urban design and morphology, transport, social, physical infrastructure and governance structures involved.

Thus, the model merged the Planning Context and Situation Analysis to form the core for the preparation of the plan, effectively guiding the crafting of the Integrated Development Analysis. A Spatial Framework Plan was then developed, comprising of a crosscutting assessment of developmental challenges and potential, collective development vision, mission statement, goals and objectives to be achieved, along with its physical translation. It provided the overall policy direction that guides development initiatives for the Municipality within the planning period.

This Spatial Framework Plan was represented at the local level through land use plans. Here the precise locations of various urban developments are provided along with the locations of environmental protection areas. The Land Use Plan was mainly implemented through a Zoning Plan, which ensured that development applications will be in line with the intentions of the Spatial Framework in terms of type of use, density, and magnitude of proposed development, etc.

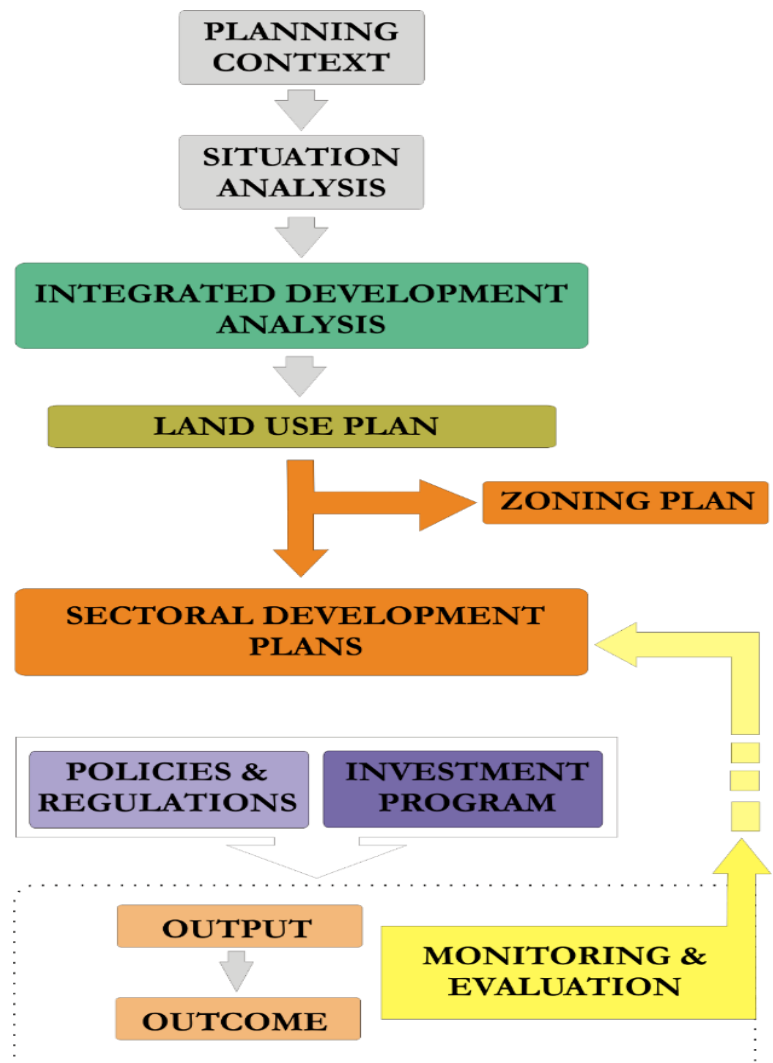


Figure 1-2: Planning Framework Model

Source: VisionRI

The Land Use Plan is supported by Sectoral Development Plans comprising of programmes and projects for broad sectors such as social, economic, transport, physical infrastructure, environment, and urban governance. The Sectoral Development Plans will be implemented in two streams; through policies, regulations, and a local development investment programme.

A monitoring and evaluation mechanism has been provided to enable plan implementers to ascertain if outputs and outcomes are within the Plan’s objectives and targets.

Methodological Framework

The Consultant’s Methodological Framework provides a guide to the planning process by way of providing the various aspects of analysis and planning. Figure 1-3 below shows the Methodological Framework.

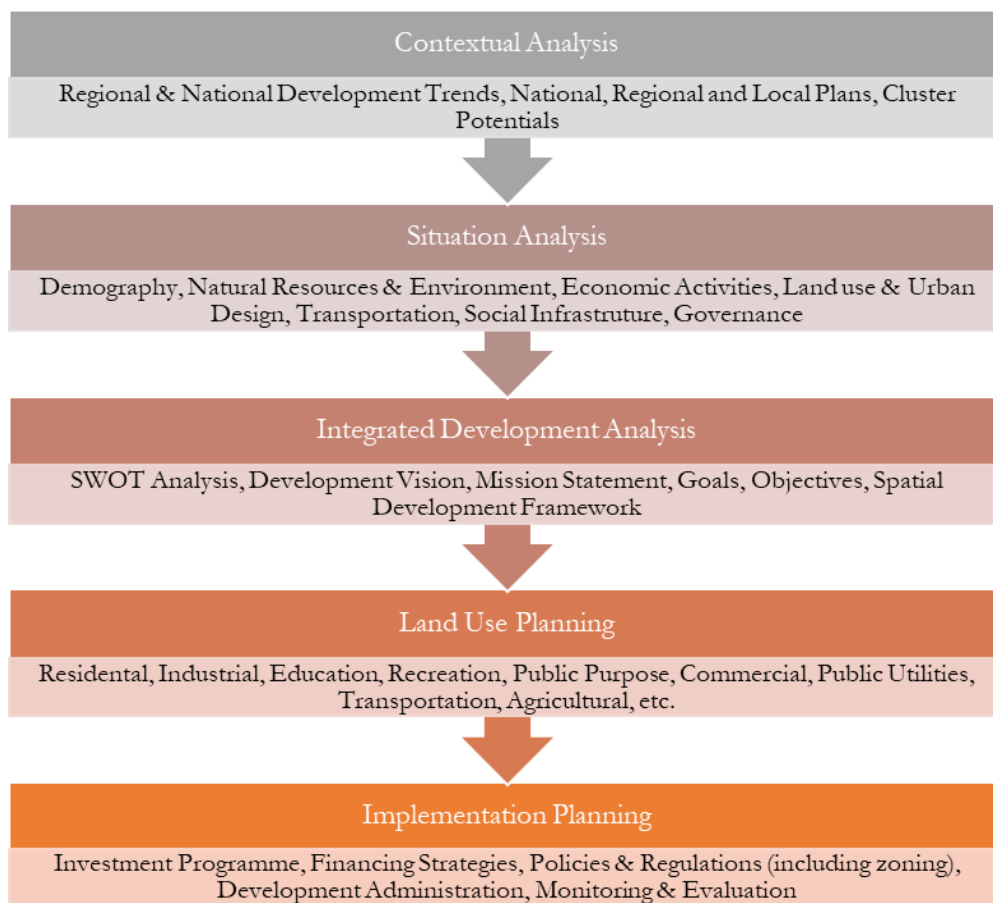


Figure 1-3: Methodological Framework

Source: VisionRI

Planning Process

The Planning Process being observed involves a sequence of 11 tasks based on the TOR. The Planning Process, with Tasks and corresponding objectives, is presented below in Figure 1-4.

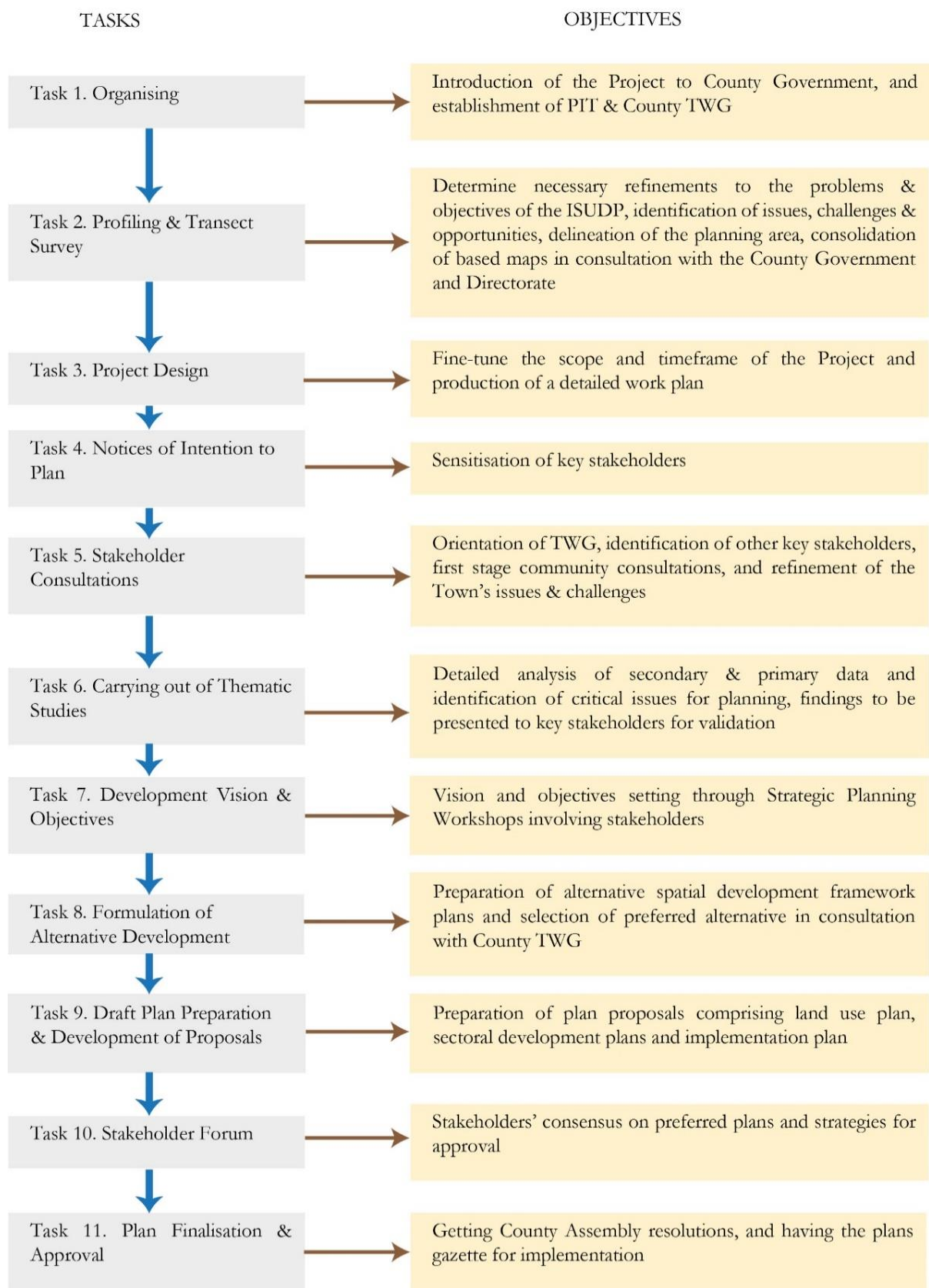


Figure 1-4: Planning process

Source: VisionRI

Methodological Approach

The planning process was conducted through secondary data and primary data collection methods. Field surveys were carried out where data was collected, interpreted and presented. The data was obtained from planners, policy makers, developers etc. and other stakeholders. Data was also obtained from secondary, sources from institutions, libraries, internet, and journals amongst other sources.

Though an inclusion and representative consultation and/ or participation of all residents, communities and stakeholders within the sampled areas, as well as representatives from other spheres of government, sector specialist, and other resource persons. This was by structured participation by organisations and legitimate representatives in stakeholder forums. The benefits of this approach were that:

- a) The local people's priority needs, and problems are well articulated and the plan proposals are sensitive and relevant to local situation and needs;
- b) The local people identify themselves with and own the output of the planning process therefore tremendously improving the chances of the implementation plan;
- c) Participation provides an opportunity for the citizens to understand how planning works and therefore improving the working relationship between various stakeholders; and
- d) Local human resources can be mobilised and sensitised to their crucial role in the development of the County.

Preparation

The preparatory steps carried out in the preparation of this Plan involved profiling, transect survey, preparation of Inception Report and Project Design. Profiling involved scanning general aspects of Kitengela to appreciate the challenges and opportunities. The output was the refinement of the problems and objectives of the plan. Transect survey involved undertaking a reconnaissance survey of the planning region. The output at this stage were: identification and appreciation of the Kitengela'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; preparation of the inception report. The project design involved fine-tuning of the scope and timeframe of the project. The output was the production of detailed work plan.

Sensitisation

Sensitisation of key stakeholders was carried out through publication of a Notice of Intention to Plan. This was done in collaboration with the Director Metropolitan Planning & Environment (DoNMED), Director of Physical Planning (Land) and the County. This was followed by stakeholder's engagement through direct interviews, focused groups discussions accumulating to first and stakeholders' workshops where wider ranges of stakeholders took place in validation of the situational analysis and later draft plan. The comments received during these forums have enriched the content of this plan as described below.

Investigation

In order to capture all the 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 especially in the slums, (but also in the towns, and corridors, peri urban and rural areas) to capture data on upgrade expectations/fears, sacred places/heritage sites, infrastructure needs, social problems and so on to

plan for were conducted. Third, key informant interviews with key actors were conducted to capture data on the status of social infrastructure, population patterns and respective needs and infrastructure needs amongst others. Fourth, the data collection endeavoured to the extent possible to seek to access all existing secondary data on population size, density and trends, economic activities, access to social infrastructure and so on. The data capture tools used include interview schedules, focus group discussion guides and key informant interview guides.

Secondary data was 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 from the towns. Reports such as publications, topo-cadastral maps and land-use plans were reviewed to give clear insights into Kitengela. It also included reviews of existing plans, policies and statutes. Some of the documents reviewed are 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 the 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 of existing conditions to assess 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 project areas. Some of the key techniques used to collect various types of data included:

- **Observations** undertaken to provide information on traffic volumes by 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 to use the 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; and flow rates and road safety; and people's perception of the transport system.
- **Inventory and condition surveys:** These involved determining the surface type of the roads (e.g. paved or gravel), the surface condition (e.g. good or fair), the road classification (e.g. Class A) and the length of the road in the project areas. It also involved determining conditions of other utilities such as water, drainage and sewer systems.
- **Key informant interviews:** The key informant's interviews were used to collect data on the historical as well as current infrastructural information. They include officials from Kenya Urban Roads Authority, Kenya National Highways Authority, Kenya Roads Board, Ministry of Lands, Housing and Urban Development, County Director of Physical Planning, Ministry of Energy and petroleum, Ministry of Transport and Infrastructure, and Kenya Railway Corporation.
- **Map preparation** was carried out using surveying and GIS software and saved into distributable formats easily understood outside surveying and GIS profession. Field validation was carried out using hand held GPS receivers pre-set to the national grid

system. Gaps found in the supplied maps were filled using hand held GPS equipment or current high-resolution imagery covering. Spatial Data acquired in hardcopy format was scanned, geo-referenced and digitised into vector maps on the same coordinate system as the project base map. Datasets that were acquired in hardcopy format included, Registry Index Maps (RIMs) showing the land subdivision, administrative maps, existing and proposed road networks, fibre optic cable network, power distribution network, etc.

2. CONTEXTUAL ANALYSIS

2.1 Introduction

The Plan was prepared within the context of international, national and regional development trends, as well as directly related plans at the national, regional and local levels. It was also prepared within the context of development potentials of the clusters within the NMR. These trends and plans, and their relevance to the Plan are briefly discussed in the following sections.

2.2 International, Regional and National Development Trends

2.2.1 International trends

- i) **Urbanisation and Globalisation:** According to Manirakiza (2012), the world system is arranged according to global capitalism with a core and a periphery. The production processes that are advanced in this theoretical perspective require the massive concentration of capital and the highest level of skills (Ibid, 2012). 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 centre of civilization, labour creation, and international financial exchanges. In this respect, present development dynamics requires 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 economy, to open, liberalisation and competitive one (Manirakiza, 2012). 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 (Manirakiza, 2012).

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 about 27 per cent urbanised 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 (National Forum for Sustainable Urbanisation. The situational analysis, therefore, focuses on the current development status of the planning area, with a view of analysing it with respect to the regional and global benchmark.

- ii) **Benchmarking urbanisation with Best Practice:** Best practice is equated to sustainable development. Kitengela planning area can learn and draw lessons of best practice from the Singapore, Malaysia, South Korea, Brazil and Botswana - five countries that have implemented similar national transformation endeavours of their environmental and socio-economic policies and strategies to manage urbanisation and achieve acceptable levels of sustainable development (Mosha, 1996; Kreimer and Gilbert, 1997:1; and Ellis and Roberts, 2016).

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 into South Korea's to a unique eco-friendly city model.

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. This is through:

- A series of long-term goals and ten-year plans to reconcile rapid economic development and environmental sustainability;
- Pursuing a vision of a clean, green city strong spatial planning; and
- A strategy of economic growth and good quality of life through a clean, green environment and best use of resources.

Case Study 3: Malaysia

Malaysia's Economic Planning Unit has developed the Malaysian Quality of Life Index (MQLI) using time series data on 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 are around seven parameters 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 making policies, preparing and implementing urban land use plans and carrying out construction by government and local authorities.

Case Study 4: The 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).

Case Study 5: Botswana

Botswana's case presented three components: Firstly, the Self-Help Housing Program that had 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 a cost-recovery, cross-subsidy and affordability considerations were introduced to secure replication and sustain the self-help housing program. Secondly, it involved Government Actors. This met the Government's service provision aim enabling for shelter provision. In line with this Botswana Housing Corporation provides rental houses and for sale in towns and some urban villages. Thirdly, in its Overall Strategy, the core principles were to continue supporting the social-cultural capabilities of households in their communities, in turn positively influencing 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 disabled) being the key enablers and security in the long-term achievement of the goals of the objective.

- iii) **Urbanisation and Housing Trends:** As 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, as the world urban cities population increased at a rate of 17 per cent, the area covered by these cities increased by 28 per cent. Built-up area densities have thus been on a decline around the world especially in developing countries were from an average of 170 persons per hectare in 1990 to 135 a decade later. A one per cent annual decline in average densities in developing countries is projected to quadruple the urban land area by the year 2050 from 2000 levels. This means that in sub-Saharan Africa, the urban land cover is to increase 7.5, times, over the period. This correlation has been translated to a 2 to 3 ratio (2:3) for the period between 2015 and 2030, where it is projected that from the year 2015 to 2030 the urban population of developing countries will double, while the area covered by this population will triple (UN Habitat, 2016).

Such urban expansion is not only wasteful in terms of land and energy consumption but increases greenhouse gas emissions. It has also led to the alteration of ecological systems in many cities over the past two decades (UN Habitat, 2016).

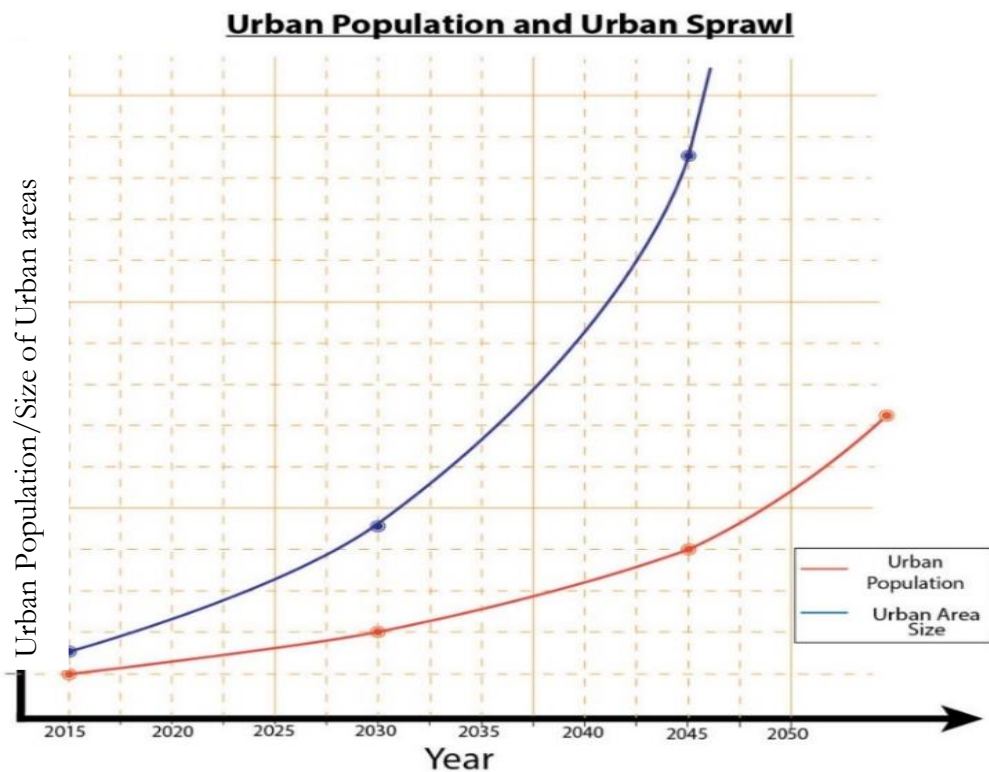


Figure 2-1: Urban Population and Sprawl

Source: VisionRI

The growth of these urban populations in developing countries is also in large part growth in the number of young people. From the year 2015 to 2030, the United Nations fund predicts where 60 per cent of those living in urban areas will be under the age of 18. The proportion of young people is particularly high in slum areas, where employment opportunities are limited. This combination of youth and poverty can

make for high crime rates. Despite the benefits of urbanisation, evidence supports that urbanisation, especially when its pace is rapid, can impede development and exacerbate environmental problems (Bloom & Khanna, 2007).

This disproportionate growth of cities and urban areas also brings with it the challenge of mushrooming informal settlements where the market forces and formal institutions are unable to keep up/ respond to the housing demand more so for the people living below the poverty line. This mushrooming informal settlement, which is seen as the urbanisation of poverty results in the challenge of providing adequate basic services and infrastructure. This challenge is central to the economic performance of cities, and their ability to provide a minimum quality of life to their citizens. The major services which cities provide include transport networks, water and sanitation connections, electricity, health, education, and a whole host of other ancillary services such as street cleaning, the maintenance of public spaces and parks, public lighting, archives, and cemeteries (UN Habitat, 2016).

With this trend, urban sprawl will further exacerbate the urban chaos in our towns; this is because there is inadequate space within our planning areas. As such, 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 the country/county of Kajiado.

- iv) **Development Trends of Urban Regions:** Large and small cities worldwide are expanding and merging to create urban settlements in the form of city-regions, urban corridors, and mega-regions. These urban configurations act as nodes where global and regional flows of people, capital goods, research and science, services and information combine and co-mingle, resulting in faster economic and demographic growth than that of the countries where they are located. These new configurations are spatially connected and are functionally bound by their economic, socio-political and environmental linkages. However, these trends have come accompanied by a high rate of suburbanisation where urbanisations flow to the peripheral areas of major cities and new centres emerge (UN Habitat, 2016).

The growth of Nairobi City has triggered such development in form of satellite towns, which have over time created and influenced their own fringes in a similar way. More dispersed patterns of urbanisation in the form of suburbanisation, peri-urbanisation, or urban sprawl have constituted a significant trend over the last decade. This urban expansion and dispersal is evidenced and spurred not only by individual preferences for a suburban lifestyle but also due to poor land management and lack of sound regulatory control over peri-urban areas; new land subdivisions accommodating highway and automobile expansion; and enhanced ease of mobility due to improved commuting technologies (UN Habitat, 2016).

As opposed to the upscale suburbanisation of developed countries, the peri-urban areas in developing countries have become divided cities, characterised by spatial segregation along socioeconomic lines. These large peri-urban areas consist of informal land-use patterns, accompanied by lack of infrastructure, poor or non-existent public services, with inferior quality housing and families living in poverty (UN Habitat, 2016).

Developers of suburbia and exurbia continue to subdivide the land and build housing, often creating single-purpose communities. These physical patterns of suburban development and car-dependent subdivisions that separate malls, workspaces and

residential uses by highways and arterial roads are not effective or efficient in the delivery of liveable urban areas. City leaders and planning professionals have responded and greatly enhanced new community design standards. smart growth is an approach to planning 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 (UN Habitat, 2016).

- v) **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 approaches 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 careful, 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 (UN Habitat, 2016).

- vi) **Sustainable Development Goals:** Sustainable Development Goals are a set of 17 goals meant to be implemented by 2030. The goals aim at; eradicating poverty, achieving food security and improved nutrition, promoting healthy lives and well-being of people, having quality education that is inclusive and equitable as well as achieving gender equality and empowering girls and women. Moreover, it also aims at ensuring availability and sustainable management of water and sanitation, accessibility to affordable, reliable and modern energy, promoting inclusive and sustainable economic growth.

The other goals are building resilient infrastructure that fosters innovation, reducing inequality within and amongst countries, making cities and human settlements inclusive, safe and resilient ensuring sustainable consumption and production patterns.

Lastly, they aim at taking urgent action to combat climate change and its impacts, conserving marine resources, protecting, restoring and promoting sustainable use of terrestrial ecosystems, forests and combat desertification, promoting peaceful and inclusive societies, and strengthening the means of implementation and revitalize the global partnership.

The Sustainable Development Goals informed the preparation of this plan and the goals were incorporated especially in the preparation of land use plans and action plans.

- vii) **Urban Agenda:** By 2050, the world's urban population is expected to nearly double, making urbanisation one of the 21st 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 these pose massive

sustainability challenges in terms of housing, infrastructure, basic services, food security, health, education, decent jobs, safety, and natural resources, amongst others.

The New Urban Agenda will help to end poverty and hunger in all its forms and dimensions; reduce inequalities; promote sustained, inclusive and sustainable economic growth; achieve gender equality and the empowerment of all women and girls in order to fully harness their vital contribution to sustainable development; improve human health and wellbeing; foster resilience; and protect the environment.

The New Urban Agenda reaffirms the global commitment to sustainable urban development as a critical step for realizing sustainable development in an integrated and coordinated manner at the global, regional, national, subnational and local levels, with the participation of all relevant actors. The implementation of the New Urban Agenda contributes to the implementation and localization 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.

2.2.2 Regional Trends

Current Development Status in East African Region

- The current development status of urbanisation can be analysed using key indicators guided by the United Nations SDG.
- Urban Population Growth
- The total population of Kenya is estimated at 47.6M. It has a population growth rate of 1.69%.

Table 2-1: Projected Population 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: Figures adapted from Kenya National Census, 2009

Kenya is urbanising at a very high rate. The concentration of Kenyans in urban areas is mainly attributed to migration to urban areas from rural areas and the geographical expansion of cities. The net migration rate is 0.2/1000 migrants. The capital city, Nairobi, has the highest urban population of nearly 2,750,547. Kenya has the second-highest rate of urbanisation amongst East African countries as shown by the graph below.

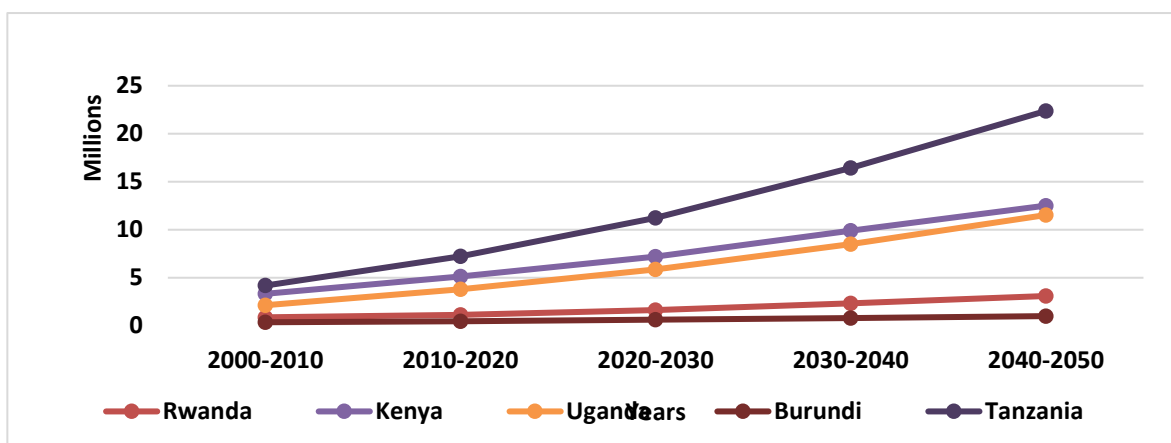


Figure 2-2: Urban Population growth rate of Kenya in comparison to other East African countries

Energy and Electricity

Higher access to electricity is correlated with higher development and human welfare indicators. East Africa has the second-largest potential of hydropower resources in Africa, of which about 20 per cent have been developed. In Kenya, electricity generation is higher compared to other East African Countries (UNHABITAT 2014). Table 2-2 below shows the hydropower potential of Kenya compared with other East African countries.

Table 2-2: Hydropower potential and Installed Capacity for selected East African Countries (MW)

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
Uganda	205	500	8	736
Burundi	43	300	14.5	-

Source: HRAA (2008) Hydropower Resource Assessment of Africa.

Table 2-3 the level of access to electricity in both rural and urban areas of Kenya and comparison in the region and globally.

Table 2-3: Access to electricity in both rural and urban areas, for selected countries in East 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%

Region	Population without electricity millions	National Electrification rate %	Urban electrification rate %	Rural electrification rate %
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%

Source: IEA, World Energy Outlook 2016

Kenya had a higher urban electrification rate compared to other East African countries and lower than the world's average rate.

Water and Sanitation

- There is a shortfall against the global target for water and sanitation. Kenya has 57 per cent of people with access to improved drinking water compared to the world's 91 per cent.
- Access to Drinking Water and Sanitation
- An average of 91% of the world's population uses improved drinking water sources whereas 68% of the world's population use improved sanitation facilities.

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

Table 2-5: Access to Sanitation Services

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 as Salaam	62	10	-

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. Waste management in Kenya is relatively good with 70% of urban households having access to rubbish collection services.

Education and Literacy rate

Education is one of the most powerful instruments for reducing poverty and inequality and lays a foundation for sustained economic growth.

Access to Education

The teacher: student ratio in Kenya is below the minimum of the United Nations Educational, Scientific, and Cultural Organisation (UNESCO). When Kenya is compared with other countries in the region, it is slightly lagging. The graph below shows the levels of accessibility to education.

Table 2-6: 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

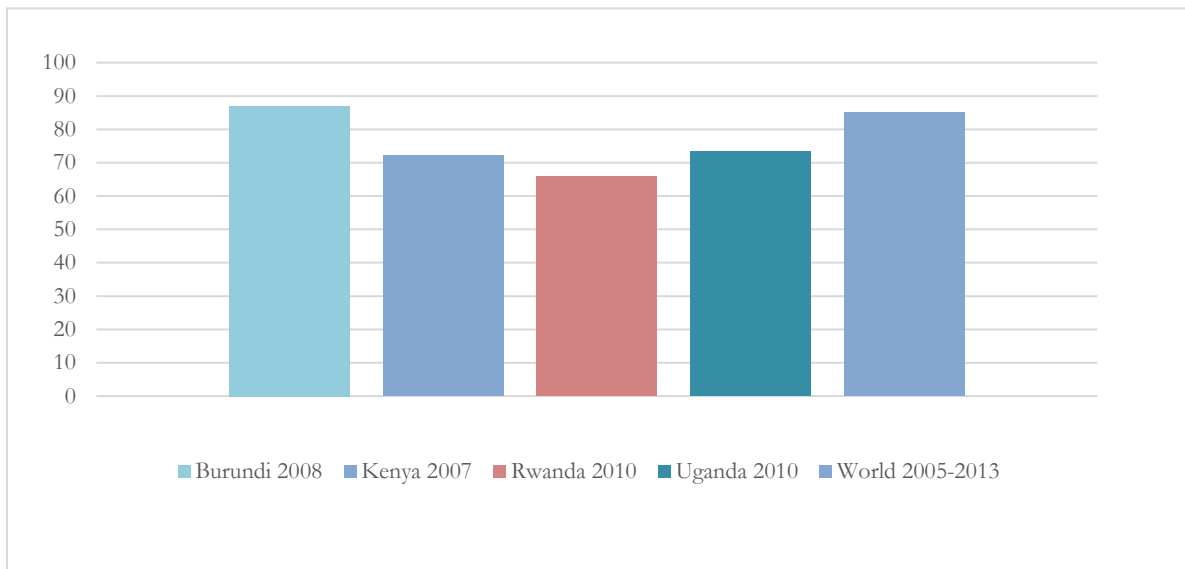


Figure 2-3: Access to education for selected countries in East Africa

Source: (UNESCO)

Health

The health sector in Kenya is underperforming as it is constrained by a limited number of expertise, beds and other resources. For instance, according to the Kenyan demographics, the physicians' density was estimated at 1 physician per 16,000 people, while the hospital density was at 1.4 beds per 1,000 populations.

Table 2-7: Analysis of health status in Kenya

Particulars	Details
Projected population for Kenya	47,615,739
Number of doctors	6,271
Doctor: Population Ratio	1:16000
WHO Ratios	1:300

Source: WHO 2012

World Health Organisation (WHO) recommends one doctor for 300 people. Kenya is far below the WHO's recommendation in terms of doctor: patient ratio. Kenya needs 53 times the existing number of doctors to bring the country at par with the WHO requirements. Table 2-8 below shows Kenya's comparison to neighbouring countries

Table 2-8: Doctor-Patient Ratio for Selected Countries in East Africa

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

Source: WHO 2012

2.2.3 Long-Term Development Strategy of the Government of Kenya

- i. **Kenya Vision 2030:** The long-term development strategy of the Government of Kenya (Vision 2030) focuses on reconstruction, deepening structural reforms and governance, improving infrastructure, reducing income inequality and creating jobs. The strategy aims at making Kenya a newly industrialising, middle-income country providing high-quality life for all its citizens by the year 2030. The vision is based on three pillars, namely the economic pillar, the social pillar, and the political pillar. The economic pillar aims to maintain sustained economic growth of 10% per annum over the next 25 years. 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 issue-based, people-centric, result-oriented and accountable democratic political system.

Six economic sectors, i.e. tourism, agriculture, manufacturing, trade, information technology, and financial services have been emphasised in the strategy. The social pillar concerns education, health, environment, water and sanitation, population, urbanisation and housing, and gender, vulnerable groups, and the youth. Finally, the political pillar addresses efforts to improve governance and the rule of law along with decentralisation of the National government to County Governments. The pillars rest on crosscutting themes, which constitute the foundation of the envisaged economic transformation. The themes include investments in physical infrastructure and information and communications technology; land and public sector reforms; human resource development, labour and employment; and security, peacebuilding, and

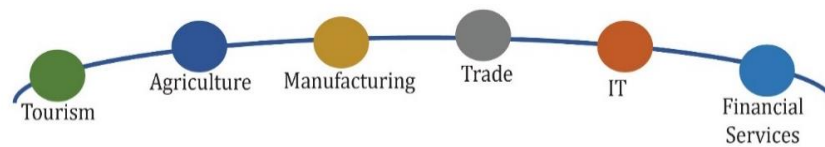


Figure 2-4: Economic sectors emphasised in Vision 2030

Source: Vision 2030

conflict resolution. The crosscutting themes are intended to nurture the economic transformation and assist in creating international competitiveness through more efficient productivity at the firm and household level, with government support.

The Kenya Vision 2030 envisages an accelerated development of the economy and a gross domestic product (GDP) growth rate of 10% is planned to be achieved. Such growth will have an impact on all sectors. Economic development calls for strong infrastructure support. With a 10% GDP growth rate, the growth of NMR would increase by 15% to 20%. It is important that the sectoral development is planned and developed to not only cater development demand at a high level of service but also, in fact, would lead and facilitate development in the desired directions.

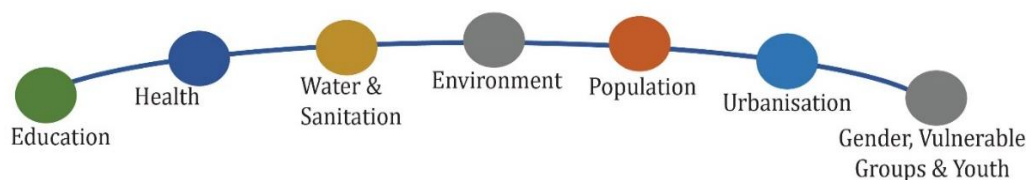


Figure 2-5: Social aspects emphasised in Vision 2030

Source: Vision 2030

2.2.4 Short-Term Development Strategy of the Government of Kenya

- i. **The Big 4 Agenda:** The Government of Kenya launched a 5-year development plan (2017-2022) that will focus on four key areas i.e. ensuring food security, Affordable housing, manufacturing and affordable healthcare are the priority areas in response to the needs of Kenyans. The national government aims to increase food production especially for the staple foods, increase affordable housing by having 500,000

affordable homes in all major cities by 2020, enhance manufacturing capacity and activities in all levels of manufacturing and affordable healthcare is available universally to all Kenyans.

2.2.5 Kenyan Economy in the Global Context

The East African Community (EAC) is making remarkable progress in institutions, integration, and infrastructure. Regional integration has been fast-tracked which has seen considerable progress in institutional reforms. Kenya's economy is the largest in the region and is much more dynamic than the economies of other member countries. The country's economy is much better linked to the other economies in terms of investment flows and trade.

Kenya's economic dominance in the region is based on a strong private sector that has evolved under relatively market-friendly policies for most of the post-independence era. Kenya's record of relative political stability and its lack of dramatic ideological shifts over the same period have done much to cement its position.

Kenya has the largest economy amongst the members of EAC in terms of Gross Domestic Product (GDP). Kenya's GDP accounts for 40 percent of the region's GDP, followed by Tanzania at 28 percent, Uganda at 21 percent, Rwanda at 8 percent, and lastly Burundi at 3 percent.

Compared to other African countries, Kenya, despite its very limited arable land and rainfall, boasts the most sophisticated agricultural sector. Horticulture contributes the highest percentage of agricultural gross domestic product (33 percent), followed by food crops (32 percent) and industrial crops (17 percent).

In terms of intra-East African trade, Kenya ranks at the top, averaging 37 percent in 2011-2012, followed by Uganda at 24 percent. The intra-regional trade is driven by the manufacturing industry, particularly the Fast-Moving Consumer Goods (FMCGs) and processed products. Kenya's competitive edge in this industry stems from the diversification of its exports basket, which makes it less vulnerable to exogenous shocks. Kenya, Uganda, and Rwanda have started building a superhighway from Mombasa to Kigali that will ease the movement of cargo through these countries. The fact that Kenya is one of the only two East African countries that is not landlocked (the other being Tanzania) gives the country a competitive advantage in terms of international trade. Kenya is also the region's major exporter and importer with the rest of the world.

Kenya is also very competitive in terms of human capital. It ranks at the top in terms of adult literacy rates. The adult literacy rate in Kenya is 87 percent; followed by Uganda at 73.2 percent; Tanzania at 72.9 percent; Rwanda at 70.7 percent and lastly Burundi at 66.6 percent. In comparison to other East African countries, meanwhile, Kenya has the highest public expenditure on education at 17.7 per cent between 2008-2009 and 2011-2012, compared to Uganda, which spends an average of 10 per cent. 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 in quality of education out of 148 countries.

Kenya's private sector has been more dynamic than that of the other members of the community, which has translated into a more competitive and innovative economy relative to its neighbours. The service sector has been a huge contributor to the growth of the private industry in Kenya. This sector has been the largest contributor to GDP growth since 2007 in the country, according to the IMF Regional Economic Outlook for Sub-Saharan Africa. Kenya has emerged as a technological and financial hub for East and Central Africa.

The Nairobi Securities Exchange (NSE) is amongst the best in Africa. Participation of foreign investors in the NSE has always been encouraged and their interests protected since independence. Another area in which Kenya is doing tremendously well in comparison to the other East African countries and the rest of the world is the mobile money services sector. The country is ranked number one in the world in mobile money. Mpesa, the flagship mobile phone banking product, put Kenya at the forefront of mobile money transfers and mobile banking services.

Kenya boasts a market-based economy and the most liberal economic system in East Africa. A market-based system, amongst its other advantages, promotes economic efficiency and competition and encourages foreign investment. Since independence, the market structure has changed from one in which prices are influenced by the government to one in which they are determined by the market forces of supply and demand. Kenya has been a pioneer in embracing the freedom of enterprise, and this has manifested itself clearly in the broadcasting industry, where Kenya Television Network (KTN), the first non-pay, a privately-owned TV station in Africa, was founded in Kenya. The liberalisation of the agricultural sector was undertaken in the 1980s and 1990s, reducing the government's control of agricultural production and marketing. This led to an environment that encouraged private sector participation in agriculture.

Moreover, building on the African Growth and Opportunity Act (AGOA) in the USA, Kenya has developed a textile and apparel industry that exports to the United States. The World Bank has also hailed Kenya's private sector as the most vibrant and dynamic in East Africa. The Kenyan economy has been market-based for a longer time than all the other East African economies, and this has given it a competitive edge in attracting foreign investment to the country. Kenya has consistently attracted relatively high levels of foreign direct investment (FDI). Kenya is the main source of FDI to its neighbours; outward investments to other countries have increased from \$9 million in 2011 to \$16 million in 2012. There are big Kenyan companies, such as the Equity Bank, Kenya Commercial Bank, and Nation Media Group, which operate throughout the East African region.

There are 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.

2.2.6 Economy of the NMR

Nairobi being a national, regional and international strategic centre for education, commerce, transport, regional cooperation, and economic development, the NMR plays an important role in Kenya's economy. It connects together 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)

Macroeconomic Performance of NMR and Economic Growth Target

- **Economic Growth:** Vision 2030 targets a GDP growth of 10 per cent per annum, which implies that NMR's GRDP would reach 15 per cent per annum. The income per capita of Kenya and NMR would double by 2018. 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 2-9.

Table 2-9: Economic Growth Assumptions of NMR (2010-2030)

	Parameters	Year
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 gross regional domestic product (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 to 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, 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.

2.2.7 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. Cash crops, such as coffee, are grown by small-scale farmers. Horticulture is a new sub-sector of agriculture that is witnessing high growth; flower exports are becoming an increasingly important source of foreign exchange. Tea, coffee, sisal, pyrethrum, corn, and wheat are grown in the fertile highlands, one of the most successful agricultural production regions in

Africa. Livestock predominates as the ancillary activities. Coconuts, pineapples, cashew nuts, cotton, sugarcane, sisal, and corn are grown in the low-lying areas. The principal cash crops are tea, horticultural produce, and coffee. Horticultural produce and tea are the main growth sectors and the two most valuable of all of Kenya's exports. The production of major food staples such as corn is subject to sharp weather-related fluctuations. Production downturns periodically necessitate food aid.

Horticulture farming through Irrigation schemes in Kitengela has gained popularity over the years with a few flower farms and others in Kisaju and Isinya. Greenhouse farming of tomatoes is also another important agricultural activity being practised in Kitengela. Rainfed agriculture is unsustainable due to erratic rains. Persistent droughts and famine have also negatively impacted on water and pasture availability.

In the past, Kitengela flourished in livestock production. However, land subdivisions have greatly contributed to the loss of communal land ownership and group ranches. This has led the conversion of grazing land to other uses. Consequently, livestock production in the planning area has significantly diminished.

Industry and Manufacturing

Although Kenya is the most industrially developed country in East Africa, manufacturing accounted for only 8.4 per cent of GDP in 2017 which is a drop from 10.7 per cent in 2013. Nairobi is also the largest industrial centre. Consequently, manufacturing per cent contribution to GRDP of NMR has as well dropped. The principal products include processed food, beer, vehicles, soaps, construction material, engineering, textiles, and chemicals. Also, a thriving sector provides employment to carpenters, metalworkers, furniture makers, vehicle repair people, and retailers. 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 EPZ 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. In addition, an 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.

There are several manufacturing industries located within Kitengela due to availability of sand and quarries. These industries are major sources of employment in the planning area.

Some of the key challenges facing the sector include low levels of productivity and the high cost of production. These challenges were aggravated by the spillover effects from high inflationary pressures, the depreciation of the Kenya shilling, counterfeits and stiff competition from cheap imports. Major industries that registered growth were beverages, clothing, wood and cork products, paper and paper products, and non-metallic mineral products, amongst others. Other initiatives to strengthen manufacturing have been government's favourable tax measures, including the removal of duties on capital equipment and other raw materials, construction of industrial parks and economic zones.

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 central business district (CBD) located in Nairobi and adjoining industrial areas. From the 2000s, however, urban

functions are being distributed along trunk roads and major transport points. The business activities taking place in NMR can be summarised as below:

- A belt-type industrial development is taking place along Mombasa Road in NMR; whilst service-oriented and residential developments are observed along Namanga Road.
- Export Processing Zones (EPZ) as the strategic industrial footholds based on the national economic development policy have been 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.
- 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.

The tourism goal in Vision 2030 is for Kenya to become a top-ten long haul destination in the world and also to make NMR a world-class metropolis. NMR's budgetary allocation for tourism marketing is small compared to other major destinations of the world. Likewise, NMR's marketing spending per tourist is amongst the lowest. In spite of increased tourism earnings and an average length of stay, per capita tourist expenditure in NMR is low compared to other destinations. In fact, Kenya and Nairobi are classified as a cheap destination. While Tunisia and Morocco are short-haul destinations from the European tourist generating countries, South Africa is a long-haul destination like Kenya and stands out as the main competitor destination. Tourism activities are largely concentrated in NMR (80% of the tourism in Kenya). This pattern of high concentration indicates that income and employment benefits from tourism are unevenly distributed. Economic benefits accruing from wildlife are also unequally distributed, with community benefits typically accounting for only a small proportion of the total value of wildlife. For instance, despite the high concentration of tourism there exist high poverty incidences. There is a need, therefore, 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.

Tourism is one of the economic sectors in Kitengela. This sector has a big potential, which can be tapped for optimal gain. Kitengela glass and Maasai Ostrich farm contribute insignificantly to the sector's economy.

NMR faces various challenges in realising the full potential of the tourism sector. These include low competitiveness with regard to infrastructure; 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. Immediate policy attention should be focused on these challenges. There is a need, therefore, to increase investment in tourism infrastructure, increase expenditure allocations, and increase concerted capacity building for local communities.

Employment

Nairobi is dominant in employment generation in Kenya for both the informal and the formal sectors. Of the working population, about three-quarters are in the informal sector in Nairobi. As discussed in the NMR Spatial Plan, 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 per cent. Unemployment amongst young women is even higher in this age group at about 27 per cent. 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 per cent. This rate is higher in rural areas than in urban areas at 24 per cent and 15 per cent, respectively. The informal sector remains the major employer, accounting for over 75 per cent of total employment in the region.

Kitengela has the highest proportion of the working-age (15-54) at 60 per cent according to the 2009 population census while the wage earners stand at 17,480 persons at the county. This population works at the formal and informal sectors. The informal sector is the major employer of the population in Kitengela. Most of the self-employed persons engaged in trade, industrial activities, juicily, horticulture/floriculture and tourist sector sale of beads. However, 10.45 percent of the productive population in the county are unemployed (2009 pop census).

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 per cent of total formal employment. Of female employees in the modern/formal sector, about 60 per cent work in the community, social and personal services.

A detailed study on employment is necessary to identify innovative and highly effective policy measures to address the above challenges and provide a basis for the development of an NMR employment strategy and policy. In particular, innovative interventions to generate quality jobs for the youth are critical and urgent. The policy implication is that creation of jobs should expand at the same rate to forestall an increase in unemployment. The employment creation in NMR is adversely affected by slow economic growth. In particular, the number of new jobs created in the modern private sector declined. The public sector has been registering negative growth. Annual average earnings per employee in the private sector remained higher than those in the public sector.

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 per cent 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 per cent of rural households incur only 2 per cent of the total expenditure, while the richest 10 per cent incur 41 per cent of the total household expenditure. Cumulatively, the top (richest) 30 per cent of households incur 75 per cent of the total household expenditure.

Micro and Small Enterprises

The micro and small enterprises (MSEs) sector contribute about 19 per cent to Nairobi's GRDP. Further, the sector, accounting for 90 per cent of all new jobs created, employs 80 per cent 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.

2.2.8 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.

2.2.9 Bottleneck of Economic Development of NMR

There are a number of social and economic problems in NMR, as summarised below.

GRDP 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 2-6: Kenya Inflation Rate (2013 – 2018)

Source: Tradingeconomics.com | KNBS

Labour Market

The efficiency and flexibility of labour market share are 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 the 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 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 2,137,000 in 1979, 1989 and 1999, respectively. The population of Nairobi continues to increase at a very high rate of 4.5 percent per annum for the last three decades (UNEP & UN-Habitat) compared to 1.2 percent average growth rate for the world. Notably important is that Nairobi's population represents about 21 per cent of Kenya's urban population. Projections presented in the NMR Spatial Plan indicate that this population is expected to hit the 8 million mark by the year 2030. About 29 percent of the population is living below the poverty line and 40 percent are categorized 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 per cent.

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 are making it easier to do business, more concerted effort is required to elevate it to a middle-level economy.

2.3 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 Spatial Planning Concept for NMR as discussed below

2.3.1 Vision 2030

The social pillar under Vision 2030 recognises that in order to achieve widespread prosperity in Kenya there is need to have a just and cohesive society through key social sectors specifically; Education and Training; Health; Water and Sanitation; the 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 stem having reforms in the wore Proper health care plays a great role in a country's economic growth and poverty. Preparation of this ISUDP was anchored on the vision 2030. This plan aims at achieving a sustainable environment, availability and accessibility of improved water and sanitation as well as efficient and quality health care as outlined in Vision 2030.

2.3.2 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 Plan 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 National Spatial Plan are:

- To create a spatial planning context to enhance economic efficiency and strengthen global competitiveness; promote balanced regional development for national integration and cohesion; optimize 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.
- The NSP guided the preparation of the ISUDP through the provision of policies to be implemented through this ISUDP. Moreover, the ISUDP aims at achieving the objectives of the NSP through enhancing the economic efficiency of Kitengela and strengthening its global competitiveness.

2.3.3 Nairobi Metro 2030

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

Nairobi Metro 2030 envisions the Nairobi Metropolitan Region (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; 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 systems.

2.3.4 Spatial Planning Concept for Nairobi Metropolitan Region

The Spatial Planning Concept 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, employ World-Class Metropolitan Governance Systems.

Key parameters that are provided in the NMR Spatial Plan that will guide the development of the ISUDP for Kitengela is its Economic Function as a Service Town. Consideration is likewise being given to its role of being a Growth Centre in the proposed settlement hierarchy for NMR, 2030.

Table 2-10: Economic Targets for Urban Centres

Spatial Units	Envisaged Function
Kitengela	Service Town
Ongata Rongai	Service Town
Kiserian	Service Town
Namanga	Trading Town
Isinya	Service Town
Bissil	Service Town
Kajiado	Administrative -cum- Service Town
Loitoktok	Administrative Town
Sultan Hamud	Transit Town
Magadi	Industrial Town

Source: Spatial Planning Concept for NMR

Table 2-11: Proposed Settlement Hierarchy for NMR, 2030

Level	Settlement Hierarchy	Settlements	Characteristics
I	Regional Complex	Nairobi- Ngong-Ongata Rongai-Ruiru Complex	<ul style="list-style-type: none"> • Highest administrative functions • Specialised & world-class facilities • Tertiary activities
III	Growth Centre	Limuru, Karuri, Juja, Mavoko, Kitengela, Loitoktok	<ul style="list-style-type: none"> • Intermediary towns • Important role in promoting rural development and in achieving a balanced distribution of urban population • Provide functional linkages between the smaller towns and Sub-Regional Centre

Source: Spatial Planning Concept for NMR

2.3.5 County Integrated Development Plans (CIDP), 2018-2022

This ISUDP likewise makes reference to the Kajiado County Integrated Development Plan 2018 - 2022 which provides the guiding vision of “A prosperous, Globally competitive County, offering a quality of life” and the mission statement of “To promote equitable and sustainable socio-economic development through efficient resource utilization and inclusive participation.”

The CIDP 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 programmes and projects to address these challenges and issues were likewise provided in the CIDP.

Priority programmes identified by the CIDP focused on:

- Agriculture and development sector;
- Energy;
- Infrastructure and IT;
- General economic;
- Commercial and labour affairs;
- Health sector;
- Education Sector;
- Public Administration and International Relations;

- Social Protection;
- Culture and Recreation;
- Governance, Justice, Law and Order;
- Environmental Protection;
- Water and Natural Resources;
- Urban development, Land use, Tourism and Wildlife;
- Sports; and
- Mining.

2.3.6 Cluster Potential

While pointing out to the lack of an integrated approach to development in the NMR, the Spatial Plan for NMR suggests that the region should consider using the cluster development strategy as an economic tool for enhancing competitiveness. Considering this, the likelihood of and potential for adoption of cluster development strategy was assessed. This assessment found that the defined four clusters in Consultant's terms of reference have some economic logic, as summarised in the following table.

Table 15: Assessment for Adopting Cluster-Based Planning Strategy

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

Source: VisionRI

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 identified key economic planks in each town and urban corridor within the four clusters may be linked to one or more of the NMR Missions under Vision 2030 as described previously. Therefore, the clusters collectively complete the NMR economy and would serve as key economic drivers of the capital city and the metropolitan region.

In addition, 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 workforce employed in the CBD 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 recommended to be considered key in all NMR level strategic planning and policy design.

2.4 Legal and Policy Framework

The ISUDP is being prepared within the relevant legal and policy frameworks of the Government of Kenya (GOK).

2.4.1 Legal Instruments

- i. **Constitution of Kenya, 2010:** The Constitution of Kenya (CoK) (2010) is the overarching legislation that guided the preparation of this ISUDP. The 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 government. With regards to development planning, CoK 2010 laid down the objects of devolution “to promote social and economic development and the provision of proximate, easily accessible services throughout Kenya” (Article 174(f)).

- ii. **County Governments Act (No of 2012):** Following CoK 2010, the County Governments Act 2012 mandates County Governments to prepare county plans which include “cities and urban areas plans,” The said Act provides that the “county planning framework shall integrate economic, physical, social, environmental and spatial planning” (Article 104(2)).

Part XI states that the designated planning authority in the county shall appropriately organise for the effective implementation of the planning function.

In the preparation of this ISUDP, there was a working liaison with the Kajiado County Government. The ISUDP plan will be approved by the County Assembly.

- iii. **Physical and Land Use Planning Act, (No 13 of 2019):** This Act regulates physical 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, subdivision plans amongst other plans. The Act also stipulates the plan preparation and approval processes.

Article 56 empowers the County Government; to prohibit or to 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.

- iv. **Land Act, 2012:** The Land Act, 2012 gives effect to Article 68 of the Constitution that calls for revision, consolidation, and rationalisation of land laws to provide for the sustainable administration and management of land and land-based resources. The Act calls for equal recognition and enforcement of land rights arising under all tenure systems and non-discrimination in ownership and access to land under all tenure systems.

The provisions of this Act apply to all stakeholders in Kitengela since all developments take place on land. The Act stipulates equitable access to land; security of land rights; sustainable and productive management of land resources; transparent and cost-effective land administration; conservation and protection of ecologically sensitive areas; elimination of gender discrimination in law, customs and practices related to

land and property in land; encouragement of communities to settle land disputes through recognised local community initiatives, amongst other principles in regard to utilisation of land.

It provides for the conversion of land from one category to another for the various listed purposes, which include land-use planning. It also prohibits the allocation of public land that has not been planned and that does not have development guidelines. The Act was vital during the ISUDP preparation process as it provided the framework for the provision of security of land tenure to Kitengela residents.

- v. **Environmental Management and Co-ordination Act, 1999, Cap. 387 (EMCA):** The Environmental Management and Co-ordination Act is the legislation that governs the management of natural resources in the country. It upholds the importance of environmental protection. The Act establishes an independent National Environment Management Authority (NEMA) to ensure enforcement and implementation of the provisions of the Act. The Act provides for the public’s involvement in any major development decisions, which have an environmental bearing. The Act also has provisions for addressing environmental offences. The preparation of the ISUDP for Kitengela will be guided by the environmental principles set out in the Act and aim to achieve an environmentally sustainable urban development framework.
- vi. **Urban Areas and Cities Act 2011:** The 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)).

2.4.2 Policy Instruments

- i. **Sessional Paper No 10. of 2012:** The social pillar under Vision 2030 recognises that in order to achieve widespread prosperity in Kenya there is need to have a just and cohesive society through key social sectors specifically; Education and Training; Health; Water and Sanitation; the 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 of water and improved sanitation to all through better management of water resources, upgrading of water supply and sanitation systems having reforms in the water sector.
 - **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.
- ii. **National Land Use Policy:** The National Land Use Policy gives the principles for guiding land use management. Sustainable land use is amongst the guiding principles outlined in the policy. Sustainability is one of the goals that this plan seeks to achieve through the prudent allocation and distribution of land uses in Kitengela.

It also recommends development control as a tool for ensuring equitable and sustainable land use. With this in mind, this plan gives development standards/guidelines/regulations to guide its implementation. The policy recognises land use planning as an important tool in land use management, which can address the current challenges and create new opportunities for sustainable human settlements.

Preparation of this plan was anchored on the policy in addressing the critical issues of land administration, access to land, land use planning, environmental degradation, and conflicts.

- iii. **Urban Development Policy:** The National Urban Development Policy aims to facilitate the implement 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 GDP accounting for about 70% of the GDP. Critical dimensions of the economy in urban areas identified were 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 programmes. In addition, it provides a platform for mobilisation for public participation in urban development, while also seeking to optimize resource allocation and utilisation.

- iv. **Other relevant policies:** Additional policies that will key to implementation of this plan are summarised in Table 2-12 below:

Table 2-12: Policy Review

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.

Policy	Relevance
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

2.5 Institutional Framework

This Plan 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 co-ordinate 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 Plan defines the role and the 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.

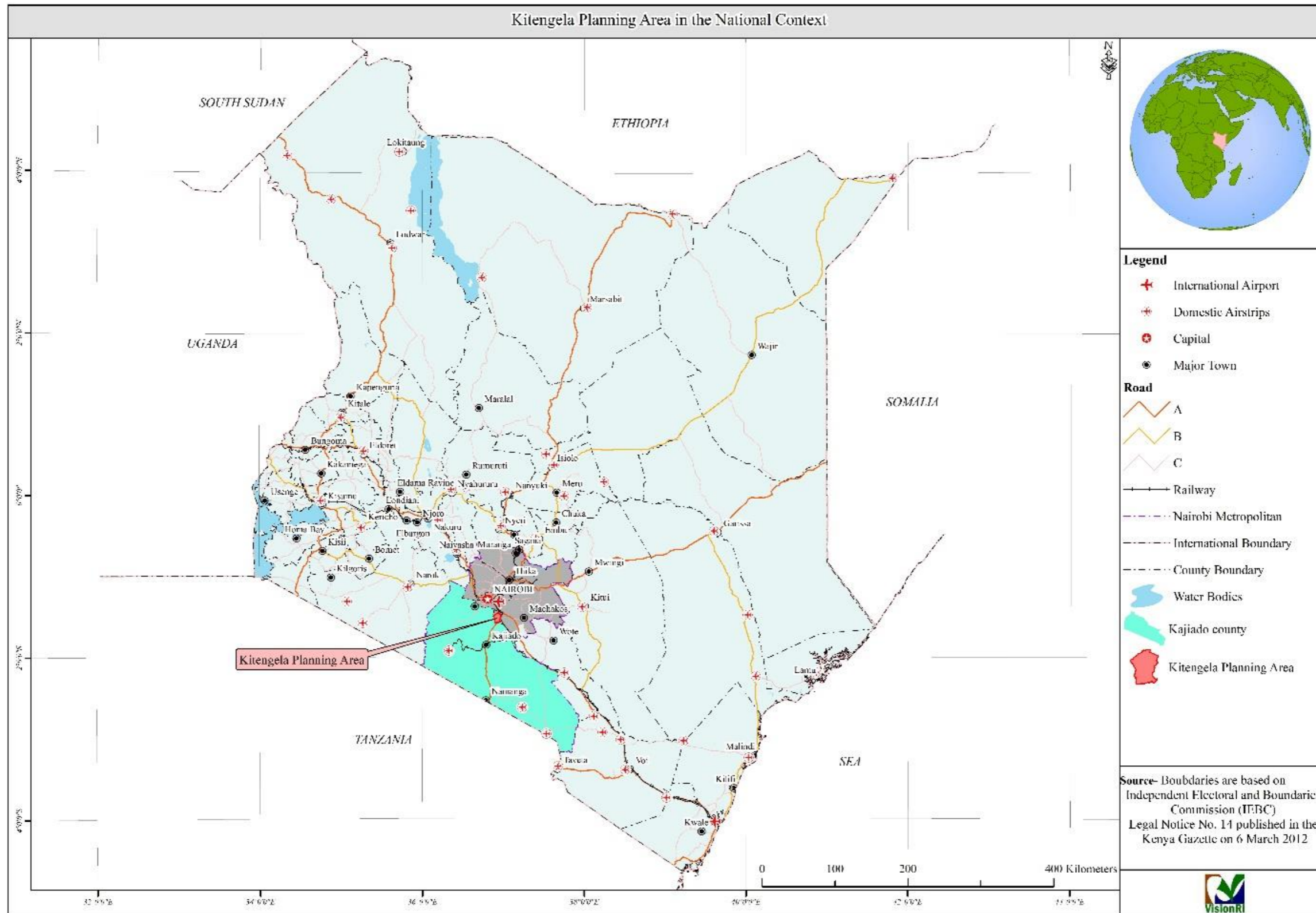
3. SECTORAL SITUATIONAL ANALYSIS

3.1 Location and Land Area

Kitengela Town is located within Kajiado County to the south of Nairobi covering an area of 97.54 square kms. Kajiado County has a population of 1,117,840 (2019 population census) with seven administrative units. Kitengela is one of the towns in the Southern Metropolitan regions. The others include Ngong, Ongata Rongai and Kiserian.

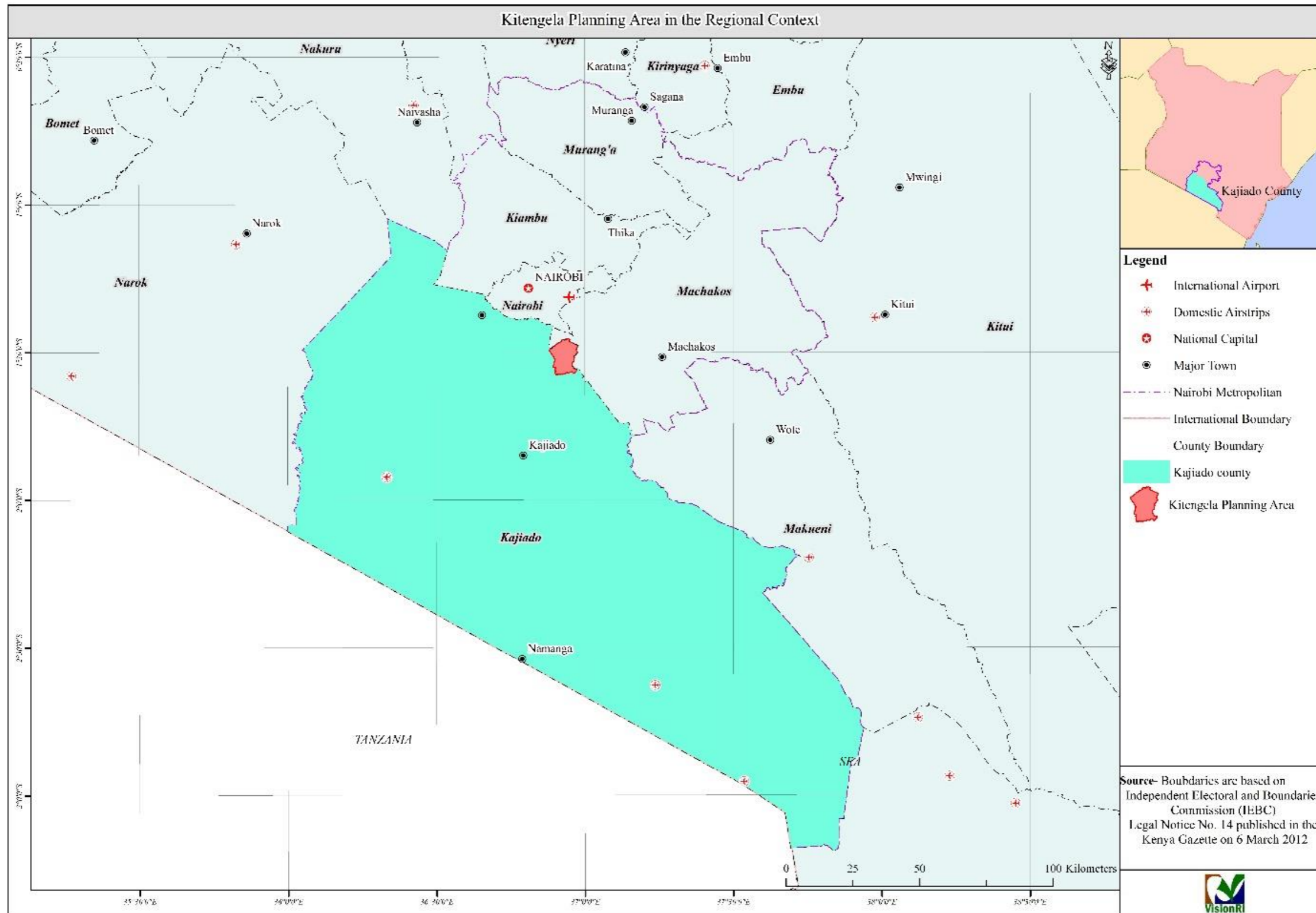
The Planning area borders Machakos County to the East and Nairobi County to the South. It is located just 30 kilometres south of Nairobi city. The Kitengela Planning Area is bounded to the northeast by Athi River, to the northeast by EPZ Road, to the east by the railway which includes portions of Kaputei North ward, to the south by Kisaju River and to the west by Kaputei plains and grasslands.

The maps below show the location of Kitengela Planning Area in relation to the national/regional and local contexts is shown in Map 3.1, Map 3.2 and Map 3.3.



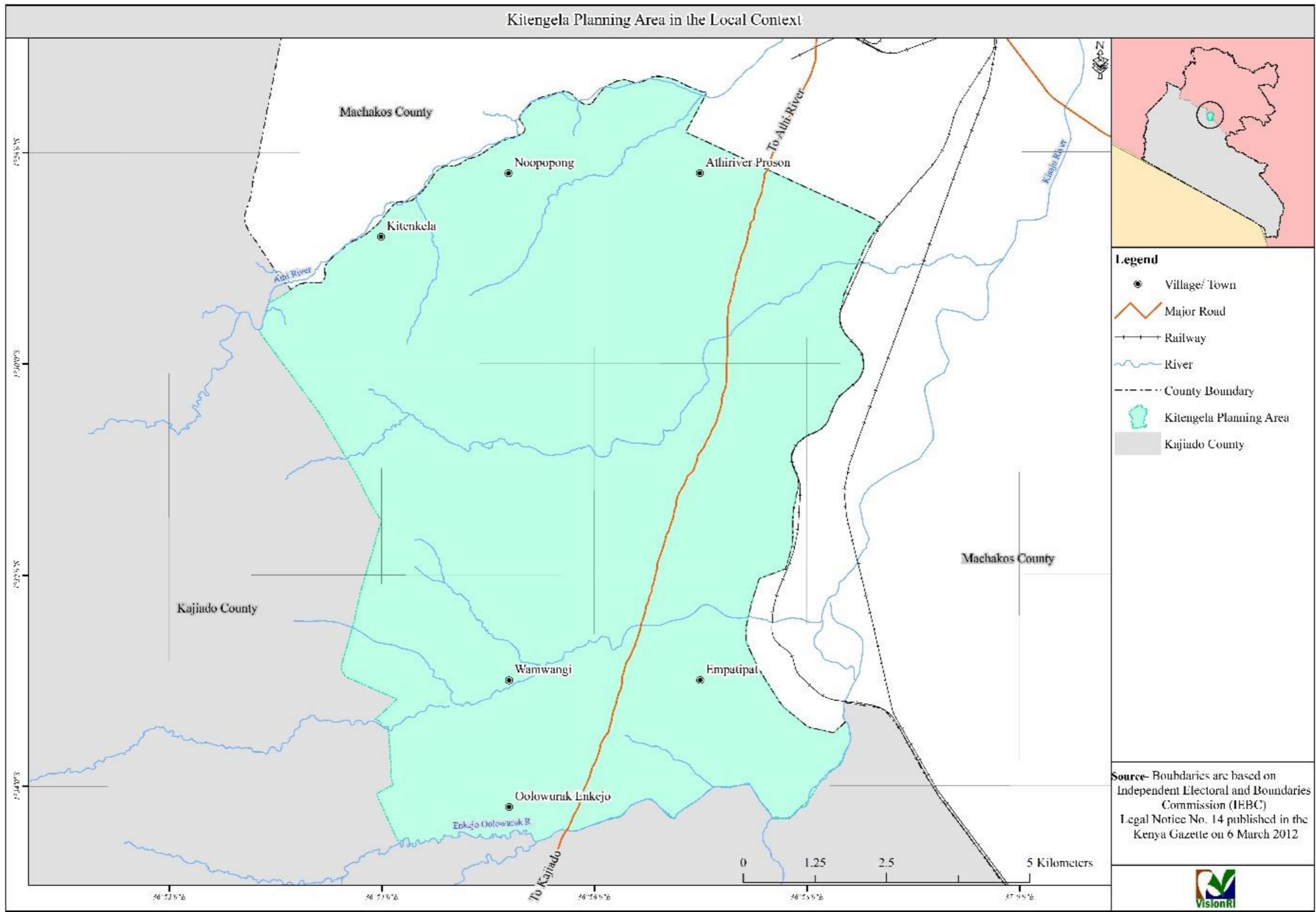
Map 3-1: Location of Planning Area in the National Context

Source: VisionRI



Map 3-2: Location of Planning Area in the Regional Context

Source: VisionRI



Map 3-3: Location of Planning Area in the Local Context

Source: VisionRI

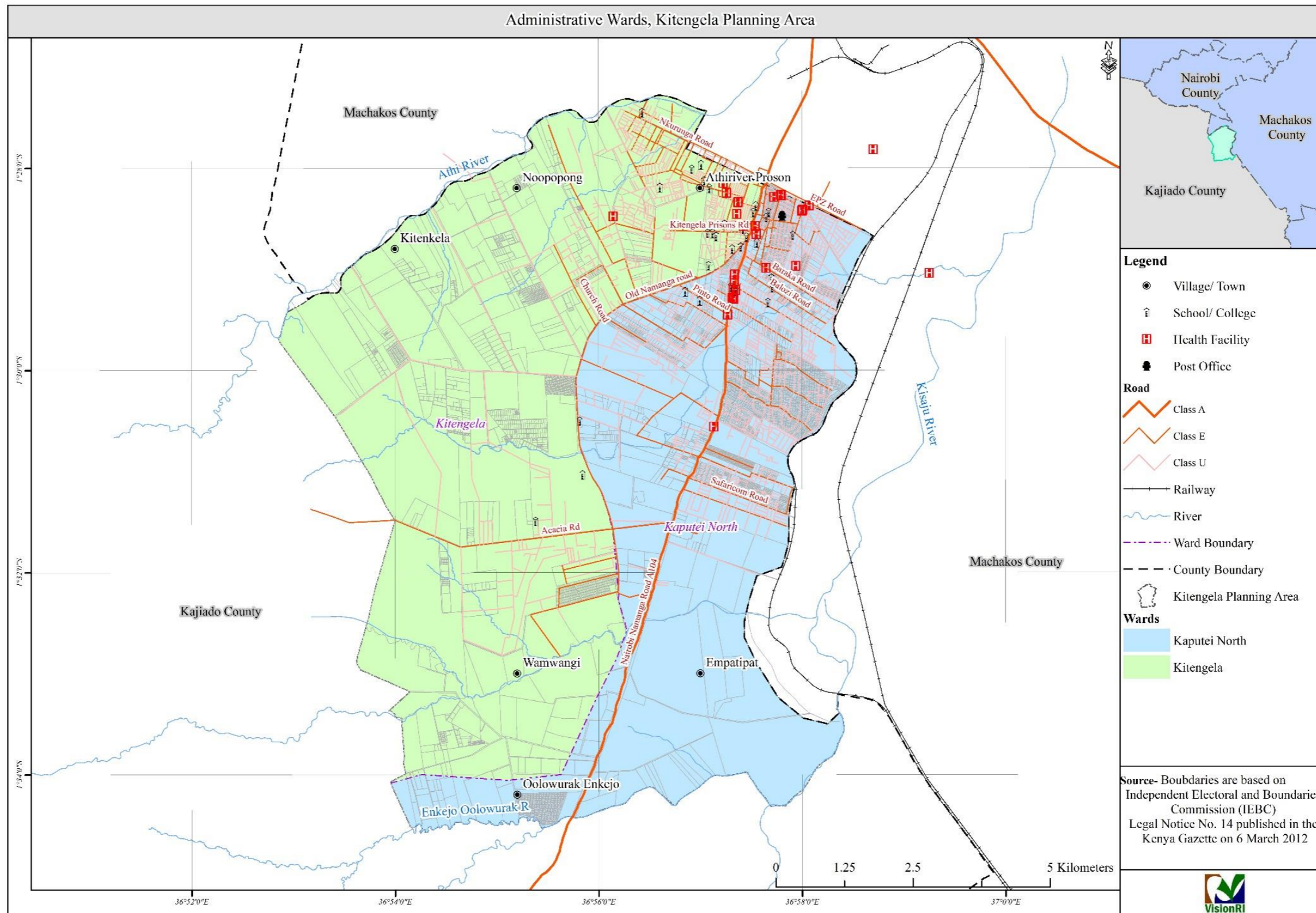
3.2 Administrative Units

Kitengela covers approximately 9,754.19 hectares. It is contained partly within two wards as well as two sub-locations whose respective land areas are presented in Table 3-1.

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

Ward	Sub location	Area in hectares	Share in %	Totals
Kitengela	Kitengela	5,595.7	57.4 %	9,754.2
Kaputei North*	Kisaju (Isinya)	4,158.5	42.6 %	

*only a part of the wards and sub-locations are included in Kitengela Planning Area.



Map 3-4: Administrative Units Map

Source: VisionRI

3.3 Natural Resource and Environment

3.3.1 Topography and Drainage

Kitengela lies on a gently sloping land in the larger Athi Kaputei Plains. Due to its gentle slopes, the area is favourable for development, and this has attracted people to the area. This has been a contributing factor for the immense developments. New Valley and Noonkopir residential areas located at river valleys and are prone to flooding.

The western side of Namanga Road in Kitengela is characterised by a gentle valley that covers a large extent of the area with grassland vegetation, shrubs. The land generally slopes from the northeast to the west and south-west areas of Kitengela towards the valley areas of Milimani,



Figure 3-1: Kitengela Topography and Vegetation.

Source: Fieldwork 2020

The main rivers draining the area include Kisaju, Green valley and Ilkeek Lemedungi all of which are seasonal. Kitengela, which is in the Kaputei plains, has undulating topography results that cause the rivers to meander which make their courses unpredictable and the area to be flood-prone. This is as illustrated in Figure 3-2 below.

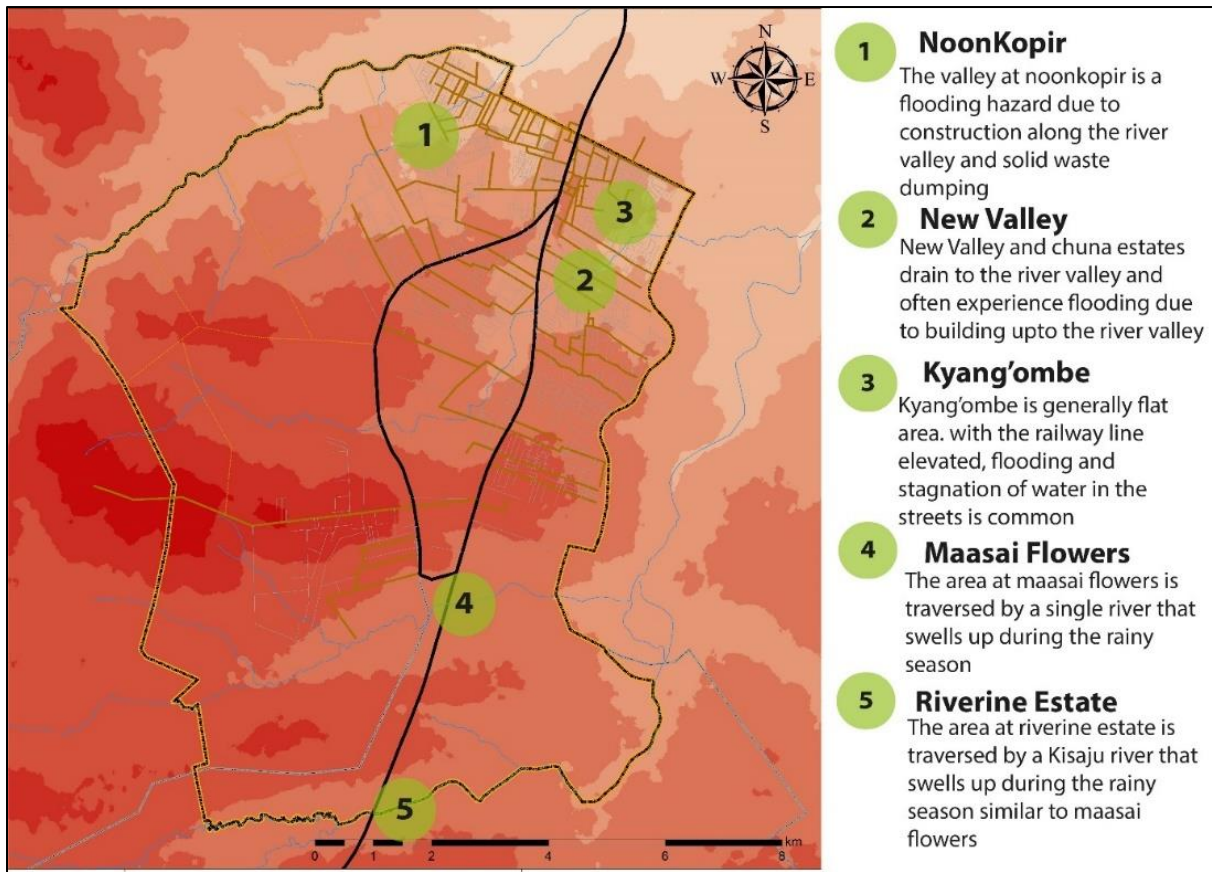


Figure 3-2 Drainage Characteristics of Kitengela- The numbered area denotes the flooding zones.



Figure 3-3: Undulating plain in Kitengela.

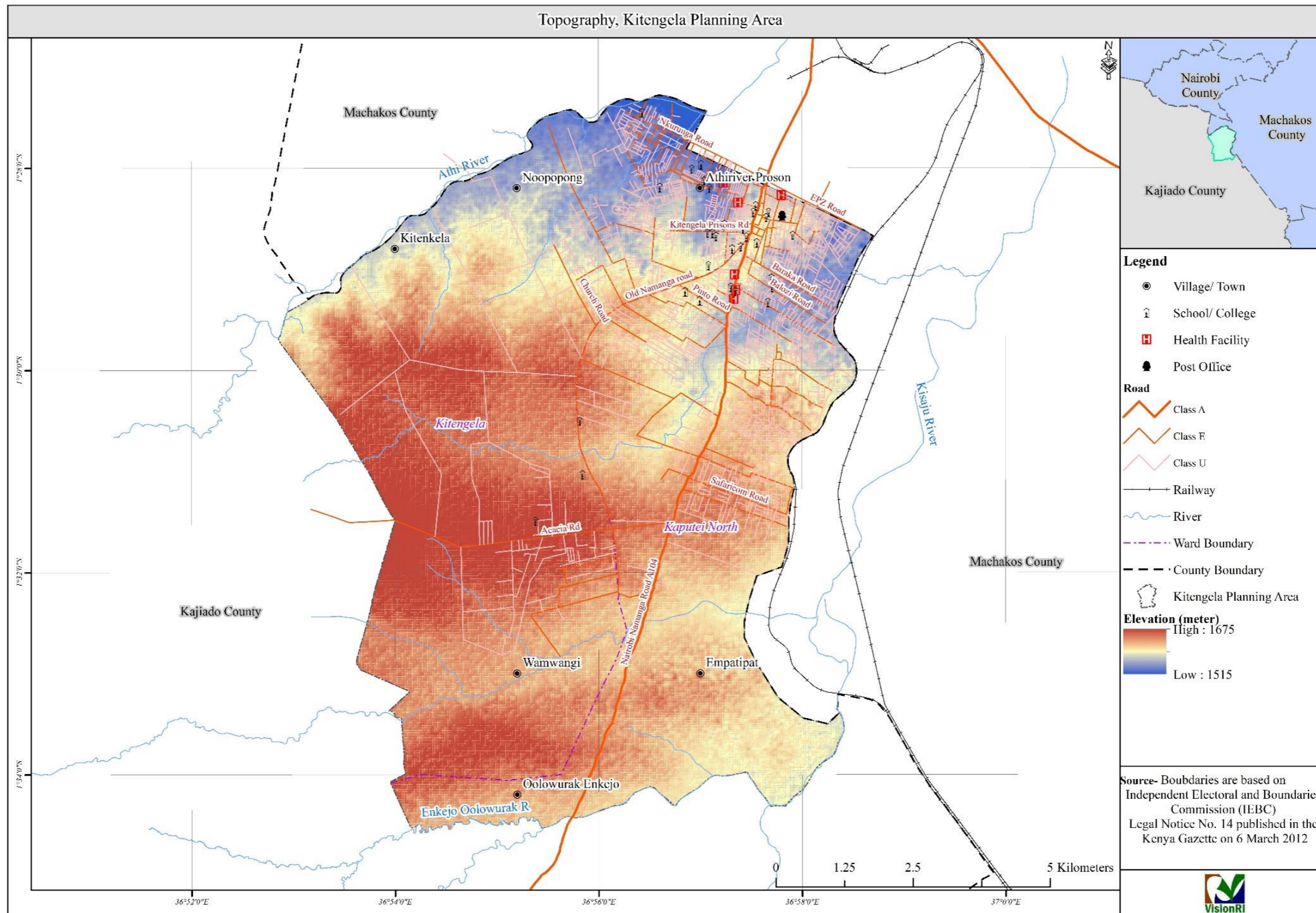
Source: Fieldwork, 2020

To the east where EPZ road meets the railway is the lowest point of the planning area. This being the case, the zone towards this point namely Kyang'ombe is where most of the floodwaters collect. Without an adequate outlet and the area being relatively flat, this area experiences a lot of flooding during the rainy season. These floodwaters often persist way after the rains due to poor drainage characteristics of the black cotton soils in the area.



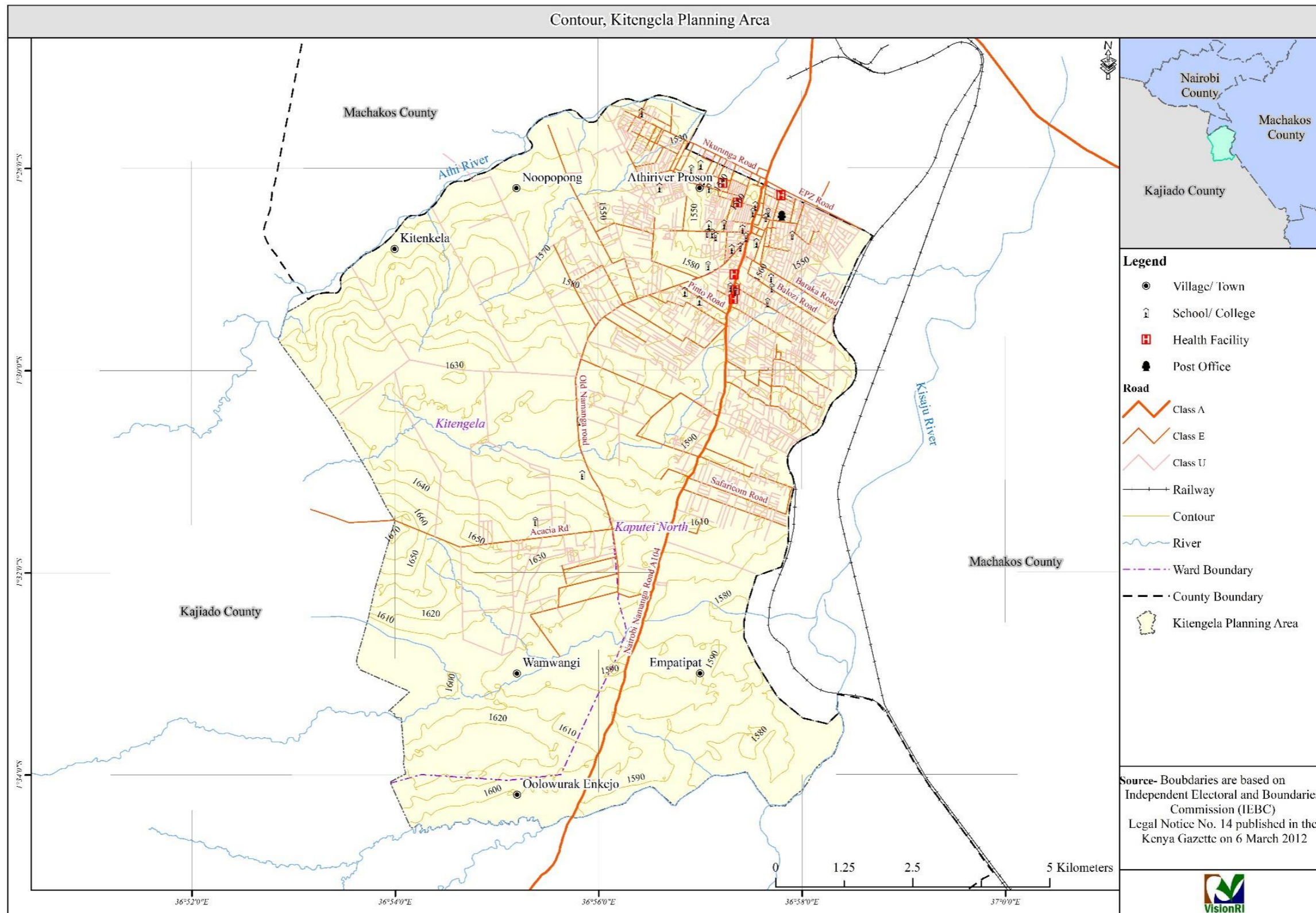
Figure 3-4: Flooded property at Kyang'ombe

Source: Fieldwork, 2020



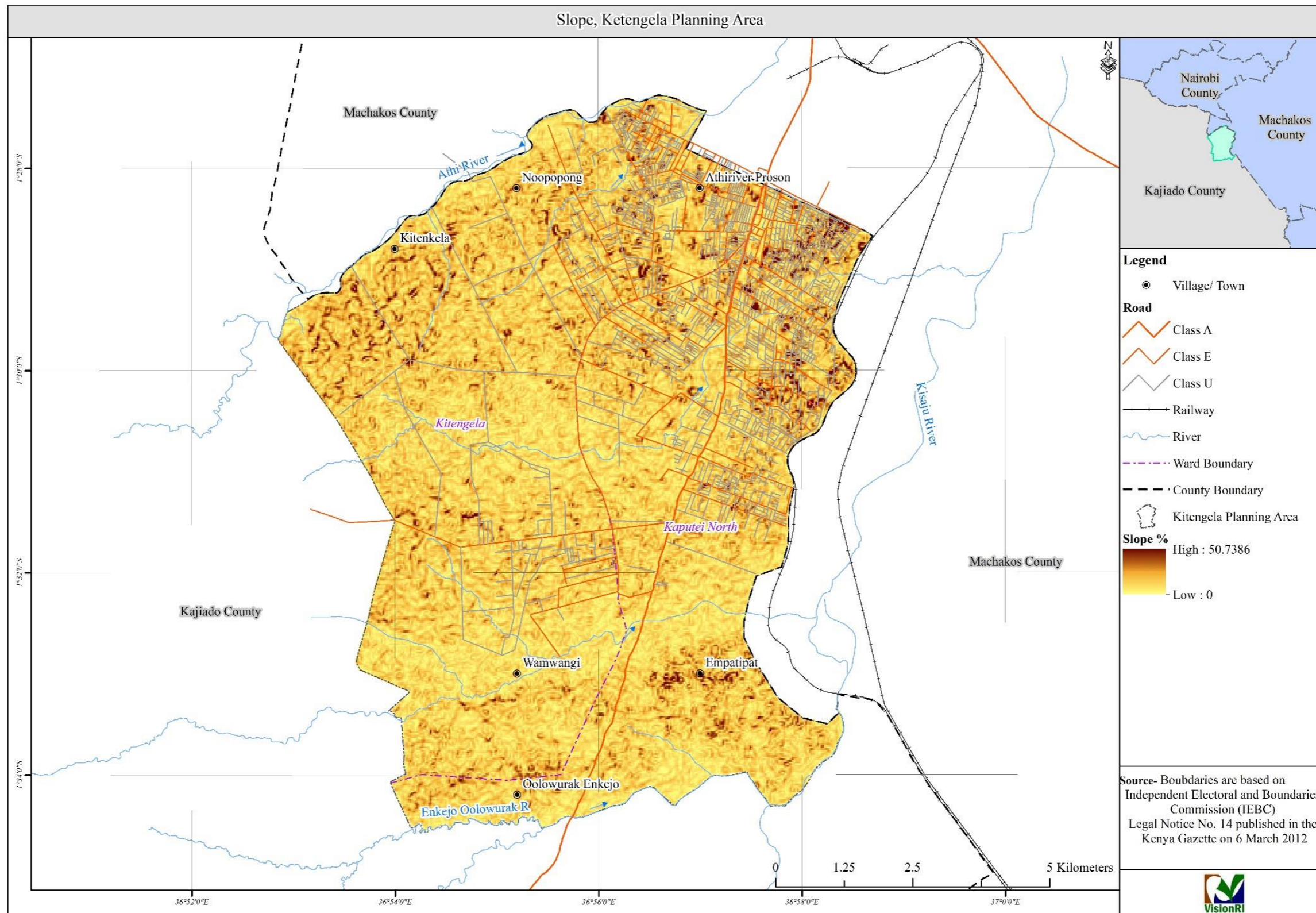
Map 3-5: Topography Map

Source: VisionRI



Map 3-6: Contour Map of the Planning Area

Source: VisionRI



Map 3-7: Slope Map of the Planning Area

Source: VisionRI

3.3.2 Geology and Soils

Both the Kapiti Phonolite and the Upper Athi Series formations are significant aquifers in various parts of the volcanic plains and plateaus of the eastern rift valley. The former is of particular importance for most of industrialised Athi River Township and the latter is of prime importance for much of urban Nairobi. In Kitengela and environs, the Upper Athi Series is not very significant as far as groundwater is concerned because they are relatively thin.

Basement System aquifers, composed of weathered material juxtaposed with fissures and faults, are frequently capable of delivering reasonable yields of water of a reasonable quality suitable for domestic and livestock watering uses. Yield limitations apart however, the difficulties of locating faulted and fissured zones in Basement rocks overlain by sheet lavas make this source of groundwater extremely uncertain in the area under consideration. The weathered section of the Basement rock which forms the contact with the volcanic is known, however, to be a potentially good aquifer.

Kitengela is overlain by relatively shallow mainly black cotton soils which in some areas grades into more greyish coloured loamy soils. Some areas in the western side of Kitengela town have murram soils thus the presence of quarry sites in this area.

The black cotton soils crack during the dry season and require judicious construction of foundations for the stability of erected buildings since they expand when wet and contract when dry. The non-murram roads flood during the rainy season as the black cotton soils have poor soil drainage properties making the roads impassable. These rocks also make it expensive for construction such that if the building is not erected in the substructure causes the building to sink or bend making it hazardous for occupation.

Soil drainage

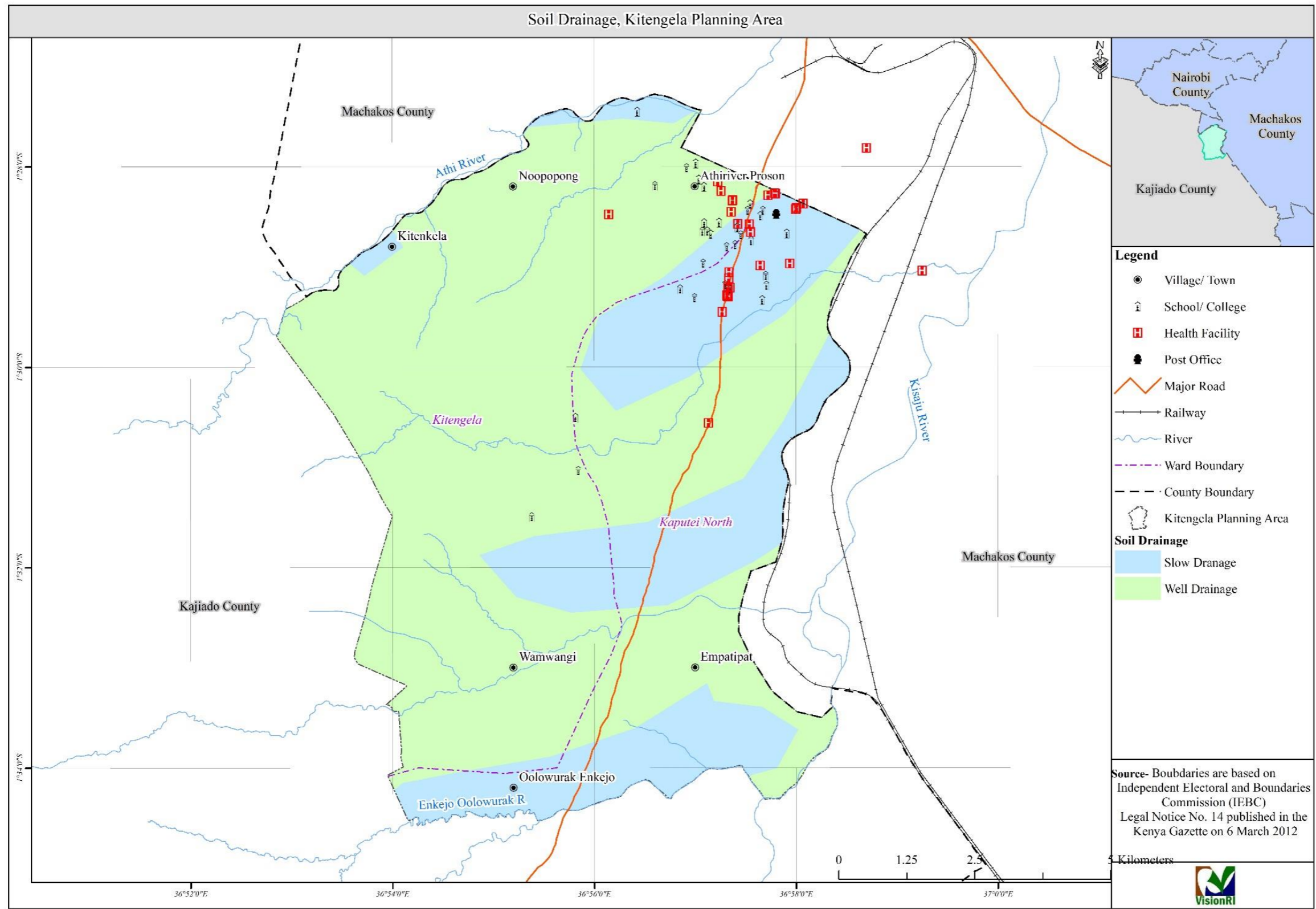
The larger part of Kaputei North has vertisols soils which are clay-rich and swell during the wet seasons, are poorly drained and experience flooding. They are sticky and plastic when wet and hard when dry hence reducing the period of time during which they can be ploughed or otherwise tilled. During the dry seasons, the soils shrink causing deep wide cracks. Their texture and the shrinking and swelling characteristics make them less suitable for crop production, building foundations, and highway construction.

The CBD and Muigai, Yukos, Chuna and New Valley Estates on the other hand have acrisols that are found on granite rocks and has a sandy soil surface. This characteristic makes the area well-drained during the rainy season but also very dusty during the dry season. The acrisols rocks are stony and rather shallow hence suitable for quarrying activities in these regions.



Figure 3-5: Black cotton soils in Milimani.

Source: Fieldwork, 2020.



Map 3-8: Soil Drainage

Source: VisionRI

Soil pollution

Soil pollution is an environmental challenge in cultivation areas, especially in Kaputei North. The use of fertiliser and chemicals in farmlands and plantations has led to soil poisoning hence interruptions.

Quarries

Potential agricultural and productive lands are being converted into quarries. Currently, a significant amount of the construction stones used in Nairobi originates from this area. The quarries and mining activities are a great source of revenue to the area and also offer a source of employment to the residents.

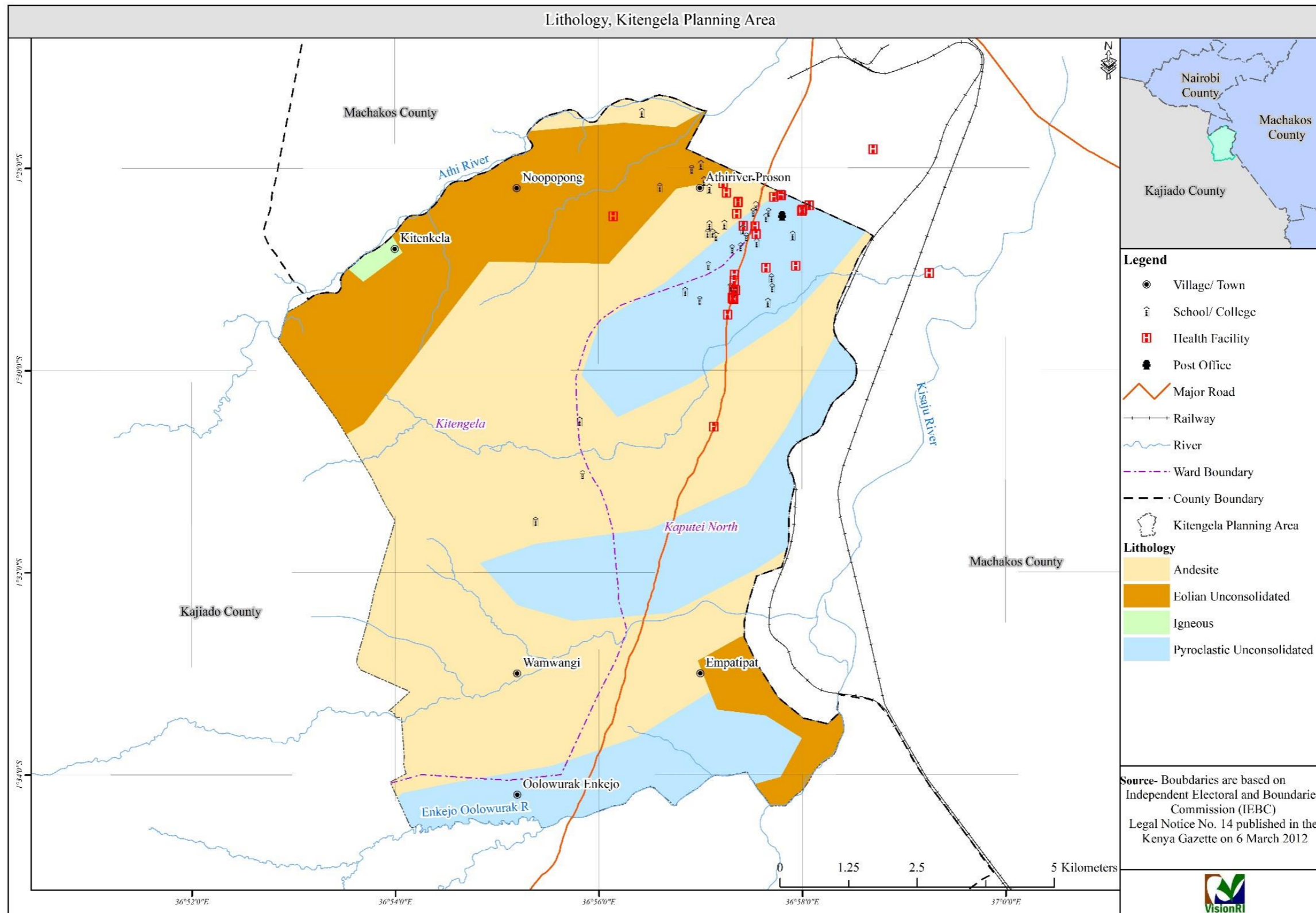
However, they are located within the residential areas and have led to environmental degradation. Significant amounts of noise and dust produced by the quarry have resulted in both respiratory diseases and hearing impairments to the residents. Moreover, the stability of houses near the quarry is at a threat.

The abandoned quarries are not properly decommissioned and lack site rehabilitation through proper re-vegetation measures and hence can lead to accidents to both humans and animals.



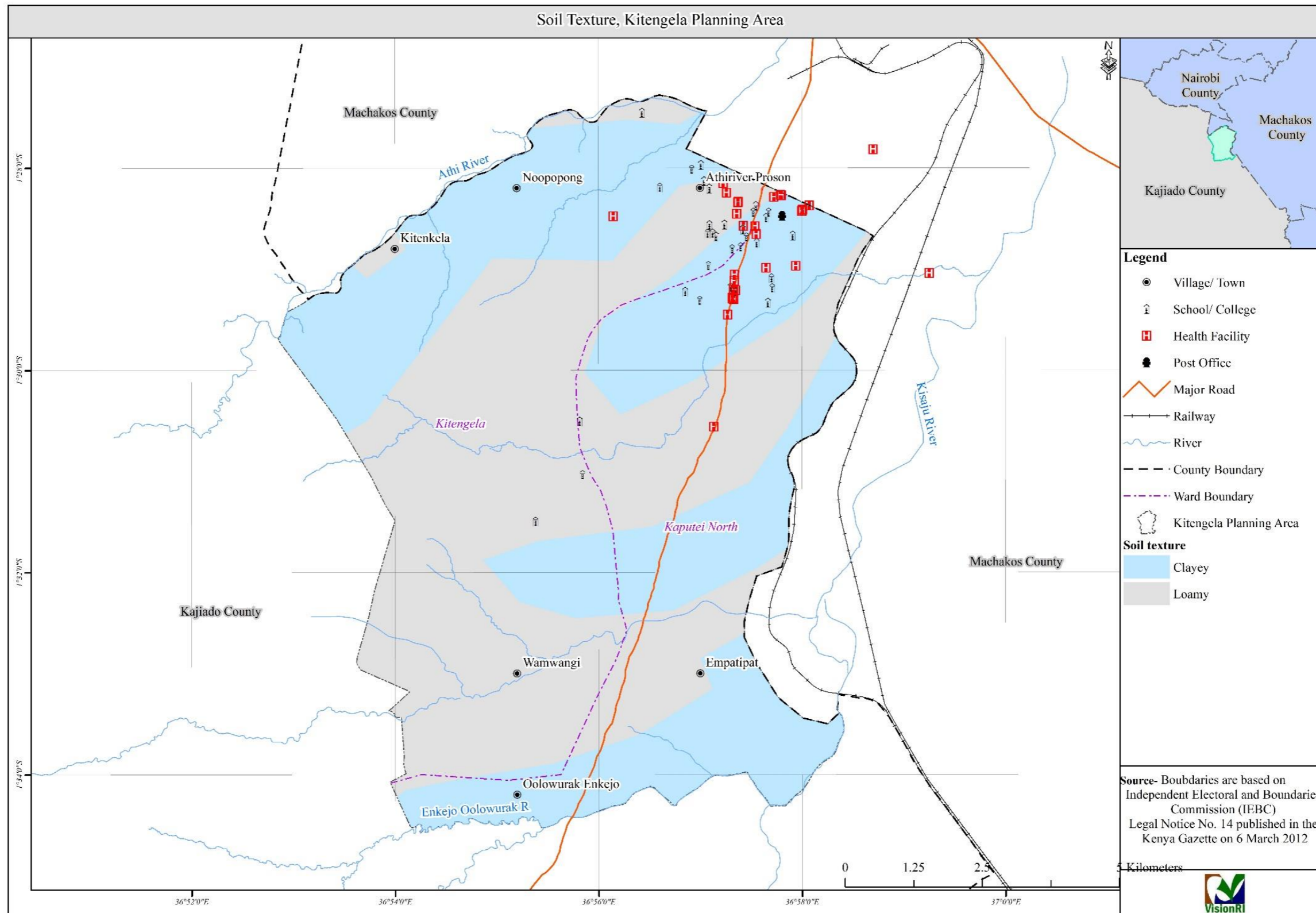
Figure 3-6: Quarry site

Source: Field visit 2018



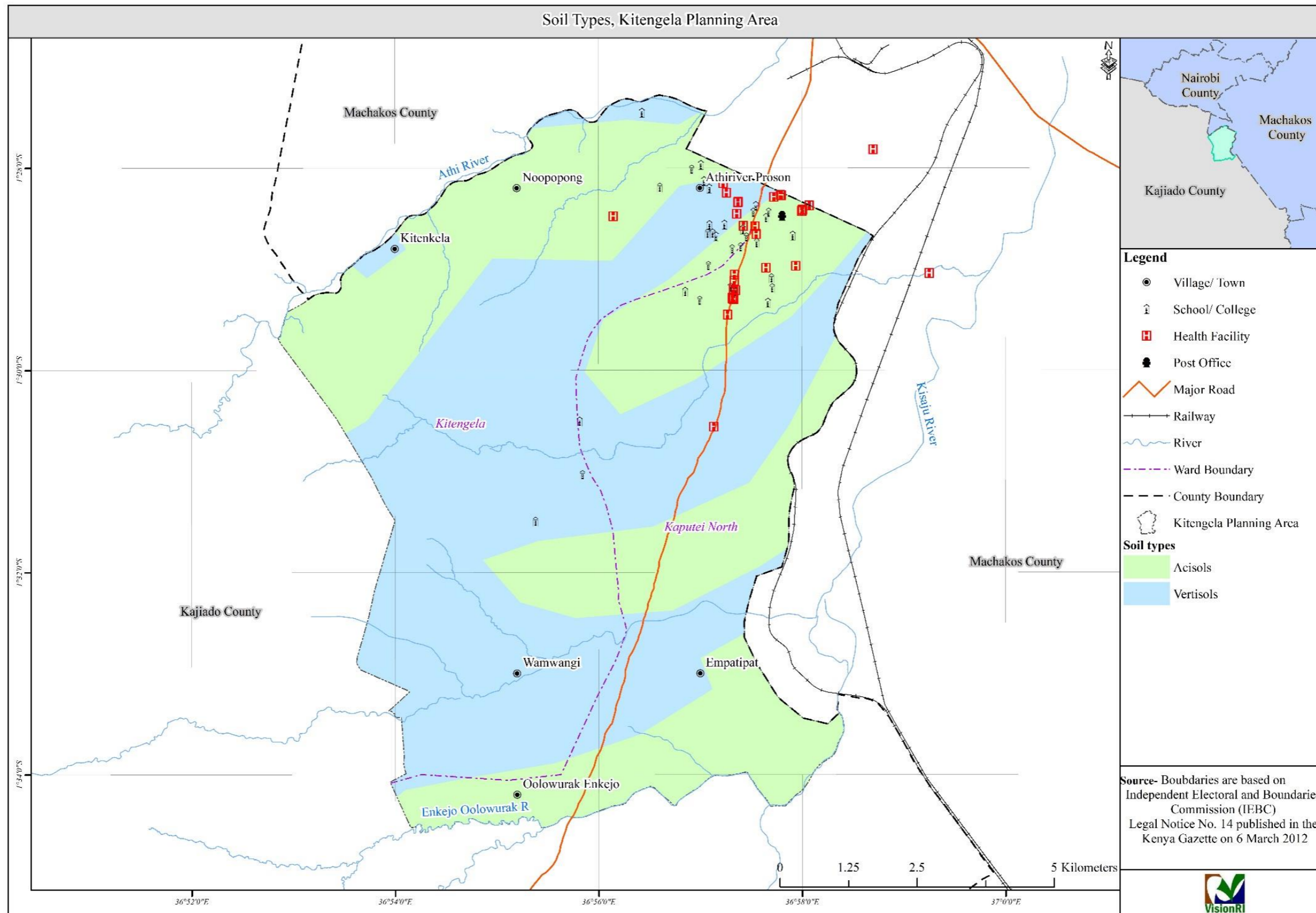
Map 3-9: Geological Map

Source: VisionRI



Map 3-10: Soil Texture Map

Source: VisionRI



Map 3-11: Soil Typology Map

:Source: Vision RI

3.3.3 Water Resources

Groundwater

The occurrence of the groundwater in the planning area is mainly influenced by climate and topography as well as the origin of the underlying parent rocks. Kitengela is situated in a hydro geologically complex zone which varies locally. Aquifers are present in the Athi Series and lake beds, as well as in fractures and old land surfaces within the Kapiti Phonolite. Significant aquifers are also found in the basement in the form of fractures, and these are important where the overlying volcanic formations have been eroded or are too thin to host any substantial aquifers. The water quality also varies locally, especially in terms of salinity. High levels of salinity may be related to the presence of evaporites which were deposited together with the Athi lake beds. These evaporites most probably occur as lensoidal bodies within the Athi lake beds and this may explain why salinity greatly varies locally (in addition to water struck in basement aquifers which is also mineralised).

The formations likely to be encountered during drilling are:

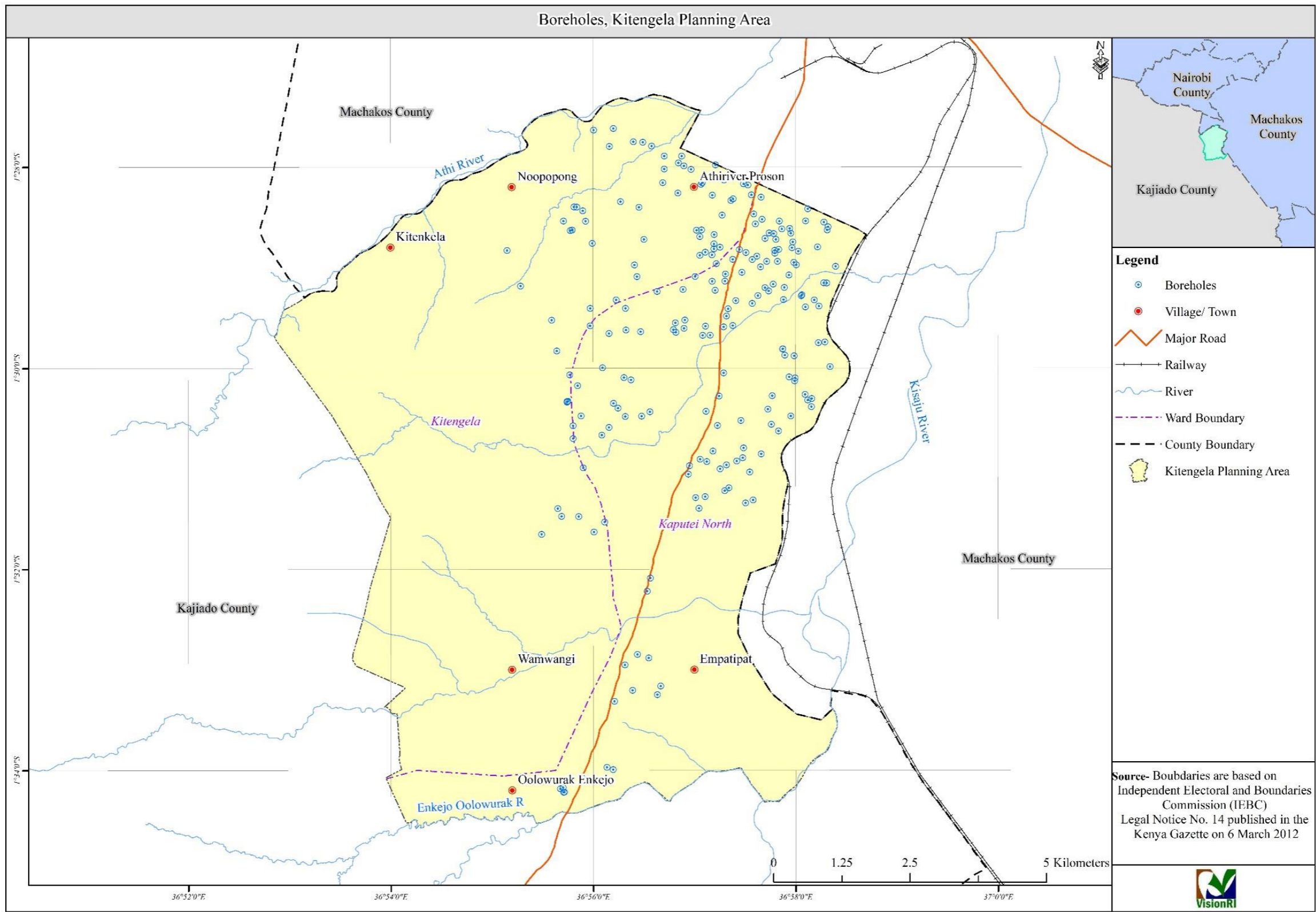
- i. Recent soils (black cotton soils, alluvial deposits, wind-blown material, weathered products *in situ*);
- ii. Tertiary Sediments and Tuffs (Athi Series);
- iii. Kapiti Phonolite); and
- iv. Fractured/weathered Basement (Quartzo-feldspathic gneiss).

Weathered layers, sediments and Kapiti Phonolites overlying the basement rocks are all potential aquifers. However, the most important local aquifer occurs within the conducting zone between the volcanic and the basement suit and or the deeply weathered/fractured zonation of the Basement System.

Surface Water

In Kitengela, the main surface water sources are Kisaju River, River Athi and springs. The planning area gets its water mainly from EPZ. The water supplied to Kitengela from EPZA is currently bulk metre thus not reliable. Water from the source undergoes full treatment before supply. Most of the rivers are seasonal hence unreliable while the available groundwater is salty hence unsafe for drinking.

The main sources of water provision are boreholes, wells and water vendors. However, most of the boreholes are also drying up because licensing for more boreholes is granted without considering the capacity of groundwater aquifers. There are, therefore, more boreholes in the planning area than the aquifer can handle. With poor drainage, surface pollution and sanitation the risk of contamination of water in the planning area is high.



Map 3-12: Boreholes

Source: VisionRI

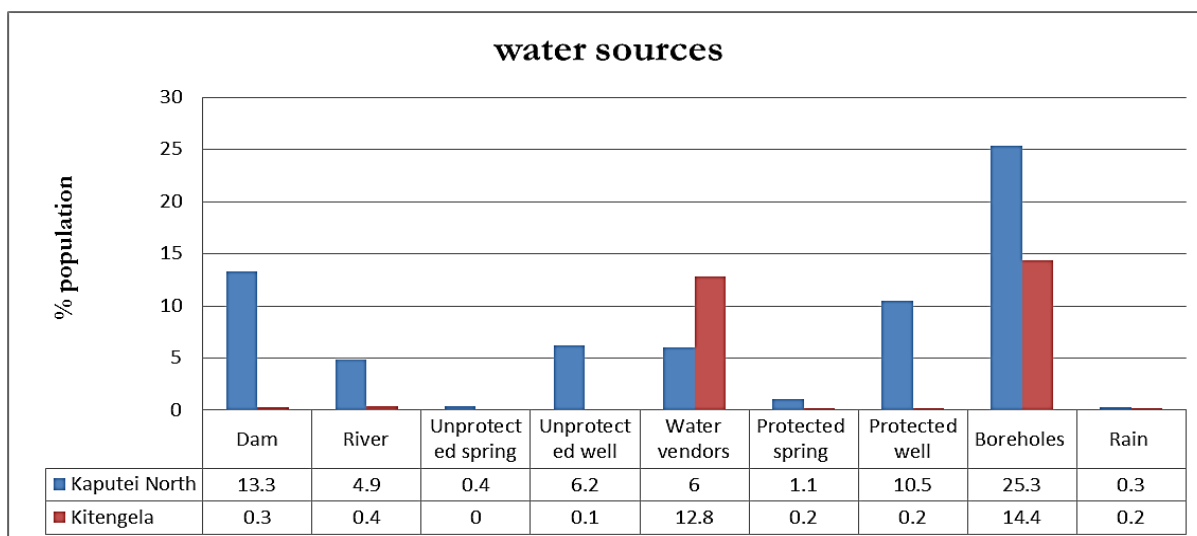


Figure 3-7: Water sources in Kitengela

Source: KNBS; Kajiado County inequality index report

Use of rainwater harvesting is underutilized mainly due to poor rainwater harvesting mechanisms. There is need to explore and harness rainwater to minimise pressure on the existing water supply, make water available at the point of consumption, reduce the need to pump or carry water over long distances as well save a considerable amount of time and energy. However, due to the town’s proximity to Athi River town, “an Industrial town”, rainwater may not be safe for domestic use due to the industrial emissions thus high acidic levels.

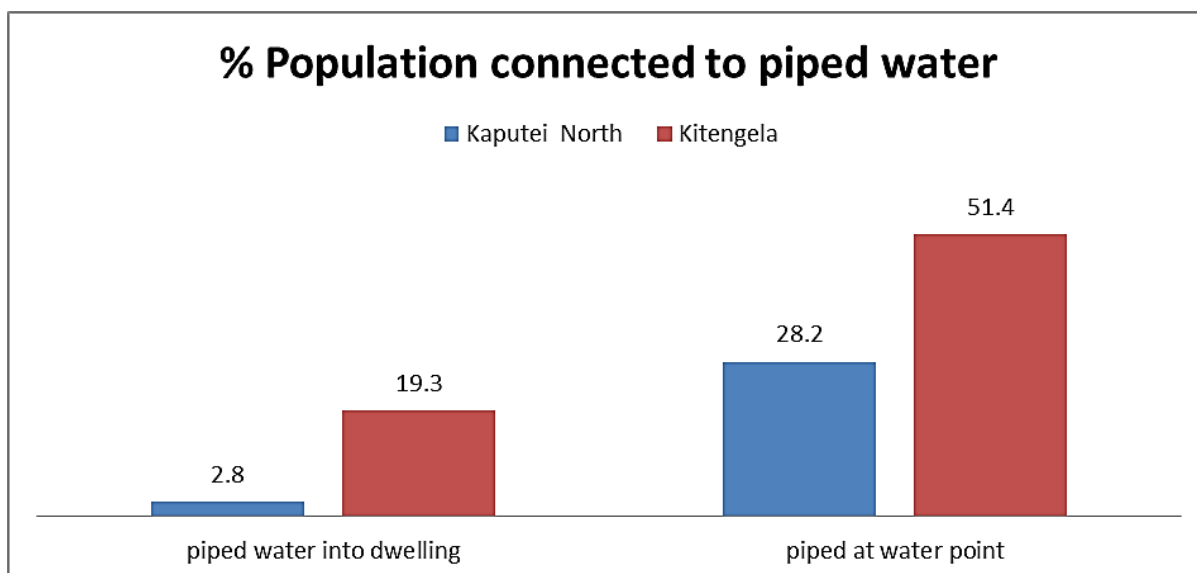


Figure 3-8: Percentage of the Population connected to piped water

Source: KNBS; Kajiado County inequality index report

Kitengela has a higher percentage of people using piped water compared to Kaputei North. As a result, the use of wells is high in Kaputei North. However, the coverage of piped water at dwellings is low, therefore a lot of people rely on piped water from the water supply points as depicted in the figure above.

Table 3-2: Access to improved drinking water in Kitengela and Kaputei North.

Ward	% with access to improved drinking water	% with no access to improved drinking water
Kaputei North	68.2	31.8
Kitengela	85.8	14.2
Total	77	23

Kitengela planning area has 77 per cent of people with access to improved drinking water compared to the world's 91 per cent.

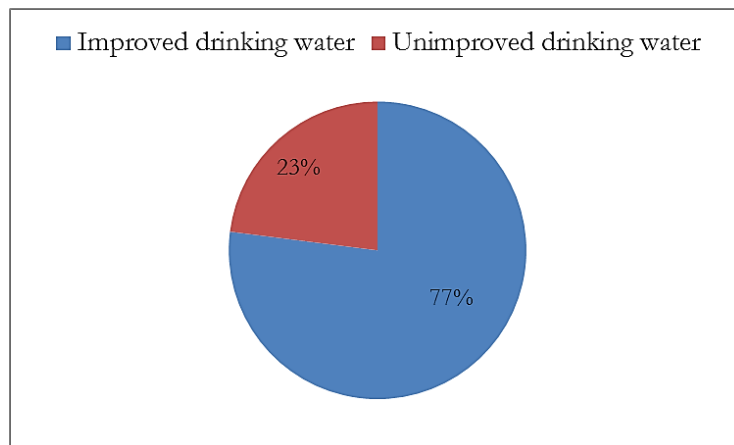


Figure 3-9: Percentage of the population with access to water.

Source: KNBS; Kajiado County Inequality Index Report

Access to improved drinking water is higher in Kitengela than Kaputei North since access to piped water in Kaputei North is low, therefore, people rely mainly on wells, boreholes and rivers.

Water pollution

Water pollution experienced in the planning area is caused by improper domestic and industrial wastewater disposal. Most of the wastewater is generated from the household in the urban centres and directed into the nearby rivers. Furthermore, flash floods cause untreated wastewater to flow into the rivers. Polluted water poses risks to residents and also plants that are dependent on the rivers.

Encroachment of wetlands and riparian areas

There exist a lot of construction activities along the Kisaju riverbank and wetlands making these areas prone to water pollution, flooding and health hazards to the residents.

3.3.4 Flora and Fauna

Flora

Kitengela town has a warm climate its vegetation includes shrubs and thickets. Vegetation in the area is mainly savanna grassland as seen in the undeveloped areas towards Kisaju river. Trees are scarcely populated especially where they are naturally found but planted vegetation in private plots

are denser. Open grassland with scattered trees dominates the area. Tree species reported to be dominant are Acacia species and Casuarina equisetifolia.

There are no forests within the planning area except scattered shrubs with open grassland. The shrub coverage is below 1 %. A small portion of land in the area under crop production is done by irrigation. Crops produced are flowers for export.

There are also flower greenhouses in the lower Kitengela town towards Kisaju river although this is for export purposes. There are also planted crops for consumption in private lands such as maize.



Figure 3-10 Shrub and grassland vegetation in Kitengela

Source: Fieldwork, 2020



Figure 3-11: Maize plantation

Source: Fieldwork, 2020

Fauna

Kitengela has few animals mostly domesticated and for commercial use for example hens, roosters, cows, goats and sheep. The Maasai community living behind Enkare practice pastoralism and keep cows, sheep, and goats as their source of livelihood.

Kitengela being part of the Athi-Kaputiei Plains were said to boast the most spectacular concentration of wildlife in East Africa at the end of the 19th century. In those days, there were four times as many wild herbivores as there were cattle. Now the reverse is true, with the wildlife beating a steady retreat. This is attributed to the disruption of the animal corridors by human settlements and activities



Figure 3-12: Sheep grazing at New Valley

Source: Fieldwork, 2020

Human-wildlife conflict

The intensity of the wildlife population at any one time is dictated by climatic regimes. In the 1980s, the land was subdivided and sold to developers. This came with fencing and developments (land-use change) along wildlife corridors. The rapid growth of human settlement as a result of subdivision and sedentary settlements has led to competition with wildlife overuse of natural resources such as water and pastures within the planning area. This has resulted to conflict e.g. encroachment onto water resources, wildlife routes and dispersal areas by human settlements.

Between 1977 and 2002, the wildlife population in the plains to the south of Nairobi National Park fell by over 70%. Particularly hard hit were migratory animals such as wildebeest, which traditionally graze in the National Park during the dry season and move south in search of new pasture during the wet season. From nearly 40,000 migrating animals in the 1970s, wildebeest numbers have fallen to about 1,000 today.

3.3.5 Air Quality

Air quality refers to the condition of the air within our surrounding. Air quality in Kitengela is generally poor and not of acceptable standards due to increased emissions from motor vehicle and processing factories located in Kitengela town, and also dust from quarries. Exposure to air pollutants at higher concentrations and longer durations has caused health complications to the residents.

Initiatives to improve the air quality by reducing odour at some areas such as the Noonkopir Slaughterhouse has been observed where a treatment chemical called Eco treat is used to destroy odour from the slaughtered remains.

However, that notwithstanding particulate matter in the atmosphere in form of dust particles, emissions from industries and vehicles have resulted in Kitengela being mocked as the dustiest area in the metropolitan region. The implications of this is a higher than average respiratory tract infections as well as heightened temperatures due to the dust particles creating a micro-climate in the area. There is, therefore, a dire need for carbon sinks as well as heat sinks in the area.

3.3.7 Noise levels

Kitengela has varied noise levels depending on the area one is. Within the residential estates (Milimani, Riverine, New Valley Chuna etc.) the noise generally low. The only evident noise in these areas is the low hum of personal vehicles during morning and evening rush hours. Within the town centre, the noise levels vary depending on the time of the day. During the day, the noise level is lower than at night. This is because clubs operate mostly at night. Sources of noise pollution during the day include automobiles such as public vehicles, excavators, posho mills and business premises amongst others.

This variation in noise levels have an implication on the type of land uses that can be accommodated in a particular zone. This is since every land use has a noise threshold beyond which a land use becomes impractical such as educational facilities. Similarly, each land use noise contribution may limit it from being suitable for certain zones such as light industrial activities such as the *jua kali* sector. This calls for land use buffering and zoning of land uses. Some buffering structures that can be of use include the planting of trees, soil bump and structures such as walls.

3.3.8 Climate

Kitengela has a warm climate. With daily average temperatures of about 27°C. The area experiences warm winds during the day and in the evening's temperatures cool bringing cool breezes with it.

Rainfall

Kitengela has a bimodal rainfall pattern. The area has a mean annual rainfall of 592mm with the driest month is August with 6mm of rain and in April, the precipitation reaches its peak. The short rains fall between October and December while the long rain falls between March and May. The mean is 809.3 mm. The rainfall gradient runs North-South. In relation to the rainfall patterns, the variability and frequency of droughts seem to be increasing in Kitengela and around the region. This has led to the death of livestock and wildlife and a reduction in crop production.

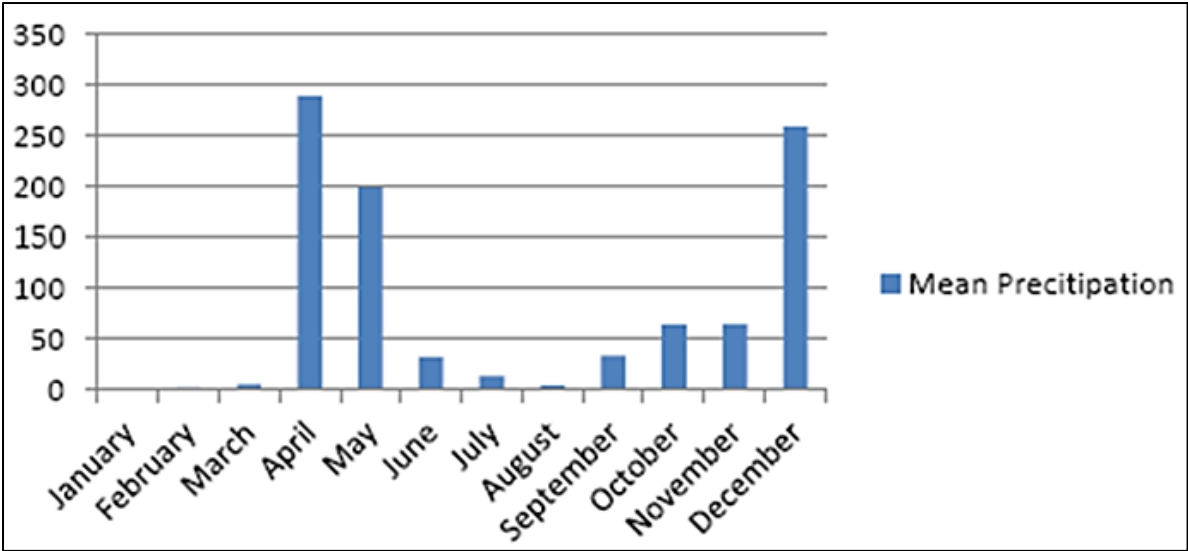
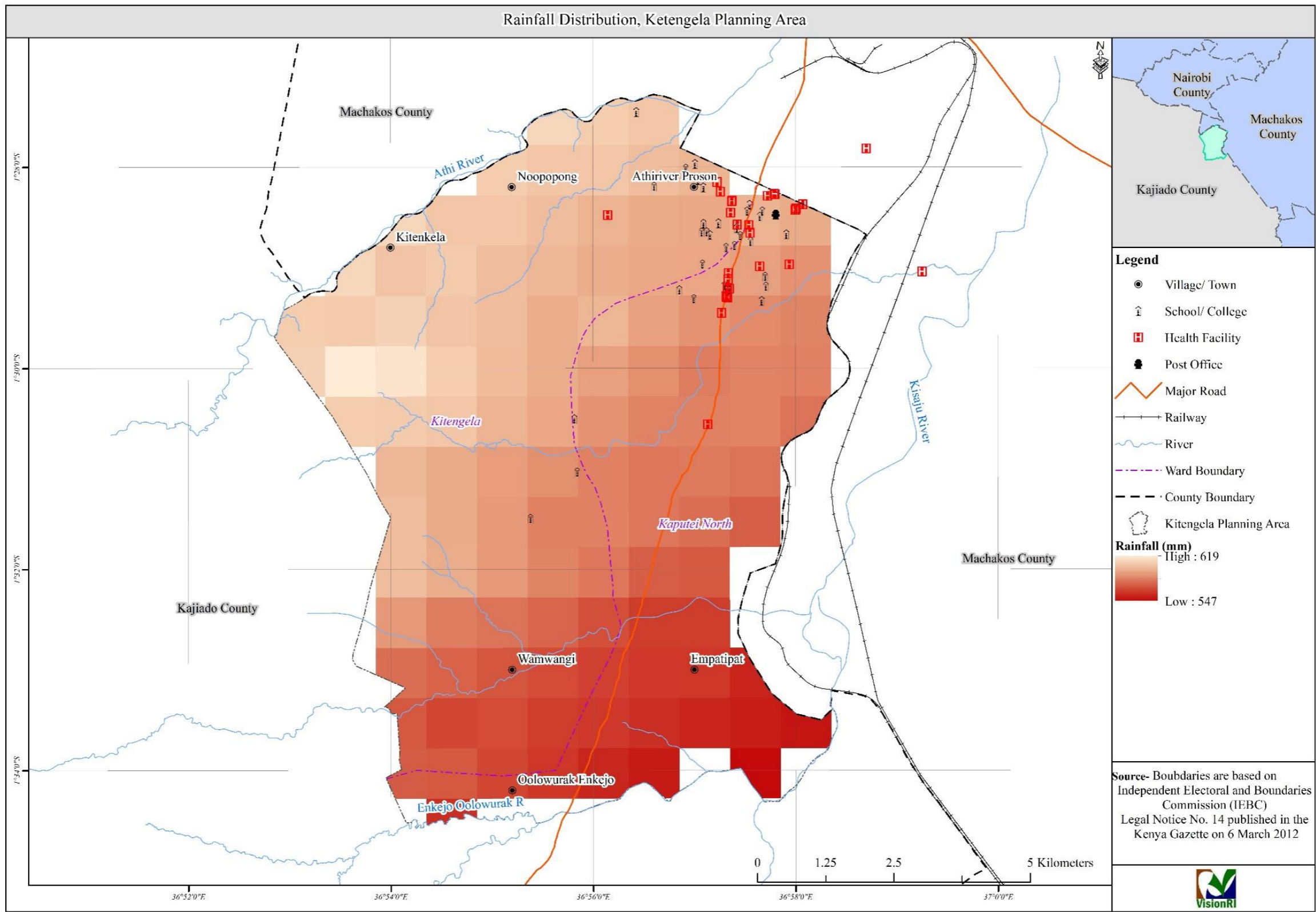


Figure 3-13: Rainfall pattern

Source: Kenya Meteorological Department



Map 3-13: Rainfall in Kitengela

Temperature

The mean annual temperature in Kitengela ranges between 21 °C to 30 °C. Low temperatures are experienced in June and July while January and March are the hottest months. The minimum temperature ranges between 12.6°C to 14.9 °C and maximum between 23°C and 30 °C. Studies indicate an increase in minimum temperature of 1.3 °C over the last 43 years. This increase in temperature has increased vegetation decimation and reduction in forage production leading to high mortalities of both livestock and wildlife. However, this poses potential in the use of solar energy.

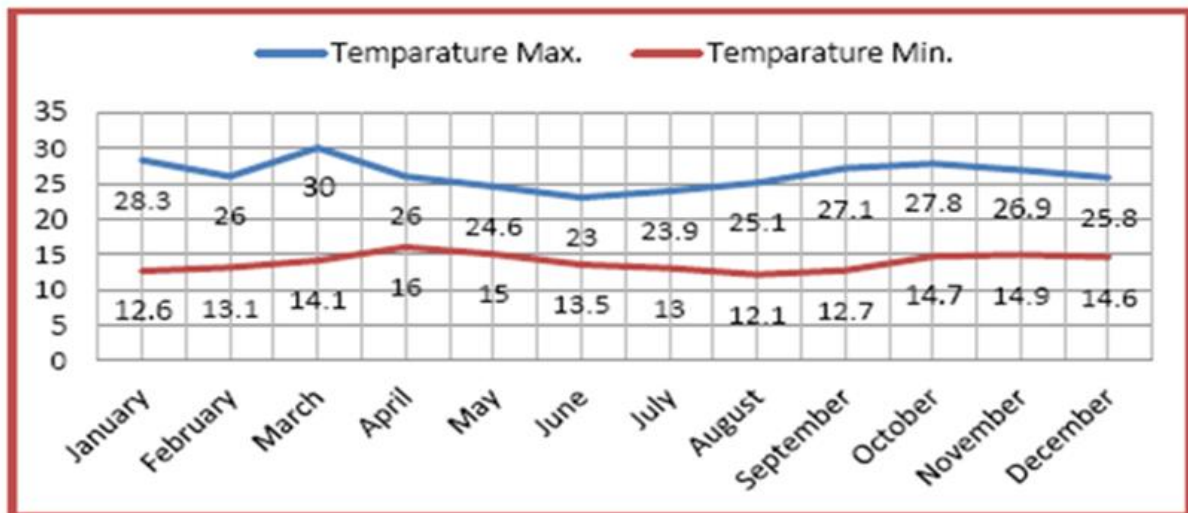


Figure 3-14: Temperatures in Kitengela

Source: Kenya Meteorological Department

Wind

The wind speed ranges between 5m/s – 7m/s in the study area. The wind blows from the north-eastern region over and across the site. Its speed is highly determined by the development conditions. Bare lands within the study area have a higher wind speed flow

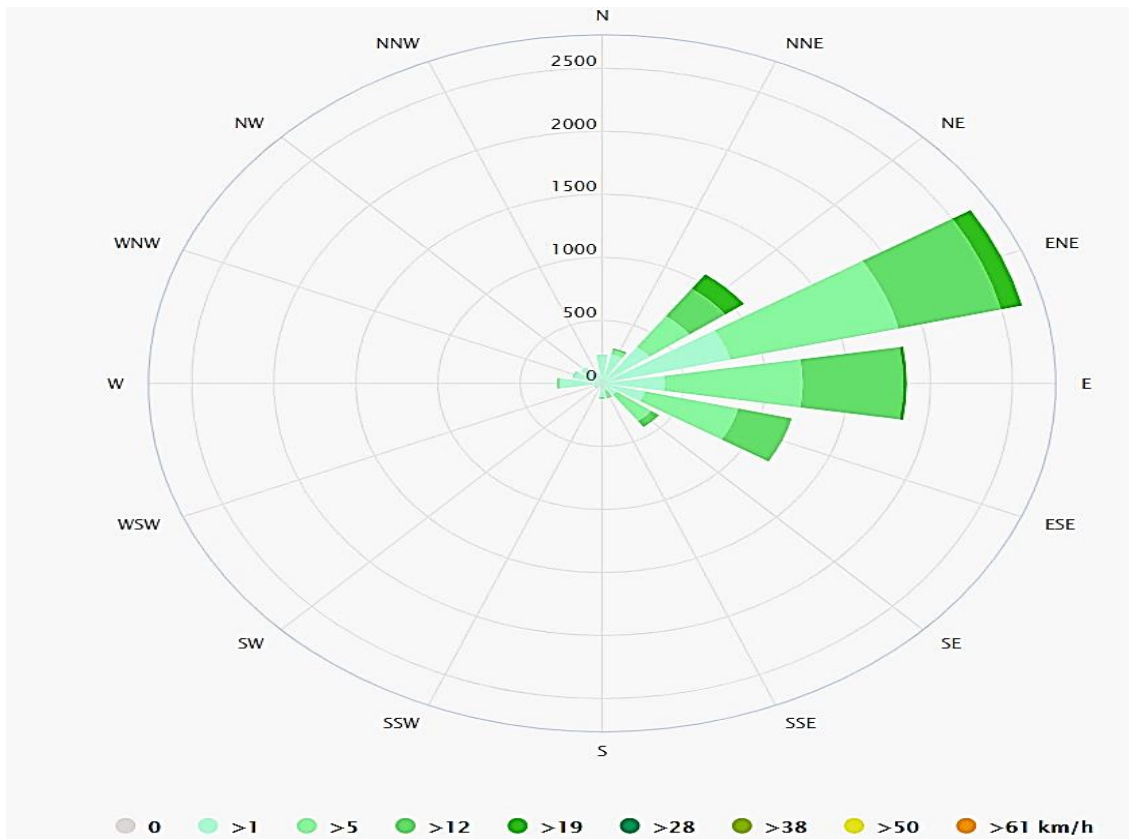
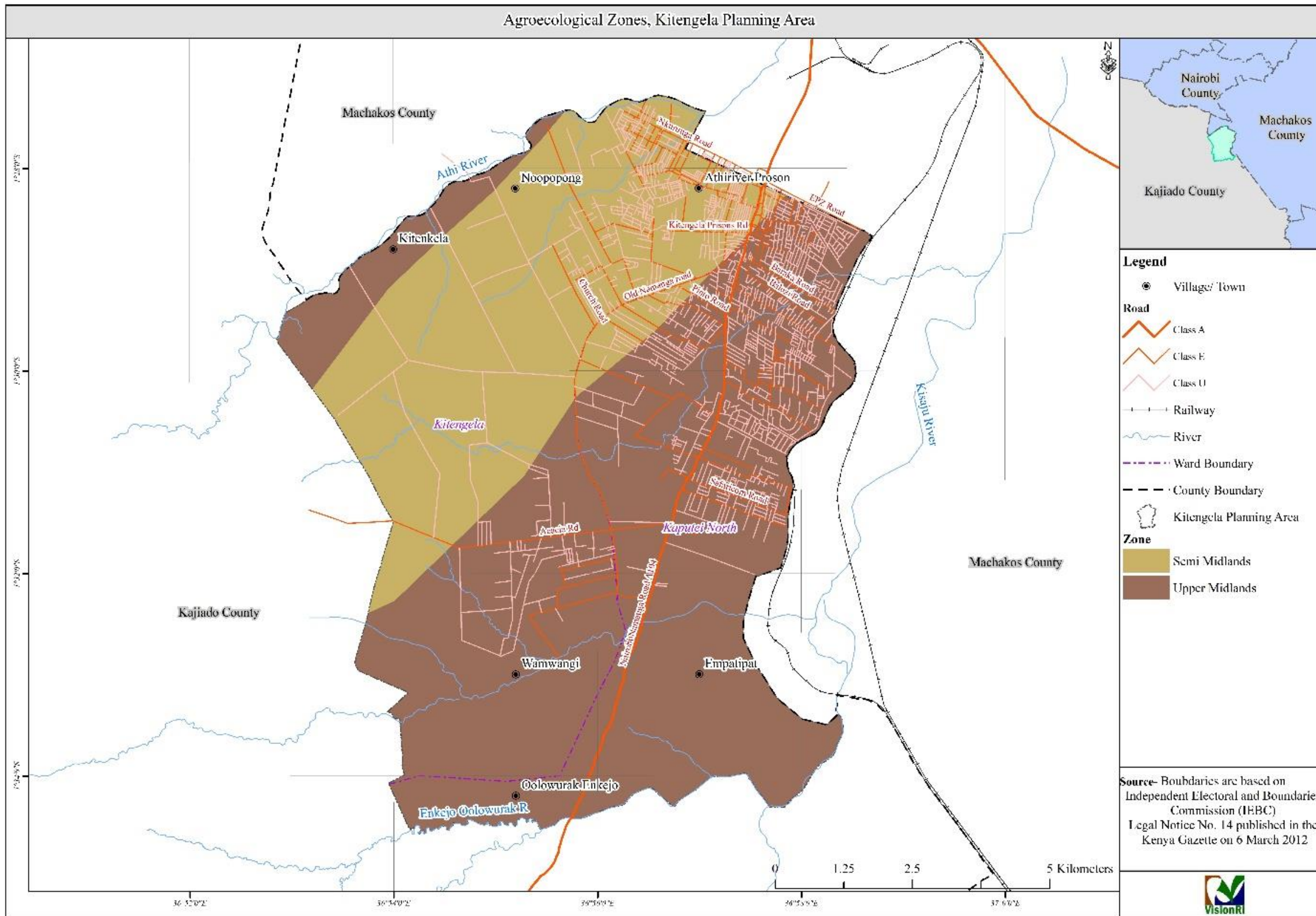


Figure 3-15: Kitengela Windrose

Source: Meteoblue 2020

3.3.9 Agro-ecological zones

Kenya is divided into seven agro-ecological zones. Most of the planning area falls within the Athi-Kaputei plains whereby 69% of this zone is in Zone VI while 31% is in zone V. Due to low amounts of rainfall, the better part of Kitengela falls within the zone VI of the upper-middle arid area and Zone V of upper-middle semi-arid area.



Map 3-14: Agro-Ecological Zones in Kitengela

Source: VisionRI

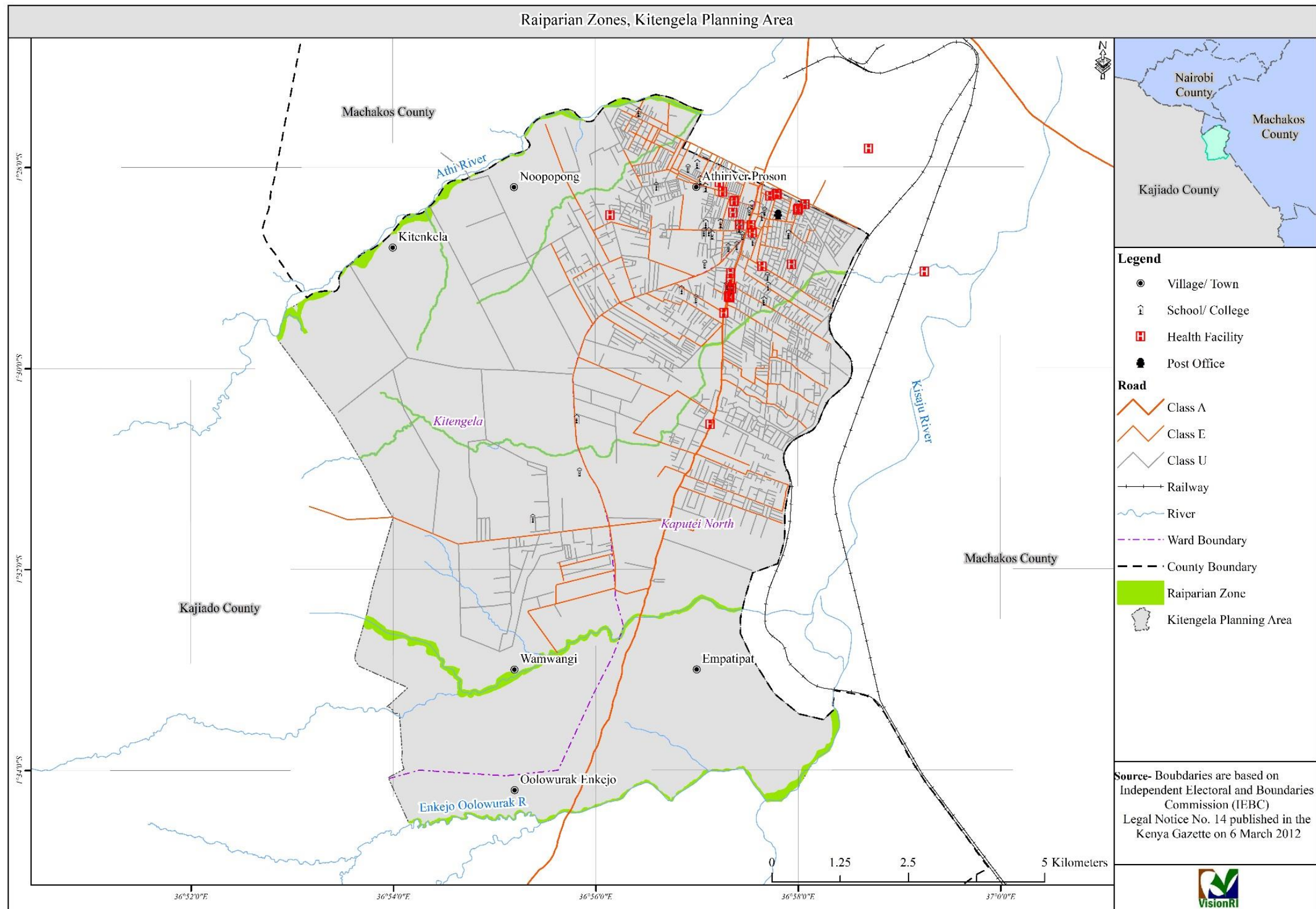
3.3.10 Environmentally Sensitive Areas

The main environmentally sensitive areas in Kitengela are the riparian zones. Most of the riparian zones in the Kitengela are not delineated, as a result, there is little if any protection of the riparian zones. There are a lot of construction activities and dumping along the riverbanks resulting in water pollution, siltation and flooding. Delineation and protection of the riparian zones, as well as the development of a drainage master plan, is necessary to mitigate flooding hazard as well as protect the riparian zones.



Figure 3-16: Flooded plot along Deliverance Road

Source: Fieldwork, 2020



Map 3-15: Riparian areas in Kitengela

Source: Vision RI

Another potentially sensitive zone is Milimani area where multiple active and abandoned quarries are located. These areas are likely to attract floodwaters as well as waterborne hazards and ailments. Moreover, dust and noise from these sites, earthmovers and trucks often result in an undesirable area for development. Adequate buffering of existing sites and decommissioning of the inactive quarries is necessary to ensure sustainability and restoration of the aesthetic character of Kitengela.



Figure 3-17: Lorry being loaded in a Murram quarry in Milimani

Source: Fieldwork, 2020

3.3.11 Pollution points

Soil pollution points

Soil pollution in Kitengela mainly occurs due to indiscriminate disposal of both solid and liquid waste. Areas such as Ndatani Road are noted where raw sewer is seen across the road. Dumping along the roads is also seen as a pollutant in areas such as Noonkopir and Kyang'ombe where substances and chemicals from the dumped waste seep into the soil.

Long term exposure to polluted soil directly or indirectly through crop produced in such soil can alter the genetic makeup of individuals often resulting in congenital and chronic illness. Organic farming methods are encouraged as well as a keen observance of appropriate solid and liquid waste disposal mechanisms.



Figure 3-18: Solid waste dumped along the street in Kyang'ombe

Source: Fieldwork, 2020

Water pollution points

Water pollution in Kitengela is along water bodies such as the stony Athi where boda-boda riders wash their motorcycles in the river channel. In addition, the sole dumping site for Kitengela in Noonkopir is located along a river channel thus polluting the water.



Figure 3-19: Motorcycle riders washing their motorcycles in Mbagathi River.

Source: Fieldwork, 2020.

Polluted water is of great concern to the aquatic organism, plants, humans, and climate and indeed alters the ecosystem. The preservation of our water environment, which is embedded in sustainable development, must be well driven by all sectors. While effective wastewater treatment has the tendency of salvaging the water environment, integration of environmental policies into the County Government's and other actors core objectives coupled with continuous sensitization and enlightenment on the present and future consequences of environmental/water pollution will greatly assist in conserving the water environment

Air Pollution

Air pollution is mostly experienced in Kitengela due to emissions from industries in Athi River which is on the windward side of Kitengela. Similarly, industries within Kitengela contribute to air pollution. There is also high release of particulate matter in the air in form of dust particles resultant to the presence of calcareous rocks in parts of Kitengela which are easily blown by wind.

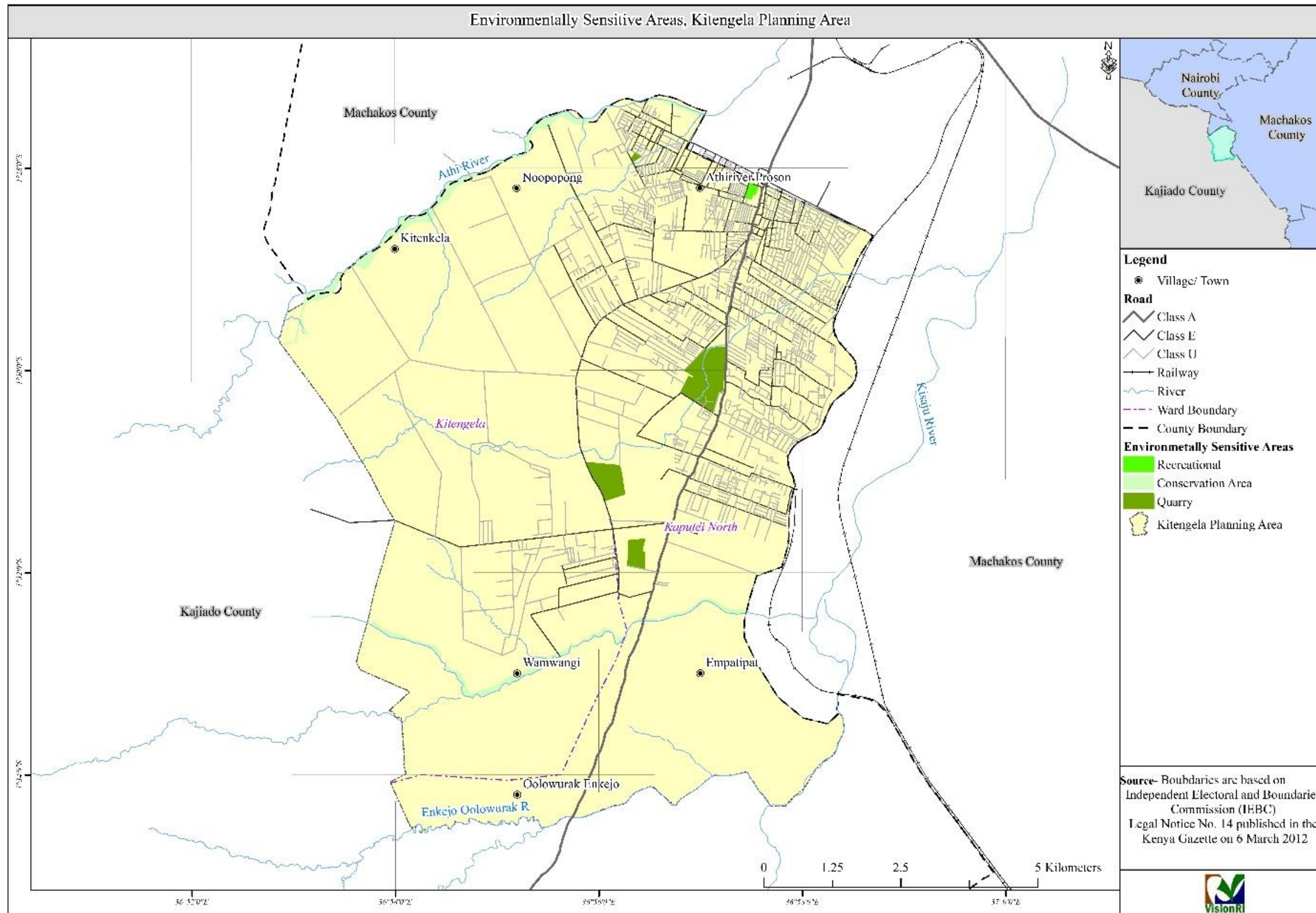


Figure 3-20: Environmentally sensitive areas.

Source: VisionRI

3.4 Population and Demography

3.4.1 Introduction

Demographic systems have a direct effect on social and economic development, provision of services and the general well-being of the people.

The provision of basic human needs such as housing, schools, health facilities, water supply and others require constant monitoring of changes in population size. A higher population growth rate implies a higher level of needed investment to achieve a given income per capita.

3.4.2 Population size

The population size of Kitengela as of the 2019 Housing and population census is at 154,436. This is a 165.5% increase from the 2009 figure of 58,167. This translates to a compounded growth rate of 10.23%. This growth rate is predicated upon different potentialities of Kitengela that make it attractive for development and living.

Key potentials of Kitengela which are also the main factors contributing to the rapid rate of growth and urbanisation in Kitengela are:

- **Proximity to Nairobi:** Proximity to Nairobi is one of the main factors of growth for Kitengela. Being only 30km from Nairobi, a sizable number of the working class in Nairobi perceive Kitengela as an optimum area of residence. As such Kitengela has grown and will continue to grow as a residential hub to Nairobi.
- **Proximity to Nairobi National Park:** Being close to Nairobi national park, Kitengela is poised to strategically place itself as a tourism destination. Coupled with the wildlife corridor and vast savannah landscape, tourism come in the form of hotels, camps, conservancies and cottages.
- **Proximity to Major Highways (A104 and A109):** The proximity to major highways makes it an easily accessible destination. It connects to Kajiado, Isinya, Ngong Municipality through Namanga highway as well as Mombasa, Machakos, Nairobi and Jomo Kenyatta International Airport through Nairobi Mombasa Highway
- **Cheap land:** Kitengela's gently rolling landscape in Kapiti Plains avails extensive land for development. This being the case results in cheaper land cost.

3.4.3 Population Growth

Kitengela town over the past ten years has exploded exponentially in growth where the population has nearly tripled its former size. This growth rate is at an annual average of 16.55% (165% over the last 10 years). This is far higher than any of the former principal towns (currently County headquarters). This is as illustrated in Figure 3-21 below.

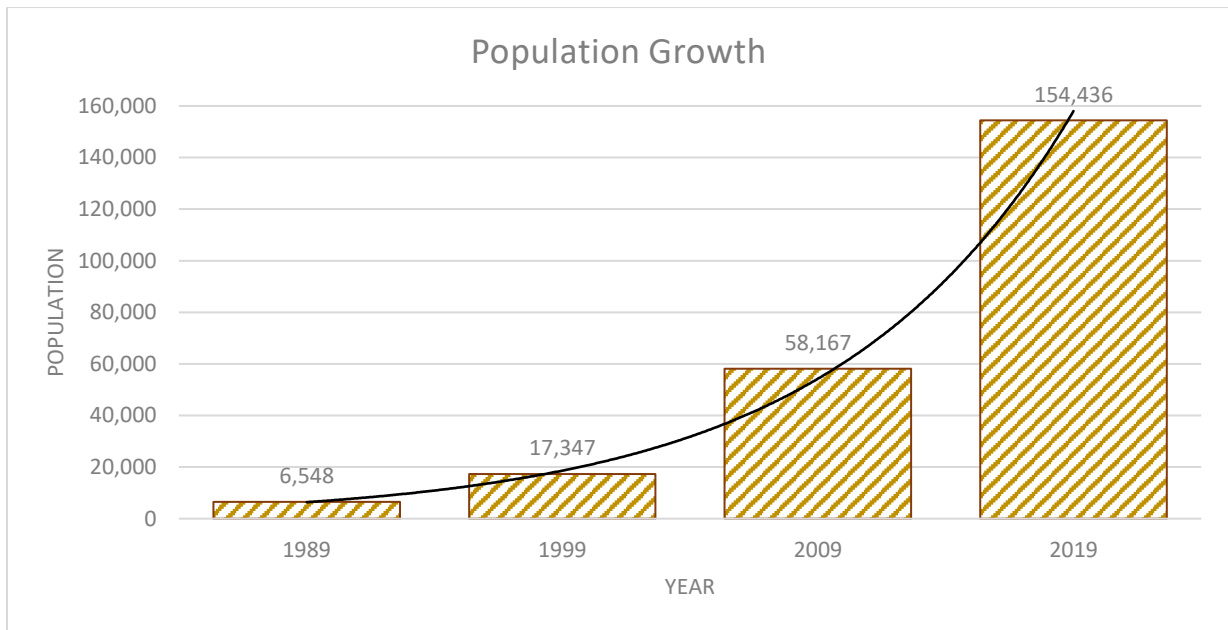


Figure 3-21: Historical population Growth

From the above graph the population of Kitengela was at 6,548 in 1989, 17,347 in 1999, 58,167 in 2009 and 154,436 in 2019. This represents growth rates of 165%, 235% and 166% as represented in Figure 3-25 below.

This indicates that the town is, therefore, growing at a very fast rate and there is a need to provide social amenities such as hospitals, schools and water to keep pace with rapid growth.

Population growth and urbanisation have occurred in parallel with land tenure changes in Kitengela. Most of the population in the area consists of the working people in Nairobi are settling in Kitengela which is far from the noise of the city but still in close proximity to their workplaces. During the 1980s and throughout the 1990s, the towns of Athi River and Kitengela also grew rapidly, due to establishment of Export Processing Zone factories. The 1999 population census counted 17,347 residents of Kitengela, up from 6,548 in 1989 (GoK, 2001). More than two-thirds of the population is concentrated in the Kitengela trading centre and other smaller trading centres (Nkedianye, 2004).

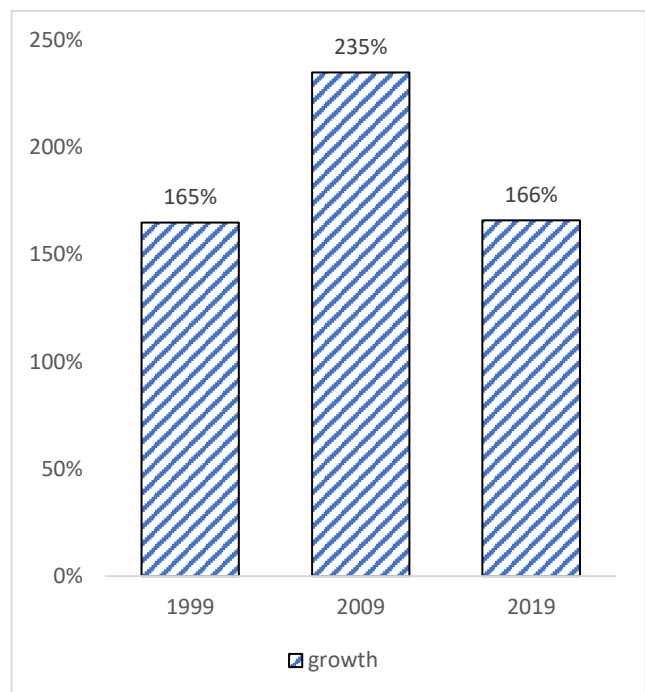


Figure 3-22: Population Growth Rate

The population of Kitengela in Comparison to other Nairobi Metropolitan Towns

The Northern Metro comprises the municipalities of Kiambu, Limuru, Ruiru, Thika, Karuri and Kikuyu. The Southern metro comprises Kajiado county and the Eastern metro of Machakos county.

As per the table, most of some of the urban centres have recorded huge population increase.

Table 3-3: Population of Other Towns in NMR

	Other towns within Nairobi metropolitan	2009 census	2019 census
1	Kitengela	58,167	154,436
2	Mavoko (Athi river)	110,396	322,499,
3	Kiambu	76,093	147,870
4	Limuru	61,336	81,316
5	Machakos	41,917	63,767
6	Thika	139,853	251,407
7	Karuri	99,739	194,342
8	Kikuyu	190,208	323,881
9	Ruiru	238,858	490,120
10	Tala/ Kangundo	13,356	21,704
11	Kajiado (municipality)	14,631	24,678
12	Juja	40,446	156,041

From this analysis, in 2009, out of the 12 towns above, Kitengela was at position 6 with a population close to that of Juja town.

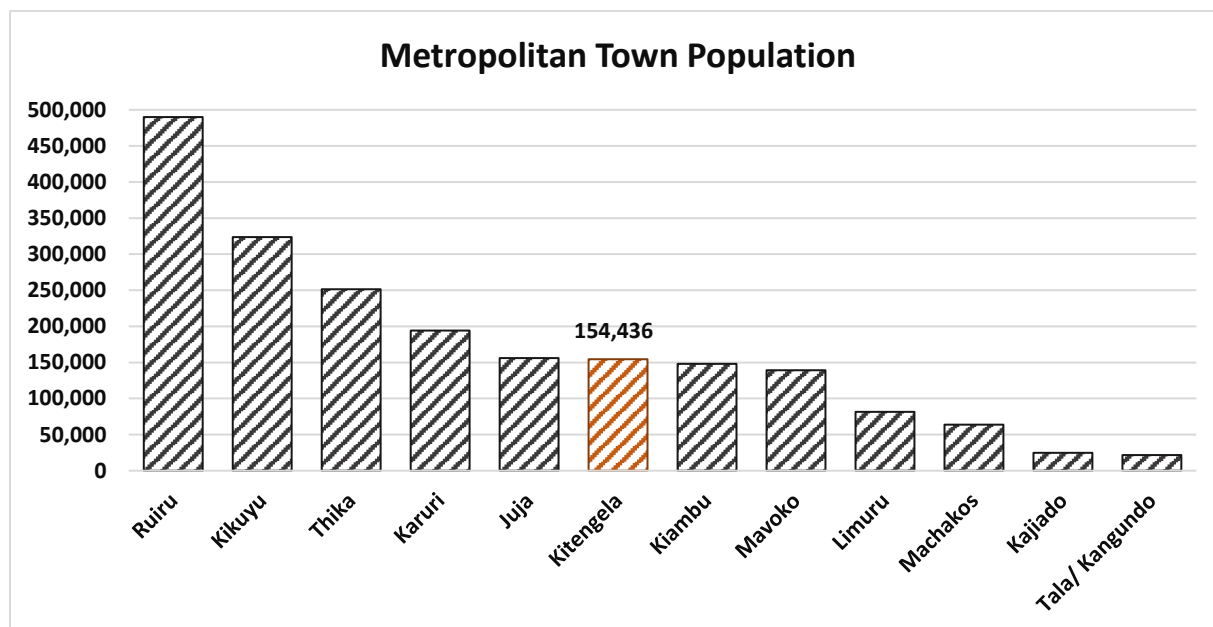


Figure 3-23: Population size of towns in the metropolitan region

Population of Kitengela in comparison to County headquarters in the country

The County Headquarters were formerly planned as the principal towns in the 1978 human settlement strategy (“Purple Book”). These principal towns later developed into provincial headquarters and were the loci of activity for the former 8 provinces of the country and were deliberately linked with Class B Roads.

Table 3-4: Growth rates of former Principal Towns in relation to Kitengela

No	Former Principal Towns Versus Kitengela	2009 Census	2019 Census	Simple Growth Rate (%)	Annual growth rate (%)
1.	Kitengela	58,167	154,436	165.50%	10.26%
2.	Nakuru (urban centre)	309,424	570,674	84.43%	6.31%
3.	Kakamega	69,502	107,227	54.28%	4.43%
4.	Mombasa (city)	939,370	1,208,333	28.63%	2.55%
5.	Kisumu(city)	390,164	397,957	2.00%	0.20%
6.	Nyeri(town)	63,626	80,081	25.86%	2.33%
7.	Embu (town)	60,673	64,979	7.10%	0.69%
8.	Garissa (town)	119,953	163,399	36.22%	3.14%
9.	Nairobi	3,138,369	4,397,073	40.11%	3.43%

Kitengela population growth is noted to grow at an annual double-digit rate of 10.26% which is at least twice as high as Nakuru which is the second-fastest-growing urban area within the former principal towns.

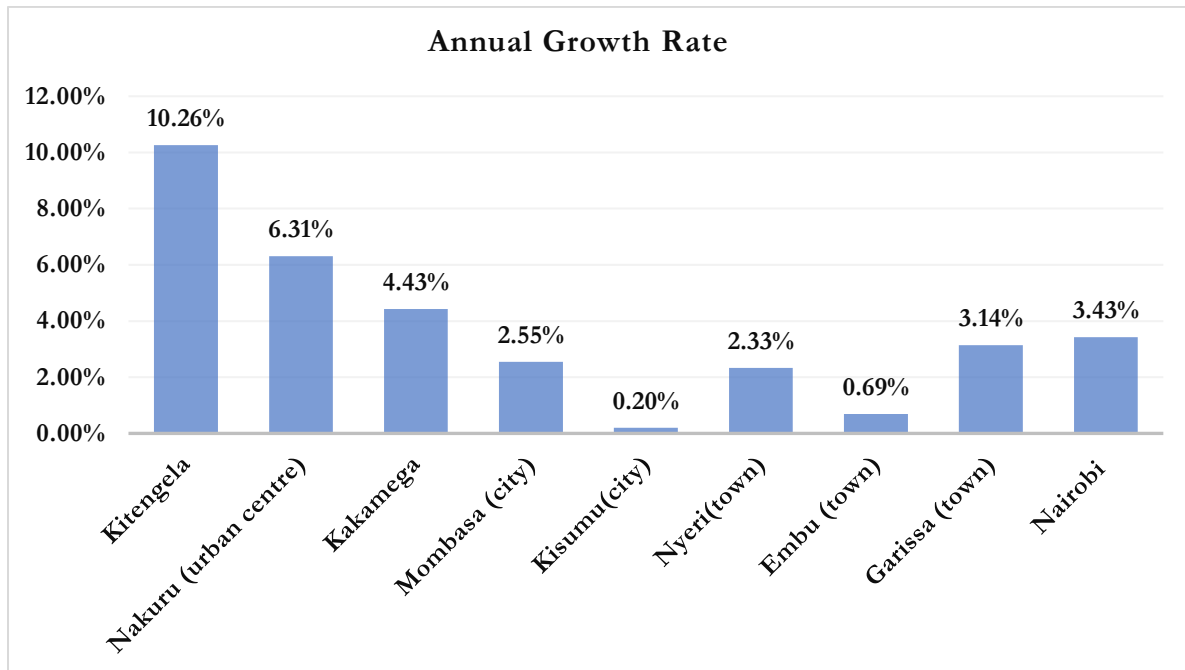


Figure 3-24: Annual Growth Rate of Kitengela Compared to other major urban areas

Kitengela town, while not formerly a principal town or a provincial headquarter has surpassed the growth rate of these principal towns. Planning for Kitengela is, therefore, critical and restructuring of the planning area is also necessary to ensure efficiency in infrastructure and service delivery.

Population structure

Kitengela town exhibits a young population where the majority of individuals are in their youth between ages 20 to 35. This presents challenges of unemployment and underemployment since

the majority are under the working-class category. The age structure is presented below as Table 3-5.

Table 3-5: Kitengela Population by Age and Sex

Age	Male	Female	Total
0 - 4	9,777	9,805	0 - 4
5-9	7,985	7,777	5-9
10 -14	6,285	6,651	10 -14
15-19	5,110	6,051	15-19
20-24	8,717	11,368	20-24
25-29	10,686	11,368	25-29
30-34	9,381	8,878	30-34
35-39	6,854	5,793	35-39
40-44	4,817	3,605	40-44
45-49	3,226	2,168	45-49
50-54	1,969	1,272	50-54
55-59	1,224	845	55-59
60-64	674	557	60-64
65-69	382	316	65-69
70-74	224	228	70-74
75+	179	261	75-79
Total	77,490	76,943	154,433

The following is the population pyramid of Kitengela (Figure 3-25) showing the bulge at the 20-35 bracket as well as the 0-4 bracket. This is indicative of a youthful working population with a similar influx of children being the offspring of the working population. Employment opportunities, childcare services as well as primary schools will be the greatest challenges as well as priorities for the young population

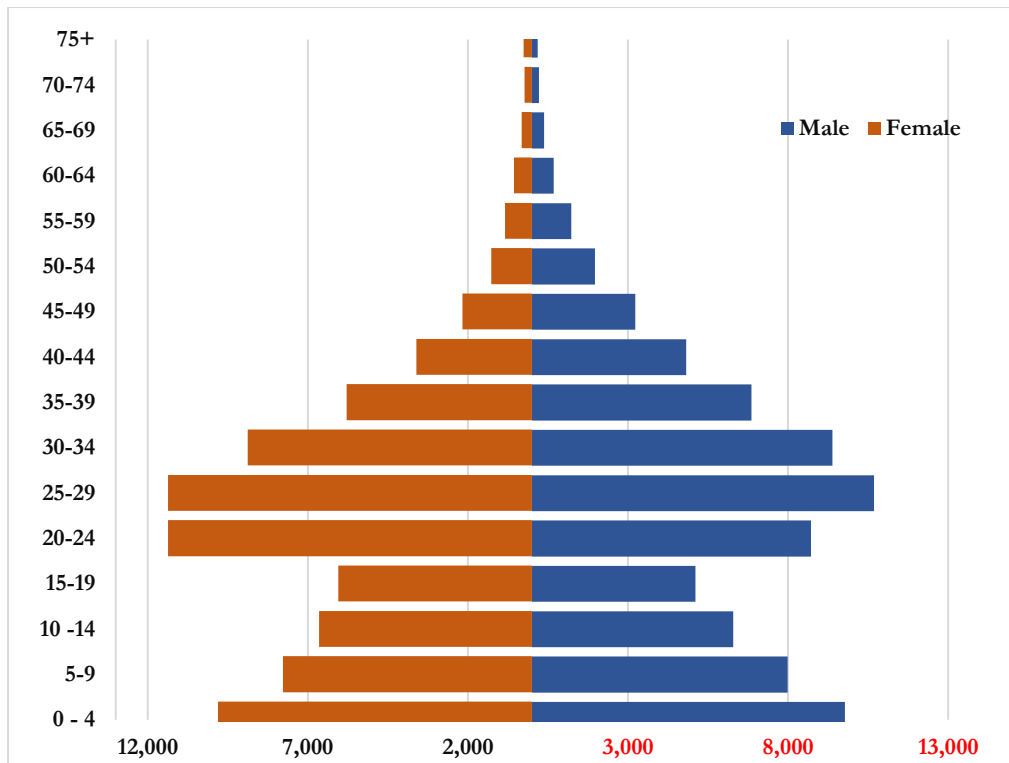


Figure 3-25: Population pyramid of Kitengela

Source: KNBS 2019 Population Census Reports

The table below represents the population projections of the planning area.

Table 3-6: Projected Population, 2019 to 2030

Year	Population Projection			
	Males	Females	Total	Density
2019	77,490	76,943	154,433	1,030
2020	85,438	84,835	170,273	1,136
2021	94,202	93,537	187,738	1,253
2022	103,864	103,131	206,995	1,382
2023	114,518	113,709	228,227	1,524
2024	126,264	125,372	251,636	1,680
2025	139,215	138,232	277,447	1,852
2026	153,494	152,411	305,905	2,042
2027	169,238	168,043	337,282	2,251
2028	186,597	185,280	371,877	2,482
2029	205,736	204,284	410,021	2,737
2030	226,839	225,238	452,077	3,018

The figure below illustrates a high population growth rate by 2030. This population increase will require to be matched with expanded social amenities and physical infrastructures such as water and solid waste management.

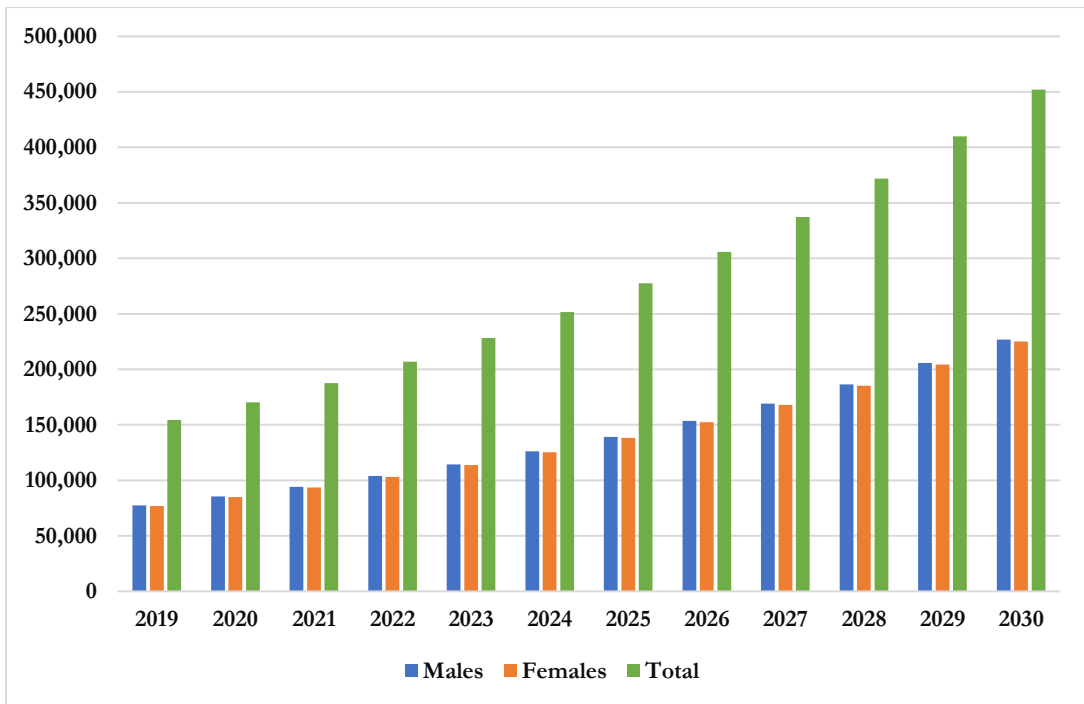


Figure 3-26: population projections

3.4.4 Population density and distribution

Kitengela with an area of 97.54km² with a population density of 1,030 persons per km² (2019 pop census). The current spatial form of Kitengela characterises the population density and distribution. Population density is influenced mainly by the availability of land, the presence of Class A road and the existing industries.

The area around Kitengela CBD and along Namanga road is densely nucleated, highly populated and character and has a lot of developments as shown in the figure below. It is the current built-up area. The scattered settlements are in the sparsely nucleated region with a big portion is still under agriculture.

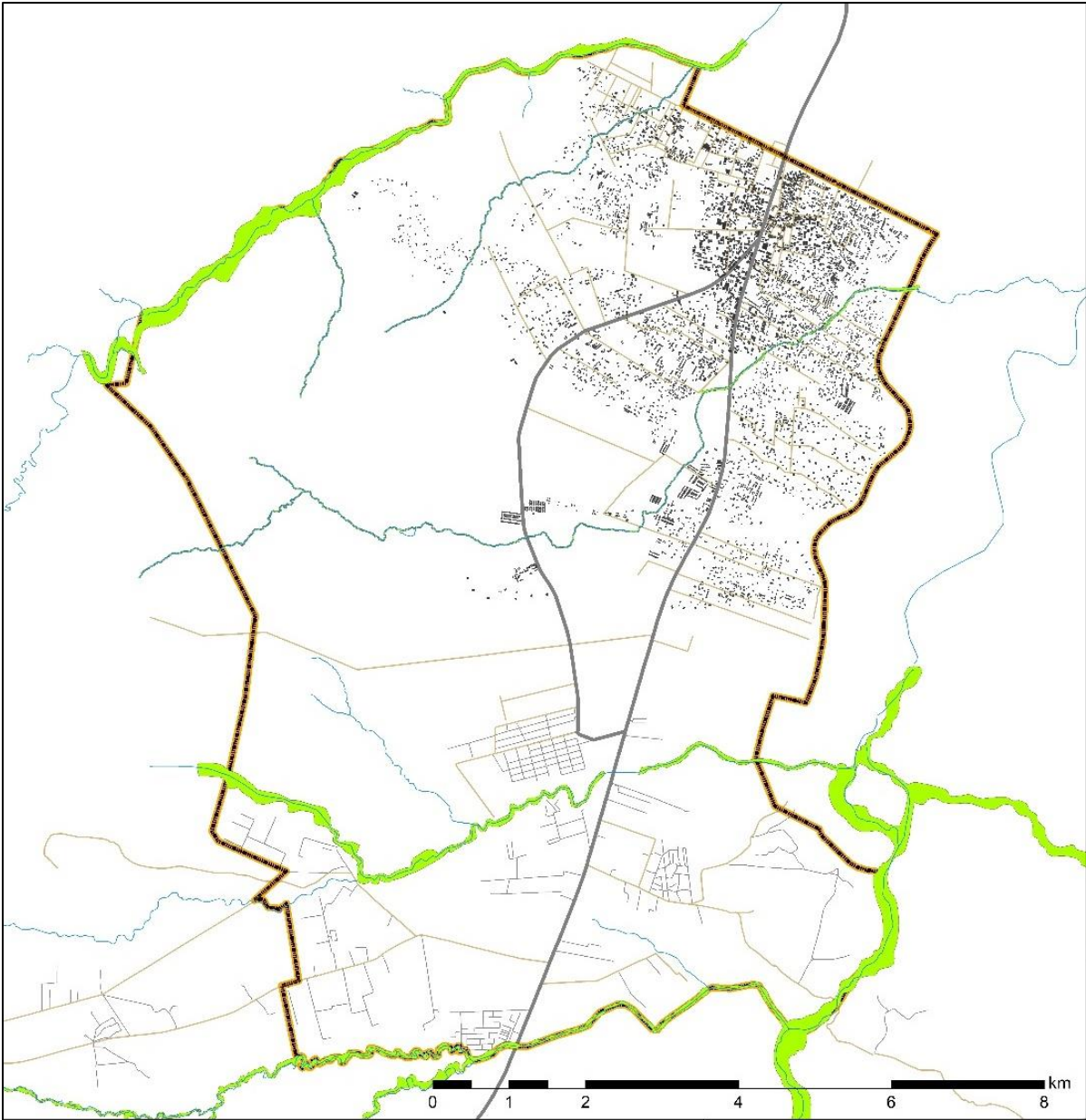


Figure 3-27: Kitengela settlement patterns

Source: VisionRI

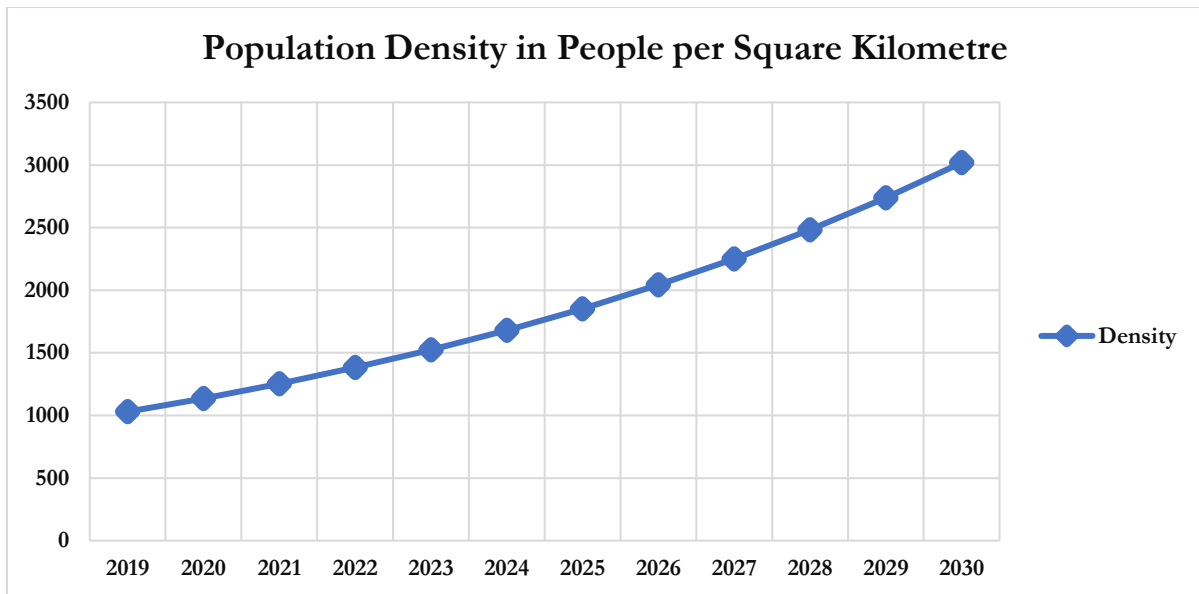


Figure 3-28: Projected Population density

Source: KNBS

High population density has adverse effects in the planning area such as pollution, land fragmentation, agricultural unproductivity, congestion as well as the loss of green and open spaces. Therefore, planning for infrastructure and social amenities should precede development.

3.4.5 Poverty levels

The proportion of Kitengela’s population living below the poverty line stands at 28.3% which is lower compared to the national level which is 45.2% and the county level which 38%.

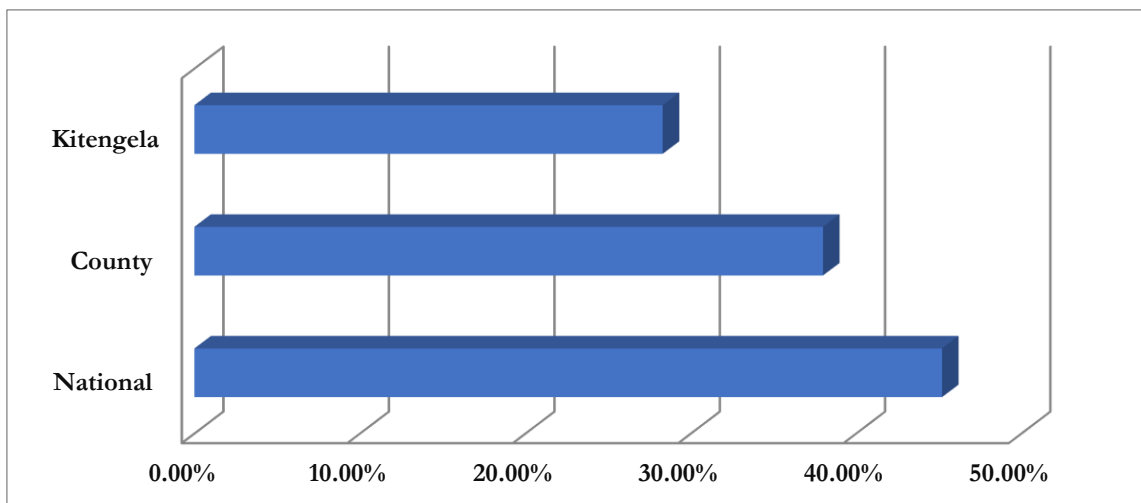


Figure 3-29: Poverty level in Kitengela in the national context.

Source: KNBS

Table 3-7: Challenges and potentials on Population and Demography

Challenges	Potential
<ul style="list-style-type: none"> • Increase in population does not match the provision of social amenities and infrastructure • High unemployment rate amongst the youth • High population density has resulted in land fragmentation. 	<ul style="list-style-type: none"> • High population will provide a large market for goods and services. • Skilled and unskilled labour from the youth. • Increased revenue to the County through economic activities

Source: VisionRI

3.5 Economic Activities

3.5.1 Introduction

Kitengela being mainly a residential hub has attracted various commercial activities to help sustain the needs of the residents. Retail shops, hotels, clubs, banks, and entertainment joints linearly placed along the A104 road from the major CBD.

3.5.2 Local Economy

Kitengela’s economy used to be pegged on livestock and slaughterhouses however this has changed with the rise of the real estate sector.

According to the County’s Inequality Index report, 55 percent of the population is employed while 6.6% are unemployed. The rest of the population are under informal employment either in business or agriculture where else the other is either incapacitated, retired, students or volunteers as shown below.

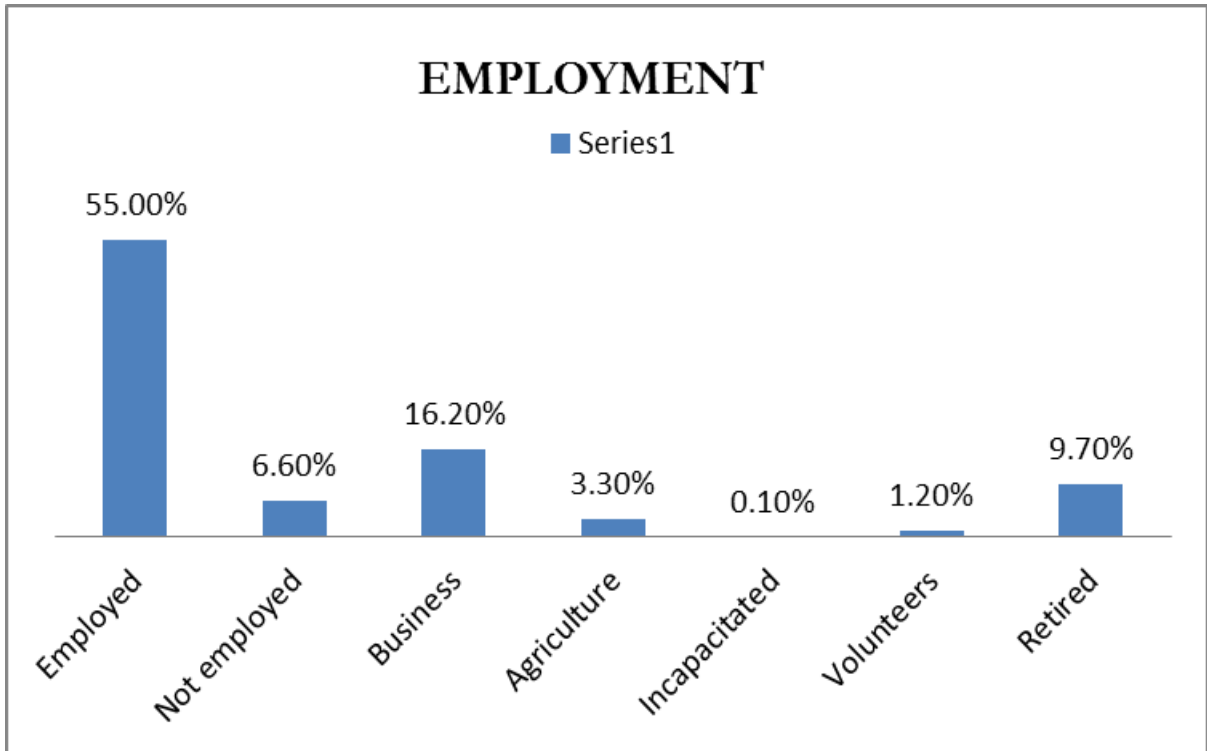


Figure 3-30: Employment in the area

Source: Kajiado County Inequality Index Report

Education plays a key role in employment and hence economic growth in the region. The levels of employment stand high amongst people with education and vice versa. Therefore, a lot of effort should be vested in the education sector.

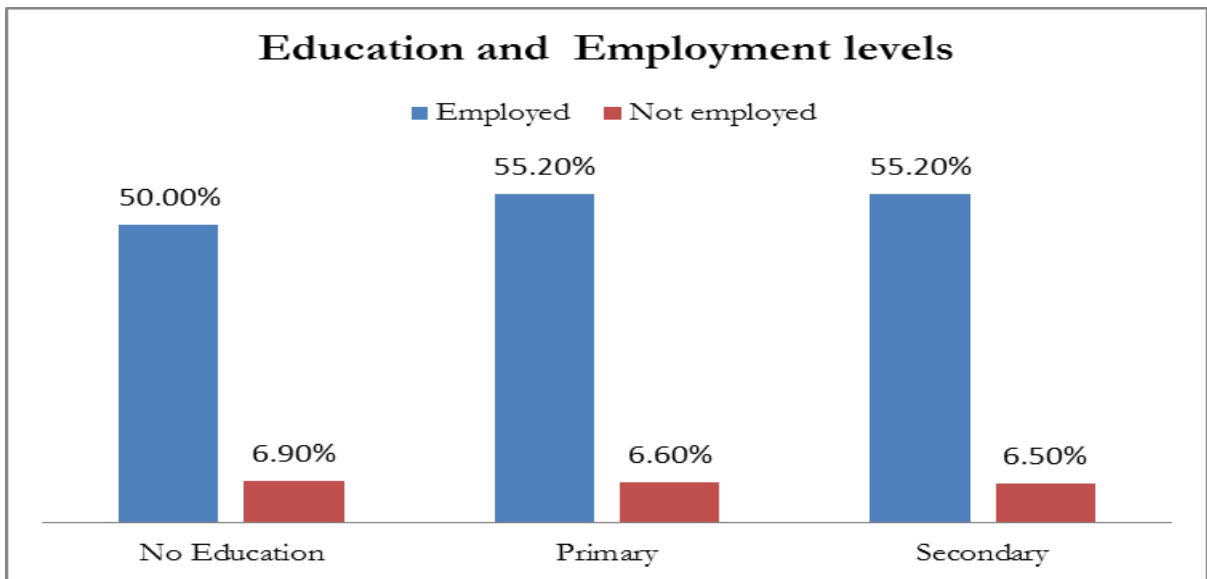


Figure 3-31: Education and employment rate in Kitengela

Source: Kajiado County Inequality Index Report

Residents are employed in the following sectors; service, agriculture, manufacturing, real estate whilst others earn their livelihoods through transportation. The main forms of businesses in Kitengela are discussed below.

Services (Tertiary Sector)

The service sector is the highest source of employment. Commercial activities are the main drivers of the economy in Kitengela being a melting point of cultures and an entry point to Kajiado county. Its prime location with adequate linkages to Nairobi, Namanga, Tanzania, Machakos, Makueni and Ngong make it an ideal place for individuals to sell their wares/ services. This is evidenced by the vibrant open-air markets, malls, eateries along the linear town.

Key Commercial Activities: Current State

Service Sector: General retail businesses, Banking and Jua Kali industry

Real Estate/Residential: Renting out and selling apartments and houses

Agriculture: Horticulture and floriculture

Transport: Motorcycles, taxis matatus and lorry business

Malls and Supermarkets

The retail sector forms a critical element of a town's economic and social welfare. It provides people with choices and services. Malls provide an assortment of products and services. Supermarkets, for example, stock thousands of products allowing customers to choose from a wide variety of brands, designs, colours, prices, etc. at one location. Kitengela has two malls (Kitengela Mall and Tarikiville Mall) and four major supermarkets (Eastmatt, Powerstar, Naivas and Tuskys Chap Chap).



Figure 3-32: Malls in Kitengela

Source: Fieldwork, 2020

Kitengela has also gained popularity because of the many eateries, joints and night clubs in the area. There are at least 23 clubs along the main A104 highway.

Petrol Stations

Having the A104 (Nairobi-Namanga) passing through the town has attracted a total of 17 petrol station along the road and one small petrol station along the deliverance road (access road

connecting the main road to the SGR station that is still under construction). The town, therefore, has a total of 18 petrol station with three yet to start operating.



Figure 3-33: Petrol Stations in Kitengela

Source: Fieldwork, 2020

Jua kali Industry

The Jua kali industry is a major employment provider for artisans in Kitengela. It encourages individuals with hand skills to apply themselves in self-employment. Most Jua kali artisans are not allocated land use spaces for their activities. As a result, they have to make do with space they are able to get which often results in spaces that are inaccessible during rainy season due to poor roads and flooding.



Figure 3-34: Jua Kali area

Source: Field work, 2020.

Banks

The economy of the planning area is facilitated by the presence of financial institutions such as Kenya Commercial Bank (KCB), Equity, Barclays, Family, Standard Chartered Bank and Saccos which provide loan facilities to the service sector as well as banking services. Kitengela has 14 banks and 5 microfinance banks. Kitengela is well served in terms of banking services and since banks are indicators of savings, the municipality has the potential to grow.

Agriculture

The area is mainly semi-arid with small pockets of arable land. The rainfall is unevenly distributed and highly variable with shallow soils. Unreliable rainfall poses challenges to crop farming. However, due to the availability of fertile land as well as the presence of boreholes in Kitengela, agriculture is an important economic activity. Farming in Kitengela is done at large and subsistence scales. People engage in irrigation-based farming, particularly horticulture and floriculture. Horticulture crops like tomatoes, onions, cabbage, spinach and a number of fruits are grown around the town and sold in the local market. Other agricultural activities practised in the planning area include poultry farming and dairy cattle rearing.

Open-Air Markets

Kitengela market has historically been the magnet for vibrant commercial activity. Produce is a source from neighbouring regions such as fruits from Makueni and maize, cabbage, potatoes and tomatoes from Kimana in Oloitoktok. There is also a market at the EPZ area that serves the residents of that region. The main market is however under construction and a temporary location has been provided behind the main bus park.

The main market which has been under construction has also taken a lot of time to complete with the project seeming to stall. Figure 3-38 below is an image of the site the new market is to be but currently, the area is fenced with an iron sheet and no construction activities are going on.



Figure 3-35: Main market construction site

Source: Fieldwork, 2020.



Figure 3-36: Active markets in Kitengela (Temporary market area & EPZ Area)

Source: Fieldwork, 2020.

Challenges Faced by the Traders

Some of the challenges experienced by traders in the alternative market site where traders have been moved to include the following.

- Poor sanitation in the market in form of washrooms;
- Dumping of solid waste;
- No personnel to clean the market; and
- Lack of water supply.

Livestock

Marketing of significant amount of livestock is mainly through hawking around trading centres. Commercialization and subdivision of land has contributed to the loss of grazing and rearing land thus low livestock production. Kitengela slaughterhouse provides key support to the growth of

the livestock sector. Misallocation of land previously set for livestock holding grounds initially has led to grazing and holding of livestock within road reserves and private properties at times leading to conflicts.

The Slaughter House

Kitengela has one slaughterhouse that is located within the residential development. It was established in 1972 by a private developer. It is a category B slaughterhouse and is approximately 2 acres. The slaughterhouse was the initial development in the area, over time as Kitengela grew it caught up with the area resulting in the slaughterhouse being isolated within a residential neighbourhood.

The facility doubles as an auctioneering market for livestock and deals with cattle, goats and sheep. Eighty per cent of the livestock slaughtered in this facility are sourced directly from pastoralists in Kajiado County. The remaining 20% are source from Bissil, Masii, Dagoretti, Kathonzweni and Eldoret.

The blood waste from the slaughterhouse is treated using Eco trait a drug that helps reduce the smell. Manure from the slaughterhouse is donated to the prisons while the wastewater is directed to lagoons and exhausted twice a month. The hide and skin are sold to Alfa Rama industrial park in Athi River. The facility pays annual rates of Ksh 25,000. After slaughtering, the animals' meat is checked by two government veterinary officers and then sold to butcheries.



Figure 3-37: Kitengela Slaughterhouse waste management

Source: Fieldwork, 2020.

Real estate/residential business

The comparative advantage of the planning area holds is the availability of vast cheap land that can be exploited for real estate development.

Real estate is another major driver of the economy in Kitengela. Low density gated community estates are on the rise. Along the main road, estates such as New World Gardens, Royal Fitness estates, and Riverine estates form the character of the area. These are estates arising from comprehensive development schemes and master planning. The challenge, however, is that the development schemes mostly fail to provide for all the requisite facilities to support the developments. Moreover, when provided some of the facility spaces provided later undergo a change of use to other uses leaving social facilities lacking in these estates.



Figure 3-38: Upcoming estates in Kitengela

Source: Fieldwork, 2020

Most of the land in Kitengela is privately owned with ownership documents. Furthermore, land in Kitengela is relatively cheaper than Nairobi and building materials are easily accessible within the area. Accordingly, this has positively contributed to the boom in the real estate sector industry in the area. This creates employment opportunities for the local residents and a major revenue contributor.

However due to speculations in land prices, currently there is an oversupply of housing in the real estate with the assumptions that in future the land prices will escalate. This, however, seems to be a looming crisis in the future with over surplus housing units with no occupancy due to exorbitant prices.

Transportation

Kitengela is dominated by transportation businesses too. There are about 1,340 registered motorbikes used in the transport of people and small goods from one part of the planning area to another. There are also several matatus and taxis that transport people from one place to another. Lorries, on the other hand, are normally used in the transportation of heavy commodities especially construction materials and stock products.



Figure 3-39: Various transport modes in Kitengela

Source: Fieldwork, 2020.

3.5.3 Revenue generation

The revenue generated in the financial year 2017/2018 in Kitengela was Kshs 64,608,000.

3.5.4 Economic Catalysts

Key identified economic catalysts in the planning area are:

- **Comparatively cheaper land:** The availability for relatively cheap land in Kitengela town and its outskirts attracts. The land is affordable compared to other areas thus favouring influx of construction activities, businesses, people and economic growth.
- **High Population growth rate:** High population growth rate will enhance demand for industrial and agricultural products, residential space, and services, thus creating market opportunities for goods and services.
- **Strategic location:** The planning area's proximity to Nairobi will be instrumental in its economic growth. In addition, its location close to the Jomo Kenyatta International Airport (JKIA) airport and standard gauge railway (SGR) station in Syokimau which are important transport nodes.
- **Existence of key industries:** Key industries like EPZ, Kitengela Glass Factory, Savannah and East African Portland cement industries spur economic growth in the region through the provision of employment to the residents and revenue generation to the county.

3.5.5 Economic Planks

The Spatial Concept Plan for NMR expects Kitengela to function as a small town having “linkages with immediate rural hinterlands.” In this context, Kitengela should develop better services and facilities in terms of education, health, communications and infrastructure, which may be utilised by the rural population in surrounding areas. The factors discussed below have been identified as the key economic planks in Kitengela, to be strategically planned and supported to enhance its future economic growth and sustainability.

- **Lower Land Prices and Rents:** Proximity to Nairobi city has been and will continue to be instrumental in the growth of the real estate sector in Kitengela. Availability of land at comparatively lower prices provides a key comparative advantage to Kitengela in its development as a residential hub.
- **Availability of natural resources:** Availability of building materials like gypsum and iron sheets (from local companies), stones from nearby quarries and cheap skilled labour are also driving the real estate industry in the area.
- **Locational Advantage:** Besides, of course, gaining immensely from the location of the planning area to the capital city, Kitengela's real estate growth is expected to benefit from its proximity to the Konza Techno City, which is just a few kilometres away. Many universities have pitched a tent in the area to capitalise on the growing population. Huge demand for rental accommodation for staff and students has caused investment in residential houses.
- **Accessibility and connectivity:** Kitengela has rail access, it being just the next station to Athi River town and is also accessible through the Athi River-Mombasa corridor. It is thus

linked to Mombasa port, Nairobi airport and thus to the rest of the NMR. Kitengela is expected to receive huge spill-over benefits of the growth of export-oriented industries in Athi River; the activities that cannot afford or do not need to be based in Athi River directly would shift to Kitengela.

- **Support Services:** Banks in the town too are fuelling growth through loans that allow people to investment. Most banks and Sacco’s are now offering longer, ten-year repayment period, thus attracting more borrowers.
- **Tourism:** Located close to Nairobi, Kitengela is already a popular weekend destination for visitors from Nairobi and beyond. The existing fame and popularity of the glassblowing industry and the ostrich farms, as well as a potential for ecotourism form a platform for development as a tourist hub.

3.5.6 Cooperative societies and SMEs

The cooperative movement is the bedrock of the Kenyan economy. In Kitengela, by the time of preparing this Plan there were 11 active cooperatives operating in the transport and housing sectors. These are shown in the table below.

Table 3-8: Cooperative Societies in Kitengela

Type of Cooperative	Number	Status
Transport	9	Active
Housing	1	Active
Motorcycle Business	1	Active
Total	11	

Source: VisionRI

The main cooperative societies are found within the transport industry and market areas. As a huge percentage of the population are from outside the area, there is a diversity of people cultures and businesses. A number of private firms and businesses have no cooperative societies as they are mostly new to the area with no familiarity with each other hence opting to venture into business alone. In the transport industry, there are several cooperative societies varying from the different modes of transport such as bus, matatu, tuk-tuk and motorcycle.

- **Bus transport societies:** Cooperative societies in the bus transport sector vary as determinants for this sector include the routes the buses cover in the business. Buses en-route from Kitengela-Nairobi has several cooperative communities such as Rembo Shuttle, Nakam Sacco, Timisa Sacco, Kimma Sacco, Wamasaa investment, Embassava amongst others. All the bus cooperative societies total to 11 Sacco. Embassava cooperative society for example has 30 buses that operate the Kitengela to Nairobi route.

Some of the challenges that the bus Saccos experience in their transport business include high rates on the road as they have to make payments to the three counties they traverse at times to the tune of 13,000 shillings per vehicle per week and an annual Machakos fee of 1,250 shillings. Cartels are also notorious in extorting bus operators where a toll fee is charged upon entry through Mlolongo.

- **Matatu cooperative societies:** Matatu cooperative societies in Kitengela also vary with the routes the Matatu take. The routes vary from Namanga- Kitengela-Nairobi to

Kitengela-Nairobi and even Mombasa-Namanga- Kitengela- Nairobi. Contributions to the Sacco's depends on the Sacco and route in which the Matatu covers. Sacco members own on average two Matatus.

Matatus covering long distances for example Namanga- Kitengela are only allowed to make a single trip a day with short distance matatus going for up to 6 trips as long as the daily target is reached. Other matatu cooperative societies include Wamasaa, Kimma, Naekana Sacco, Super coach Sacco, Eleven amongst others

The main challenges they experience is that the matatu drivers plying long distances are prone to accidents during late hours as there is no street lighting beyond Kitengela town on Mombasa road and Namanga road lack street lighting altogether.

- **Tuk tuk cooperative societies:** All the tuk tuks in Kitengela town belong to Kitengela Tuk tuk Management in which smaller cooperative Sacco's are in. There are 350 tuk tuks in Kitengela.
- **Motorcycle cooperative societies:** There are only two motorcycle cooperative societies in Kitengela and that is Kitengela Sacco and Kitengela Bodaboda Riders (K.B.R).
- **Market cooperative societies:** Kitengela Market located just beside the bus terminus has a cooperative society that a majority of the sellers belong to. Market cooperative societies in Kitengela is only Kitengela Market Sacco.

3.6 Land and Land Use

The land has diverse meanings and perceptions amongst different communities. It is these that remain central in shaping man and land relations in these societies. A disruption of the relations thus triggers new realities such as emerging new tenure relations. In addition, land should be appreciated as more than a commodity. It is further viewed as a capital asset and regarded as a source of identity (See Kenyatta, 1937). This section of the plan report presents issues related to land administration and management against a background of rapid urbanisation fuelled by social, environmental, economic, political and technological transformations. Key amongst the factors is rural-urban migration, declining agricultural productivity and climate change amongst others.

Kajiado County has experienced significant land-use changes. The case of Kitengela is even more pronounced. Like Kiambu County, that has seen land use changing from agriculture due to poor returns, Kajiado has since the early 1980s attracted migrant population from different parts of the country. At the same time, fundamental changes have been taking place – particularly with respect economic activities, land ownership practices and adoption of new ideas. These coupled with the changing climatic situation as well as environmental changes and challenges. The County was until a few decades back largely grassland with the limited built area.

Several events took place, which triggered rapid land-use changes. These included land policy changes amongst them abandoning of group ranch tenure system due to inherent abuses by the officials, close proximity to an expanding Nairobi, improvement of the road network and later the establishment of Export Processing Zones Authority nearby – all conspired to enhance land-use changes in the area. Thus, changes in land use cover have been as in the table below in the Stony Athi Sub-catchment in which Kitengela falls.

Table 3-9: Land use and land cover changes (LULC) in Stony Athi Sub-catchment

LULC	1984 Area (km) %	1995 Area (km) %	2005 Area (km) %	2017 Area (km) %
Built –up area	0.64	4.1	33.4	59.5
	0.04	0.2	2.0	3.4
Agricultural land	1.04	6.2	3.7	11.6
	0.06	0.4	0.2	0.7
Grassland	1016.4	910.0	1175.5	1250
	58.2	52.1	67.4	71.6
Shrub land	647.7	765.7	486.2	368
	37.1	44.0	28.0	21.1
Mixed forests	44.0	57.5	34.0	23.7
	2.5	3.3	2.0	1.4
Bare land	35.8	2.08	12.6	32.6
	2.1	0.1	0.7	2.0
Total	1,745	1,745	1,745	1,745
	100	100	100	100

Source: Mathenge, et al (2019)

Land-use changes point to a number of issues including - increased population, changes in economic activities and need for the provision of services in Kitengela. This is because there is increased land residential and commercial real estate development in the County and Town.

3.6.1 Forms of land ownership and changing land sizes

There are various forms of land ownership in the area that include freehold, private leasehold, communal land ownership and public land. Previously, land ownership in Kitengela was communal in form of group ranches. Kitengela was one of the first areas in Maasai land where group ranches were subdivided into private landholdings. Since subdivision began in the mid to late 1980s, the land has continued to change hands and the process of land subdivision has had considerable implications for land use, distribution and access, with associated impacts on household economies and wildlife. The average amount of land owned by the households surveyed in 2004 was 137 acres, ranging from as low as 2 acres to as high as 870 acres. The average land size for households who acquired land through subdivision was much higher (179 acres) than the land sizes for those who acquired land through inheritance (118 acres) or purchases (28 acres).

The main reasons for selling land includes the desire to invest in other forms of enterprises, acquisition of capital for investment in productive assets or to meet significant household needs. Land sales started just before and proceeded quickly immediately after the group ranch subdivision occurred. Current average land holdings are much lower than the previous average landholdings. Many of the group ranches have subdivided their land to small plots hence loss of communal land ownership.

Currently, land ownership in Kitengela is mainly freehold. Most of the landowners have title deeds to their land. Government trust land is found in mainly in Noonkopir. The owners are issued with temporary letters of allotment and pay an annual fee of one thousand five hundred shillings.

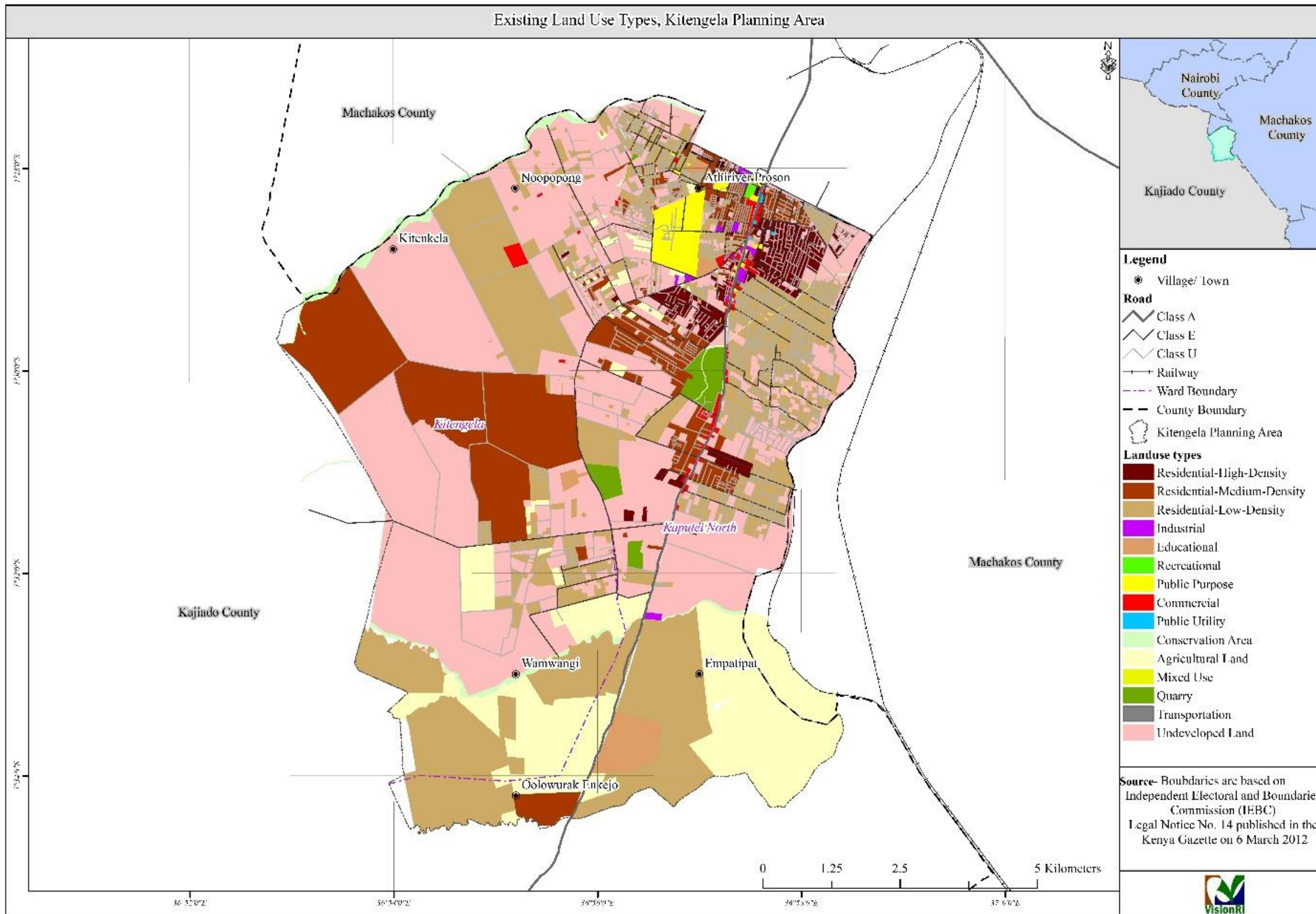
The county government of Kajiado has come up with stringent measures to curb inefficient land subdivisions through the land subdivision guidelines. This provision will deter land degradation, haphazard development, and sprawl of the residential buildings into agricultural lands and promote densification at the CBD. Table 3-11 and Map 3-16 shows the current land use patterns.

3.6.2 Land Use Pattern

Table 3-10: Existing land uses and their location

Land Use	Land Use Zone	Minimum Land Subdivision	Location
Residential	01-Low density residential housing	0.2 ha	G.K Prison, Mohammed Estate, old Namanga Rd, Acacia road
			Mohammed Estate
	02-05-Medium density Residential housing	0.1ha	Shooting Range Estate
			Sifa Farm B
			Chuna, Safaricom, Utumishi, Selelo, New Valley B, Upper Valley B, Kiang'ombe A, and Kimmerland Estates
			Noonkopir Estate
	06-09-High-Density Residential Housing	0.1ha	Kiang'ombe C
			Kiang'ombe B
			New valley A
			Upper valley A
Quarry			
Industrial		0.4 ha	11 - Near Mohammed Estate bordered by River Athi.
			12 - EPZ Area
Recreational	31 & 32		Near Quarry and Borders by class (A104) road
			32 – Borders Mohammed Estate and Milimani B
Public Purpose	41		Bordered by G. O. K prisons and Noonkopir estate
Commercial	51-54	0.05ha	51 - C. B. D area
			Jua kali estate
			52–Borders Mohammed Estate, Milimani B and the proposed ring road joining old Namanga Rd
			53-Borders by Acacia Rd and Nairobi- Namanga road within Sifa Farm
			54-Borders Nairobi-Namanga Rd, Selelo and Kimmerland Estates
Public Utilities	61 - 65		61-G. K Prison Area
			62-Borders Athi and Parkview estate
			63-Near the EPZ area
			64-On the I.S.K pillar near the commercial boundary within Sifa Farm B.

Land Use	Land Use Zone	Minimum Land Subdivision	Location
			65-Near the proposed recreation park 31
Agricultural	91	2ha	Sifa Farm C-defined by Acacia Rd, Kisaju River, Namanga Rd, and the commercial boundary



Map 3-16: Land Use

Source: VisionRI

3.6.3 Land Administration and Management

Land administration and management, in other words, is the process of managing land use and development. The processes may include registration of rights (ownership, mortgage, easements and wayleaves, etc.) and related transactions such as subdivisions amongst others. As encompassing terms, they include land valuation, taxation, planning and control amongst others.

An efficient land administration and management system ensures ease in land transactions hence enhancing the security of tenure and supporting land taxation and valuation. Land administration and management in Kenya are undertaken at two levels; at National level and County level. The key actors in land administration and management at the National level and County level are provided in the table below:

Table 3-11: Land Administration and Management Actors

	Key Actors	Roles	Guiding Legislation
National Government	National Land Commission	<ul style="list-style-type: none"> • Amongst other functions of the National Land Commission, the main ones are: • Manage public land on behalf of the National and County Governments. • Monitor and have oversight responsibilities over land use planning in the country. • Alienate public land 	<ul style="list-style-type: none"> • Kenya Constitution 2010 Article 67 • National Land Commission Act of 2012
	National Director of Physical Planning	<ul style="list-style-type: none"> • According to the Physical and Land Use Planning Act 2019, the Director has the following functions: • Advise government on strategic physical and land use planning matters • Formulate policies, guidelines and standards • Capacity building and technical support on county planning staff. 	<ul style="list-style-type: none"> • Physical and Land Use Planning Act of 2019
	Director of Survey	<ul style="list-style-type: none"> • Establish and maintain a national geodetic control network to facilitate other surveys and research. • Produce and maintain plans of property boundaries in support of land registration. • Produce and continuously update national topographical basic maps. 	<ul style="list-style-type: none"> • Survey Act

	Key Actors	Roles	Guiding Legislation
		<ul style="list-style-type: none"> • Maintain national and international boundaries. • Prepare and publish the National Atlas of Kenya, as documentation of National Heritage and promotion of Nation's identity. 	
	Director of Land Administration	<p>Functions of the office include the following;</p> <ul style="list-style-type: none"> • Establish and manage Land Control Boards, • Process and approve development applications e.g. issuance of consents to charge, lease or transfer, • Process ownership documents such as titles/grants for both public and community • Setting apart land for public use • Custody and maintenance of land records • Document public land and preservation of fragile ecosystems e.g. wetlands and water catchment areas for purposes of conservation. 	<ul style="list-style-type: none"> • Land Act of 2016 • Land Registration Act of 2012
	Principal Land Registrar/Chief Land Registrar	<ul style="list-style-type: none"> • Registers land titles, leases. 	<ul style="list-style-type: none"> • Land Registration Act of 2012; and • Community Land Regulations of 2017.
County Level	County Executive Committee Members of Land	Oversees the entire County Land Management and Administration team.	<ul style="list-style-type: none"> • County Government Act of 2012; • Urban Areas and Cities Act; and • County Government Act, 2012.
	County Director of Physical Planning	<ul style="list-style-type: none"> • Develop sustainable strategies for urban and rural development and management. • Formulate, implement and review various policies in the Department • Promote and facilitate the development of decent housing 	

	Key Actors	Roles	Guiding Legislation
		<ul style="list-style-type: none"> To achieve timely delivery of planning decisions on private sector and community development initiatives. 	
	County Director of Survey	<ul style="list-style-type: none"> Carry out a survey on public land. Develop a Geographic Information System and Land Information System database for spatial data management; and Provide efficient land and property management for effective county land documentation and land taxation. 	<ul style="list-style-type: none"> County Government Act of 2012; and Survey Act, 1961 (Revised 2012).
	Land Control Board	<ul style="list-style-type: none"> Approve or reject subdivision requests on agricultural land; Approve transactions such as sale, transfer or mortgage of shares in private companies or cooperative societies that own agricultural land; and Issue consent to carry out transactions on majorly agricultural land (freehold land). 	<ul style="list-style-type: none"> Land Control Act Cap 302 (Revised 2017).
Other Key players	Registered Physical Planners	<ul style="list-style-type: none"> Development approval applications to the county; and Advise county on new innovations in the land and planning sector. 	<ul style="list-style-type: none"> Urban Areas and Cities Act, 2011; Physical and Land Use Planning Act, 2019; Physical Planners Registration Act, 1996; Land Act, 2012 (Amended 2016); and Water Act, 2002.

	Key Actors	Roles	Guiding Legislation
	Registered Land Surveyors	<ul style="list-style-type: none"> • Boundary confirmation; • Beaconing of approved subdivision and amalgamation scheme; • Amendment of RIM; and • Preparation of deed plans. 	<ul style="list-style-type: none"> • Survey Act, 1961 (Revised 2012).

3.6.4 Land Supply and Actors in Kitengela

Kitengela has witnessed an influx of real estate's companies and cooperative societies in the area as the major actors in land transactions. The land buying companies inevitably play a key role in influencing the land market in the town and its surroundings. The companies and cooperative societies are involved in buying huge tracts of land, subdividing and selling. Quite often, the subdivisions do not conform to any planning guidelines and regulations. In some cases, the subdivision schemes are never submitted for approval to the County Government.

Emerging Issues related to land supply

The issues include:

- Incomplete land subdivision by land buying companies leading to the proliferation of informal settlements;
- Non-adherence to planning guidelines and regulations in land subdivisions; and
- Fraudulent land transactions.

3.6.5 Land Market Dynamics

Kitengela has become an attractive location for real estate developers due to its friendly terrain and relatively cheap land. Land sales in Kitengela started occurring in the 1990s, with owners selling parts of their plots, as well as passing on plots to several inheritors. Over the years, Kitengela has attracted a lot of investment opportunities through Real estate development with over 50 new estates, international schools, medical institutions, industries, and hotels.

Urban sprawl has caused migration in search for cheaper land and a cleaner environment, in an effort to avoid the hustle and bustle of the city. This scenario has had implications on the land market where an acre of land in Kitengela fetches approximately between Kshs.12 Million to Kshs.25Million depending on location. The presence of major firms and parastatals has contributed to fuelling land price. In addition, land buying companies and SACCOs have also led to accelerated land prices by buying large tracts and reselling them in small portions of eighth and quarter acres to potential buyers.

The land prices are related to location, average pasture potential, population density, distance to the nearest permanent water source, distance to the nearest market town, and distance to the nearest primary school are all significant determinants of land price.

The prices of land have, therefore, more than doubled because of the increased interests. Nonetheless, it is apparent that the cost of land in the area has been purely on a speculative basis. Thus, many individuals have several parcels of land lying undeveloped in the hope that they will at one time benefit from a windfall in prices. This has led to land prices appreciating quickly making

the land less accessible. Those who manage to access, however, have to struggle before getting their dream houses after spending a fortune to acquire land.

The table below illustrates the change in land prices over five years (that is between 2013 to 2018). The average appreciation is somewhere between 5 per cent for commercial properties and 20 per cent per annum residential properties. This is due to the increasing demand for residential accommodation as more people migrate to the town in search of priced housing.

Many local Maasai are realising how difficult it can be to keep large herds within a fast-shrinking grazing space, with multiple landowners and increasing mobility restrictions. More and more are investing in plots in the shopping centres, whether developed or undeveloped, with the hope of earning a regular income that is less susceptible to droughts and other periodic shocks.

Table 3-12: Current Land Prices

Land Use	Land Value 2013	Land Value 2018	Appreciation Rate
Residential	8M – 12M	16M – 24M	100%
Commercial (Around Town)	28M – 40M	40M – 55M	40%
Agricultural	4M – 7M	7M – 10M	54%
Industrial	15M – 25M	28M – 35M	58%

Land Administration and Management

Land administration and management services have not yet been decentralised to Kitengela. Therefore, the County is charged with land administration and management issues relating to Kitengela. 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, unfair and prone to abuse, resulting into excessive delays in the administration of land. This has made access to the relevant information necessary in land transactions quite hard.

Key Land Administration and Management Challenges

The land registry at Kajiado is where all land transactions are recorded for the sub county. However, the Registry is still operating on analogue platforms which make access to land information difficult. In addition, there are gaps in existing laws making management and administration of land ineffective and inefficient. These have affected smooth land transactions. As a result, below are some of the challenges faced in land administration in the Kitengela:

- Poor coordination, communication and overlapping mandate between different actors leading to delays and frustration of those seeking the services. Once an application is submitted, it is normally subjected to a number of stops/departments, which leads to unnecessary delays as some of the officials do not act immediately on such applications;

- The existing land register is still analogue. This makes it difficult to access information related to land and monitor land transactions;
- Land Control Boards play a critical role in land administration and management yet it lacks professional and technical representative well versed on matters relating to land use planning and standards requirements;
- Lengthy process of amalgamation, subdivision; change of user etc., leading to many people avoiding the process resulting into unplanned development;
- Poor governance creates a negative attitude to delivering services in the sector and opening up avenues for misinformation in the public domain, with brokers taking advantage of the gaps;
- Misunderstanding of the mandate of the Land Control Board by the public – for example, once a party obtains consent to subdivide land, they do not proceed to the County planning department to land use planning approvals. This leads to uncontrolled subdivision of land, land use conflicts and loss of revenue;
- Incomplete land subdivision by land buying companies leading to proliferation of informal settlements;
- Rate charging on agricultural land as caused a lot of resentment from the public;
- Land use planning has been a preserve of urban areas, hence negating rural and agricultural land resulting into subdivision and land uses, which lead loss of vital agricultural, forest and land uses.
- Land prices are increasing very high rates for instance, residential property appreciated at an average of 20 per cent per annum making it difficult for the poor to access land;

These issues need to address to improve land sector, planning and development in Kitengela

3.7 Urban Design

3.7.1 Urban Morphology

The subdivision of the Kitengela Group Ranch into private landholdings was originally intended to intensify and commercialise livestock production. Thereafter, land sales rapidly occurred which resulted in the urbanisation of the area and the significant increase of its resident population. Urban development was further boosted by the building of the Standard Gauge Railway and improvements to Namanga Road. Thus, the area where, only 15 years ago, residents were previously dependent on livestock and slaughterhouses and where wildlife freely roamed the land was quickly transformed into a bustling dormitory town with the booming construction industry. The rapid market-driven growth is the key reason why there is no clear rational pattern of urban growth in Kitengela beyond the ribbon-type developments along the Nairobi-Namanga Road.

Kitengela's urban structure is strongly ribbon-type following the Nairobi-Namanga Road with a marked increase in densities in the CBD. A leap-frogging and haphazard pattern of development may be observed outside the CBD. These developments are mostly gated residential communities many of which are not serviced by good roads as well as water supply, drainage and sewerage systems.

It is notable that most of the areas outside the CBD are still vastly open and un-utilised. The urban form of the CBD is most related to a grid-pattern although many of the roads are disjointed. The streetscape in the CBD is generally disorganised due to the inadequacy of pedestrian sidewalks, street furniture (such as barriers) and parking areas. Bad road conditions at the interior of the CBD further contributes to the disorganisation of the streetscape.

Buildings in the CBD are built in a compact manner. There is a mixture of a single storey to mid-rise developments. There is no distinct architectural theme amongst the buildings and structures in the CBD.

Noonkopir Township is the old town in Kitengela before developments came in full swing along the Nairobi-Namanga Road. It has its own Primary School and shopping centre. Mainly accessed through the Kitengela Prisons Road/Kitengela-Noonkopir Road and the Kitengela-Ongata Rongai Road, the old town is also structured along the grid road network model and structures are mostly single storey residences.

Prospects for Urban Design Improvements

Key strategies to improve Kitengela's urban design character include the following:

- **Upgrade the CBD and secondary node:** The quality of the urban environment and liveability of the CBD should be upgraded to sustain its socio-economic vibrancy. Key interventions will include hard approaches such as upgrading road pavements to all-weather types, clearing of encroachments along road reserves, construction and landscaping of pedestrian sidewalks, installation of street lights and street furniture, as well as provision of adequate physical infrastructures such as water supply, sewerage, drainage, and solid waste management systems. Improvements to the bus park and the public market will also contribute to upgrading the quality of CBD's urban environment.
- Noonkopir should also be upgraded with an orientation to maintaining its quaint residential neighbourhood characteristics. The array of public infrastructure investments proposed for the CBD will be similar but will vary in scale.
- **Minimise roadside friction along major arteries:** Vehicular movement along major arteries that are intended for "through town traffic," such as Nairobi Namanga Road and others that will be proposed by this plan, should be kept flowing. The construction of service lanes should be considered as well as zonal regulations that regulate the number, location and design of parking spaces.
- **Develop a network of shopping centres:** The wide distribution of gated communities has the potential to make Kitengela a sprawling car-dependent town. This will eventually result in the exacerbation of vehicular traffic conditions due to the necessity to, for example, drive a car to go to the nearest convenience store. What could be done is to use the local concept of having village-level shopping centres to provide for the basic requirements of a certain number of residents. This may, however, pose land availability and acquisition issues and the County Government may seek to pass regulations requiring developers to provide such before they are granted development permissions or allowed to sell to other parties.
- **Require private residential developers to provide basic infrastructure:** An issue that was observed in the planning area is the observation that many gated communities have been subdivided, granted development permission and sold without paved roads, drainage and other infrastructure. The County Government may seek to regulate this by requiring private developers to provide these before development permission is granted or before they are allowed to offer the subdivided properties for sale.

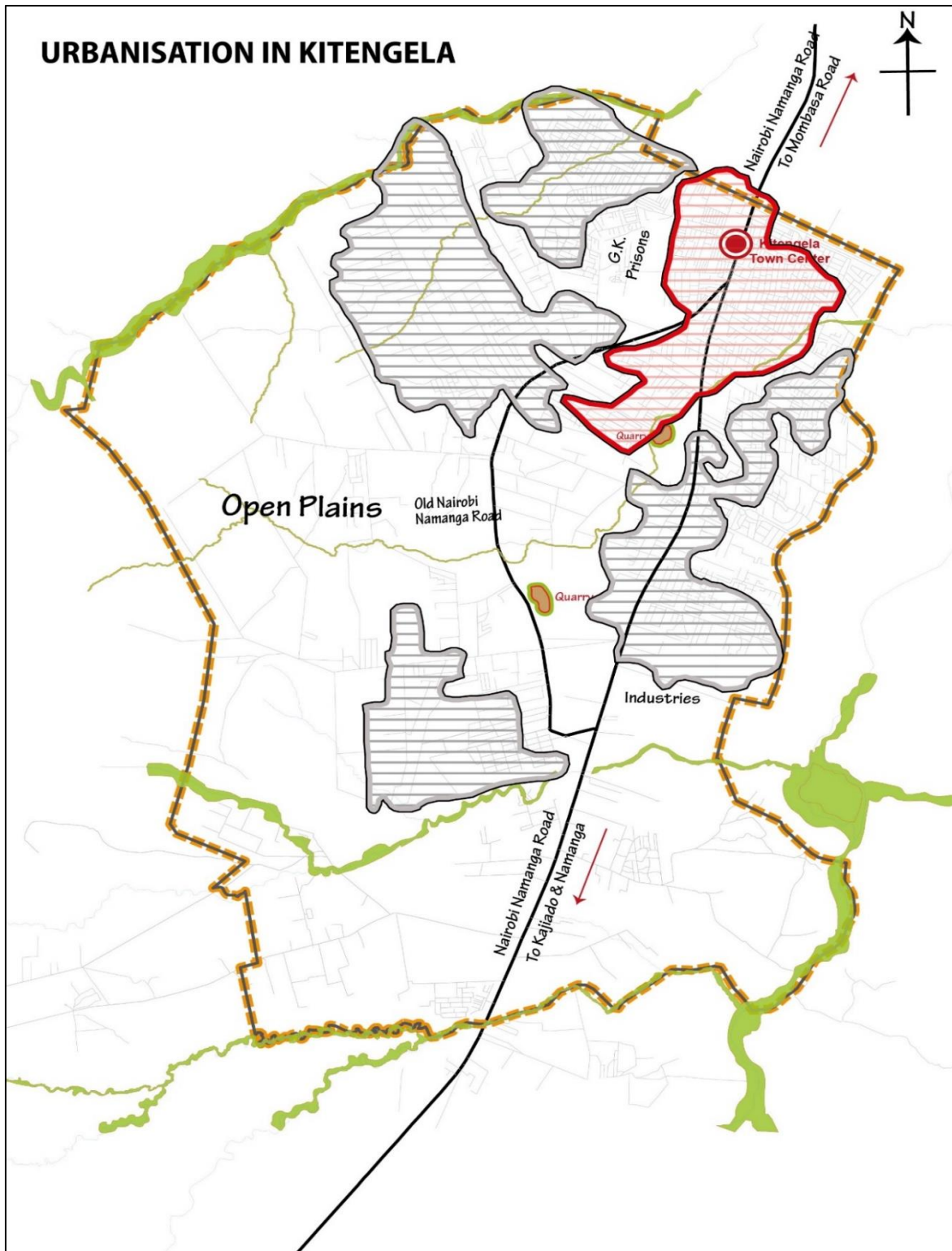


Figure 3-40: Urbanisation trends in Kitengela

Source: VisionRI

Table 3-13:Challenges and Potential in Urban Design

Challenges	Potentials
<ul style="list-style-type: none"> • Lack of distinct architectural designs for buildings • Poor road network and street walkways • Ribbon development along Namanga road • Traffic congestion 	<ul style="list-style-type: none"> • Existing land for development

Source: VisionRI

3.8 Transportation

Transportation goes beyond transportation’s basic purpose of moving goods and people from one place to another. An efficient transportation system attracts development hence improving the quality of life in the planning area. However, if not properly planned for it can lead to haphazard developments. This chapter discusses the components of transportation and the importance of an improved transportation system.

3.8.1 Road Transport

Roads in Kenya are categorised into two: 1) classified and 2) unclassified roads. 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 while the road conditions exist in 3 main types: hard-top surface roads (concrete, bitumen/tarmac); loose pebbles surface roads (gravel/murram); loose/earth surface roads (earth roads).

3.8.2 Network and modal split

Transport services in the planning area are mainly road-based, with the A104 international road serving as the main artery through the CBD. Traffic grid jams are experienced along the A104 road because it serves both transit and local access purposes. This reduces the effectiveness of road transport. There is no road hierarchy while the existing roads are interlocked and have been formed haphazardly hence inhibiting interconnectivity within the area.



Figure 3-41: Poor Condition of Market Road & Congestion on Namanga Road

Source: Field survey, 2015

Road surface types in Kitengela include Bitumen, gravel and paved. Road A104 is the only bitumen standard road in the area. Most of the roads are constructed to gravel standards. Paved roads are very few in the area.

Table 3-14: Road Surface Types

Surface Types	Number of Roads	Length in Km	NMT Volumes	MT Volumes
Bitumen	1	5.5	1,824	11,739
Gravel	8	16.68	10,419	36,037
Paved	1	1.7	722	912

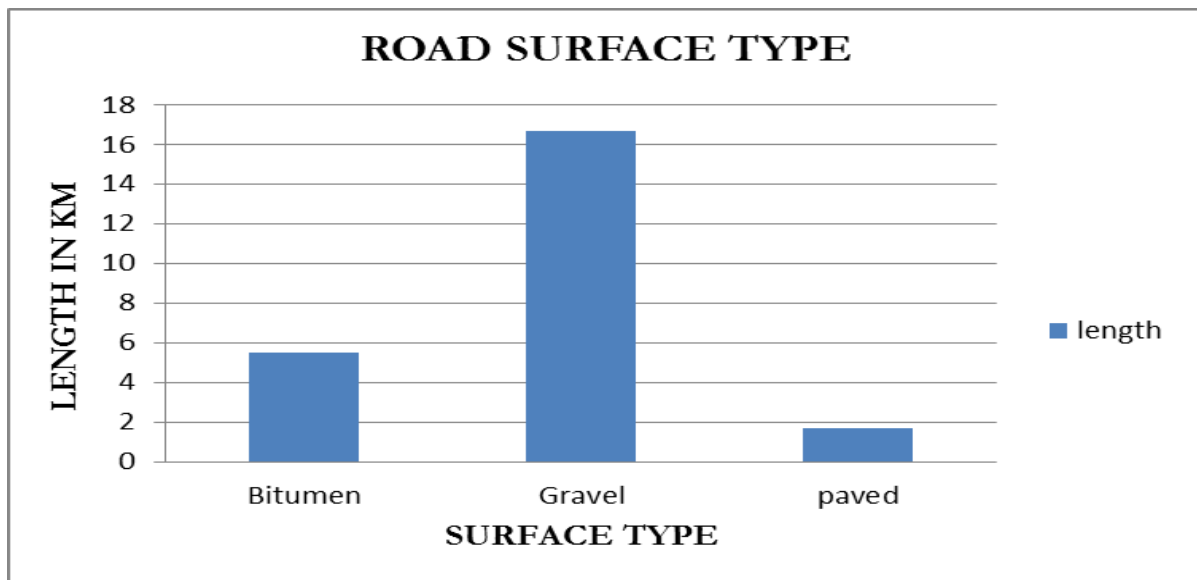


Figure 3-42: Road surface types in Kitengela

Source: Traffic Survey 2019

Most of the roads are in poor condition as shown in the table below and this hampers mobility and interconnectivity. Nairobi Namanga road is the only road in good condition.

Table 3-15: Road condition

Condition	Number of roads	Length in km
Good	1	5.5
Fair	3	3.7
Poor	5	11.28
Very poor	1	3.4

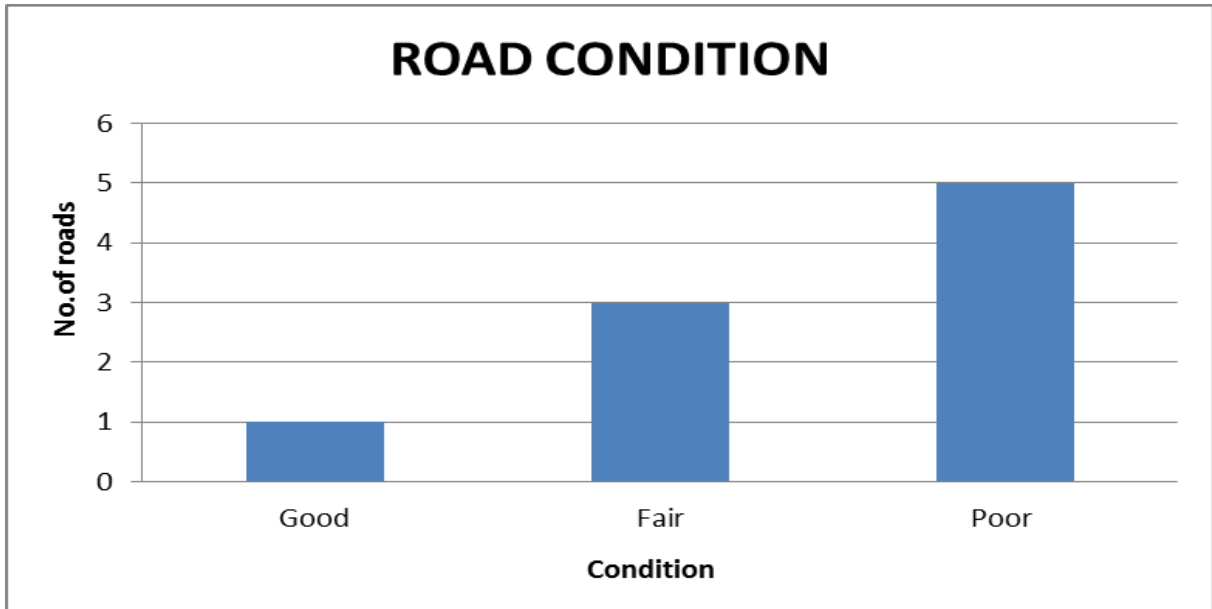


Figure 3-43: Road condition in the area

Time taken to travel is high whereas accessibility and movement becomes problematic during the rainy seasons due to poor road condition



Figure 3-44: Poor roads in Milimani

Source: Fieldwork, 2020

Public Transport

Public transport service is available and adequate in the form of matatus and buses. The intermediate public transport includes; Boda-boda, taxis, tuk-tuk and bicycles. The public transport vehicles operate under SACCOs.

Taxis, rickshaws and motorcycle taxis ply all roads in Kitengela Town. There are more than 120 rickshaws in Kitengela however, they are a major cause of congestion and conflicts in the Town since they lack designated terminus.



Figure 3-45: Motorcycle Taxis & Rickshaws

Source: Field survey, 2015

Major types of movements take place within the area. They are national, intra-regional, intra town, intra CBD.

Presently the types of movements share the same transport links resulting in road use conflicts, congestion and lack of safety.

Parking

Both on-street and off-street parking are common along the A104 road. The shopping malls and supermarkets along the road have got their own parking spaces. Other vehicles, rickshaws and motorcycle taxis park along the service lanes and footpaths.

There are about 216 parking spaces along the A104 service lanes. However, these are inadequate to handle the current parking demand in Kitengela town. From the traffic survey, the utilisation percentage is above 100% between 1.00 pm and 6.30 pm. The maximum utilisation percentage is 226%. This could be attributed to double parking as well as parking in undesignated areas.

NMT Facilities

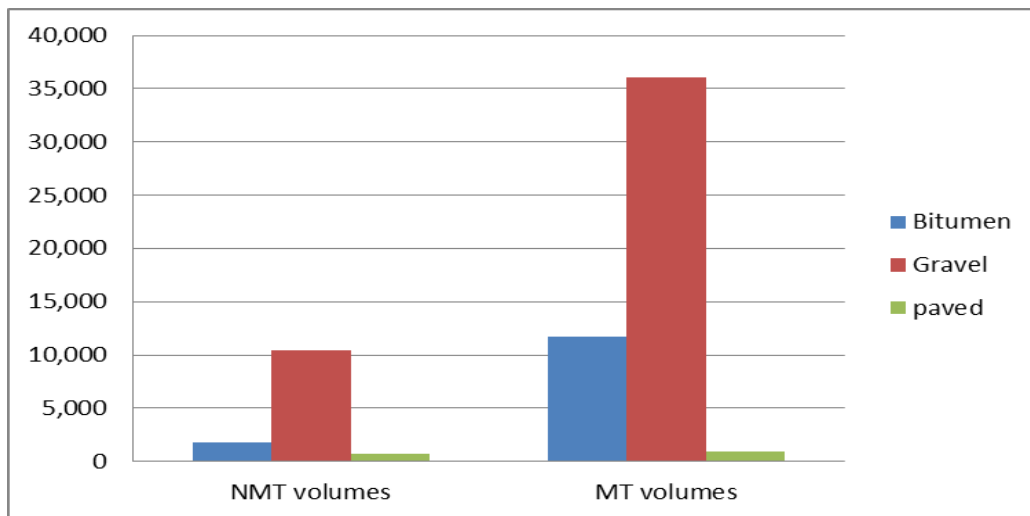


Figure 3-46: NMT volumes on the various road surface types

NMT facilities are inadequate as the only NMT facilities present are paved footpaths along A104 road (towards Namanga). Pedestrians and cyclists walk along the roads due to inadequate NMT

facilities. NMT volumes are high at the gravel roads since they are the main access roads. Therefore, they should be graded and fitted with NMT facilities.

Freight Transport

There are many freight vehicles ferrying building materials from the quarries and raw and processed products from the cement factories in the neighbourhood.

Terminal facilities

There is one designated bus park in Kitengela used for through and local traffic. The current bus park was relocated from its former location at the CBD to the outskirts of the CBD. The bus park accommodates buses, mini-buses, tuk-tuks and boda-boda. The bus park needs future expansion due to an increase in the number of vehicles. There are inadequate boda-boda parking bays and as a result the boda-boda's park along the Namanga road and junctions causing traffic congestion.

3.8.1 Rail transport

Railway transport is available in Kitengela on the Nairobi-Mombasa railway line. However, there is no railway station to facilitate rail transport. Rail transport is underutilised although it has the potential to enhance interconnectivity and reduce traffic congestion as well as make transport affordable.

Table 3-16: Challenges and Potentials in Rail Transport

Challenges	Potentials
<ul style="list-style-type: none"> • Most of the roads are in poor condition • Inadequate NMT facilities • Use of Namanga road both for transit and local access creates traffic congestion. 	<ul style="list-style-type: none"> • Existing road network can be upgraded to enhance intra and interconnectivity • Availability of land can be used for the construction of more roads and bus parks • The area can become a transport hub with appropriate transfer terminals • Availability of the railway can enhance transportation.

Source: VisionRI

3.9 Social Infrastructure

3.9.1 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 the socio-economic development of the planning area. Housing is a critical component of any development agenda because it consumes the highest amount of space within urban development 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.

Kitengela 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 Kitengela and work in

Nairobi. Secondly, the presence of major roads connecting Kitengela with other parts of the country such as Mombasa Road and Namanga Road has acted as a pull factor making Kitengela a major transport hub. Subsequently, this has acted as a pull factor as traders converge in the area buying products from as far as Tanzania and selling their wares. This has created job opportunities, therefore, pulling people from all parts of the country and hence the demand for housing. These factors have played a key role in shaping the land use and housing sector in the planning area as they have sky-rocketed the demand.

On the supply side, the main building materials in the area, namely sand and quarry stone, are accessed easily within Kitengela and Machakos. On the other hand, the Kitengela is synonymous with ranches/expansive terrain (though this is changing very fast) and at the same time, the prices of land are relatively cheap compared to other areas within the NMR such as Kiambu. The land-selling companies have been buying the big parcels and subdividing into smaller portions which they sell to potential homeowners. With evidenced high housing demand coupled with ineffective regulations, supply has in most cases created other problems such as poor drainage, sanitation and water shortages.

Kitengela town being within the Nairobi metropolitan has become a major residential hub for the working people in Nairobi CBD and the environs. The town is, therefore, categorised by mainly high- and middle-income residential areas and a smaller percentage of low-income houses which are mainly seen in the flower farms to offer shelter for the workers working in the flower farms, as well as in Kyang'ombe and Noonkopir.

Types of Housing

Kitengela is dominated by modern housing units. There are a variety of housing set-ups from spacious apartments, bungalows, maisonettes, townhouses to single room storey building for low-income earners. There are nonetheless a few pockets of poor-quality housing units made of corrugated iron sheets.

- **Low Income Housing:** Low-income housing in Kitengela is located next to the EPZ. The area has high-rise buildings. Others are sporadic apartments developed further from the existing town centre in the sparsely nucleated area of Noonkopir. The dominant feature of this type of housing is the single rooms and bedsitters. Most houses have not adhered to the building by-laws due to lack of enforcement of building standards.
- **Middle Income Housing:** The middle-income area is found within the zone predominated by saving societies such as Chuna, Safaricom, Utumishi and New valley. The household typology in the zones is generally maisonette and bungalows. The average plot sizes in the middle-income zones in Kitengela are 0.1ha. The residents are served with water from EPZ and use septic tanks as a means of human waste disposal. In some states such as Chuna development is well controlled and developers have their buildings approved by Kajado County. However, in some of the middle-income estates, intensive developments of several houses are taking place without due consideration of utilities to serve the developments.
- **High Income Housing:** High-income residential is located within Milimani A and B areas of the town. This is a high ground suitable for such development. Most of the plot sizes are 0.2ha. However, there is a wave of subdivision into 0.1Ha and even 0.05Ha. The housing typology comprises of maisonette which is well constructed with good aesthetics.

- **Gated community Neighbourhoods/Estates:** Several of them are coming up within Kitengela mainly in Milimani, Chuna, Kapiti as well as some sections of the upper valley.



Figure 3-47: Estates in the planning area

Source: Fieldwork, 2020

The residents within the gated communities are provided with facilities within the estate such as borehole water, garbage collection, education facilities (Riverine has a nursery school) and ample security.

- **Single Dwelling:** Other families/ individuals have bought land and built their homes. This is mainly seen in Chuna, Milimani as well as Kapiti and some sections of Kapiti. The owners have fenced their homes for security and dug boreholes to provide for water since Kitengela does not have piped water supply to homesteads.



Figure 3-48: Single dwelling home in Chuna

Source: Fieldwork, 2020

- **Apartments:** These are seen in the high-density areas of Kitengela town especially around the town, Kyang’ombe, upper valley and Noonkopir. Riverine development which is a gated community estate has also provided for apartments within the estate.



Figure 3-49: Apartments in Kyang'ombe and Riverine area

Source: Fieldwork, 2020

Building Materials and Construction Sub-sector

Housing condition is a key social welfare indicator. Materials used in the construction of the floor, roof and wall materials 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 sub-sector in Kitengela is a booming one due to increased subdivision of the land. This sector supports the local economy. The demand for housing is forecast to be growing owing to the relatively low land prices in the town and neighbouring areas.

Table 3-17: Sources of Selected Building Materials

Material	Source	Remarks
Quarry Stones	Quarries Kajiado East Sub-county	Large amounts in Sub-county
Sand	Kajiado and Machakos	Large deposits in the County
Timber	Western and Central Kenya	Expensive some imported
Steel	Nairobi	25 – 40 Kilometres away
Galvanised Iron Sheet	Local hardware shops	Locally available

Type of Housing by Roofing Walling and floor Materials

The roofing materials used varies across Kitengela. 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.

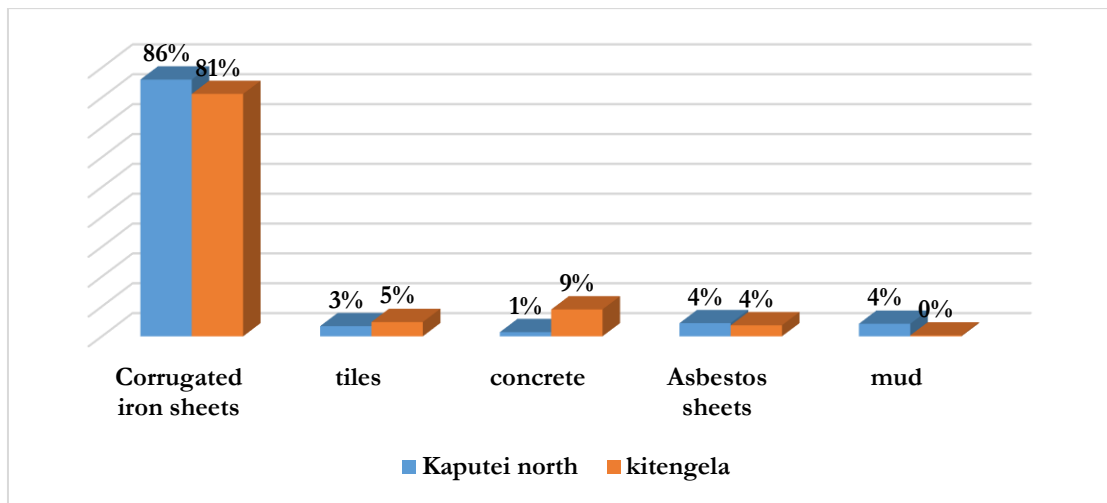


Figure 3-50: Types of roofing materials

Source: Kajiado Inequality Index Report

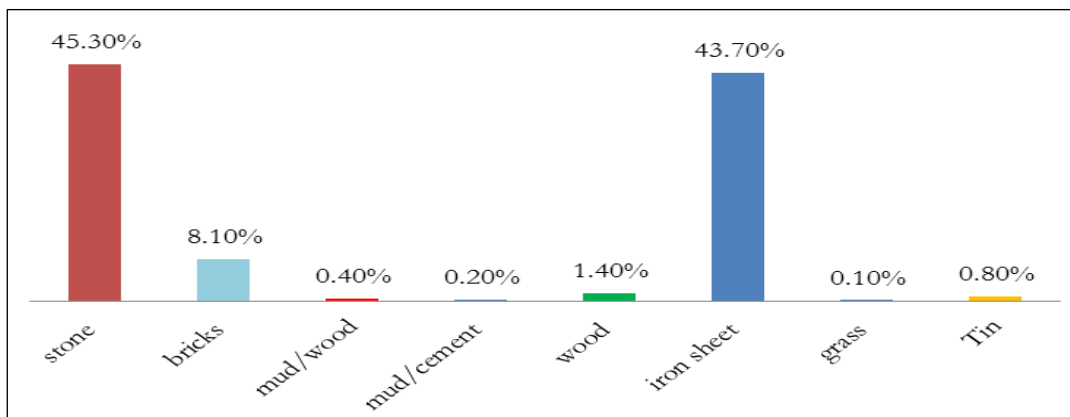


Figure 3-51: Types of wall materials

Source: Kajiado Inequality Index Report

In the low-income areas, walls are mainly made of bricks, wood and corrugated iron sheets. In the rest of the planning area, walls are made of quarry stones. Very few houses are walled with blocks made of sand and cement.

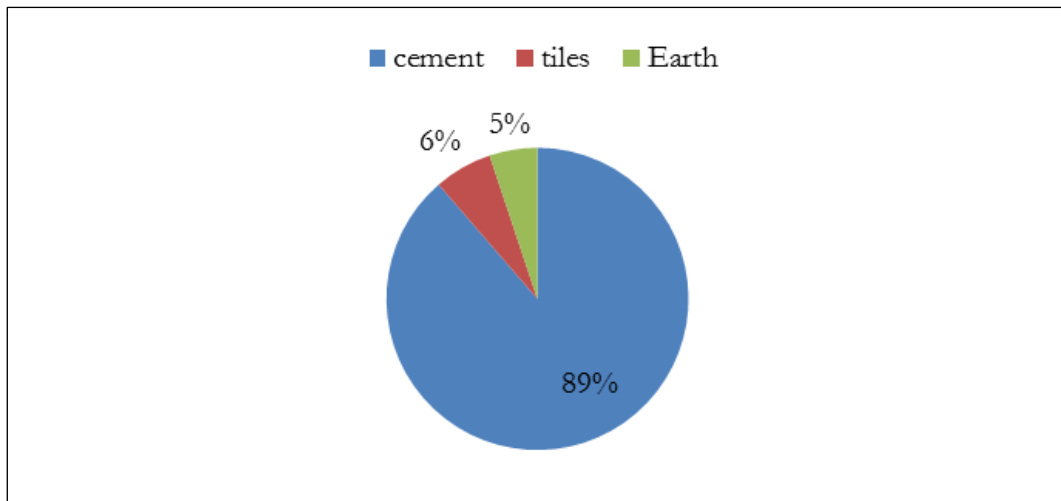


Figure 3-52: Types of roofing materials

Source: Kajiado Inequality Index Report

The most salient point from the charts above is that in every structural feature, the urban households mainly in Kitengela generally have more durable roofs, walls and floors.

- **Housing Tenure:** The housing tenure comprises of owner-occupier and tenant occupier. The tenant occupier is mostly found in the low-income areas while the owner-occupier is within the middle and high-income areas.
- **Housing Stock and Projections:** The housing stock 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. According to the Physical Planning Handbook, the minimum plot area should be determined by the user, type of waste disposal, availability of water and the level of building technology applied. For low density, the minimum lot size is 0.2 Ha, medium density is 0.045 Ha and high density is 0.03 Ha. The plan considers the population distribution by income in Kitengela to be as follows.

Table 3-18: Population Projections according to Income levels in Kitengela

Income Level	Per cent of the population (%)	2019	2020	2022	2024	2026	2028	2030
Low	70	108,103	119,191	144,896	176,145	214,133	260,314	316,454
Middle	25	38,608	42,568	51,748	62,908	76,475	92,968	113,018
High	5	7,722	8,514	10,350	12,582	15,295	18,594	22,604

Housing projection was determined based on an average household unit of five persons.

Table 3-19 Projected number of Household over the planning period

Year	Projected population	Projected number of households
2019	154,433	39,598
2020	170,273	43,660
2022	206,995	53,076
2024	251,636	64,522
2026	305,905	78,437
2028	371,877	95,353
2030	452,077	115,917

Table 3-20: Projected Housing stock in Kitengela according to income levels

Income level	Housing stock projections						
	2019	2020	2022	2024	2026	2028	2030
High	1,980	2,183	2,654	3,226	3,922	4,768	5,796
Middle	9,900	10,915	13,269	16,131	19,609	23,838	28,979
Low	27,719	30,562	37,153	45,165	54,906	66,747	81,142
Totals	39,598	43,660	53,076	64,522	78,437	95,353	115,917

Housing stock projections indicate housing stocks amongst the low-income group will be higher than the other income groups. Consequently, this ISUDP will solve this issue by proposing ways to cater to this high demand. Generally, housing demands for all groups will increase by 2030.

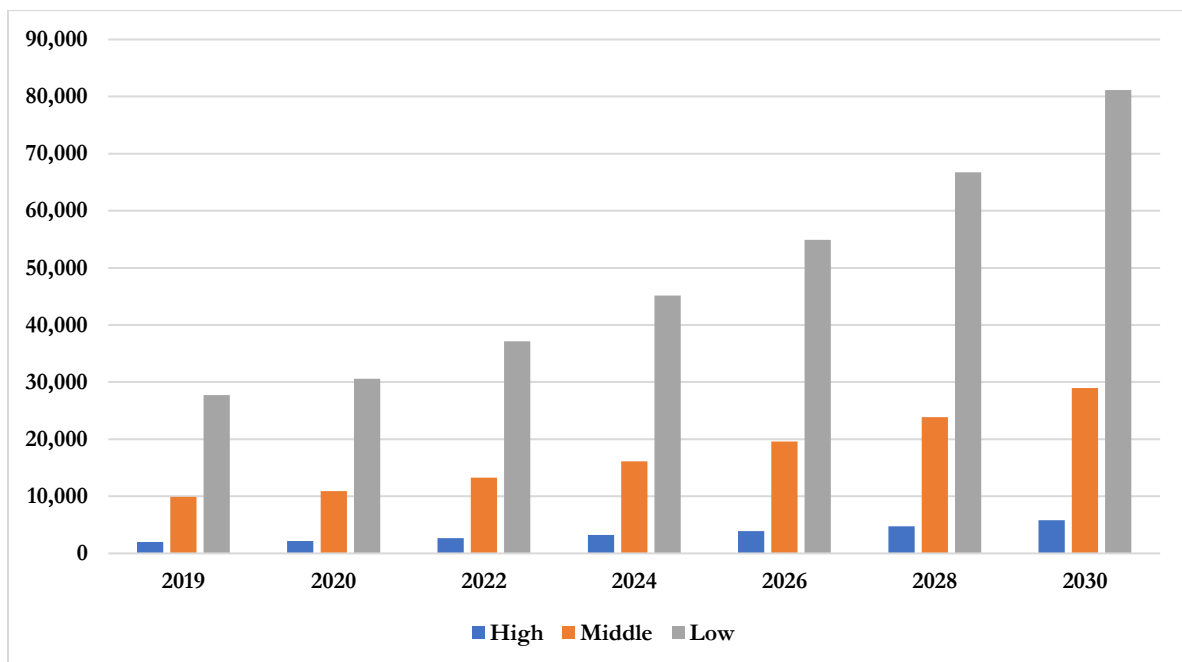


Figure 3-53: Housing projections

Table 3-21: Challenges and Potentials on Housing

Challenges	Potentials
<ul style="list-style-type: none"> • Construction of houses does not adhere to the set regulations i.e. zoning, plot sizes, setbacks, coverage and plot ratios; • Housing designs do not incorporate the needs of physically challenged people; • Layout designs do not complement with the other neighbourhood designs; • Rapid construction of houses without provision of social amenities; and • Construction of houses is relatively expensive due to the nature of the black cotton soils that require creating a strong foundation. 	<ul style="list-style-type: none"> • Abundant supplies of sand and construction stones; and • Availability of land for development.

Source: VisionRI

3.9.2 Education

The Education Policy in Kenya is based on the Constitution of Kenya 2010 which promises access to quality education for all. This is in line with the SDG to ensure that by 2030 all girls and boys acquire free, equitable and quality primary and secondary education. Quality education is an education that works for every child and enables all children to achieve their full potential. The United Nation Children’s Emergency Fund’s (UNICEF) 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, emphasizing links with the community, the influence of pedagogic considerations, cost-effectiveness and sustainability (UNICEF, 2009).

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 an Early Childhood Development Education (ECDE) facility is 300-500 metres and primary school should serve a catchment of the population of 4000 and should be between 500m-2km. Kitengela town is dominated by private primary schools and only two public schools (GK primary School and Noonkopir Primary). Both public and private schools double as ECDEs and primary schools.

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. The 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, emphasizing links with the community, the influence of pedagogic considerations, cost-effectiveness and sustainability (UNICEF, 2009). Safety and environment of an ECDE facility are important because young children are vulnerable to many risks, therefore, the location of the institution and the distance, they cover from their homes to the facility is a key determinant of access. Therefore, 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 metres.

There are three ECDE centres (Noonkopir; GK Athi River and Kitengela boarding) in Kitengela. The distribution of ECDE should be 1: 4000. By 2030, the area will need 19 more 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, therefore, transition from primary to secondary school. There are 3 public primary schools within the planning area. 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 the table below. A single school should occupy at least 3.9ha, it encourages the schools to build a storied building for better efficiency of land.

Table 3-22: Primary School Facilities

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

Source: Physical Planning Handbook

The table below shows the enrolment rates in primary schools.

Table 3-23: Enrolment rates in primary schools

No. of Schools	2015 Enrolment			2018 Enrolment		
	Male	Female	Total	Male	Female	Total
G.K Athi river	544	532	1076	644	654	1298
Kitengela Boarding	154	134	288	173	150	323
Noonkopir	415	401	816	379	389	768
Total	1,113	1,067	2180	1,196	1,193	2389

Source: Kajiado County Education Office

With the government's free primary education programme, the school population and enrolment rates have increased. In 2018, the enrolment rate of pupils was 2389 which is a 9.5% increment from 2180 pupils in 2015. Although there is an increase in the enrolment, it's worth mentioning that Kitengela Boarding primary school had the lowest enrolment compared to the other two schools. This is mainly due to inadequate teaching facilities.

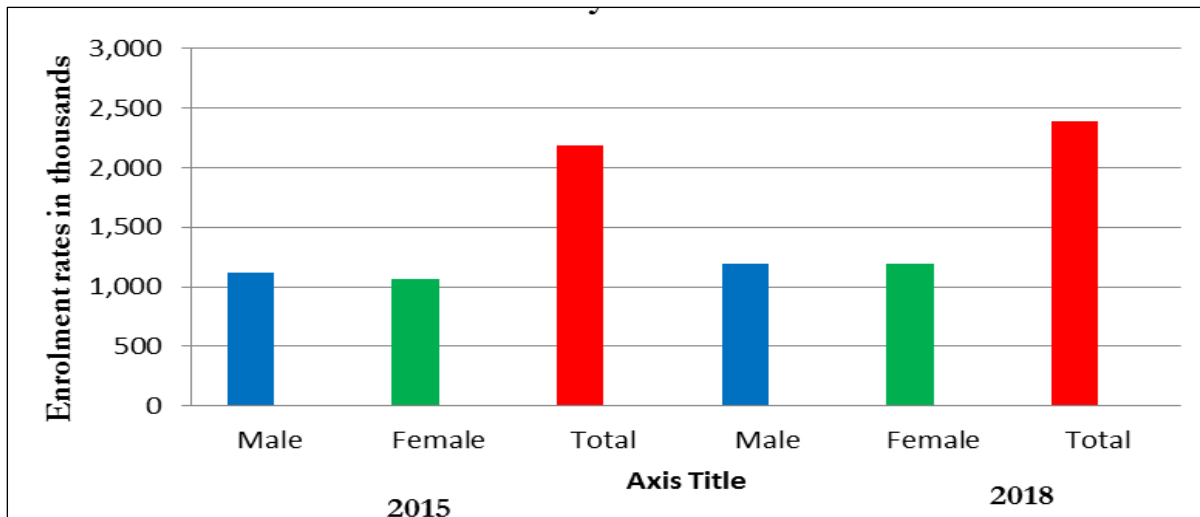


Figure 3-54: Enrolment Rates in primary schools for boys and girls

Source: Kajiado County Education Office

The enrolment rate for the girls is slightly lower than that of the boys by 2% in 2015. However, in 2018, equality has been reached as the percentage of boys and girls is at 50%. Nevertheless, the girl's enrolment rate has increased by 11.8 % from 2015 while that of boys has increased by 7.4%. Therefore, this depicts an increase in the number of girls joining the primary school.

Public schools are located within a minimum range of 500m and hence easily accessible to the students. However, the existing public primary schools are inadequate for the current population of Kitengela. Due to the inadequate number of schools and inadequate teaching facilities in the existing public schools the private sector has emerged strongly to cater for this gap. As a result, a lot of private schools have emerged in the area. Some schools are located in shanties or informal structures compromising the health and safety of students and staff. The reduced minimum plot sizes also deny the students their extracurricular component and satisfaction. It is important to enforce planning standards with respect to education facilities.

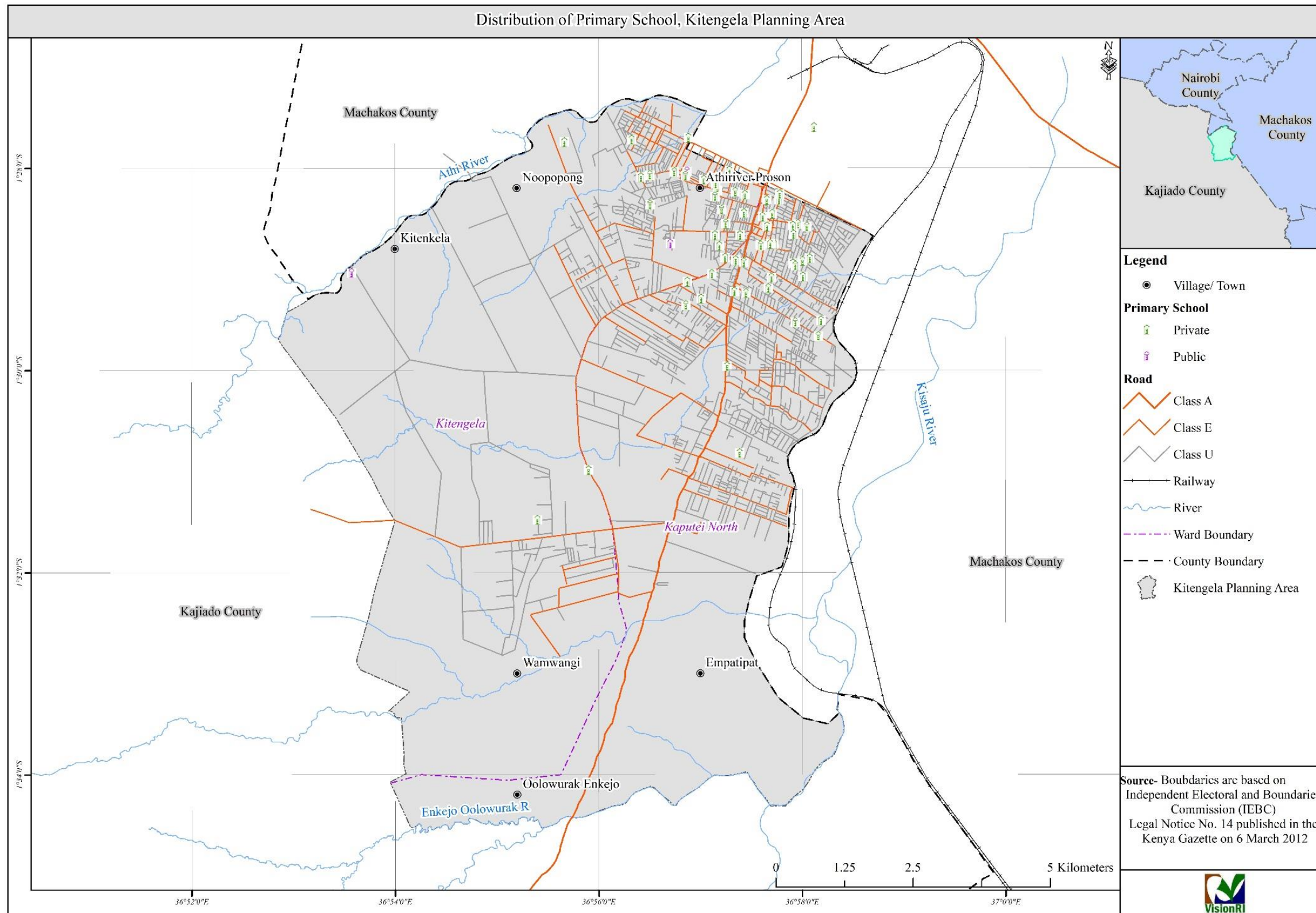


Figure 3-55 Primary Schools coverage

Source: VisionRI

Education Projections for Primary Schools

In 2019, the planning area required about 38 schools (one school per 4000 people) compared to the existing three public schools showing a deficit of 35 schools. This deficit is attended to by the 23 additional private schools in the area.

Figure 3-56: Projected requirements for primary schools

Year	Population Projection	No. of Public Primary Schools Present	No. of Primary Schools Needed	Deficit
2019	154,433	26	39	-13
2020	170,273		43	-17
2022	206,995		52	-26
2024	251,636		63	-37
2026	305,905		76	-50
2028	371,877		93	-67
2030	452,077		113	-87

Source: VisionRI

The area will require over 87 primary schools by 2030. However, this figure can be reduced with additional private investment and a concerted effort between the county and private schools to increase the capacity of the schools. From the analysis above, the southern part of the planning area has a deficit of primary schools according to the physical planning handbook which states that one school should serve a catchment of 4000 people. However, the northern parts have an adequate number of schools with two public and several private primary schools. Though the eastern part of Kaputei North is densely populated, the area lacks public primary school, and this has caused the proliferation of private primary schools to meet the demand



Figure 3-57: Photo showing a private primary school

The graph below depicts an increase in demand for schools over the years.

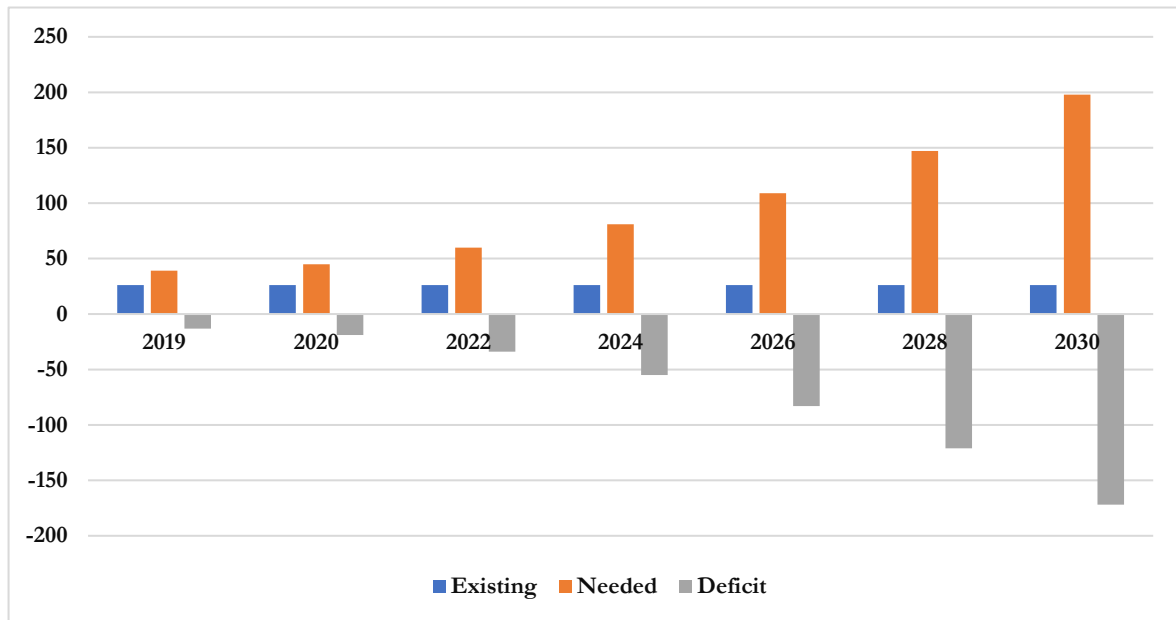


Figure 3-58: Projected number of primary schools

Most private primary schools in the area fail the set standards of a school. The facilities fall short of the requirements as most of them are not constructed on at least 3.9ha. Such schools would require to develop storied structures for capacity while ensuring extracurricular spaces such as playgrounds are adequately provided Discussion with the education officers in Kajiado education office revealed that, there are numerous private primary schools in the county but few are registered with the ministry. Monitoring of these unregistered schools is a challenge and this might compromise the quality of education in the area.

Public Secondary Schools

There is only one public secondary school in the planning area i.e. Noonkopir Girls secondary school. This is insufficient for the current population. Furthermore, students have to travel more than the recommended distance (3km) to reach the school. Therefore, residents have to seek education elsewhere mostly in Isinya. Kitengela has one public secondary school (Kitengela Girls High School).



Figure 3-59: Public Secondary School

Source: Fieldwork, 2020

Education Projections for Secondary Schools

Though primary education is important for individual welfare, it is nevertheless an insufficient condition for national economic growth and poverty reduction. Government has put emphasis on the transition from primary to secondary. According to the Exploring Kenyan Inequality Report, fifty-two (52%) percent of the population in Kitengela have secondary education and above. In 2019, the town required 19 secondary schools (1:8000 people) compared to the existing two schools showing a deficit of 18 schools. The land requirement for a secondary school is 4.5 ha for a catchment population of 8,000 people according to the physical planning handbook. By 2030 the area will require 33 more secondary schools. Table 3-24 below shows the deficit of secondary schools in Kitengela while Figure 3.61 shows the distribution of public and the coverage of these schools.

Table 3-24: Projected requirements for secondary schools

Year	Population Projection	No. of public secondary schools present	No. of secondary schools needed	Deficit
2019	154,433	2	19	-17
2020	170,273		21	-19
2022	187,738		23	-21
2024	206,994		26	-24
2026	228,226		29	-27
2028	251,635		31	-29
2030	277,445		35	-33

Source: VisionRI

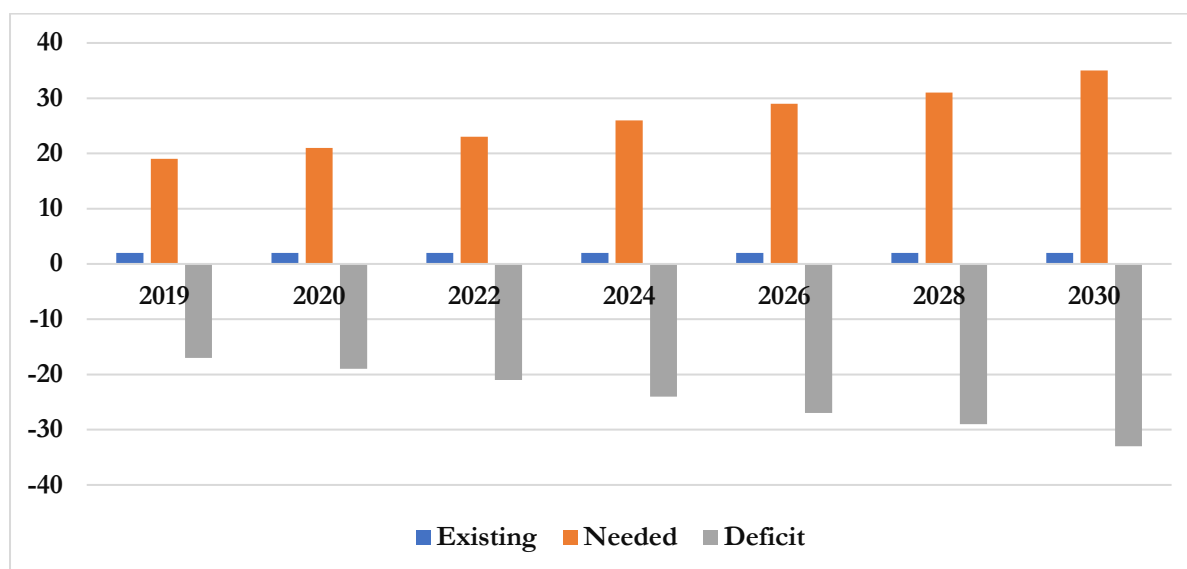
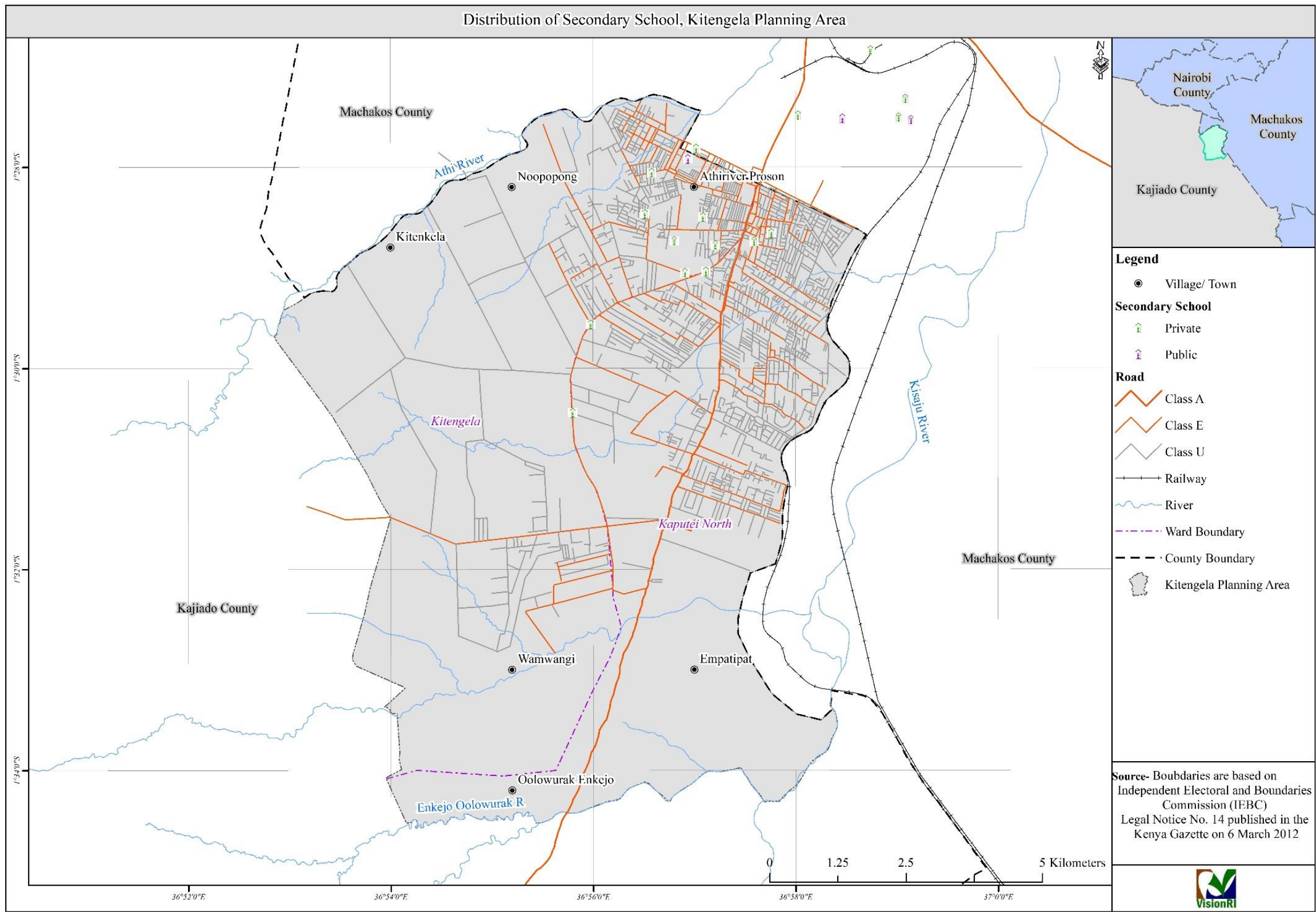


Figure 3-60: Projected Number of secondary schools



Map 3-17: Coverage of Public Secondary Schools in Kitengela

Source: VisionRI

Adult Education Centres

Adult education facilitates provide avenues for those who are not within the formal school set up to reap the fruits of education. Other than improving one's professional qualifications, they aim at achieving civic, social, moral and cultural attitudes as well as skills necessary in order to progress in every sphere of life. For this to be achieved there is a need to have the adult education programmes consciously designed to meet specific learning needs.

There is no adult learning centre within the planning area. This 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 Kitengela. On the other hand, poor neighbourhood such as informal settlements where literacy levels are low due to high school drop-out cases as a result of factors such as early pregnancies and inability to pay for education, adult learning can bring the much-needed solutions for basic education. There is, therefore, a need to plan for adult learning institution within the planning area.

Universities and Colleges

There is no public university in the area. However, there are two private universities (KCA Campus and East African University) which serve not only the residents of Kitengela but also the entire country.



Figure 3-61: East African University along Nairobi- Namanga road.

Source: Fieldwork, 2020

Technical and Vocational education training (TVET) institutes

The Kenya TVET Policy, which has a target of gross enrolment rate of 30% by the year 2030, places emphasis on enhancing access to Tertiary Education. This might not be achieved in Kitengela because the only existing public TVET that serves the area is located in Isinya. The other vocational institutes in the area are privately owned. Evidently, many young people who clear their secondary education and are unable to join colleges and universities end up in the informal sector.

Special needs schools

There are no special schools in the planning area. However, some private schools, such as Kitengela International School have integrated special needs curriculum and accommodate students with special needs.

3.9.3 Health

Most of the hospitals in Kitengela are located along the main road A104. This is since most of the access roads in Kitengela are in very poor condition apart from the Nairobi-Namanga road (A104). Therefore, the hospitals are distributed within Kapiti, Noonkopir, Kaputei and a few in Kyang'ombe.

It is 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. Key to these standards is the requirement for a hierarchy of health facilities of level 2, 3 and 4 in a sub-county in order to facilitate referrals. 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 to achieve. By 2019 there was a need for 500 skilled professionals in the planning area

There is a total of 23 hospitals/medical clinics within the planning area of which two are public hospitals both within Noonkopir: Kitengela sub-county public hospital and the Athi River GK prisons Dispensary. The other 21 are private hospitals, with one, Top care Nursing Home, being a nursing home.

Table 3-25: Health facilities in Kitengela

Facility type	Provider	No of facilities	Level
Medical clinics	Private	23	2
Dispensaries	Ministry of Health	1	2
Basic primary health care	Private	6	3
Basic primary health care	Non-governmental Organisation	1	3
Primary care facilities	Ministry of Health	1	4
Primary care facilities	Private	1	4

Source: VisionRI 2020

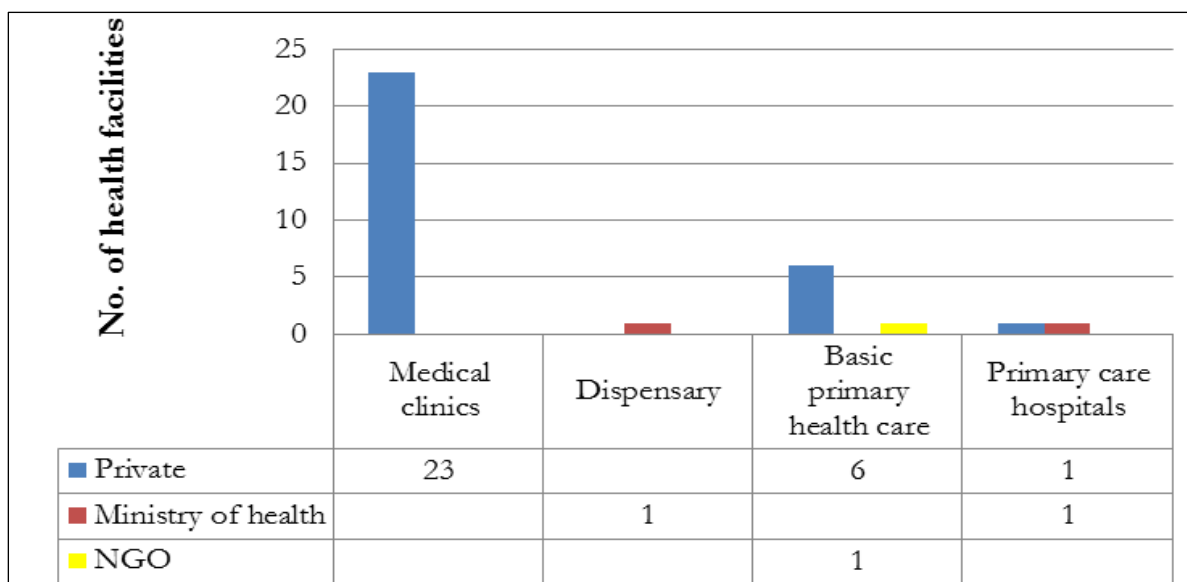


Figure 3-62: Types of Health Facilities

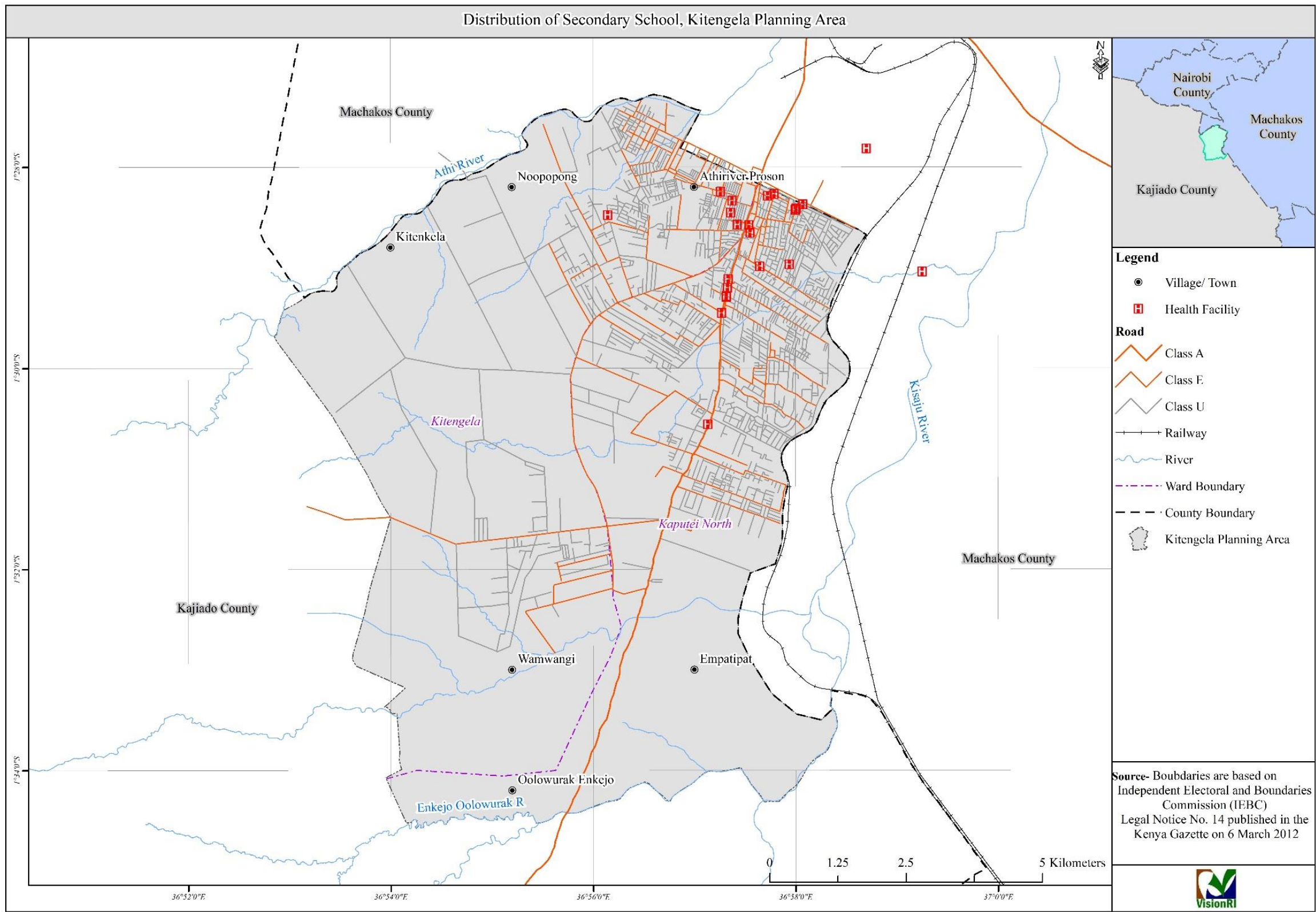
Source: Kajiado County Health Offices

Two of the private hospitals, namely, Blessed Medical centre in Kapiti and Kitengela West Hospitals, are accredited by NHIF. The health facilities are distributed as follows:

Area	Hospital
Kapiti	<ul style="list-style-type: none"> • Kitengela Medical Services • Scanlab Kitengela • CHANF Community and Family Health Services • Blessed Medical Centre Kitengela • Kitengela Baraka centre • FHOK Family care medical centre Kitengela
Noorkopir	<ul style="list-style-type: none"> • Topcare Nursing Home • Kitengela Sub County public hospital • Prison Hospital • Hopecare Medical centre • Maasai Medical Centre
Kaputiei	<ul style="list-style-type: none"> • St. Paul’s Hospital • Kitengela Pona Hospital • Nairobi Women’s Hospital • Gertrude children’s Hospital • Kitengela west hospital • Le Maiyan Hospital • AAR Health Care Kitengela Clinic • Karen Hospital Kitengela • Aghakan University Hospital • 10. Adora Children’s Clinic.
Korompoi area	<ul style="list-style-type: none"> • Halisi Family Hospital
Kyang’ombe	<ul style="list-style-type: none"> • Batian medical centre.

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 planning area is presented in a map below.



Map 3-18: Distribution of health facilities in Kitengela

Source: VisionRI

According to the map above, there are two public health facilities in the planning area i.e. Kitengela sub-county hospital and Athi river GK Prisons dispensary. According to The Kenya Health Policy, 2014 – 2030, the facilities are inadequate especially in the southern parts of Kaputei North. The deficient 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 as shown in the figure below.

This plan proposes for additional public health facility to be located in the southern part of Kaputei North.

Health provision is dominated by the private sector. All the medical clinics and the six basic primary health care facilities are provided by private owners. Access to public health facilities is limited due to the availability of only one level 2 dispensary which caters for the whole population of Kitengela. In addition, the dispensary lacks the required facilities for effective health provision. As a result, access to public health care is problematic. Consequently, people have to access public health care from Kajiado or Athi-River or go to the private hospitals which are expensive ill-equipped and at times run by unqualified health officials.

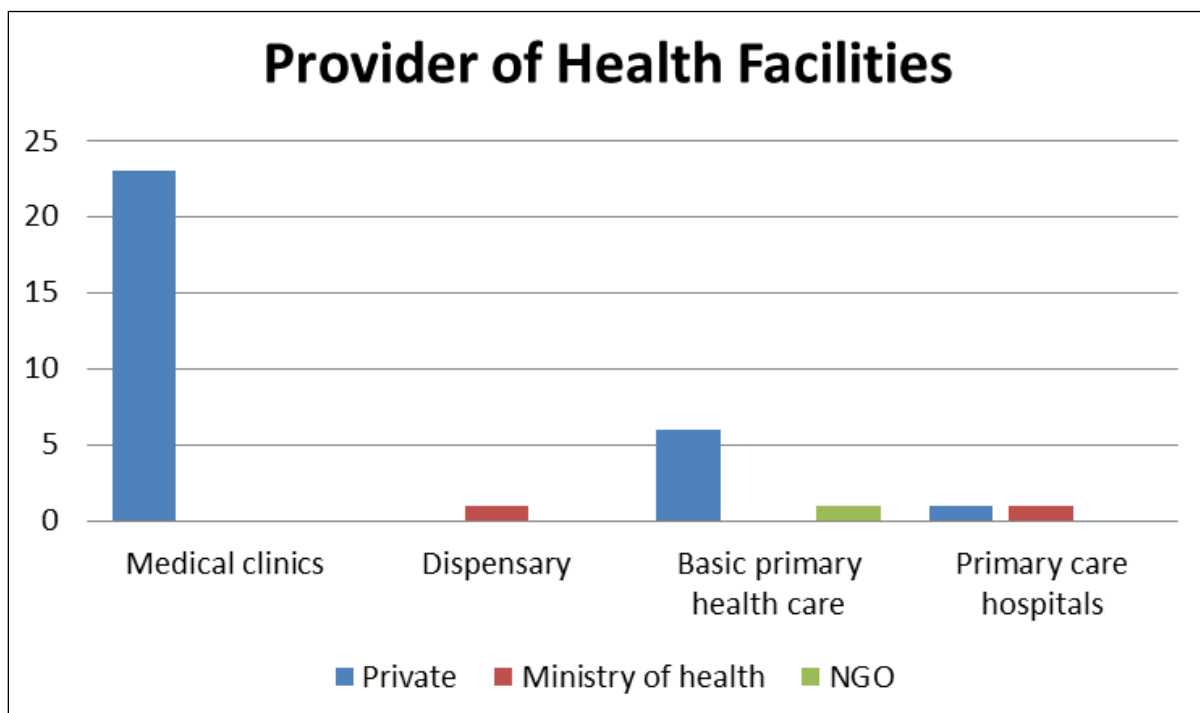


Figure 3-63: Provider of health facilities

Health Personnel

Specifically, at 2009 population level of 154433 WHO standards demand that the planning area would have 531 professional health workers (at 34.5 professionals per 10,000 people)

Projections for health centres

Planning standards prescribe one health centre and one county hospital for every 20 000 and 50 000 persons in the population, respectively. The minimum land acreage for a health centre ought to be 3ha, referral hospitals should be allocated 20 hectares while county and sub-county hospitals should be allocated 8 ha and 4ha, respectively.

Table 3-26: Projected number of health centres

Year	Population Projection	No. of Health Centres Present	No. of Health Centres Needed	Deficit	Acreage Requirement
2019	154,433	9	8	1	
2020	170,273		9	0	
2022	206,995		10	-1	3
2024	251,636		13	-4	12
2026	305,905		15	-6	18
2028	371,877		19	-10	30
2030	452,077		23	-14	42

Kitengela will require 99 health centres by 2030 to cater for the health needs of the population. There is a need to empower different actors- public, private and faith-based organisations to provide health facilities amongst other social infrastructure like schools.

Table 3-27 Projected number of hospitals

Year	Population Projection	No. of Hospitals Present	No. of Health Centres Needed	Deficit	Acreage Requirement
2026	305,905	2	6	-4	16
2028	371,877		7	-5	20
2030	452,077		9	-7	28

3.9.4 Community facilities and services

Fire station

Currently, there isn't a fire station in Kitengela. For every 50,000-100,000 population, there should be one fire station. Therefore, at least two fire stations need to be planned for at present and an additional 3 by 2030.

Social hall and libraries

Kitengela town has no library facilities. The nearest library facilities are located in Nairobi. With the emergence of universities, colleges, primary schools and a relatively young population, it is imperative to have adequate space for library facilities in major residential and commercial zones. According to planning standards, a population of 80,000 persons is supposed to be served by a library. By the end of the planning period, the area should have five libraries.

Sports and Recreation

Sports including athletics and soccer are a major industry and of great interest to the youth in the area. Therefore, facilities for these activities are critical. However, there is no stadium in the planning area as most public lands was reported to have been grabbed and used for private developments. Planning standards recommend a stadium of 8 hectares for 10,000 to 20,000 people. The stadium should have sufficient parking facilities and a football pitch. The stadium could be located in peripheral locations to avoid traffic congestion on residential zones.

Public Parks, Open Spaces and Playgrounds

Open spaces are critical in urban areas to provide air circulation and greenery. While two-thirds of Kitengela Town area remains undeveloped, it is necessary to preserve open spaces and recreation facilities. Open spaces provided initially have been converted to other uses. The only recreation facilities are found in educational institutions which limit accessibility to the general public. Kitengela urgently requires sports grounds, and stadium.

Cemeteries and Burial Grounds

Kitengela is growing into a big cosmopolitan urban settlement. With changing cultural trends in Kenya, more and more people are living in urban areas with little link to their rural areas. However, there is no cemetery or burial ground for public use in Kitengela. Therefore, it is important to provide for cemeteries for the area. Firm and non-porous soils are should be considered when allocating the cemeteries. They should be located away from busy routes and watercourses.

Religious Institutions

Being just off the highway to Mombasa, Kitengela has plenty of religious facilities. They consist of churches and mosques. Churches are distributed in the built area especially along the highway with various denominations being represented. Planning standards recommend 3 churches per 500 residential units. Each church should be 0.2Ha approximately. However, the number of churches has surpassed this requirement.

The town has a total of 4 mosques and several churches. The planning standards recommend that there should be only 3 churches per 500 residential units. This is however not the case since several churches have been developed even close to each other hence so much noise in a particular neighbourhood. Some churches have gone ahead to improvise temporary dwellings such as tents within a residential neighbourhood or a public space as shown below.



Figure 3-64: Church character in Kitengela

Source: Fieldwork, 2020.

Similarly, mosques are often of the different condition such as the Masjid Hakan Mosque in the following image (left) in is within a locality with poor sanitation as well as inaccessible roads. Masjid Ameer mosque, on the other hand, is well designed in an adequately serviced environment



Figure 3-65: Masjid Hakan and Masjid Ameer Mosques

Source: Fieldwork, 2020.

Security

The security situation is relatively good however residents of the high-end estates seek the services security services from private companies to beef up the security. In addition, there is a police post at the Kitengela market set up to provide security to the residents. Streetlights along the Namanga road have immensely helped in eradicating issues.

The table below illustrates the available facilities in the planning area.

Table 3-28: Available security facilities in the planning area

Facility	Number	Location
Police station	1	Along Namanga road
Police post	1	Milimani
		New valley
		Chief's camp
Prison	1	Milimani

Markets

Kitengela has two market centres that sell foodstuff and clothing. Namanga Road transects the planning area creating an important connection between the border town, Namanga and the rest of the country. This has acted as a pull factor for traders who converge in the town to transact.

Table 3-29: Challenges and potentials on Social Infrastructure

Challenges	Potentials
<ul style="list-style-type: none"> • There is no public stadium in the planning area. This may be the result of the area’s close proximity to facilities in Nairobi such as Nyayo National Stadium which is less than 10 kilometres from the boundary of the planning area with Nairobi. • There are no social halls in the planning area for people to use for meetings and indoor games. • There are no designated public parks and playgrounds in the planning area safe for playgrounds in the educational institutions. • There are no public cemeteries and burial grounds in the planning area. 	<ul style="list-style-type: none"> • There is ample private land in large ranches that may be acquired for the required facilities in the planning area. • An increasing number of urban people living in apartments in different parts of the planning area that may require the sports and recreation facilities. • County governments around the country are generally prioritising sports • Existing or acquired public land can be used for burial purposes.

3.10 Physical Infrastructure

3.10.1 Water Supply

Water Resources

The key water resources in the area are:

- Rainwater harvesting;
- Groundwater;
- Running water (rivers); and
- Subsurface water (boreholes).

Water is used for multiple purposes amongst them being domestic, livestock and agriculture. The area faces an acute water shortage due to low and unreliable rainfall, limited permanent water resources and pollution of water sources. Kitengela town has scarce permanent natural sources of surface water with the main one being Athi River. Generally, the severe water shortage in Kitengela is due to lack of surface waters mostly in rivers and streams due to seasonality. Kitengela has very many boreholes constructed mainly through individual initiatives.

Water

Water supply within Kitengela is mainly through borehole, rivers and streams both permanent and seasonal although the area. Within the town, several water supply Lorries could be seen as well as several water points with boreholes selling water. Many developments are seen to have a large water tank that store water of up to 200,000 litres of water. Water supply is a booming business in Kitengela with many lorries seen distributing water to dwellers at a fee. This is an indication of the water shortage problem in the area. Several private companies have also come up to drill boreholes and sell water to the residents such as the Seven-Eleven Water Supply Company that served residents within the upper valley. The cost of the water then varies depending on whether the water is soft (fresh) or hard (salty).

Almost all homes had their own boreholes. In gated communities, the facilitators have provided for a borehole to supply water to the residents within that particular estate.



Figure 3-66: Private water sources in Kitengela

The current natural sources of water in the area, being river Kisaju and Mtomawe seem to be drying up since the water levels have gone down. River Mtomawe in particular has very low amounts of water flow as shown below. However, according to the residents during the rainy seasons, the water volume of the river increases causing flooding within the adjacent homes, which is Upper valley, Balozi and Tropikana.



Figure 3-67: River Kisaju and Mto Mawe

Source: Fieldwork, 2020.

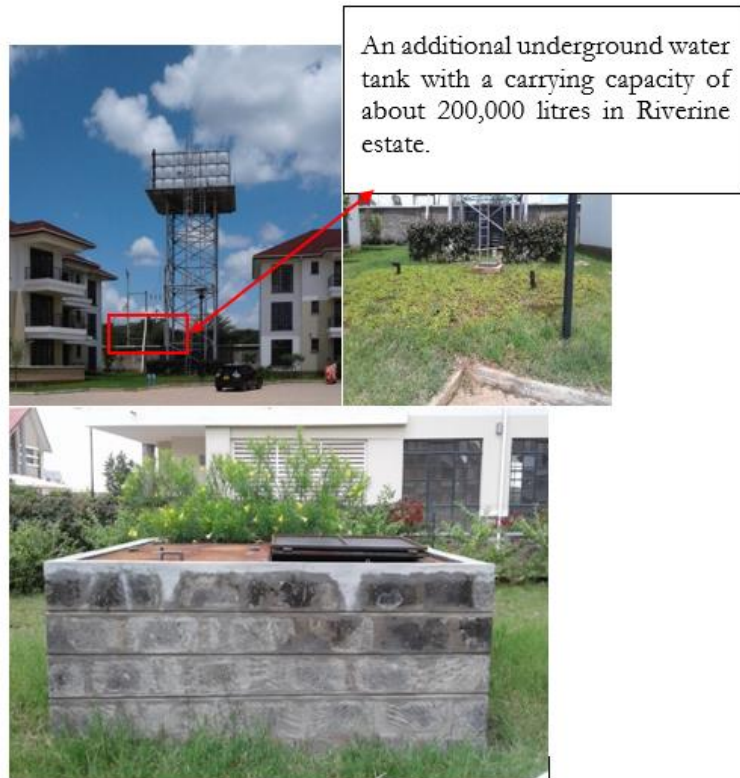


Figure 3-68: Sources of water for Riverine estate.

Source: Fieldwork, 2020.

Kitengela has the highest share of residents in the whole county using improved sources of water at 77%. However, there are several cases of water contamination as a result of an improper liquid waste management system. Flowing sewers from domestic and commercial ventures, pollute underground water system and hence increased cases of water-borne diseases like typhoid and amoeba.

Water demand and supply assessment

Demand for water for a community is dynamic and it changes with time to match a growth pattern of the community. The demand for water for a community is the quantity of water required to meet its needs against the various category of consumptions which are domestic, commercial, industrial and institutional.

The following are the required amount of water for an urban area:

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

The following Table presents the projected water demand.

Table 3-30: Water Demand and Supply

Year	Projection	Current Water Supply	Current water demand	Deficit
2019	154,433	4,000	15,829	-11,829
2020	170,273	4,000	17,453	-13,453
2022	206,995	4,000	21,217	-17,217
2024	251,636	4,000	25,793	-21,793
2026	305,905	4,000	31,355	-27,355
2028	371,877	4,000	38,117	-34,117
2030	452,077	4,000	46,338	-42,338

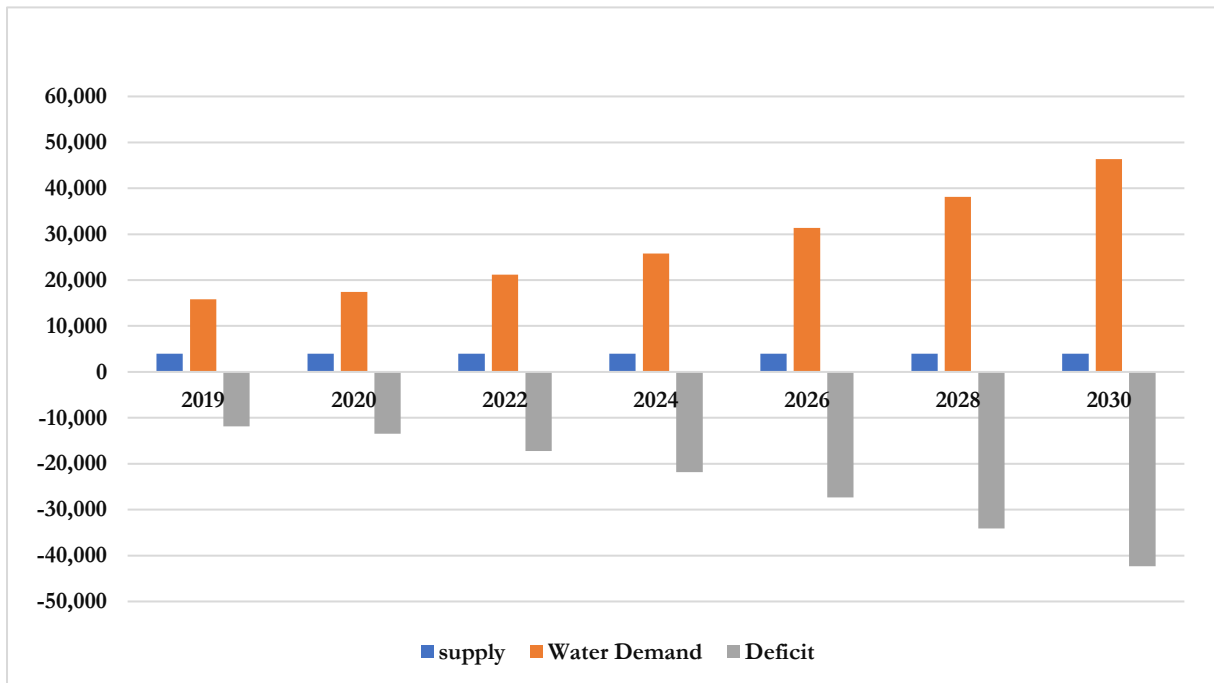


Figure 3-69: Water demand and supply in Kitengela

Most landowners depend on private boreholes for water supply to tenants. However, there is a limit of 800 metres provided in the Water Act 2002 as the minimum distance between any two boreholes. This has deterred development, especially where land has been fragmented into small units.

Kisaju and other seasonal rivers provide great opportunities if they can be harnessed upstream through the construction of water storage facilities. However, the Ministry of Water and Irrigation and its agencies have not tapped the water resources.

3.10.2 Energy Infrastructure

Currently, the County has a variety of energy sources both for domestic, commercial and industrial use. These are gas, diesel, kerosene, charcoal, wood, and electricity. Utilization of the above is according to one's social-economic status. Some of the energy sources are not sustainable like wood and charcoal. However, Kitengela has great potential of tapping into renewable energy such as solar and wind. This is supported by wind speeds in some parts of the County as well as solar irradiation intensity. It is a better alternative to the coal power plant.

Table 3-31: Main Sources of Energy in Kitengela

Cooking	Lighting
Gas	Electricity
Charcoal	Kerosene
Kerosene	Solar Panels

In the planning area, 69.1% of the population is connected to electricity. Therefore, it's the predominant source for lighting. However, solar energy is underutilised in Kitengela considering its high potential.

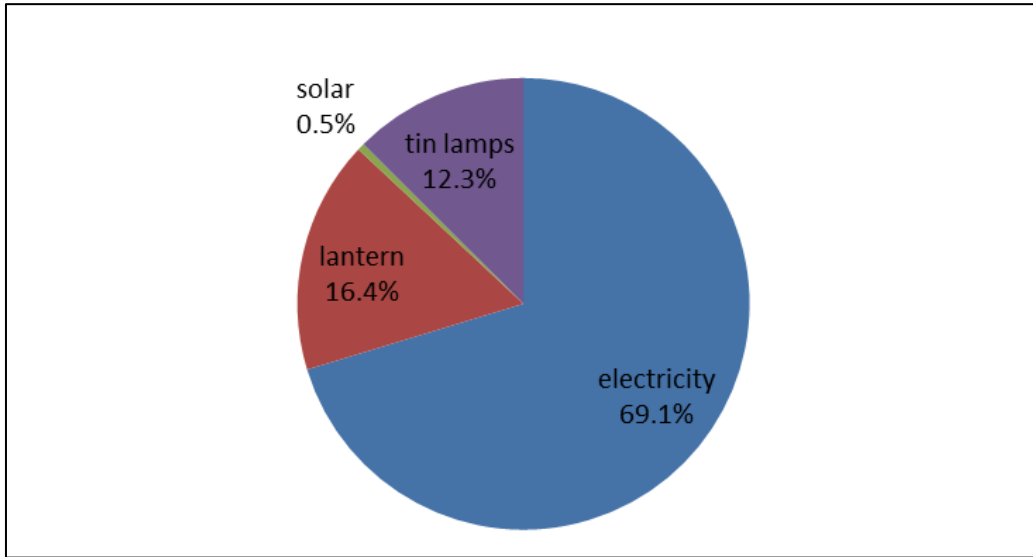


Figure 3-70: Energy sources for lighting

The most prevalent source of cooking fuel is paraffin with 40% followed by charcoal and LPG while the least common of cooking energy is electricity and biogas as shown in the figure below.

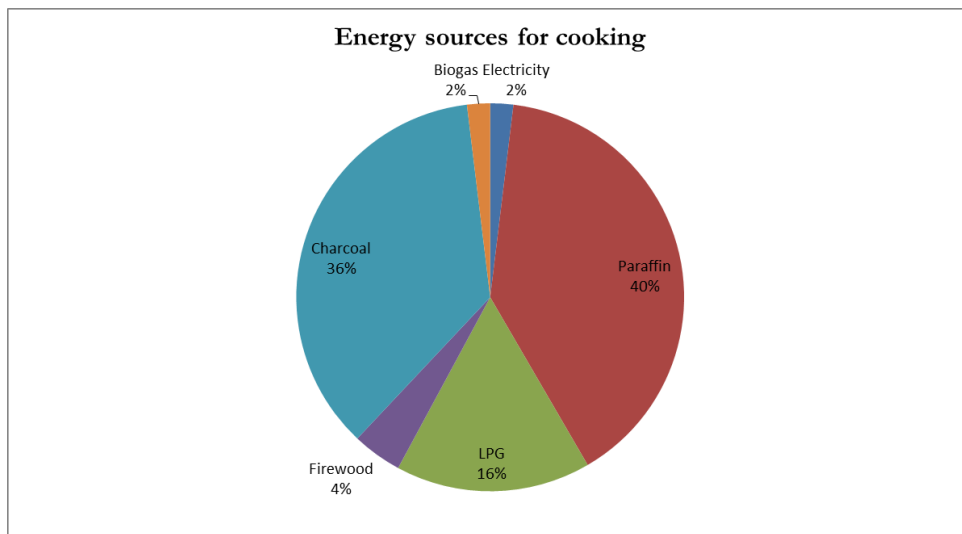


Figure 3-71: Energy sources for cooking

Source: KNBS Kajiado Inequality Index Report

Energy demand

The rapid population growth and expected higher per capita income will lead to an increase in demand for power. Economic growth depends directly on the level of energy consumption of the region. By 2030, the expected demand for power in Kitengela is estimated to be 160MW. To meet the load demand, enhancing energy resources and adopting energy-efficient measures are to be undertaken. As far as higher energy generation in Kitengela is concerned, it shall 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 shall be utilized. The existing generation of power generation will not be sufficient to cater to the estimated expected future load demand as per the gap between present power generation and future load demand is too high.

Electricity

The main source of energy for lighting in Kitengela is electricity, kerosene and solar panels. The main and major energy infrastructure includes electricity; electricity lines, poles and transformers, street lighting. Most of the roads lack street lighting while some of the streetlights that exist actually do not work. Energy infrastructure includes the traditional utilities associated with energy transmission and management, generation and delivery.

The Namanga Road (A104) passes through Kitengela town and is well lit with working streetlights. Other streetlights are available in high-income residential neighbourhoods such as Riverine, whose lights are solar powered within the estate.



Figure 3-72: Tower floodlights near Kitengela Academy.

Source: Fieldwork, 2020



Figure 3-73: Electricity lines connecting electricity along Namanga-Nairobi highway

Source: Fieldwork, 2020

Solar

Solar energy in Kitengela is not as common as it should be in Kitengela. Few estates especially high-income estates have incorporated solar power into one of the sources of energy. Solar energy is mainly used to heat water in these instances. Solar energy in the area is not in full use as they are relatively expensive to install.

As Kitengela Town experiences warm climate, it would be wise to look into tapping into solar energy in the area as a major source of energy for example to cheapen street lighting costs that could help in saving the county's revenue.

3.10.3 ICT Infrastructure

The main ICT infrastructure in the area includes communication/network masts that provide connection networks for different communication providers with the main communication masts observed were two Safaricom masts one at EPZ the border of Machakos County and Kajiado County and the other in Safaricom (the area is named after the mast's location point).

Internet connection in Kitengela is low, connectivity more likely is seen in the town centre where there are cyber cafes.

3.10.4 Solid Waste Management

Solid waste management in Kitengela town is handled by private organisations and also by the local government. There are 14 private



Figure 3-74: Safaricom communication mast at Safaricom

organisations involved in garbage collection in Kitengela. This is then transported to a dumpsite located in Milimani.



Figure 3-75: Dumping site in Noonkopir.

Source: Fieldwork, 2020.

Human waste in Kitengela is disposed of through the use of pit latrines which include ventilated improved pit latrines. These are common in Kitengela especially in the high-density neighbourhoods like Balozi.

3.10.5 Wastewater Disposal System

The main wastewater disposal systems are septic tanks, pit latrines and main sewer. From the figure below, it is evident that septic is the most common type of wastewater disposal.



Figure 3-76: A ventilated improved latrine

Source: Fieldwork, 2020.

Due to inadequate water supply, people opt to use pit latrines. A larger proportion of the area is not connected to a sewer line, therefore, most developers opt to use septic tanks.

About 81.88% of the population has access to improved sanitation while the rest 18.12% do not have access to improved sanitation. The area has achieved the global rate of improved sanitation since 68% of the world's population use improved sanitation facilities.

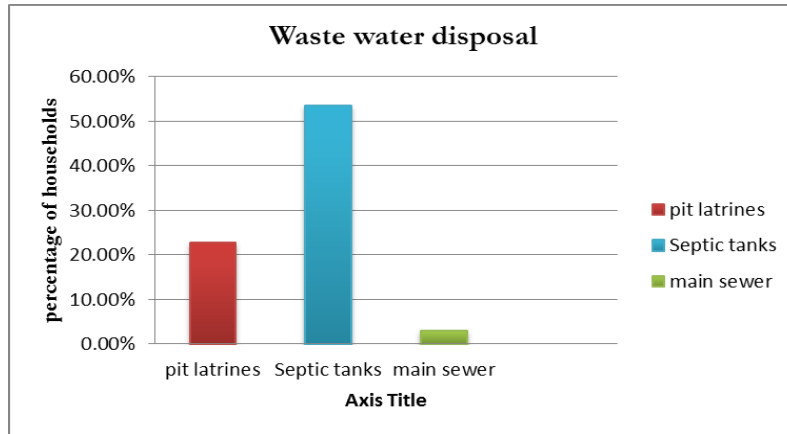


Figure 3-77: Waste disposal systems

Source: Kajiado Inequality Index Report

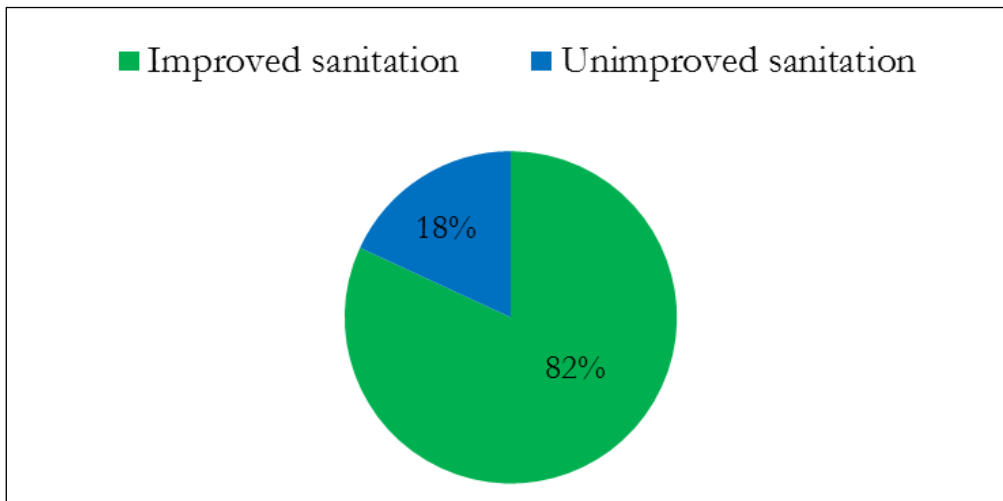


Figure 3-78: Access to improved sanitation

Source: Kajiado Inequality Index Report

However, generated wastewater and sewers are directed to the rivers due to inadequate and dysfunctional sewerage systems. Moreover, once the septic tanks are full, they release raw sewer to the neighbourhood leading to environmental pollution. More often than not, the sewer mixes with groundwater hence contaminating the water which poses a serious health hazard.

Kitengela wastewater management is generally relatively poor, this is especially evident in high-density areas like in Kyang’ombe A and B especially



Figure 3-79: Sewage openly discharged across a road in Ndatani

Source: Fieldwork, 2020

in Kaka House and Ndatani where the sewage is passing across the road without proper drainage infrastructure.

Wastewater generation

Based on 80% of water demand, the wastewater generation of Kitengela is indicated in the table below.

Table 3-32: Sewerage generation in m³

Year	2019	2020	2022	2024	2026	2028	2030
Sewerage Demand	12,664	13,962	16,974	20,634	25,084	30,494	37,070

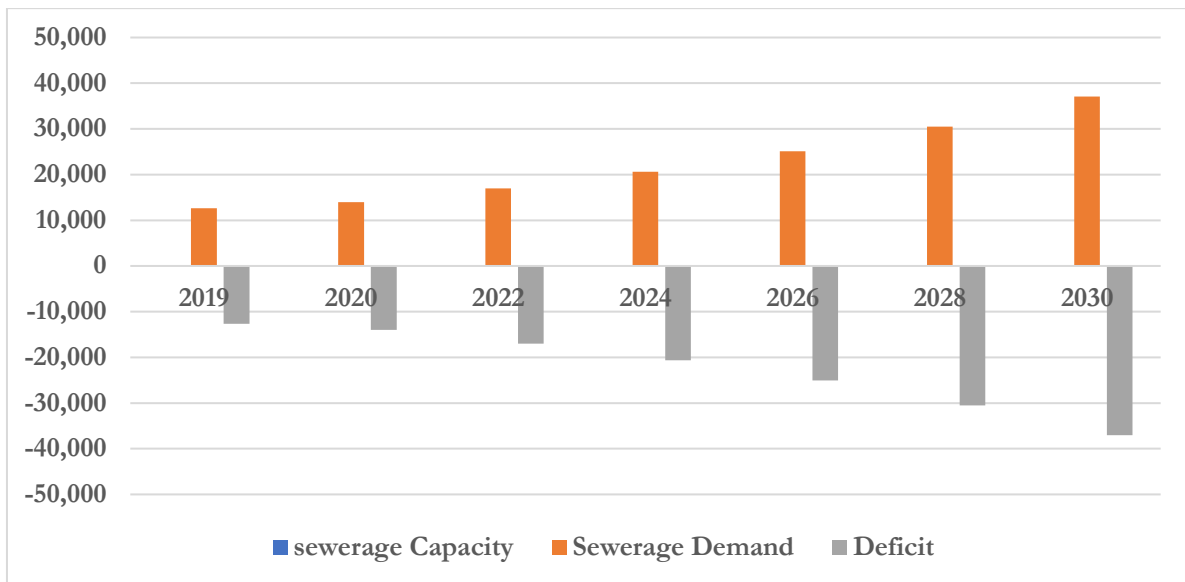


Figure 3-80: Projected sewerage generation

3.10.6 Storm Water Drainage

It was observable that stormwater drainage in Kitengela is better established in high-income neighbourhoods and estates such as Chuna, riverine and single dwelling properties.

There is poor stormwater drainage in the high-density areas such as Kyang’ombe where the high-rise building has not prepared for management of their drainage.



Figure 3-81: A well-constructed storm water drainage outside Riverine estate

Source: Fieldwork, 2020



Figure 3-82: Example of a poor storm water drainage

Source: Fieldwork, 2020

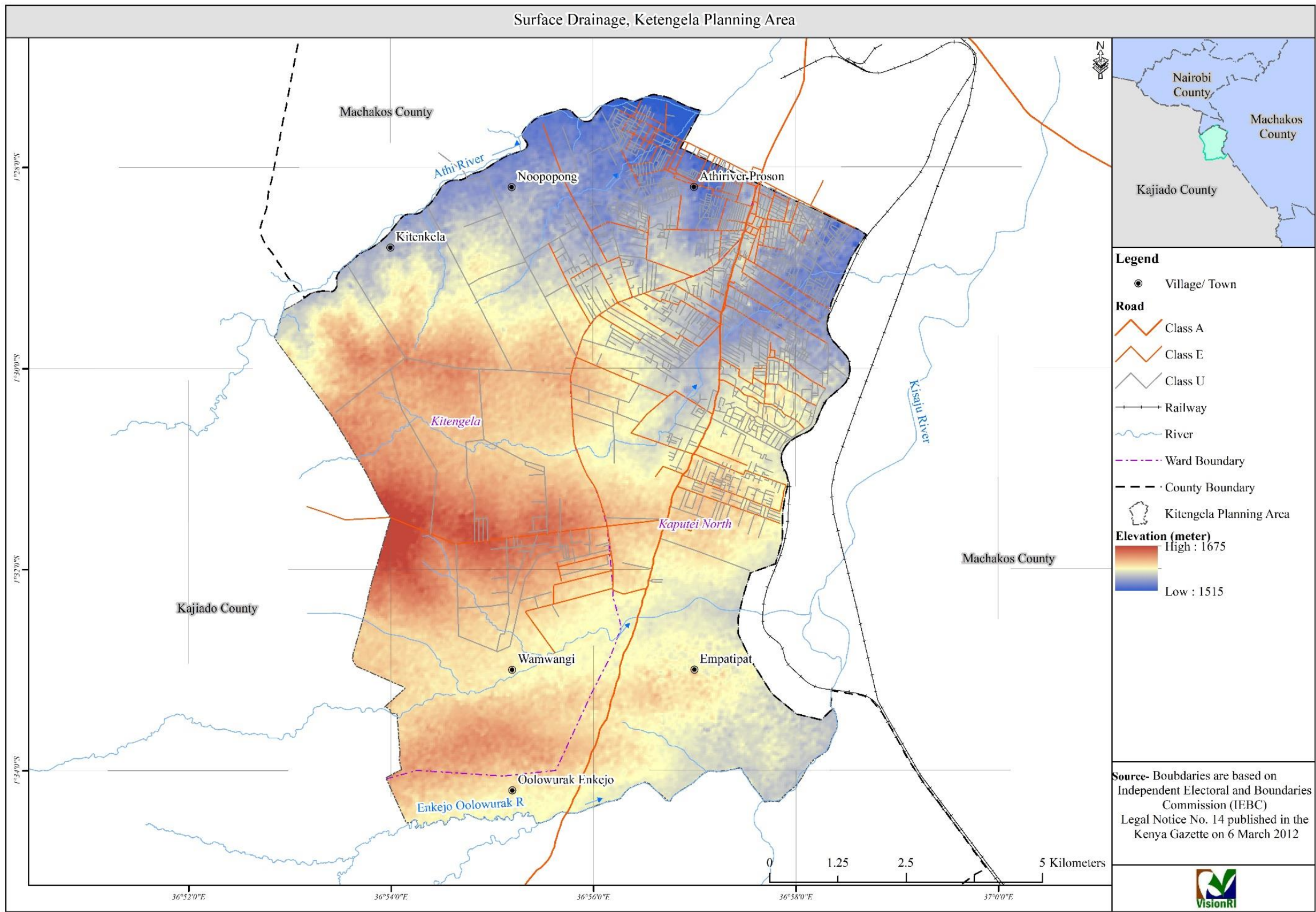


Figure 3-83: Surface Drainage Map

Source: VisionRI

3.11 Governance

3.11.1 Institutional Framework

The Plan, prepared was done 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 plans “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 this Plan 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.”

3.11.2 Planning

The County Government, through its Ministry 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 Plan. The County Executive Committee is, in turn, in charge of monitoring all stages of the Plan preparation, from formulation, adoption and review (County Governments Act 2012).

3.11.3 Implementation

All offices of the County Government will be involved in the implementation of this Plan 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 were identified upon the identification of the various policies, programmes and projects of this Plan.

The co-ordination of the various actions to be implemented during the implementation of the Plan shall be undertaken by the County Intergovernmental 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.

3.11.4 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 Plan shall be reviewed every five years.

3.11.5 Plan Amendments

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

3.12 Disaster Management and Risk Reduction

3.12.1 Introduction

Disaster Risk Reduction is the conceptual framework and practises of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events. Interaction of human activities with the natural environment increases the risks of natural hazards. As the Sub-County advances in economic development, the focus is needed on the integration of Disaster Risk Reduction strategies in planning activities. Kajiado County is prone to disasters such as floods, fires, and vehicle accidents especially along the main Athi river-Namanga road resulting in loss of property and lives. Key priority areas to be focused on in the framework of action while undertaking disaster reduction strategies include Governance strategies (organisational, legal and policy frameworks); risk identification, assessment, monitoring and early warning systems; knowledge management and education; reducing underlying risk factors and preparedness for effective response and recovery.

3.12.2 Climate Change and Vulnerability

Climate plays an important role in many socio-economic and environment activities since it determines the space-time distribution of the world's resources; about 90 per cent of natural disasters worldwide are climate-related; and about 10 per cent of the disasters often emanate from geological, biological and technological/anthropogenic activities. Climate change is considered as one of the serious threats to sustainable development globally. Studies have shown that about 90 % of the disaster afflicting the world are related to severe weather and extreme climate change events. Impacts of the projected climate change are expected in many sectors such as environment, human health, food security, economic activities, natural resources and physical infrastructure. Disaster is a serious disruption to the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

3.12.3 Evidence of climate change in the County

Temperatures have risen throughout the County. Rainfalls have become irregular and unpredictable, and when it rains, a downpour is more intense. In addition, the County remains dry for the better part of the year. The mean maximum temperature is 24 -26°C and the mean minimum temperature is 12-14° C. The coldest months being July to August, while October to March are the hottest. The recent downpour (long rains between March and May 2018 left rivers such as Athi River and Kisaju that cuts across the county and fed by Ngong hills flooded and wreaked havoc to people residing near riparian land. There is a general decline of rainfall in the main rainfall season of March-May (the “Long Rains”). In other words, drought in the Long Rains Season which has greatly affected residents and the agricultural sector.

3.12.4 Adaptation to Climate Change

- **Agriculture:** provision of downscaled weather information and farm inputs; water harvesting e.g. building of sand dams/water pans for irrigation; protection of natural resource base (soil and water conservation techniques); and research and dissemination of superior (drought tolerant, pest and disease resistant) crops;
- **Intercropping and use of animal manure to boost harvests:** In Isinya and Kisaju areas there are many private and communal water pans which have provided water for domestic and agricultural activities;
- **Water:** construction of dams and water pans; de-silting of dams/pans; building capacity for water quality improvement, and awareness campaign to promote water efficiency measures. Recent construction of the Katumani-Konza-Machakos-Tala-Kangundo link left a number of people in Konza area with water pans after providing murram which acted as raw materials in the construction of the road;
- **Physical Infrastructure including transportation networks:** ensuring that the infrastructure is climate-proof over its lifespan, which includes designing infrastructure that can withstand the prevailing climatic conditions, e.g. structures that can withstand strong winds, tides as well as high temperatures such as the SGR; and
- Establishment of greenhouses for vegetable growing.

3.12.5 Vulnerability of the key sectors.

- **Agriculture:** This sector remains the backbone of the Counties economy directly providing employment, food security and rural livelihoods. Productivity in the sector is directly influenced by climatic conditions. Nearly all crops in the County are rain-fed and drought has adversely affected livestock especially around the Kitengela area; and
- **Health:** The sector is influenced by extreme weather events such as droughts and by climate, influenced vector and water-borne diseases such as malaria, cholera and typhoid.



Figure 3-84: Environmentally Fragile Areas that are prone to disasters

3.12.6 Types of Disasters

The main types of disasters in the planning area are hydrological hazards that include the following: Storms surges, floods, drought and pollution of rivers, and wetlands, and biological epidemic diseases. The other main within the planning area include technological hazards: dam failures, fires, hazardous materials events, collapsed Buildings and road accidents. Hydrological disasters are a violent, sharp and harmful amendment either in quality of earth's water or in distribution or movement of water ashore below the surface of an atmosphere. These are hazards associated with water which has the potential to cause loss of life and possessions whether the threat is direct e.g. death or indirect threats such as loss of crops leading to famine, but it can be considered that the event is not a hazard if there are no influences on human.

3.12.7 Flooding and Soil Erosion

The planning area experiences soil erosion especially in areas with acrisols during the rainy seasons due to lack of vegetation cover. Furthermore, the area experiences flooding as a result of the gentle slopes. In addition, inadequate stormwater drainage systems have contributed to the flash floods. Flooding and soil erosion challenges can be mitigated through establishment and development of policies by the County Government of Kajiado to avoid conversion of wetlands to residential areas, to enhance the potential of a wetland during flooding seasons. In addition, maintenance of drainage systems is vital to ensure wastewater is not a disaster during rainy seasons. Capacity building of the local residents to enable them to practice water harvesting techniques in order to reduce water runoff that will increase flooding and soil erosion.



Figure 3-85: Soil erosion and gully in Kitengela

Drought and famine

Climate change in the area has led to increased drought and famine in the area. This has resulted in decreased livestock production and loss of the vegetation cover

Technological Hazards

Hazards originating from technological or industrial accidents, dangerous procedures, infrastructure failures or specific human activities that may cause the loss of life or injury, property damage, social and economic disruption, or environmental degradation. Examples of technological hazards include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport, industrial or technological accidents (explosion, fires, chemical spills). Technological hazards are an increasing source of risk to people and the environment. This is an effect of globalisation of production; an increase of industrialization and certain.

Air Pollution

Air pollution in Kitengela is the main source of bad smell as a result of domestic and industrial effluents (air pollution) from various industries resulting to complain by residents. Air pollutants like Sulphur dioxide, Nitrogen dioxide from cement industries, suspended particulate matter (Birgen, 2017) like ammonia, sodium chloride, black carbon, sulphates, nitrates, mineral dust (dust emissions), Shilenge Z. W, et al, 2015, and water. Major sources of these pollutants include manufacturing plants, power plants, waste incinerators, motor vehicles, construction activities, fires, natural wind-blown dust. They are hazardous to human health respiratory system causing cardiovascular diseases and worsening heart and lung diseases.

Fire

Another form of hazard in Kitengela planning area is fire whose damage on the property is enormous and may lead to loss of lives. The most prone areas to fires are slum areas and industries.

In the years, the fire caused great damage to property in informal settlements and two lives were lost in addition to the loss of properties

Road Accidents

Road traffic accidents and associated injuries are a major cause of death and disability globally. Of the 23-34 million people injured in road accidents annually, an average of 1.24 million die. This makes road accidents the ninth-ranked cause of death in the world and the ranking is projected to rise. A majority of the deaths occur in developing countries. In Kenya, about 3000 people lose their lives in road traffic crashes every year. The majority of these people are vulnerable road users such as pedestrians, motorcyclists, and cyclists. In addition, nearly one-third of deaths are amongst passengers, many of whom are killed in unsafe forms of public transportation. Most of the victims are in their prime (15-45 years). The cost of these accidents to the economy and families is significant. It is important to re-examine traffic policies and laws that govern users, road design and meaningful participation by stakeholders in addressing disasters caused by road users.

3.10.8 Disaster Management

Disaster Risk Management includes but goes beyond disaster risk reduction by adding a management perspective that combines prevention, mitigation and preparedness with a response. Reducing disaster risks is through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events. Early warning system is the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organisations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

Preparedness is key to provide knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions. Prevention is the outright avoidance of adverse impacts of hazards and related disasters within the planning area. Mavoko team need to build resilience which is the ability of the county, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely & efficient manner, including through the preservation and restoration of its essential basic structures and functions.

Disaster management cycles within the Kitengela planning area will be based on the mitigation, preparedness, response, and recovery strategies. Mitigation involves the policies and activities that attempt to reduce and/or eliminate individual and/or community vulnerability to damage from future hazards. Mitigation goals within Kitengela planning area will involve risk likelihood reduction, risk consequence reduction, risk avoidance, risk acceptance, and risk transfer, sharing and spreading. Disaster preparedness will be based on the degree of alertness and readiness of an individual, a household, or a community against an impending disaster. Preparedness activities include formulating, testing and exercising disaster plans, providing warnings, communicating with the public and institutions regarding disaster vulnerability and what to do with it, evacuating people from harm's way, conducting emergency response drills, providing disaster training for emergency responders and the general public.

Disaster response involves all actions taken immediately before, during, and after a disaster to save lives, minimise damage to property, and enhance the effectiveness of recovery at the shortest possible time. The first 72 hours after a disaster are the most important to save lives. Response operations within planning area entail: Search and rescue operation, emergency medical care,

identification and disposal of dead bodies, debris removal, post-disaster sheltering and housing, repairing utilities and key infrastructure, safety and security. The recovery phase begins during and/or after the response phase, and its primary purpose is to reverse the damaging effects of disasters and restore survivors' lives.

The main challenges of DRR are summarised below:

- Inadequate disaster preparedness;
- Poor coordination of disaster response bodies;
- Inadequate information regarding the magnitude of the disaster;
- Inadequate financial resources; and
- Inadequate community participation.

4. STAKEHOLDERS PARTICIPATION

4.1 Introduction

This chapter highlights the various stakeholder engagement sessions and methods that were used in the development of this report. 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 Stakeholders 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 & others; county government; legislators; educational institutions; the business community; public health and environment; informal businesses; non- governmental organisations; transport sector associations; religious institutions; community-based organisations; farmers; professional bodies; minority and marginalised groups; persons with disabilities; youth and women.

4.3 Mode and Level of Engagement

The workshop mechanics were developed, 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 introduction to NaMSIP; Presentation of the objectives of the ISUDP; Introduction to the Workshop & Presentation of Situation Analysis; and Identification of sectoral SWOT and formulation of Development Vision, Mission Statement and Goals and Objectives.

4.4 Stakeholders Issues and Concerns

One of the concerns raised was how the plan would address the issue of liquid and solid waste management. Residents of Kitengela have opted to use septic tanks due to lack of a sewer system. Moreover, the existing dumping site in Kitengela town is illegal and hence the plan needs to come up with a Sustainable waste management proposal.

It was noted that there are many plans which have been prepared both at the National and municipal level, therefore, the consultant should refer to these plans to deter duplication of plans and ensure that all the plans are in harmony.

Subdivision of plots into small plots emerged as a critical issue. Subdivision of land into 50x100 plot should be discouraged and rather encourage industrial development. These subdivisions

encourage the growth of informal settlements and will also make it difficult for the execution of plans in the future.

It was also noted that the level of representation from the county government was low, therefore, there should be more representation in other forthcoming forums. It was further pointed out that people living with disabilities had been left out and there is a need for the consultant to enhance the level of stakeholder consultations. The plan needs to factor in people living with disabilities and youths.

Traffic congestion along Namanga road was raised as a major problem being experienced by the residents. Consequently, there were suggestions to have two by-pass roads on either side of Namanga road to decongest the town.

Inadequate financial resources were identified as the main challenge to the implementation of many plans prepared. Lastly, NMR proposals were mentioned as too ambitious and it was enquired whether the proposals would be implementable.

4.5 Key Concerns

- Solid and liquid waste management;
- Traffic congestion;
- Insufficient financial resources;
- Engagement of all stakeholders during the planning;
- Integration of the plan with other plans;
- People with disabilities;
- Practicability of the NMR proposals; and
- Inefficient land subdivisions.

4.6 SWOT Analysis

This section discusses a synthesis of the planning area's key strengths and opportunities as well as its key weaknesses and threats based on the foregoing identification of its challenges and potentials. The sectoral strengths-weaknesses-opportunities-threats (SWOT) matrix for the planning area is given in Table 45. This synthesis will serve as the platform for the next step in the planning process, which is to the formulation of the planning area's Strategic Direction in the form of a collective Development Vision, Goals and Objectives.

4.7 Strengths and Opportunities

Kitengela's strategic advantages and potentials should be fully utilised to chart its future growth and development. These include:

- **Residential Hub:** Kitengela is one of the preferred locations of new residential developments in the NMR and is expected to continue to attract property investors and individual land buyers. Its advantages include proximity to high growth areas particularly Nairobi city and Mavoko town as well as the emerging Konza Techno City which are sources of residential property demand, lower land prices and rents, road and rail links, availability of building materials, and an existing network of support services such as commercial activities, businesses, schools, hospitals, etc.
- **Industrial Hub:** Kitengela also has potentials to be an Industrial Hub as industrials and investors move to the outskirts of Nairobi in search of cheaper land, a cleaner environment, and easier transport mobility. Kitengela's locational and accessibility

advantages, its existing industrial base, higher quality human resource base, proximity to the EPZ and upcoming transport improvement proposals augur well for the development of industries.

- **Tourism:** Kitengela is a well-known tourism destination due to its glassblowing industry and the ostrich farm and an existing network of tourist cottages providing high-class accommodations. The potential to revive the wildlife corridor is also an interesting proposition for eco-tourism. These strengths should be enhanced in order to maintain diversity in the local economy.
- **Transport Hub:** Kitengela can become a Transport Hub with the greater southern by-pass (to Ongata Rongai, Ngong and Kikuyu) and the Standard Gauge Railway passing through it. KRC's proposal to expand the existing commuter rail service to Kitengela will also complement this potential. The planning area can thus position itself as a transport hub for freight and passengers destined to Nairobi CBD and towns on the Mavoko-Namanga corridor (Isinya, Kajiado and Namanga).

4.8 Weaknesses and Threats

Key challenges that must be hurdled in order for Kitengela to attain its full development potentials include the following:

- **Strains in social infrastructure provision:** The tremendous rate of increase in Kitengela's population has and will continue to strain the government's social infrastructure delivery system. Currently, there already exist significant backlogs in social infrastructure and services such as for housing, health, education and security, amongst others. These backlogs, in turn, may result in urban blight, poor health conditions, rising poverty and criminality and other social issues. The backlogs will compound if government resources continue to be unable to keep up with the population growth rate which is primarily driven by in-migration.
- **Backlogs in transport and physical infrastructure:** Kitengela's rapid population growth rate and corollary urban growth has also caused backlogs in transport and physical infrastructure. Thus, challenges such as traffic congestion along the Nairobi-Namanga road, poor road conditions at the interior portions of town, insufficiency of water supply, lack of proper drainage facilities and inadequacy of wastewater and solid waste management facilities have emerged. These challenges, in turn, resulted in downstream issues such as difficulty in mobility, hygiene, pollution and a general lowering of the quality of the urban environment. Similar to social infrastructure, backlogs in these services will mount in the future if the government is unable to come up with viable solutions.
- **Poor planning and coordination:** Government's planning and coordination mechanisms also did not keep pace with Kitengela's rapid urban growth. This resulted to Kitengela's overall land use pattern that is characterised by an intensely developed central business district (CBD), an extended urban corridor along the main highway and a leap-frogging sprawl of gated communities at the interior. If left unguided, this development pattern will have the combined potential to cause Kitengela to "choke on its own development" manifested in amongst others, the saturation of the Nairobi-Namanga Road, the prevalence of ribbon development along the said road, and under-utilisation of land at the interior portion of the planning area.

Table 4-1: SWOT Analysis

Strengths	Weaknesses	Opportunities	Threats
Demography			
<ul style="list-style-type: none"> • High population and thus a good human resource base; and • The comparatively lower population density in the NMR. 	<ul style="list-style-type: none"> • Unemployment amongst the youth. 	<ul style="list-style-type: none"> • High literacy levels amongst the youth. 	<ul style="list-style-type: none"> • High population growth rate.
Natural Resources & Environment			
<ul style="list-style-type: none"> • Available land for residential and institutional development; • Land for industrial commercial development; and • Land for agricultural activities such as flower farms. 	<ul style="list-style-type: none"> • Inadequate waste management system; • Encroachment of riparian and open spaces; • Uncontrolled development; • Human-wildlife conflict; • Pollution of water resources; • Air and noise pollution; and • Increase of water-borne diseases. 	<ul style="list-style-type: none"> • Sustainable exploitation of natural resources such as building stones and sand. 	<ul style="list-style-type: none"> • Development of informal settlements; • Increase in disasters e.g. floods, fire, industrial emissions etc.; and • Increase in road accidents.
Economic Activities			
<ul style="list-style-type: none"> • Existing Real Estate and Industrial Base; • Available space for expansion; • A well-developed network of commercial, transport and other services; 	<ul style="list-style-type: none"> • Inadequate physical infrastructure; and • Administrative challenges (business hurdles). 	<ul style="list-style-type: none"> • Investment attractiveness; • Proximity to Nairobi; and • Residential, industrial and tourism hub. 	<ul style="list-style-type: none"> • Haphazard planning.

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> Established the banking industry; Location advantage; and EPZ. 			
Land Use, Land Economics & Urban Design			
Land Use			
<ul style="list-style-type: none"> Housing construction boom; Proximity to Nairobi city and Mavoko town; Robust and mixed-use CBD; Noonkopir old town already an established residential neighbourhood; and Presence of Old Namanga Road to supplement Nairobi-Namanga Road. 	<ul style="list-style-type: none"> The rapid population growth rate; Ribbon-type development along Nairobi-Namanga Road; Leap-frogging sprawl of gated communities at the interior; and Loss of wildlife corridor. 	<ul style="list-style-type: none"> Designated as a Growth Centre (Level III); May develop as a residential, industrial, and transport hub and as an extension of Mavoko town; May also become a tourism hub with the re-establishment of the wildlife corridor; and TOD proposals under NaMSIP. 	<ul style="list-style-type: none"> Saturation of Nairobi-Namanga Road; Under-utilisation of land at the interior portion; Incongruous land uses such as quarries beside residential areas; and Urban expansion causing the premature conversion of agricultural lands and open areas.
Land Economics			
<ul style="list-style-type: none"> Well established land registry at the County; Support by the County Government for land administration; Flexibility of the predominant tenure (private tenure); and Existence of a dynamic land market. 	<ul style="list-style-type: none"> Analogue land registry; Poorly trained land administration staff (carry over from the old system); Rising land prices – likely to increase the cost of development of public utilities; and Lack of capacity to monitor land market. 	<ul style="list-style-type: none"> County Government and national support for reform in land administration; Development of appropriate laws at the county and national levels; and Development of structure plans and zoning regulations for the towns. 	<ul style="list-style-type: none"> The influx of land speculators from Nairobi distorting the property market; Exploitation and displacement of locals from their land by richer individuals from Nairobi; and

Strengths	Weaknesses	Opportunities	Threats
			<ul style="list-style-type: none"> Emergence of slums and illegal subdivisions due to increased demand for land.
Urban Design			
<ul style="list-style-type: none"> Mixed-use compact CBD; and Noonkopir as an established residential neighbourhood. 	<ul style="list-style-type: none"> Ribbon-type urban structure; Limited roads that are lateral to Nairobi-Namanga Road; Leap-frogging and haphazard development outside the CBD; Gated communities not adequately serviced by good roads and physical infrastructure; Disjointed roads and disorganised streetscape in CBD; Lack of pedestrian sidewalks, cycling tracks, and street lighting; and Lack of public open spaces that may commonly be used for recreation. 	<ul style="list-style-type: none"> Transport proposals of SPC for NMR; TOD proposals of NaMSIP; Additional regulations on the development and sale of gated communities; Create pedestrian and cycling-friendly streetscapes; and Implement a land acquisition programme to be able to develop public open spaces. 	<ul style="list-style-type: none"> Deterioration of the quality of the CBD's and Noonkopir old town's urban environments; and Increased roadside friction along major road arteries.
Transportation			
<ul style="list-style-type: none"> Town is well connected by road to Mavoko, Nairobi, Kajiado and Namanga border; There are many public transport operators, including motorcyclists; 	<ul style="list-style-type: none"> Congestion due to on-street parking along the service lanes of the A104 and Kitengela Prison Road; Poor condition of side streets away from the A104 road; 	<ul style="list-style-type: none"> The old Namanga road can be used to distribute traffic off the Namanga (A104) road; Due to its location along the A104 road, the town can transform itself into a transport hub with 	<ul style="list-style-type: none"> Conflicts and accidents due to high vehicle speeds and volumes along the A104 road; Small and congested bus park that stands on private property; and

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Dedicated budgets for provision and maintenance of transport facilities available at the County; and • Close proximity to Mavoko town for connectivity to the Northern economic corridor 	<ul style="list-style-type: none"> • Narrow road reserves even for roads serving major land uses such as the retail market; • Narrow side roads; • Inadequate NMT facilities – the only NMT facility present is a footpath on the right of A104 (towards Namanga), which is in a bad condition; • Lack of designated bus bays along the A104 road hence PSVs pick passengers at petrol stations and along the road; and • Lack of designated bus bays along the A104 road hence PSVs pick passengers at petrol stations and along the road. 	<ul style="list-style-type: none"> • appropriate transfer terminals for goods to/from Tanzania and Mombasa; • Private sector finance can be mobilised to provide some transport facilities such as public transport terminals and parking areas; • By-laws to make off-street parking a condition for development approval; 	<ul style="list-style-type: none"> • High traffic volumes and speeds on A104 road making the CBD unattractive.
Social Infrastructure			
Housing			
<ul style="list-style-type: none"> • Ample land for housing development especially for owner-occupier housing; and • Ample supply of quarry stone from within Kajiado County. 	<ul style="list-style-type: none"> • High prices of construction steel; and • Expensive building technology using sand, cement and quarry stones. 	<ul style="list-style-type: none"> • Ample supply of sand from within Kajiado County at affordable prices; and • Close proximity to the steelworks in Nairobi's industrial areas. 	<ul style="list-style-type: none"> • Tenants from Nairobi unable to own houses; and • Low-income tenants from Nairobi creating demand for informal settlements.
Education			
<ul style="list-style-type: none"> • County government and CDF support for basic education; and 	<ul style="list-style-type: none"> • Insufficient number of public pre-primary and primary schools; 	<ul style="list-style-type: none"> • County and national government support to basic education; and 	<ul style="list-style-type: none"> • Proximity to Nairobi attracts school-going children to the streets to beg; and

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Deep local people’s support for education in the county as shown in high educational achievement. 	<ul style="list-style-type: none"> • Limited public land for new schools during the planning period; and • Pockets of indigenous Maasai populations where education for girls is not emphasized. 	<ul style="list-style-type: none"> • Free Basic Education Policy at National Level. 	<ul style="list-style-type: none"> • Proceeds from crime in Nairobi attract children from school into crime.
Health			
<ul style="list-style-type: none"> • Available private land to acquire for more health facilities; and • Funding for health facility construction from Constituency Development Fund and County Government. 	<ul style="list-style-type: none"> • Poor spread of the available public health facilities in the planning area; • Unavailability of the correct hierarchy of health facilities given there are no level 3 facilities; and • Long distances (more than 5 kilometres) covered by most residents to reach health facilities. 	<ul style="list-style-type: none"> • County government support to health services in the planning area; and • Free Health Care for All Policy being pursued by the National Government. 	<ul style="list-style-type: none"> • Health labour force actions including withdrawals around the country; and • Inadequate health care personnel being hired and/or retained in the health sector in the country.
Sports and Recreation			
<ul style="list-style-type: none"> • Ample private land is available for acquisition for the construction of a stadium; and • There is a tradition of sports in secondary schools across the planning area which may be built on in future. 	<ul style="list-style-type: none"> • Lack of a stadium in the planning area; • A weak history of sports and the use of social halls outside schools in the planning area; and • No land designated for a stadium. 	<ul style="list-style-type: none"> • Possible funding for sports activities and facilities from the County Government; and • Emphasis of the sport by the national government with possible support for sports facilities such as stadia. 	<ul style="list-style-type: none"> • Funding for the construction of the stadium may be slow in coming due to demand for similar funding across the country; and • Limited support and funding for social halls and in-door sports across the country.
Public Parks and Playgrounds			

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> Private land is available for purchase to use as public parks in the planning area; and There is an emerging urban population that requires parks and playgrounds in the planning area. 	<ul style="list-style-type: none"> Lack of public parks and playgrounds in the planning area; and A weak history and use of public parks in the planning area. 	<ul style="list-style-type: none"> Middle-class influence from Nairobi will increase the demand for leisure and play spaces; and Emphasis of the sport by the national government with possible support for sports facilities such as stadia. 	<ul style="list-style-type: none"> Funding for the construction of public parks may be slow in coming due to demand for similar funding across the country; and Limited support and funding for public parks across the country.
Religious			
<ul style="list-style-type: none"> Religious groups use private land for their activities; There is a strong tradition of religious activity in the planning area; and Large numbers of adherents in most religious groups. 	<ul style="list-style-type: none"> Inadequate quality of worship facilities in the planning area; and Poor location of worship facilities including many without adequate parking space in the planning area. 	<ul style="list-style-type: none"> Religious freedom in the country; and Widespread support and patronage of religious health and educational institutions in Kenya. 	<ul style="list-style-type: none"> Religious extremism which likely to mar inter-religious harmony in Kenya.
Cemeteries and Burial Grounds			
<ul style="list-style-type: none"> Available or acquired land can be used to set up cemeteries for Muslims and Christians separately; Private land may be acquired and used as cemeteries; and People from the planning area are open to using public cemeteries. 	<ul style="list-style-type: none"> Lack of public cemeteries and burial grounds in the planning area; and Weak support from CDF in setting up cemeteries in the planning area. 	<ul style="list-style-type: none"> Preference by people to bury the remains of their loved ones in public land to free private land for commercial purposes; and Shrinking privately owned land sizes per family. 	<ul style="list-style-type: none"> Funding for the construction of public cemeteries may be slow in coming due to their not being prioritized across the country; and Limited funding for public cemeteries across the country.
Cooperative Societies			

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> Strengthened cooperatives in the public transport sector in the planning area; and There are strong cooperative roots in the teaching profession in the planning areas. Hence, people know the benefits of movement first-hand. 	<ul style="list-style-type: none"> Cooperatives cover a limited number of sectors mainly public transport and urban entrepreneurship. Other sectors are left out; and Cooperatives especially in the public transport sector pay workers poorly and give cooperatives a bad name due to their strong profit maximization motive. 	<ul style="list-style-type: none"> More people around the country are interested in cooperatives as they aim to pool resources together and borrow; and National government support for the cooperative movement. 	<ul style="list-style-type: none"> Competition from banks and micro-finance companies offering similar services at larger scale hence cheaply.
Physical Infrastructure			
Water Supply			
<ul style="list-style-type: none"> Available water resources; Water connection company; Water treatment; and Water distribution system. 	<ul style="list-style-type: none"> Limited funding; High cost of water treatment; High cost of connection; Water catchment degradation; Vandalism of water connection pipes; and Population influx. 	<ul style="list-style-type: none"> Financing opportunities from donors etc.; Affordable means of water treatment; Capacity building on water and sanitation; Increased revenue collection' and Expanding accessibility. 	<ul style="list-style-type: none"> Illegal connections; Vandalism of water pipes; and Water pollution.
Energy Infrastructure			
<ul style="list-style-type: none"> Presence of power sub-station at the junction of Rongai road and A104; and Government's UMEME PAMOJA Scheme. 	<ul style="list-style-type: none"> Vandalism of transformers and conductors continue to frustrate efforts to increase access and reliability to power as there are recurrent power blackouts, especially on Sundays; and 	<ul style="list-style-type: none"> Development of alternative sources of energy such as energy-saving jikos; solar panels; windmills; and use of biogas 	<ul style="list-style-type: none"> Low cooperation of citizens in energy conservation programmes.

Strengths	Weaknesses	Opportunities	Threats
	<ul style="list-style-type: none"> High urban population growth rate also strains the available energy sources and utilities leading to power rationing. 		
ICT Infrastructure			
<ul style="list-style-type: none"> Serviced by all mobile phone operators; Serviced by various national and local television and radio stations; and Extensive use of the internet and the presence of fibre optic cables in the Town. 	<ul style="list-style-type: none"> Disruption of fibre optic cable and other ICT infrastructure during road maintenance and/or upgrading. 	<ul style="list-style-type: none"> Expansion of coverage of ICT service providers due to heightened demand; improved services due to business competition 	<ul style="list-style-type: none"> Lowering of service quality due to over-subscription.
Solid Waste Management			
<ul style="list-style-type: none"> County Government involvement in the weekly collection of waste; County Government conducts clean-up activities; River rehabilitation programmes; and Designated dump sites. 	<ul style="list-style-type: none"> Limited funding; Certain households are unable to make payment for solid waste collection; Informal settlements; and Population influx. 	<ul style="list-style-type: none"> Recycling of waste; Increased revenue collection; Energy from landfill; Relocation of dumpsites; Funding opportunities; and Supply of refuse collection bags. 	<ul style="list-style-type: none"> Poorly sited dumpsite e.g. Near riparian areas, commercials, and residential areas; Delays in the collection by the waste collection companies or county government; Dumpsite may attract avian; Pollution of water resources; and Blockage of storm drains.
Wastewater Management			

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • County Government involvement in the expansion of the sewerage system; • Available land for expansion of the sewerage system; and • EIA done before the new sewerage system is constructed. 	<ul style="list-style-type: none"> • Constrained sewerage systems; • Limited funding; • Certain households are unable to make payment for wastewater disposal connection; • Informal settlements; and • Population influx. 	<ul style="list-style-type: none"> • Affordable waste treatment; • Recycling of wastewater; • Increased revenue collection; • Funding opportunities; and • Improvement of wastewater infrastructure. 	<ul style="list-style-type: none"> • Sewer bursts hence pollution of the environment e.g. water resources; • Construction on sewer lines. • Contamination of clean potable water; • Waterborne diseases such as typhoid, amoeba etc.; • Destruction of habitats; • Illegal connections; • Destruction of the sewer system during infrastructural developments; and • Vandalism of wastewater collection pipes.
Storm Drainage			
<ul style="list-style-type: none"> • County Government involvement in improving the storm drainage system; and • Available land for expansion of storm drainage system. 	<ul style="list-style-type: none"> • Poorly designed storm drainage system; • Limited funding; • Informal settlements; and • Population influx (hence solid waste may block storm drainage system). 	<ul style="list-style-type: none"> • Re-design storm drainage system; • Funding opportunities; • Maintenance of storm drainage system; • Re-location of residents in informal settlements living near storm drainage system; and • Informal settlement up-grading programmes. 	<ul style="list-style-type: none"> • Overflow of the storm drainage system, hence pollution of the environment e.g. water resources; • Spread of water-borne diseases such as typhoid, amoeba etc.; • Illegal connections in the existing storm drainage system.;

Strengths	Weaknesses	Opportunities	Threats
			<ul style="list-style-type: none"> • Destruction of the storm drainage system during major infrastructural developments; and • Solid waste blockage and siltation of storm drainage system.
Disaster Risk Reduction & Management			
<ul style="list-style-type: none"> • County strategies to mitigate the effects of climate change and variability; • Global partnerships towards addressing climate change; • Awareness created; and • Preparedness strategies. 	<ul style="list-style-type: none"> • Inadequate resources to mitigate the effects of climate change and variability; • There is inadequate information on climate change; and • Climate change and variability not given priority. 	<ul style="list-style-type: none"> • Carbon market for example tree planting and renewable energy; • Improvement of the drainage system; • Capacity building on climate change; and • Financing opportunities. 	<ul style="list-style-type: none"> • Geo-hazards such as floods and landslides; • Loss of livelihoods as a result of prolonged droughts; • Loss of lives and property; and • Water bore related diseases such as malaria, diarrhoea, typhoid, amongst others.

Source: Stakeholders' Workshop

5. DEVELOPMENT PLAN

5.1 Introduction

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

5.2 Development Vision, Mission, Goals and Objectives

Vision

The vision statement to guide the development of alternative models for the planning area is:

“A well-planned and secure town with a 24-hour economy”.

Mission

The mission for the planning area as developed by the stakeholders was “A well-planned and secure town with a 24-hour economy through an efficient and reliable infrastructure”.

Objectives

- To improve security through installation of CCTV cameras, increasing police posts, patrol cars and street lighting;
- To provide a proper waste management system;
- To promote efficient, accessible, reliable and affordable infrastructure;
- To encourage the incorporation of ICT in the management of the town;
- To promote the use and production of renewable energy;
- To enhance the economy through the provision of incentives to investors; and
- To enhance transparency and integrity in the provision of government services.

6. DEVELOPMENT PROPOSALS

6.1 Introduction

This chapter explores and provides strategies to resolve the issues identified and position Kitengela to growth. This chapter provides approaches that shall be utilized to overcome the challenges identified in the situational analysis. This shall enable the town to meet envisaged growth amongst the key development challenges identified include:

- Scarcity of portable clean water;
- The poorly designed road network that occasion traffic snail up and congestion;
- Poor management of waste (solid waste) and non-existent sewer;
- Degenerating quality of the environment;
- Unguided expansion of the town/uncontrolled spatial growth;
- Competing land use and limited protection to wildlife;
- The unmanaged informal sector that lacks form and space;
- Linear commercial expansion with limited service lanes;
- Dependence urban economy that is externally driven whose labour serves elsewhere by day and back in the evening; and
- Increasing population with no provision for public amenities (schools, hospitals, markets for the sale of wares etc.).

Careful review and evaluation have demonstrated emerging issues are manageable. The challenges posed are within the capacity of established institutions to resolve. In addressing the challenges, it is necessary to identify the underline causes:

The listed strategies found suitable to address the challenges identified and as steps to realising the development include:

- Decongesting Kitengela town;
- Compact city/town;
- Plan the city/town to accommodate, guide and enhance development;
- Control Town development.
- Environmental management.
- Manage and reform city transport circulation and movement;
- Have a comprehensive land-use plan envisaged on the vision from growth and development;
- Control and minimize human-wildlife conflict;
- Minimize water pollution and delicate harness the resources;
- Promote inter-city management framework to leverage on potentials from both Mavoko and Athi river;
- Provide strong urban economy and vibrant economic strands for Kitengela to avert dependency; and
- Have an informal trade and microenterprise strategy.

6.2 Urban Transport Strategy (Decongestion)

Transport is a key driver to urban growth and placement of urban activities. Its efficiency defines the quality of life while its inefficiency possesses constraints to the residents of ant given town.

Availability of diverse modes provides convenience in use. This can be complemented by the state and quality of corridors. It ensures delivery of goods, mobility within the town, convenience, safety within the town, healthy living, access to emergencies, access to markets, homes and other destinations. Situations interrupting the flow and movements inconveniences the users and may lead to time wastage.

Kitengela is served by Namanga road. It is the main spine traversing the CBD. The terminus and CBD fronting it has a key array of activities. This has a major contributor to traffic flow problems.

Amongst the main attributes to traffic flow constrictions are:

- The town has one main road spine (Namanga Rd) cutting through the centre of town;
- Most primary roads connect to Namanga road: they have no alternative passage and connection;
- Majority of the roads are narrow and in a poor state;
- They have no traffic movement plan;
- They have no back lane designed to offload traffic and be used for deliveries;
- Have no design for convenience turning; and
- Earth roads with dilapidated surface attracting pooling of water.

Objectives of the strategy:

- Improve the flow of traffic and reduce time wastage;
- Enhance safety and risks experienced by road users; and
- Make the town convenient and ideal to live.

Key strategies:

- Develop two by-pass roads; one on the lower edge of the town connecting Kitengela to Athi River through Koromboi to Athi Steel Mills. The road in some section runs parallel to the railway station. The second bypass goes through the old Namanga road, connects to Chief Mutungei road through Migingo estate to Shallom in Athi River. The two proposals shall reduce volumes of traffic through the CBD. They also offer alternative exists to the residential estate whose access is mainly Namanga Rd;
- Develop an underpass and overpass within the CBD. The entry to Kitengela CBD has constant road nuisance that interrupts the flow, and movement of the road is not well-coordinated. To minimise congestion, traffic can be segregated. Transit traffic may use the main trunk road with the option of turning away from the CBD;
- The road shall be cordoned off to minimise disruptive entries and exists this applies too to pedestrians, motorcycles and other road users;
- Alternative roads within the CBD must be improved to motorable standards: must have provision for drainage; and
- Connection to the railway stations in Athi river both the SGR and ordinary railway stations provide alternatives to traffic movements and a great offload to the traffic flow on the existing roads.

The structuring elements of the Town are determined by three natural and man-made factors, which are: Existing land use trends, main transportation system, and the physiographic factors, especially the high ground.

6.3 Existing Land Use Trends

The concentration of population in the town which is a small portion of the municipality and the largely unoccupied land provides a good opportunity for structuring the Town through this ISUDP. The Town remains generally vacant to the south and west.

6.4 Main Transportation System

Namanga Road is the main structuring element in terms of the transport system of the Town. All other road network connects to this international trunk road.

The Railway line apart from being the administrative boundary between Machakos and Kajiado Counties it provides opportunities to Kitengela in terms of connectivity to the City of Nairobi and other regions. The upcoming Konza City will also provide further opportunity to residents of Kitengela in terms of employment and business.

6.5 Physiographic Factors

In Kitengela Town, the topography is characterised by high and low grounds. The high grounds are indicators for the planning of high-income settlements. This is where Milimani A and B estates are situated. In addition, the high ground provides an opportunity to locate water reservoirs at the highest point at the SK survey pillar, which is at elevation 1674 metres above mean sea level. Topography, especially high grounds determines the positioning of water reservoirs to enable gravity flows to settlements at lower grounds.

The lowest grounds in the planning area provide opportunities to plan and locate the sewerage treatment system. There are various possibilities: one site next to the river Athi after the Noonkopir estate. The other is in Mavoko Sub-county of Machakos County after the railway line near the Stony Athi River. The third possibility is to explore and negotiation for a connection to the EPZ sewer.

Rivers dictate the drainage patterns of a town. The river system also acts as boundary buffers for different land uses. The Town has predominantly vertisols (black cotton) soils, and some places have sandy and light-textured soil. The geological formation gives rise to minerals of economic importance such as gypsum, limestone, soda ash and salt. The minerals provide opportunities for the location of cement industries in the area.

The average temperature of the town falls between 21 °C to 30 °C. This high temperature encourages the use of green energy as a source of energy for the residents, businesses and industries in the Town.

6.6 Development trends

6.6.1 Urban growth trends and patterns

The distinct urban centre is Kitengela CBD which is a robust trading and business centre, with an array of mid-rise residential and commercial buildings. The central business district (CBD) is immediately surrounded by an “inner residential area” which, as of now, is relatively more developed as compared to outlying residential areas.

Noonkopir, the old townsite, may also be considered as a secondary node. It has its own village-level commercial area surrounded by older residential developments.



Figure 6-1: Kitengela CBD (left) & Noonkopir Old Town Site (right)

Source: Field Survey 2018

Kitengela's distinct feature is the obvious housing construction boom it is currently experiencing. Urban growth is driven by proximity to Nairobi City via the Athi River-Namanga Road coupled with a relatively lower cost of land. From the 1999 census when Kitengela only had a population of 9,327, the urban centre's population grew to 58,167 in 2009 and 154,433 in 2019. This represents an astounding growth of more than six times making Kitengela rank as the 13th largest urban centre amongst the 24 in NMR in 2009.

The cumulative annual growth rate (CAGR) of Kitengela from 2009 - 2019 was calculated at 10.25%. This made Kitengela as one of the fastest-growing urban centres in NMR. Kitengela's population grew more than three times faster than that of Nairobi (3.43%) and more than five times faster than that of the country (2.11%).

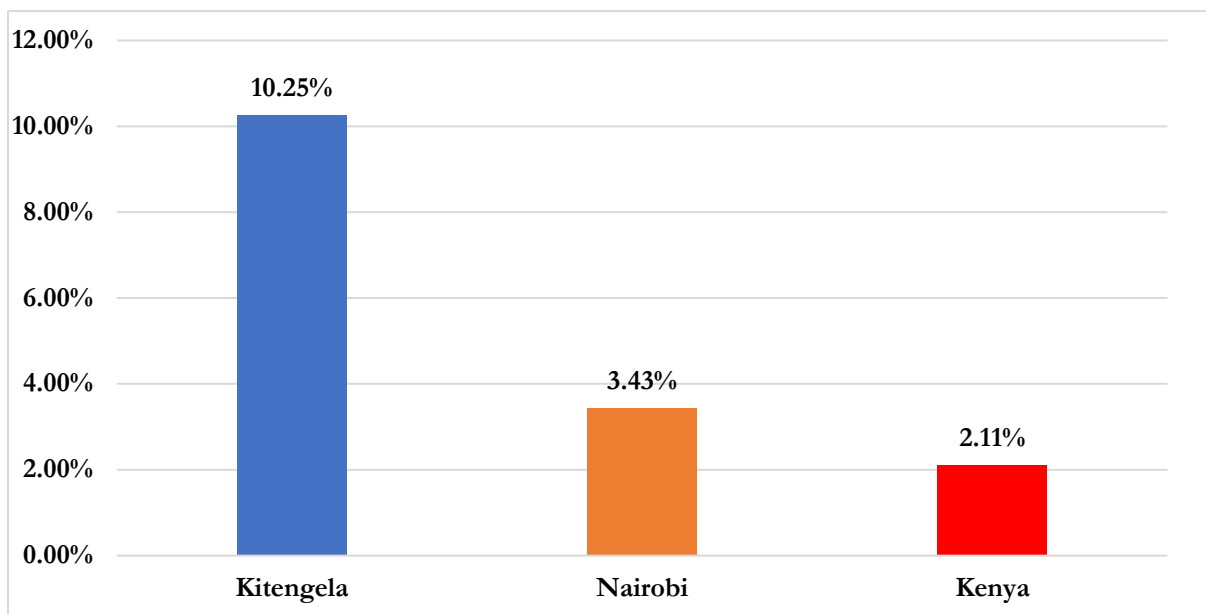


Figure 6-2: Cumulative Annual Growth Rate of Kitengela in comparison to Nairobi and Kenya

Kitengela is the second largest urban centre in terms of population in Kajiado County in 2019, next only to Ongata Rongai (popn = 172,569). It grew slower than Ngong' (CAGR = 15.69%) but has the potential for more growth due to its relatively gentle terrain, convenient accessibility to Nairobi and other urban centres, and lower land costs, amongst others. These significant pull factors are expected to continue driving urban growth towards the planning area.

The urban corridor along Namanga Road is observably being extended as evidenced by numerous on-going constructions. Land use along the corridor is predominantly commercial and residential. Urban sprawl, in ribbon development, may be seen on both sides of the corridor through commercial developments along the road.

Urban sprawl is being experienced at the low-density areas which is manifesting itself through the construction of gated residential estates on lands that were originally used for cattle grazing.



Figure 6-3: Urban Corridor and Urban Sprawl

Source: Field Survey 2018

URBAN SPRAWL IN KITENGELA

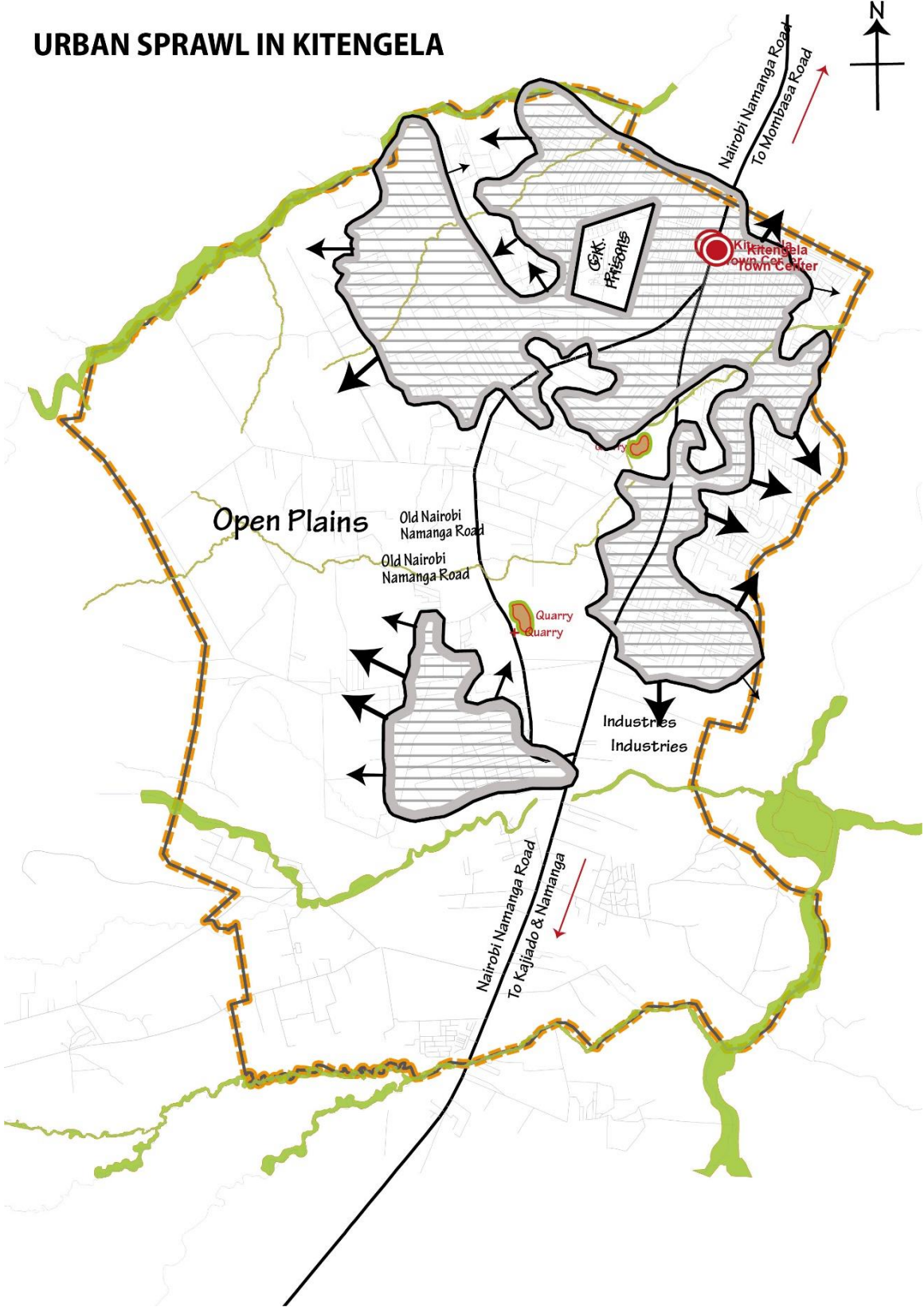


Figure 6-4: Urban Sprawl in Kitengela

Source: VisionRI

7. SPATIAL DEVELOPMENT MODELS

7.1 Nil intervention-Laissez-Faire

In laissez-faire, planning model development takes place with minimal government intervention as is experienced in the municipality. The assumption in this model is that the current haphazard growth of Kitengela will continue without regard to planning interventions. Residential, commercial, institutional and industrial development will continue to leapfrog or develop in a linear pattern along the class A104 road. Land sub-divisions will continue albeit with narrow roads, inadequate infrastructure and community facilities. For example, inadequate water supply, bus parks, open-air market, library, education facilities and so on. In other words, zero planning or laissez-faire option represents the worst-case scenario. The town will ultimately develop into slums and blight areas if the status quo continues.

7.2 Concentric zone model

The concentric ring model depicts urban land use in concentric rings: The Central Business District is in the northern tip of the municipality. The model postulates that the development expands in rings with different land uses. The different land uses will result from the competition of different socio-economic groups for land. This competition results in variations in the cost of land, therefore, causes segregation within the town.

The model assumes uniformly flat, and available, land, and ignores the importance of transport routes, but relies on the theory that city growth results from distinct waves of in-migrants, that is due to invasion and succession. The zones identified are:

- **CBD:** The innermost ring, where non-residential activities are concentrated;
- **Zone in transition:** Industry and poorer-quality housing; immigrants to the city first live in this zone in small dwelling units, frequently created by subdividing larger houses into apartments;
- **Zone of working-class homes:** Modest older houses occupied by stable, working-class families;
- **Zone of better residences:** Newer and more spacious houses for middle-class families; and
- **Commuters' zone:** Beyond the continuous built-up area of the city, where people live in small communities and commute to work in the CBD.

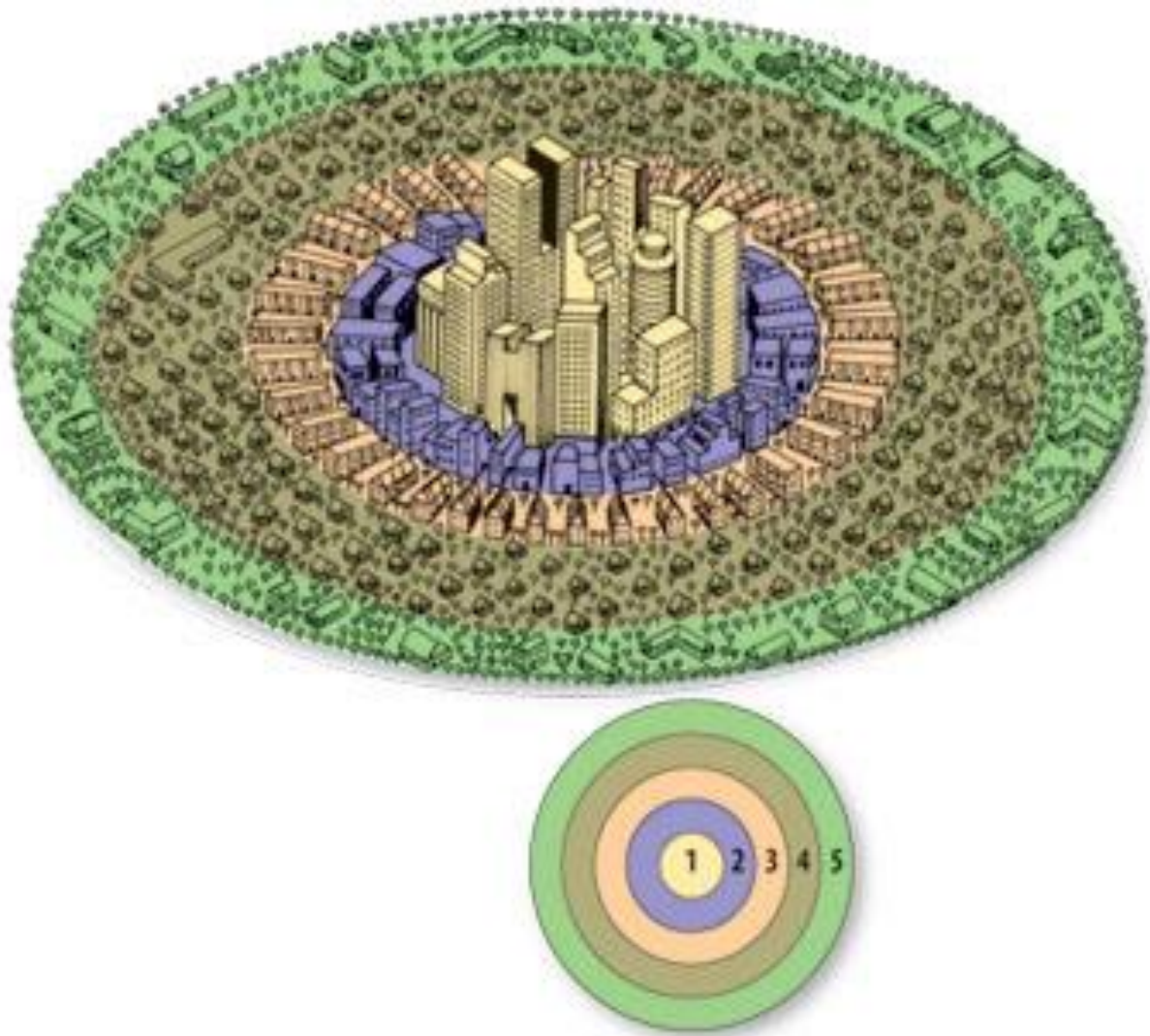


Figure 7-1: Illustration of the Concentric Model

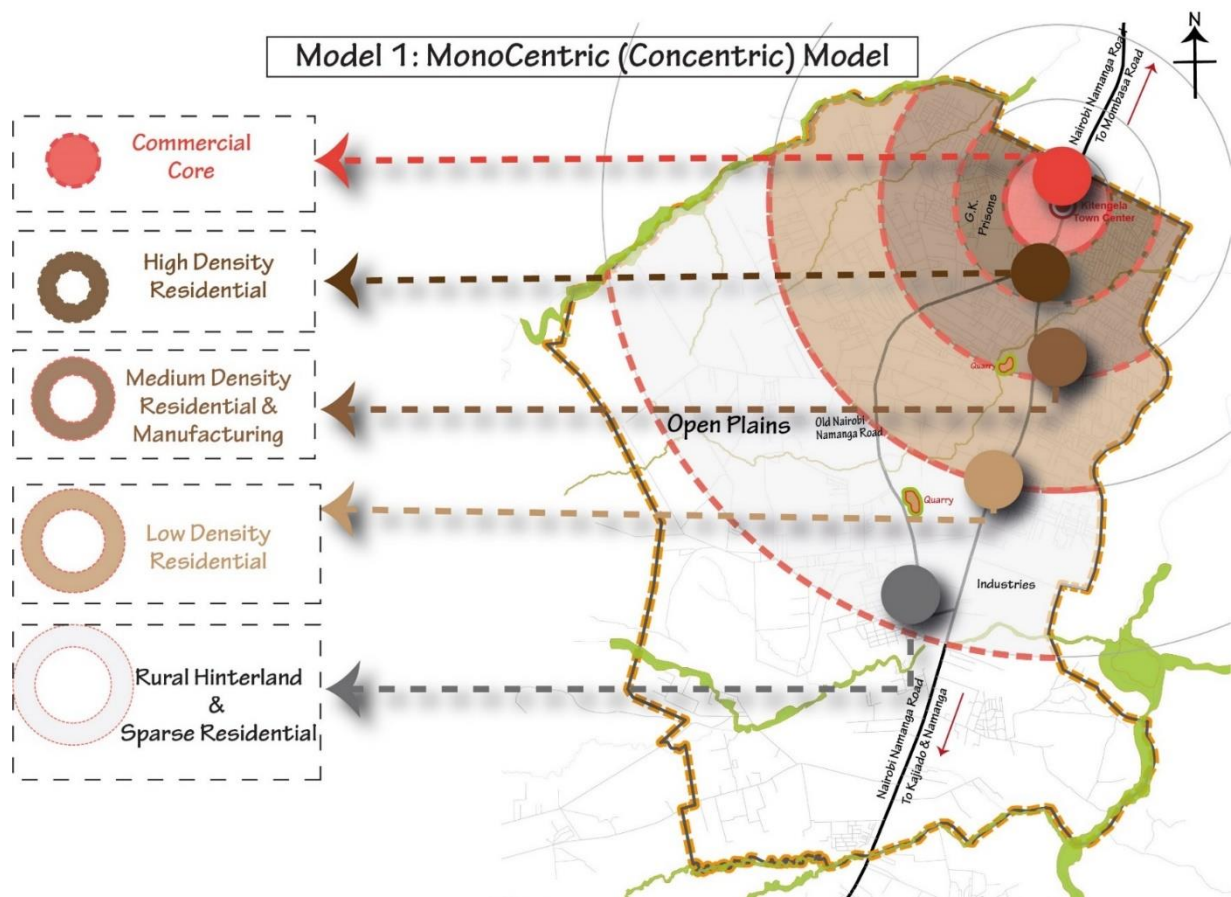


Figure 7-2: Monocentric Model in Kitengela

Disadvantages

In relation to Kitengela town, this alternative model fails to fit within the existing land use. For example, development intensifies along the highway with specific zones for high income being dictated by the topography.

Distribution of the population and easy development in all directions does not apply for Kitengela.

TOD as an implementation of the concentric model

For effective implementation of the monocentric (concentric model), there is need to integrate the transport-oriented model that will enhance transportation and deter traffic congestion at the main Magadi road as well as create interconnectivity and accessibility within the town. The TOD is based on the following principles:

- i. **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; and
 - Design of designated bus parks for public transport to discourage on-street parking, loading and off-loading of passengers.
- ii. **Private transport management:** Private vehicles are facilitated to use a park and a riding facility. Access to the core of the centres is limited to PSVs and freight vehicles.
- iii. **Road transport design:** The road design encourages public mobility through:

- Construction of service lanes;
 - Construction of non-motorised transport facilities and BRT lanes for 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.
- iv. **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 transport corridor and enforcement of regulations to curb access of residential areas through major transport routes.

Model 1: MonoCentric (with TOD)

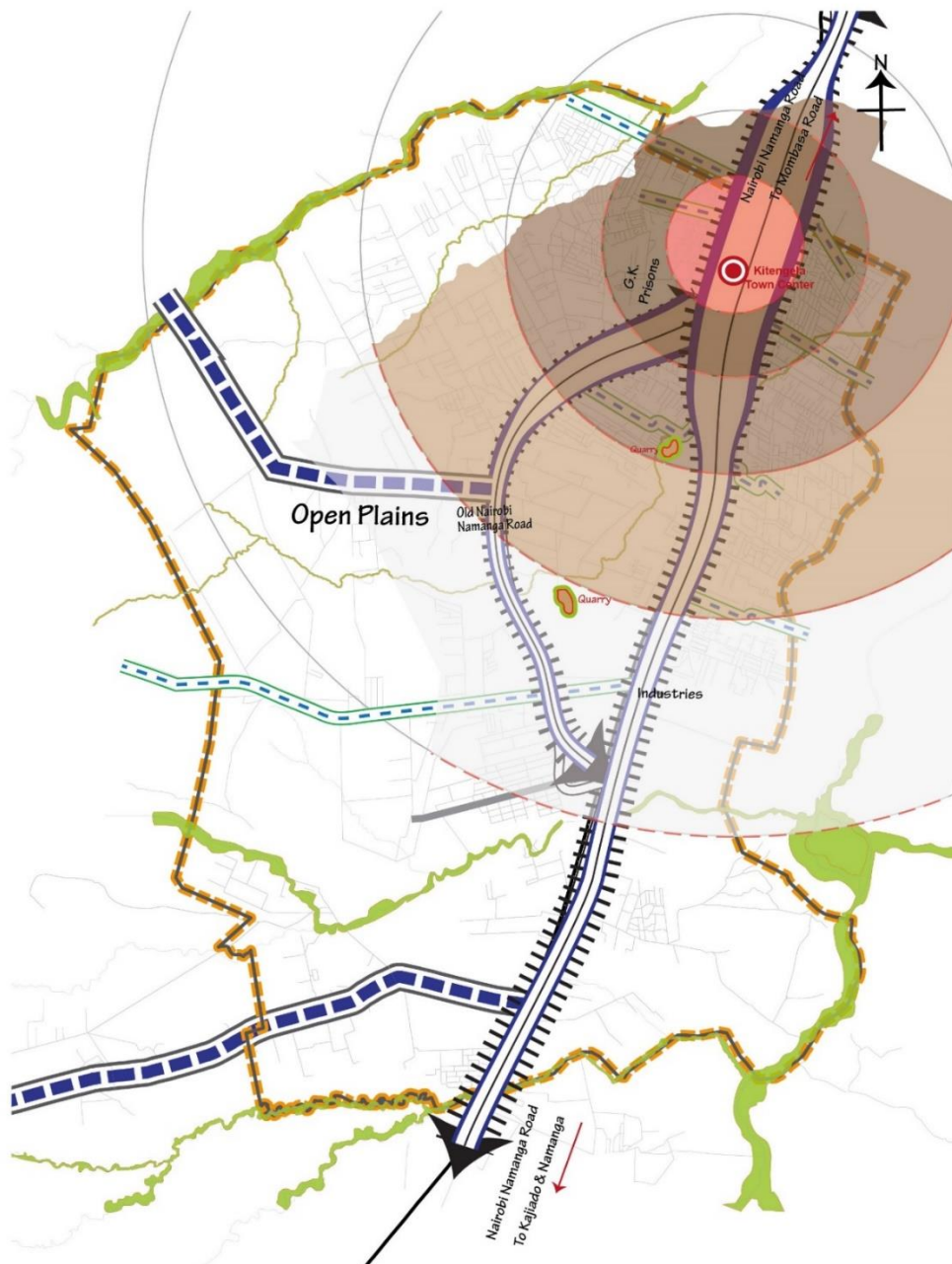


Figure 7-3: TOD model as an implementation of the Monocentric model

Source: VisionRI

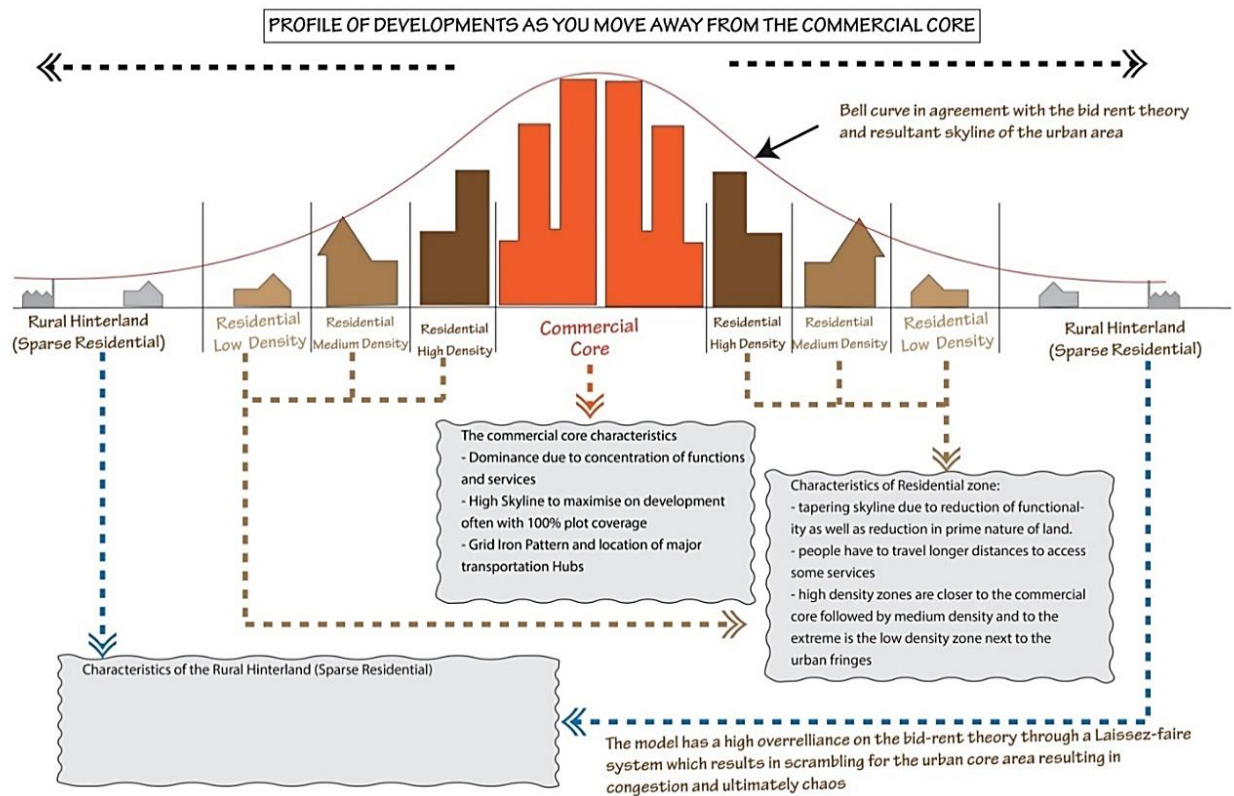


Figure 7-4: Profile of developments according to the TOD

Source: VisionRI

The bid rent model postulates commercial land use as having the highest rent. Commercial activities, therefore, compete for the first row of the highway. High-density residential uses including at Kyang’ombe A and B can be seen next to the CBD. Low-density housing is forming further from the CBD at Milimani leading to suburbanisation. This model assumes that security would be good at the far fringe of the CBD. However, when security deteriorates farther away, the high-income populace tends to prefer the inner cities especially high-end apartments. Transit-oriented development around a distinct core that has already formed, therefore, becomes a priority for a municipality that remains largely undeveloped like Kitengela.

7.3 Multiple Nuclei Model

The multi-nuclei model was developed by C.D. Harris & E.L. Ullman in 1945. The basic concept is that cities do not grow up around a single core but have several nodes. Examples of these nodes include a port, neighbourhood business centre, university, park, and airport. The multiple nuclei theory states that some activities are attracted to particular nodes, whereas others try to avoid them. For example, a university node may attract well-educated residents and students, whereas a railway station may attract hotels and warehouses. On the other hand, incompatible land-use activities will avoid clustering in the same locations. Heavy industry and high-class housing, for example, rarely exist in the same neighbourhood. The nodes in this model are:

- Central business district;
- Wholesale light manufacturing;
- Low-income residential;
- Middle-class residential;
- High-income residential;

- Heavy manufacturing;
- Outlying business district;
- Residential suburb; and
- Industrial suburb.

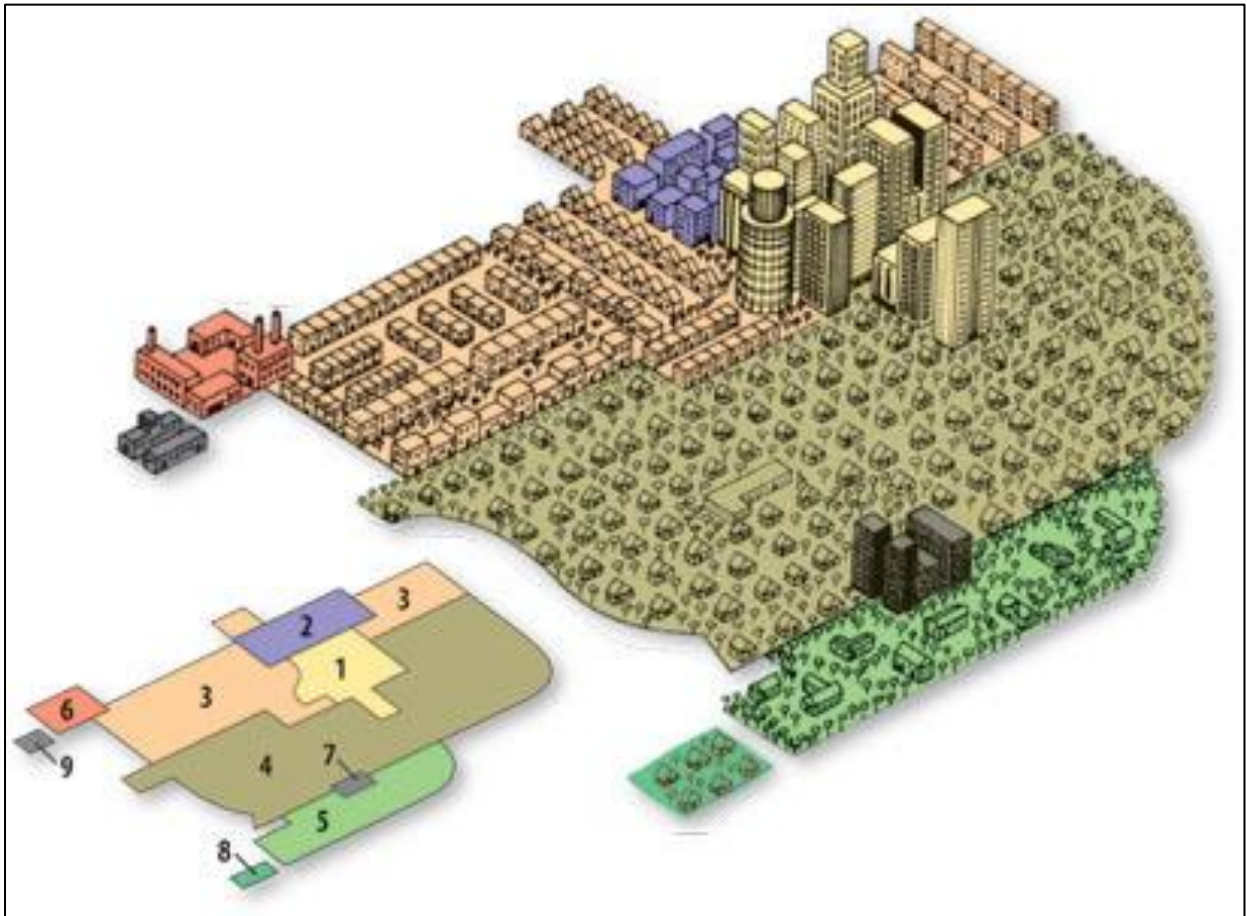


Figure 7-5: Illustration of the Multi-Nuclei Model

Development in Kitengela seems to follow the multi-nuclei zonation model with different nodal points appearing to emerge. Each of these zones sits on key transportation nodes and strategic residential zones. The current central business district of Kitengela Town forms one of the nuclei.

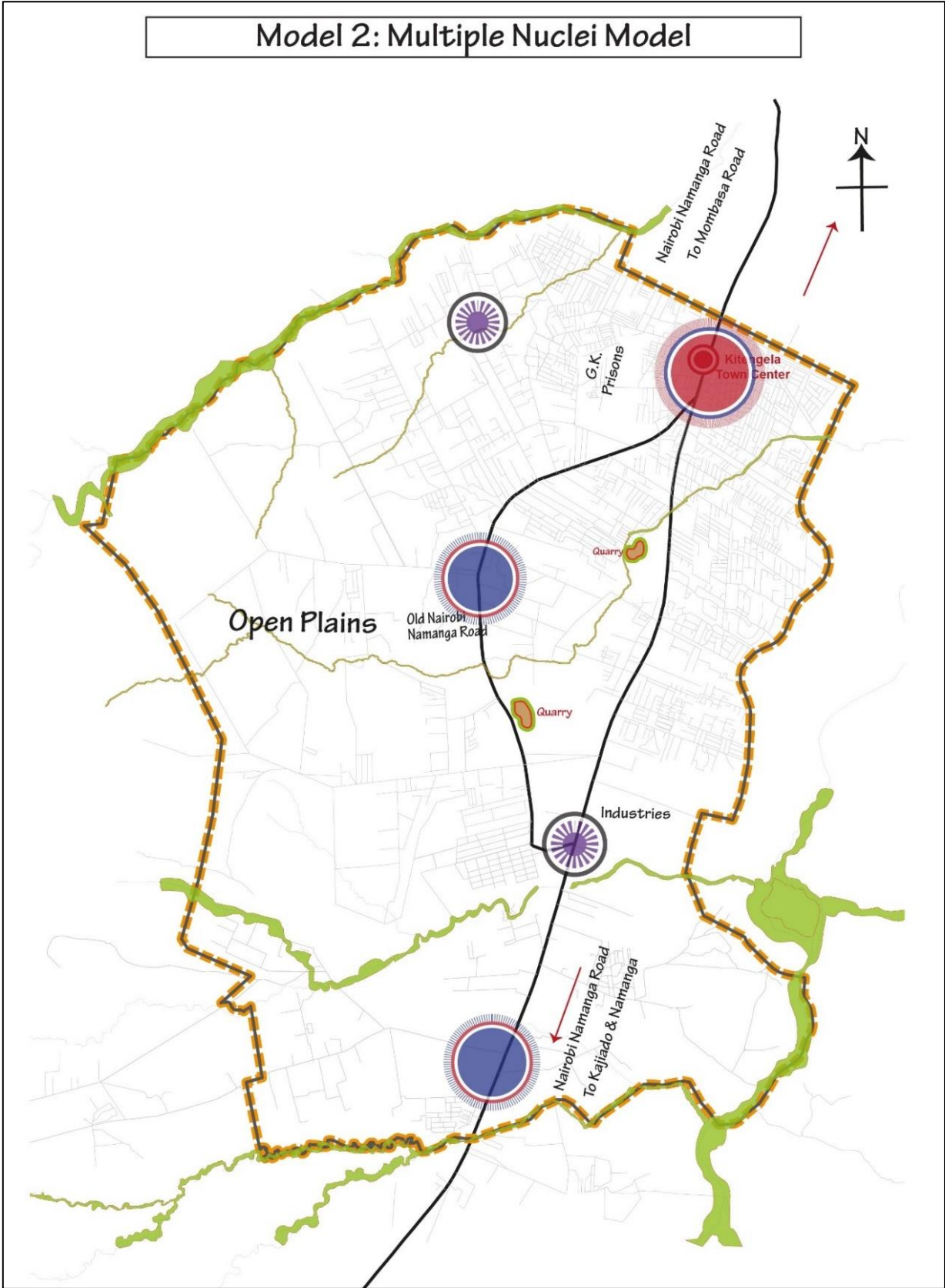


Figure 7-6: Model 2: Multi- Nuclei Model

The advantages and disadvantages of the implementation of the multi- nuclei model in Kitengela are:

Table 7-1: Advantages and Disadvantages of the Multi- Nuclei Model

Advantages	Disadvantages
<ul style="list-style-type: none"> • The lower class live close to the manufacturing area and CBD, making it easier to commute. The wealthier class live farther away; • The middle and high-income earners are close, so they get the best jobs, shopping, and entertainment, which supports the economy; • The industrial area is on the opposite side of where the high-income earners live so they do not have to deal with pollution, noise, and traffic; • Allows the suburbanisation, transport development, outward growth of the city; and • Easily adapts to existing conditions. 	<ul style="list-style-type: none"> • The weaknesses of this model are that the abrupt division between zones is non-existent. There is no homogeneity between the different nuclei; and • The disadvantages of this model are that the poorer people live on the very outside of the city making it hard and expensive to commute to work each day. Because of this, they become stuck in the lower class.

Source: VisionRI

7.4 The Integrated Model

The integrated model is a combination of the multi- nuclei and the Transit-Oriented Development. This model outweighs the disadvantages brought about the multi-nuclei model and the concentric model earlier discussed. The advantages and disadvantages of this model, therefore, are:

Table 7-2: Advantages and Disadvantages of the Integrated Model

Advantages	Disadvantages
<ul style="list-style-type: none"> • The lower class live close to the manufacturing area and CBD, making it easier to commute. The wealthier class live farther away; • The middle and high-income earners are close, so they get the best jobs, shopping, and entertainment, which supports the economy; • The industrial area is on the opposite side of where the high-income earners live so they do not have to deal with pollution, noise, and traffic; and • Allows the suburbanisation, transport development, outward growth of the city. Easily adapts to existing conditions. 	<ul style="list-style-type: none"> • The weaknesses of this model are that the abrupt division between zones is non-existent. There is no homogeneity between the different nuclei; and • The disadvantage of this model is that the poorer people live on the very outside of the city making it hard and expensive to commute to work each day. Because of this, they become stuck in the lower class.

Source: VisionRI

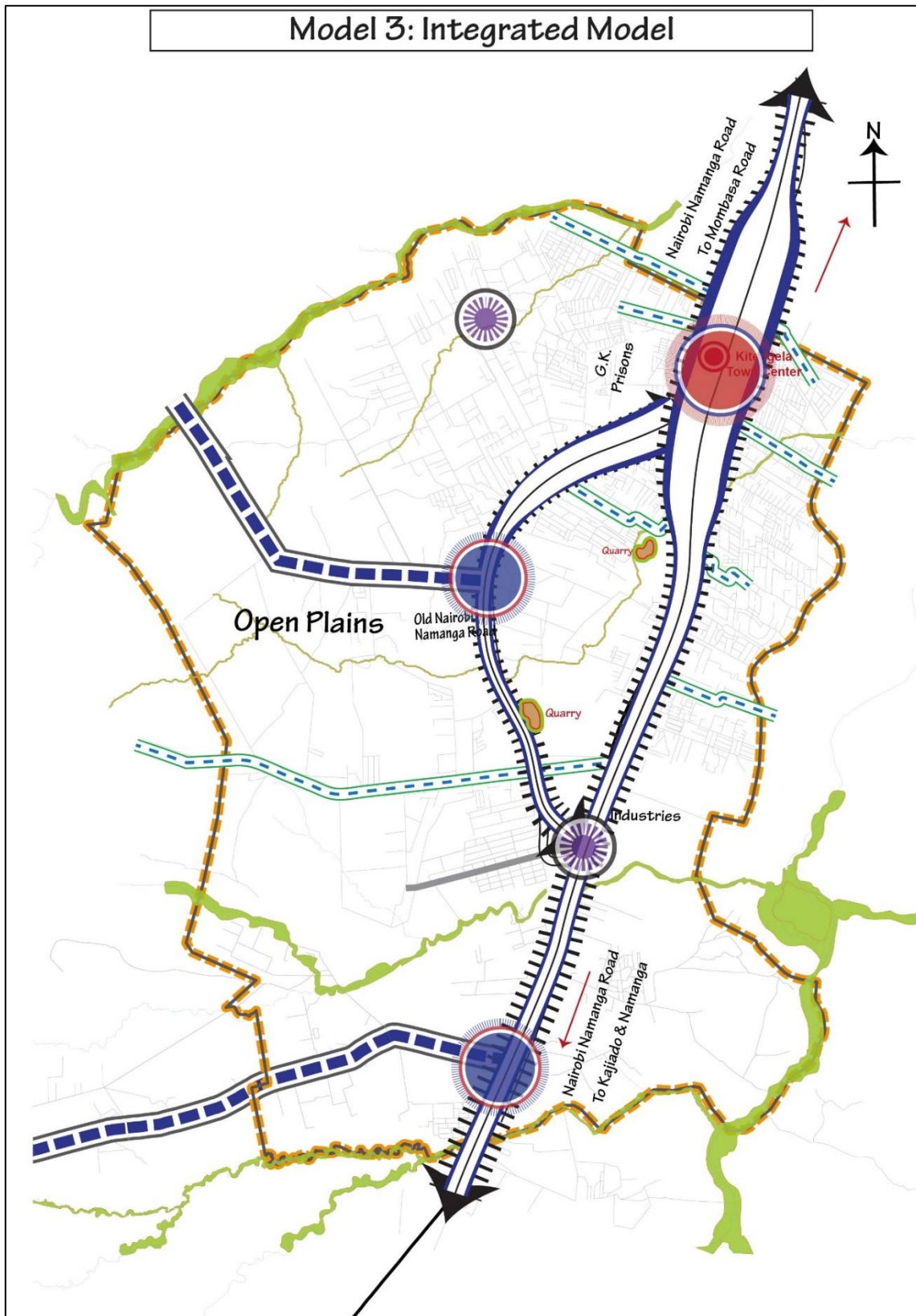


Figure 7-7: Model 3: Integrated Model

Source: VisionRI

The above model has been used to inform the formulation of the land use development plan as presented in the next chapter.

8. PROPOSED DEVELOPMENT PLAN

8.1 Land Use Plan

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. This chapter has been prepared after analysing the existing situation of land use, environmental sensitivity, regional setting, demographics and provision of services amongst others.

8.2 Land use proposals

The categorisation of the entire planning area's land uses into the prescribed land uses is important. The Physical Planning Handbook identifies the following land and proportions for urban areas.

Urban planning involves the management of space; therefore, the land is an important element in planning. Kitengela is experiencing high growth to accommodate people, their activities and related infrastructure. This Plan will ensure that there is equitable distribution of facilities without disturbance of the ecological balance. A good transportation network, green character and protection of sensitive areas has been considered when proposing the spatial structure of Kitengela municipality. Activity nodes are proposed through the striking of a balance in the physical, social, economic and ecological character of the planning area. The existing land uses are proposed to be in harmony and with the clear interrelationship between various activities under the proposed uses.

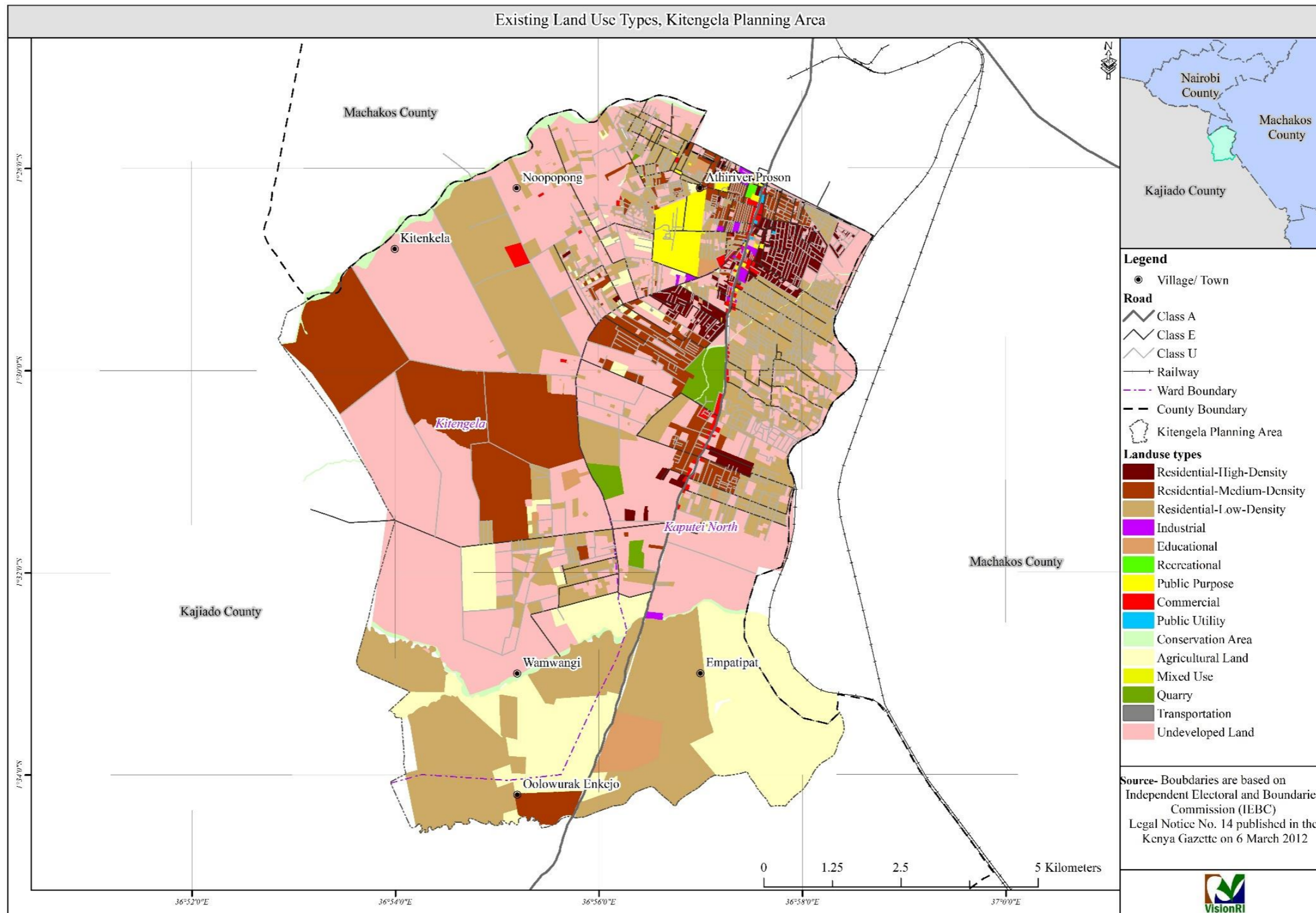
The proposed land uses are expected to be fundamentally linked up with an improved and efficient transport system that will be able to cater to future demand.

It has been considered most suitable to have a polycentric model with multiple activities within multiple nodes to minimise the number of trips and trip length brought about by a mono-centric model. The following section presents a long-term development framework for Kitengela 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 Kitengela remains the same.

Table 8-1: Current and proposed land use area

Land Use	Current land area (sq. km)	Percentage (%)	Proposed land area (sq. km)	Percentage (%)
Commercial	0.67	0.69%	0.74	0.76%
Mixed Use (commercial/ Residential)	0.01	0.01%	1.6	1.64%
Industrial	0.23	0.72%	1.87	1.93%
Residential- High density	2.2	2.26%	4.48	4.59%
Residential -low density	25.77	26.41%	34.87	35.74%
Residential –medium density	12.31	12.6%	16.34	16.75%
Educational	1.39	1.42%	1.65	1.69%
Transportation & Roads	5.51	5.65%	6.42	6.58%
Recreational	0.04	0.04%	0.95	0.97%
Agricultural land	45.08	45.99%	25.05	25.68%

Source: VisionRI



Map 8-1: Existing land use plan

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 the residential land use and in-fill development to sprawl commonly depicted through residential establishments in Kitengela.

The plan complements the Kitengela zoning plan 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 some sections of the CBD. Such areas already experience mixed-use developments in form of residential and commercial. However, if well planned, these mixed-use developments would manage to reduce traffic by ensuring that each block is self-sufficient in the provision of basic commodities and services. It is however encouraged to have the commercial and service provision units to be away from the major spine roads emanating from the CBD and Namanga Highway.

- **High-Density Residential:** Existing high-density residential areas include: Kyang'ombe B, Kyang'ombe C, Noonkopir Estate. These estates are encouraged to increase plot ratios and coverages. However, each development is required to provide parking to the tune of 1.5 parking spaces per unit. This is to avoid on-street parking.
- **Medium Density Residential:** Existing areas include Sifa farm, New Valley, Upper Valley, Kyang'ombe A and Kimmerland Estate. These estates are mainly single dwelling maisonettes on half and quarter-acre plots. These areas will be encouraged to develop up to four dwelling units per plot with a maximum plot coverage of 80% and parking space of at least 10 parking spaces. This is to minimise the sprawl caused by these areas which result in high costs of provision and maintenance of services and infrastructure.

Similarly, several growths and shopping centres will be introduced in these areas to minimise the distance travelled to the CBD of Kitengela. Sprawl into adjacent land use zones will be discouraged and densification be the main approach to accommodate new developments. Developments will, however, be limited to three levels (ground plus two).

- **Low-Density Residential:** Existing areas Milimani estate, Acacia, Chuna estate, Mohammed estate. Here plot coverages will be closely monitored, and sprawl discouraged into the adjacent land uses. A plot coverage of 60% will be enforced in these estates and minimum plot size of a quarter an acre with more emphasis being on half-acre plots.
- **Industrial Land Use Plan:** Current industrial area in Kitengela is 0.24% of the total developed area. This plan proposes to increase the total percentage to 1.76%. Two types of industries namely light and medium industries are proposed. The industries will be concentrated to the southern edge of the town which is the leeward side of the planning area. This will be primarily for light industrial uses. Heavy industrial activity will require vetting at the environmental offices and involvement of the local residential associations done.
- **Light Industry:** These are industries such as furniture and shoemaking, consumer electronics, home appliances repairing, Juakali and flour milling amongst others. Light industries have been proposed at the CBD and Juakali areas. The plan also proposes some light industrial activities such as metal workshops, dry cleaners and printing

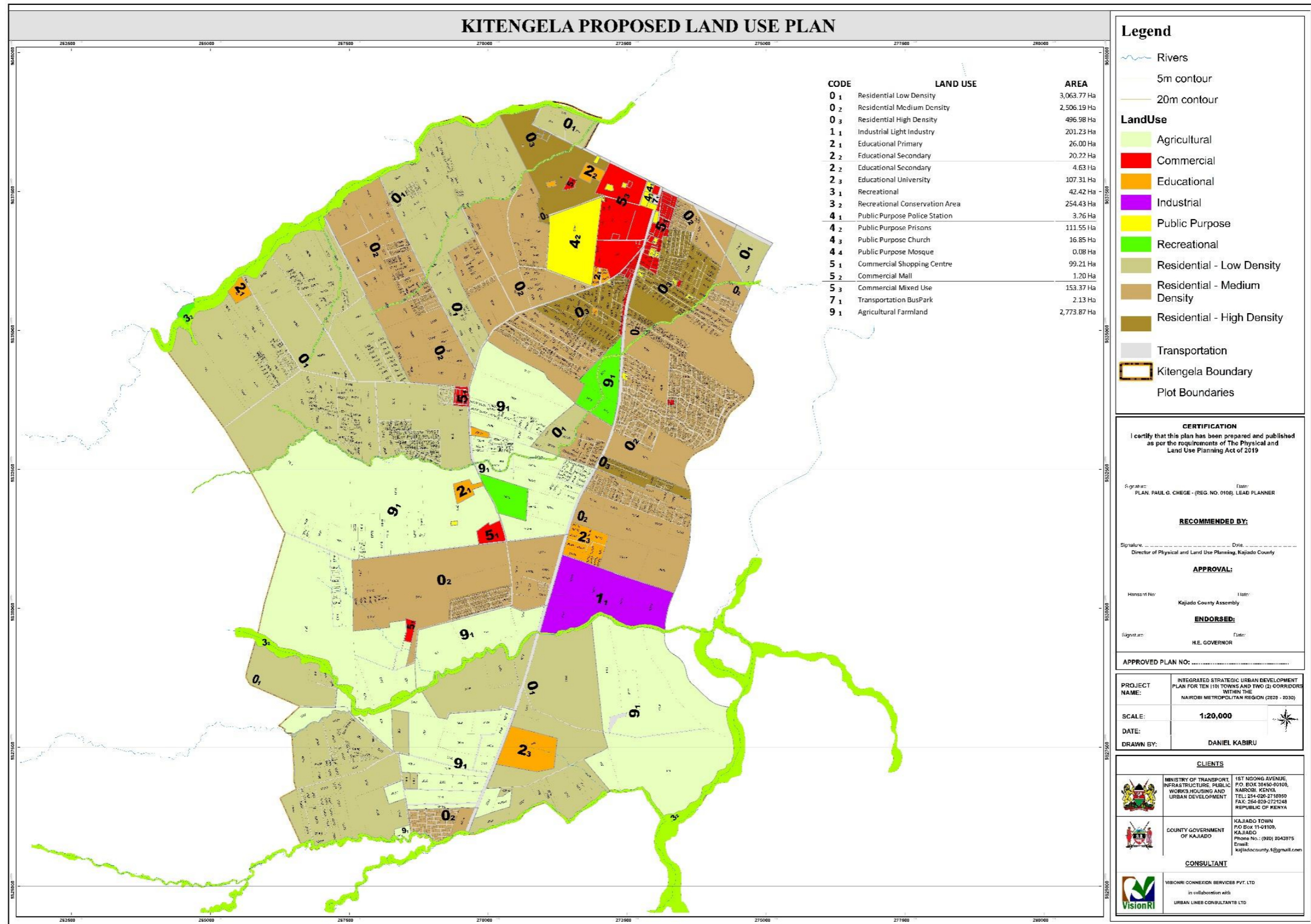
amongst others within residential areas. The minimum plot size proposed under light industries is 0.05 ha.

- **Commercial Land Use:** High density and compact commercial areas are proposed at the CBD's and along the proposed TOD at Namanga road. The existing commercial area is 0.69 % of the total developable areas within the planning area. This area is proposed to increase to about 0.74% of the total developable area by 2028. This is as a result of the proposed cluster level shopping areas, neighbourhood shopping and service centres, sub-sectorial commercial centres and wholesale markets amongst others. The adjacent area to the commercial area will be developed as a high-density mixed-use development area taking up 1.64% of the total developable land.
- **Education Use Plan:** The total land occupied by educational facilities is 1.42% of the area. Educational facilities are proposed within the residential areas and the CBD which will comprise of mixed land uses. Areas designated as purely educational purpose areas will increase to 1.69% of the total developable land. To secure land for educational facilities, the plan proposes the County to enforce the surrender of land by when private; landowners are subdividing land for sale or development. This should be done in accordance with Physical Land Use Planning Act No 13 of 2019, Land Act 2012 and other related Acts, and planning guidelines amongst others.
- **Public and Utility Purpose:** The current area under public purpose is 1.18% and that under public utility is 0.11% giving a total of 1.29%. The public purpose of land use will be integrated with residential and commercial developments. New proposed facilities such as sewer treatment plants, solid waste recycling centres amongst others will cause the land under public utilities and public use to increase. As noted above the County need to enforce setting apart/surrender when where the subdivision is being carried to ensure the proposed new development are adequately served.
- **Transportation Use:** The total area occupied by transportation will thus increase from the current 5.65% to 6.58% by the year 2028 to cater for the rapid growth in road transport and expansion of existing Roads. The minimal increase in road areas is since the majority of the planning areas is well networked with roads with only a few areas requiring new roads. The major developments in the roads' subsector will be expansion and upgrading of key road links and maintenance of other smaller roads.
- **Recreational Land Use:** Recreational facilities accounts for 0.05% of the developable area. For sufficient provision of recreational facilities by the year 2030, this plan has provided for an increase to 0.97% of developable land. This will be the exclusive recreational areas. Additional green spaces and recreational areas will be provided through the residential court system, at walkways including street furniture for the same purpose.
- **Agriculture Use Plan:** This plan proposes agricultural land uses in the undeveloped areas. These is with an aim to minimise the trade imbalance brought about by overreliance on neighbouring areas for the provision of food. It is however noted that the area cannot rely on rain-fed agriculture and that the soil will require further enrichment, activities that would require additional investment by the relevant authorities. However, once this is achieved Kitengela terrain would be ideal for its gently rolling landscape allowing for proper drainage and minimal destruction of structures and farmland by rainfall/water.

- **Land for Future Development:** This Plan proposes to reserve land for future development. The reserved land is in the areas to the west of the planning area. These areas will be retained as primarily farming areas with a bias towards greenhouse farming and irrigation fed agriculture. The minimum plot sizes will be retained at one acre for future subdivisions and no more than 30% development allowed on the properties.
- **Non-Developable Land (Fragile Areas):** Riparian reserves will be maintained as non-developable land and will be a forestation area to minimise human interference. This will include the land adjacent to major rivers and main natural drainage channels in the planning area.

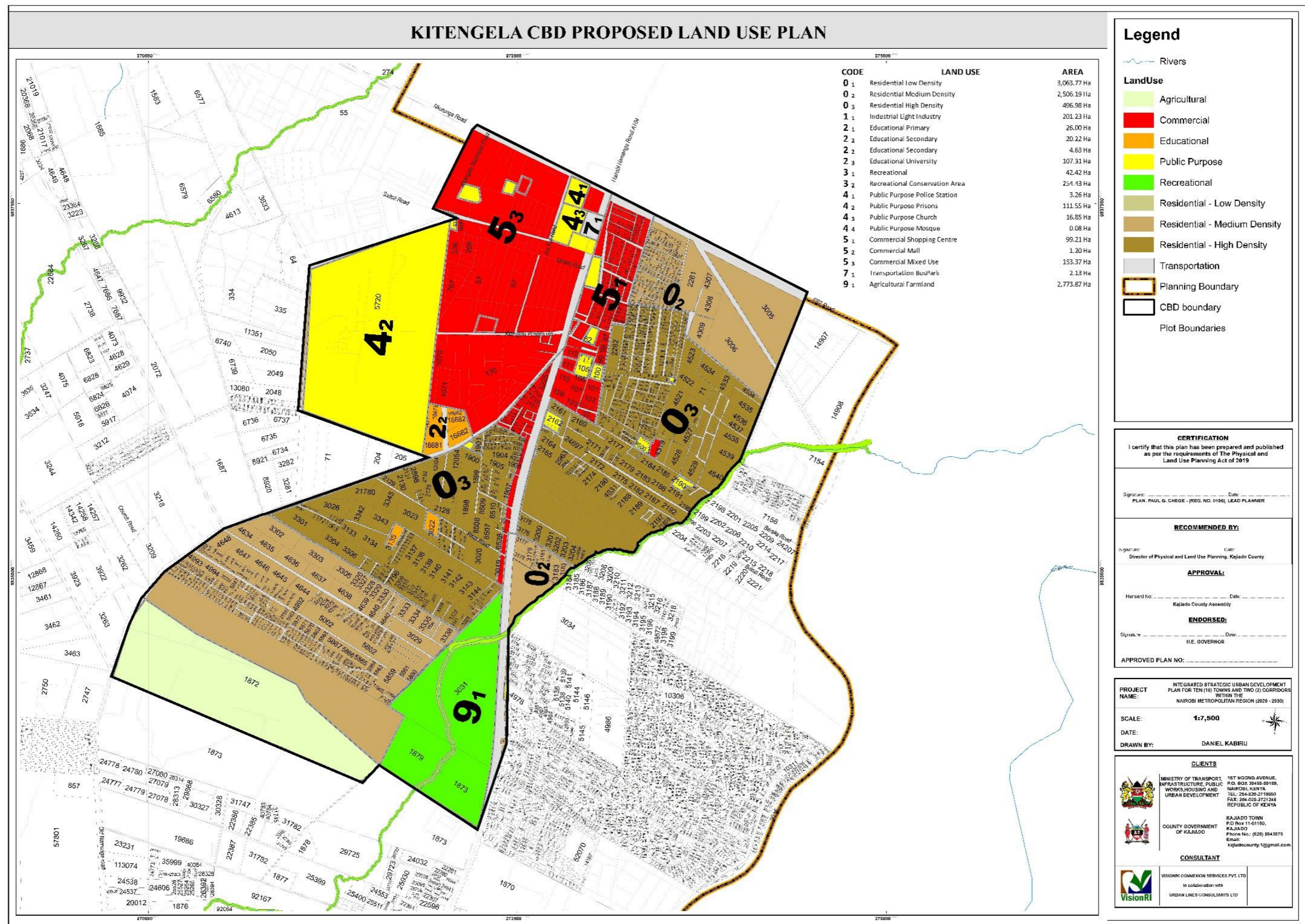
8.3 Proposed Land Use Zones and Regulation

The Land use plan proposes different land use as described above. This is guided by the situational analysis, land use requirements, the structure layout and the intended spatial structure as per spatial development model. The maps below show overall structure plan and detailed structure plans for the CBD and Eastern Kitengela which are two areas experiencing a lot of development. The maps below show the proposed structure plan for the overall Kitengela as per Map 8.1 and CBD as per Map 8.2 and Eastern side depicted in map 8.3. In addition Table 8.2 provides a detailed zoning guidelines for the various land use and areas.



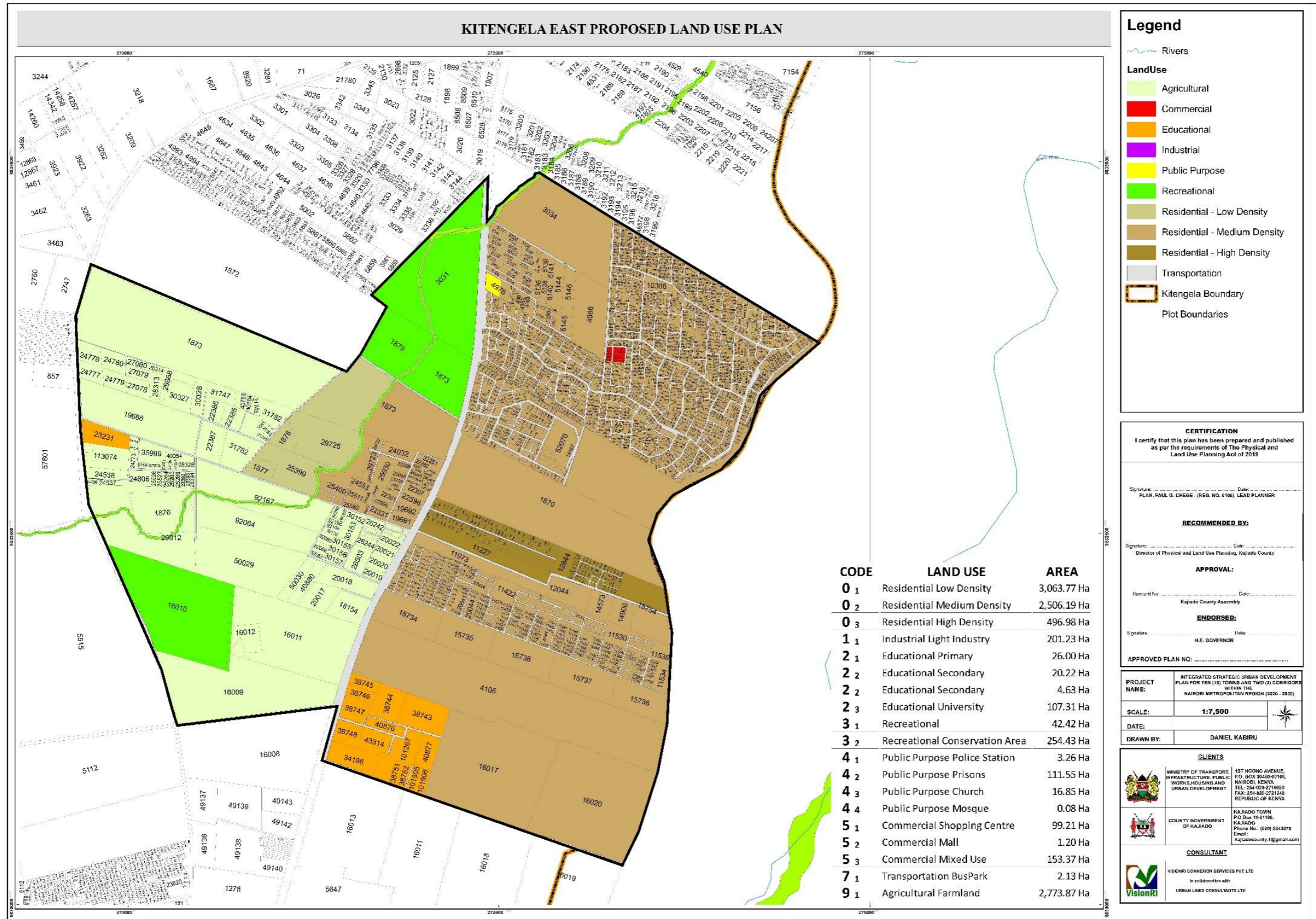
Map 8-2: Kitengela proposed land use plan

Source: VisionRI



Map 8-3: CBD proposed land use plan

Source: VisionRI



Map 8-4: Kitengela East Proposed land use plan

Source: VisionRI

Table 8-2: Detailed zoning guidelines for the various land use and areas.

Zone	Location	Structure type	Minimum area(Ha)	Building line (m)	Ground coverage %
Residential	G.K Prison, Mohammed estate, old Namaga road, Acacia road, Milimani estate.	Low -density residential housing Single dwelling units, maisonettes and bungalows.	0.2	6	50
	Utumishi, Yukos, Selelo, New valley B, Upper valley B, Kiang'ombe A and Kimmerland Estates.	Medium-density residential housing Single dwelling units, maisonettes and bungalows and gated communities.	0.045	5	65
	Noonkopir Estate, Kiang'ombe C, Kiang'ombe B, New valley A, Upper valley A.	High-density residential housing Multi-dwelling units(flats).	0.03		75
Industrial	Near Mohammed Estate bordered by R. Athi. EPZ Area.		0.4	8	50
Recreational	The area near Quarry and bordered by class (A104) road. The area bordered by Mohammed estate and Milimani B.	Recreational Park			
Public Purpose	Area bordered by G. o. K prisons and Noonkopir estate.	Social hall Fire station			
Commercial	C. B. D area Jua kali estate The area bordered by Mohammed estate,	Commercial blocks and mixed-use developments	0.05	6	80

Zone	Location	Structure type	Minimum area(Ha)	Building line (m)	Ground coverage %
	<p>Milimani B and the proposed ring road joining old Namanga road. The area bordered by Acacia road and Nairobi-Namanga road within Sifa farm C. The area bordered by Nairobi-Namanga road, Selelo and Kimmerland Estates.</p>				
Public Utilities	<p>G.K Prison Area Area bordered by R. Athi and Parkview estate Near the EPZ area. On the I.S.K pillar near the commercial boundary within Sifa farm B.</p>	Sewer treatment works			
Agricultural	<p>Sifa farm C – defined by Acacia road, Kisaju River, Namanga road and the commercial boundary.</p>	Agricultural farms	2		

Table 8-3: Proposed Land Use Zones and Regulation

Land Use Zone	Permitted use	Prohibited land use	Conditional land use
Residential	<ul style="list-style-type: none"> Residential dwellings such as bungalows, maisonettes, 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 metres 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. 	<ul style="list-style-type: none"> 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- matatu/boda-boda/buses; Hospitals treating contagious diseases (e.g. tuberculosis); and Prisons and garrison barracks. 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Wholesale and retail shops and stores, markets, advertisements and 	<ul style="list-style-type: none"> All commercial business uses and manufacturing establishments 	<ul style="list-style-type: none"> Sale of explosive obnoxious products and other materials

Land Use Zone	Permitted use	Prohibited land use	Conditional land use
	<p>merchandise, excluding not exceeding an area of 1000 Sq.m.;</p> <ul style="list-style-type: none"> • 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 Sqm; • 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 Sq.m; and • Warehouses, repositories and other uses connected with storage or wholesale trade occupying a floor area not exceeding 1000 sq.m but excluding storage of explosive or products which are either obnoxious or likely to cause health hazards. 	<p>obnoxious or hazardous nature by reason of odour, effluent, dust smoke, gas, vibration, noise etc. or otherwise likely to cause danger or nuisance to public health or amenity;</p> <ul style="list-style-type: none"> • 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. 	<p>likely to cause health hazards; and</p> <ul style="list-style-type: none"> • Convention centres, trade centres, market centre, travel agencies, agro-tourist centres.
Industrial	<ul style="list-style-type: none"> • Manufacturing and processing industries; • Slaughterhouses; • Storage warehouse and go-downs; • Sewerage treatment plants; • Industrial research centres; 	<ul style="list-style-type: none"> • Storage of petroleum, timber, explosive and inflammable and dangerous materials; and • All industries up to 200 H.P where sufficient precautions have been 	<ul style="list-style-type: none"> • All uses not specifically permitted in this zone shall be prohibited; and • All industries of obnoxious and hazardous nature by reasons or

Land Use Zone	Permitted use	Prohibited land use	Conditional land use
	<ul style="list-style-type: none"> • 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 on the premises; and • All industries using electrical power utilizing machinery not exceeding 100 H.P. 	taken to the satisfaction of the Authority to eliminate noxious or dangerous effluents.	odour, effluent, dust, smoke, gas, vibration etc. or otherwise likely to cause danger or nuisance to public health or amenity.
Educational	<ul style="list-style-type: none"> • Assembly halls, colleges, reading rooms, higher educational technology and research institutions. 		<ul style="list-style-type: none"> • All uses not specifically permitted in this zone shall be prohibited.
Recreational	<ul style="list-style-type: none"> • Parks and open spaces and playgrounds • Zoological and botanical gardens, nurseries; • Waterfront developments, museums and memorials; • Open-air theatres, exhibition, circus, fairs and festival ground; and • Gymnasium, water sports training centre and swimming pool. 	<ul style="list-style-type: none"> • Installation of Electric Motors not exceeding; • H.P. may be permitted for pumping water; • for 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. 	<ul style="list-style-type: none"> • Buildings structure can be permitted not more than 2 % of the total area.

Land Use Zone	Permitted use	Prohibited land use	Conditional land use
Transportation	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Hotels, exhibition ground and convention centre; and • All related to the development of the roads and other transport modes including essential housing. 	<ul style="list-style-type: none"> • All uses not specifically permitted in this zone shall be prohibited.
Agriculture	<ul style="list-style-type: none"> • 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 fertilizers. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • All uses not specifically permitted in this zone shall be prohibited.

8.4 Land Use Regulations

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/heights of the building. The table below shows indicative dwelling unit sizes.

Table 8-4: Proposed dwelling unit sizes (sqm)

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)

Density of Development

Population size, plot coverage and the number of dwelling units per plot defines density in development. 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 the purpose of 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 8-5: Proposed number of dwellings and space allocation per dwelling

Type of Dwelling	Density	No of Dwellings per Ha	Space Allocation Per Dwelling Unit in sqm
		Proposed	Proposed
Bungalow detached	Low density	10	1000
	Medium-density	16	500
	High density	35	417
Semi-detached and row housing	Low density	35	300
	Medium-density	50	333
	High density	80	250
Multi-family dwellings	Low density	50	200
	Medium density	60	167.6

Type of Dwelling	Density	No of Dwellings per Ha	Space Allocation Per Dwelling Unit in sqm
		Proposed	Proposed
	High density	70	142.8
	Special Density (Rental Housing)	133	75

Building Lines (setback 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.

Table 8-6: Proposed setbacks

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

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:

Table 8-7: 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

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 8-8: Proposed plot sizes, plot coverage and plot coverage.

Land use	Typology	Minimum Plot size (Ha)	Maximum Plot Coverage %	Plot Ratio
Low density residential	Bungalow	0.2	50	1:3
	Maisonette	0.2	50	1:3
Medium-density residential	Bungalow	0.045	65	1:3
	Maisonette	0.045	65	1:3
	Multi-family dwelling	0.045	65	1:4- 1:6
High density residential	Detached	0.03	75	1:4- 1:6
	Semi-detached		75	1:4- 1:6
	Multi-family dwelling	0.025	75	1:4- 1:6

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 square metres;
- The road shall not be less than 12 metres abutting the plot and in case of existing plot in built-up areas, a 9-metre 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.;
 - and
 - 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 to 12 m wide;
- There should be a minimum 10-15 % of the area for landscaping and developed as park and buffers (organised open space);

- Minimum 10 m wide buffer should be provided all along the industrial area with tree plantation; and
- One car space parking per 100 square metres floor area be provided.

The size of plots, plot ratio and setbacks permissible in industrial estates are given in the table below.

Table 8-9: 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

Educational Use

The size of plots, plot ratio and setbacks permissible in educational plots are given in the table below.

Table 8-10: 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 Plus1
Secondary schools	3.4	30	1: 0.9	Ground Plus2
Special schools	3.5	30	1: 0.6	Ground Plus1
Youth polytechnic	3.5	30	1: 0.6	Ground Plus1
Research institute	10	20	1: 0.8	Ground Plus3
University	50	10	1: 0.4	Ground Plus3
Engineering college, national polytechnic	10	20	1: 0.8	Ground Plus3
Medical training college	10	20	1: 0.8	Ground Plus3
Management training/ teachers training institute	5	30	1: 1.2	Ground Plus3

Health Facilities

The size of plots, plot ratio and setbacks permissible in plots under health facilities are given in the table below.

Table 8-11 Land requirements land requirement for 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

Public Purpose

The size of plots, plot ratio and setbacks permissible in plots under public purpose use are given in the table below.

Table 8-12: Requirements for the 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

Recreational Facilities

The size of plots, plot ratio and setbacks permissible in plots under recreational facilities are given in the table below.

Table 8-13: Requirements of Plots in Recreational Use

Public Purpose Facility	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. of floors allowed
City park	10	1.5	1:0.015	1 (Ground)
Amusement park	10	10	1: 0.2	2 (Ground Plus One)
Zoo	10	5	1:0.5	1 (Ground)
Integrated sports centre-City 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)

9. SECTORAL PROGRAMMES AND PROJECTS

9.1 Introduction

This chapter provides sectoral strategies and 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 utilization of all the available.

The implementation of the plan requires the collective efforts of various agencies. The key institutions include Kajiado County government, various government ministries, departments and parastatal organisations, neighbourhood associations, other local community groups, landowners and the general public. The period for each action has been given indicating the expected implementation time, i.e. short term, medium-term or long term. Short-term projects are those that are to be implemented within two years, medium-term between three to five years and long term beyond and ten years.

9.2 Natural Resources & the Environment

Challenges facing the environment include encroachment of riparian reserves, air & water pollution, un-rehabilitated quarries, dust and soil erosion. These shall be solved through the following strategies.

9.3 Strategies

- i. **Protect riparian reserves:** This is through creation of riparian zones of at least 30 metres. Trees and other vegetation cover should be planted within the riparian reserves and incompatible land uses such as solid waste disposal sites should be discouraged.
- ii. **Prevent soil erosion and dust:** Construction of gabions and vegetation cover should be done to curb soil erosion. Control of dust will range from a simple act of sprinkling water on the earth surfaces to setting up of suitable barricades to serve as buffer zones at the quarry areas. Pennisetum Purpureum plants can be used to trap dust from quarries. Wind carrying dust particles towards human settlements can be intercepted by Pennisetum purpureum along the paths.

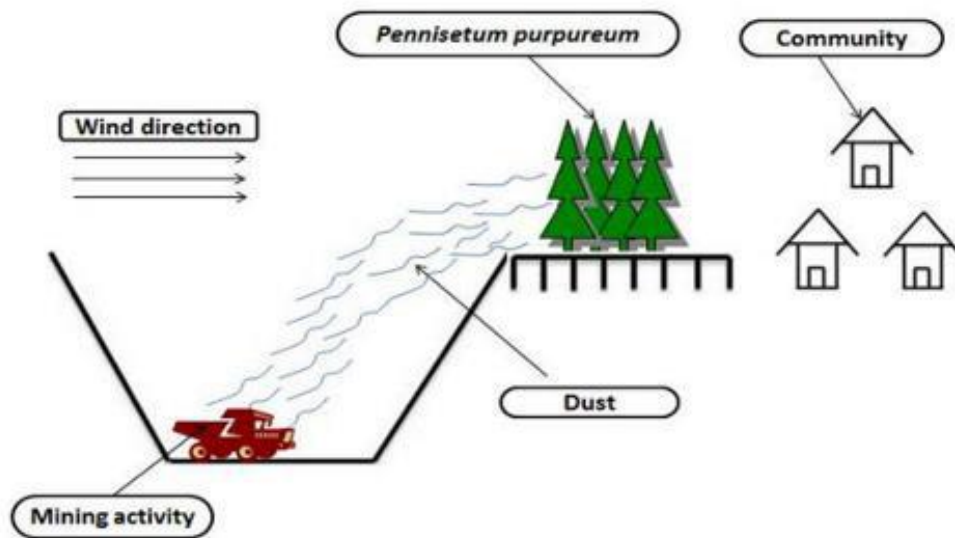


Figure 9-1: Dust barrier model

- iii. **Protect water resources:** Zoning areas for water conservation and watershed management should be delineated. Dams and pans should be constructed to increase water capacities. Other strategies include protection of rivers from pollution through creation of buffers zones.
- iv. **Protect over-extraction of resources:** The Government should enforce strict control on quarrying activities including; the need for formulation of quarrying by-laws by Kajiado County to regulate and manage to quarry and require Environmental Impact Assessments for any new quarrying projects. Enforcement of quarrying standards has been lacking.
- v. **Afforestation:** The planning area lacks forests, therefore, land should be demarcated and set aside for forest areas. Trees should be planted in these areas to increase the vegetation cover of the forest.
- vi. **Maintain Air Quality:** An air quality monitoring system may be established in specific sites that are representative of the air quality in Kitengela. Data collected can be used to analyse the impacts of air quality in Kitengela.
- vii. **Community sensitisation:** Communities that live within the proximity of the river, and amongst those who have already encroached into the riparian should be sensitized on the significance of observing a riparian distance as stipulated by WARMA-the Water Resources Management Authority. An acceptable distance ranges from 6-30 m; 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).
- viii. **Planting trees along the riverbanks:** Planting bamboo trees as buffers zones will also protect the riparian effectively, stabilize soils and restore the natural vegetation which is diminishing. However, it is important to avoid planting eucalyptus trees.
- ix. **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

- x. **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 operationalization of environmentally negative projects.
- xi. **Rehabilitation of abandoned quarries:** This would be through the formulation of quarrying by-laws by Kajiado County 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 plan.

Below Map 9.2. Shows the areas which needs to protect.

NATURAL RESOURCE AND ENVIRONMENT

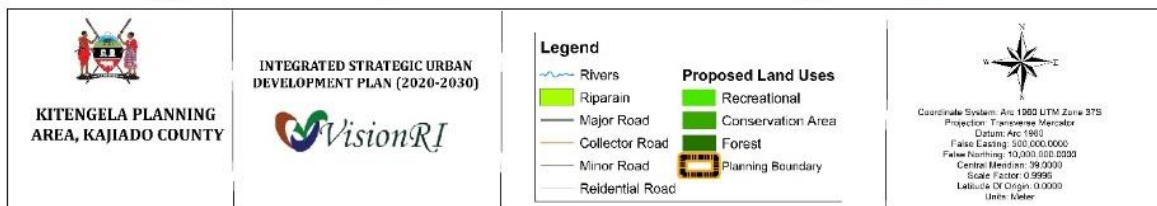
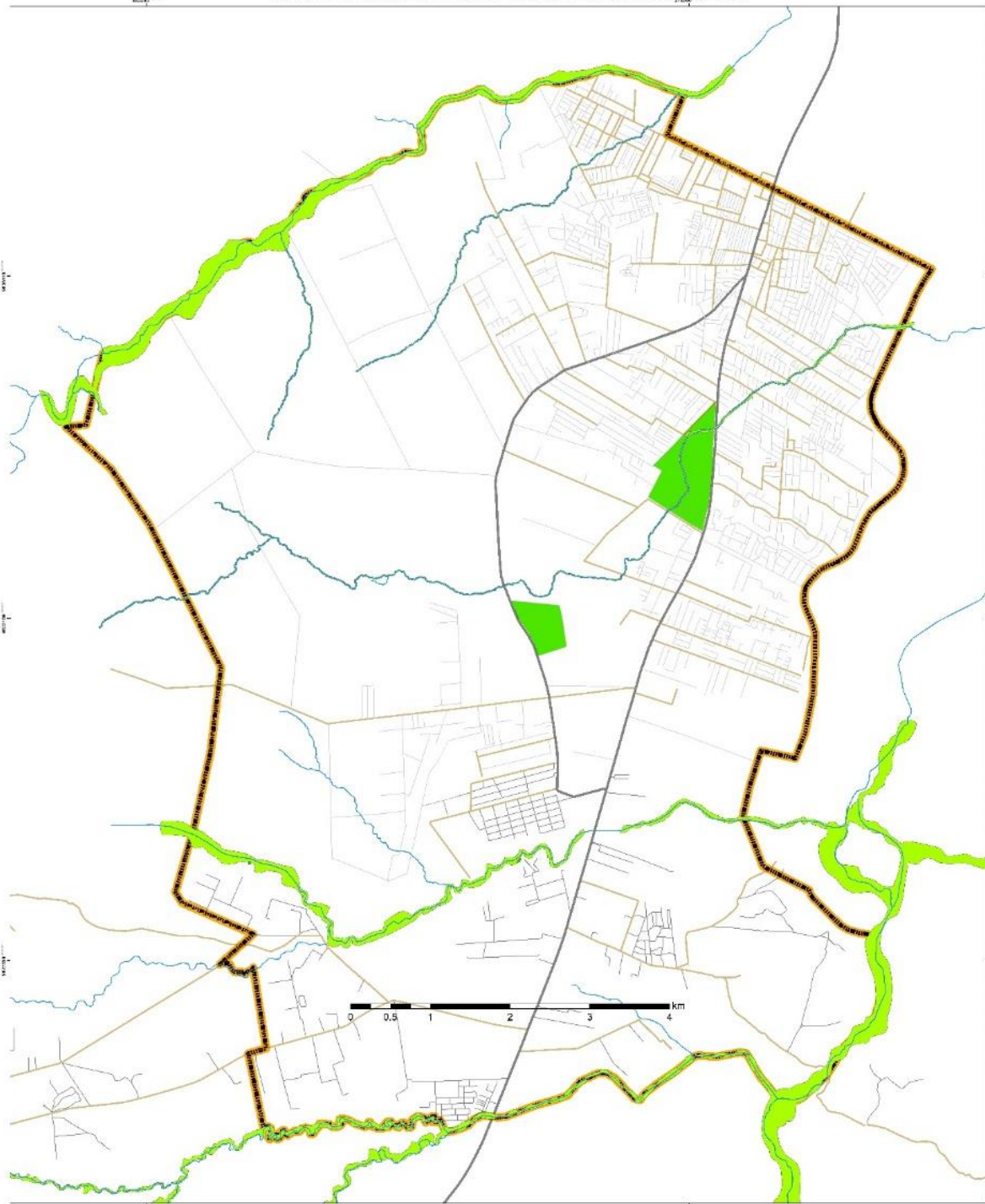


Figure 9-2: Proposed Conservation Areas

Source: VisionRI

9.3.1 Physical Infrastructure

The main challenges include acute water shortage, lack of a sewer system, poor solid waste management, poor drainage systems and under-utilisation of other sources of energy. The following strategies shall be used to solve these challenges.

Strategies:

- i. **Increase water supply:** The major water reservoirs should be located at the highest elevation next to the survey pillar (elevation 1674m). Wayleaves should be provided to enable gravitation flow to various locations. The plan proposes increased funding to TANATHI water and sewerage company. Other strategies include; fully utilize permanent and seasonal rivers, assess groundwater potential, drill and equip boreholes, revive and empower community water committees, develop major pipelines from permanent rivers and encourage households to adapt rain harvesting technology as well as water recycling.
- ii. **Integrated solid and liquid waste management system:** Two new sewerage treatment plants are proposed. One should be located next to River Athi while the other across the railway line next to the stony Athi. The two are necessary because of the ground slopes on either side of the Class A104 highway. A joint effort between Kitengela and Mavoko urban areas may be explored in liquid waste management. Immediate intervention for the built-up commercial area is to connect to the EPZ sewerage system.

A solid waste recycling centre should be developed to manage solid waste. Other proposals are creating composting sites for biodegradable waste at subsector level, installation of bins and waste collection facilities. Incineration facilities should be developed at level 4 and all level 3 hospitals within the planning area. The current solid waste disposal site which is a dumping ground in a stream requires to be decommissioned promptly after the establishment of an appropriate and well-managed disposal site. Other proposals are creating composting sites for biodegradable waste at the installation of bins along the roads and markets and the CBD and waste collection facilities.

- iii. **Construct new drains and missing links:** New stormwater drains should be developed for the management of stormwater drainage while the existing drains should be maintained. This 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.

Over and above the above measures a stormwater drainage master plan is to be developed to ensure concerted effort in surface drainage. Such a master plan would analyse water discharge volumes for various regions and their projections, mechanisms of management as well as the reticulation system to ensure localised flooding does not occur.

9.3.2 Social Infrastructure

There are inadequate public schools and inadequate facilities, high teacher-student ratio, inadequate health facilities, inadequate recreational areas, lack of cemeteries and crematorium. These shall be solved through the following strategies.

i. Education

Strategy: Increase and expand educational institutions

- i. **Primary Schools:** Primary schools have been proposed at a catchment population of 1:4000, taking a pupil enrolment of 40 per class for a three-streamed school from class 1-8. Therefore, one primary school should have a maximum number of 960 pupils. At least one primary school should be provided in each residential land use block.

Table 9-1: Projected number of primary schools

Year	Population Projection	No. of Primary Schools Present	No. of Primary Schools Needed	Deficit
2019	154,433	26	39	-13
2020	170,273		43	-17
2022	206,995		52	-26
2024	251,636		63	-37
2026	305,905		76	-50
2028	371,877		93	-67
2030	452,077		113	-87

By the end of the planning period, there should be 113 schools with current existing at 26 including private ones. There will be a need for 87 new schools with the land requirement of 3.9ha for a catchment population of 4,000 people.

- ii. **Secondary schools:** In 2009, the town required 19 secondary schools (1:8000 people) compared to the existing two schools showing a deficit of 17 schools. One school of 480 pupils would be required for a population of 8000. The land requirement for a secondary school is 4.5 ha for a catchment population of 8,000 residents. Therefore, at the end of the planning area, there should be 35 secondary schools and 157.5 ha of land is required for the development of schools. However, to reduce demand for land high-rise school buildings need to be encouraged.

Table 9-2: Projected number of secondary schools

Year	Population Projection	No. of secondary schools present	No. Of secondary schools needed	Deficit
2019	154,433	2	19	-17
2020	170,273		21	-19
2022	187,738		23	-21
2024	206,994		26	-24
2026	228,226		29	-27

Year	Population Projection	No. of secondary schools present	No. Of secondary schools needed	Deficit
2028	251,635		31	-29
2030	277,445		35	-33

The schools should be at a walking distance of 500-600 metres. At a gross density of lower than 50 persons per hectare, a school transport system should be implemented.

Other major challenges facing the provision of education in the planning area are inadequate facilities in existing schools, overcrowding in classrooms and understaffing. To arrest this situation, the other strategies include; upgrading, renewal (renovation) and the expansion of existing schools. Whereas the overcrowding problem could easily be addressed through the provision of more public schools. As such, the expansion of existing schools to a minimum of three (3) streams is desirable. To combat understaffing, the Department of Education jointly with the Ministry of Education should ensure that more teachers are posted to the area.

Health facilities

Strategy 1: Increase/expand existing health facilities

Planning standards prescribe one health centre and one district hospital for every 20,000 and 50,000 persons in the population, respectively. The table below presents the projected growth in the number of health centres and hospitals in the planning area during the development plan period.

At the end of the planning period, the area will need 14 health centres and a land requirement of 42 ha.

Table 9-3: Projected Total Number of Health Centre

Year	Population Projection	No. of Health Centres Present	No. of Health Centres Needed	Deficit	Acreage Requirement
2019	154,433	9	8	1	
2020	170,273		9	0	
2022	206,995		10	-1	3
2024	251,636		13	-4	12
2026	305,905		15	-6	18
2028	371,877		19	-10	30
2030	452,077		23	-14	42

There will also be a need for 7 main hospitals requiring 28 ha of land.

Table 9-4: Projected Total Number of Hospitals

Year	Population Projection	No. of Hospitals Present	No. of Health Centres Needed	Deficit	Acreage Requirement
2026	305,905	2	6	-4	16
2028	371,877		7	-5	20
2030	452,077		9	-7	28

Strategy 2 = Establish emergency medical services

- Procure ambulances for the hospitals; and
- Ensure sufficient provisions for target group-oriented specialised facilities.

This ISUDP proposes provisions for a care centre for the blind and a communicable disease hospital.

- **Markets:** The current market under construction is to be upgraded to ensure that it is able to handle the full capacity of the traders. It is also to be developed as a sectioned multi-storey development to accommodate different type of traders including *jua kali* artisans.
- **Security Facilities:** The town has a police station and three police posts. An additional police post is proposed at Noonkopir area due to the high crime rate in the area.
- **Fire Station:** Kitengela has no fire station. A fire station has been proposed within Kitengela.
- **Library:** The town has no library, and 0.4 hectares should be provided for this facility.
- **Social halls:** There are no social halls in Kitengela. The social halls should be located in positions along main pedestrian routes not isolated and away from main lines of pedestrian movement. 0.5 hectares of land will be needed for the creation of social halls.

On-Going and Planned Projects

The government rolled out the digital literacy programme to incorporate the use of technology at the primary level. In 2017, free day secondary education programme was commissioned as well as school meals feeding programme in public education institutions. A public street lighting initiative at old Namanga road budgeted to cost Kshs 4.8M and Kitengela town budgeted for Kshs 57.6M is the planned projects by the government.

SOCIAL INFRASTRUCTURE

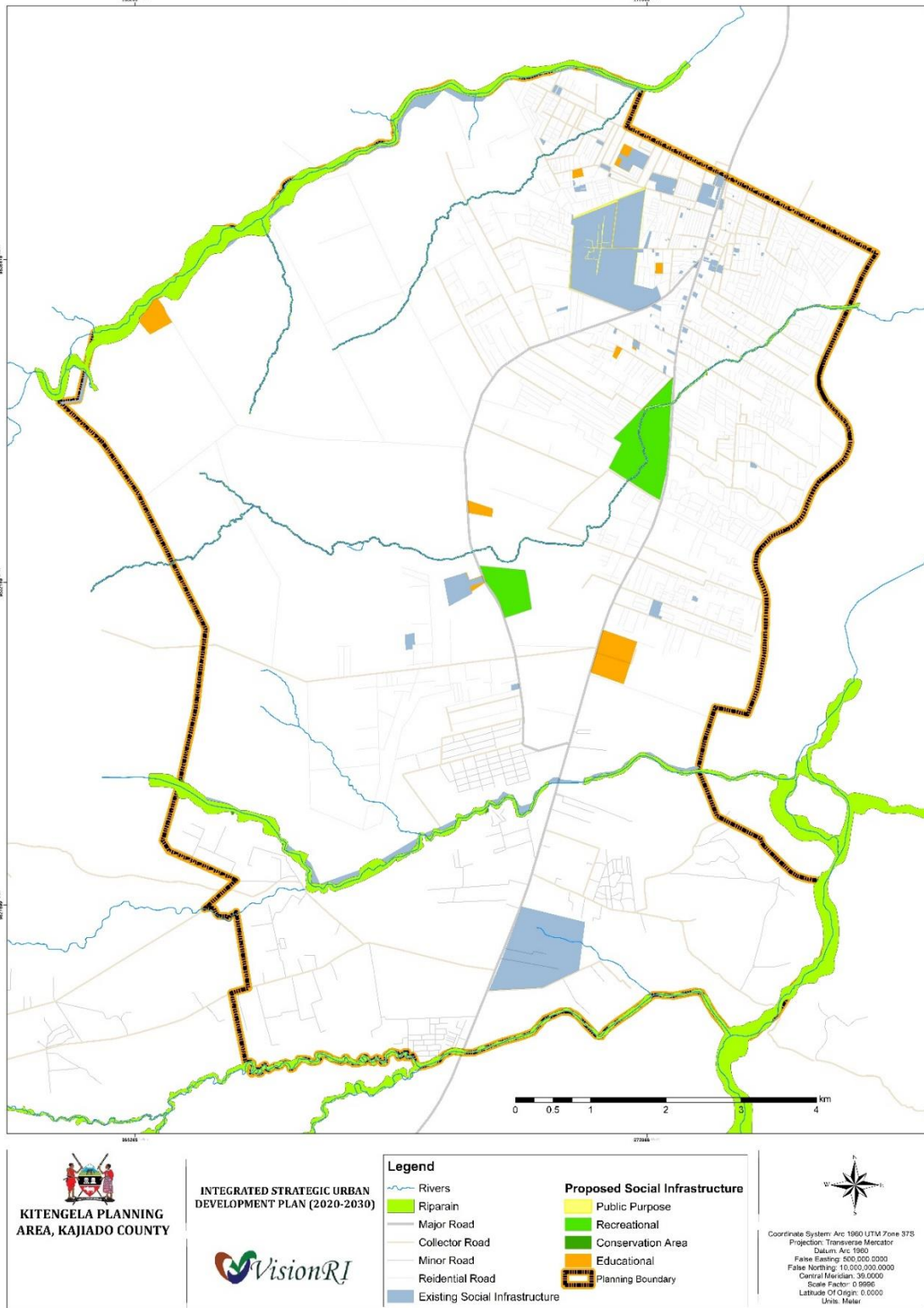


Figure 9-3: Proposed social infrastructure

Source: VisionRI

9.3.3 Local Economy

Strategies: Creation of proper external links to Kitengela town to facilitate the movement of people, goods and services to and from the town, and overcome drought constraints to both crop and animal production using underground water. Farm production system to be organised on smallholder and large scale.

Other strategies include:

- Linkage of tax registers to Geographical Information System (GIS). The County should conduct surveys to set up and regularly up-date registers of land parcels in the area (with details as to their numbers, sizes, location, use, and details of owners) and registers of businesses operating in Kitengela This will facilitate improved assessment, invoicing and collection of revenue due to the County;
- Encourage the growth of the SMEs sector and promote hi-tech and low volume-high value-added industries, which are not labour intensive; and
- Encourage modernization and technological up-gradation of existing industries required for day-to-day needs of the people of Kitengela and develop a Special Economic Zone (SEZ). The indirect employment in SEZs will depend upon backward and forward linkage of the SEZ industry with local supplies of raw materials and the employment opportunities generated by the operations of the SEZ.

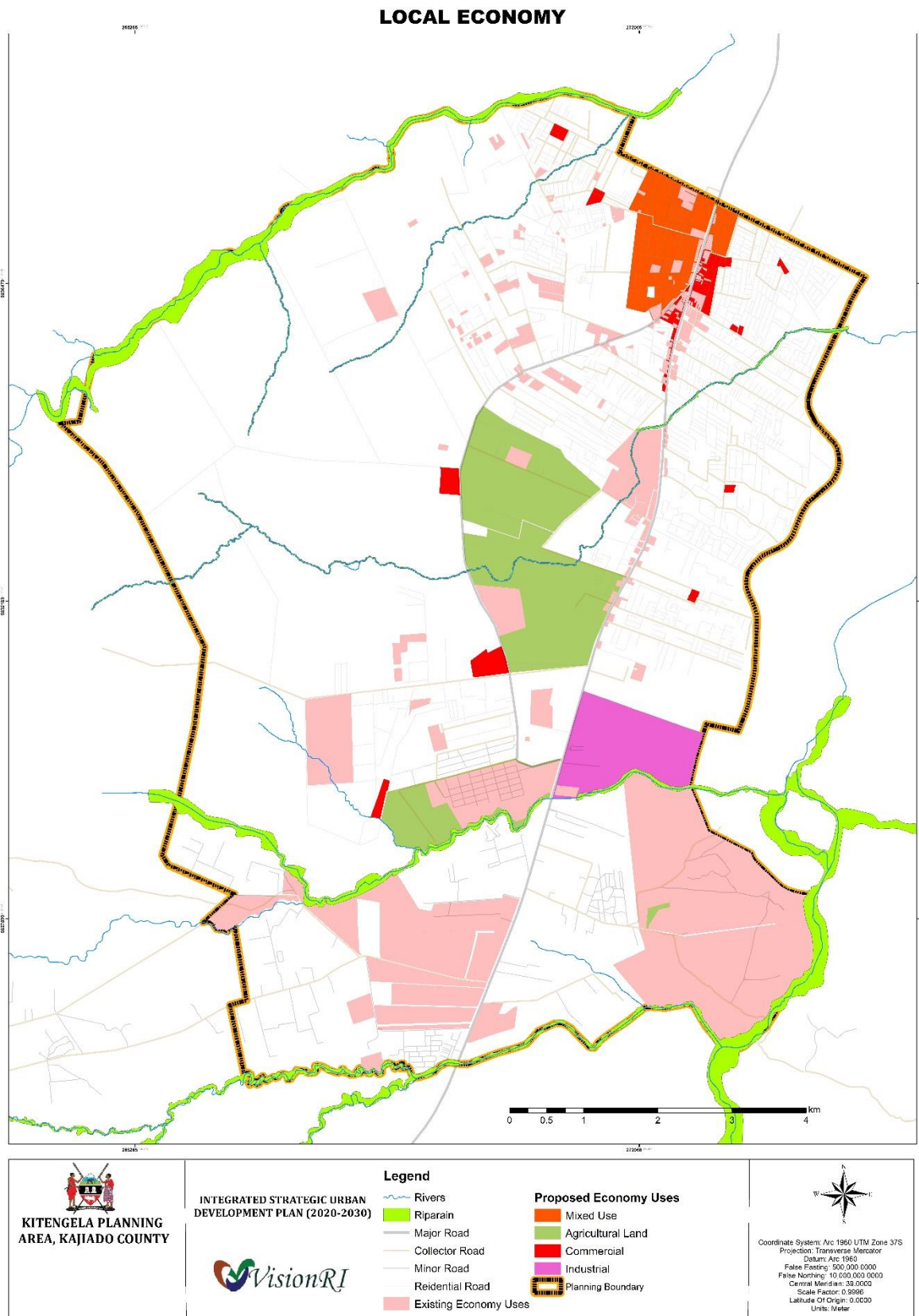


Figure 9-4: Proposed agricultural and commercial areas

Source: VisionRI

9.3.4 Land Administration

In order to manage the outlined challenges, the following are the proposals that could be incorporated:

- Capacity building in the Lands office including surveying, mapping, valuation, town planning and land management processes and departments;
- Increase human capital;
- Come up with a one-stop-shop for all land transactions. This will reduce the number of departments/personnel handling an application hence hasten the process;
- Digitization of land registries to enhance effectiveness, monitor land transactions and reduce the loss of revenue;
- Include a private registered physical planner in the Land Control Boards to provide professional support in land planning matters; and
- Organising Community planning clinics to create awareness to the public on the importance of planning.

Strategies & Recommendations

The proposed recommendations are as follows:

- Registration of all the land buying and selling properties companies by the Ministry of Lands;
- Registration and licensing of all buying and selling companies by the County Government under the Department of Physical Planning;
- Mandatory requirements of all the buying and selling land companies to have at least one planner to advice on all planning regulations relating to land;
- Land banking: Due to the scarcity of public land and increasing prices of land, it is important that the County government in consultation with the national government consider acquiring land for future public projects. The land so acquired should be protected from further allocation to private individuals by successive County and/or national government;
- There is need to encourage and /or develop an appropriate legal framework to facilitate collaborative development and/or partnership for land acquisition by private developers that ensures that land is acquired at reasonable prices and the landowner also benefits. This will ensure that housing prices and rents are reasonable and cost of living manageable within the County; and
- Development of low-cost housing to ensure that the poor have access to housing.

Housing Development

There is inadequate county government housing, non-adherence to building codes and construction of sub-standard housing. These challenges shall be solved through the following strategies.

On-Going and Planned Projects

Construction of housing units for national police and prisons services by the national government which is 20% complete.

Strategies

- **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 to deter the low-density residential sprawl that is witnessed in Kitengela. Other ways that will encourage densification include high density along the major roads, re-densification of areas with low densities and increase of plot ratio and coverage.
- **Housing development fund:** The other strategy includes formulating a Housing Development Fund to be financed through budgetary allocations and financial support from development partners and other sources. This will be used in the provision of adequate housing by the County.
- **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 utilization of land through vertical growth.
- **In-fill development:** The consultant proposes to use vacant and underutilized land for optimal utilization of land for future demand for housing. This land can be used for the development of infrastructure and housing.
- **Planning for varying land-use intensities:** This will be through distinguishing between central business districts (CBDs), village-level shopping centres, low density to medium density housing areas, and open spaces. The various land uses will have different regulations and specifications.
- **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.
- **Setting and enforcement of zoning policy:** The zoning policy will cover minimum design standards, such as plot sizes, level of infrastructure, type of housing, materials of construction, and the like to be observed by private developers.

Other interventions should include land adjustment, road widening and surrenders of land for a public purpose and utilities and provision of amenities.

In addition, facilitating increased investment by the formal and informal private sector, in the production of housing for low and middle-income urban dwellers

Table 9-5 Housing projections

Income level	Housing stock projections						
	2019	2020	2022	2024	2026	2028	2030
High	1,980	2,183	2,654	3,226	3,922	4,768	5,796
Middle	9,900	10,915	13,269	16,131	19,609	23,838	28,979

Income level	Housing stock projections						
	2019	2020	2022	2024	2026	2028	2030
Low	27,719	30,562	37,153	45,165	54,906	66,747	81,142
Totals	39,598	43,660	53,076	64,522	78,437	95,353	115,917

There is a total of 115,917 units of housing required by 2030. For these housing demands to be met, the County Government will require to liaise with the national government as well as private developers. The county's role in this will be that of an enabler by creating the right environment for developers. It will also play the role of the regulator by ensuring the right zoning standards are applied and ensuring that the requisite support facilities and amenities are provided for in housing developments.

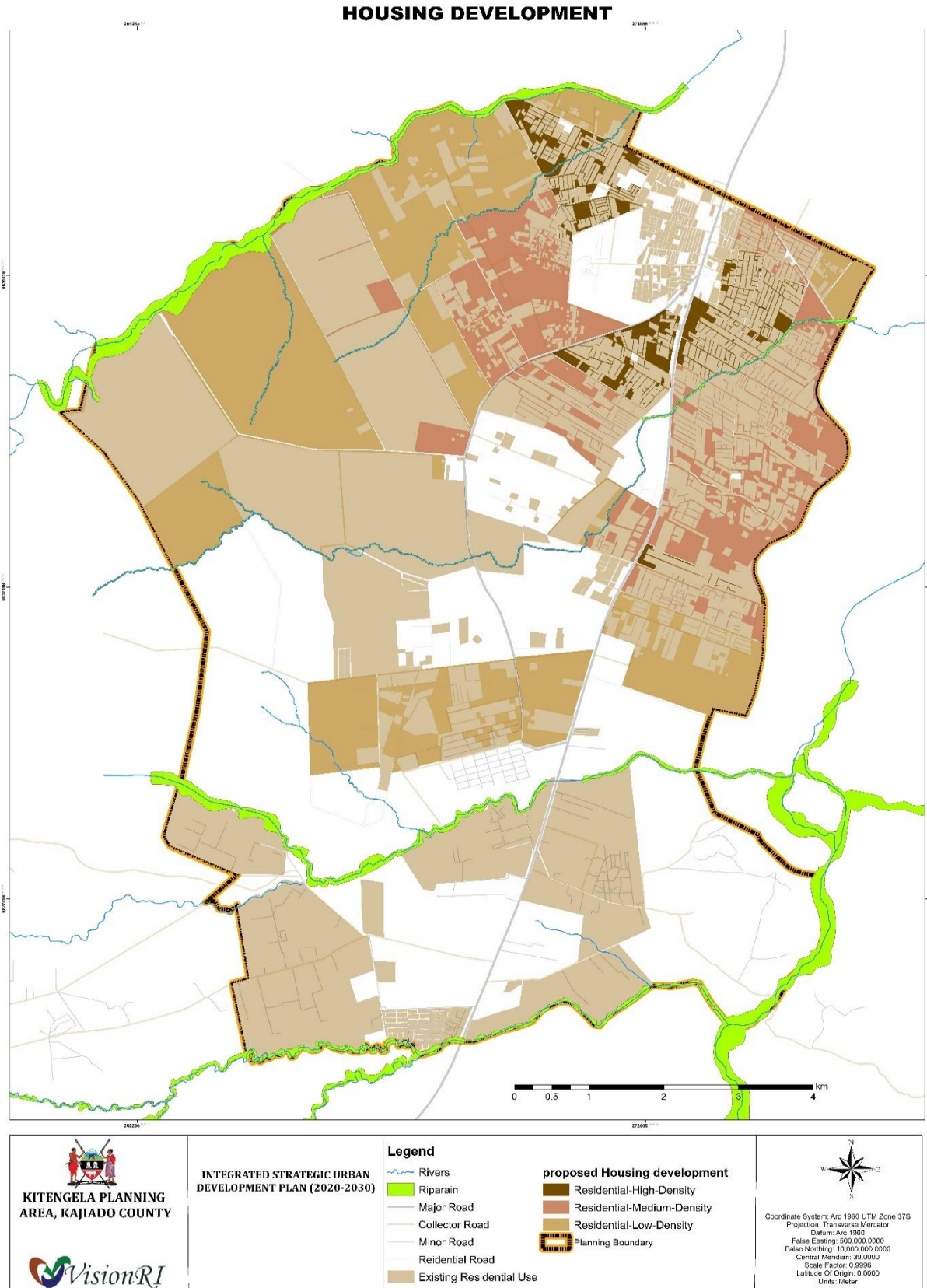


Figure 9-5: Proposed residential areas

Source: VisionRI

9.3.5 Transportation

Kitengela faces traffic congestion, lack of NMT facilities, poor road conditions, narrow roads, use of Namanga road as the main access road to residential areas, lack of street furniture and traffic lights. The following strategies shall solve these issues.

Strategies

i) Road network

The road network in Kitengela should be improved to enhance intra-connectivity of the area. The county government should acquire funds/land for the bus park and improve compliance of standards and regulations. It should also provide funds for redesign and construction of access roads for local vehicles. Lastly, the public-private partnership should be facilitated in road construction and upgrading.

It is envisaged that the collector streets would segregate the different kinds of traffic. Between the collector street and the major transit, a green belt buffer is proposed which will combat the air and noise pollution in the area. An attempt should also be made to provide dedicated cycle tracks, overpasses and underpasses in the major corridors, which will be linked with sector level, segregated non-motorized corridors.

Similarly, two bypasses will be introduced running parallel to the existing spine, These are the Northern and Southern Bypass as highlighted in Figure 9-6. The link roads from Namanga road to these bypasses will be upgraded and tarmacked to ensure maximum interconnectivity within Kitengela. This proposal would also involve tarmacking of access roads to provide alternative access to neighbourhoods that currently have direct access to Kitengela town. Proposed roads to be tarmacked include:

- i. Old Namanga road
- ii. Kwa chief-market road
- iii. Nyika road
- iv. Kitengela- Ongata Rongai road
- v. Saitoti road
- vi. Discovery road
- vii. Balozi road
- viii. Imani avenue

Efforts should be made to demarcate the road to avoid future encroachment.

The other strategy is the creation of high capacity public transport system. High capacity public transport system could be offered through the following ways:

- Strategic link roads are to be upgraded to link with other towns at a regional scale. This is to include two major road upgrades:
 - i. Kitengela-Ngurunga-Ongata Rongai Road (through Nazarene university area).
 - ii. Maasai farm-Birika Road (links to pipeline road to Kiserian).

The Kitengela-Ngurunga-Ongata Rongai will provide direct access between the two towns while at the same time improving transportation of material from the quarry. Given the views along this road, the hotel will be boosted by the encouraging tourists to visit this side of Nairobi national park. The Maasai farm-Birika road will encourage more interconnectivity with Kiserian town as well as Ngong Municipality. These strategic link roads are as outlined in Figure 9-7 below.

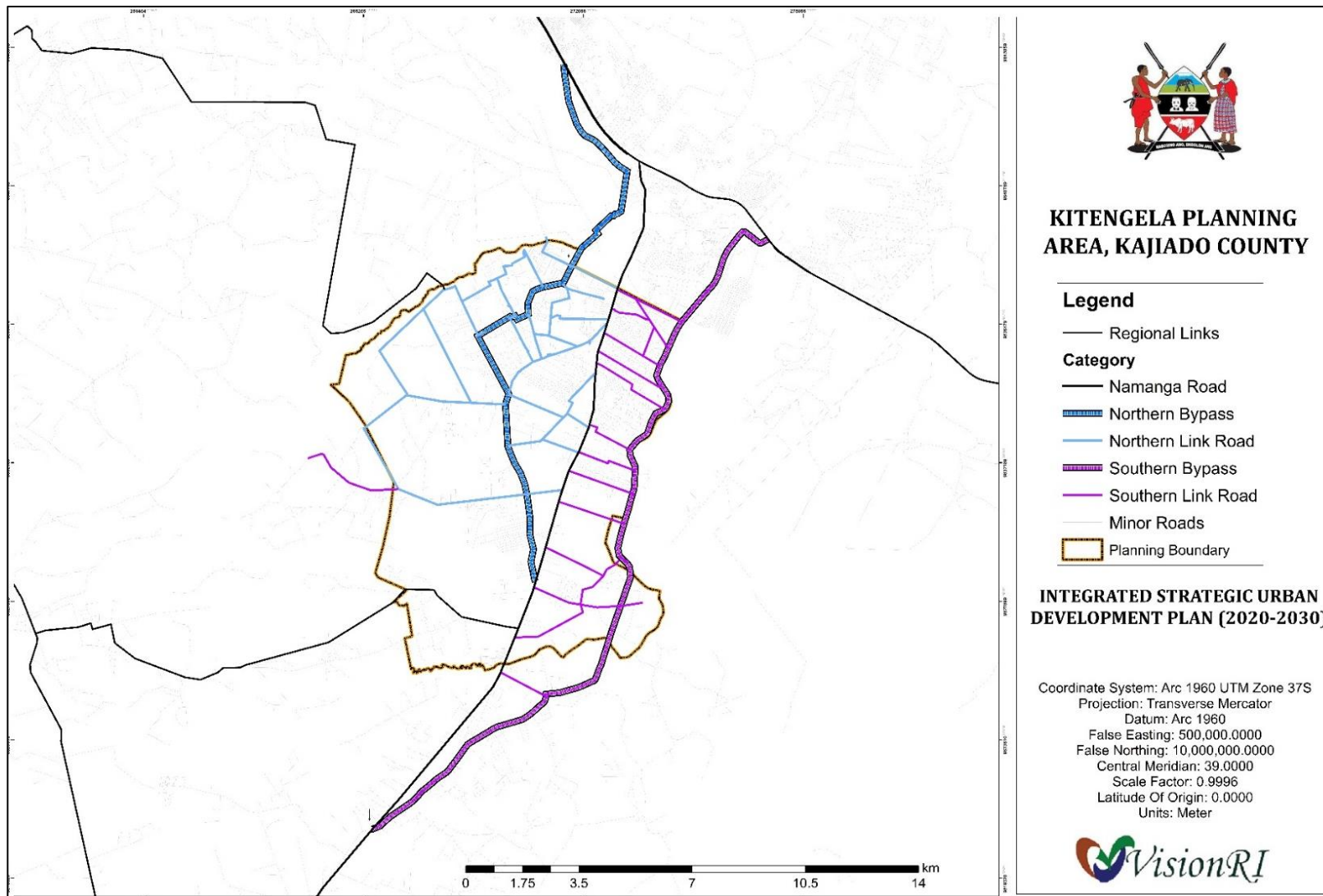


Figure 9-6: Kitengela road transport strategy

Source: VisionRI

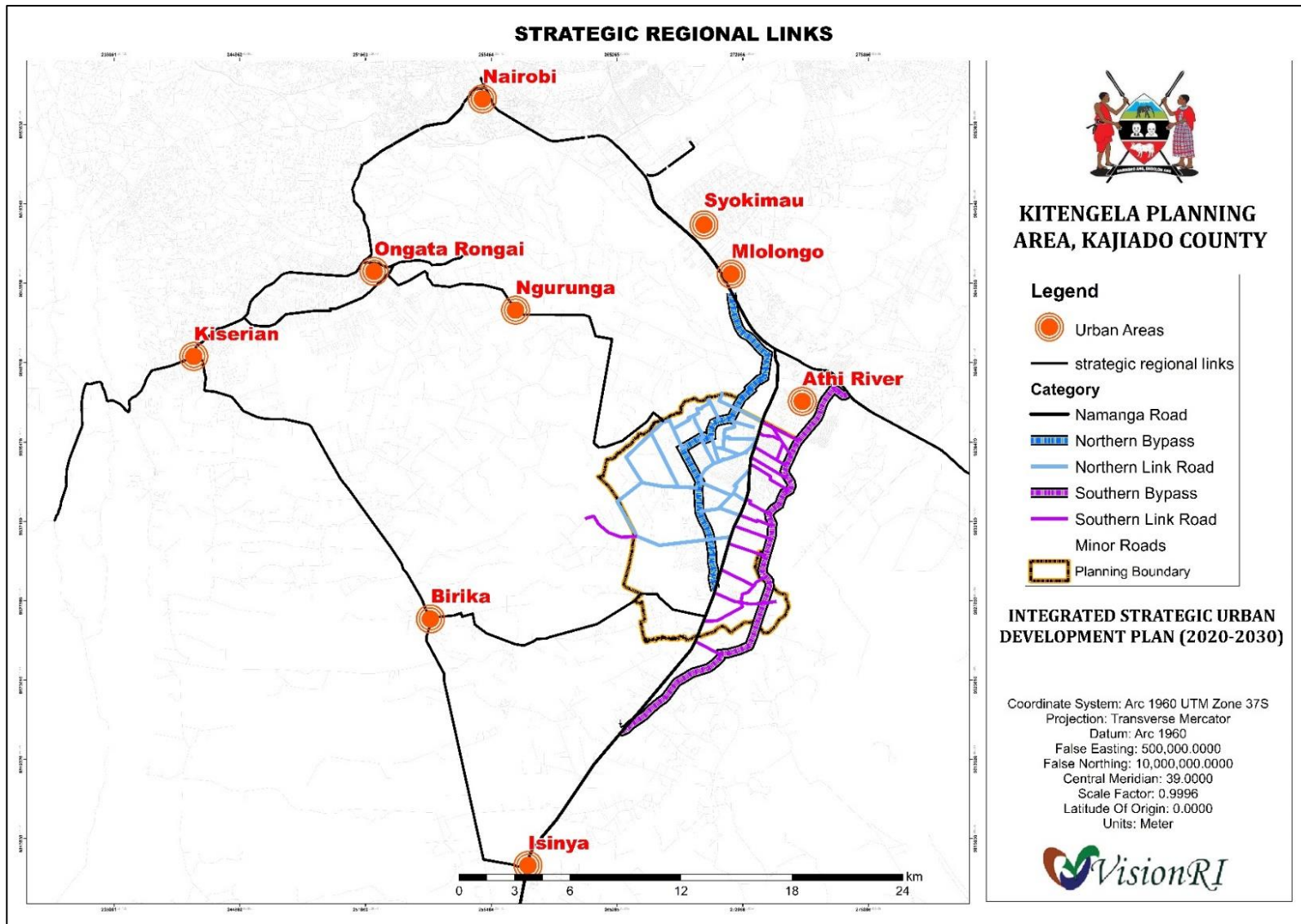


Figure 9-7: Sectoral regional link

- i. **Upgrade of existing Namanga Road:** The existing Namanga road requires an adequate upgrade to ensure that through and local traffic is separated. Entries and exits are to be at a minimum distance of 700 metres and should all be grade-separated.

Namanga road is to remain at an elevated position in comparison to the service roads. All the service roads are to be tarmacked and extended to Yukos from EPZ road. The elevated position of Namanga road is also to aid in allowing for ground-level pedestrian and vehicular crossings. All the vehicular crossings in the CBD are to be provided with adequate and well-guarded pedestrian ways. There shall also be separate pedestrian crossings under the main highway. All crossings will be done on grade¹ with the service roads. No underground tunnels will be done to avoid flooding

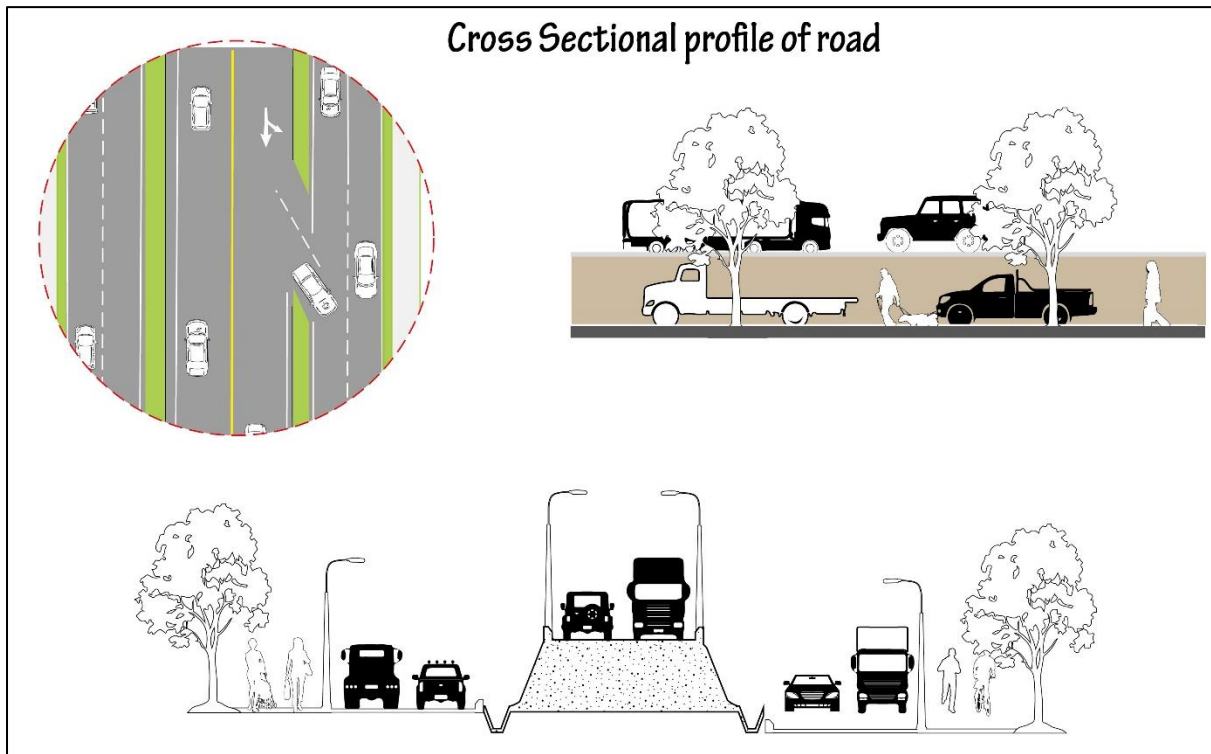


Figure 9-8 Cross sectional profile of proposed Namanga road design

¹ On Grade: at the same level ie. Ground level

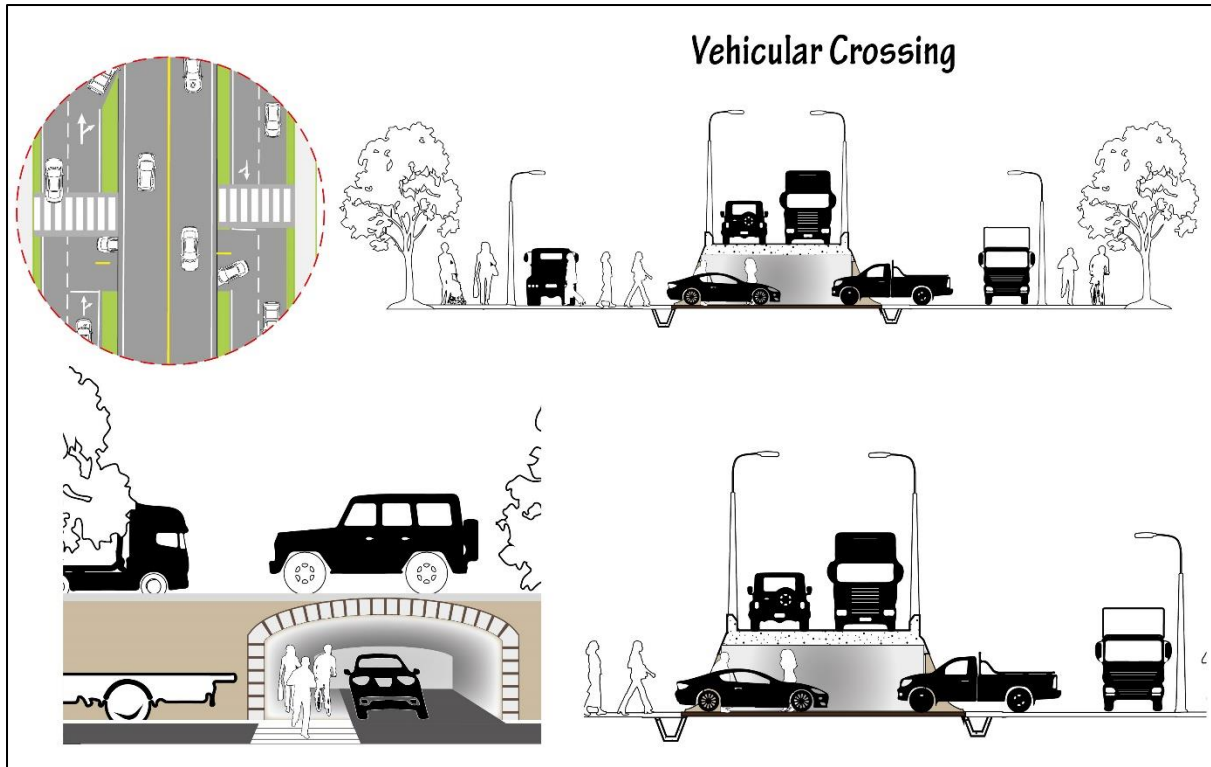


Figure 9-9: proposed vehicular crossing tunnels for Namanga road

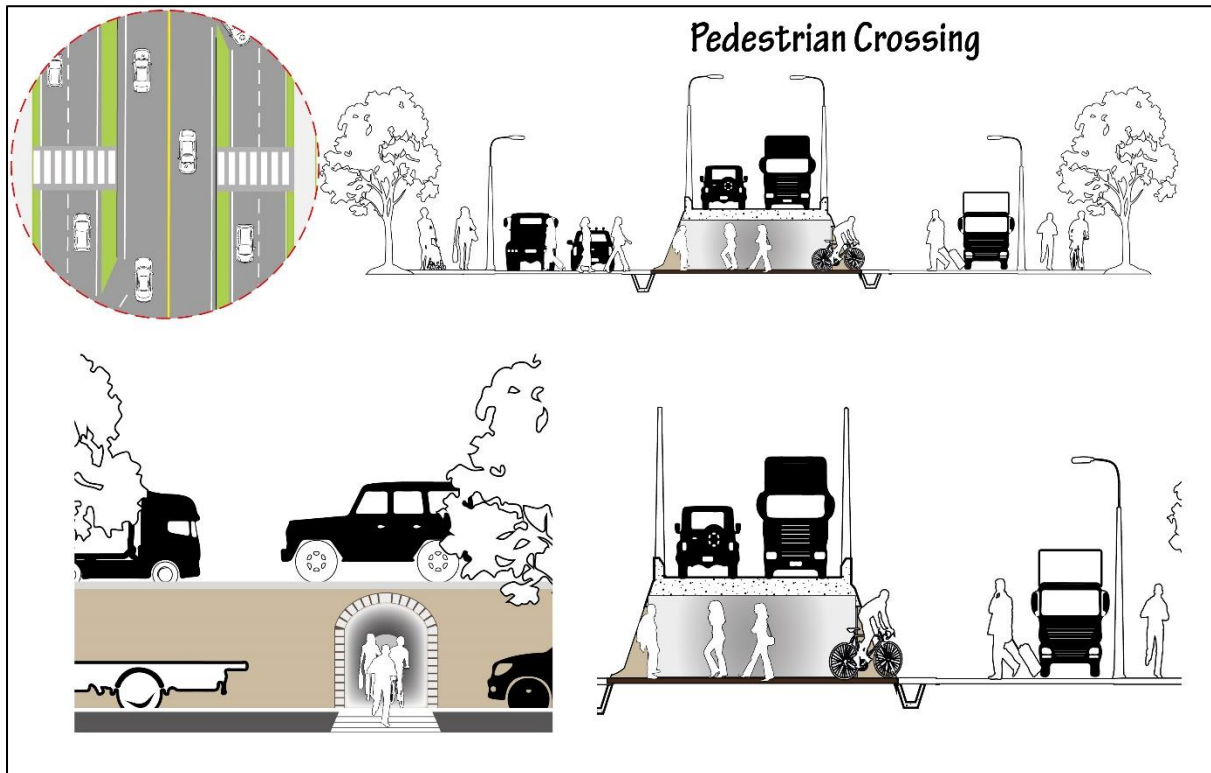


Figure 9-10: proposed pedestrian crossing tunnels at grade with the service roads

- ii. **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

will be controlled from a central system and bus route and timing related information will be 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 is proposed along the main/primary trunk road Namanga road.

- iii. **Introduction of city bus service:** A city bus system can be introduced as a new public transport system in Kitengela. It could be designed in a way to provide high quality, reliable, comfortable, accessible and affordable public transport system. The city bus services can play along Old Namanga road.
- iv. **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.

The Railway line from Mombasa to Nairobi is abutting the Kitengela area. LRT system can be used to link Kitengela to the city of Nairobi, proposed Konza city and other regions. This will reduce travel time, traffic and cost of transportation within the region. Strategic railway stopping points and storage facilities should be developed along the railway lines.

- v. **Transit-oriented development:** To reduce the traffic congestion experienced along Namanga road in the region, a transit orient development (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.

Transit-Oriented Development Corridor (TOD) is proposed to be developed at Namanga road connecting Kitengela to Kajiado and Namanga. 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 the bus-based or rail-based transit system. A minimum 60 metre Right of Way (RoW) is proposed for the TOD corridor.

- vi. **Increase parking facilities:** To increase the parking facilities, multi-storey car parking is proposed to be developed at the Kitengela bus park and commercial developments. Tuk-tuk's and bodaboda 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 private and public partnerships. New developments at the CBD should be encouraged to incorporate the multi-storey parking designs.

- vii. **Create pedestrian facilities:** From the situational analysis, it is clear that most of the pedestrian activities happen along the gravel roads, i.e. Kwa chief- Market road, Balozi road, Discovery road, Saitoti road and Imani avenue. The pedestrian trips include work, business and school trips. Pedestrian pathways on both sides with a width of 2 m is recommended. Landscaping, planting of trees and establishment of street furniture and lighting should also be incorporated along the pedestrian pathways to promote the pedestrian activities.
- viii. **Street Lighting:** All the major link roads apart from being upgraded will be fitted with streetlights to facilitate better mobility, road safety and security during night-time.

Where already fitted, maintenance will be done to ensure they are adequately working. Namanga road and old Namanga road will be the first to be fitted with streetlights along their entire stretch in Kitengela.

Other roads to be installed the street lighting include EPZ road, Road to Ngurunga - quarry (CBD Stretch), Main internal Link Roads in the CBD and all the main access roads to the major estates such as Chuna, Muigai, Milimani as well as the Maasai farm road (Road to Birika).

- ix. **Construction of waiting bays and NMT facilities:** NMT include handcarts, bicycles and animal-drawn handcarts. NMT traffic is high at the gravel roads. Motorcycle taxis waiting for bays in the planning area, as well as provisions for NMT users, will be constructed, especially on the bitumen and gravel roads.
- x. **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.

Programmes & Projects

The county government launched and funded improvement of the prison road to a bitumen standard road. This will greatly help in intra-connectivity within the town as well as reduce the use of the main arterial road. The Kenya Railways Corporation is planning to expand the existing commuter rail service to Kitengela and that will complement the town's function as a transport hub.

9.3.6 Tourism and Heritage

Kitengela has inadequate tourism and heritage sites, poor road connectivity and inadequate five-star hotels.

Strategies: Development/upgrading of tourist infrastructure i.e. the hotels and guesthouses within the proposed commercial areas. In addition, roads leading to the tourist's sites should be improved through tarmacking

The Maasai history and culture can be used to boost tourism in the planning area through the establishment of a Maasai cultural centre that will display the Maasai artefacts and cultural heritage. In addition, the Maasai market at Naivas mall can be boosted through the provision of adequate space whereby Maasai beadwork is can be displayed and sold to the tourists and locals as well. This will create more 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.

A tourism circuit should be developed to link the Kaputei Athi plains with the Nairobi national park. To realize this, a tourist circuit map will be developed showing the tourist routes that will link the tourist sites.

9.3.7 Disaster Risk Management

The main disasters include climate change, fires drought and famine and floods. The strategies will solve these challenges.

Strategies

- To reduce disasters, it is proposed to develop better coordination amongst institutions responding to disaster incidences, integrate disaster risk reduction in building approvals and establish fully equipped disaster management cum rescue centres;
- Acquire firefighting equipment;
- Create a Town Disaster Management Authority;
- Identify indicators of disaster risks and disaster-prone areas in Kitengela;
- Develop an early warning system including guidance on how to act upon warnings;
- Enhance the capacity of human resource, equipment and infrastructure;
- Reduce response time for any disasters within the town and decentralize and equip disaster management units;
- Quarrying accidents can be reduced through training of workers on accidents prevention and management. Safe quarrying procedures can be drafted by NEMA; and
- Implementation of occupation health procedures should be enforced during the occupation of a building to access whether it is in a good habitable condition.

10. ACTION AREA PLANS

These are action-oriented plans for specific areas with specific interventions designed on the basis of 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. Kitengela bus park, market and Kitengela quarry were identified as the areas that need urban design interventions.

10.1 Purpose of urban design

The purpose of urban design of Kitengela bus Park and Market Area, as well as the Kitengela Quarry, is to indicate action areas for immediate development or re-development. This will enhance physical needs of citizens; promote safety, security and protection of residents; provide an environment free of pollution, noise, accidents, and crime; foster a conducive social environment bringing in a sense of community; bring about an appropriate image and prestige; heighten creativity and self-expression in neighbourhoods and finally boost the aesthetical appeal and pleasantness of the proposed action areas.

10.2 Objectives of Urban design

The specific objectives of urban design in Kitengela are:

- To enhance the strong visual impact of Kitengela CBD through improved aesthetics;
- To boost the development of Kitengela through the attraction of new investment and the creation of more employment opportunities;
- To facilitate functional efficiency through improved infrastructural design; and
- To rehabilitate Kitengela Quarry thereby enhancing improved environmental conditions of the Sub County and provide social services.

10.3 Action area 1: Kitengela bus park and market area

10.3.1 Issues/challenges

The existing bus park is inadequate to accommodate all the matatus, boda-bodas and Tuk-tuk. Therefore, the boda-bodas and Tuk-tuk's park along the Namanga road. One of the challenges to the growth of businesses and the economy identified by stakeholders in Kitengela is the undeveloped market. The improvement of Kitengela market will also contribute to the quality of the CBD's urban environment.

10.3.2 Principles and Goals

The urban design goals will serve to ensure that the future development of the Kitengela bus Park and Market Area, as well as the Kitengela Quarry precincts, meet the desired character, vibrancy, comfort and convenience necessary to attract residents and businesses. These principles are:

- i. **Ease of movement and Pedestrian Comfort:** Wide sidewalks and pedestrian safety strategies, will be implemented to make walking safe and comfortable. Streets and pedestrian walkways must be enjoyable to walk, must link key destinations, and must operate at a fine scale. Communities must also be compact and concentrate on a critical mass of people and activities to support walking.

- ii. **Environmental Conservation/Sustainability:** The environment is a key driver in transforming our development patterns and living choices. It is imperative to take action to enhance and conserve the quality of the air and land. The natural conditions, native ecology of environmentally sensitive areas should be rehabilitated.
- iii. **Conviviality:** Urban environments should be social and lively with spaces for personal solace, companionship, family and community.
- iv. **Public Space:** The availability of natural areas, parks, and other spaces that are open to the public have a profound value to an urban area.
- v. **Compact development/Densification:** It is necessary to use the internal urban potential through the effective use of limited territorial urban resources. This can be achieved through urban densification/infill densification/urban compaction.

10.3.3 Action area proposals

The following section highlights the urban design proposals for the Kitengela bus park and market area as well as the Kitengela quarry precincts.

Kitengela bus park and market area

Site 1 Analysis

The streetscape in the Kitengela CBD is generally disorganised due to the inadequacy of pedestrian sidewalks, street furniture (such as barriers) and parking areas which results to a lack of definition of spaces for pedestrians and vehicles. Bad road conditions at the interior of the CBD further contributes to the disorganisation of the streetscape. Buildings in the CBD are built in a compact manner in a mixture of a single storey to mid-rise developments with no distinct architectural theme amongst the buildings and structures.

Public transport service is available and adequate, in the form of matatus and buses. The intermediate public transport includes boda boda, taxis, tuk-tuk and bicycles. However, the heavy traffic jams experienced in the town reduce the effectiveness of road transport. There is also only one designated Bus Park in Kitengela that is constructed by the County Government which was relocated from its former location at the CBD to the outskirts of the CBD.

As for the Kitengela market, it is an important location for the local farmers who engage in irrigation-based farming, particularly horticulture and floriculture; horticulture crops like tomatoes, onions, cabbage, spinach and a number of fruits are grown around the town and sold which are then sold in the local market.

Kitengela market can be accessed through the Kwa Chief-Market Road that links A104-Kitengela open-air market. The 7m wide gravel type road is in poor condition with no drainage and no NMT facilities. The users include the pedestrians, private cars, boda-bodas, human & animal-drawn carts and Freight vehicles moving to and from the Market. Road reserve encroachment coupled with the presence of heavy vehicles to and from the market, the very narrow road, the human and animal-drawn carts, the lack of a drainage system makes access to the market difficult. The roads reserves near the market have been encroached on including the Kwa Chief Market Road and the Nyika Road that serve as access points.

The development of the market is supported by the efficiency of the transport network. Thus, it is vital to consider both the market and the adjacent bus stop that serves as a link between the market and the people.



Kitengela Bus Stop and Market Site

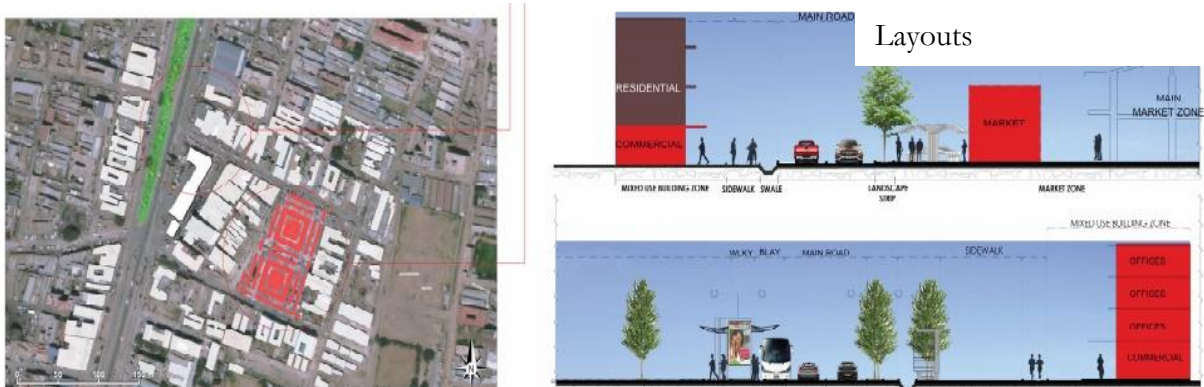


Figure 10-1: Kitengela bus park and market area Urban Design Proposal

10.4 Action Area 2: Kitengela quarry

10.4.1 Issues/challenges

Potential agricultural and productive lands are being converted into quarries. Kitengela currently contributes a significant amount of the construction stones that are used in Nairobi. There are several quarries for construction stones in the area. Most of the quarries are not properly decommissioned and lack site rehabilitation through proper re-vegetation measures. Quarries are considered environmentally sensitive areas in the Kitengela ISUDP. Quarrying activities have the potential to lead to landslide disasters. In addition to this, the borrow-pits and open quarry sites also affect scenic beauty negatively. Quarrying sites are a source of noise and air pollution in Kitengela. Despite these encumbrances, the quarries have positively impacted the housing market in the area. The identified quarry is located on private property owned by the Karsan Ramji and Sons Ltd Company

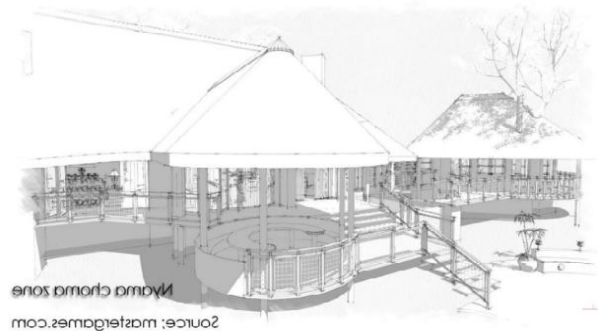
10.4.2 Proposed intervention

The intervention will target the restoration of the natural conditions, native ecology, and the re-integration of the quarry into the external environment. The aim is to convert the site into a recreational zone.

The figures below show the proposed interventions.

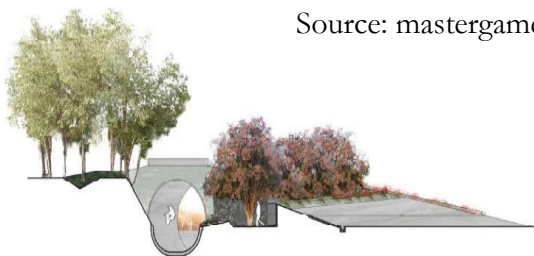


Figure 10-2: Kitengela quarry urban design proposal 1



Roller Skating Rink

Source: mastergames.com



Roller Skating Rink Cross Sections

Source Google Images

The design will include four critical zones; rock climbing zone, the motocross zone and the Nyama choma zone, and a roller-skating rink.

Figure 10-3: Kitengela quarry urban design proposal 2

10.5 Conclusion

In line with the Kitengela ISUDP, the proposed designs will achieve the following:

- **Improved transport infrastructure:** This will cater for the backlogs in transport provisions that have resulted to downstream issues such as difficulty in mobility, hygiene, pollution and a general lowering of the quality of the urban environment.
- **Upgraded the CBD:** The design will upgrade the CBD through the improvement of the bus park and public market that will also contribute to upgrading the quality of the CBD's urban environment.
- **Increased social infrastructure:** This will be achieved through the creation of more public spaces that will also serve to increase the quality of the urban environment. This will cater to the tremendous rate of increase in Kitengela's population
- **Environmental conservation and protection:** The natural conditions, native ecology of environmentally sensitive areas such as the quarries will be rehabilitated. This will also be utilized through careful planning and design to reintegrate the quarry into the urban fabric. This is especially important because there is a serious challenge of the conversion of potential and productive agricultural land into quarries most of which are not properly decommissioned and rehabilitated.
- **Improved economic infrastructure:** The County Spatial Framework (CSF) calls for the strengthening the County's economic infrastructure including the open-air market. The proposal will address economic development challenges also in line with the CIDP that calls for the construction of modern markets.
- The proposal will provide services necessary for an urbanising population such as parks and playgrounds.

11. PROGRAMMES AND PROJECT IMPLEMENTATION PLAN

The Implementation Plan for this ISUDP defines how the plan will be implemented over the 10- The project implementation Plan for next 10-years planning period derived from the sector strategies and activities as discussed in Chapter 10 above. The plan contains the various plans and projects to be implemented and institutions responsible for implementing the various projects.

The time period for implementation of the various projects will be implemented within three phases i.e. short 2020- 2022, medium 2022- 2025 and long term 2025-2030. The sector-wise implementation schedule and a proposed budget is shown the matrix below.

11.1 Proposed Natural Resources and Environment Projects

Table 11-1: Proposed Natural Resources and Environment Projects

Projects	Proposed Budget (Kshs.)	Time Frame	Lead Departments
Construction of gabions in area prone to soil erosion	50M	ST	Environment and Water Depts.
Afforestation Noonkopir	10M	ST	Department of Physical Planning, Environment, KWS & NEMA
Surveying and mapping riparian zones of at least 30 metres.	30M	MT	Dept. of Environment and Physical Planning
Promote tree planting to control dust	5M	ST	Dept. of Environment
Promote water harvesting tanks in residential buildings	5M	ST	Depts. Physical Planning, & Water,
Promote construction of water pans	8M	MT	Dept. Water
Construction of 2 Water dams	150M	LT	NEMA, Department of physical planning water and public works Kajjado county
Planting of Pennisetum Purpureum plants	10M	MT	Department of environment

11.2 Proposed Physical infrastructure Projects

Table 11-2: Proposed Physical infrastructure Projects

Sector	Projects	Proposed Budget Ksh	Time Frame	Lead institution/Depts.
Liquid waste	Establishment of sewer systems in Kitengela CDB and waste water treatment plant	1billion	MT	Dept. of Water and Tana-Athi Water Board
Water supply	Establishment of water and sewerage company	500M	ST	Dept. of water and public works
	Installing water harvesting tanks			Dept. of water
	2 construction of water dams	500M	MT	National Govt, NEMA, WARMA, Dept. of water
	Construction of water pans	100M	MT	Dept. of water, NEMA, WARMA
Storm water management	Lining and covering of major roads with storm water drains	500M	MT	Dept. of public works
	Construction of primary and secondary drains	300M	MT	Department of public works
	Improve/ repair existing primary and secondary drains	200M	ST	Department of public works
	Plantations along natural drains	30M	ST	Department of environment
Energy	Compulsory installation of solar panels for every new building	5M	ST	Department of physical planning and energy
Solid waste management	Installation of bins in the CBD, markets and along the street	10M	ST	Department of environment and physical planning
	Increase solid waste collection facilities	30M	MT	Department of human resource
	Develop composting sites for biodegradable waste at subsector level	20M	MT	Department of environment and NEMA
	Develop incineration facilities in health facilities	50M	MT	County government in Partnership with NGO's and KENGEN

11.3 Proposed Local Economy Projects

Table 11-3: Proposed Local Economy Projects

Projects	Budget Kshs.	Time Frame	Lead Depart. and agencies
Establish one value addition industry the slaughterhouse	100M	MT	Department of Trade, Economic Planning and Finance
Establishment of a meat processing industry	3000M	LT	Department of Trade, Economic Planning and Finance
Support SMEs on value addition and financial institutions	500M	MT	Department of Trade, Economic Planning and Finance
Establish a business park for SMEs	250M	MT	Department of Trade and Physical Planning
Link Kitengela with its environs i.e. Mavoko and Nairobi through the railway system	500M	MT	CGK & Kenya Railways

11.4 Social Infrastructure Projects

Table 11-4: Proposed Social infrastructure Projects

Projects	Budget Kshs.	Time Frame	Lead Depart. and agencies
Construct 51 Primary Schools	1Billion	MT	Departments of Education and Public Works
Construct 25 secondary schools	5000M	MT	Departments of Education and Public Works
Construct two special needs school	150M	MT	Departments of Education and Public Works
Construct 3 health centres	300M	MT	Departments of Health and Public Works
Expansion of the existing market	200M	ST	Departments of Trade, Economic Planning and Finance and Public works
Construction of 2 social halls in Kitengela town and East	100M	LT	Departments of Social Services and Public Works
Police post at Noonkopir	50M	MT	NG Department of Internal, CDF, COK
Acquire land and construction of two cemeteries	200M	MT	Departments of Health, Social Service and Lands,

11.5 Proposed Housing Projects

Table 11-5: Proposed Housing Projects

Projects	Budget Kshs.	Time Frame	Lead Depart. and agencies
Implementation of Enforcement of zoning and housing guidelines through planning clinics	15M	ST	Department of physical planning enforcement & development control
Prepare guidelines and detailed plan on densification	10M	ST	Department of physical planning and development control
Formulate housing by-laws for Kitengela.	5M	ST	Department of physical planning and housing and development control
Extend water, roads, to unserviced land to cater for future development	500M	MT	Department of housing and public works
Set up digital approval system for land and housing approvals to get rid of the cumbersome and slow processes	100M	ST	Department of lands , ICT and housing
Promote though affordable houses projects in partnership with GOK and private sector	300M	MT	Department of lands, housing
Implementation of Enforcement of zoning and housing guidelines through planning clinics	15M	ST	Department of physical planning enforcement & development control
Prepare guidelines and detailed plan on densification	10M	ST	Department of physical planning and development control

11.6 Proposed Transportation Projects

Table 11-6: Proposed Transportation Projects

Projects	Budget Kshs.	Time Frame	Lead Depart. and agencies
Upgrading of 20km gravel roads	800M	MT	Department of roads, transport, survey, public works and KURA
Develop a LRT system	500M	MT	Department of roads, transport, public works, physical planning, GIS, urban development, National government, Kenya Railways Corporations
Design Transport network to support	500M	LT	Department of roads, transport, public works, physical planning, GIS,

Projects	Budget Kshs.	Time Frame	Lead Depart. and agencies
TOD for the main road trunks			National government, KENHA, KURA
Establish a city bus system		MT	Department of transport
Construction of multi-storey parking facilities at the bus park and in commercial building at the CBD's	700M	LT	Department of trade, public works and physical planning
Construction of motorcycle taxis waiting bays	20M	ST	Department of transport
Create pedestrian pathways of minimum 2m wide.	60M	ST	Department of planning, roads and transport
Landscaping and planting of trees at the pedestrian pathways.	50M	ST	Department of roads and environment
Expand the towards prisons and Railway area	300M	MT	Department of public works, water and sanitation
Put road signage and traffic lights	20M	ST	Department of transport, NTSA
Establish a street addressing system	10	ST	Department of physical planning
Construction of a ring road through Ngurunga to decongest Namanga	2Billion	MT-LT	Department of roads, transport, public works, physical planning, survey, GIS, National government, KURA
Road construction of service roads along Namanga road	1Billion	MT	Department of roads, transport, public works, physical planning, survey, GIS, National government, KURA

11.7 Tourism and Conferencing Promotion Projects

Table 11-7: Proposed Tourism and Conferencing Promotion Projects

Projects	Budget Kshs.	Time Frame	Lead Depart. and agencies
Creation of Maasai market	20	MT	Department of culture and heritage
Promote hotels and conference facilities s.	250M	MT- LT	Department of tourism
Upgrade and tarmac roads leading to the tourist various destinations		MT-LT	Department of tourism and public works and roads
Set up a cultural centre	50M	MT	Department of Culture and Heritage

Projects	Budget Kshs.	Time Frame	Lead Depart. and agencies
Develop a tourist circuit map showing the routes links the tourist sites.	2M	ST	Department of Tourism
Creation of Maasai market	20	MT	Department of culture and heritage
Promote hotels and conference facilities s.	250M	MT- LT	Department of tourism
Upgrade and tarmac roads leading to the tourist various destinations		MT-LT	Department of tourism and public works and roads
Set up a cultural centre	50M	MT	Department of Culture and Heritage
Develop a tourist circuit map showing the routes links the tourist sites.	2M	ST	Department of Tourism
Creation of Maasai market	20	MT	Department of culture and heritage
Promote hotels and conference facilities s.	250M	MT- LT	Department of tourism
Upgrade and tarmac roads leading to the tourist various destinations		MT-LT	Department of tourism and public works and roads

11.8 Proposed Project for Disaster Management

Table 11-8: Proposed Disaster Management

Projects	Budget Kshs.	Time Frame	Lead Depart. and agencies
Mapping disaster prone areas	25M	ST	Environment and Lands
Update County management Plan	5M	ST	DRR
Training of quarry workers on accident prevention	5M	ST	Trade
Formulate safe quarrying procedures	2M		Environment
Establish a disaster warning information system	5M		Environment

12. MONITORING AND EVALUATION

12.1 Overview

To assess the effectiveness of this Plan in achieving its objectives will be need a robust Monitoring and Evaluation (M&E) system to monitor the progress, challenges, lessons learnt and to inform and provide any adjustments needed during the implementation. A fully functional M&E system is important for the implementation and review of the plan to ensure it delivers the envisioned results. An effective M&E requires good coordination of the different actors and agencies to ensure all-inclusiveness process, which reflects the multi-sectoral aspects of the plan.

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.²

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.”³

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;
- 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 challenges 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 the county level are limited due to lack of capacity and backstopping role from NLC, national physical planning department;

² Government of Kenya, 2016:254

³ Republic of Kenya (2016), Urban Land Use Planning: Monitoring and Oversight Guidelines - National Land Commission

- 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

This plan proposes the following sets of M&E tools which will be applied assessing the implementation of this plan. The Plan will be assessed at two levels. The physical planning process and at sectoral level. Tables 12.-1 and 12.-2 below provide the physical planning and sector framework which will be applied in the monitoring process.

12.4 Physical Planning Monitoring and Evaluation Process.

The physical planning process will monitor *inter-alia* the compliance and integration of this ISUDP with the legal and policy compliance, the implementation of physical planning process and projects as per this plan, institutional framework and linkages, citizenry participation, its integration with other plans and resource mobilisation.

Table 12-1: Physical Planning Indicators and means of verification

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
	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
	No. of reviews of the ISUDP
	No. 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
	Functionality of the physical planning liaison committee
	Technical staff capacity of the Sub-County/Sub-County
	Technical equipment capacity at the Sub-County/Sub-County
	No. of committees constituted as per the legal requirements

Physical planning indicators	Means of verification
Community participation	Level of resident consultation on physical and land use planning issues
	No. of neighbourhood associations engaged in planning issues
	No. of planning clinics on awareness held per year
	Responses on public notices on plans and planning intention adverts
	% of participation in planning forums
Integration with other county and sectoral plans	No. of Departments/Units reporting well functional M&E
	No. of annual physical planning needs assessments carried out
	No. of staff trained and applying M&E tools
	Availability of M&E tools
Resource Mobilization	No. of partners/agencies supporting ISUDP implementation
	Revenue generated by physical planning activities

Source: VisionRI

12.5 Sector Monitoring and Evaluation Process

The monitoring of the sector performances as articulated in this Plan is based on sector programmes and projects which are aimed at achieving the specific goal of each sector in as per this plan. Table 12-2 provide a overall framework which will be used to monitor sector specific performance.

Table 12-2: Monitoring and Evaluation Plan

Sector	Expected outcome	Indicators/Means of verification
Environment	<ul style="list-style-type: none"> Protection and conservation of the natural environment Re-establishment of the forest cover 	<ul style="list-style-type: none"> Acreage of increased forest cover and agro-forestry activities Acreage of riparian reserves and buffer zones established or reclaimed Number of gabions constructed and other soil and water conservation measures implemented Enacted by-laws on quarrying level of compliance Increased amount of solid waste safely collected and disposed
Economy	<ul style="list-style-type: none"> Increased revenue generation Increased employment opportunities Updated land parcel records 	<ul style="list-style-type: none"> Number of jua kali and SMEs established and functional Number of new people employed Number of new markets constructed markets and functional Number of new licensed businesses Established meat processing plant and functional
Social infrastructure	<ul style="list-style-type: none"> Provision of adequate and 	<ul style="list-style-type: none"> Number primary and secondary schools constructed or expanded

Sector	Expected outcome	Indicators/Means of verification
	accessible social infrastructure	<ul style="list-style-type: none"> • Number of students enrolled in schools • New special needs and technical schools established. • Increased coverage and reduced distance to public health facilities • Established parks and playground • Number of social halls established • Waste collection, disposal and recycling facilities.
Physical infrastructure	<ul style="list-style-type: none"> • Provision of adequate and efficient physical infrastructure 	<ul style="list-style-type: none"> • Increased coverage of street lights and flood light masts • Improved drainage system • Number of household new water connections • Reduced travel distance due new or improved roads
Transportation	<ul style="list-style-type: none"> • Effective public transport system 	<ul style="list-style-type: none"> • Reduced traffic congestion • Developed NMTs • Tarmacked roads • Use of bus service • Widened access roads
Housing	<ul style="list-style-type: none"> • Quality houses with provision of infrastructure 	<ul style="list-style-type: none"> • Number of new houses constructed • Number of affordable housing schemes completed. • Infrastructural provision to support housing provision.
Tourism	<ul style="list-style-type: none"> • Increased tourism activities 	<ul style="list-style-type: none"> • Developed tourism circuit • Developed cultural centres • Number of tourists
Disaster management	<ul style="list-style-type: none"> • Effective management of disasters 	<ul style="list-style-type: none"> • Formulated disaster management plan • Fire fighting equipment • Short response time to disasters

12.6 Institutionalization of the M&E

As described in above, the role of M&E will be anchored within the County Planning Unit whose core mandate is as stipulated in Clause 105 of the County Government 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 entire County planning process to reflect the spatial, social, and economic development programmes and projects in the County.

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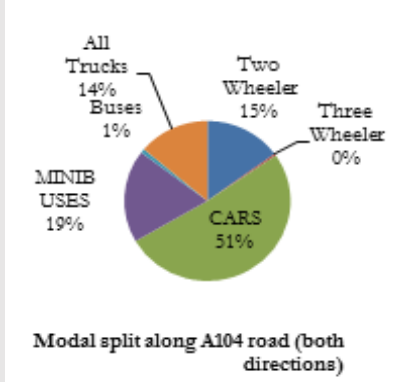
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ANNEXURES

ANNEXE 1: KITENGELA ROAD INVENTORIES AND CONDITIONS SURVEY

S. No	Road Name	Link	Function	Shape	Use	Key issues	Modal Split														
1	Namanga Road (A104)	Nairobi-Namanga	Connects Namanga to Nairobi through Kajiado County; -Within the town, it serves both the flow and access function to commercial areas.	<ul style="list-style-type: none"> Total length: Approx. 5.5 km; Road reserve: 60m; Carriageway width: 7m (it is divided); and Surface Type: paved. Surface condition: good; Shoulders: 2m on either side (paved); Has service lanes on both sides; Left (from Mavoko) the service lane is 8.5 m wide; The service lane has been encroached by on-street traders; There is on-street parking of 	<ul style="list-style-type: none"> Traffic composition: matatus, taxis, private cars, freight vehicles, boda boda, tuk-tuks and pedestrians; There is through traffic to Kajiado, Namanga and Tanzania; and On-street Parking: Both parallel and angular are present along the service lanes. 	<ul style="list-style-type: none"> Heavy traffic congestion; The road is not wide enough to accommodate the current traffic volumes; The road serves both flow and access functions causing congestion; Poor condition of the service lanes On-street parking and trading along the service lanes; Lack of adequate NMT facilities; Encroachment of road reserve of the service lanes; Many road accidents (mostly caused speeding vehicles [through 	 <p>Modal split along A104 road (both directions)</p> <table border="1"> <caption>Modal Split Data</caption> <thead> <tr> <th>Vehicle Type</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>CARS</td> <td>51%</td> </tr> <tr> <td>MINIB USES</td> <td>19%</td> </tr> <tr> <td>All Trucks</td> <td>14%</td> </tr> <tr> <td>Two Wheeler</td> <td>15%</td> </tr> <tr> <td>Buses</td> <td>1%</td> </tr> <tr> <td>Three Wheeler</td> <td>0%</td> </tr> </tbody> </table>	Vehicle Type	Percentage	CARS	51%	MINIB USES	19%	All Trucks	14%	Two Wheeler	15%	Buses	1%	Three Wheeler	0%
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S. No	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
				freight vehicles, private cars, tuk-tuks and boda boda motorcycles; <ul style="list-style-type: none"> • Right (from Mavoko) the service lane is 5m wide; • The service lane has been converted to a bus park near the Kitengela bus park; • There is on-street parking along the service lane; • Both service lanes are in poor condition (worn out bitumen surface); • The right-hand side (from Mavoko) has a footpath that is 1.6m wide. It's paved but in a 		traffic to Namanga].	

S. No	Road Name	Link	Function	Shape	Use	Key issues	Modal Split														
				bad condition; and <ul style="list-style-type: none"> Side drains: open and heavily silted. Contains wastewater. Road markings are very clear; and Streetlights: absent but there are flood masts. 																	
2	Kitengela prisons Road	Kenya prisons are located along the road.	<ul style="list-style-type: none"> It serves access function to commercial areas, residential, public places (Kitengela Prison and churches), Schools and industries (Kitengela slaughterhouse). 	<ul style="list-style-type: none"> Total Length: 1.5 km; Road reserve: 20 m but narrows to 13m near the prison; Carriageway width: 6m; Shoulders: Not visible; Surface Type: Gravel; Surface condition: poor; Open drains which are heavily silted; and 	<ul style="list-style-type: none"> Traffic composition: boda-boda, taxis, private cars, pedestrians, and human-drawn carts. Both parallel and angular on-street parking is present. 	<ul style="list-style-type: none"> Lack of streetlights; Bad stench from the slaughterhouse; Poor drainage system; Poor road condition; The bus park is very small and is located on private property; Encroachment of the road reserve; and Lack of NMT facilities yet there 	<p>Modal split along Prisons road (both directions)</p> <table border="1"> <thead> <tr> <th>Mode</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Two Wheeler</td> <td>57%</td> </tr> <tr> <td>CARS</td> <td>24%</td> </tr> <tr> <td>MINIBUSES</td> <td>13%</td> </tr> <tr> <td>Three Wheeler</td> <td>2%</td> </tr> <tr> <td>Buses</td> <td>1%</td> </tr> <tr> <td>All Trucks</td> <td>3%</td> </tr> </tbody> </table>	Mode	Percentage	Two Wheeler	57%	CARS	24%	MINIBUSES	13%	Three Wheeler	2%	Buses	1%	All Trucks	3%
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				<ul style="list-style-type: none"> Streetlights and NMT facilities: absent. 		are many schools located along this road.															
3	Old Namanga Road	Kitengela - Isinya	<ul style="list-style-type: none"> Provides access to the commercial and residential areas. It provides access to commercial, residential areas (Milimani Estate) and public places like churches and schools. 	<ul style="list-style-type: none"> Total Length: 6 km Road reserve: 18 m Carriageway width: 6m Shoulders: Not visible Surface Type: Gravel Surface condition: poor Open drains which are heavily silted. They contain wastewater; Streetlights and NMT facilities: absent. 	<ul style="list-style-type: none"> Traffic composition: private cars on the road, motorcycles, animal and human-drawn carts and pedestrians. On-street parking: present (both parallel and angular): due to the congestion in the bus park, PSV park along this road. 	<ul style="list-style-type: none"> The road becomes impassable during rainy seasons; PSV park along the road; and The road is a very poor condition. 	<p>Modal split along Old Namanga road (both directions)</p> <table border="1"> <thead> <tr> <th>Mode</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Two Wheeler</td> <td>57%</td> </tr> <tr> <td>CARS</td> <td>24%</td> </tr> <tr> <td>MINIBUSES</td> <td>13%</td> </tr> <tr> <td>All Trucks</td> <td>3%</td> </tr> <tr> <td>Buses</td> <td>1%</td> </tr> <tr> <td>Three Wheeler</td> <td>2%</td> </tr> </tbody> </table>	Mode	Percentage	Two Wheeler	57%	CARS	24%	MINIBUSES	13%	All Trucks	3%	Buses	1%	Three Wheeler	2%
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S. No	Road Name	Link	Function	Shape	Use	Key issues	Modal Split														
4	Rongai Road	Kitengela - Rongai	<ul style="list-style-type: none"> Serves both flow and access function to residential, industrial (there are many quarries along the road), educational and public places (e.g. police station churches, KLPC Power Sub-Station), 	<ul style="list-style-type: none"> Total Length:3.4 km Road reserve: 30m Carriageway width: 6m Surface Type: Gravel Surface condition: very poor Shoulders: not visible Road markings and traffic signs: absent; Open drains whose condition is poor. There are a few longitudinal culverts near A104; NMT facilities: absent Streetlights and NMT facilities: absent. 	<ul style="list-style-type: none"> Traffic: Few private cars, pedestrians, bicycles, freight vehicles (from the quarries) and taxis On-street parking: absent 	<ul style="list-style-type: none"> Lack of streetlights; Lack of NMT facilities and road markings; The road condition is very poor and it's only passable by 4-wheel drive vehicles. 	<p>Modal Split along A104-Rongai road (Both directions)</p> <table border="1"> <thead> <tr> <th>Mode</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>All Trucks</td> <td>43%</td> </tr> <tr> <td>CARS</td> <td>34%</td> </tr> <tr> <td>Two Wheeler</td> <td>19%</td> </tr> <tr> <td>MINIBUSES</td> <td>3%</td> </tr> <tr> <td>Buses</td> <td>1%</td> </tr> <tr> <td>Three Wheeler</td> <td>0%</td> </tr> </tbody> </table>	Mode	Percentage	All Trucks	43%	CARS	34%	Two Wheeler	19%	MINIBUSES	3%	Buses	1%	Three Wheeler	0%
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S. No	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
5	EPZ Road	A104 - EPZ	<ul style="list-style-type: none"> -It serves commercial, residential and industrial areas. There are undeveloped parcels along the road. 	<ul style="list-style-type: none"> Total Length: 1.7 km; Road reserve: 30m; Carriageway width: 10 m; Surface Type: paved; Surface condition: fair; Shoulders: not visible; There is a footpath (2.3m) on the left (from A104) but its condition is poor; Road markings (lane and edge marking) and informatory traffic signs: present; Drainage: Lined drainage to the left (from A104) and open drains on the right. 	<ul style="list-style-type: none"> Traffic composition: private cars, <i>boda boda</i>, <i>tuk-tuks</i>, freight vehicles and pedestrians; On-street parking: Absent. 	<ul style="list-style-type: none"> The footpath is in a poor condition. 	

S. No	Road Name	Link	Function	Shape	Use	Key issues	Modal Split														
				They are in fair condition; and <ul style="list-style-type: none"> Streetlights are present on the left and right. 																	
6	Kwa Chief-Market Road	A104-Kitengela open-air market	<ul style="list-style-type: none"> Provides access function to the Kitengela open-air market, commercial and public places (the Chief's Camp is located along this road). 	<ul style="list-style-type: none"> Total Length: 0.2 km; Road reserve: 7m; Carriageway width: 4m; Surface Type: Gravel; Surface condition: poor; Shoulders: not visible; Drainage provisions: absent; NMT facilities: absent; and Streetlights (there is a flood mast near the market) and NMT facilities: absent. 	<ul style="list-style-type: none"> Traffic: pedestrians, private cars, <i>boda-bodas</i>, human & animal-drawn carts and Freight vehicles (to and from the Market). 	<ul style="list-style-type: none"> The presence of heavy vehicles to and from the market; The road is very narrow; Human and animal drew carts; The drainage system is not provided for; and Road reserve encroachment. 	<table border="1"> <caption>Modal Split Data</caption> <thead> <tr> <th>Mode</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Two Wheeler</td> <td>75%</td> </tr> <tr> <td>CARS</td> <td>15%</td> </tr> <tr> <td>Three Wheeler</td> <td>2%</td> </tr> <tr> <td>MINIBUSES</td> <td>1%</td> </tr> <tr> <td>Buses</td> <td>0%</td> </tr> <tr> <td>All Trucks</td> <td>0%</td> </tr> </tbody> </table>	Mode	Percentage	Two Wheeler	75%	CARS	15%	Three Wheeler	2%	MINIBUSES	1%	Buses	0%	All Trucks	0%
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7	Nyika Road	Chairman Road-Discover y Road	<ul style="list-style-type: none"> It serves access function to educational (Kitengela Girls High School), commercial (Open-air market), public places (Catholic Church) areas amongst others. 	<ul style="list-style-type: none"> Total Length: 0.6 km; Road reserve: 14.5m but narrows to 12m from Kitengela Girls High School; Carriageway width: 4m but widens to 5-5m from Kitengela Girls High School; Surface Type: Gravel; Condition: Fair; Shoulders: Not visible; Drainage system: absent; NMT facilities: absent; and Streetlights and NMT facilities: absent. 	<ul style="list-style-type: none"> Traffic composition: private cars, <i>boda boda</i>, <i>tuk-tuks</i>, freight vehicles and pedestrians; and On-street parking: present near the bus park (both parallel and angular). 	<ul style="list-style-type: none"> Poor condition of the road; Lack of streetlights; Lack of NMT facilities and road markings; and Road reserve encroachment near the market. 	
8	Discover y Road	A104 to New Valley Estate	<ul style="list-style-type: none"> Serves access function to commercial 	<ul style="list-style-type: none"> Total length: 1.98 km; 	<ul style="list-style-type: none"> Traffic: private cars, freight vehicles (from 	<ul style="list-style-type: none"> It's a very busy road because of the many hard 	

S. No	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
			(many hard wares), educational and residential areas in New Valley estate	<ul style="list-style-type: none"> • Road reserve: 11m; • Carriageway width: 4m; • Surface Type: Gravel; • Condition: poor; • Shoulders: Not visible; • Drainage: open drains which are in a bad condition; • NMT facilities: absent; and • Streetlights and NMT facilities: absent. 	<p>the hard wares), bodaboda, pedestrians, bicycles, tuk-tuks and taxis; and</p> <ul style="list-style-type: none"> • On-street parking: present (perpendicular). 	<p>wares located along it.</p> <ul style="list-style-type: none"> • However, it lacks NMT facilities hence endangering people's lives; and • Lack of streetlights. 	
9	Imani Avenue	Ongata Rongai Police station	<ul style="list-style-type: none"> • Serves access function to public places such as the Police Station, Churches and also residential and 	<ul style="list-style-type: none"> • Total Length: 0.43km; • Road reserve: 16m; • Carriageway width: 6m; • Surface Type: CPB paved= 0.1 km; • Condition: Good; 	<ul style="list-style-type: none"> • Traffic: private cars, bodaboda, pedestrians, bicycles and taxis; and • On-street parking: present to the left-hand side from Magadi Road (Both 	<ul style="list-style-type: none"> • Lack of NMT facilities; • Lack of streetlights; and • Poor road condition 	

S. No	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
			commercial areas.	<ul style="list-style-type: none"> Gravel=0.33 km Condition: fair; Shoulders: 1.5 m unpaved (both sides); Drainage: open drains and collapsed to the right-hand side from Magadi Road; NMT facilities: absent; and Streetlights and NMT facilities: absent. 	Parallel and angular).		
10	Balozi Road	A104-Balozi Estate	<ul style="list-style-type: none"> Serves access function to commercial, educational, public places and residential areas in Balozi Estate. 	<ul style="list-style-type: none"> Total Length: 1.4 km; Road reserve: 10.4m; Carriageway width: 4m; Surface Type: Gravel; Condition: poor Shoulders: not visible; Drainage: open drains; 	<ul style="list-style-type: none"> Traffic: pedestrians, private cars, boda-bodas, tuk-tuks and human & animal-drawn carts. 	<ul style="list-style-type: none"> Road reserve encroachment; Lack of streetlights; and Poor road condition. 	

S. No	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
				<ul style="list-style-type: none"> • NMT facilities: absent; and • Street-lights and NMT facilities: absent. 			
11	Saitoti Road	Juakali Road-Estates	<ul style="list-style-type: none"> • Serves access function to commercial, educational, public places (Kitengela Sub-County Hospital) and residential areas. 	<ul style="list-style-type: none"> • Total Length: 1.6 km; • Road reserve: 11m; • Carriageway width: 4m; • Surface Type Gravel; • Condition: fair; • Shoulders: not visible; • Drainage: open drains whose condition is poor; • NMT facilities: absent; and • Streetlights and NMT facilities: absent. 	<ul style="list-style-type: none"> • Traffic: pedestrians, private cars, boda-bodas, tuk-tuks and human & animal-drawn carts. 	<ul style="list-style-type: none"> • Road reserve encroachment; • Lack of streetlights; and • Poor road condition. 	-