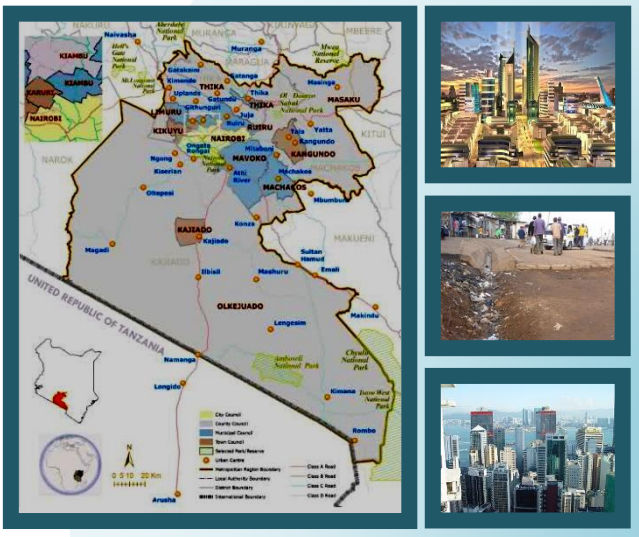
NAIROBI METROPOLITAN SERVICE IMPROVEMENT PROJECT

MINISTRY OF TRANSPORT, INFRASTRUCTURE, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT



CONSULTING SERVICES FOR PREPARATION OF INTEGRATED STRATEGIC URBAN DEVELOPMENT PLANS FOR TWELVE (12) TOWNS IN 4 CLUSTERS WITHIN THE NAIROBI METROPOLITAN

KITENGELA DRAFT REPORT (KAJIADO COUNTY)

FEBRUARY 2019

VisionRI

URS
UKAS QUALITY MANAGEMENT 043-A
ISO 9001:2008 CERTIFIED ORGANISATION

FOREWORD BY H.E THE GOVERNOR

ACKNOWLEDGMENTS

The Consultant Team acknowledges the officials of Kajiado County Government, the Technical Working Group, Ministry of Transport, Infrastructure, Public works, Housing & Urban Development, the World Bank, Kenya Bureau of Statistics, Survey of Kenya and other government agencies as well as stakeholders who provided valuable contribution and assistance in the preparation of this Draft ISUDP Report

EXECUTIVE SUMMARY

Kitengela is located on the Athi-Kaputiei Plains and is part of Kajiado East Sub-county, Kajiado County. It is located just 30 kilometres south of Nairobi city. The Kitengela Planning Area is bounded to the northwest 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 vast open area and then Maasai village.

Kitengela covers approximately 7,439.52 hectares and is composed of 2 wards with 2 sub-locations. Its population as of the 2009 was 60,652 per data from Kenya National Bureau of Statistics (2009).

Being primarily a dormitory town of the Nairobi Metropolitan Region, 59.34% of the residents are employed in the service sector, another 25.32% practice agriculture, 8.58% are in the manufacturing sector, while others earn their livelihoods through transportation and construction.

Kitengela's overall land use pattern is characterised by an intensely developed central business district, an extended urban corridor along the main highway and a leap-frogging sprawl of gated communities at the interior. This land conversion has been accelerated in recent years by frequent droughts, forcing pastoralists to sell their land to the rich who buy them in large tracks and then resell them in small portions of an eighth or even quarter acres at a profit. Urban growth is driven by proximity to Nairobi City via the Nairobi-Namanga Road coupled with relatively lower cost of land.

Kitengela has strategic advantages and potentials which 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 potential to be an Industrial Hub as industrials and investors move to the outskirts of Nairobi in search of cheaper land, cleaner environment, and easier transport mobility. Kitengela's locational and **accessibility** advantages, its existing industrial base, higher quality human resource base, proximity to the Athi River Export Processing Zone 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. Kenya Railway Corporation'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).

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 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 may result to 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 waste water and solid waste management facilities have emerged. These **challenges**, in turn, resulted to downstream issues such as difficulty in mobility, unsanitary living conditions, environmental pollution and a general lowering of the quality of the urban area. Similar to social infrastructure, backlogs in these services will mount in the future if 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. If left un-guided, this trend will have the potential to cause Kitengela to "choke on its own development" manifested in amongst others, the saturation of the Nairobi-Namanga Road, prevalence of ribbon development along the said road and under-utilisation of land at the interior portion of the planning area.

The above are findings of the key potentials and challenges facing the planning area. This was the foundation of the participatory problem identification and solving that conducted during the stakeholders' forum as well as the basis for preparation of the proposed land use plans and zoning regulations as well as the sectoral plans and projects. Moreover, action area plans have been prepared for areas with dire need for intervention. Financial and capital investment strategies have been prepared to guide the implementation of this plan. Finally, this Draft ISUDP report contains a monitoring and evaluation plan that will be the basis for evaluating the expected outcome against the outcome.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ANNEXES

ABBREVIATIONS AND ACRONYMS

ADT	Average Daily Trip
BRT	Bus Rapid Transit
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
MoTIPWH&UD	Ministry of Transport, Infrastructure, Public works, Housing & 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

CHAPTER 1:PLANNING FRAMEWORK

1.1.INTRODUCTION

1.1.1. Background

The preparation of the Kitengela Integrated Strategic Development Plan (ISUDP) 2018 – 2028 is part of the Institutional Reform and Planning of the Nairobi Metropolitan Service Improvement Project (NaMSIP) which is a broader initiative that addresses key urban development issues such as infrastructure and governance capabilities in the metropolitan area.

The preparation of the Kitengela ISUDP) is one among other twelve ISUDP's prepared for the Nairobi metropolitan areas i.e. Kiambu, Machakos and Kajiado. Preparation of Nairobi metropolitan area ISUDP's is structured into four clusters i.e

Cluster 1: Juja- Ruiru & Thika-Nairobi transport corridor

Cluster 2: Limuru-Kikuyu-Kiambaa

Cluster 3: Ngong-Ongata Rongai-Kiserian & **Kitengela**

Cluster 4: Mavoko & Nairobi – Malili transport corridor

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 Vision RI Connexion Service Private Limited of India was commissioned by the MoTIPWH&UD to provide technical consultancy services for the Project.

This Draft Report presents the initial findings and recommendations of the Consultant Team following comments of the Project Implementation Team (PIT) and the World Bank (WB). This ISUDP document has evolved through subsequent participatory consultations with the PIT, WB, County Government and various stakeholder groups.

This Draft Report is the product of the first Stakeholders Forum, called Strategic Planning Workshop (SPW). The SPW was a held at Sandalwood Hotel, Kitengela, where stakeholders validated the initial findings contained in this report and directly involved in the determination of the desired development of the planning area as embodied in collective Vision & Mission Statements and a set of key Goals and Objectives.

1.1.2. Purpose & Objectives

In accordance with the Project's Terms of Reference (TOR), the general purposes of the ISUDP are as follows:

Articulating the aims of the National and County governments for the area together with strategies, policies and general proposals which it will intend to achieve. Moreover, it aims at providing a framework for detailed development policies and proposals for the planning area. It will indicate action areas for immediate development or re-development and provide 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.

In turn, the **objectives** of the ISUDP 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 designs that enhances the character and form of the town; To provide a basis for development control and investment decisions; and to develop plan implementation and monitoring framework.

1.2. SCOPE OF WORK

1.2.1. Geographical Scope

The geographical scope of the ISUDP was agreed upon after consultations with the County TWG after site visits and mapping work. The planning area includes the following wards and sub-locations:

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

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

1.2.2. Planning scope

With reference to the TOR, the preparation of this ISUDP entailed the following tasks:

1) Delineation of the boundaries for the planning area;
2) Preparation of an elaborate base map showing the existing spatial structure of the planning area. The base map includes, at the minimum, planning boundaries, existing road network, landmarks, major natural features and the topography;
3) Contextual analysis of the planning area and its environs;
4) Undertaking a land-use , socio-economic study and survey of the planning area, accommodating all the changes that have occurred over time and projecting future changes, and comparing how these changes compare in the metro region and in the county;
5) Undertaking strategic environmental assessments of the planning area;
6) Undertaking an assessment of transport, infrastructure and utility needs, housing and community services. This included mapping of the transport, infrastructure and utility network of the planning area;
7) Detailed study on the redevelopment of the CBDs;
8) Identification of suitable land for residential, industrial, education, recreational, public purposes, commercial, public utilities, transportation and other uses applicable to the planning area;
9) Analyse administration and institutional requirements for planning and development;
10) Preparation of analysis reports indicating projected land use, infrastructure and services required over the plan period;
11) Preparation of a detailed short term, and a 10 year land use plan for the planning area;
12) Preparation of detailed 10 year sectorial development plans in support of the land use plan for the planning area. The sectors that were covered included those that are provided in the TOR;
13) Preparation of individual implementation plans with proposed requisite resource and institutional frameworks; and
14) Preparation of zoning plans for the planning area with requisite development densities and guidelines.

1.2.3. Deliverables

The key deliverables for the ISUDP are: demography, natural resources and the environment. Others include economic activities, land use, urban design, physical infrastructure, informal settlements, transportation and governance. Social facilities, informal settlements, culture and heritage, SWOT analysis, integrated development plans and the implementation strategy are the other deliverables after the preparation of the draft report.

Table 2: ISUDP Deliverables

Final Preliminary ISUP Report	Draft Final ISUDP Report (Plan Proposals)
a. Demography b. Environment c. Infrastructure and utilities (Transport infrastructure services, Social services including housing, informal settlements and utilities) d. Economy e. Land use and Urban Design f. Governance g. SWOT analysis h. Digitized maps for the towns and corridors i. Investment strategy j. Local authority financing/revenue enhancement strategy and k. Action Area plans	a. Refined Thematic Studies reports b. Development Vision and objectives c. Alternative Development Proposals and preferred alternatives d. Structure plans e. Land use plans and f. Zoning Plans

The above reports shall be refined in two stages, namely the Draft Final Report on ISUDP; and the Final ISUDP Report, which is a refined, complete and final copy of all ISUDPs. These two reports shall incorporate feedback from the County Government, PIT, WB and stakeholders. The stakeholders' comments will be obtained by way of Stakeholders Forums.

NOTE: This report covers deliverables No 6 and 7 of the ISUDP schedule of deliverables.

1.3. METHODOLOGY

1.3.1. Planning Approach

Integrated and strategic planning approaches that are underpinned by participatory processes were utilized in preparing the ISUDP. The integrated approach includes metropolitan-wide studies that contextualize the planning area'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 characterized 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 the planning area 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 order to guide the integrated and strategic urban planning process, the Consultant analyzed the economic context for the preparation of the ISUDP with the following objectives in mind:

a) Identifying the key economic planks and role of the planning area to contribute in the economic development priorities of NMR, and in turn, the economy of Kenya;

b) Identifying the key challenges and constraints that the planning area 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

In line with the above spelled out objectives, the analytical framework adopted by the Consultant is summarized in the figure below. A quick overview of regional context of Kenyan economy is presented followed by the economic context at NMR level. At the NMR level, a review of economic development priorities, key challenges and the role of the planning area and economic clustering to meet the development priorities were undertaken.

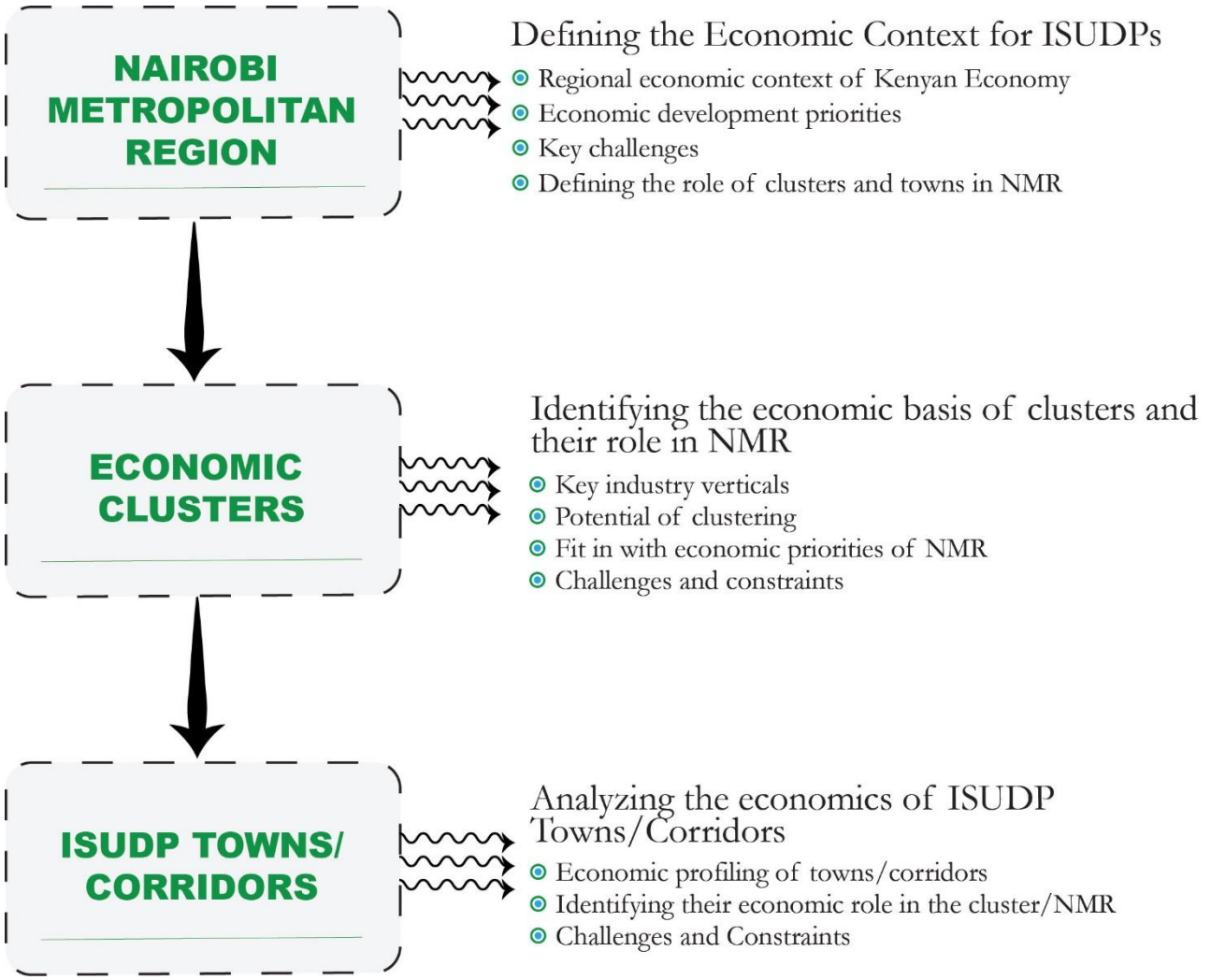


Figure 1: Analytical Framework for Economic Analysis

Source: Vision RI

In this context, special reference was made to Metro 2030 and Spatial Planning Concept for NMR. The TORs for the consultant clusters 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 ISUDP 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.

1.3.2. Planning Model

A Planning Model (Figure 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 ISUDP preparation.

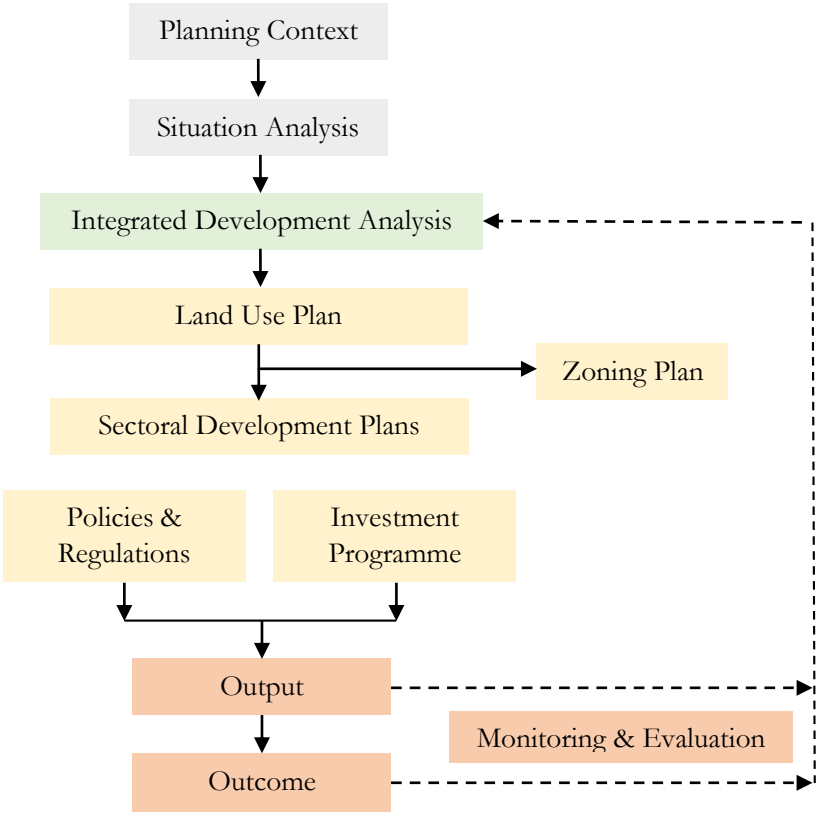


Figure 2: Planning Model

Source: Vision RI

The Model provides that the ISUDP is framed within the planning area's context, which considers affecting legislation and policies, economic, & urban development contexts, and transportation linkages, amongst others. Contextual analysis also considers related plans and programs at the National, Regional and County levels that will likely affect strategy formulation.

The ISUDP likewise is framed upon the Planning Area's Situation Analysis, which entails the review and analyses of the current state and anticipated requirements of its various development sectors such as Demography, Economic, Land Use, Urban Design, Transport, Social, Physical Infrastructure, and Governance.

The Planning Context and Situation Analysis was then be pulled together to form the basis for the pivotal point in ISUDP preparation which is the crafting of the planning area's Integrated Development Analysis comprising a cross-cutting assessment of development challenges and potentials, collective Development Vision, Mission Statement, Goals and Objectives along with their physical translation – the Spatial Framework Plan. The latter provides the overall policy direction, which guides development initiatives for the planning area within the planning period.

The Spatial Framework Plan was then actualized at the local level through land use plans. At this level, the precise locations of various urban types of developments are provided along with the locations of environmental protection areas. The Land Use Plan will mainly be implemented through a Zoning Plan, which will ensure 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, amongst others.

The Land Use Plan is supported by Sectoral Development Plans comprising of programs 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, i.e., through policies & regulations and a local development investment program.

A monitoring and evaluation mechanism is provided to enable plan implementers to ascertain if outputs and outcomes are within the ISUDP's objectives and targets.

1.3.3. 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. Below is the Methodological Framework

Figure 3: Methodological Framework

Source: Vision RI

1.3.4. 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 in the figure below:

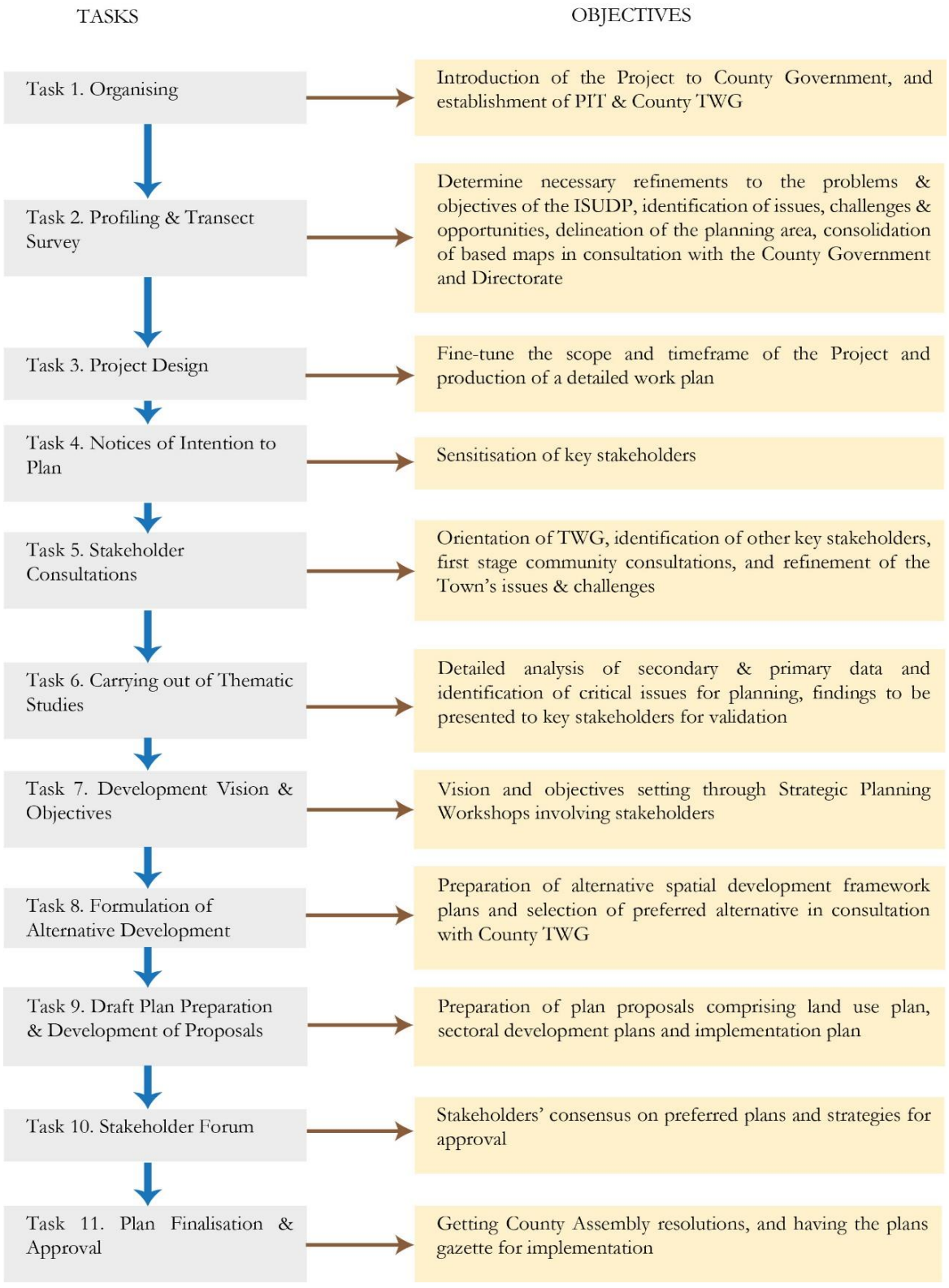


Figure 4: Planning process
Source: Vision RI

This Draft Report presents outputs up to Task 9 and is an outcome of several activities undertaken by the Consultant Team which include the following, amongst others:

Reconnaissance survey of proposed planning boundaries, secondary data collection and analysis from relevant national and county government agencies as well as parastatals and interviews with key informants from agencies such as: Kenya Forest Service, Kenya Wildlife Service ,Ministry of Land, Housing & Physical Planning Kajiado County among others. Focus Group Discussions (FGDs) with key stakeholder representatives from public health & environment and the business community as well as structured transect surveys and traffic surveys were also done.

1.3.5. 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 and so on

Consultative/ participatory Approach

The approach was based on the principle of inclusive 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 organizations 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.
d) Local human resources can be mobilized and sensitized to their crucial role in the development of their county

Preparation of Base maps

Base maps were generated from existing 1:50,000 Survey of Kenya topographical sheets and from other databases, satellite imageries and GIS. The major land uses, major communication routes were mapped and analyzed to prepare sieve maps of the county

Sieve maps that depict among other details, the constraints areas have been prepared using GIS techniques. The maps have been able to depict details of land that is environmentally sensitive areas, areas facing urban sprawl.

CHAPTER 2: CONTEXTUAL ANALYSIS

2.1. INTRODUCTION

The ISUDP is 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 is also prepared within the context of development potentials of the clusters within the NMR. These trends and plans, and their relevance to the ISUDP, are briefly discussed in the following sections.

2.2. INTERNATIONAL, NATIONAL & REGIONAL DEVELOPMENT TRENDS

2.2.1. International trends

i). Urbanization and Globalization

According to Manirakiza (2012), the world system structure is arranged according to the global capitalism with a core and a periphery. The production processes that are advanced in this theoretical perspective require 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's 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 protected or closed national economy, to open, liberalization 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 Urbanization, almost, no countries can graduate from low-middle income status without reaching 50 per cent urbanization. Kenya is presently at 27 per cent urbanised and has to avoid the challenges of "premature urbanization", before the urban infrastructure, economic intensity, and human capital necessary for agglomeration economies have been developed (National Forum for Sustainable Urbanization. The situational analysis, therefore focuses on the current development status of the planning area, with a view of analyzing it with respect to regional and global benchmark.

ii). Benchmarking urbanization 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 Botwana - five countries that have implemented similar national transformation endeavours of their environmental and socio-economic policies and strategies to manage urbanization 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 urbanization in 1950s damaged Seoul 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 urbanization by focusing on economic growth, improving quality of life, clean and green environment. This is through: (1) a series of long-term goals and ten-year plans to reconcile rapid economic development and environmental sustainability; (2) pursuing a vision of a clean, green city strong spatial planning and (3) a strategy of economic growth and a 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 weighted Malaysian Quality of Life Index (MQLI) using time series data in: education, urban safety, income levels and distribution, culture and leisure, family life, environment, transport and communication. These are further developed into a weighted central index to determine centrality of Malaysian urban settlements that are around 7 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: 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 evolution of key BRT transportation routes with only few tall building allowed to locate along the new system of bus routes. The Curituba case study has inspired implementation of other urban sustainable development initiatives in and outside Brazil (Kreimer, A. and Gilbert, R. (1997).

Case Study 5: Botswana

Three Components of Botswana's best practice

1. *Self-Help Housing Programme:*

Is a two-pronged strategy to manage fast urbanization resulting from rural-urban migration and development of informal settlements: (i) self-help squatter settlement upgrading; and (ii) site service programme of self-help squatter settlement accounting for 60% of Botswana's urban population

1. *Government Actors:*
   - The housing Shelter is a basic human needs and an enabling for shelter provision is necessary (Re: Housing Department).
   - Botswana Housing Corporation provides houses fir rental and sale in towns and some urban villages
   - Cost recovery, cross subsidy and affordability considerations are introduced to secure replication and sustainable of self-help housing.

2. *Overall Strategy:*

Core principles of the strategy are to: (i) support social-cultural capabilities of households in their communities, (ii) positively impact marginalized and disenfranchised groups in society living in towns and in clusters/ nucleated of rural settlements. The strategy is supported through:

Technical cooperation

Tripartite partnership of public, private and community sectors and with participation of community group, special interest groups (women, indigenous people, the elderly and disables) being 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 percent, the area covered by these cities increased by 28 percent. Built-up area densities have thus been on a decline around the world especially in developing countries where from an average 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).

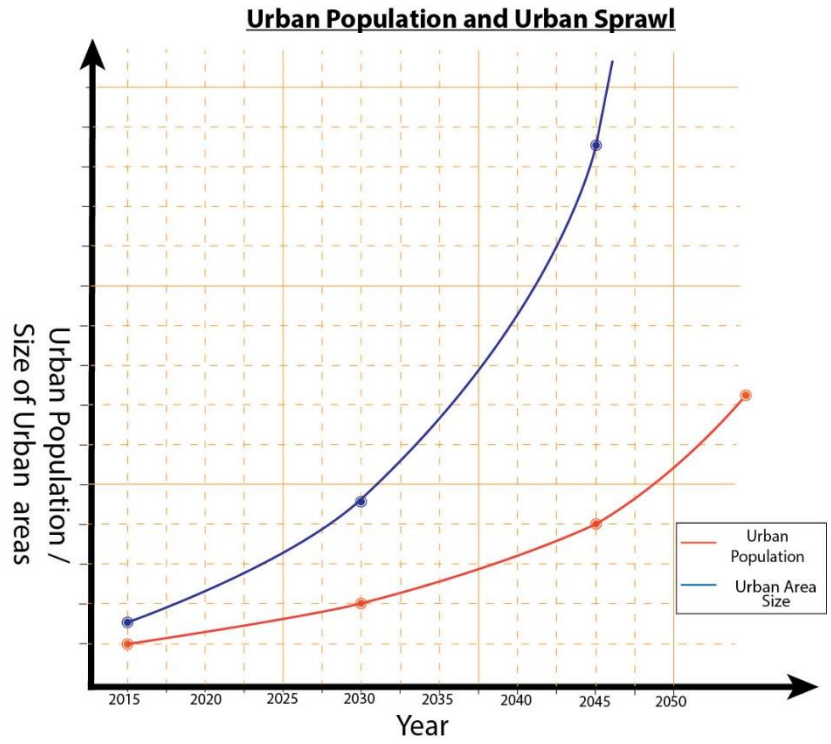


Figure 4: Urban population and sprawl

Source: Vision RI 2018

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).

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 UN fund predicts that 60 percent 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 settlements 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 the 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 flows 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 urbanization in the form of suburbanization, peri-urbanization, 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 suburbanization of developed countries, the peri-urban areas in developing countries have become divided cities, characterized by of 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 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 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 growing consensus that urban planning can reduce sprawl and promote compact, contiguous development; unplanned city extensions lead to sprawling city-regions. Containment tools have proved quite successful in a variety of settings. Urban growth boundaries, greenbelts, urban service boundaries, and nodal location of economic activity centres are each 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 among 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 will inform the preparation of this plan and the goals will be incorporated especially in preparation of land use plans and action plans.

vii). Urban Agenda

By 2050, the world's urban population is expected to nearly double, making urbanization one of the twenty-first century's most transformative trends. Populations, economic activities, social and cultural interactions, as well as environmental and humanitarian impacts, are increasingly concentrated in cities, and this poses massive sustainability challenges in terms of housing, infrastructure, basic services, food security, health, education, decent jobs, safety and natural resources, among 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 urbanization can be analyzed using key indicators guided by the United Nations Millennium Development Goals (MDGs)

Urban Population Growth

The total population of Kenya is estimated at 47.6 M. It has a population growth rate of 1.69%

Table 3: Projected population of Kenya

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

Source: Modified from Kenya National Census, 2009

Kenya is urbanizing at a very high rate. The concentration of Kenyans in urban areas is mainly attributed to migration to urban areas from rural areas, and annexation (geographical expansion) of cities). The net migration rate is 0.2/1000 migrants. The capital city, Nairobi has the highest urban population of nearly 2,750,547inhabitants. Kenya has the highest rate of urbanization compared to other East African countries as shown by the graph below.

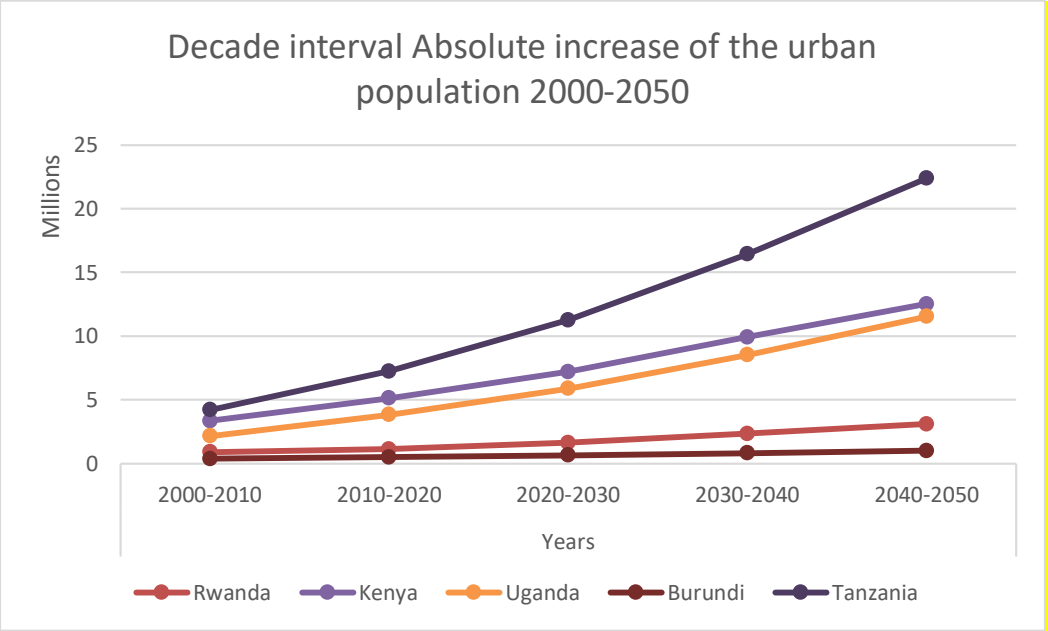


Figure 5: Urban Population growth rate of Kenya in comparison to other East African countries

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). The table below shows the hydropower potential of Kenya compared with other East African countries.

Table 4: Hydropower potential for selected countries East African Countries

Electricity access in Africa - 2014				
Region	Population without electricity millions	National electrification rate %	Urban electrification rate %	Rural electrification rate %
Africa	**634**	**45%**	**71%**	**28%**
WORLD	**1,186**	**84%**	**95%**	**71%**
Rwanda	*8*	*27%*	*72%*	*9%*
Tanzania	*36*	*30%*	*57%*	*18%*
Uganda	*31*	*19%*	*52%*	*12%*
Kenya	***36***	***20%***	***60%***	***7%***
Burundi	*10*	*5%*	*28%*	*2%*

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

The table below shows the level of access to electricity in both rural and urban areas of Kenya and comparison in the region and globally.

Table 5: Access to electricity in both rural and urban areas, for selected countries in East Africa

Hydropower potential and installed capacity in eastern 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: 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 urban electrification 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 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 6: 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 improved sanitation facility	% with no access to 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

Waste management

More than 52% (over 3.5 billion) of the Earth's population in 2008 did not have access to the most elementary Waste Management services like e.g. a sound waste collection and removal out of the residential areas and at least a controlled disposal. (ASSOCIATION, 2012).Waste management in Kenya is relatively good with 70% of urban households having access to rubbish collection services

These services include; piped water, sewerage and telephone services. Limited access to, or poor quality of, infrastructure services in developing countries can be major impediments to business productivity, and major sources of frustration to the population.

Table 7: Access to service for selected countries in East Africa (Percentage of households)

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

Source: UNICEF Progress on drinking water and sanitation

From the table above, it is evident that service provision is inadequate in most of the East African region.

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 in the secondary section is below the minimum of 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 8: Teacher: Student ratio for selected countries in East Africa

Categories	Pre-Primary			Primary			Secondary		
	Public	**Private**	**Total**	**Public**	**Private**	**Total**	**Public**	**Private**	Total
UNESCO Teacher: Student Ratio	**1:33**						1:19		
Other Countries ▪ Kenya ▪ Eritrea ▪ S. Africa ▪ Chile ▪ Mexico ▪ Uganda							1:26 1:51 1:29 1:23 1:21 1:19		

Source: (UNESCO)

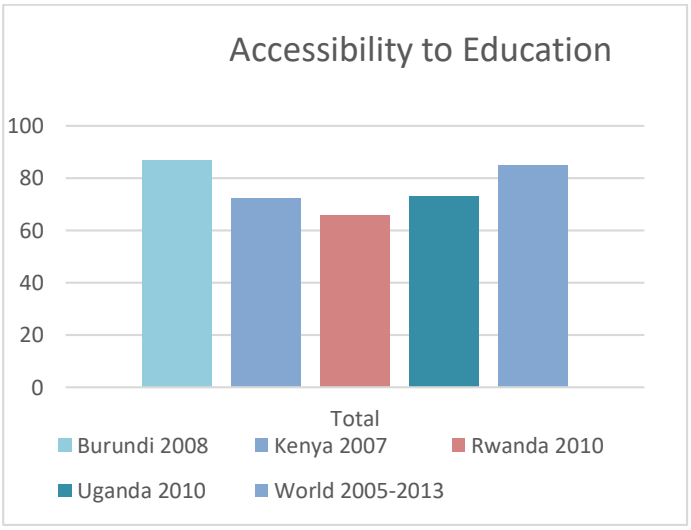


Figure 6: Access to education for selected countries in East Africa
Source: (UNESCO)

Health

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

Table 9: Analysis of health status in Kenya

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

Source: WHO 2012

WHO (World health organization) recommends 1 Doctor for 300 people. Kenya is far below the WHO recommendation in terms of Doctor Patient Ratio. Kenya needs 53 times the existing number of Doctors to bring the country at per with the WHO requirements.

The table below shows Kenya's comparison to neighboring countries

Table 10: 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

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 new 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 a 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.

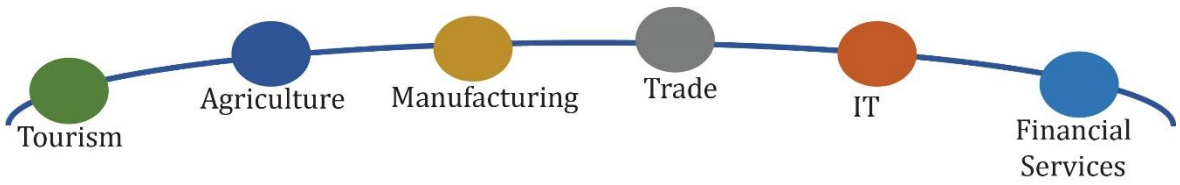


Figure 7: Economic sectors emphasised in Vision 2030

Source: Vision 2030

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 cross-cutting 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, peace building and conflict resolution. The cross-cutting 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 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 Nairobi Metropolitan Region (NMR) would increase by 15% to 20%. It is important that the sectoral development are planned and developed not only to cater development demand at a high level of service but in fact would lead and facilitate development in the desired directions.

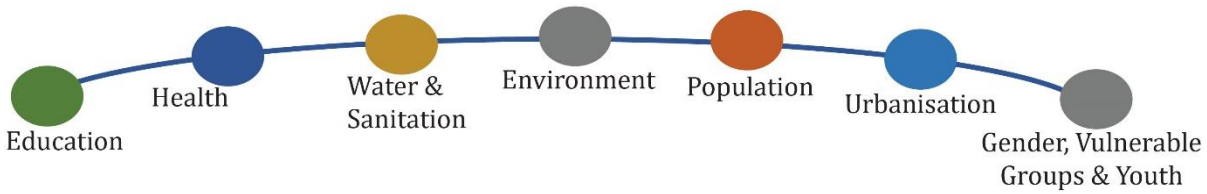


Figure 8: Social aspects emphasised in Vision 2030
Source: Vision 2030

2.2.4. Short-Term Development Strategy of the Government of Kenya

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 as 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 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 in education at 17.7 percent between 2008-2009 and 2011-2012, compared to Uganda, which spends an average of 10 percent. 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 neighbors. 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 freedom of enterprise, and this has manifested itself clearly in the broadcasting industry, where Kenya Television Network (KTN), the first non-pay, privately owned TV station in Africa, was founded in Kenya. Liberalization of the agricultural sector was undertaken in the 1980s and 1990s, reducing 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 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 neighbors; 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 center 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 center 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

i). Macroeconomic Performance of NMR and Economic Growth Target

a) 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.

b) 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 12**.

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

Parameters	Year	
	2010	2030
GRDP	Ksh 899.7 billion	Ksh. 14,725.2 billion
Per Capita	Ksh. 81,957	Ksh. 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 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 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 among comparable metropolitan cities around the globe. The key challenges to improving the investment climate include insecurity, corruption, poor infrastructure (including roads and energy/ electricity), and limited access to credit by small and medium enterprises.

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

ii). The Sectoral Economies of Nairobi Metropolitan Region

a) 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. Green house farming of tomatoes is also another important agricultural activity being practiced in Kitengela. Rain fed agriculture is unsustainable due to eratic 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 loss of communal land ownership and group ranches. This has led conversion of grazing land to other uses. Consequently, livestock production in the planning area has significantly diminished.

b) Industry and Manufacturing

Although Kenya is the most industrially developed country in East Africa, manufacturing accounted for only 8.4 percent of gross domestic product (GDP) in 2017 which is a drop from 10.7 percent in 2013. Nairobi is also the largest industrial centre. Consequently, manufacturing percent contribution to GRDP of NMR has as well dropped. The principal products include processed food, beer, vehicles, soaps, construction material, engineering, textiles and chemicals. There is also a thriving sector that provides employment to carpenters, metal workers, furniture makers, vehicle repairmen 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. There is also an informal sector that, though generally not included in

statistics, 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 in 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 spill over 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 duty on capital equipment and other raw materials, construction of industrial parks and economic zones.

c) 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 2000's, 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 (EPZs) 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.

d) 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 a 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 average length of stay, per capita tourist expenditure in NMR is low compared to other destinations. In fact, Kenya and Nairobi is 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 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 need, therefore, to increase investment in tourism infrastructure, increase expenditure allocations, and increase concerted capacity building for local communities.

e) 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 percent 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 engage in trade, industrial activities, juakali, horticulture/floriculture and tourist sector sale of beads. However, 10.45 percent of the productive population in the county are unemployed (2009 pop census).

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 increase in unemployment. The employment creation in NMR is adversely affected by the 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.

f) 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.

g) Micro and Small Enterprises

The micro and small enterprises (MSEs) sector contributes 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.

2.2.7. Economic Potential of NMR

NMR offers numerous investment opportunities in the manufacturing sector, infrastructural development, financial sector, agro-processing, agro-chemicals, 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 building sector, metal, and wood working machine tools. Investment opportunities exist in 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.

2.2.8. Bottleneck of Economic Development of NMR

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

a) GRDP Growth

High and rising living standards are key indicators of the successful utilization 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..

b) 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 realizing overall price stability should address these two issues.

Figure 9: Kenya Inflation Rate (2013 – 2018)
Source: Trading economics.com | KNBS

c) Labour Market

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

Kenyan work force 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.

d) 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 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 reliability of police services, organized crime in public institutions and business costs of terrorism. Kenya also performs poorly in the judicial independence ranking and law and order index.

e) Infrastructure Development

Infrastructure bottlenecks constrain economic growth, competitiveness and poverty reduction. The existence of high-quality infrastructure is critical in ensuring 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 unfavorably in terms of access to communication system, port and rail transport infrastructure, and electricity supply.

f) Rapid Population Growth

Nairobi's population has grown significantly from 350,000 in 1963 to 828,000, 1,325,000 and 2,137000 in 1979, 1989 and 1999 respectively. Population of Nairobi continues to increase at a very high rate of 4.5 percent per annum for 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 population is living below poverty line and 40 percent are categorized as living in informal settlements, mainly slums. This is further accelerated by influx of people from rural areas where the poverty ratio is over 50 percent.

g) 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.

h) 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 reduction in vegetation and open land, which have been playing an important role in maintenance of natural environment.

i) Lack of Integrated Approach to Development

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

2.3. NATIONAL, REGIONAL AND LOCAL PLANS

The ISUDP is prepared within the context of the regional plans for NMR, namely, Vision 20303, Nairobi Metro 2030 and Spatial Planning Concept for NMR as discussed below

2.3.1. Vision 2030

The social pillar under Vision 2030 recognizes 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

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

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

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's 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 organized, 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 organization 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 utilization of land and natural resources for sustainable development; create liveable and functional Human Settlements both urban and rural and secure the natural environment for high quality of life.

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 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 12: Economic Targets for Urban Centres

Spatial Units	Envisaged Function
1. **Kitengela**	**Service Town**
2. Ongata Rongai	Service Town
3. Kiserian	Service Town
4. Namanga	Trading Town
5. Isinya	Service Town
6. Bissil	Service Town
7. Kajiado	Administrative -cum- Service Town

8. Loitoktok	Administrative Town
9. Sultan Hamud	Transit Town
10. Magadi	Industrial Town

Source: Spatial Planning Concept for NMR

Table 13: Proposed Settlement Hierarchy for NMR, 2030

Level	Settlement Hierarchy	Settlements	Characteristics
I	Regional Complex	Nairobi- Ngong-Ongata Rongai-Ruiru Complex	• Highest administrative functions • Specialised & world class facilities • Tertiary activities
III	**Growth Centre**	Limuru, Karuri, Juja, Mavoki, **Kitengela**, Loitoktok	• 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

This ISUDP likewise takes reference to the Kajiado County Integrated Development Plan 2013 – 2017 which provides the guiding vision of "A prosperous, globally competitive County, offering quality of life" and the mission statement of "To promote equitable and sustainable socio-economic development through efficient resource utilization and inclusive participation."

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

Priority programs identified by the CIDP focused on; Agriculture and development sector; Energy, Infrastructure and IT; General economic, commercial and labor affairs sector; 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; Education development; Health development; Sports and cultural development; Energy; and Mining.

2.3.6. Cluster Potential

While pointing out to the lack of 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 got some economic logic, as summarised in **Table 14**.

Table 14: 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	
	Mavoko	Services, Manufacturing, Transport	Industry, Logistics and Transportation	
	Nairobi-Malili	IT Services, Commercial, Transport Services	Real Estate, Logistics and Transportation, IT Education and Services	

Source: Vision RI

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. The clusters therefore 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 Central Business District of Nairobi as well as in other urban centres of the NMR. The economic spillovers from one cluster too, if absorbed optimally, will have 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 framework

a) Constitution of Kenya 2010

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

Article 60(1) of CoK 2010 provides that land in Kenya shall be held, used and managed in a manner that is equitable, efficient, productive and sustainable. For these purposes, the use of land and property shall be regulated by the State "in

the interest of defence, public safety, public order, public morality, public health, or land use planning" (Article 66(1)). Development planning is inextricably linked to the ownership, use and management of land.

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

b) County Governments Act 2012

Following CoK 2010, the County Governments Act 2012 mandates County Governments to prepare county plans which include "cities and urban areas plans," amongst others. The said Act provides that the "county planning framework shall integrate economic, physical, social, environmental and spatial planning" (Article 104(2)).

c) Physical Planning Act 1998 cap. 286

Physical Planning Act 1998 cap. 286 defines the types of physical development plans. This ISUDP may be considered as a Short-term Plan of the Action Area Plans typology which is defined in the said Act as plans intended for "comprehensive planning of areas selected for intense development, which is to commence within a specified period" (Third Schedule). This ISUDP also includes Short-term Plans of the Advisory or Zoning Plans typology which indicate "permitted subdivision, use and density of development" (Third Schedule).

Article 29 of the same Act also empowers local authorities to prohibit or control the use and development of land and buildings in the interests of proper and orderly development as well as control subdivision of land. They are also empowered to ensure the proper execution and implementation of approved physical development plans; formulate by-laws to regulate zoning in respect of use and density of development; and reserve and maintain all the land planned for open spaces, parks, urban forests and green belts in accordance with the approved physical development plan.

d) Land Act

The Land Act, 2012 gives effect to Article 68 of the Constitution that calls for revision, consolidation and rationalization 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 takes 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 recognized local community initiatives, among other principles in regard to utilization 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.

e) 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

f) 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 frame works

Sessional Paper No 10. of 2012

The social pillar under Vision 2030 recognizes 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 urbanization; *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.

National Land Policy

The National Land Policy gives the principles for guiding land use management. Sustainable land use is among 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

The land policy also recommends development control as a tool in ensuring equitable and sustainable land use. With this in mind, this plan gives development standards / guidelines / regulations to guide its implementation. The policy recognizes 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.

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 blue print that envisages transition of the country to middle income with majority of its population living in urban areas.

The policy identifies urban areas as the main contributors of the GDP accounting for about 70% of the GDP. Critical dimensions of the economy in urban areas identified are: Global competitiveness; Local economic development; Urban investment; Rural-urban and intercity linkages; Specialized urban areas and Industrial development.

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

CHAPTER 3: SECTORAL SITUATIONAL ANALYSIS

3.1. LOCATION AND LAND AREA

Kitengela is within Kajiado county which is located at the South of Kenya covering an area of 21,292.7 square Kms. Kajiado county has a population of 687, 312 (2009 population census) with 7 administrative units. Kitengela is one of the towns in the Southern Metropolitan regions. The others include Ngong, Ongata Rongai and Kiserian. Kitengela 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 northwest 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 vast open area and then Maasai village.

The mapped location of Kitengela Planning Area in relation to the national/ regional and local contexts is shown in the figures below.

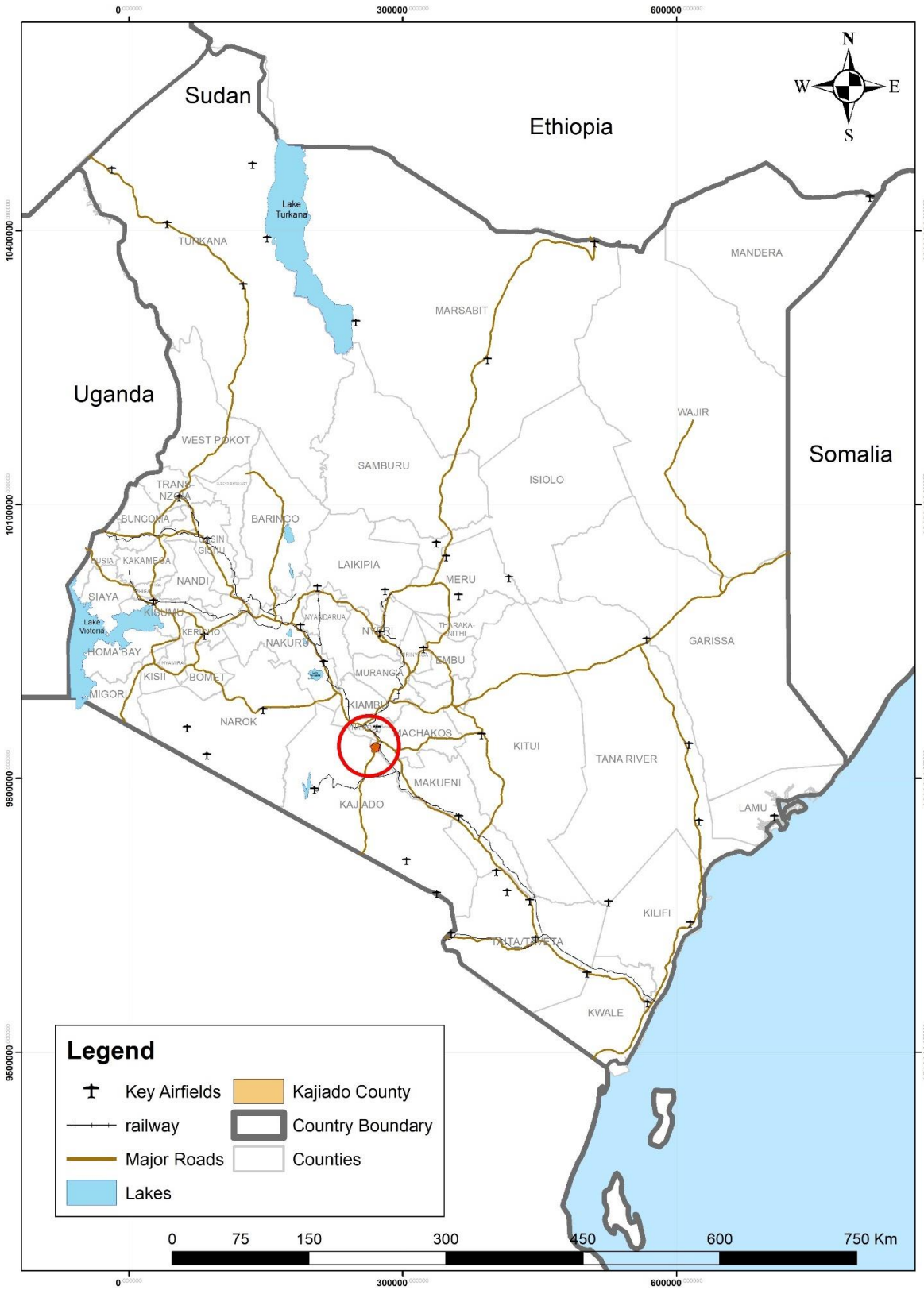


Figure 10: Location of Planning Area in the National Context

Source : Vision RI

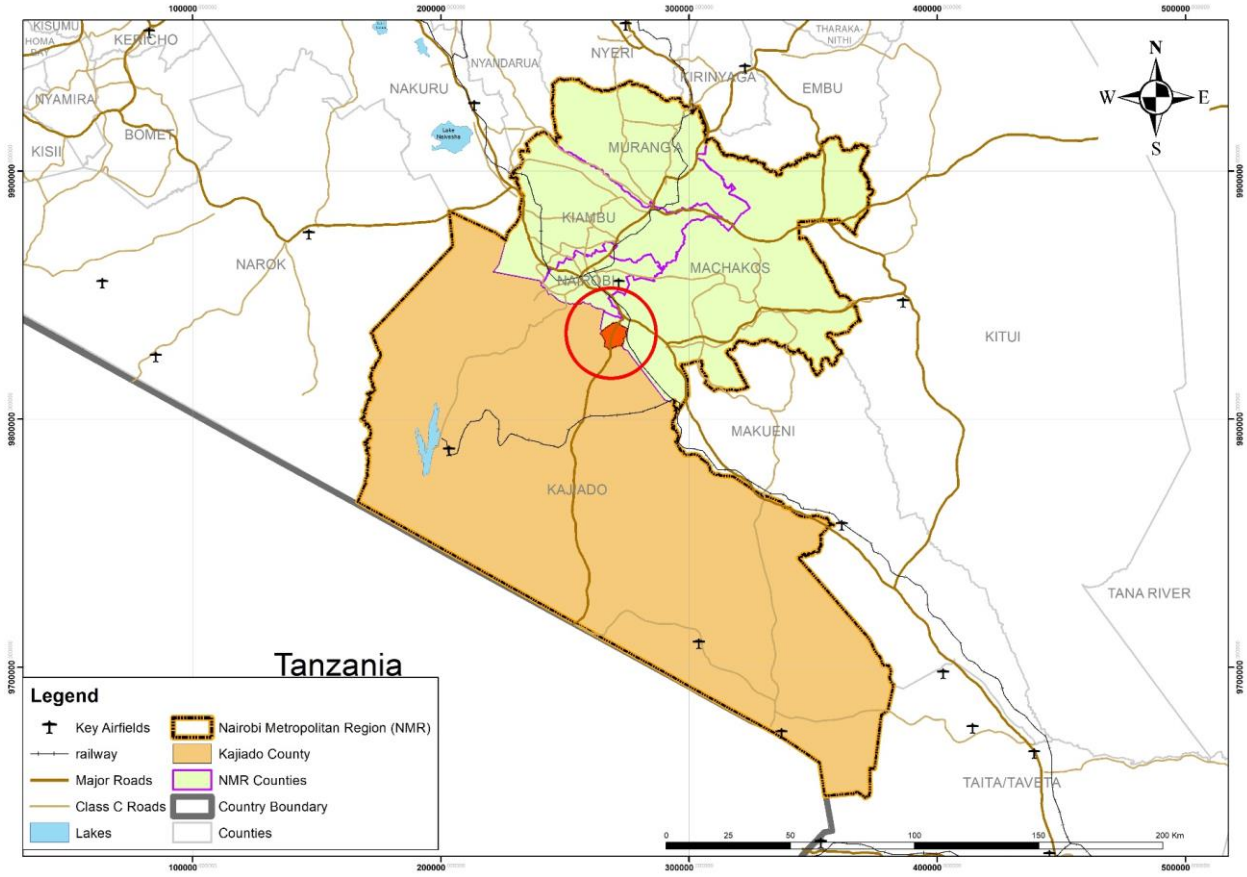


Figure 11: Location of Planning Area in the Regional Context
Source: Vision RI

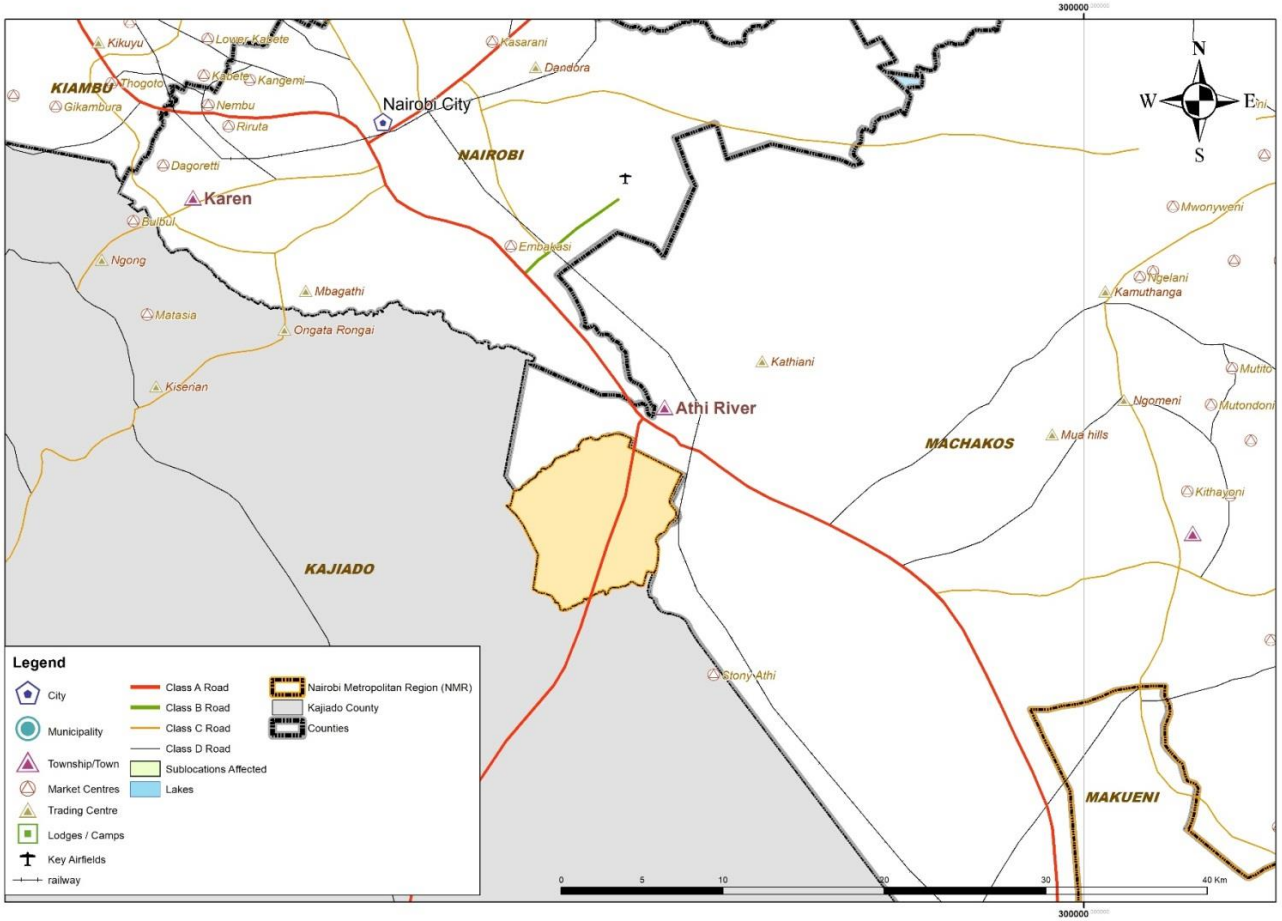


Figure 12: Location of Planning Area in the Local Context
Source: Vision RI

3.2. ADMINISTRATIVE UNITS

Kitengela covers approximately 7,439.50 hectares. It is composed of 2 wards and 2 sub-locations whose respective land areas are presented in the following table.

Table 15: Administrative & Political Units and their Areas

Ward/ Sub-location		Area in hectares		Share in %
		Ward	Sub-location	
Kitengela		4,829.30		64.91%
	Kitengela		4,829.30	
Kaputei North		2,610.22		35.09%
	Kisaju(Isinya)		2,610.22	
Totals		**7,439.52**	**7,439.52**	**100%**

***only a part of Kisaju is included**

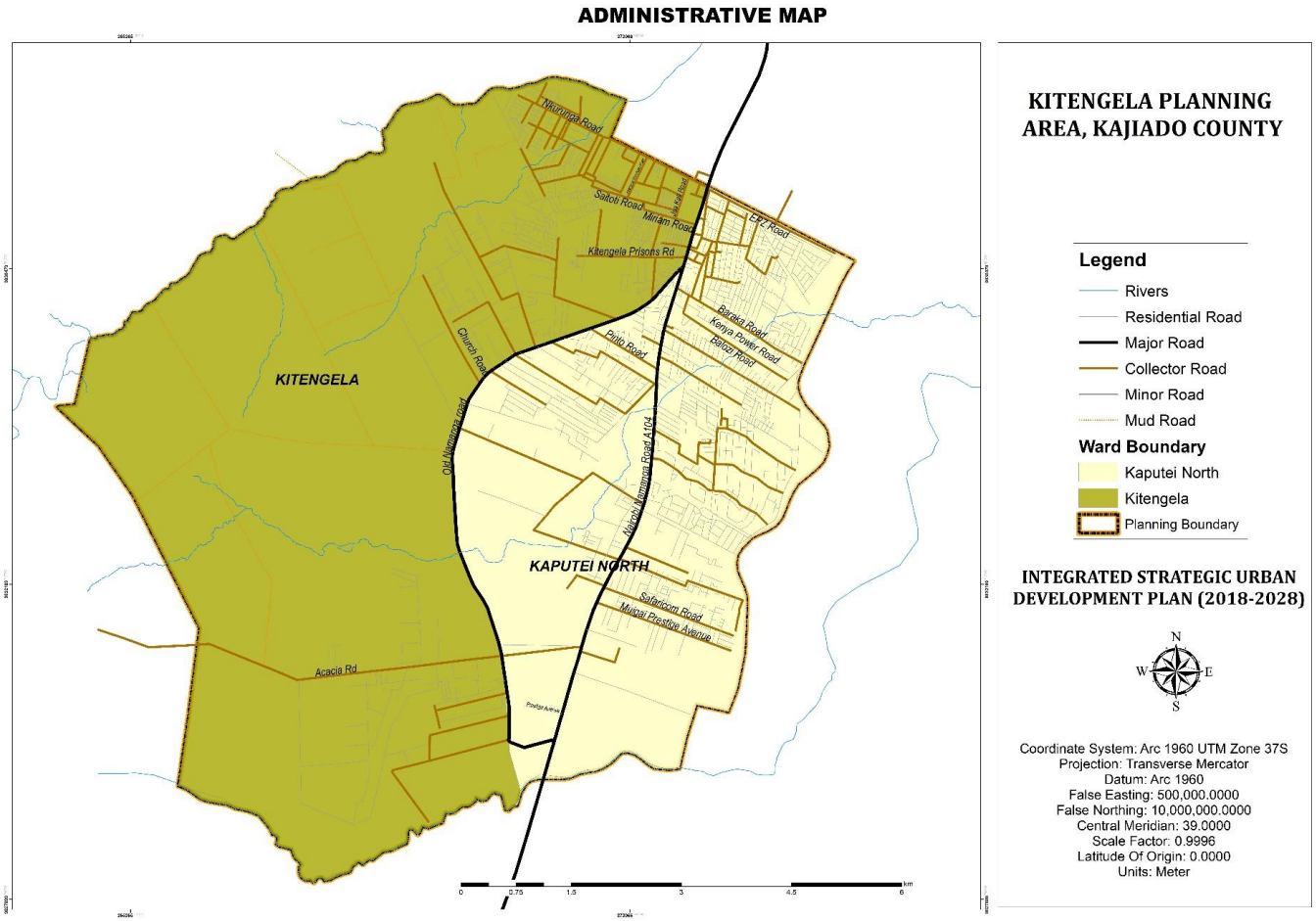


Figure 13 Administrative Units Map

Source: Vision RI

3.3.DEMOGRAPHIC FEATURES

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.

3.3.1. Historical Population Size and Growth

Kitengela planning area is located just off Mombasa highway and is closely linked to Nairobi in terms of offering residential facilities for the workers of the city. Therefore, many of the people that live in the planning area work in Nairobi. The night population is thus fairly different from the day population. To this extent, the population character of the planning area is complex.

The population of the two wards comprising the planning area is shown in the table below.

Table 16: Historical Growth of Population, 1999 to 2009

Ward	Population		Population Change
	1999	2009	
Kitengela	17,347	30,663	76.8 %
Kaputei North	5,966	29,989	402.7 %
Total	**23,313**	**60,652**	**160.2 %**

Source: KNBS 1999 and 2009 Population Census Report

As shown in the table above, the population of the planning area increased by 160% between 1999 and 2009 hence this indicates a high population growth rate. In particular, the population in Kaputei North ward was higher during the period mainly because Kitengela CBD was already saturated and therefore migration to open rangelands in Kaputei North.
In terms of age structure, the table is presented below.

Table 17: Kitengela Population by Age and Sex

Age	Male	Female	Total
0-4	6,045	4,981	11,026
5-9	5,480	4,653	10,133
10-14	4,743	3,859	8,601
15-19	3,441	2,877	6,318
20-24	2,510	2,910	5,420
25-29	2,373	2,341	4,715
30-34	1,721	1,649	3,370
35-39	1,569	1,432	3,001
40-44	1,068	1,005	2,073
45-49	862	762	1,624
50-54	665	568	1,233
55-59	463	361	824
60-64	348	329	677
65-69	256	203	459
70-74	214	220	434
75+	358	387	745
Total	**32,116**	**28,536**	**60,652**

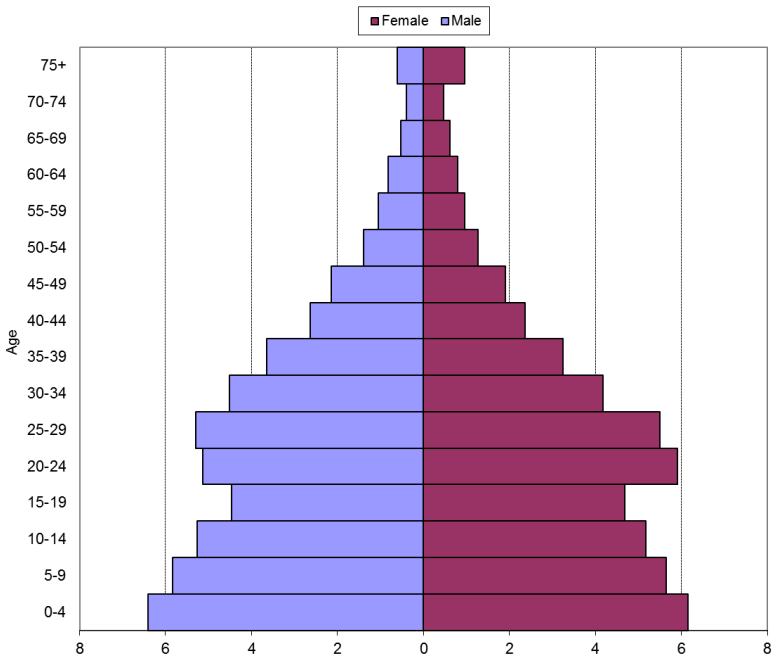


Figure 14: Population pyramid of Kitengela
Source: KNBS 2009 Population Census Reports

From the population pyramid above, the age structure of the population has a high dependency ratio (0-9). The population is generally school going. This calls for expansion of education and health services. There's also a bulge in the age structure are around the ages 20-29 which specifically calls for job creation efforts for the youth.

The table below represents the population projections of the planning area

Table 18: Projected Population, 2010 to 2028

Year	POPULATION PROJECTION			PROJECTED POPULATION DENSITY (Persons per sq Km)
	Males	Females	Total	
2010	16,903	15,791	32694	862
2012	19,217	17,953	37,170	980
2014	21,848	20,411	42,259	1114
2016	24,838	23,205	48,043	1267
2018	28,238	26,381	54,619	1440
2020	32,104	29,993	62,097	1631
2022	36,499	34,098	70,597	1862
2024	41,495	38,766	80,261	2116
2026	47,175	44,073	91,248	2406
2028	53,633	50,106	103,739	2736

Source: KNBS

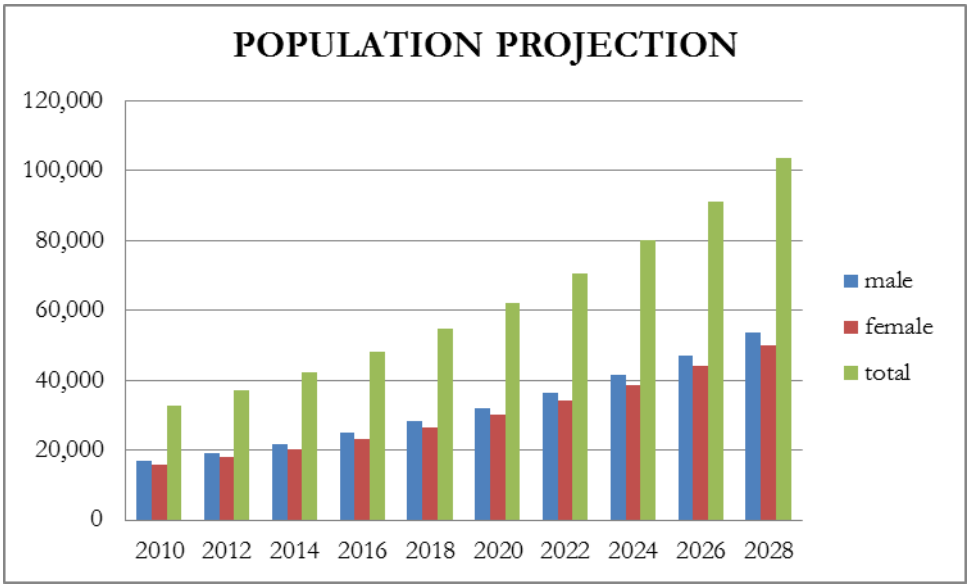


Figure 15: population projections
Source: Vision RI

The figure below illustrates a high population growth rate by 2028. This population increase will require to be matched with expanded social amenities and physical infrastructure such as water and solid waste management.

3.3.2. Population density and distribution

Kitengela has an area of 75.01km² with a population density of 809 persons per km² (2009 pop census).

The current spatial form of Kitengela characterizes the population density and distribution. Population density is influenced mainly by availability of land, 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

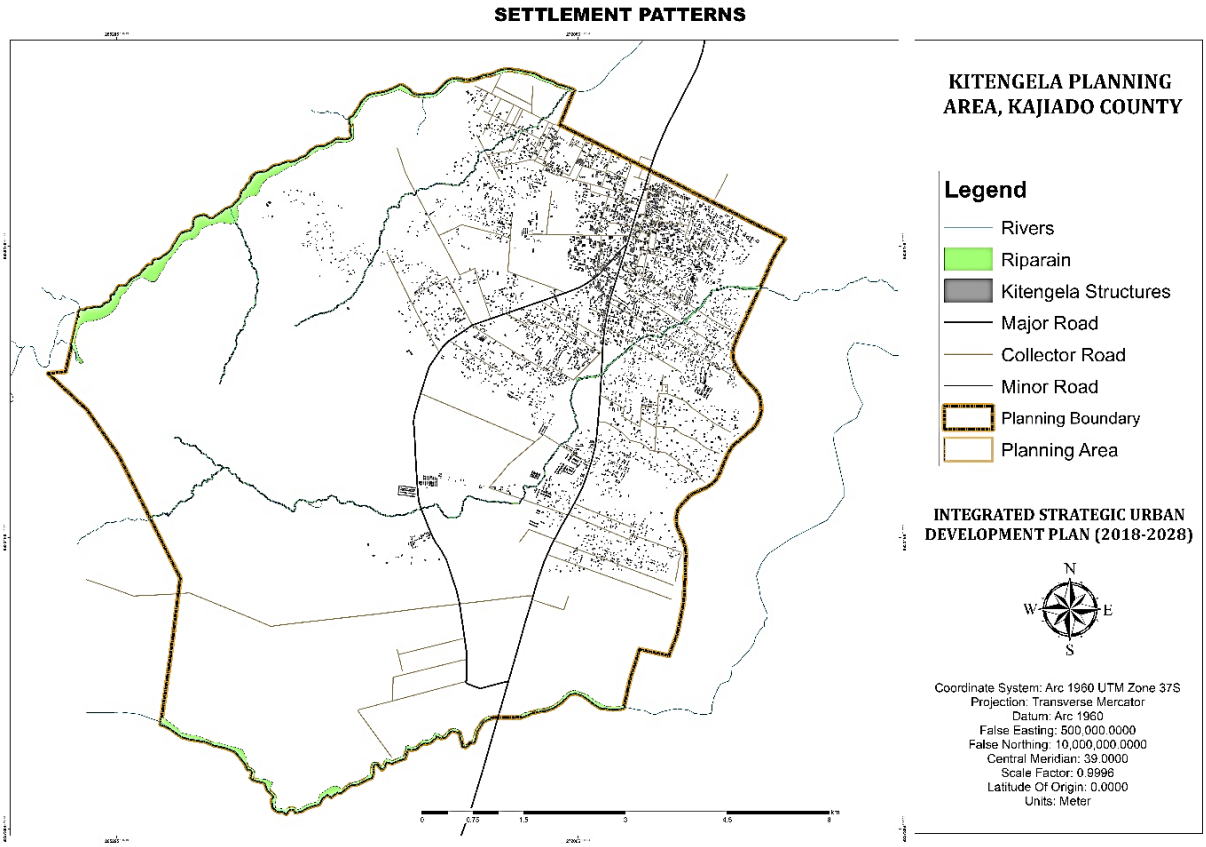


Figure 16: Kitengela settlement patterns
Source: Kitengela Zoning plan

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

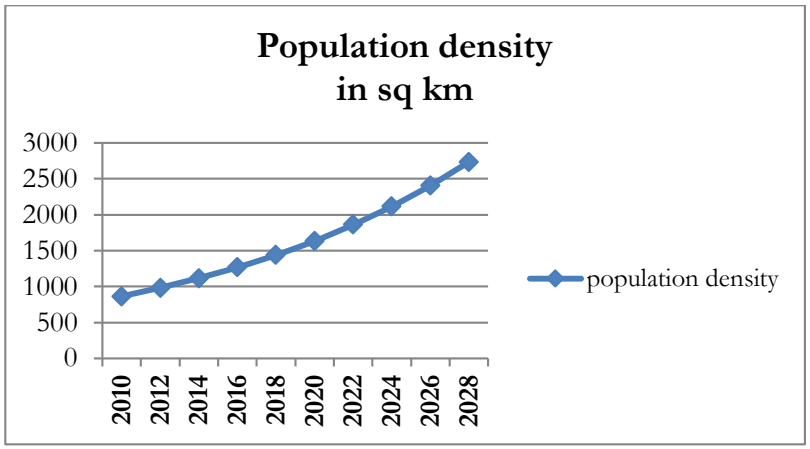


Figure 17: Projected Population density
Source: KNBS

3.3.1. 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%.

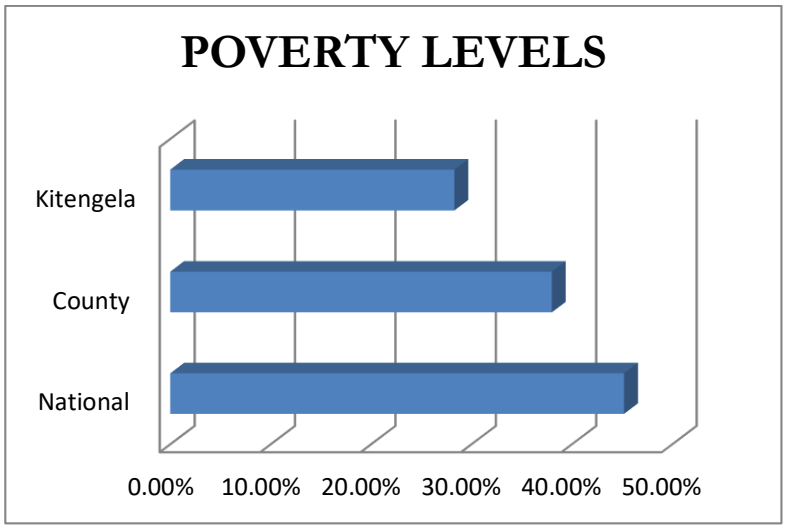


Figure 18: Poverty level in Kitengela in the national context.
Source: KNBS

Challenges	Potential
1. Increase in population does not match provision of social amenities and infrastructure 2. High unemployment rate among the youth **3.** High population density has resulted to land fragmentation.	1. High population will provide a large market for goods and services. 2. Skilled and unskilled labour from the youth. 3. Increased revenue to the county through economic activities

3.4. NATURAL RESOURCES AND THE ENVIRONMENT

This section focuses on resource base in the planning area. It examines the topography, climate, agro-ecological zones, water resources, flora &fauna, sources of energy, air quality, noise levels and the environmentally fragile areas.

3.4.1. Topography and Drainage

The planning area is part of a larger rangeland ecosystem called the Athi-Kaputiei Plains. It is in a region of undulating slopes which become rolling and hilly towards the Ngong Hills. It lies at an altitude of about 1,700m above sea level and is characterised by gentle slopes.

Due to the gentle slopes, the area is favorable for development, and this has attracted people to the area. This has been a contributing factor for the immerse developments. New valley and Noonkopir areas located at valleys are prone to flooding.

The main rivers draining the area include Kisaju, Green valley and Ilkeek Lemedungi river and are seasonal. Kitengela area being in the Kaputei plains and with undulating topography has caused meandering of the rivers.

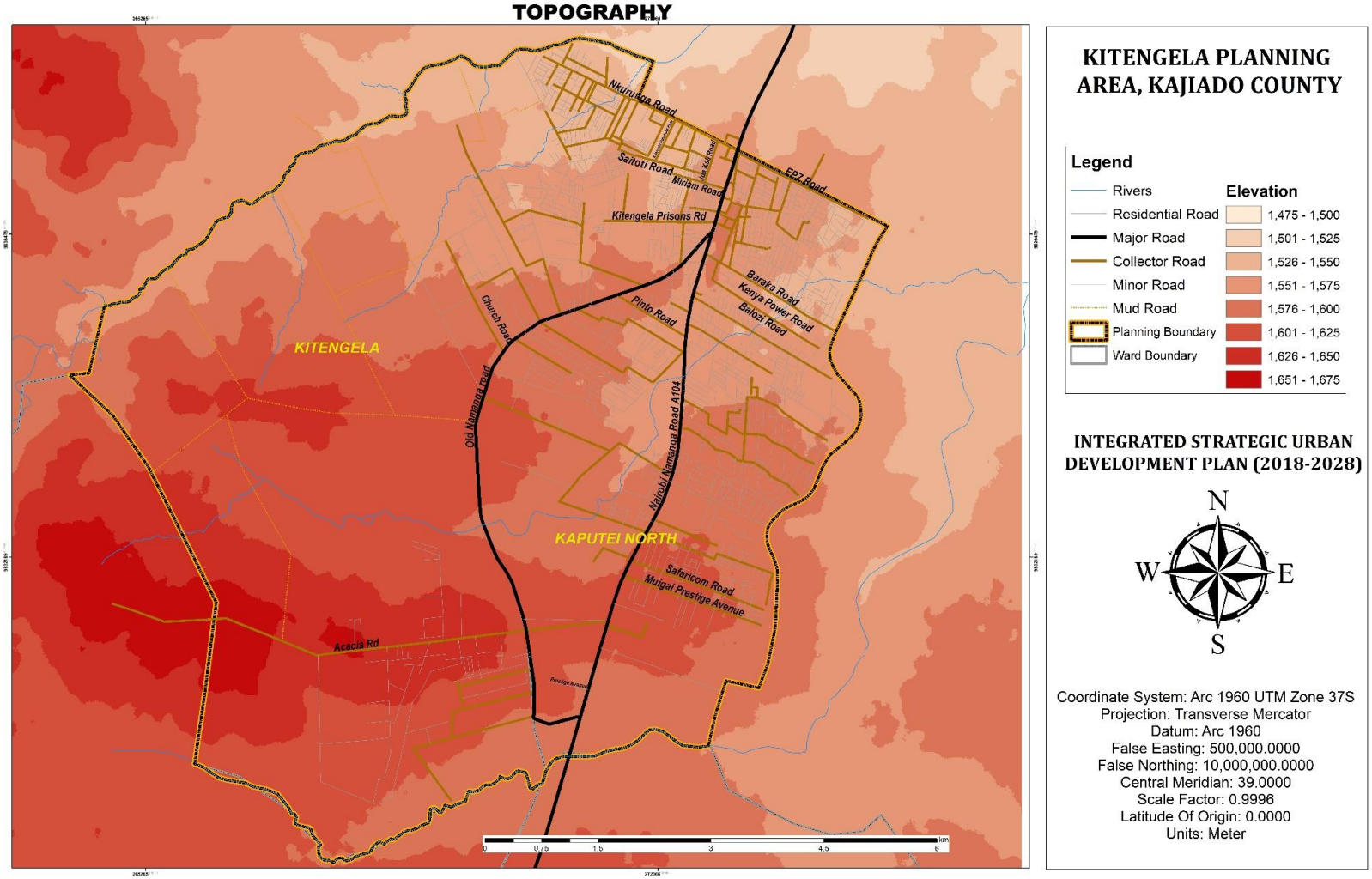


Figure 19: Elevation Map of the Planning Area
Source: Vision RI

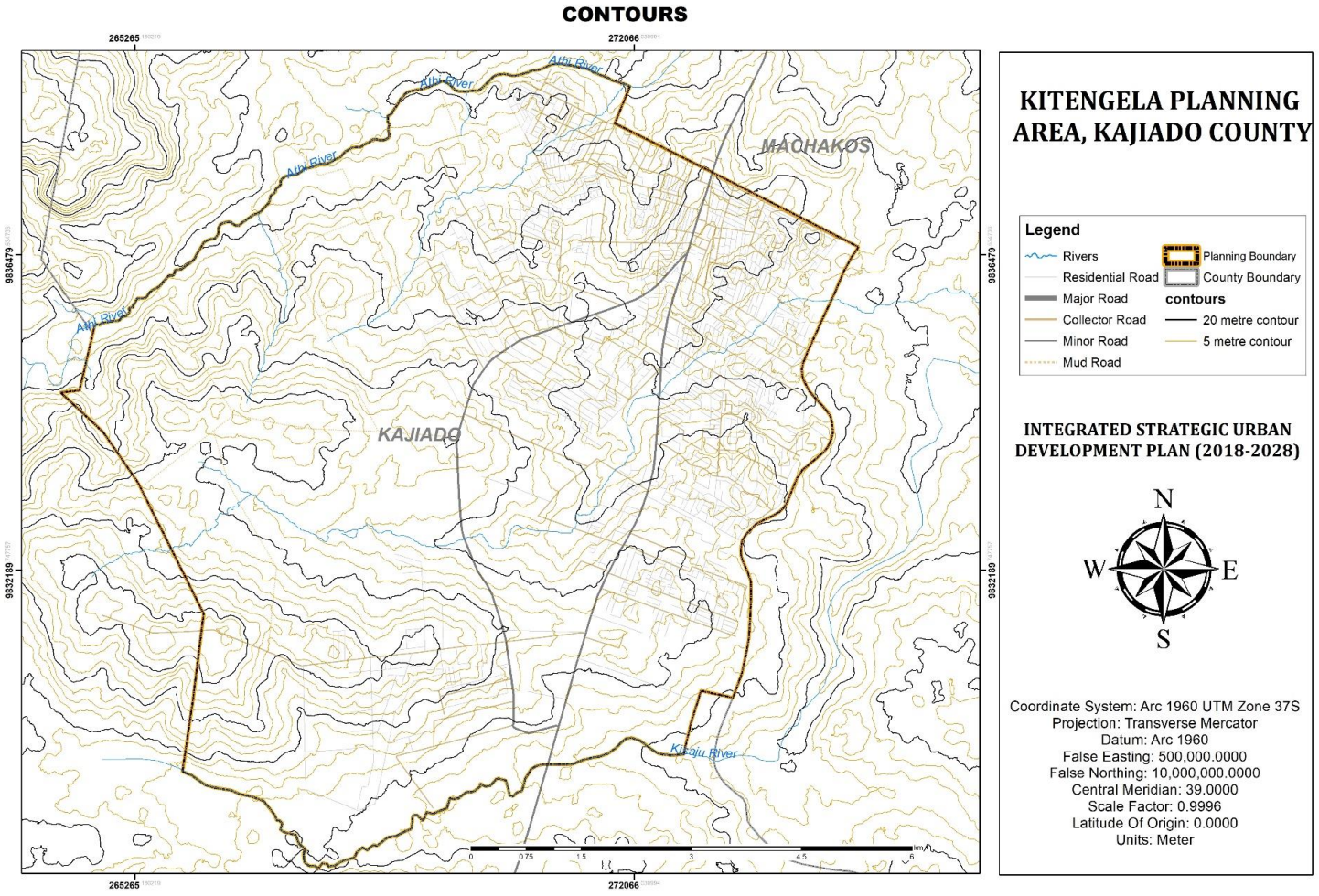


Figure 20: Contour Map of the Planning Area
Source: Vision RI

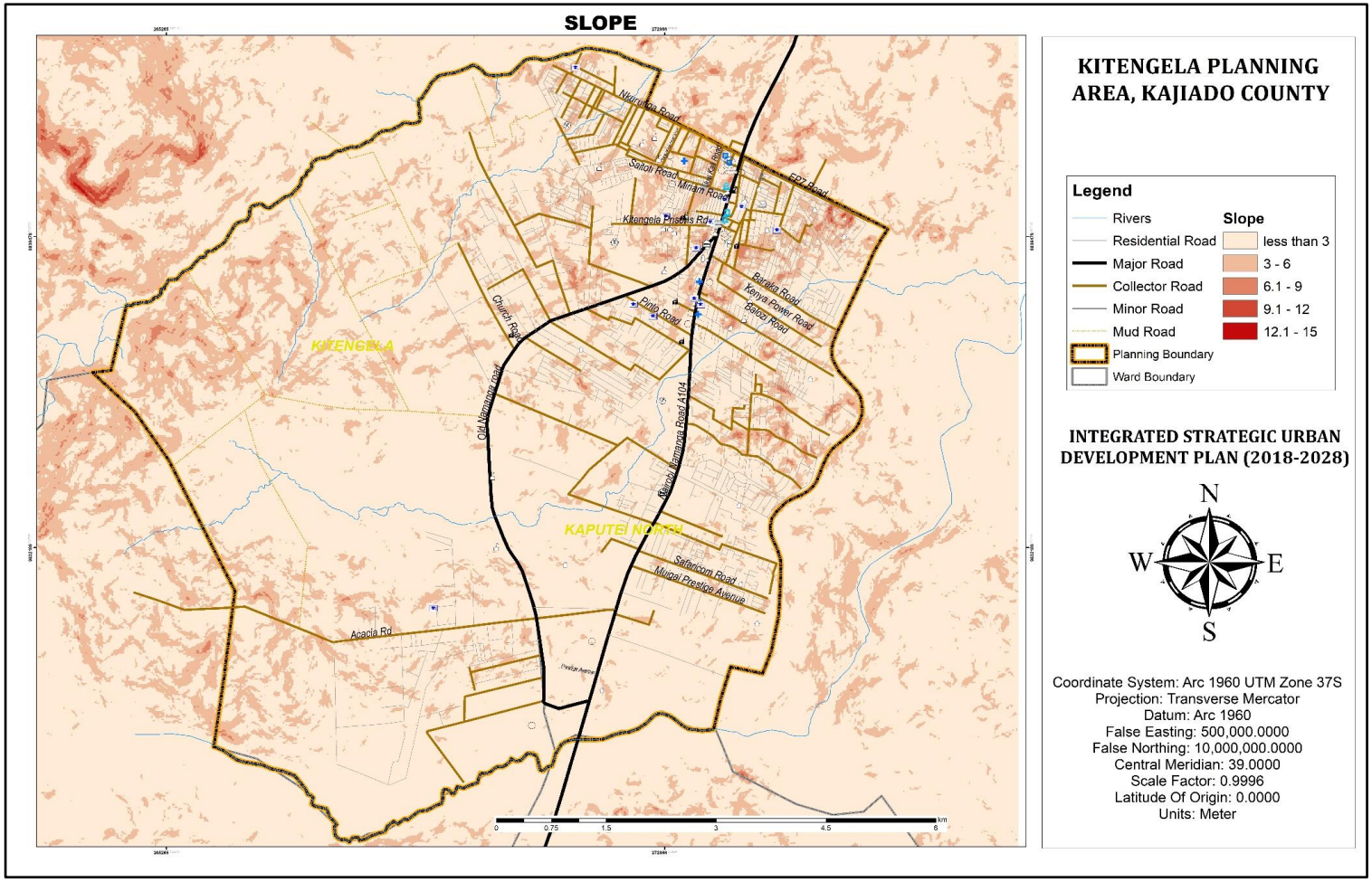


Figure 21: Slope Map of the Planning Area
Source: Vision RI

3.4.2. Geology & Soils

i). Geology

The geology is comprised of tertiary volcanics underlain by basement complex of Precambrian rocks (Schists and gneisses/igneous) . The oldest of these rocks is the Kapiti Phonolite, which covers a vast area in Kitengela. The largest outcrop of the Kapiti Phonolite is found in the east and north-east, forming the western part of the Kapiti plains. The other geological rocks are the Eolian and Pyrocrastic unconsolidated rocks.

The major aquifers in the area are in Upper Athi Series due to the availability of tuffs, lake beds and sediments in between the phonolites. Other aquifers are found in basement rocks due to fracturing and exposure of the rocks due to erosion.

The natural physical and geological features and geology of Kitengela are key determinants of the land use, land use intensity, building height, building density and liquid waste disposal mechanisms.

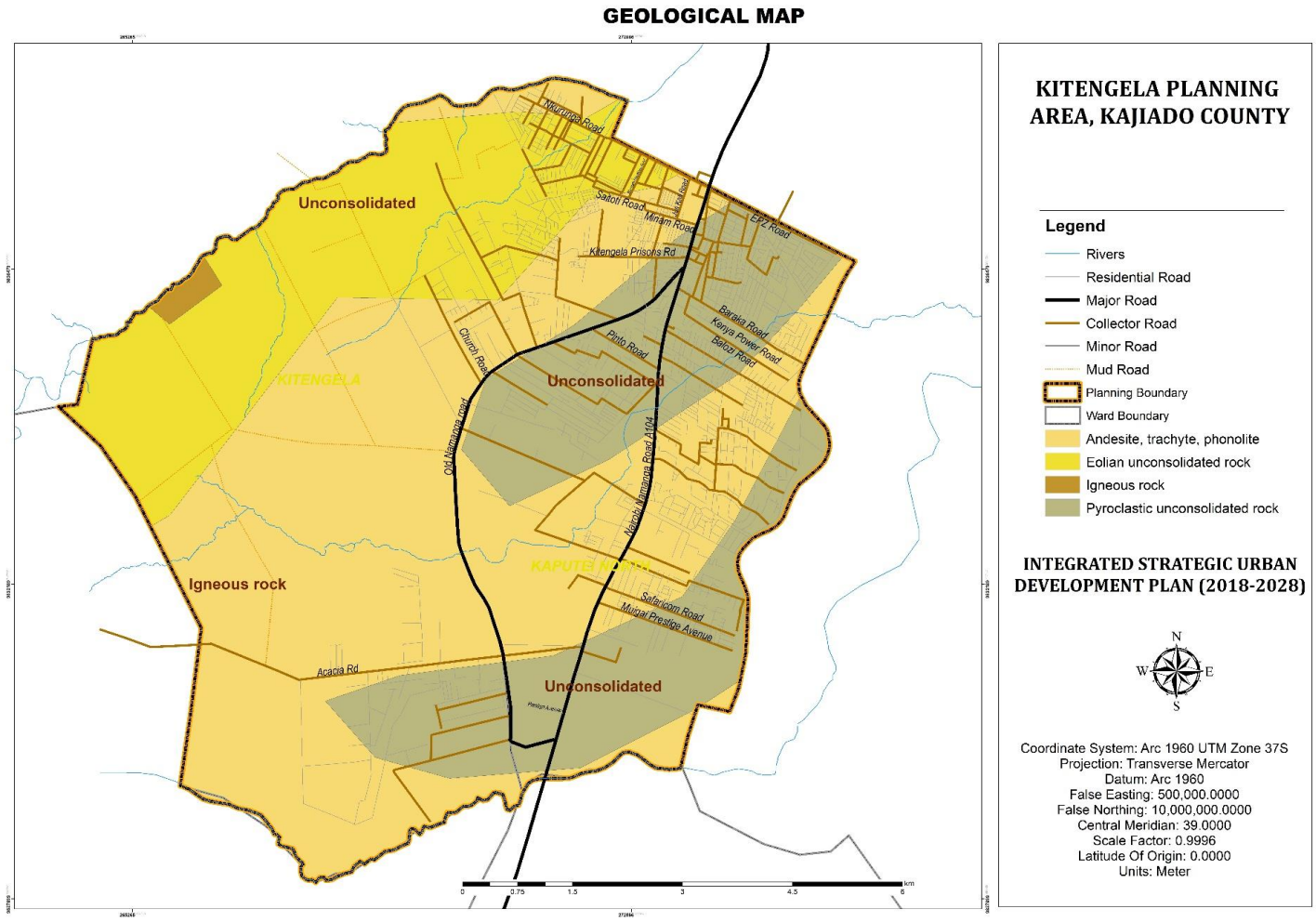


Figure 22: Geological Map
Source: Vision RI

ii). Soils

a) Soil Typology

The soils in the area are classified as vertisols and the underlying rocks are composed of crystalline granitoid gneiss that is mostly residual weathering deposits. The area is also characterised by grumosolic soils i.e. black and grey clay soils and acrisol soils.

The grumosolic soils crack during drying seasons and require judicious construction of foundations for the stability of erected buildings since they expand when wet and contract when dry.

Acrisols are extensive leaching soils, have low levels of plant nutrients, excess aluminium, and high soil erodibility, all of which make agriculture problematic. As a result, Kitengela experiences soil erosion especially at the Old Namanga road, Milimani estate, the CBD and the low density residential zone of Muigai, Safaricom, Yukos, Acacia, New valley and Upper valley estates. Therefore, it is essential to consider soil erosion control measures.

The soils are not favourable for growth of most of the crops due to the poor texture which in turn translates to low water holding capacity and high water infiltration rates. The soils are very susceptible to erosion processes such as wind erosion due to their light weight nature. The poor soils and low rainfall within Kitengela has discouraged farming resulting to change in land use from agricultural to other uses such as residential, commercial, industrial etc.

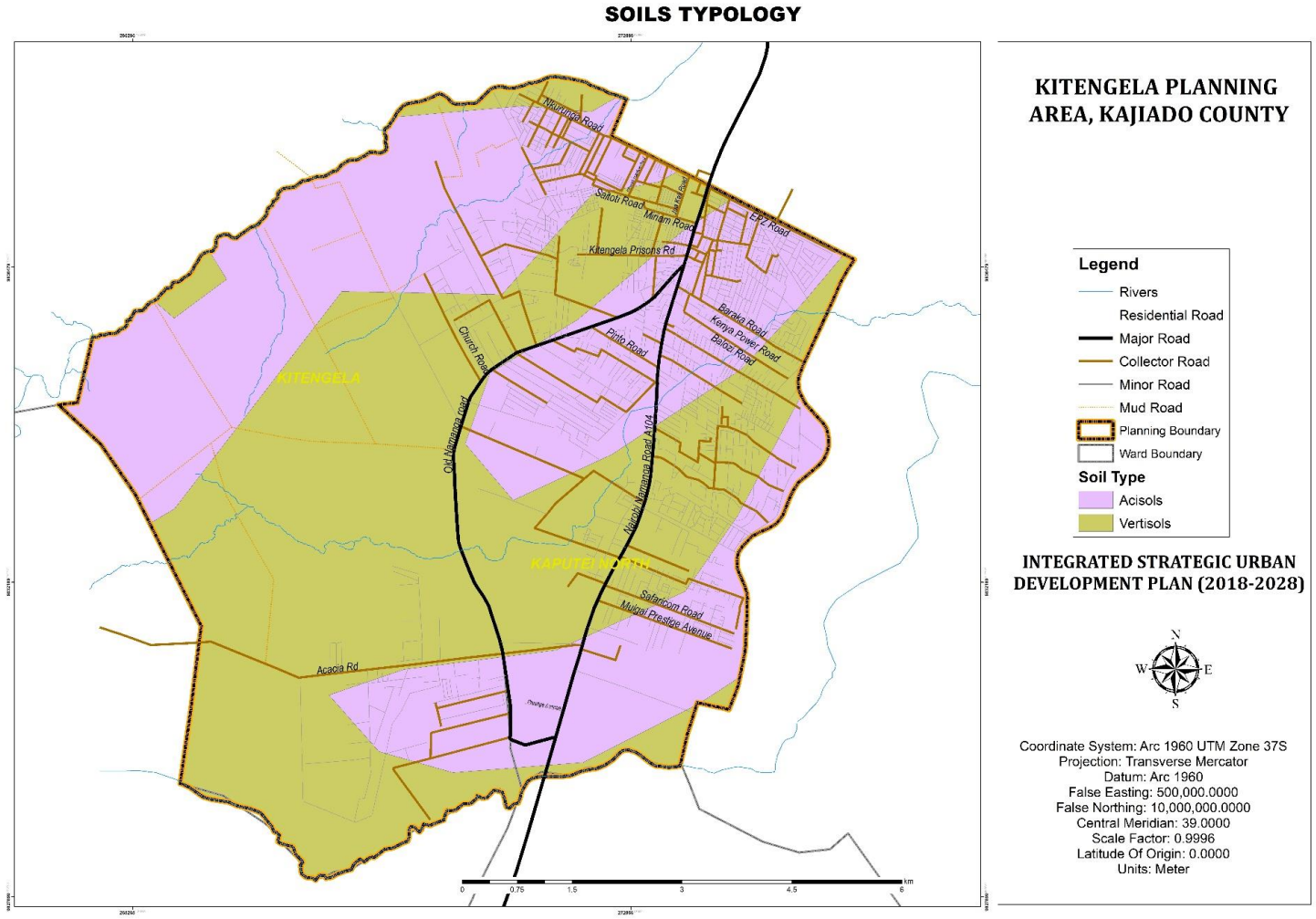


Figure 23 Soil Typology
Source: Vision RI

b) 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 characteristic make them less suitable for crop production, building foundations and highway basis.

The CBD, Muigai estate, 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.

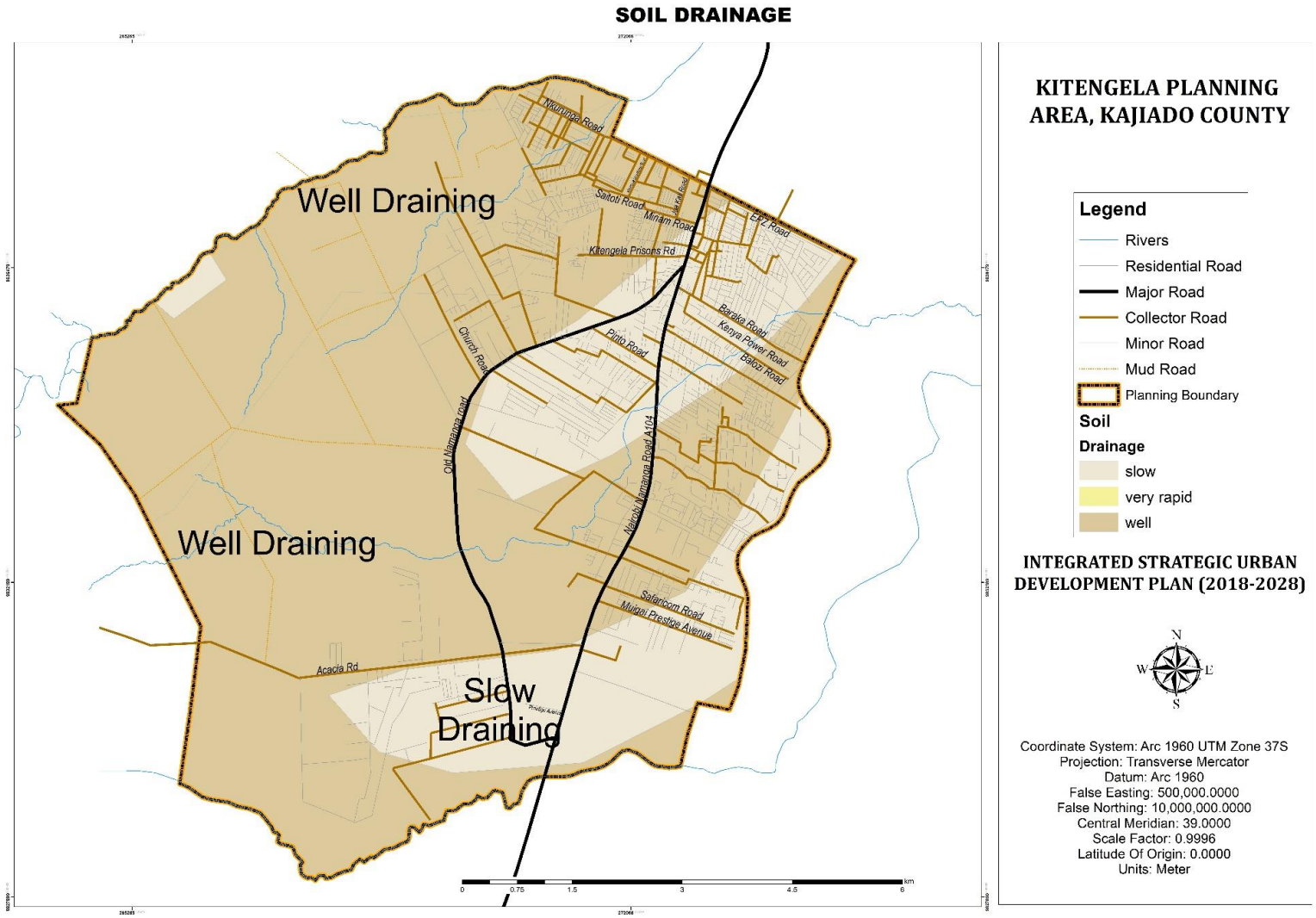


Figure 24: Soil Drainage
Source: Vision RI

c) 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 of the natural and productive soils. Soil pollution affects underground water when chemicals leach.

iii). 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 environment degradation. Significant amounts of noise and dust produced by the quarry have resulted to both respiratory diseases and hearing impairments to the residents. Moreover, 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 25: Quarry site
Source: Field visit 2018

3.4.1. Water Resources

a) Groundwater

The occurrence of the ground water in the planning area is mainly influenced by climate and topography as well as origin of the underlying parent rocks.

b) Surface Water

In Kitengela, the main surface water sources are Kisaju River, Athi River and springs. The planning area gets its water mainly from EPZ. Water from the source undergoes full treatment before supply. Most of the rivers are seasonal hence unreliable while the available ground water 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 ground water aquifers.

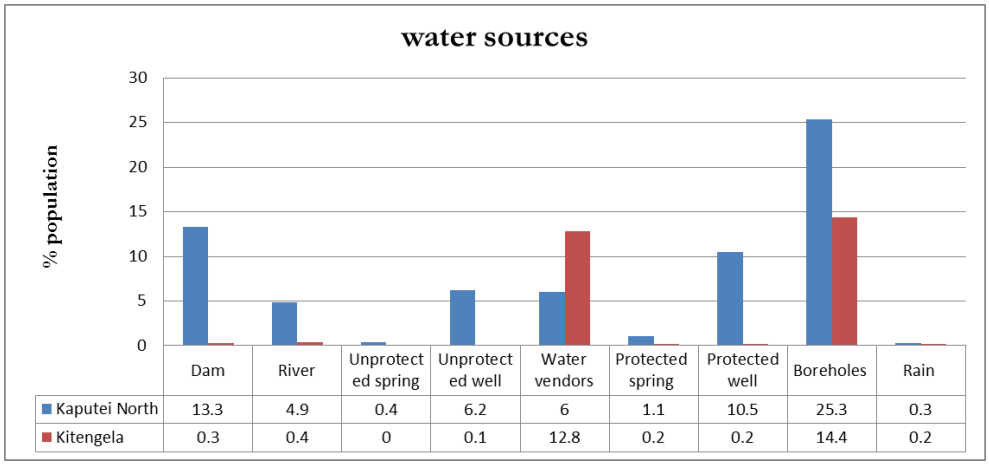


Figure 26: Water sources in Kitengela
Source: KNBS; Kajiado County inequality index report

Use of rain water harvesting is nonetheless underutilized mainly due to poor rain water 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 considerable amount of time and energy.

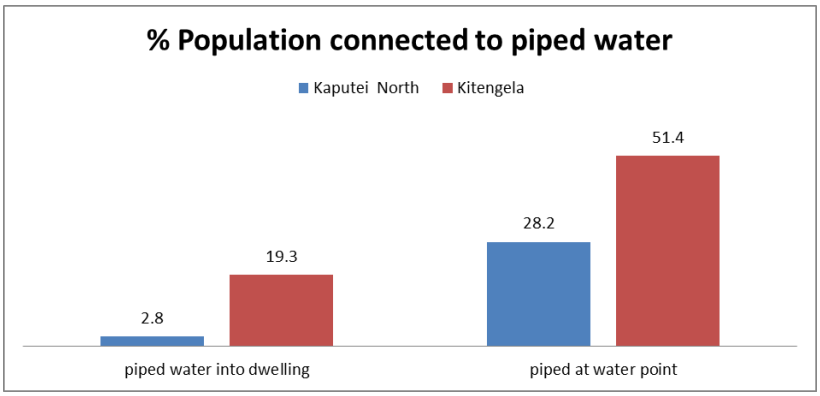


Figure 27: Percentage of the Population connected to piped water
Source: KNBS; Kajiado County inequality index report

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

Table 19: 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.

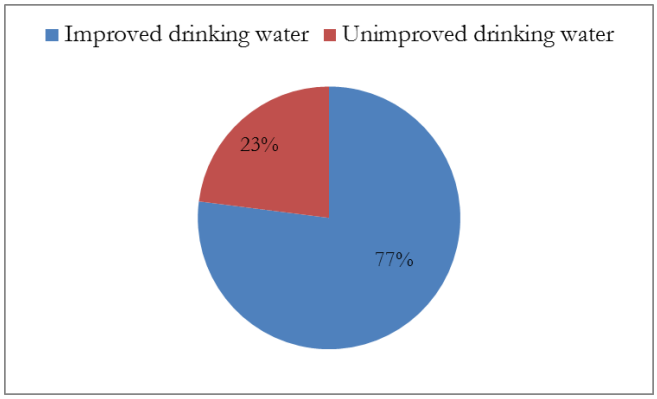


Figure 28: percentage of the population with access to water.
Source: KNBS; Kajiado County inequality index report

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

c) Water pollution

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

d) Encroachment of wetlands and riparian areas

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

3.4.1. Flora & Fauna

i) Flora

The planning area has relatively homogenous vegetation consisting primarily of dry savannah, scattered acacia and balanites bushes. Open grass land 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 though at a low quantity are flowers for horticulture export.

Degradation of vegetation has also been noted where vegetation is being cleared for farming and human settlement. This has led to degradation of water catchments, soil erosion, loss of biodiversity and wildlife ecosystems as well as adverse phenomena like recurring droughts.

ii) Fauna

Kitengela town is part of a larger rangeland ecosystem called the Athi-Kaputiei Plains. At the end of the 19th century, the Athi-Kaputiei Plains were said to boast the most spectacular concentration of wildlife in East Africa. 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.

a) Human wildlife conflict

The intensity of wildlife population at any one time is dictated by climatic regimes. In 1980s, 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 over use 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.

3.4.1. Air Quality

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 dusts from quarries. Exposure to air pollutants at higher concentrations and longer durations has caused health complications to the residents.

3.4.1. Noise Levels

Sources of noise pollution include automobiles such as public vehicles, excavators, posho mills, and business premises amongst others.

3.4.2. Climate

The climate in Kitengela is warm and temperate. Strong winds are experienced during the dry spells.

i). Rainfall

Kitengela has a bimodal rainfall pattern. The area has a mean annual rainfall of 592mm with the driest month in 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 death of livestock and wildlife and reduction in crop production.

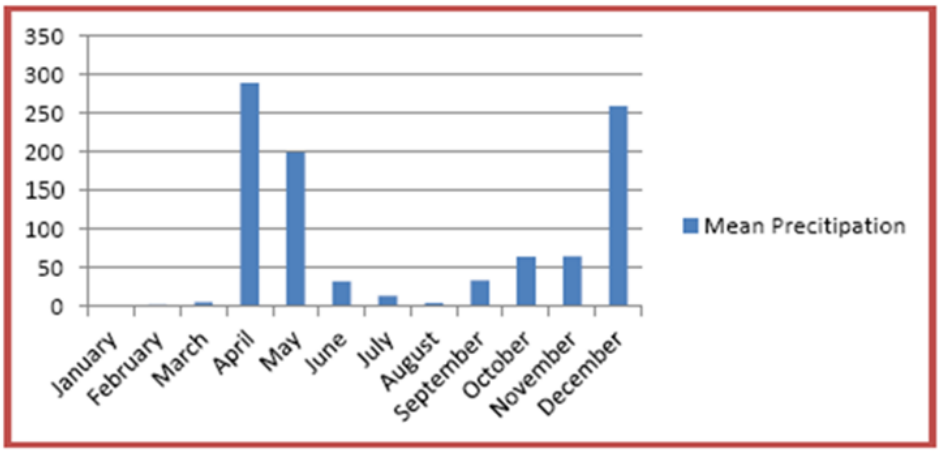


Figure 29: Rainfall pattern

Source: Kenya Metrological Department

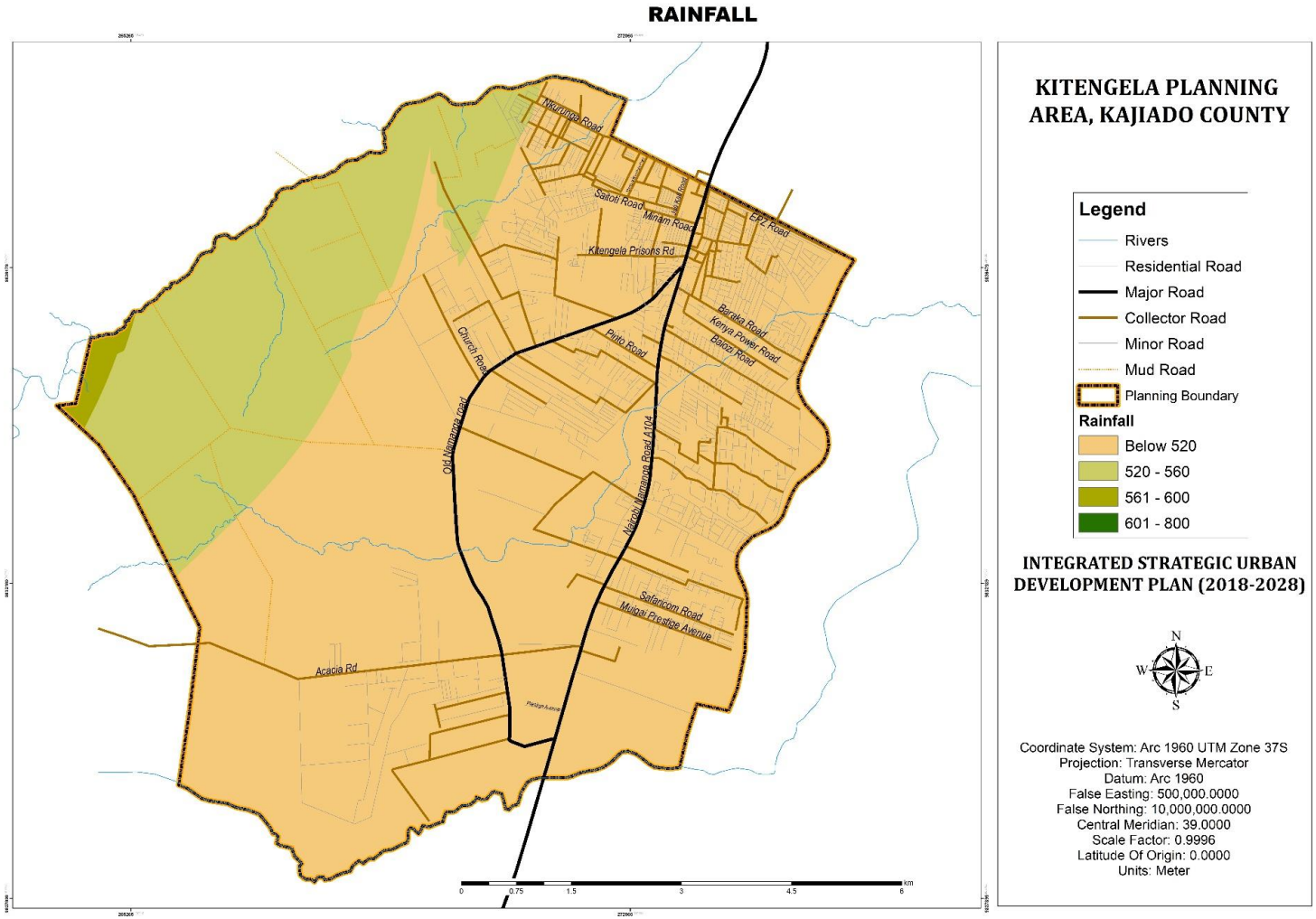


Figure 30: Rainfall in Kitengela
Source: Vision RI

ii). Temperature

The mean annual temperature in Kitengela ranges between 21 ºC to 30 ºC. Low temperatures are experienced in June and July while January and March are the hottest months. The minimum temperature ranges between 12.6ºC to 14.9 ºC and maximum between 23ºC and 30 ºC. Studies indicate an increase of minimum temperature of 1.3 ºC 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 a potential in the use of solar energy.

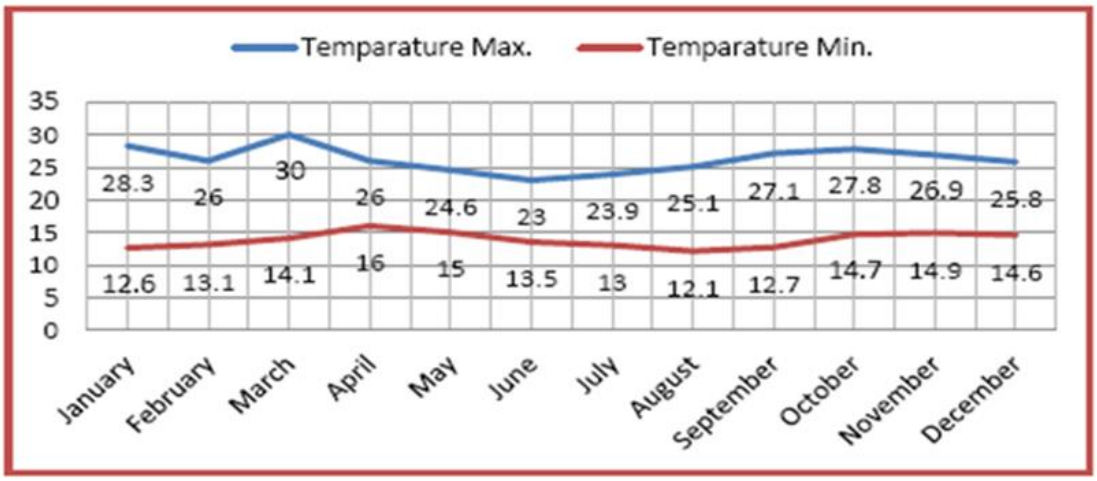


Figure 31: Temperatures in Kitengela
Source: Kenya Metrological Department

iii). Wind

The wind speed ranges between 5m/s – 2m/s in the study area. The wind blows from the southern 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

iv). Climate Change and its Effects in the Sub-County

Climate plays an important role in many socio-economic and environment activities since it determines the space-time distribution of the world's resources. The rainfalls patterns have changed and more often than not have become unpredictable. Due to climate change, there has been widespread drought and famine that has led to loss of cattle and decrease in food production. In addition, flash floods are also being experienced leading to loss of property. Also, quarrying activities in the planning area may lead to landslide disasters.

3.4.3. Agro-ecological zones

Kenya is divided into seven agro-ecological zones. Most of the planning area falls within the Athi Kapiti 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 upper middle arid area and Zone V of upper middle semi-arid area.

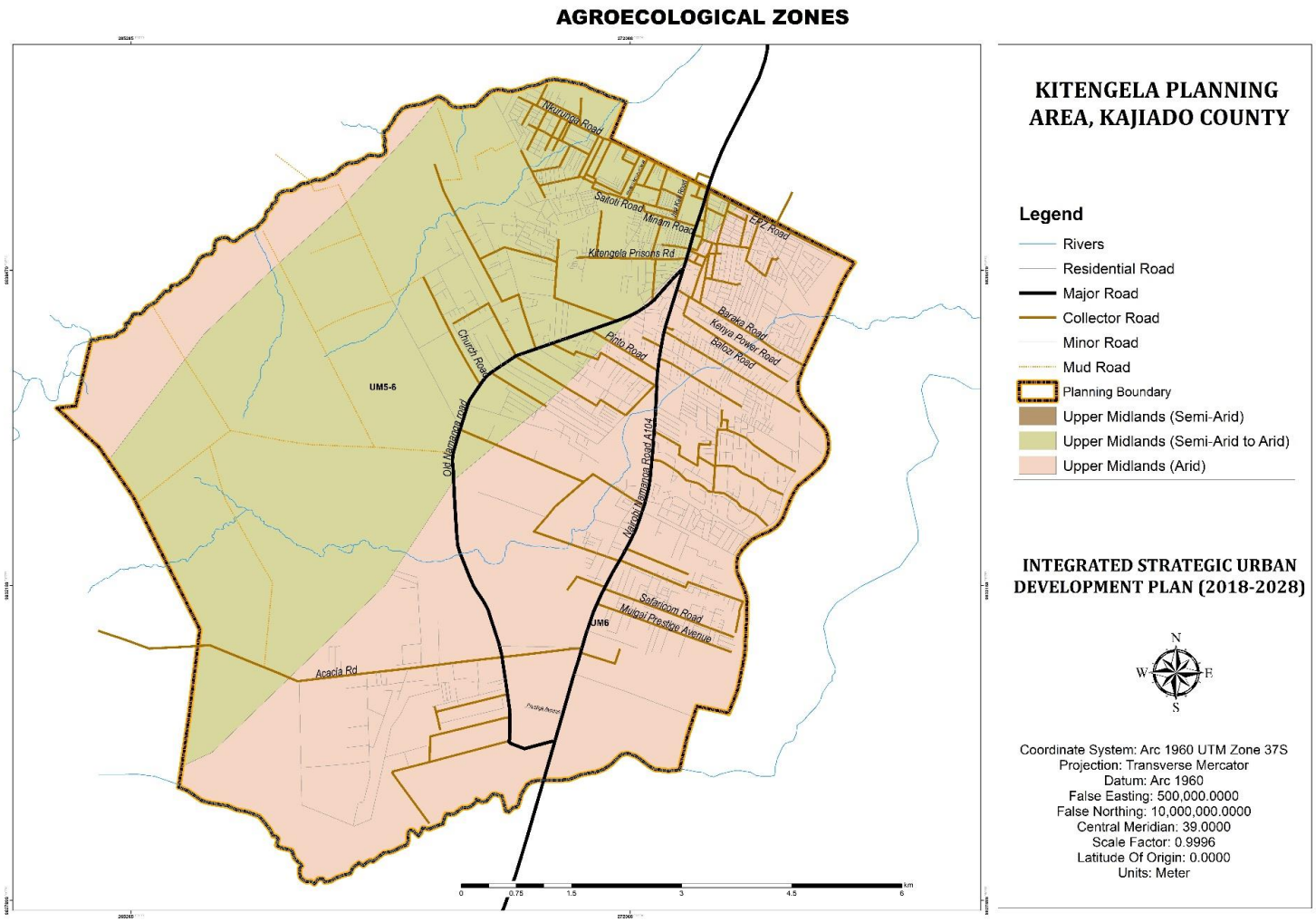


Figure 32 Agro-Ecological Zones in Kitengela
Source: Vision RI

3.4.4. Environmentally sensitive areas

Environmentally sensitive areas mainly include the riparian reserves, the quarries, and the valley area.

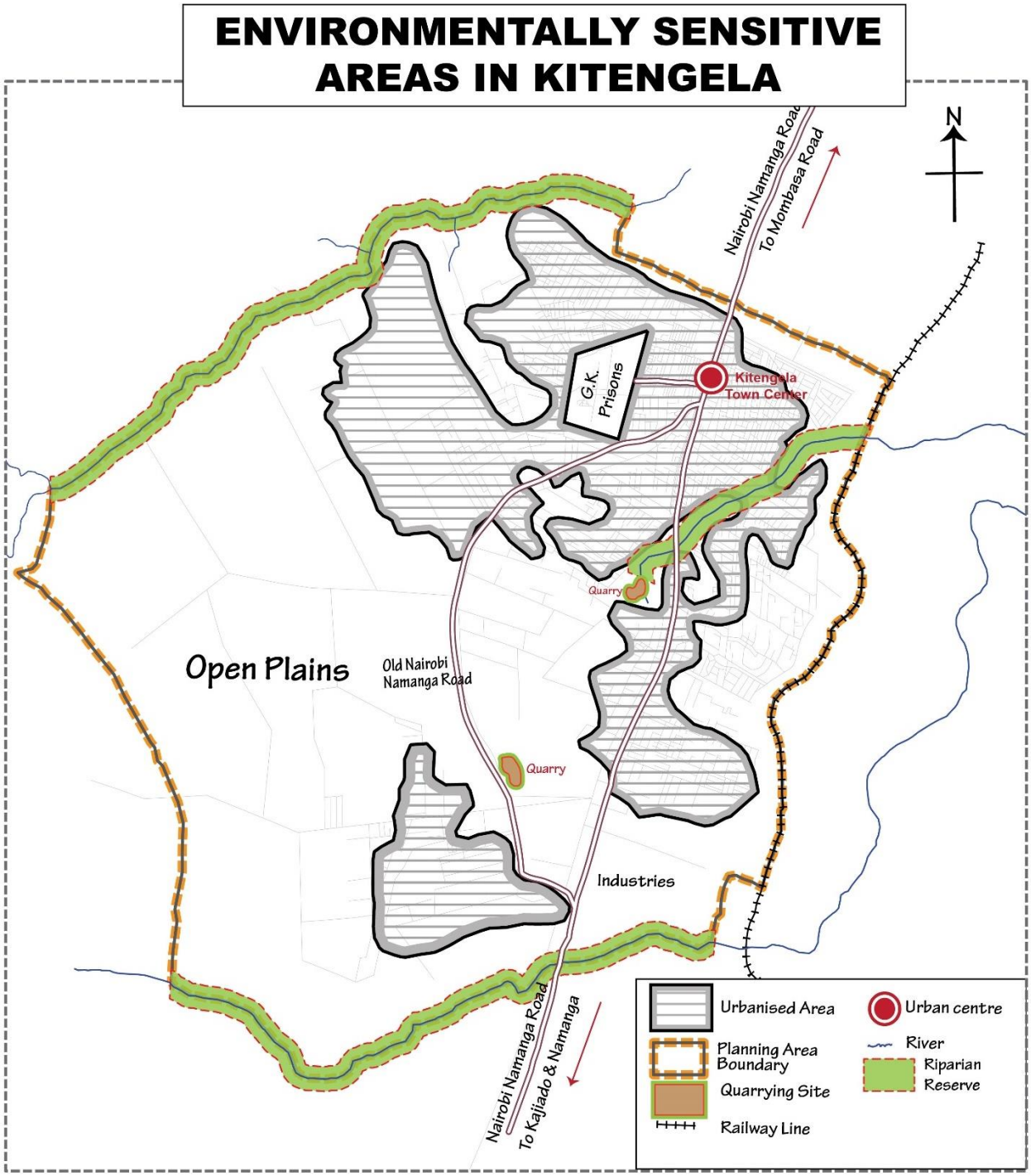


Figure 33: Environmentally sensitive areas.
Source: Vision RI

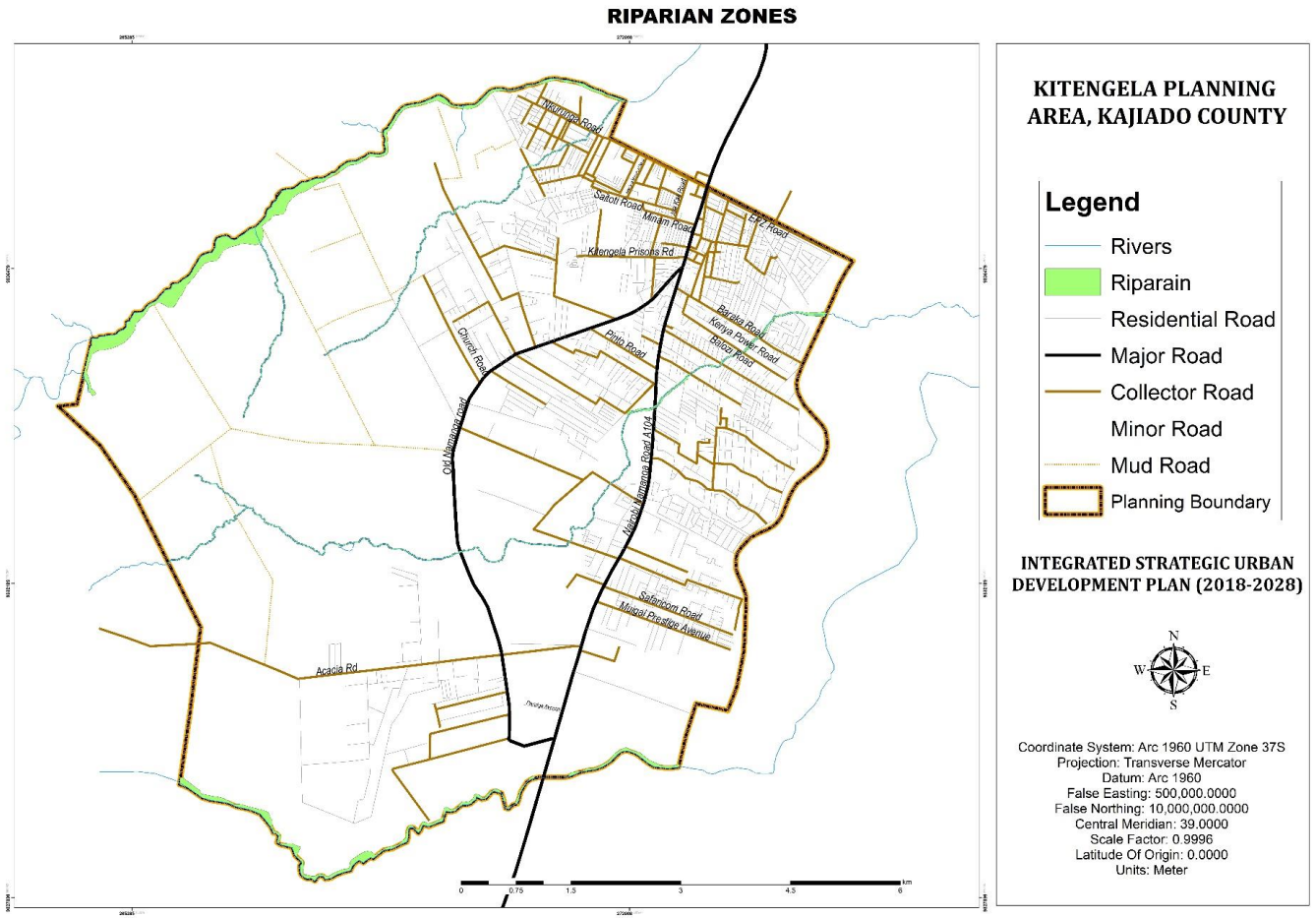


Figure 34: Riparian areas in Kitengela
Source: Vision RI

Immense developments have occurred at these environmentally sensitive areas and as a result water sources have been polluted, the wildlife population has decreased drastically over time as well as air pollution due to mining.

Consequently, these areas ought to be reclaimed and protected to ensure environmental sustainability is attained.

Challenges	Potential
1. Degradation of water catchment areas through; human settlements and developments at the riparian reserves 2. Over extraction of sand 3. Loss of agricultural areas which are being converted to quarries. 4. Quarries pose safety and health issues to the residents. 5. Black cotton soils make construction activities expensive. 6. Extinction of wildlife species primarily due to development at wildlife ecosystems. 7. Pollution of water sources 8. Air pollution caused by the neighbouring cement factories **9.** Lack of forests in the planning area	1. Availability of natural resources such as construction stones and sand 2. Good topography is also favourable for development and drainage 3. High temperatures that can support solar energy systems. 4. Strong winds that are favourable for wind energy generation.

3.5. ECONOMIC ACTIVITIES

This sector focuses on the local economic activities, the economic catalysts, the cooperatives and SME's

3.5.1. Local economy

i). Introduction

Economic activities provide important indicators for assessing the rate and level of growth and development in a region. The Economic sector has linkages with other sectors of the economy, which need to be nurtured. This sector prospers where infrastructure, especially roads and energy sources are well developed. It relies on the public administration and institutional arrangements in place and the planning, security and legal framework pertaining to the sector, while human resources development is crucial for imparting skills and ensuring good health for the workforce.

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

According to the counties 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 wherelse the other are either incapacitated, retired, students or volunteers as shown below

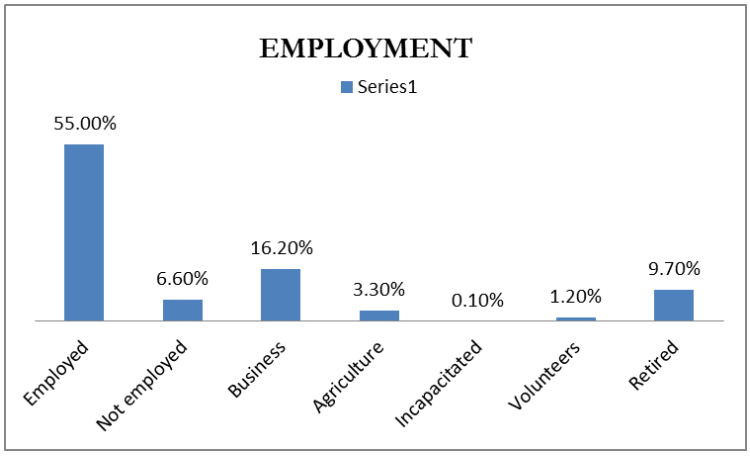


Figure 35: Employment in the area
Source: KNBS; Kajiado County inequality index report

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

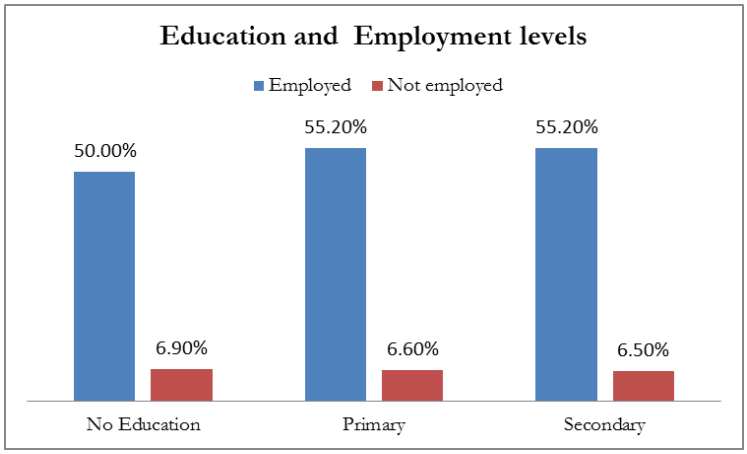


Figure 36: Education and employment rate in Kitengela
Source: KNBS; Kajiado County inequality index report

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

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: Motor cycles, taxis matatu and lorry business

ii). Services (Tertiary Sector)

The service sector is the highest source of employment. The main forms of businesses are Small and Medium Enterprises (SMEs), General Retail businesses such as groceries, wholesale, supermarkets and retail shops, markets and juakali industry including activities such as carpentry, welding and metal fabrication. Commercial activities in Kitengela

are more intensified at the central business district and along the Class A104 Road. The activities include hotels, bars and restaurants, retail shops, butcheries, and hawking business. Formal businesses operate with a valid business permit from Kajiado County. Informal businesses operate on temporary sheds with no valid permit from the county government.

The economy of the planning area is facilitated by the presence of financial institutions such as KCB, Equity, Barclays, Family, Standard chartered bank and Saccos which provide loan facilities to the service sector as well as banking services.

The table below indicates major commercial and industrial enterprises within and in the neighborhood of Kitengela town.

Table 20: Commercial and Industrial enterprises

Supermarkets in Kitengela • Acacia supermarket • Naivas • Eastmart	**Hotels with Accommodation** • Nomads • Tropikana • Sandalwood • Kaputei • Travellas etc
Service/Filling Stations • Kobil • Total • Shell • Tosha etc.	**Banks** • National bank • Post bank • Co-operative • Kenya Commercial Bank • Equity • Diamond Trust Bank • Kenya Women Finance Trust • Barclays
Industries • Savannah Cement Factory • Blue triangle Cement Factory • Bamburi Cement Factory • Mombasa Cement Factory • EPZ	**Hospitals** • Kitengela medical • Nairobi women's Hospital • Gertrude hospital etc.

iii). 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 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.

iv). Livestock

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

due to improper treatment of blood effluent. Grabbing of livestock holding grounds initially set aside has led to grazing and holding of livestock within road reserves and private properties at times leading to conflicts.

v). Real estate/residential business

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

Most of the land in Kitengela is privately owned with ownership documents. Furthermore, land in Kitengela is relatively cheaper than Nairobi and building materials area 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 to 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.

vi). Transportation

Kitengela is dominated by transportation businesses too. There are about 1,340 registered motor bikes 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.

3.5.2. Revenue generation

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

3.5.3. Economic Catalysts

Key identified economic catalysts in the planning area are:

a) **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.

b) **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.

c) **Strategic location**

The planning area's proximity to Central Nairobi will be instrumental in its economic growth. In addition, its location close to JKIA airport and SGR railway station at Syokimau which are important transport nodes.

d) **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 provision of employment to the residents and revenue generation to the county.

3.5.4. 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 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 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 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 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 glassblowing industry and the ostrich farms, as well as a potential for ecotourism form a platform for development as a tourist hub.

3.5.5. Cooperative Societies

The cooperative movement is the bedrock of the Kenyan economy. In Kitengela, there are cooperatives operating in the transport and housing sectors. These are shown in the table below.

Table 21: Cooperative Societies in Kitengela

Type of Cooperative	Number	Status
Transport	9	Active
Housing	1	Active
Motor Cycle Business	1	Active
Total	**11**	

Source: Interviews and Focus Group Discussions, 2018

All the 11 are active. The Urithi Housing Cooperative and KUWASCO have focused on housing development. Motorcycle operators also ran a cooperative society for the members indicating that the sub-sector is set to contribute significantly to growth. Public transport vehicle operators constitute the bulk of the cooperatives and indicated that they had streamlined the sector.

Challenges	Potentials
1. Inefficient ways of revenue collection by the county. **2. Poor infrastructure and social facilities** **3. Embezzlement of funds**	1. Availability of land for expansion 2. Strategic location of close to Nairobi CBD 3. Established banking industry that gives financial support. 4. High population growth rate that provides a market for goods and services.

3.6.LAND USE

3.6.1. Land use types, Ownership & Access

Land ownership

Forms of land ownership include freehold, leasehold, communal land ownership and government trust 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 land holdings. Since subdivision begun in the mid to late1980s, 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 on 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 land holdings. 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 land owners 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.

Land use

Table 22: Existing land uses and their location

Land use	Land use zone	Minimum land subdivision	Land size	Location
Residential	0_1- Low density residential housing	0.2 ha		G.K Prison, Mohammed estate, old Namaga road, Acacia road
	0_2 - 0_5- Medium density Residential housing	0.1ha		Mohammed Estate Shooting range Estate Sifa Farm B Chuna, Safaricom, Utumishi, Selelo, New valley B, Upper valley B, Kiang'ombe A and Kimmerland Estates
	0_6 - 0_9- High density residential housing	0.1ha		Noonkopir Estate Kiang'ombe C Kiang'ombe B New valley A Upper valley A Quarry
Industrial	1_1 - 1_2	0.4 ha		**1_1** - Near Mohammed Estate bordered by R. Athi. **1_2** - EPZ Area
Recreational	3_1 & 3_2			Near Quarry and bordered by class (A104) road **3_2** – bordered by Mohammed estate and Milimani B
Public Purpose	4_1			Bordered by G. O. K prisons and Noonkopir estate
Commercial	5_1 - 5_4	0.05ha		**5_1** - C. B. D area Jua kali estate **5_2** – bordered by Mohammed estate, Milimani B and the proposed ring road joining old Namanga road **5_3** - bordered by Acacia road and Nairobi-Namanga road within Sifa farm **5_4** – bordered by Nairobi-Namanga road, Selelo and kimmerland estates
Public Utilities	6_1 - 6_5			**6_1** - G.K Prison Area **6_2** - bordered by R. Athi and Parkview estate **6_3** - is near the EPZ area **6_4** - On the I.S.K pillar near the commercial boundary within Sifa farm B. **6_5** - Near the proposed recreation park 3_1

Agricultural	91	2ha		**Sifa farm C –** defined by Acacia road, Kisaju River, Namanga road and the commercial boundary

3.6.2. Land Market Dynamics

Kitengela has become an attractive location for real estate developers due to its friendly terrain and relatively cheap land prices. 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 to Kitengela 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. The presence of major firms and parastatals has contributed to fuelling land price. In addition, companies and SACCO's have also led to accelerated land prices by buying large tracts and reselling them in small portions of eighth or even quarter acres.

In Kitengela (as elsewhere), 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 a five-year period (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 increasing demand for residential accommodation as more people migrate to the town in search of fairly priced housing.

Many local Maasai are realizing 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 regular income that is less susceptible to droughts and other periodic shocks

Table 22: 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%

3.6.3. Land Administration and Management

Land administration and management services have not yet been decentralized to the planning area.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.

LAND ACTS AND POLICIES

Sets goals for land reforms and forms part of the national development policy

Guides land administration and management

Includes: **National land policy, Land Act of 2012, Land registration act of 2012, land Acquisition act,**

LAND MANAGEMENT

Strategic level

Functions: Sets strategies and measures for implementing land policy

Includes: Land use planning, land consolidation, land reallocation, land recycling

Actors: Land Control Boards, NLC, Physical planning

LAND ADMINISTRATION

Operational level

Functions: land registration, provide land title and land tenure security, supports land taxation, development and transactions,

Actors: County land administrator, County land registrar, Land Valuer, land adjudicator

Figure 37: Land management and administration structure

Challenges	Potentials
1. **Inefficient entrenched practises by the land administrators** 2. **Lack of collaboration among the different land administration departments.** 3. **Inaccurate and outdated maps.** 4. **Fraud in land ownership**	1. Use of ICT in land management 2. Existing legal framework to guide the management of land

5. **Lack of decentralization of services to the area** 6. **Inefficient land subdivisions.**	

3.7.URBAN DESIGN

3.7.1. Urban Morphology

The subdivision of the Kitengela Group Ranch into private land holdings was originally intended to intensify and commercialise livestock production. Thereafter, land sales rapidly occurred which resulted to 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 a 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 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. These are a mixture of 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.

3.7.2. 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 infrastructure 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 the 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 the ISUDP, 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 to 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.

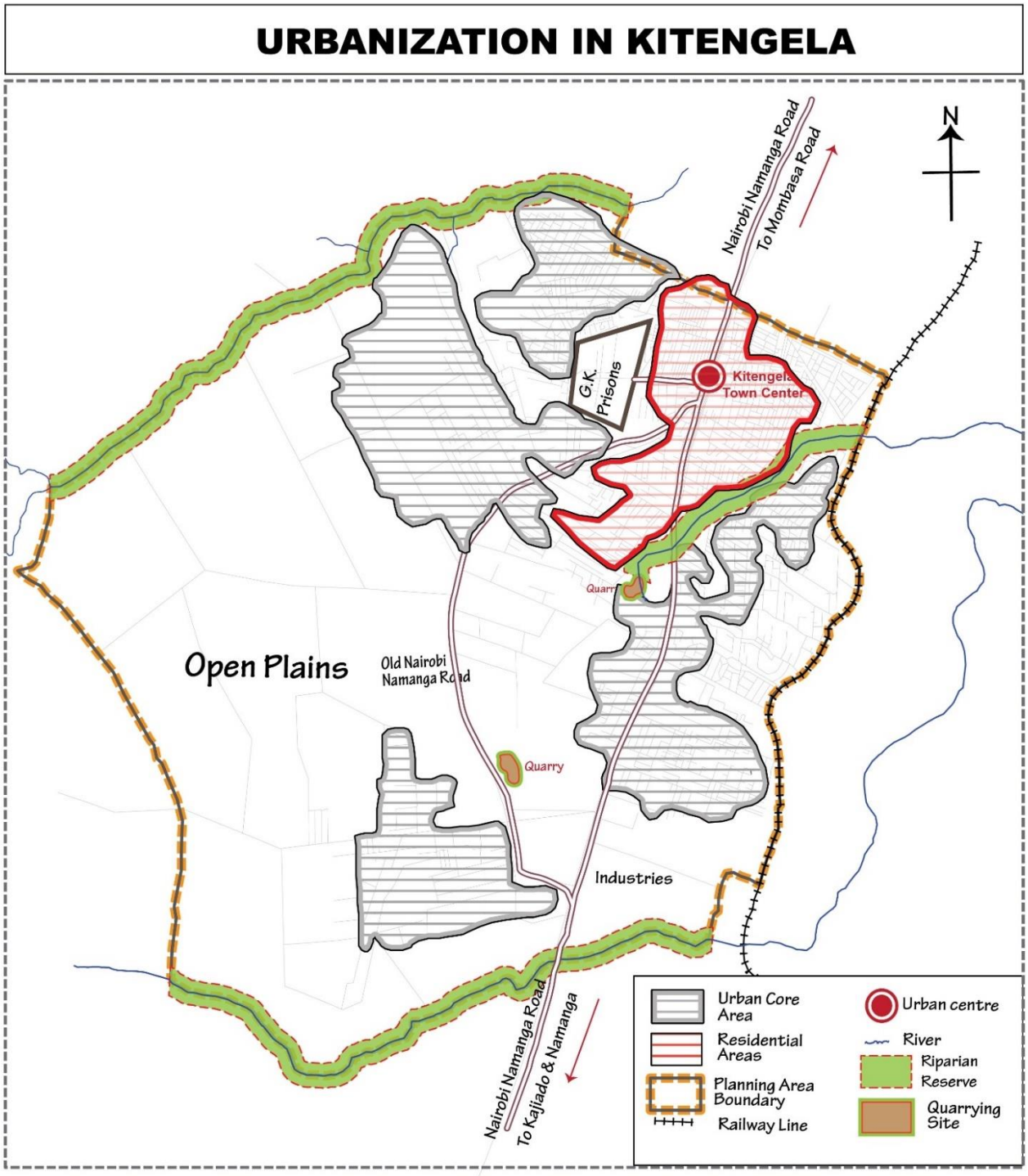


Figure 38: Urbanization trends in Kitengela

Source: Vision RI

Challenges	Potentials
1. **Lack of distinct architectural designs for buildings** 2. **Poor road network and street walkways** 3. **Ribbon development along Namanga road** 4. **Traffic congestion**	1. Existing land for development

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 categorized into two; 1) the classified and 2) the 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)

i). 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 39: Poor Condition of Market Road & Congestion on Namanga Road
Source: Field survey, 2018

Table 23: 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

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.

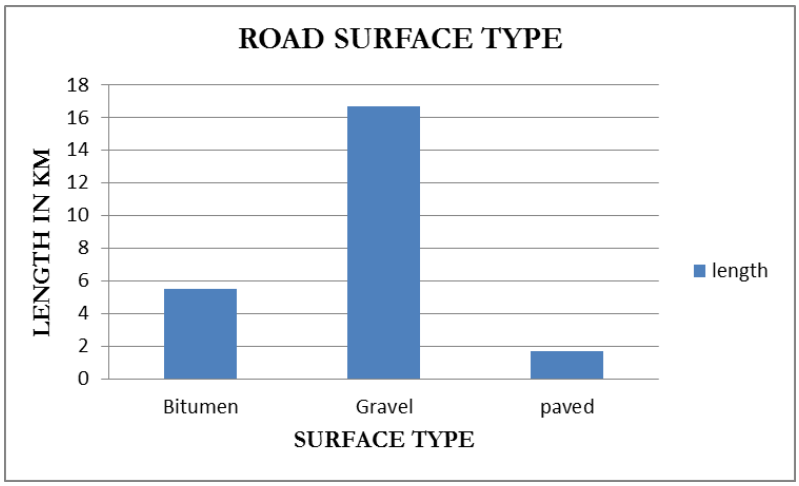


Figure 40: Road surface types in Kitengela
Source: Traffic Survey 2018

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 24: 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

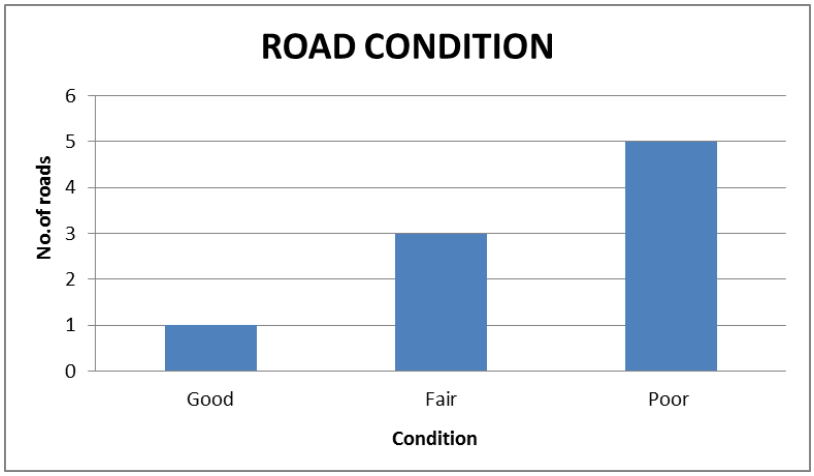


Figure 41: Road condition in the area

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

ii). Public Transport

Public transport service is available and adequate in the form of matatus and buses. The intermediate public transport include; Boda-boda, taxis, tuktuk 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 26: 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 to road use conflicts, congestion and lack of safety.

a) 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 1.00pm and 6.30pm. The maximum utilisation percentage is 226%. This could be attributed to double parking as well as parking in undesignated areas.

iii). NMT Facilities

NMT facilities are inadequate as the only NMT facilities present are paved foot paths 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 the NMT facilities.

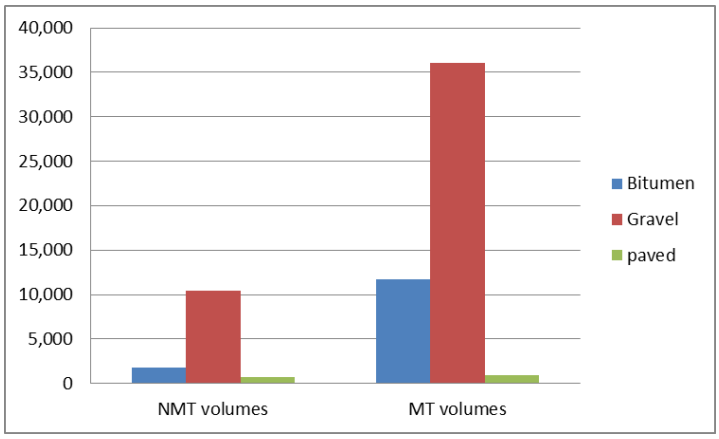


Figure 42: NMT volumes on the various road surface types

iv). 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.

v). 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, Tuktuk's and boda-boda. The bus park needs future expansion due to 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.

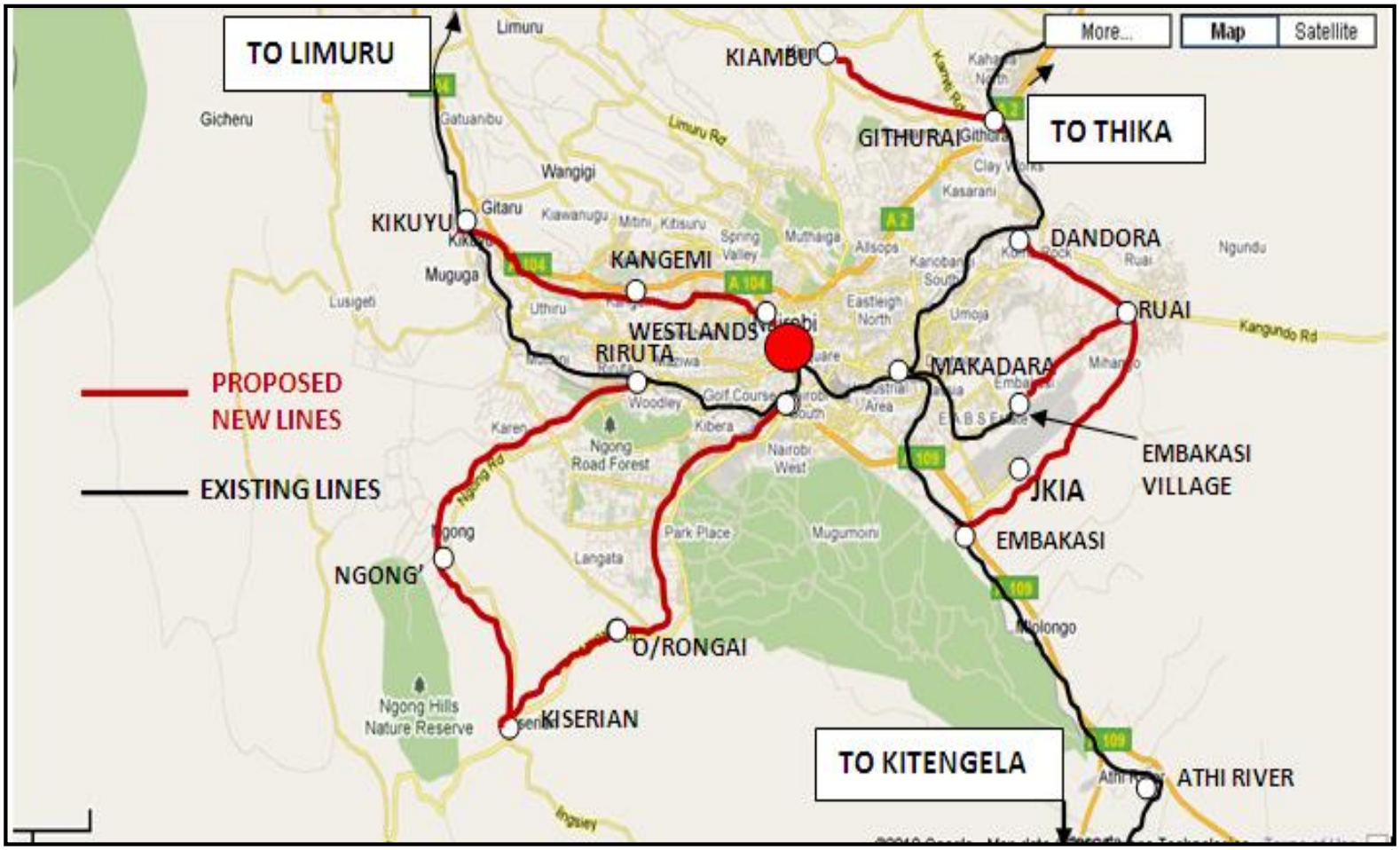


Figure 43: Existing and Proposed Commuter Routes for the Greater Nairobi (KRC)

Source: Spatial plan for NMR

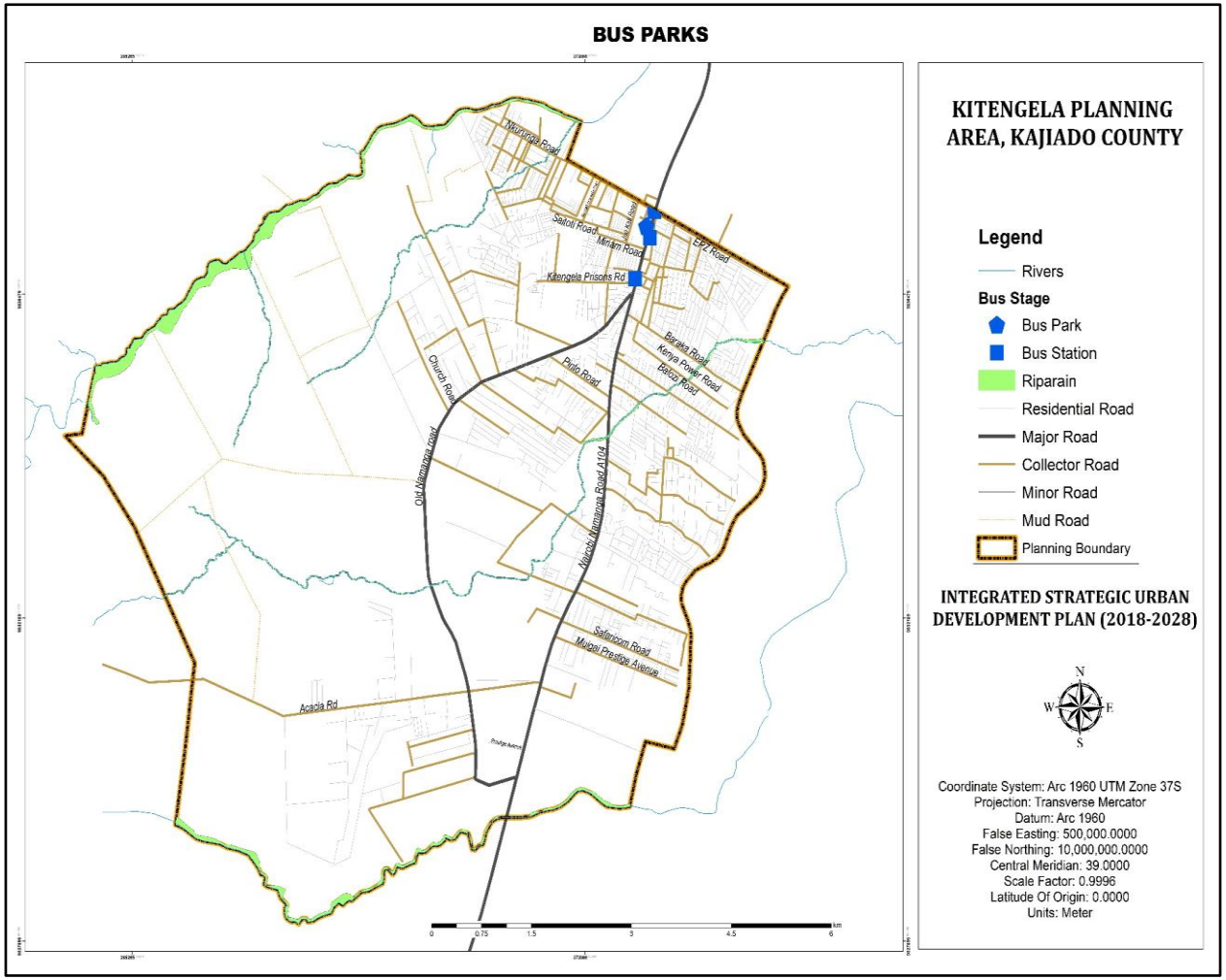


Figure 44: Transportation Map of the Planning Area

Source: Vision RI

3.8.2. 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 underutilized although it has the potential to enhance interconnectivity and reduce traffic congestion as well as make transport affordable.

Challenges	Potentials
1. **Most of the roads are in poor condition** 2. **Inadequate NMT facilities** 3. **Use of Namanga road both for transit and local access creates traffic congestion.**	1. Existing road network can be upgraded to enhance intra and inter connectivity 2. Availability of land can be used for construction of more roads and bus parks 3. The area can become a transport hub with appropriate transfer terminals 4. Availability of railway can enhance transportation.

3.9. SOCIAL INFASTRACTURE

3.9.1. Housing

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.

Kenya is among the 190 countries which is dedicated to attainment of the Sustainable Development Goals (SDGs) aimed at fighting poverty, inequality and impediments to growth and human development. The goal number 11 aims to "make cities and Human Settlements Inclusive, Safe, Resilient and Sustainable". This goal is informed by the fact that at least 50% of the world's population in 2015 lived in urban settlements and that urbanization is growing in many developing countries. Target 1 of Goal 11 urges governments to "ensure for all adequate, safe and affordable housing and basic services and to upgrade slums."

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

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

The Kenyan Government has drawn The Big Four Agenda, one of them being affordable housing. Under this agenda, The President intends to have over 500,000 Kenyans owning their own homes by 2022. According to the

president, this will be done by reducing the cost of mortgages, raising low cost funds in both private and public for investment in large scale house construction and cutting the cost of construction by use of innovative ways and materials. He further promised to continue issuing more title deeds adding that this plan will ensure that more people are employed.

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

i). Housing Situation

Kitengela has been termed as the dormitory town of Nairobi due to several factors. Firstly, the proximity to the 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 and therefore pulling people from all parts of the country and hence 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 sub-county is synonymous with ranches/expansive terrain (though this is changing very fast) and at the same time, the prices of land is 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 home owners. 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.

a) Types of Housing

Kitengela is dominated by modern housing units. There are a variety of housing set-ups from spacious apartments, bungalows, maisonettes, town houses 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 Export Processing Zone. 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 estates such as Chuna development is well controlled and developers have their buildings approved by Kajiado county. However, in some of the middle income estates, intensive developments of several houses is 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 plots 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 are well constructed with good aesthetics.

b) 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 provision of other services such as connections to water supply, electricity, and waste disposal. Low provision of these essential services leads to 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 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 25: 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 the 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 remain to be the main roofing material followed by concrete.

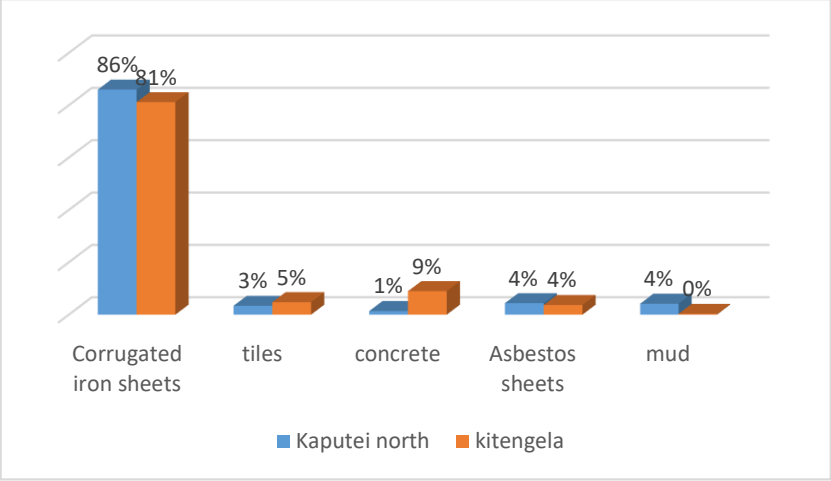


Figure 45: Types of roofing materials

Source: KNBS, Kajiado Inequality Index report

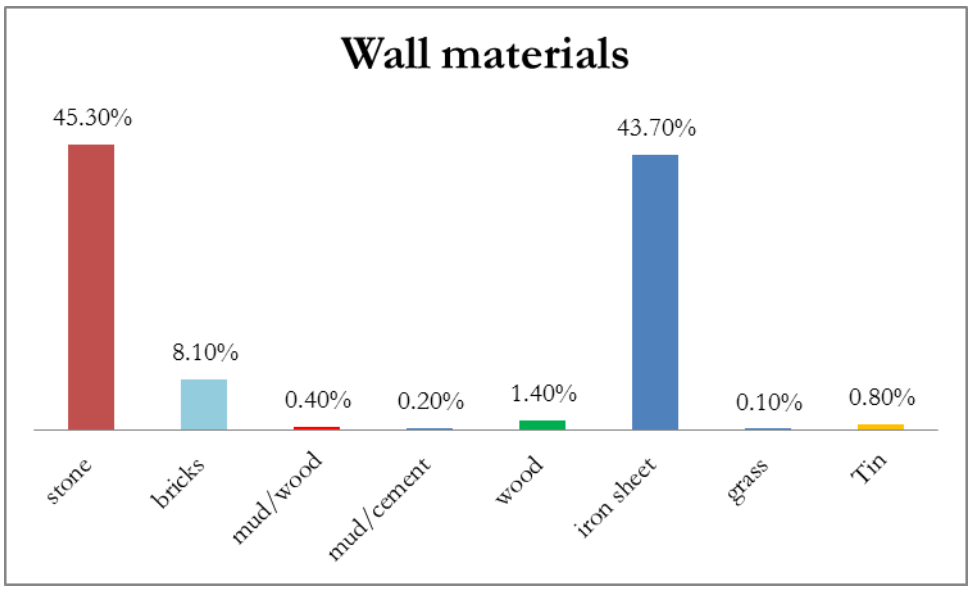


Figure 46: Types of wall materials
Source: KNBS; Kajiado Inequality Index report

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.

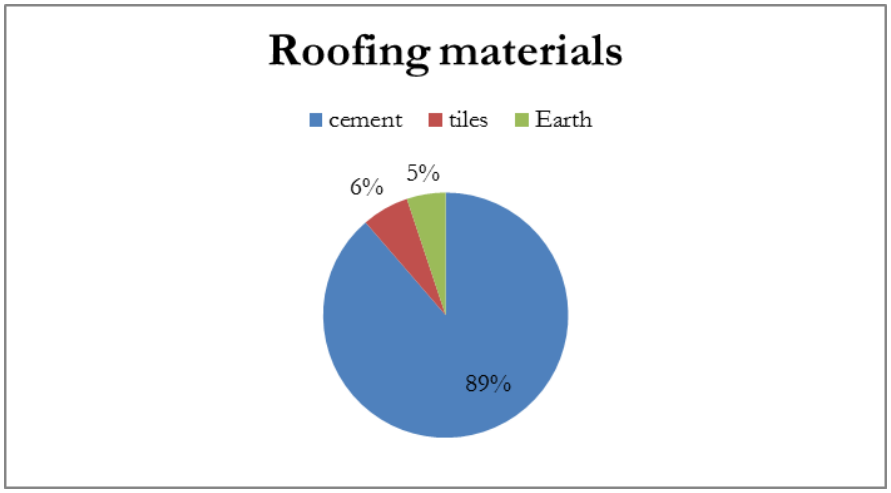


Figure 47: types of roofing materials
Source: KNBS; Kajiado Inequality Index report

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. The direct inference from this is that there is less use of durable materials for roofs, walls and floors given the quantity and cost of materials required to construct them in low income areas. Again, this is an effect of the cost of construction materials such as bricks, steel and cement that are required to construct floors and solid walls. Housing policy takes cognisance of the fact that the quality of housing in Kenya correlates highly with the income level of the household owners. This means that income growth is an important factor in meeting the objectives contained in the consolidated policies for housing in Kenya. This is demonstrated by the fact that in addition to income growth that would make housing more affordable, housing policy should focus as well on reducing the domestic cost of cement, steel and other construction material. This is in line with Jubilee Government Agenda Four as described above.

ii). 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.

iii). Housing Stock and Projections

The housing stock as at 2009 represents a 53% deficit given the population levels at that time. Subsequent projections are based on the total required housing units given the projected population and number of households. According to the Physical Planning Handbook, the minimum plot area should be determined by user, type of waste disposal, availability of water and the level of building technology applied. For low density the minimum plot 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 26: Population Projections according to Income levels in Kitengela

Income Level	Percentage of population (%)	2018	2020	2022	2024	2026	2028
Low	**70**	**38,233**	**43,468**	**49,417**	**56,182**	**63,874**	**72,617**
Middle	**25**	**13,655**	**15,524**	**17,650**	**20,065**	**22,813**	**25,935**
High	**5**	**2,731**	**3,105**	**3,530**	**4,014**	**4,562**	**5,187**

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

Year	Projected population	Number of households
2018	54,619	10,924
2020	62,097	12,419
2022	70,597	14,119
2024	80,261	16,052
2026	91,248	18,249
2028	103,739	20,747

Table 27: Projected Housing stocks in Kitengela according to income levels

Income level	Housing stock projections					
	2018	2020	2022	2024	2026	2028
Low	7,646	8694	9883	11,236	12,775	14,523
Middle	2,732	3104	3530	4,013	4,562	5,187
High	546	621	706	803	912	1037
Totals	10,924	12,419	14,119	16,052	18,249	20,747

Housing stocks projections indicate housing stocks among the low-income group will be higher than the other income groups. Consequently, this ISUDP will solve this issue through proposing ways to cater for this high demand. Generally, housing demands for all groups will increase by 2028.

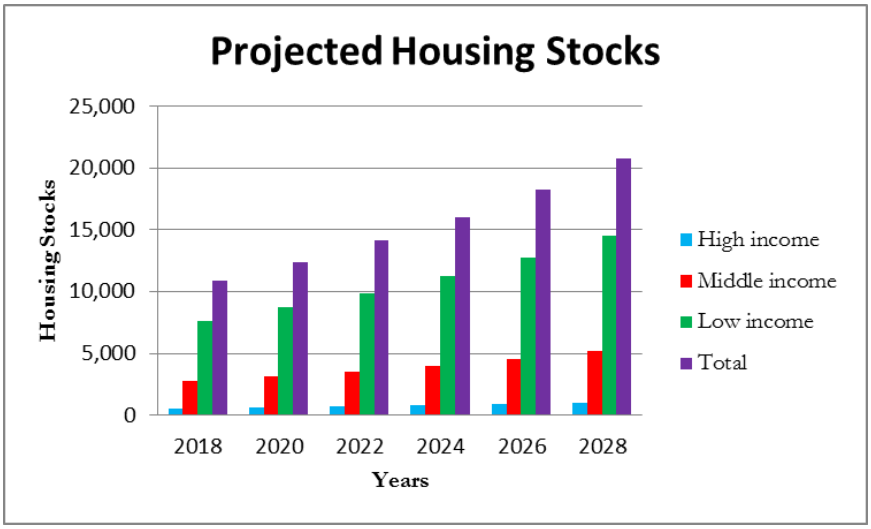


Figure 48: Housing projections.

Challenges	Potentials
1. Construction of houses does not adhere to the set regulations i.e. zoning, plot sizes, setbacks, coverage and plot ratios. 2. Housing designs do not incorporate the needs of the physically challenged people 3. Layout designs do not compliment with the other neighbourhood designs 4. Rapid construction of houses without provision of social amenities **5.** Construction of houses is relatively expensive due to the nature of the black cotton soils that require creating a strong foundation.	1. Abundant supplies of sand and construction stones 2. Availability of land for development

3.9.2. Education

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

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

According to the Exploring Kajiado Inequality Report, ten(10%) percent of the population in Kitengela have no education, while 37 and 53 percent have primary and secondary education respectively.

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

i). Education facilities

a. Early Childhood Development Education (ECDE) Facilities

Quality education is education that works for every child and enables all children to achieve their full potential. 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 (United Nation Chilredn's Fund (UNICEF), 2009). Safety and environment of an ECDE facility is important because young children are vulnerable to many risks and 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 advancement of education by young children because parents are always afraid to let the young ones especially girls walk alone and they may be kept out of school unless there was someone to accompany them. According to the physical planning handbook, the recommended distance from home to ECDE facility is 300-500 meters.

There are 3 ECDE centres (Noonkopir; GK Athi River and Kitengela boarding) in Kitengela.

According to the Physical Planning Handbook the distribution should be 1: 4000. By 2028, the area will need 19 more ECDE centres.

b. Primary School Facilities

Access to education is key factor in quality of the service. Distance a child covers from home to school has a direct relation with the enrolment, performance, retention and therefore transition from primary to secondary school. There are 3 public primary schools within the planning area. The physical planning handbook guides that primary school should serve a catchment of population of 4000 and should be between 500m-2km as shown in table below. While the hand book recommends that a single school to occupy at least 3.9ha, it encourages the schools to build storied building for economy.

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

The table below shows the enrolment rates in the primary schools.

Table 28: 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 2018

With free primary education programme, the schools 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.

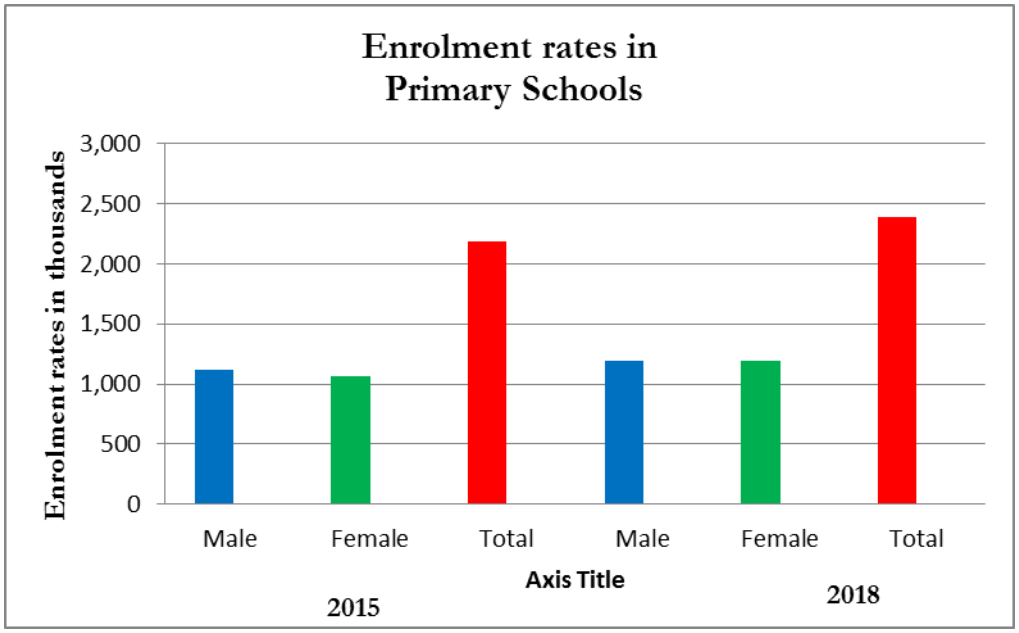


Figure 49: Enrolment Rates for boys and girls

Source: Kajiado County Education Office 2018

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 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 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.

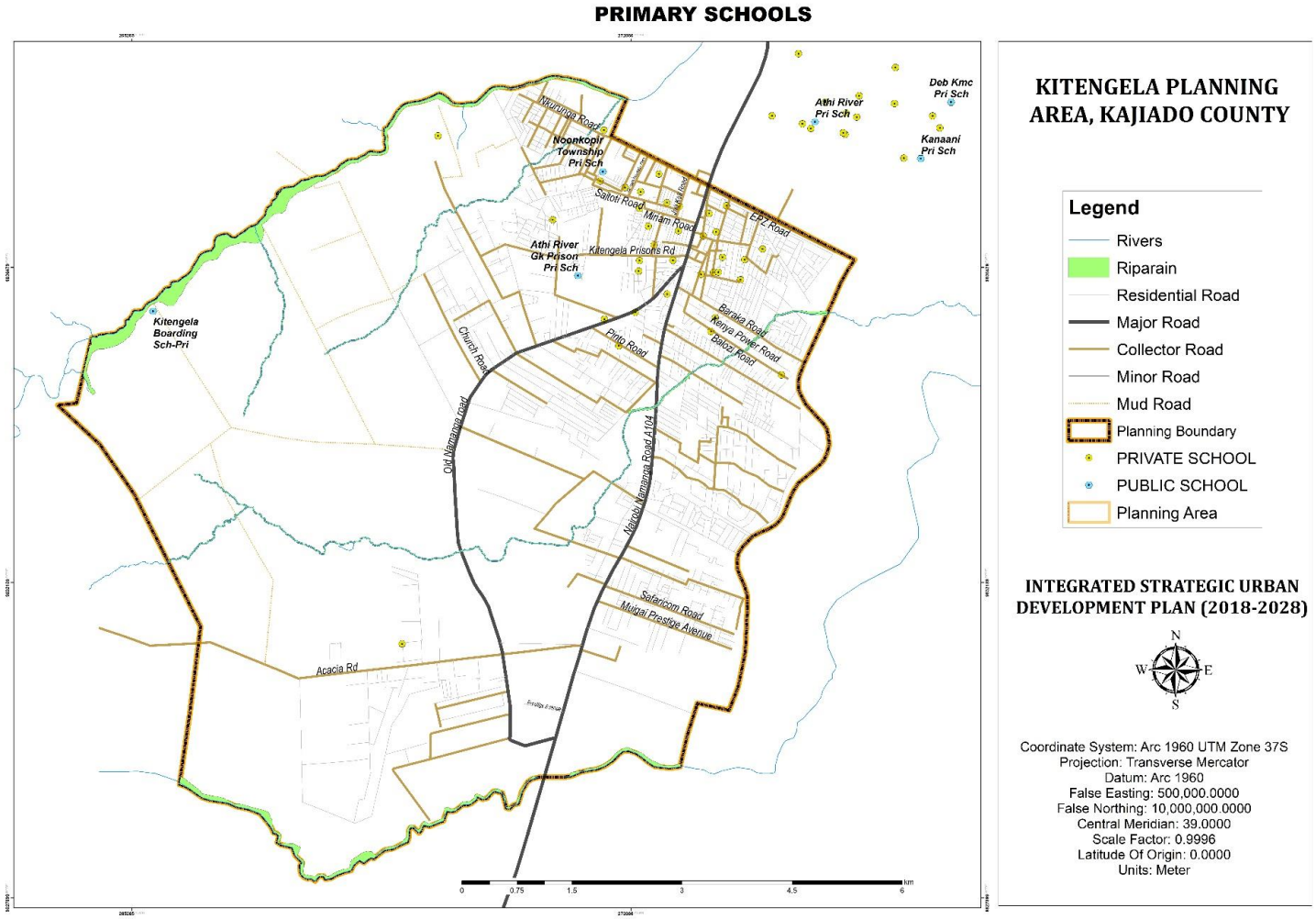


Figure 50 Primary Schools in Kitengela
Source: Vision RI

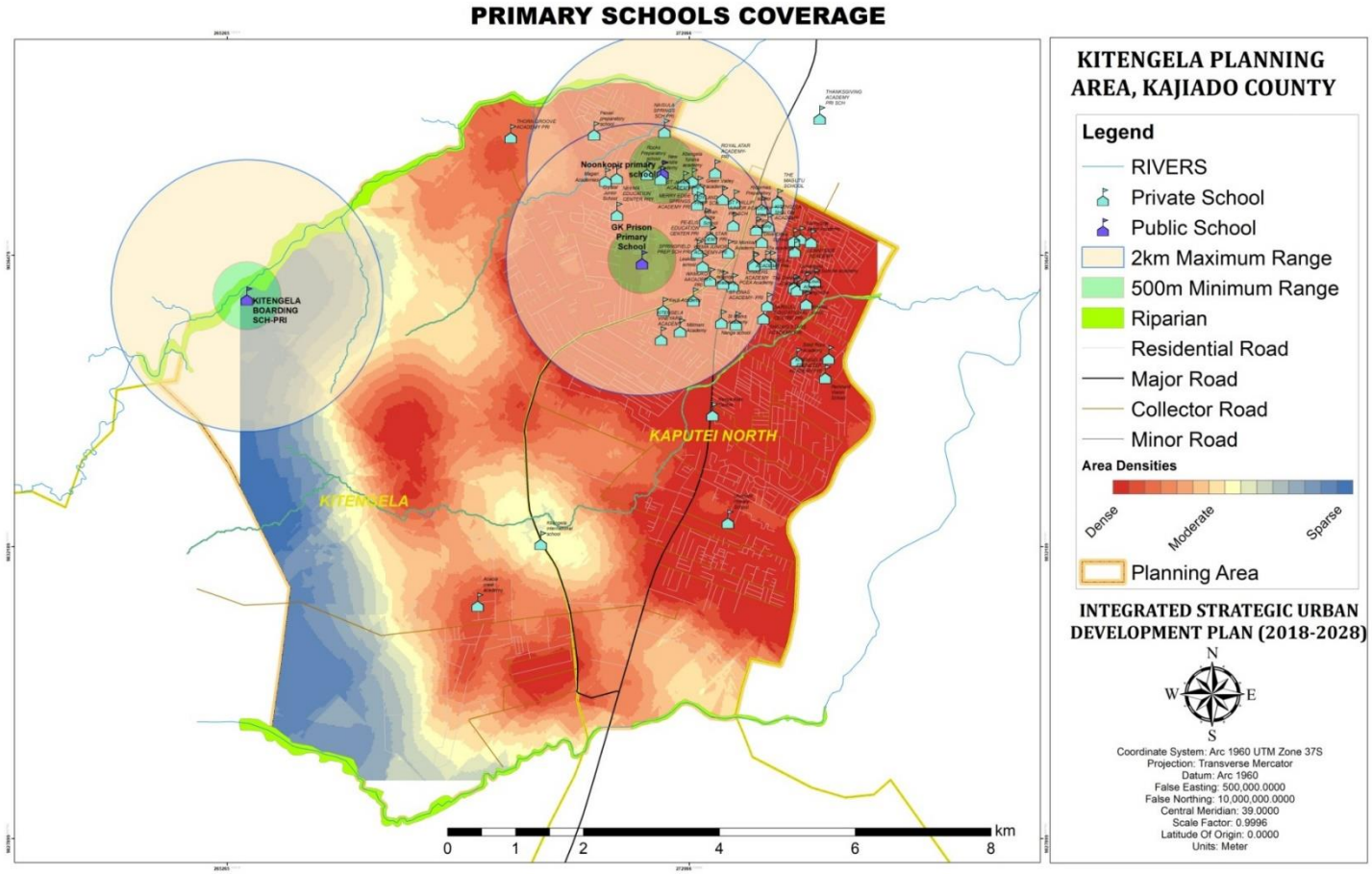


Figure 51: Primary Schools coverage
Source: Vision RI

Education Projections for Primary Schools

In 2009, the planning area required about 15 schools (1 school per 4000 people) compared to the existing 13 showing a deficit of 2 schools. The area will require 23 primary schools by 2028.

Figure 52: Projected no of schools

YEAR	POPULATION PROJECTION	NO.OF PRIMARY SCHOOLS PRESENT	NO. OF PRIMARY SCHOOLS NEEDED	DEFICIT
2018	54,619	3	13	-10
2020	62,097		15	-12
2022	70,597		17	-14
2024	80,261		20	-17
2026	91,248		23	-20
2028	103,739		26	-23

The area has a deficit of 10 public primary schools and the demand is expected to grow as population increases. The area will require 23 primary schools by 2028. From the analysis above, the southern part of the planning area have a deficit of primary schools according to the physical planning hand book which states that one school should serve a catchment of 4000 people. However, the northern parts have 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

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

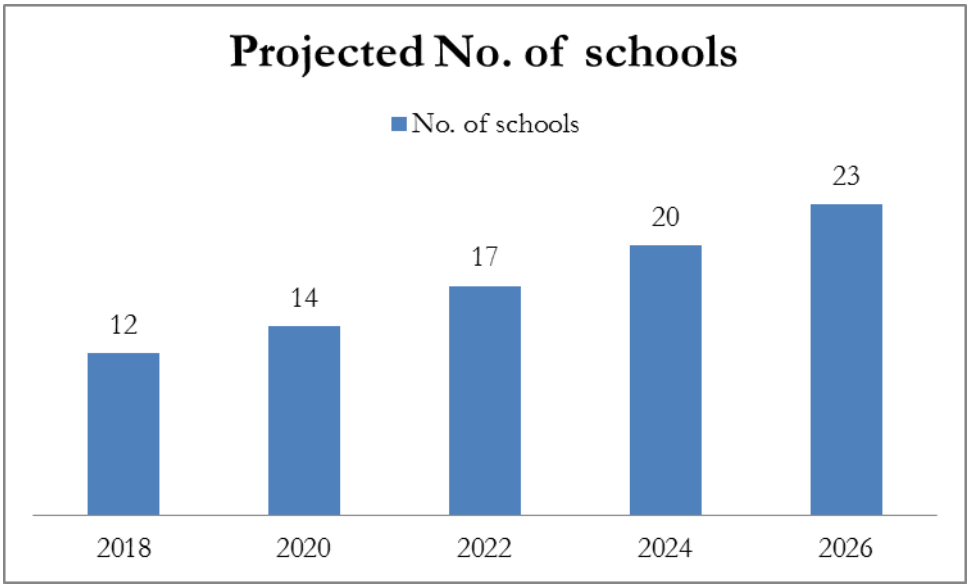


Figure 53: Projected number of primary schools

Figure 54: photo showing a private primary school in Kitengela
Source: Field survey 2018

Most private primary schools in the area fails 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 and they have not build storied building to solve this problem. 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.

c. Public Secondary Schools

There is only one public secondary school in 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 sought education elsewhere mostly in Isinya.

Education projections for secondary schools

Though the 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 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 2009, the town required 7 secondary schools (1:8000 people) compared to the existing one school showing a deficit of 6 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 2028 the area will require 12 more secondary schools.

Table 29: secondary schools projections

YEAR	POPULATION PROJECTION	NO.OF SECONDARY SCHOOLS PRESENT	NO. OF SECONADRY SCHOOLS NEEDED	DEFICIT
2018	54,619	1	6	-5
2020	62,097		8	-7
2022	70,597		9	-8
2024	80,261		10	-9
2026	91,248		11	-10
2028	103,739		13	-12

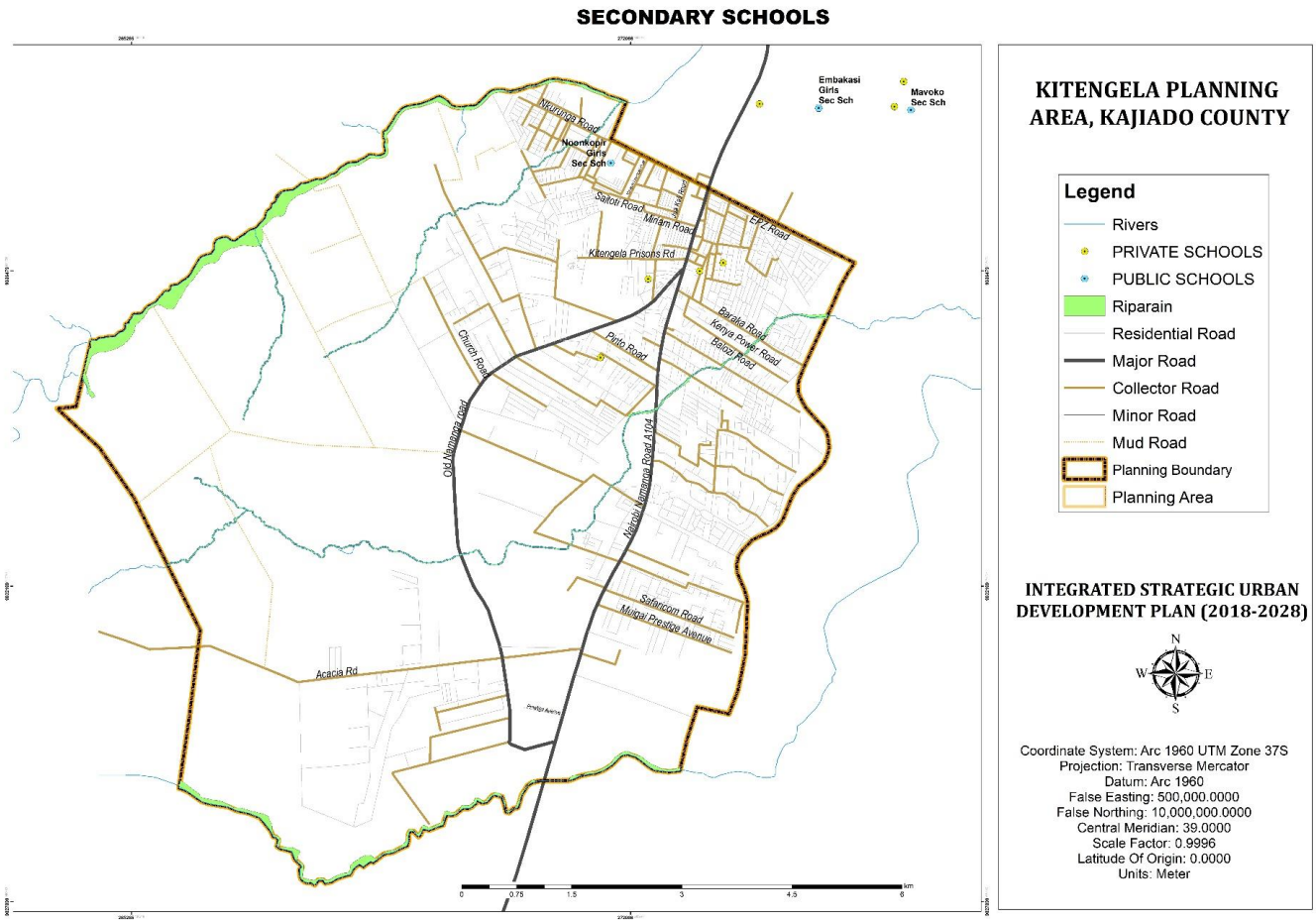


Figure 55 Secondary Schools in Kitengela

Source: Vision RI

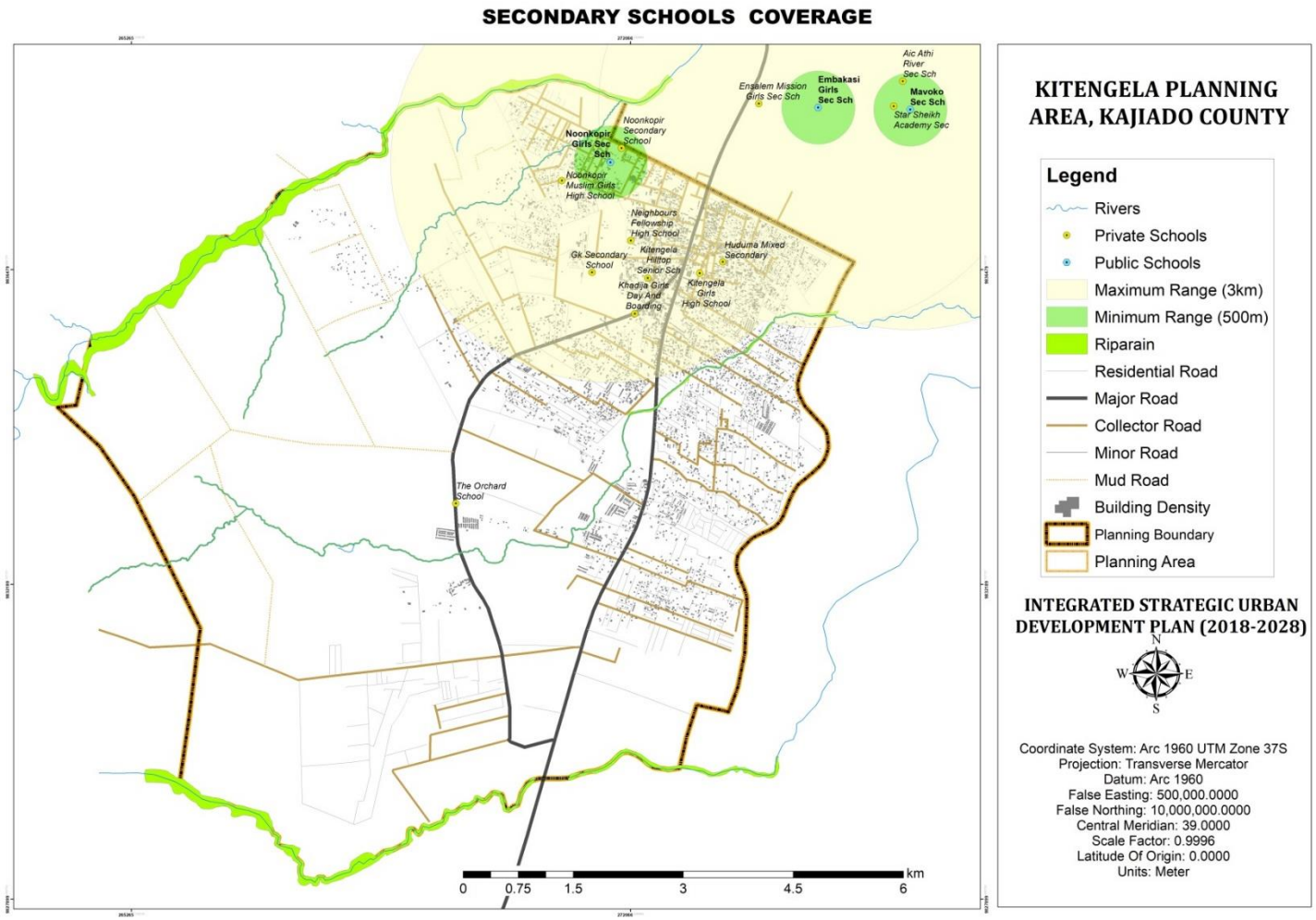


Figure 56: Coverage of Public Secondary Schools in Kitengela
Source: Vision RI

From the map above showing the distribution of public secondary schools, and the buffer of 3 km as per the physical planning handbook, and the table below, there is a deficit in the planning area.

d. Adult Education Centres

As stated in the beginning of this section, the national policies and The Kenyan Constitution take cognizance of the fact that all citizens have a right to basic education. It is important to note that adult education facilitates this by providing 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 need to have the adult education programmes consciously designed to meet specific learning needs.

Within the planning area in Kitengela, there is no adult learning centre. This poses a hindrance to adults especially women who would want to acquire basic knowledge. This is because women have responsibilities which range from child-bearing to management of their family home/farms which leave them with little time to walk for long distances to access institutions outside the planning area. 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 need to plan for at least one adult learning institution within the planning area.

e. Universities and Colleges

There is one university in the planning area namely, KCA Campus however there are two other universities at Isinya i.e. KAG University and East African University which serve the residents of the planning area. In addition, due to close proximity to Nairobi people opt to go to Nairobi. There is no public university in the area.

f. Technical and Vocational education training institutes

Kenya's focus under Technical and Vocational Education and Training is on providing skills that meet the needs of the workplace as well as self-employment. The goal of the TVET Sub Sector is to provide relevant and adequate skills and competencies in strategic disciplines for spurring industrial and economic development. The Kenya TVET Policy, which has a target of gross enrolment rate of 30% by the year 2030, 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 informal sector such as motorcycle riders (boda boda). Though this sector has created employment, it is male dominated and therefore young women are always disadvantaged.

This plan proposes for development of TVET's in the area as a transition platforms for students who did not qualify to join higher education learning institutions. This will benefit young people especially women who are in most cases disadvantaged by the available options in the Jua Kali sector such as boda boda and casual labour n construction sites. TVET's will enhance development of both technical and entrepreneurial skills. .

g. Special needs schools

Special schools are yet to be developed in the planning area. Some schools have integrated special needs curriculum and accommodate students with special needs.

Challenges	Potentials
1. Inadequate public schools 2. Inadequate teaching facilities 3. Inadequate water supplies and poor sanitary facilities in public and private schools 4. Congestion in classes in public schools 5. Lack of special needs schools 6. Most private schools have no playgrounds	Readily available land for construction of more schools Availability of trained teachers

3.9.3. Health

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

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.

Kenyan Healthcare system is provided by the public Sector, private Sector, Faith Based Organisations (FBOs) and Non- Governmental organizations. The public sector is the largest in terms of delivery of public health services

i). Health facilities

The health facilities within the planning area include medical clinics, dispensaries, primary care hospitals and basic primary health care hospitals as shown in the table below.

Table 30: 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 Organization.	1	3
Primary care hospitals	Ministry of Health	1	4
Primary care hospitals	Private	1	4

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.

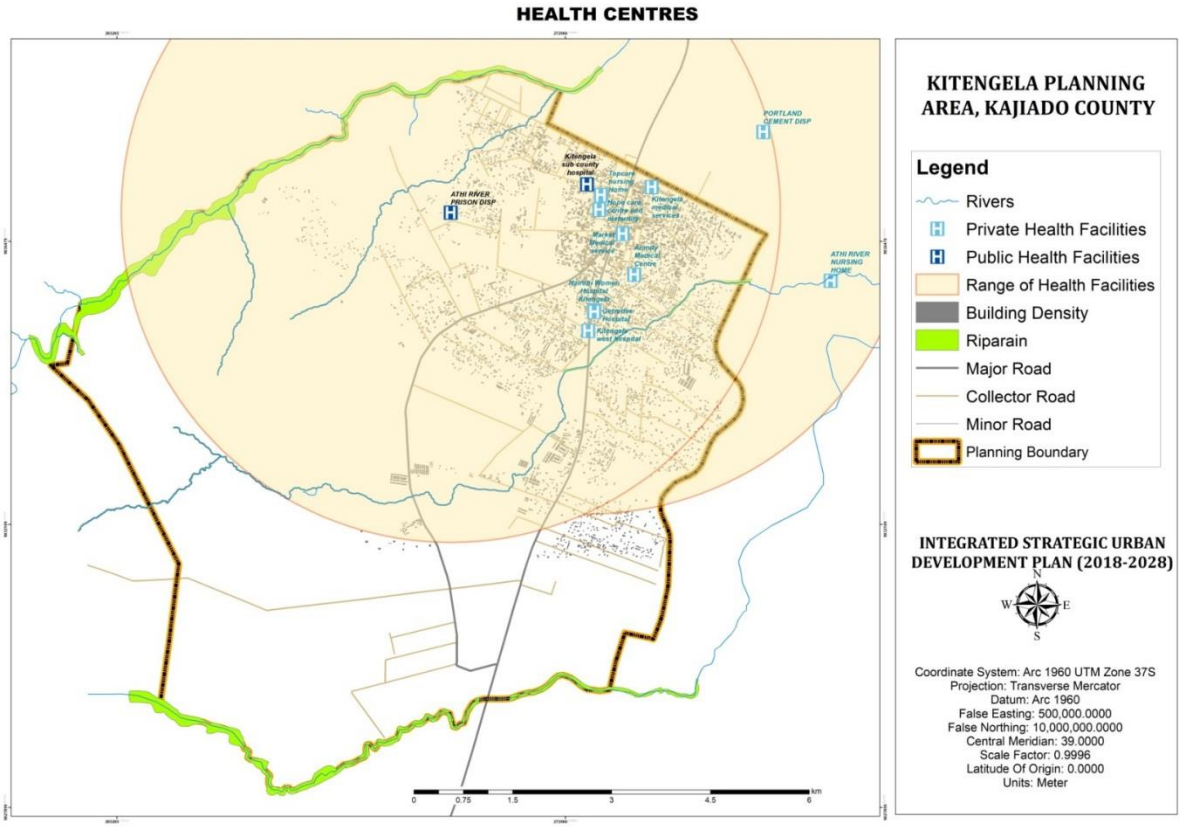


Figure 57: Distribution of health facilities in Kitengela
Source: Vision RI

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.

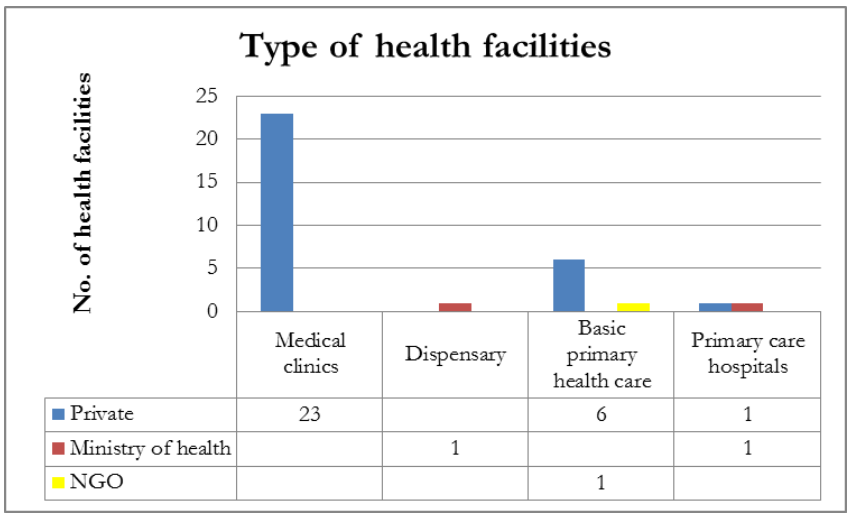


Figure 58: Types of Health Facilities
Source: Kajiado County Health Offices 2018

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 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 quacks.

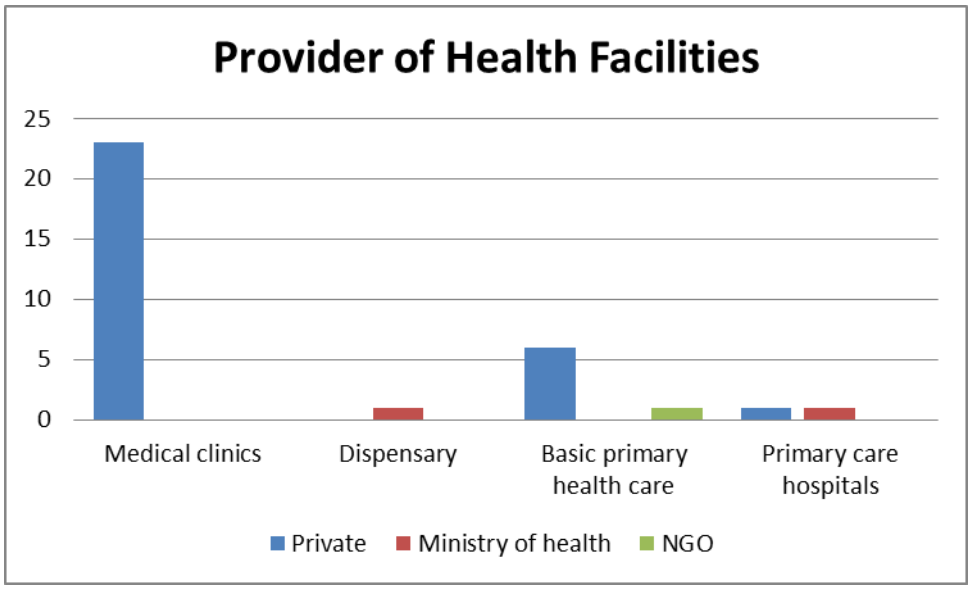


Figure 59: Provider of health facilities

ii). Health personnel

Specifically at 2009 population level of 60,652 WHO standards demand that the planning area would have 207 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. According to the physical planning handbook, 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.

Projected number of health centres

YEAR	POPULATION PROJECTION	NO.OF HEALTH CENTRES PRESENT	NO. OF HEALTH CENTRES NEEDED	DEFICIT	ACREAGE REQUIREMENT
2018	54,619	0	3	-3	9 Ha
2020	62,097		3	-3	9 Ha
2022	70,597		4	-4	12 Ha
2024	80,261		4	-4	12 Ha
2026	91,248		5	-5	15 Ha
2028	103,739		5	-5	15 Ha

Kitengela will require 5 health centres by 2028 to cater for the health needs of the population.

Projected number of hospitals

YEAR	POPULATION PROJECTION	NO.OF HOSPITALS PRESENT	NO. OF HEALTH CENTRES NEEDED	DEFICIT	ACREAGE REQUIREMENT
2018	54,619	1	2	-1	8Ha
2023	75,274		2	-1	8 Ha
2028	103,739		3	-2	16 Ha

Challenges	Potential
Inadequate public health facilities and personnel	Availability of land and budgetary allocation to employ health personnel

3.9.4. Community Facilities and Services

i). Fire station

Currently, there isn't a fire station in Kitengela. According to the physical planning handbook, for every 50,000-100,000 population, there should be one fire station. Therefore at least one fire station needs to be planned for.

ii). Social hall and libraries

Kitengela town has no library facilities. The nearest library facilities are located in Nairobi. With 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 2 libraries.

iii). 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 land was reported to have been grabbed and used for private developments. This ISUDP will seek to solve this issue

iv). 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. Planning standards recommends 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.

v). 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.

vi). 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.

vii). Markets

Kitengela has two market centres that sell food stuff and clothing. Namanga Road transect 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.

Challenges	Potentials
1. 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. 2. There are no social halls in the planning area for people to use for meetings and in-door games. 3. There are no designated public parks and playgrounds in the planning area safe for playgrounds in the educational institutions. 4. There are no public cemeteries and burial grounds in the planning area.	1. There is ample private land in large ranches that may be acquired for the required facilities in the planning area. 2. An increasing number of urban people living in apartments in different parts of the planning area that may require the sports and recreation facilities. 3. County governments around the country are generally prioritizing sports 4. Existing or acquired public land can be used for burial purposes. 5.

viii).Security

The security situation is relatively good however residents of the high end estates sort 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. Street lights along the Namanga road have immensely helped in eradicating insecurity issues

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

3.9.5. Culture, Tourism and Heritage

Tourism is one of the economic sectors in Kitengela. The hotel industry provides a good environment for growth in tourism. Kitengela glass and Maasai Ostrich farm are some of the tourist sites however they are privately owned. There are no heritage sites in Kitengela. This sector has a big potential which can be tapped for optimal gain.

Challenges	Potential
1. Public parks, open spaces, stadium, cemeteries, fire-stations and social halls are lacking in the area 2. Inadequate recreational spaces 3. Demarcated land for social amenities is being grabbed.	1. Availability of land for development of social infrastructure 2. Presence of policy and institutional framework to provide an enabling environment for development of the facilities

3.10. INFORMAL SETTLEMENTS

There are no informal settlements in the planning area. However, there are plots with very congested houses partitioned into 10 by 10 feet rooms with walls and rooms made of corrugated iron sheets. This congestion and low quality housing resemble conditions in informal settlements especially in Kiangombe area. To avert development of informal settlements, the planning process should remedy this anomaly by zoning the town and prescribing the required minimum and maximum density as per zone.

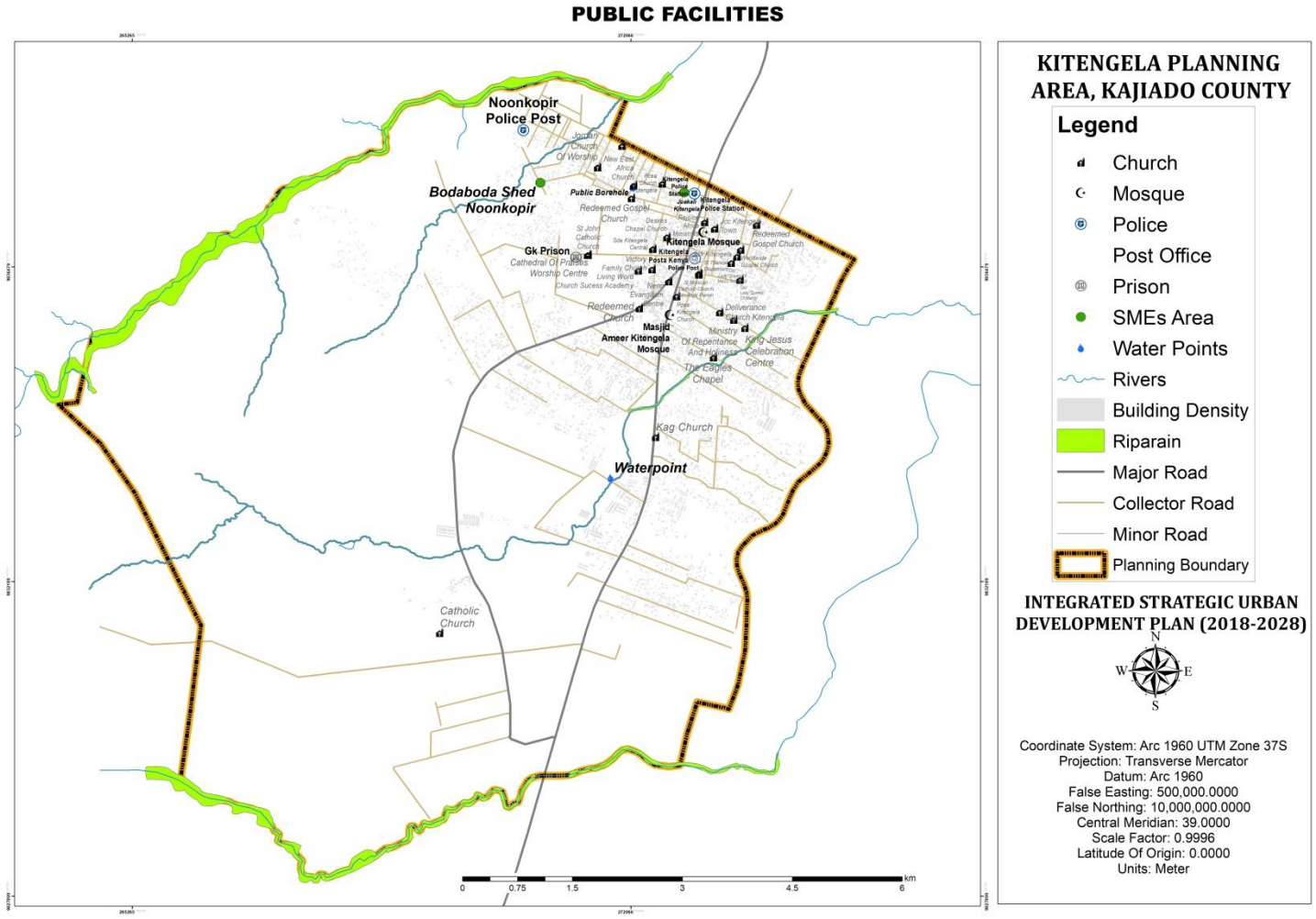


Figure 60: Public health facilities

Source: Vision RI

3.11. PHYSICAL INFASTRACTURE

3.11.1. Water Supply

Water resources in the planning area are from two principal sources i.e. both surface and ground water.

i). Main Sources of Water

The main sources of water in Kitengela are: Piped water from EPZ, Rain water and boreholes. Kitengela piped water supply system is drawn from Export Promotion Zone (EPZ). The main source of water used by EPZ is from Nairobi Water and Sewerage Company reticulation system. EPZ supplies water to Kitengela 5 days in a week. However, with increased population growth, the water has hence become insufficient to the residents of Kitengela.

Individuals who have sunk private boreholes supply water to their neighbourhoods at an average cost of about Kshs 20 per unit (1unit = 20 litres).

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 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.

ii). Water demand and supply assessment

Demand of water for a community is dynamic and it changes with time to match a growth pattern of the community. Demand of water for a community is the quantity of water required to meet its needs against various category of consumptions which are:-Domestic, Commercial, Industrial and Institutional demand

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

- Low class housing 75 L/head/day

The following presents the projected water demand.

Table 31: water demand and supply

Current Water Supply	Current water demand	Deficit
4000m^3	20,000m^3	16,000m^3

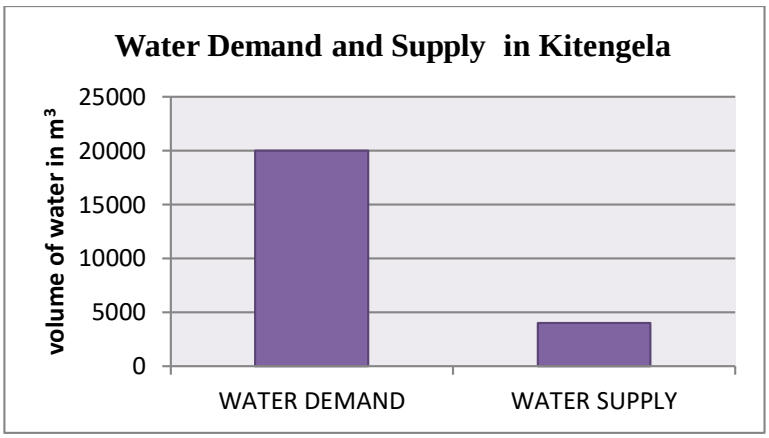


Figure 61: Water demand and supply in Kitengela

It has also emerged that there are some cartels that destroy the EPZ water pipes and divert the water channels to their own residences and sell the water at exorbitant prices of Ksh 50-80 per 20litre jerican. This has led to acute water supply. Water has also become an expensive commodity.

Most of the 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 construction of water storage facilities. However, the Ministry of Water and Irrigation and its agencies have not tapped the water resources.

Challenges	Potentials
1. Lack of a Water and Sewerage Company. 2. Lacks of a sewer networks results to leakages in underground water 3. Inadequate water supply by EPZ **4.** Vandalism and Illegal connections of water pipes	1. Water capacity can be increased through harvesting of rainwater mechanisms

3.11.1. Energy Infrastructure

i). Main Sources of Energy

Adequate and reliable sources of energy are essential for any country's security and economic development. The type of cooking or lighting fuel used by households is related to the socio-economic status of households. To achieve a ten per cent annual GDP growth rate, the planning area needs to secure and maintain sustainable supplies of energy. Power being the basis for development of modern industries and infrastructure should be given the utmost attention. Inadequate energy supply hampers social and economic development and leads low Gross Domestic Product (GDP).

Table 32: Main Sources of Energy in Kitengela

Cooking	Lighting
Gas	Electricity
Charcoal	Kerosene
Kerosene	Solar Panels

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

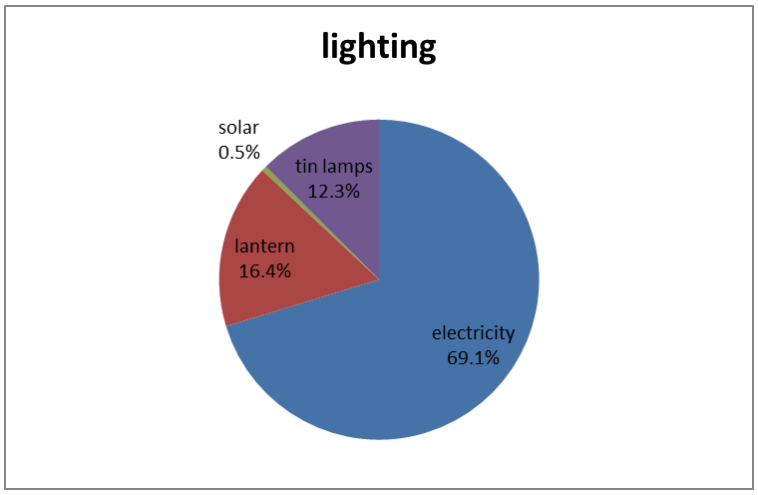


Figure 62: Energy sources for lighting.
Source: KNBS, Kajiado Inequality Index Report

The common 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.

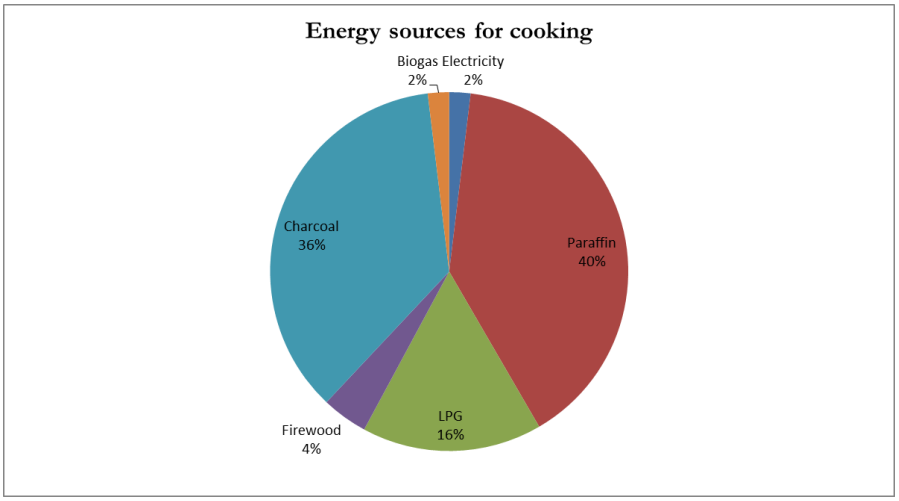


Figure 63: Energy sources for cooking
Source: KNBS Kajiado inequality index

ii). Energy demand

A rapid population growth and expected higher per capita income will lead to increase in demand of 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 of energy resources and adapting of energy efficient measures are to be undertaken. As far as higher energy generation in Kitengela is concerned, it shall be complimented 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 the estimated expected future load demand as per the gap between present power generation and future load demand is too high.

Challenges	Potentials
1. Strain in the available energy sources due to high urban population growth rate. **2.** Low cooperation among the citizens in engaging in energy conservation programmes	Use of solar energy and bio-gas

3.11.2. Ict Infrastructure

Integrated Financial Management Information System (IFMIS) is being used in payment of salaries to Kitengela sub-county employees and disbursement of funds. This has enhanced accountability and integrity among the employees.

Although the area has made the initiative to integrate ICT for better service delivery, there is still more which can be done. Use of ICT in the planning area in record keeping, traffic management, land transaction applications among others is not applicable. The main ICT infrastructure and services in Kitengela include:

a) Telephone Networks & Mobile Phone Networks: They include; Safaricom, Airtel, Telcom and Equitel and Mpesa shops

b) Television & Radio Transmission Stations

c) Internet use was evident by the numerous cybercafés and local internet service providers i.e. Zuku, Telcom Kenya, Safaricom and Airtel

d) Postal services in the area are available with the EMS (Expedited Mail Service) speed post also in Kitengela. So far that's the only company offering mailing services in the town.

Challenges	Potential
Inadequate internet coverage **Misleading information from the internet has caused moral decay among the youth**	High population growth supports growth and use of ICT Availability of land for establishment of ICT firms Availability of internet and mobile operators who can expand the coverage

3.11.3. Solid Waste Management

Each individual plot and household manages its own solid waste. Refuse collection and disposal is currently undertaken by private garbage collection firms even though there is provision of a public dumpsite in the western edge of Kitengela in Noonkopir area. Other residents dispose waste in open spaces; riparian, and along the roadside, hence polluting the environment. Kitengela town lacks a licensed solid waste treatment facility hence poor solid waste management.

Challenges	Potentials
Lack of solid waste management systems	Availability of land to construct a land fill
Delayed waste collection	Waste generated can be used to generate power

3.11.4. Waste Water Disposal System

The main wastewater disposal systems are septic tanks, pit latrines and main sewer. From the figure below, it is evident that septic are the most common type of wastewater disposal. Due to inadequate water supply, people opt to use pit latrines. A larger proportion of the area is not connected to a sewer line and therefore most developers opt to use septic tanks.

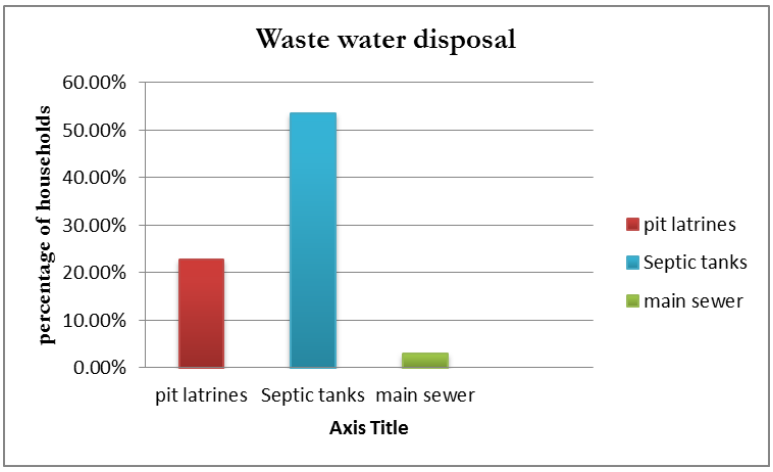


Figure 64: Waste disposal systems

Source: KNBS; Kajiado Inequality index report

81.88% of the population have 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.

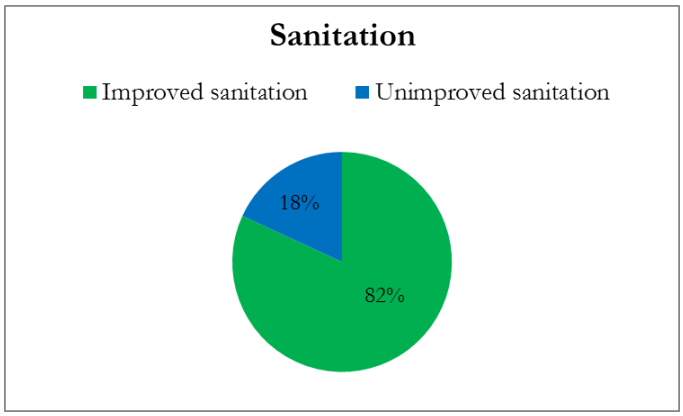


Figure 65: Access to improved sanitation

Source: KNBS; Kajiado Inequality index report

However, generated waste water 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 ground water hence contaminating the water which poses a serious health hazard.

Figure 33: Examples of Pollution of Permanent Streams & Bad Drainage
Source: Field Survey, 2018

Wastewater generation

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

Table 33: Sewerage generation in m^3

2015	2020	2025	2030
18,748	23,855	30988	40775

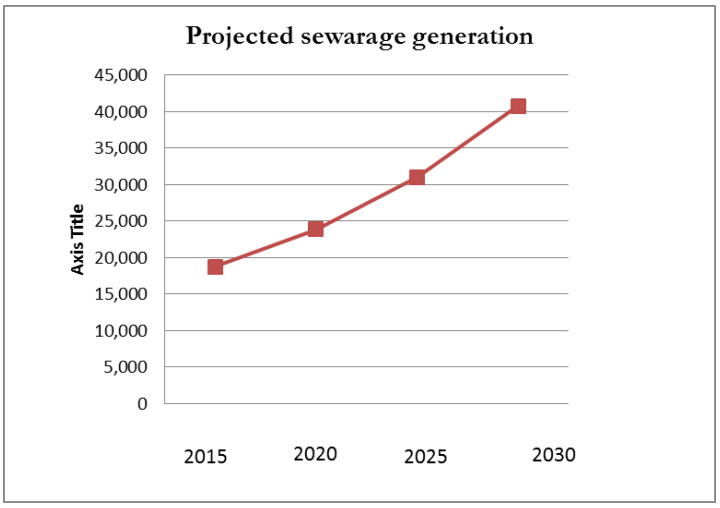


Figure 66: projected sewerage generation

Challenges	Potential
1. Sewerage systems are constrained due to population influx and growth **2.** Inadequate operational public sewer systems. Inadequate funds limit expansion of waste water disposal system	1 Construction of more treatment plants/systems through budgetary allocation to manage 2 Promote re-use of waste water.

3.11.5. Storm Water Drainage

There is an existing common drainage system which drains the area. Proposed developments in Kitengela should be designed to provide for internal drains to collect the surface run-off and dispose to the area drainage system.

Challenges	Potential
Lack of proper storm water drainage systems Flooding Drainage systems too have been clogged with solid waste.	Good topography that encourages proper storm drainage.

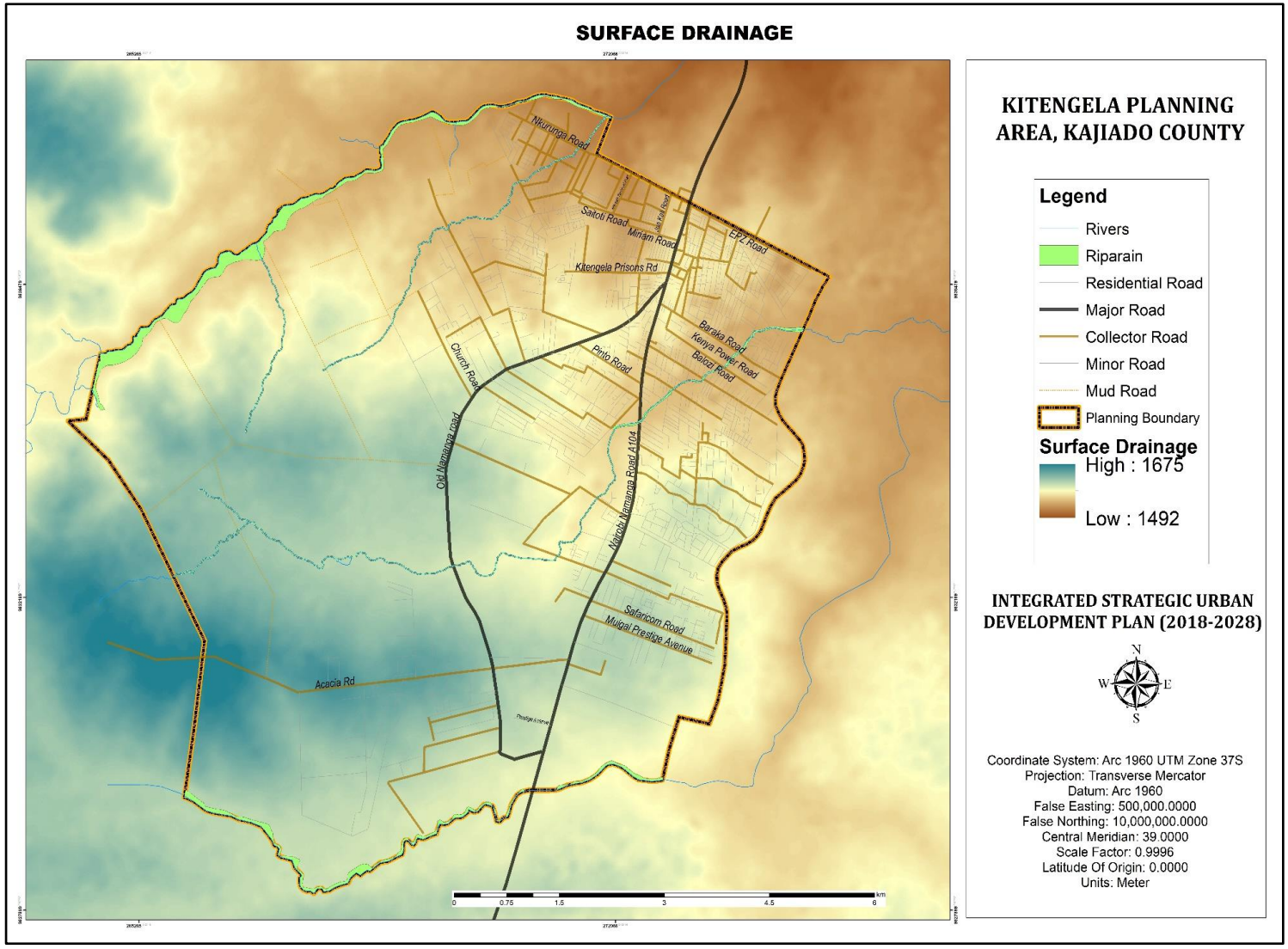


Figure 34: Surface Drainage Map Kitengela Planning Area
Source: Vision RI

3.12. DISASTER MANAGEMENT AND RISK REDUCTION

Introduction

Disaster Risk Reduction is the conceptual framework and practice 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, 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 (organizational, 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.

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 all natural disasters world-wide 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.

Evidence of climate change in the County

Temperatures have risen throughout the County. Rainfalls have become irregular and unpredictable, and when it rains, downpour is more intense. In addition the County remains dry for the better part of the year. The mean maximum temperature is 24 -26oC and the mean minimum temperature is 12-14o 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 wrecked an 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.

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 Katumumani- 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.

Establishment of greenhouses for vegetable growing.

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 Kitengela area.

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 67: Environmentally Fragile Areas that are prone to disasters
Source: Field visit 2018

3.12.1. 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 is 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 in 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

i). 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

storm water 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 waste water is not a disaster during rainy seasons. Capacity building of the local residents to enable them practice water harvesting techniques in order to reduce water runoff that will increase flooding and soil erosion.

Figure 68: Soil erosion in Kitengela

Source: Field visit 2018

ii). Drought and famine

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

iii). 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 increasing source of risk to people and the environment. This is an effect of globalization of production; an increase of industrialization and certain.

iv). 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 ad worsening heart and lung diseases.

v). Fire

Another form of hazard in Kitengela planning area is fire whose damage on property is enormous and may lead to loss of lives. The most prone areas to fires are slum areas and industries. In the years, fire caused great damage to property in informal settlements and two lives were lost in addition to loss of properties

vi). Road accidents

Road traffic accidents and the 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 pedestrians, motorcyclists, and cyclists. In addition, nearly one-third of deaths are among 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 from 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.

3.12.2. Disaster Management

Disaster Risk Management includes but goes beyond disaster risk reduction by adding a management perspective that combines prevention, mitigation and preparedness with 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 **t**he 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 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 includes: 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 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. Recovery involved household recovery and community recovery

Challenges	Potentials
Inadequate disaster preparedness **Poor coordination of disaster response bodies** **Inadequate information regarding the magnitude of the disaster** **Inadequate financial resources** **Inadequate community participation**	

3.13.GOVERNANCE

3.13.1. Institutional Framework

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

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

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

3.13.2. Planning

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

3.13.3. Implementation

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

The co-ordination of the various actions to be implemented during the implementation of this ISUDP shall be undertaken by the County Intergovernmental Forum comprising the following:

a. The heads of all departments of the National Government rendering services in the county; and

b. The County Executive Committee members or their appointed nominees.

3.13.4. 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 ISUDP shall be reviewed every five years.

3.13.5. Plan Amendments

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

CHAPTER 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, 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 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; Business community; Public health and environment; Informal Businesses; Non- governmental Organizations; Transport Sector Associations; Religious Institutions; Community Based Organizations; Farmers; Professional Bodies; Minority and Marginalized groups; Persons with disabilities; Youth and Women.

4.3. MODE AND LEVEL OF ENGAGEMENT

The consultant's team developed a workshop mechanics, which provided the type; manner and sequence of activities intended to elicit optimal participation and results from the stakeholders. It includes the designation of direct roles of various stakeholder participants intended to initiate plan ownership. The Consultant's roles were confined to the provision of technical inputs and facilitation of workshop activities. The workshop mechanics involved 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 & 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 and therefore the consultant should refer to these plans to deter duplication of plans and ensure that all the plans are in harmony. In addition, the spatial plan should guide the preparation of the ISUDP and hence preparation of the spatial plan and the ISUDP should be harmonized.

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

It was also noted that the level of representation from the county government was low and 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 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 sides of Namanga road to decongest the town.

Inadequate financial resources was 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.

4.4.1. Key Concerns

1. Solid and liquid waste management
2. Traffic congestion
3. Insufficient financial resources
4. Engagement of all stakeholders during planning
5. Integration of the plan with other plans
6. People with disabilities
7. Practicability of the NMR proposals
8. Inefficient land subdivisions

4.5. 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 SWOT matrix for the planning area is given in **Annex 3**. This synthesis will serve as the platform for the next step in the planning process, which is to formulation of the planning area's Strategic Direction in the form of a collective Development Vision, Goals and Objectives.

4.5.1. 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, 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).

4.5.2. 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 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 to 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 waste water and solid waste management facilities have emerged. These challenges, in turn, resulted to 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 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 un-guided, 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, prevalence of ribbon development along the said road and under-utilisation of land at the interior portion of the planning area.

Strengths	Weaknesses	Opportunities	Threats
Demography			
• High population and thus a good human resource base. • Comparatively lower population density in the NMR	• Unemployment among the youth	• High literacy levels among the youth	• High population growth rate
Natural Resources & Environment			
• Available land for residential and institutional development, • Land for industrial commercial development • Land for agricultural activities such as the flower farms.	• Inadequate waste management system; • Encroachment of riparian and open spaces. • Uncontrolled development • Human-wildlife conflict • Pollution of water resources • Air and noise pollution • Increase of water borne diseases	• Sustainable exploitation of natural resources such as building stones and sand.	• Development of informal settlements • Increase in disasters e.g. floods, fire, industrial emissions etc. • Increase in road accidents.
Economic Activities			
• Existing Real Estate and Industrial Base • Available space for expansion • Well-developed network of commercial, transport and other services • Established Banking Industry • Location advantage • EPZ	• Inadequate physical Infrastructure • Administrative Challenges (Business Hurdles)	• Investment Attractiveness • Proximity to Nairobi • Residential, industrial and tourism hub	• Haphazard Planning
Land Use, Land Economics & Urban Design			
Land Use			

Strengths	Weaknesses	Opportunities	Threats
• Housing construction boom • Proximity to Nairobi city and Mavoko town • Robust and mixed-use CBD • Noonkopir old town already an established residential neighbourhood • Presence of Old Namanga Road to supplement Nairobi-Namanga Road	• Rapid population growth rate • Ribbon-type development along Nairobi-Namanga Road • Leap-frogging sprawl of gated communities at the interior • Loss of wildlife corridor	• Designated as a Growth Centre (Level III) • May develop as a residential, industrial, and transport hub and as extension of Mavoko town • May also become a tourism hub with the re-establishment of the wildlife corridor • TOD proposals under NaMSIP	• Saturation of Nairobi-Namanga Road • Under-utilisation of land at the interior portion • Incongruous land uses such as a quarries beside residential areas • Urban expansion causing the premature conversion of agricultural lands and open areas
Land Economics			
• Well established land registry at the County • Support by the County Government for land administration • Flexibility of the predominant tenure (private tenure) • Existence of a dynamic land market	• Analogue land registry • Poorly trained land administration staff (carry over from the old system) • Rising land prices – likely to increase cost of development of public utilities • Lack of capacity to monitor land market	• County Government and national support for reform in land administration • Development of appropriate laws at county and national levels • Development of structure plans and zoning regulations for the towns.	• Influx of land speculators from Nairobi distorting the property market • Exploitation and displacement of locals from their land by richer individuals from Nairobi • Emergence of slums and illegal subdivisions due to increased demand for land.
Urban Design			
• Mixed-use compact CBD • Noonkopir as an established residential neighbourhood	• 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	• 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	• Deterioration of the quality of the CBD's and Noonkopir old town's urban environments • Increased roadside friction along major road arteries

Strengths	Weaknesses	Opportunities	Threats
	• Disjointed roads and disorganised streetscape in CBD • Lack of pedestrian sidewalks, cycling tracks, and street lighting • Lack of public open spaces that may commonly be used for recreation	• Implement a land acquisition programme to be able to develop public open spaces	
Transportation			
• Town is well connected by road to Mavoko, Nairobi, Kajiado and Namanga border • There are many public transport operators, including motorcyclists • Dedicated budgets for provision and maintenance of transport facilities available at the County • Close proximity to Mavoko town for connectivity to the Northern economic corridor	• 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; • 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.	• 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 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	• Conflicts and accidents due to high vehicle speeds and volumes along the A104 road • Small and congested bus park that stands on a private property. • High traffic volumes and speeds on A104 road making the CBD unattractive.
Social Infrastructure			

Strengths	Weaknesses	Opportunities	Threats
Housing			
• Ample land for housing development especially for owner occupier housing • Ample supply of quarry stone from within Kajiado County	• High prices of construction steel • Expensive building technology using sand, cement and quarry stones	• Ample supply of sand from within Kajiado County at affordable prices • Close proximity to steel works in Nairobi's industrial areas.	• Tenants from Nairobi unable to own houses • Low income tenants from Nairobi creating demand for informal settlements
Education			
• County government and CDF support for basic education • Deep local people's support for education in the county as shown in high education achievement.	• Insufficient number of public pre-primary and primary schools • Limited public land for new schools during the planning period • Pockets of indigenous Maasai populations where education for girls is not emphasized.	• County and national government support to basic education • Free Basic Education Policy at National Level	• Proximity to Nairobi attracts school-going children to the streets to beg • Proceeds from crime in Nairobi attract children from school into crime
Health			
• Available private land to acquire for more health facilities • Funding for health facility construction from Constituency Development Fund and County Government	• 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 • Long distances (more than 5 kilometres) covered by most residents to reach health facilities.	• County government support to health services in the planning area • Free Health Care for All Policy being pursued by the National Government	• Health labour force actions including withdrawals around the country • Inadequate health care personnel being hired and/or retained in the health sector in the country.
Sports and Recreation			
• Ample private land is available for acquisition for the construction of a stadium	• Lack of a stadium in the planning area. • A weak history of sports and use of social halls outside schools in the planning area.	• Possible funding for sports activities and facilities from the County Government	• Funding for the construction of the stadium may be slow in coming due to demand for similar funding across the country

Strengths	Weaknesses	Opportunities	Threats
• There is a tradition of sports in secondary schools across the planning area which may be built on in future	• No land designated for a stadium	• Emphasis of sport by the national government with possible support for sports facilities such as stadia	• Limited support and funding for social halls and in-door sports across the country.
Public Parks and Playgrounds			
• Private land is available for purchase to use as public parks in the planning area. • There is an emerging urban population that requires parks and playgrounds in the planning area	• Lack of public parks and playgrounds in the planning area. • A weak history and use of public parks in the planning area.	• Middle class influence from Nairobi will increases demand for leisure and play spaces • Emphasis of sport by the national government with possible support for sports facilities such as stadia	• Funding for the construction of public parks may be slow in coming due to demand for similar funding across the country • Limited support and funding for public parks across the country.
Religious			
• Religious groups use private land for their activities • There is a strong tradition of religious activity in the planning area • Large numbers of adherents in most religious groups	• Inadequate quality of worship facilities in the planning area. • Poor location of worship facilities including many without adequate parking space in the planning area.	• Religious freedom in the country • Widespread support and patronage of religious health and educational institutions in Kenya	• Religious extremism which likely to mar inter-religious harmony in Kenya.
Cemeteries and Burial Grounds			
• Available or acquired land can be used to set up cemeteries for Muslims and for Christians separately. • Private land may be acquired and used as cemeteries • People from the planning area are open to using public cemeteries	• Lack of public cemeteries and burial grounds in the planning area. • Weak support from CDF in setting up cemeteries in the planning area.	• Preference by people to bury the remains of their loved ones in public land to free private land for commercial purposes • Shrinking privately owned land sizes per family.	• Funding for the construction of public cemeteries may be slow in coming due to their not being prioritized across the country • Limited funding for public cemeteries across the country.
Cooperative Societies			

Strengths	Weaknesses	Opportunities	Threats
• Strengthened cooperatives in the public transport sector in the planning area • There are strong cooperative roots in the teaching profession in the planning areas. Hence, people know the benefits of the movement first-hand.	• Cooperatives cover a limited number of sectors mainly public transport and urban entrepreneurship. Other sectors are left out. • Cooperatives especially in the public transport sector pay workers poorly and give cooperatives a bad name due to their strong profit maximization motive.	• More people around the country are interested in cooperatives as they aim to pool resources together and borrow. • National government support for the cooperative movement.	• Competition from banks and micro-finance companies offering similar services at larger scale hence cheaply.
Physical Infrastructure			
Water Supply			
• Available water resources. • Water connection company. • Water treatment. • Water distribution system.	• Limited funding • High cost of water treatment. • High cost of connection. • Water catchment degradation. • Vandalism of water connection pipes. • Population influx.	• Financing opportunities from donors etc. • Affordable means of water treatment. • Capacity building on water and sanitation. • Increased revenue collection. • Expanding accessibility.	• Illegal connections. • Vandalism of water pipes. • Water pollution.
Energy Infrastructure			
• Presence of power sub-station at the junction of Rongai road and A104 • Government's UMEME PAMOJA SCHEME	• 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. • High urban population growth rate also strains the available energy sources and utilities leading to power rationing.	• Development of alternative sources of energy such as energy saving jikos; solar panels; wind mills; and use of biogas	• Low cooperation of citizens in energy conservation programmes
ICT Infrastructure			

Strengths	Weaknesses	Opportunities	Threats
• Serviced by all mobile phone operators • Serviced by various national and local television and radio stations • Extensive use of internet and presence of fibre optic cables in the Town	• Disruption of fibre optic cable and other ICT infrastructure during road maintenance and/or upgrading.	• Expansion of coverage of ICT service providers due to heightened demand; improved services due to business competition	• Lowering of service quality due to over-subscription
Solid Waste Management			
• County Government involvement in weekly collection of waste. • County Government conducts clean-up activities. • River rehabilitation programmes. • Designated dump sites.	• Limited funding • Certain households unable to make payment for solid waste collection. • Informal settlements. • Population influx.	• Recycling of waste. • Increased revenue collection. • Energy form landfill. • Relocation of dump sites. • Funding opportunities. • Supply of refuse collection bags.	• Poorly sited dumpsite e.g. Near riparian areas, commercials, and residential areas. • Delays in collection by the waste collection companies or county government. • Dumpsite may attract avian. • Pollution of water resources. • Blockage of storm drains.
Waste Water Management			
• County Government involvement in expansion of sewerage system. • Available land for expansion of sewerage system. • EIA done before new sewerage system is constructed.	• Constrained sewerage systems. • Limited funding. • Certain households unable to make payment for waste water disposal connection. • Informal settlements. • Population influx.	• Affordable waste treatment. • Recycling of waste water. • Increased revenue collection. • Funding opportunities. • Improvement of waste water infrastructure.	• Sewer bursts hence pollution of the environment e.g. water resources. • Construction on sewer lines. • Contamination of clean potable water. • Water borne diseases such as typhoid, amoeba etc. • Destruction of habitats. • Illegal connections. • Destruction of sewer system during infrastructural developments.

Strengths	Weaknesses	Opportunities	Threats
			• Vandalism of waste water collection pipes.
Storm Drainage			
• County Government involvement in improving storm drainage system. • Available land for expansion of storm drainage system.	• Poorly designed storm drainage system. • Limited funding. • Informal settlements. • Population influx (hence solid waste may block storm drainage system).	• Re-design storm drainage system. • Funding opportunities. • Maintenance of storm drainage system. • Re-location of residents in informal settlements living near storm drainage system. • Informal settlement up-grading programmes.	• Overflow of 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. • Destruction of storm drainage system during major infrastructural developments. • Solid waste blockage and siltation of storm drainage system.
Disaster Risk Reduction & Management			
• County strategies to mitigate effects of climate change and variability. • Global partnerships towards addressing climate change. • Awareness created. • Preparedness strategies.	• Inadequate resources to mitigate effects of climate change and variability. • There is inadequate information on climate change. • Climate change and variability not given priority.	• Carbon market for example tree planting and renewable energy. • Improvement of drainage system. • Capacity building on climate change. • Financing opportunities.	• Geo-hazards such as floods and landslides. • Loss of livelihoods as a result of prolonged droughts. • Loss of lives and property. • Water borne related diseases such as Malaria, diarrhoea, typhoid, among other.

CHAPTER 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.OVERALL DEVELOPMENT STRATEGY

5.2.1. DEVELOPMENT VISION, MISSION, GOALS AND OBJECTIVES

i). Vision

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

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

ii). 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".**

iii). Goals and objectives

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 incorporation of ICT in the management of the town
To promote the use and production of renewable energy
To enhance the economy through provision of incentives to investors
To enhance transparency and integrity in provision of government services.

5.3.DEVELOPMENT OF ALTERNATIVE MODELS

5.3.1. Plan Structuring Elements

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.

5.3.2. 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 good opportunity for structuring the municipality through this ISUDP. The municipality remains generally vacant to the south and to the west.

5.3.3. Main Transportation System

Namanga Road is the main structuring element in terms of the transport system of the municipality. All other road network connect 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.

5.3.4. Physiographic Factors

In Kitengela town, the topography is characterized by high and low grounds. The high grounds are indicators for 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 a planning area provide opportunities to plan and locate sewerage treatment system for the municipality. 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 the EPZ sewer.

Rivers dictate the drainage patterns of a town. The river system also acts as boundary buffers for different land uses. The Municipality 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 location of cement industries in the area.

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

5.3.5. Development trends

Urban growth trends and patterns

The distinct urban centre in the municipality is Kitengela Town 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 town site, may also be considered as a secondary node. It has its own village level commercial area surrounded by older residential developments.

Figure 69: 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 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. 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 1999 – 2009 was calculated at 20.09%. This made Kitengela as the second fastest growing urban centre in NMR, second only to Juja which exhibited a CAGR of 21.01%. Kitengela's population grew more than five times faster than that of Nairobi (3.89%) and more than six times faster than that of the country (3.03%).

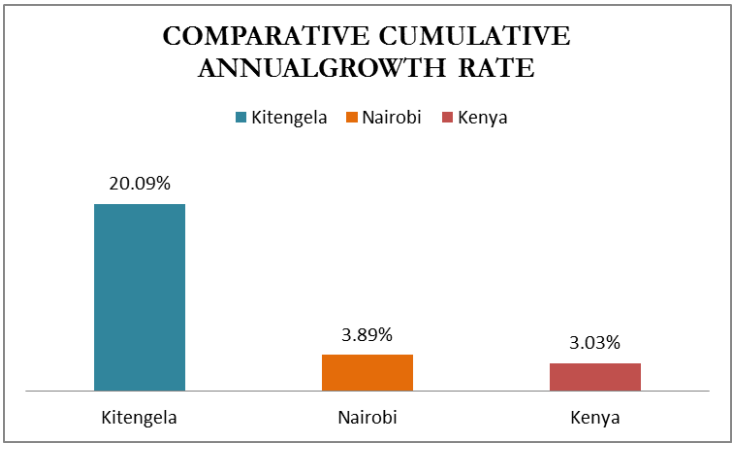


Figure 70: Cumulative Annual Growth Rate of Kitengela in comparison to Nairobi and Kenya

Kitengela is the second largest urban centre in terms of population in Kajiado County in 2009, next only to Ngong (popn = 104,073). Nonetheless, it grew faster than Ngong (CAGR = 17.87%) and the potential for more growth remains significant due to Kitengela's 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 the 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 construction of gated residential estates on lands that were originally used for cattle grazing.

Figure 71: Urban Corridor and Urban Sprawl
Source: Field Survey 2018

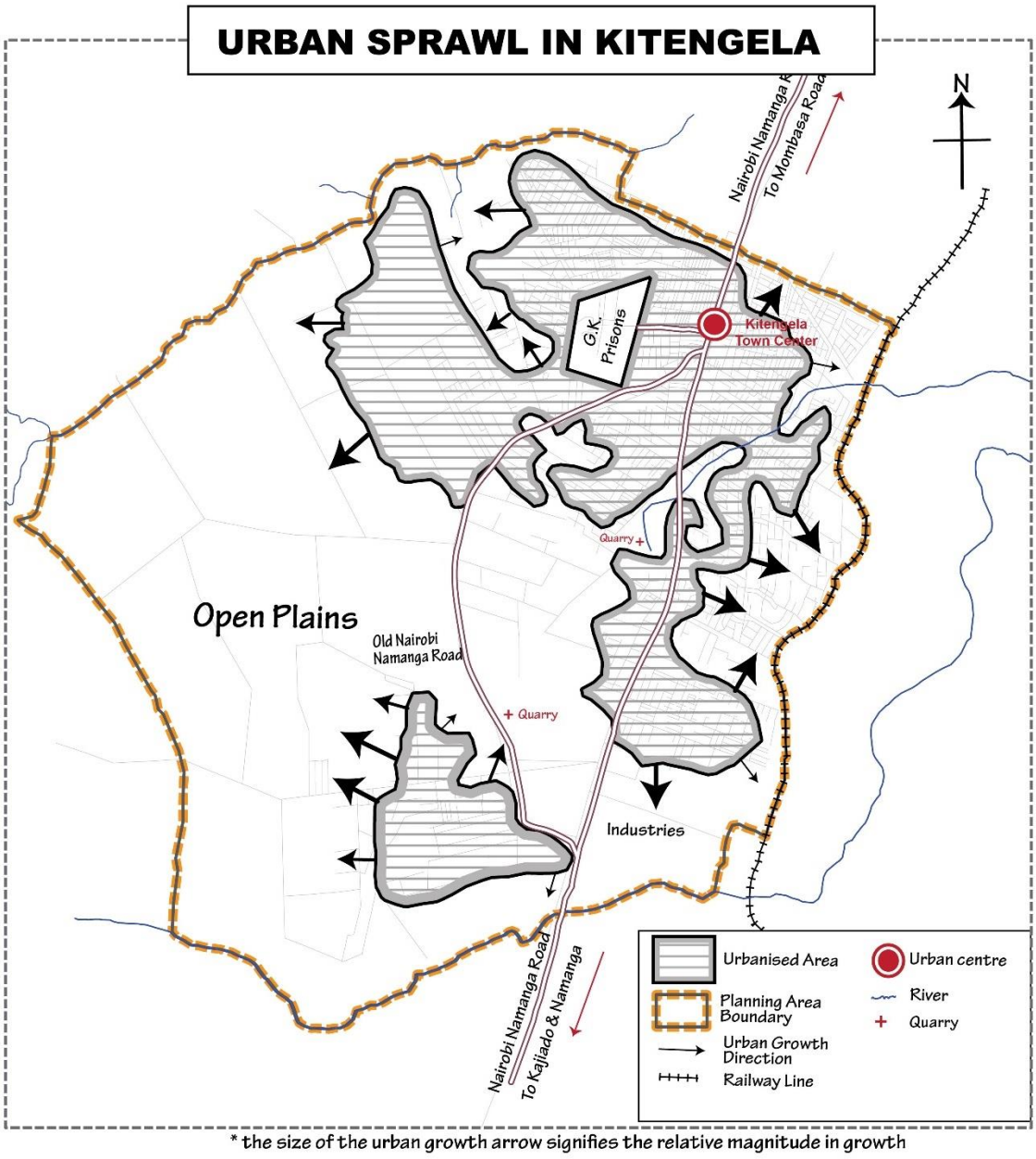


Figure 72: Urban Sprawl in Kitengela

5.4. SPATIAL DEVELOPMENT MODELS

Alternative Growth Models

5.4.1. Nil intervention-Laissez- faire

In a 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 municipality will ultimately develop into slums and blight areas if the status quo continues.

5.4.2. 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 and, therefore, causes segregation within the municipality.

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:

1. **CBD:** The innermost ring, where non-residential activities are concentrated.
2. **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.
3. **Zone of working-class homes:** Modest older houses occupied by stable, working-class families.
4. **Zone of better residences:** Newer and more spacious houses for middle-class families.
5. **Commuters' zone:** Beyond the continuous built-up area of the city, where people live in small communities and commute to work in the CBD.

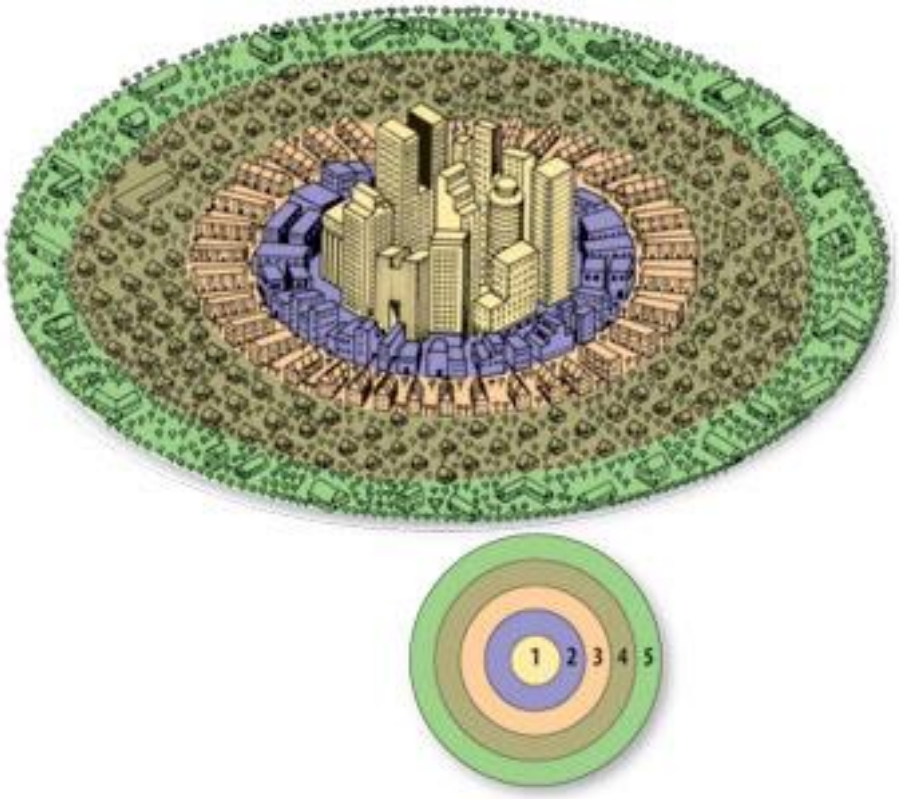


Figure 73: Illustration of the Concentric Model

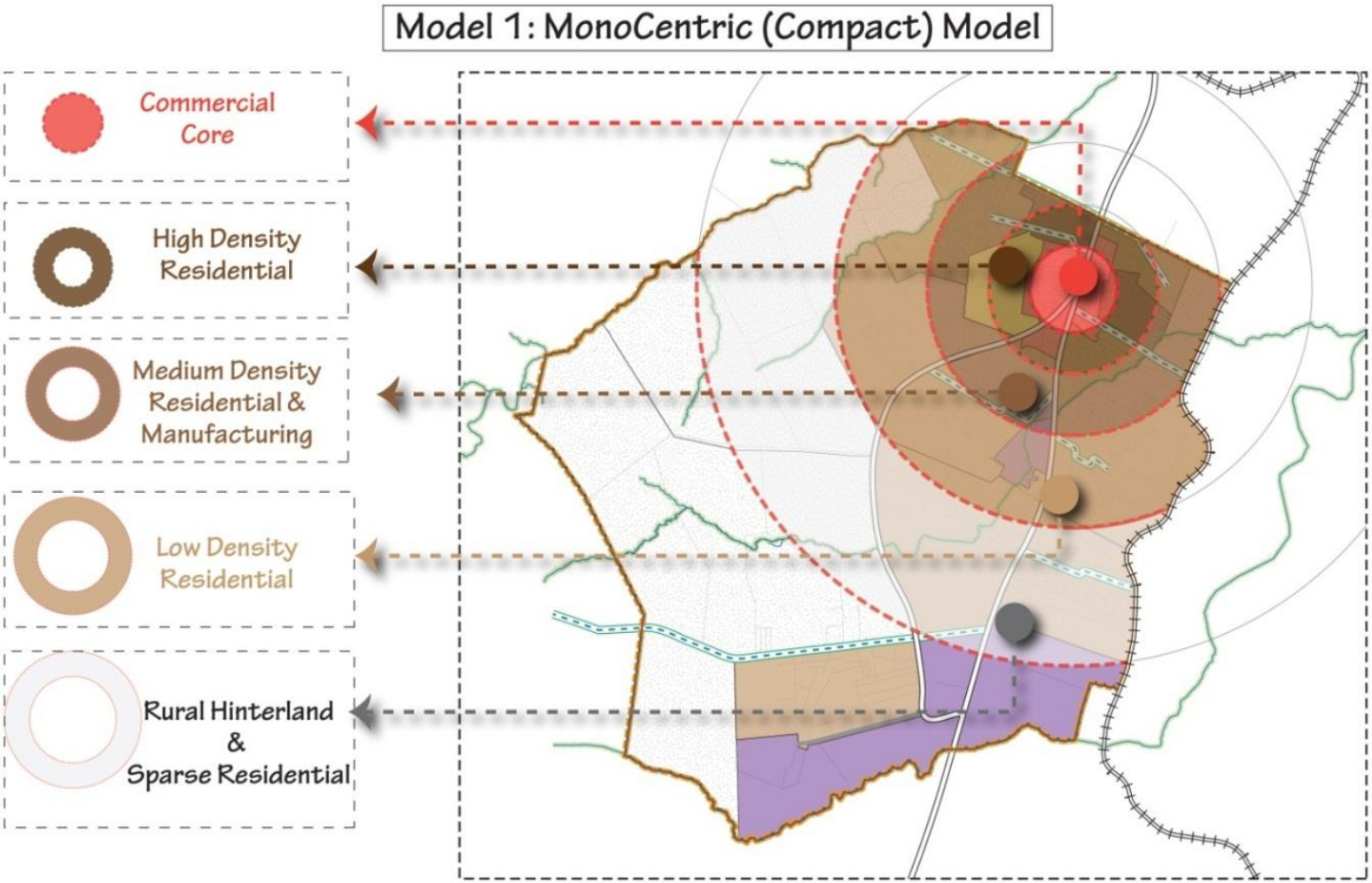


Figure 74: Monocnetric Model in Kitengela

Disadvantages;

1. 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.
2. Distribution of the population and easy development in all directions does not apply for Kitengela.

i). TOD as an implementation of the concentric model

For effective implementation of the monocentric (concentric model) there is need to integrated 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

1. Public transport management

Public transport is created to encourage high capacity vehicles through

a) 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.

b) Design of designated bus parks for public transport to discourage on street parking, loading and off-loading of passengers.

2. Private transport management

Private vehicles are facilitated to use a park and a ride facility. Access to the core of the centers is limited to PSV's and freight vehicles.

3. Road transport design

The road design encourages public mobility through;

a) Construction of service lanes,

b) Construction of Non-Motorized transport facilities and BRT lanes for the buses

c) Construction of parallel transport routes for entry and exit of vehicles to deter in through access at the major transport corridor.

d) Construction of underpasses and overpasses to distribute traffic.

e) Use of road hierarchy systems

4. Development control: Development of comprehensive legal framework i.e. Zoning regulations allow high rise and mixed land development of at least four levels with the two lower levels being exclusively commercial with

arcades between them along the transport corridor and Enforcement regulations to curb access of residential areas through the major transport routes.

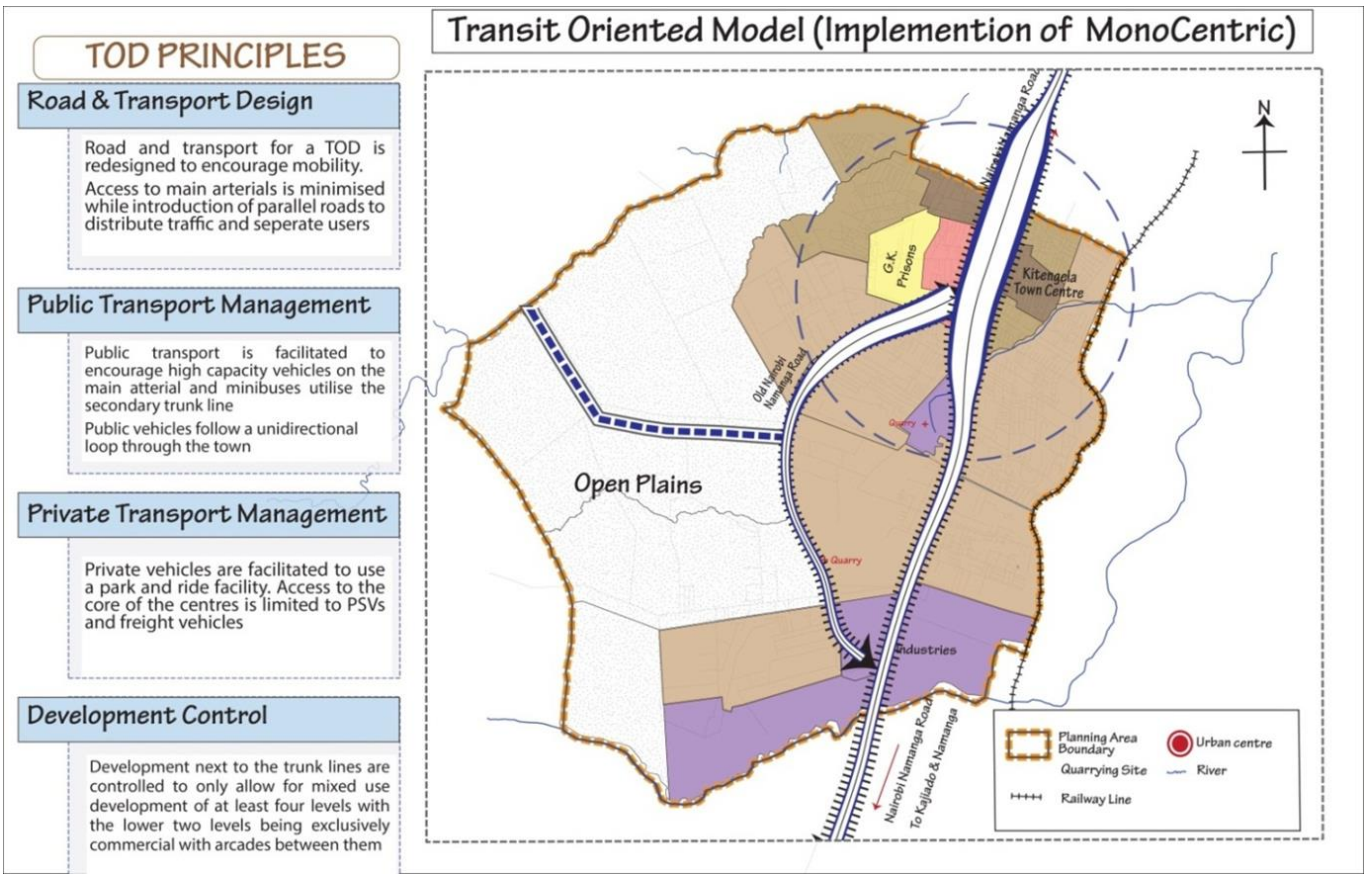


Figure 75: TOD model as an implementation of the Monocentric model

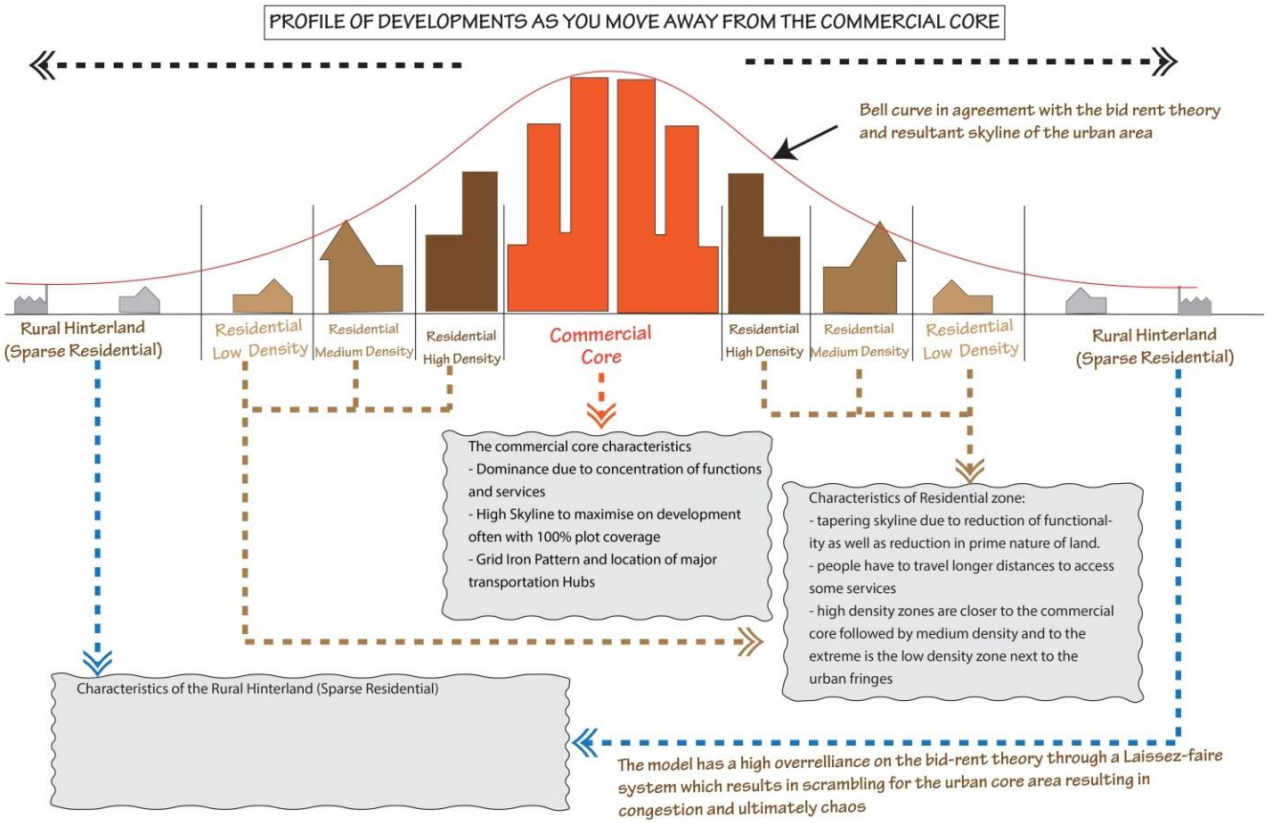


Figure 76: Profile of developments according to the TOD

The bid rent model postulates commercial land use as having the highest rent. Commercial activities therefore compete for the first row of the high way. High density residential uses including at Kiang'ombe A and B can be seen next to the CBD. Low density housing is forming further from the CBD at Milimani leading to suburbanization. This model assumes that security would be good at the far fringe of the CBD. However, when security deteriorates farther away, the high income tend 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 largerly undeveloped like Kitengela.

5.4.3. Multiple Nuclei Model

The multi-nuclei model was developed by C.D. Harris & E.L. Ullman in 1945. The basic concept is that cities don't grow up around a single core but have several nodes. Examples of these nodes include a port, neighborhood business center, 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 neighborhood. The nodes in this model are:

1. Central business district
2. Wholesale light manufacturing
3. Low-income residential
4. Middle-class residential
5. High-income residential
6. Heavy manufacturing
7. Outlying business district
8. Residential suburb
9. Industrial suburb

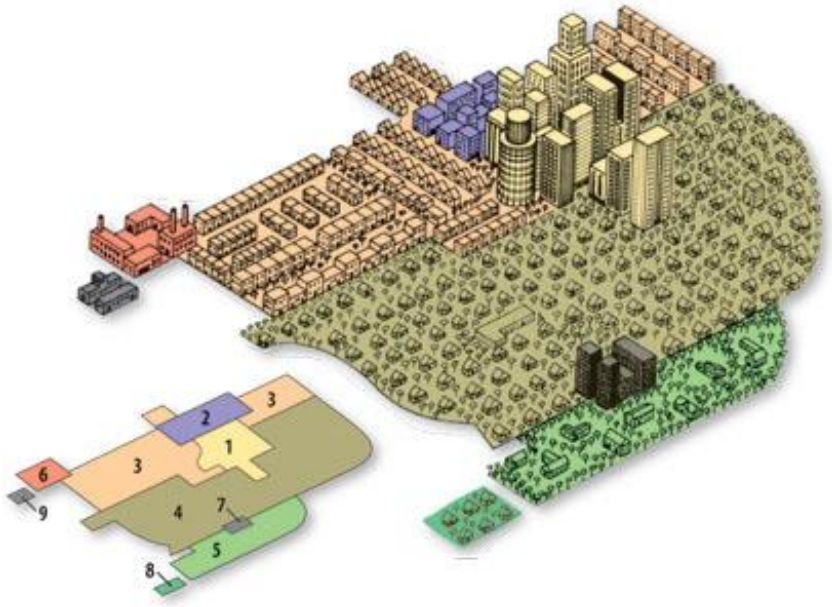


Figure 77: Illustration of the Multi-Nuclei Model

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.

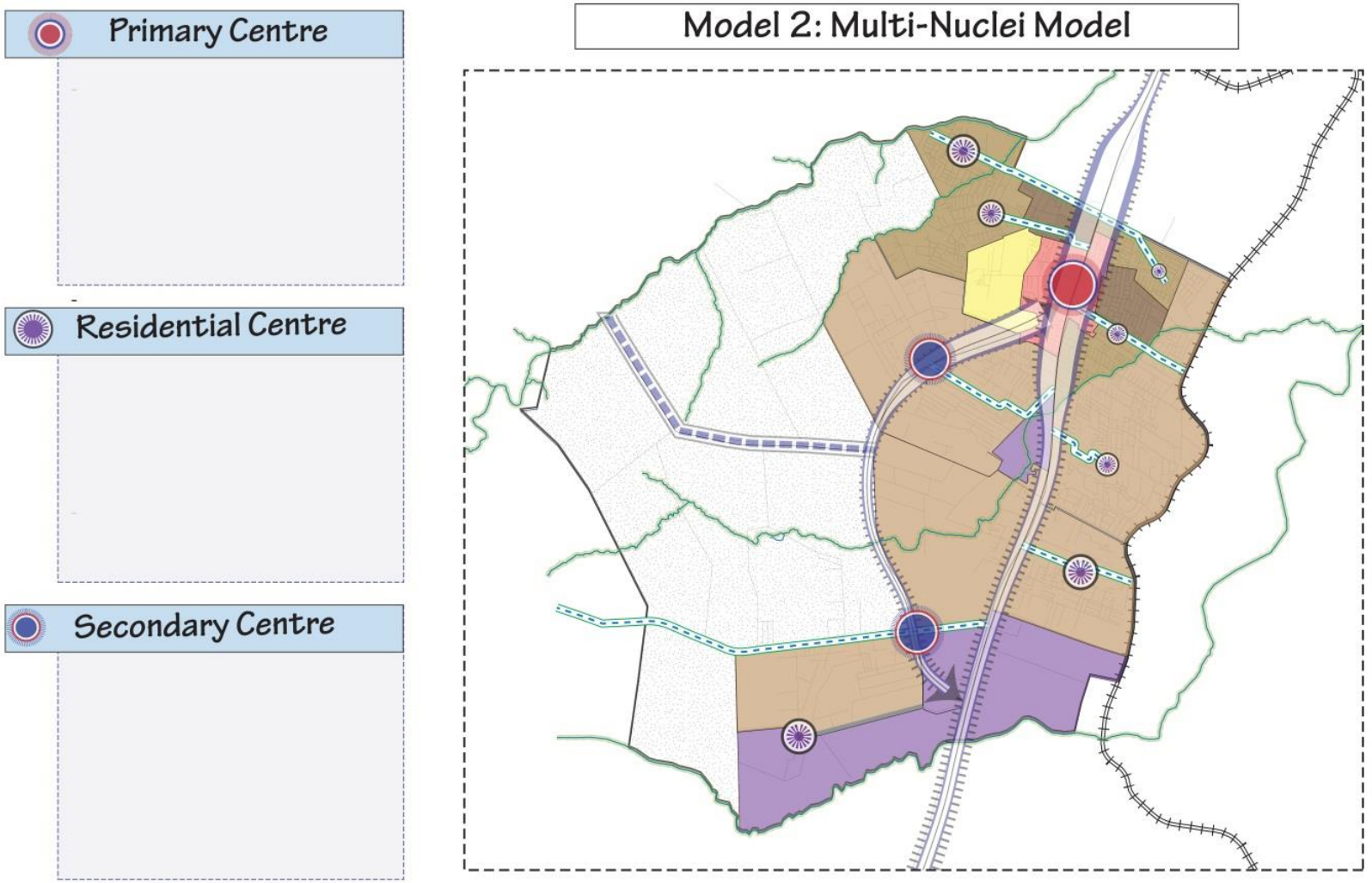


Figure 78: Model 2: Multi- Nuclei Model

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

Advantages;	Disadvantages
1. The lower class live close to the manufacturing area and CBD, making it easier to commute. The wealthier class live farther away. 2. The middle and high-income earners are close so they get the best jobs, shopping, and entertainment, which supports the economy. 3. The industrial area is on opposite side of where the high-income earners live so they do not have to deal with pollution, noise, and traffic. 4. Allows the suburbanization, transport development, outward growth of city. 5. Easily adapts to existing conditions.	1. The weaknesses of this model are that the abrupt division between zones is non-existent. There is no homogeneity between the different nuclei's. 2. The disadvantages 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

5.5.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:

Advantages;	Disadvantages
1. The lower class live close to the manufacturing area and CBD, making it easier to commute. The wealthier class live farther away. 2. The middle and high-income earners are close so they get the best jobs, shopping, and entertainment, which supports the economy. 3. The industrial area is on opposite side of where the high-income earners live so they do not have to deal with pollution, noise, and traffic. 4. Allows the suburbanization, transport development, outward growth of city. Easily adapts to existing conditions.	1. The weaknesses of this model are that the abrupt division between zones is non-existent. There is no homogeneity between the different nuclei's. 2. The disadvantages 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

CHAPTER 6: THE DEVELOPMENT PLAN

6.1. LAND USE PLAN

This chapter deals with existing and proposed land uses, 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 among others.

6.1.1. Land use proposals

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 management of space and therefore, land is an important element in planning. Kitengela is experiencing high growth to accommodate people, their activities and related infrastructure. This ISUDP 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 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 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 for future demand.

It has been considered most suitable to have a polycentric model with multiple activities within multiple nodes to minimize the number of trips and trip length brought about by a mono-centric model. The following section presents 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 34: Current and proposed land use area

Land Use	Current land Area (sq km)	Area (Ha)	Percentage (%)	Proposed land area (sq km)	Percentage (%)
Agricultural land	2.54	254.15	3.40%	4.45	5.95%
Commercial	0.67	67.24	0.90%	0.79	1.06%
Mixed Use (commercial/ Residential)	0	0	0.00%	1.62	2.17%
Conservation area	1.93	192.86	2.58%	1.22	1.63%
Educational	0.43	43.37	0.58%	0.81	1.08%
Industrial	0.23	22.53	0.31%	4.53	6.06%
Public purpose & Public Utility	1.26	126.54	1.69%	1.12	1.50%
Quarry	0.9	90.08	1.20%	0	0.00%
Residential- High density	2.2	220.19	2.94%	2.4	3.21%
Residential -low density	11.79	1,178.52	15.77%	15.9	21.27%
Residential –medium density	3.24	323.65	4.33%	3.1	4.15%
Transportation & Roads	4.91	491.96	6.57%	5.37	7.18%
Undeveloped land	44.63	4,463.28	59.69%	32.45	43.40%
Recreational	0.04	4.05	0.05%	1.01	1.35%

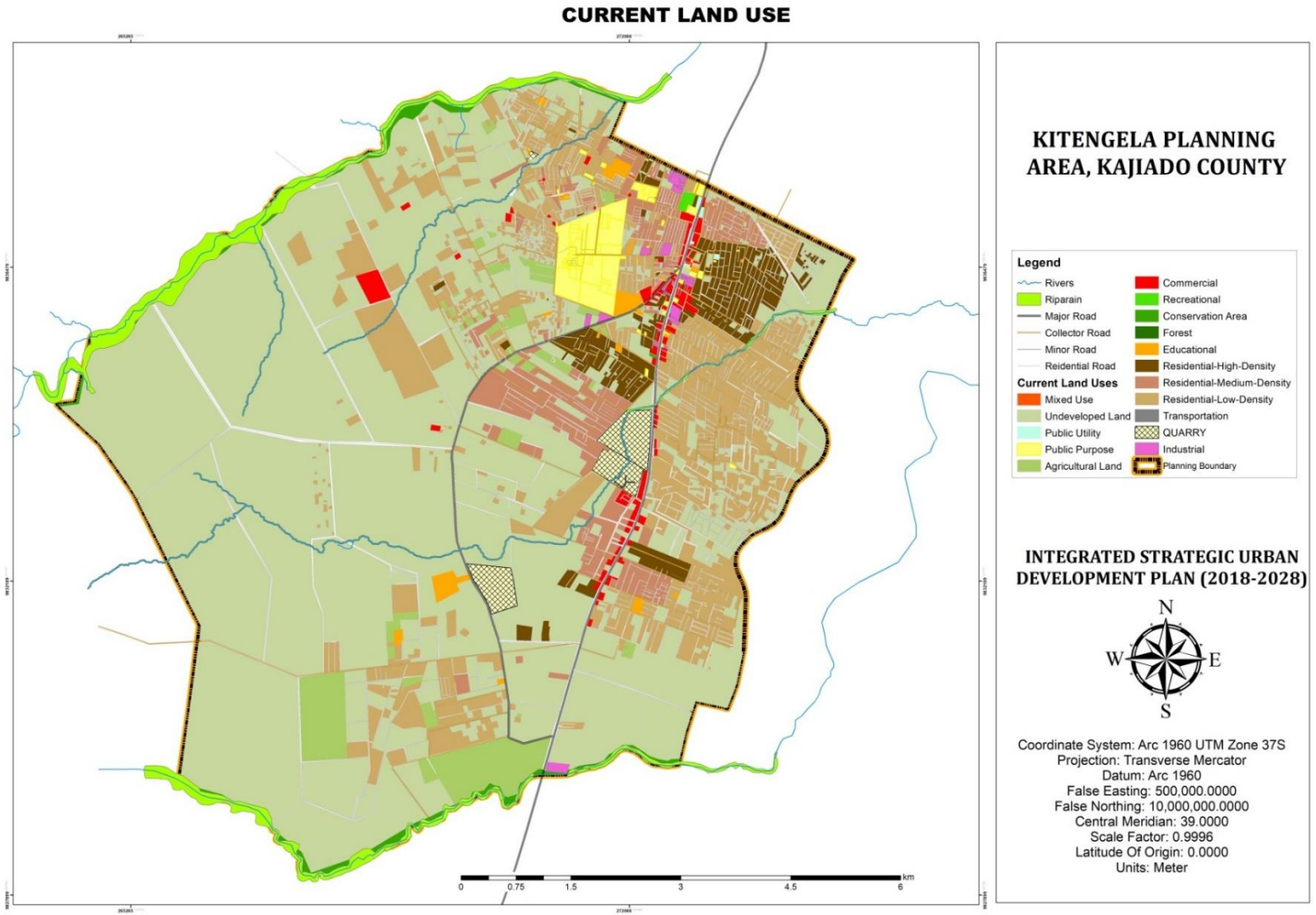


Figure 79Kitengela current land use

i). Residential land use

Residential land is the basic unit for projecting and budgeting for 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 compliments 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 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 High way.

High Density Residential

Existing high density residential areas include: Kiang'ombe B, Kiang'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, Kiang'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 upto 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 growth 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 quarter an acre with more emphasis being on half acre plots.

ii). Industrial land Use Plan

Current industrial area in Kitengela is 0.23% of total developed area. This plan proposes to increase the total percentage to 6.06%. The major industrial activity includes quarrying. Three types of industries namely light, medium and heavy 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 shoe making, consumer electronics, home appliances repairing, Jua kali and flour milling among 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 among others within residential areas. The minimum plot size proposed under light industries is 0.05ha.

iii). Commercial Land Use

High density and compact commercial areas are proposed at the CBD's and along the proposed TOD's at Namanga road. The existing commercial area is 0.9 % of the total developable areas within the planning area. This area is proposed to increase to about 1.06% 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 among others. The adjacent area to the commercial area will be developed as a high density mixed use development area taking up 2.17% of the total developable land.

iv). Education Use Plan

The total land occupied by educational facilities is 0.58% 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 1.08% of the total developable land.

v). Public and Utility Purpose

The current area under public purpose is 1.66% and that under public utility is 0.02% giving a total of 1.68%. The public purpose land use will be integrated with the residential and commercial developments. New proposed facilities such as sewer treatment plants, solid waste recycling centres among other will cause the land under public utilities and public use to increase.

vi). Transportation Use

The total area occupied by transportation will thus increase from the current 6.57% to 7.18% by year 2028 to cater for the rapid growth in road transport and expansion of existing Roads. The minimal increase in road areas is since 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.

vii). Recreational Land Use

Recreational facilities accounts for 0.05% of developable area. For sufficient provision of recreational facilities by year 2028, this plan has provided for and increase to 1.35% of developable land. This will be the exclusive recreational areas. Additional green spaces and recreational areas will be provided through residential court system, at walkways including street furniture for the same purpose.

viii).Agriculture Use Plan

This plan proposes agricultural land uses at the undeveloped areas. These is with an aim to minimise the trade imbalance brought about by overreliance on neighbouring areas for 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.

ix). Land for Future Development

This ISUDP 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.

x). Non-Developable Land

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.

P

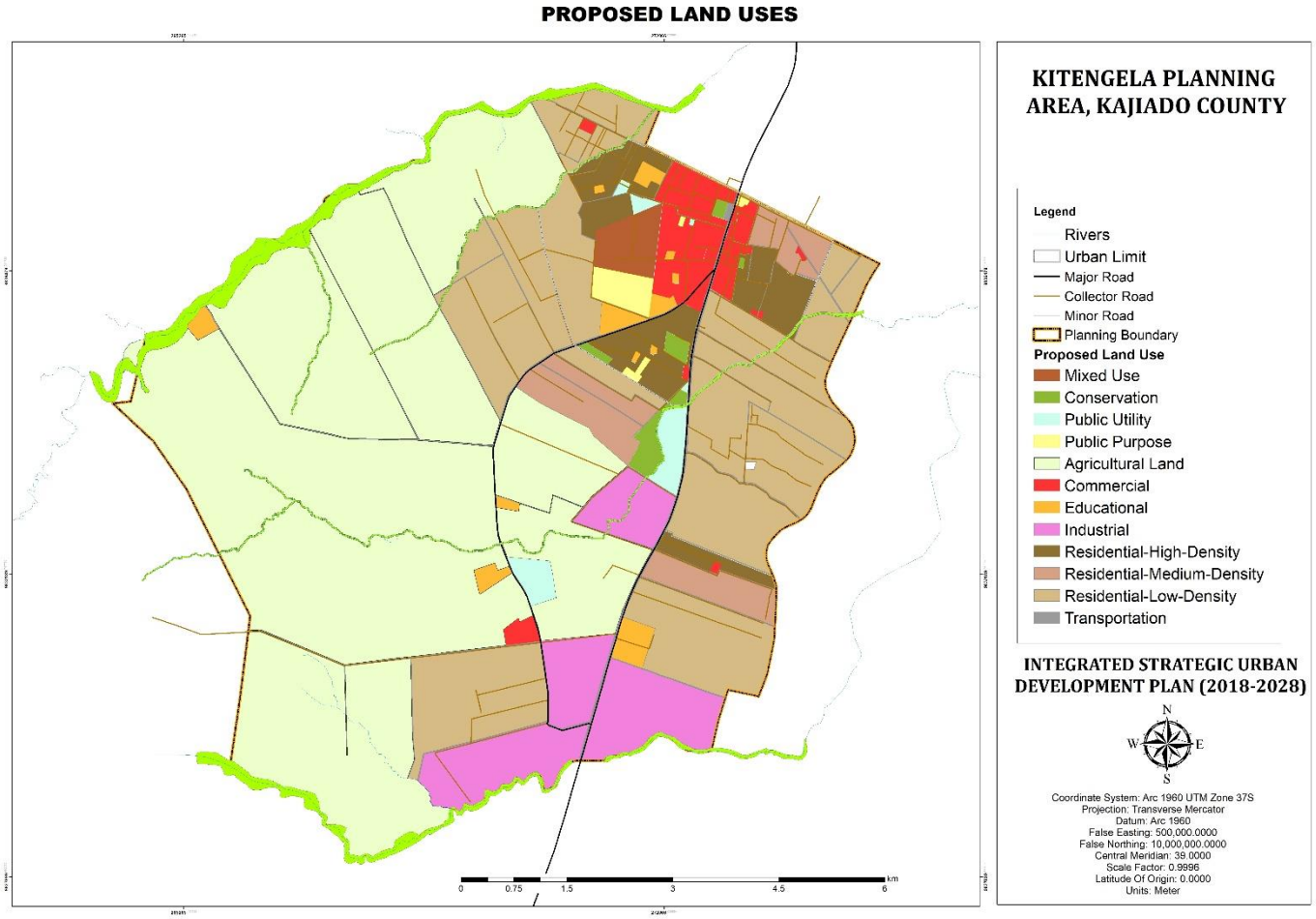


Figure 80: Proposed land use plan

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 Singe 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	Area near Quarry and bordered by class (A104) road 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 Area bordered by Mohammed estate, Milimani B and the proposed ring road joining old Namanga road Area bordered by Acacia road and Nairobi-Namanga road within Sifa farm C Area bordered by Nairobi-Namanga road, Selelo and kimmerland estates	Commercial blocks and mixed use developments	0.05	6	80
Public Utilities	G.K Prison Area Area bordered by R. Athi and Parkview estate	Sewer treatment works			

	Near the EPZ area On the I.S.K pillar near the commercial boundary within Sifa farm B.				
Agricultural	**Sifa farm C –** defined by Acacia road, Kisaju River, Namanga road and the commercial boundary	Agricultural farms	2		

6.1.2. Proposed land use zones and regulations

Land Use Zone	Permitted use	Prohibited land use	Conditional land use
Residential	Residential dwellings such as bungalows, maisonettes, multi-family dwellings (multi-storey flats/apartments), town houses (detached, semi-detached), residential-cum-commercial Day care centres and kindergartens Hostels, old age homes, community halls, police posts, guest houses (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 Exhibition and art galleries	Sewage treatment plant and water treatment plant Solid waste dumpsites Slaughterhouses Heavy, large and extensive industries i.e. noxious and hazardous industries Warehousing, storage go-downs of perishables, hazardous and inflammable goods. Workshops/garages for motor vehicles-matatu/boda-boda/buses. Hospitals treating contagious diseases (e.g. tuberculosis) Prisons and garrison barracks	Cemeteries Clubs, Hotels and Restaurants Petrol pumps Garages Bakeries, Storage of LPG gas cylinders, Informal and weekly markets(if not obstructing traffic circulation and open during non-working hours) Mobile towers Fire stations Printing presses and auditoriums, Public utility buildings like electrical distribution depot, water/sewerage pumping stations, water works

Commercial	Wholesale and retail shops and stores, markets, advertisements and merchandise, excluding not exceeding an area of 1000 sq.m. Assembly halls, colleges, reading rooms, higher educational technical 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 show rooms and workshops with permission of parking vehicles occupying a site area not exceeding 200 Sq.m 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.	All commercial business uses and manufacturing establishments obnoxious or hazardous nature by reason or odour, effluent, dust smoke, gas, vibration, noise etc. or otherwise likely to cause danger or nuisance to public health or amenity. Government offices, business offices and other financial institutions without limitations of floor area. Commercial and entertainment centres, sports stadium, recreation complexes, research experimental or testing laboratories not involving danger of fire explosive or health hazards. Organized parking, tot lots, multi-storey parking, bus terminal and depot, transport terminals, motor garage and workshops. Educational, technical and research institutions. Garment industries irrespective of the number of persons employed where authority is satisfied of its non-objectionable nature based on its performance characteristics.	Sale of explosive obnoxious products and other materials likely to cause health hazards Convention centres, trade centres, market centre, travel agencies, agro-tourist centres.

Industrial	Manufacturing and processing industries Slaughterhouses Storage warehouse and go-downs Sewerage treatment plants Industrial research centres Agro-based industry All uses permissible in the Commercial Use Zone with the special sanction of the Authority except residential uses. Residential buildings for security and other essential staff required to be maintained in the premises. All industries using electrical power utilizing machinery not exceeding 100 H.P.	Storage of petroleum, timber, explosive and inflammable and dangerous materials. All industries up to 200 H.P where sufficient precautions have been taken to the satisfaction of the Authority to eliminate noxious or dangerous effluents	All uses not specifically permitted in this zone shall be prohibited All industries of obnoxious and hazardous nature by reasons or odour, effluent, dust, smoke, gas, vibration etc. or otherwise likely to cause danger or nuisance to public health or amenity
Educational	Assembly halls, colleges, reading rooms, higher educational technical and research institutions		All uses not specifically permitted in this zone shall be prohibited
Recreational	Parks and open spaces and play grounds Zoological and botanical gardens, nurseries Water fronts development, museums and memorials. Open-air theatres, exhibition, circus, fairs and festival ground Gymnasium, water sports training centre and	Installation of Electric Motors not exceeding 5 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.	Buildings structure can be permitted not more than the 2 % of the total area.

	swimming pool.	All agricultural uses outside the municipal area. Cemeteries and crematorium. Police post	
Transportation	Roads, goods shed terminals, bus stops, bus depot, bus terminals and truck terminals. Airport, air strip, and helipad stations Cruise landing port, docks, shipping and ferry stations, Fishing port, Yards, railways and railway stations, warehouses, storage and container fright stations Petrol filling and service station.	Hotels, exhibition ground and convention centre All related to development of the roads and other transport modes including essential housing.	All uses not specifically permitted in this zone shall be prohibited
Agriculture	All agriculture uses such as Diary and cattle farms, fish farms, poultry farms, and stud farms. Forestry. Farm-house, buildings for agricultural activities Storing and drying of fertilizers	Residential buildings for growing rural populations or the urban population living below poverty lines Parks and play ground, camping sites and other recreational uses. Sewage farms and garbage dumps, Burial grounds. Temporary touring cinemas. Utility services may be permitted without	All uses not specifically permitted in this zone shall be prohibited

		spoiling the natural features.	

6.1.3. Land use regulations

a) Building Control Regulations/Standards

The Land Use Zone controls volume, 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 the suitable environment for the specific type of land use. Following section presents the building control standards:

RESIDENTIAL USE

Residential development shall be guided by the size of plot, number of dwelling units on each plot, setbacks, plot ratio and the number of storeys/ height of the building. The table below shows indicative dwelling unit sizes.

Table 35: Proposed dwelling units size (sqm)

Number of Rooms	Dwelling Units Size (sqm)
One Bed Room	40-50 (45)
Two Bed Room	60-70 (65)
Three Bed Room	80-120 (100)
Four Bed Room	130-180 (160)
Five Bed Room	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 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. 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 36: Proposed no 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
	High density	70	142.8
	Special Density (Rental Housing)	133	75

Building Lines (set back lines)

This is the minimum distance of a house from the plot boundary. The purpose of building lines is either to achieve a visual effect or reserve a certain access of area of ground.

Table 37: Proposed set backs

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 38: Minimum Street Width Per Given Number of Plots

Number Of Plots	Street Width
1 to 30	9m
31 to 60	12m
Or	
up to 500 m length	9m
501 to 750 m length	12m

751 to 1000 m length	18m
1001 m or more length	24/30m

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 table below.

Table 39: proposed plot sizes, plot coverage and plot coverages.

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:

1) The minimum plot size shall be 1500 square metres.
2) The road shall not be less than 12 meters abutting the plot and in case of existing plot in built up areas 9 meter road shall be the minimum requirement.
3) The minimum coverage of the plot shall not be more than 40 %.
4) The minimum space for recreational purpose shall not be less than 10 % of the plot area

INDUSTRIAL DEVELOPMENT

The following controls shall guide the development of industries:

1) The industrial area should have an access/approach from major roads.
2) The industrial estate shall have minimum 20-25 % of the area reserved for the following facilities:
    a) Sub Fire Station, Banks, Petrol Pump, Restaurants
    b) Police Station, Waste Disposal Dumping Yard, Truck Terminal, parking area, Taxi stand etc.
    c) Industrial Area Centre (Commercial Centre) to accommodate commercial and other facilities, show rooms etc.
    d) Electric Sub-station, Water Supply Tank, Common effluent Treatment Plant etc

e) Other facilities such as Recreational Club, Associations, Community Hall, Medical Centre, Administrative Block and other allied common facilities.

3) New Industrial Estate should be located on the main roads or secondary roads.
4) Heavy industries shall not be located within the residential areas
5) No road within the industrial estate shall be less than 9 to12 m wide
6) There should be minimum 10-15 % of the area for landscaping and developed as park and buffers (organized open space).
7) Minimum 10 m wide buffer should be provided all along the industrial area with tree plantation.
8) 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 40: 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
Slaughter-house	Existing slaughter -house 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 table below.

Table 41: 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 table below.

Table 42: Requirements of Plots under Health Services

Type of use proposed	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. of floors allowed
Sub-county Level -Referral Hospital	8	25	1 : 1	4
District level hospital	4	25	1: 0.75	3
Health Centre	2	30	1:0.9	3
Basic health sub-centre/nursing home	1	30	1:0.9	3
Communicable disease hospital	4	25	1:1	4
Dispensary	0.5	40	1:0.8	2
Veterinary hospital	5	30	1:0.6	2

PUBLIC PURPOSE

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

Table 43: Requirements for 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 44: 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)

6.2. SECTORAL PROGRAMMES & PROJECTS

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 collective efforts of various agencies. The key institutions includes Kajiado County government, various government ministries, departments and parastatal organizations, neighbourhood

associations, other local community groups, land owners 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

Short-term actions are those that are to be implemented zero to two years.

Medium Term

Medium term projects and programmes are intended to be achieved between three to five years. In this plan, medium term actions are set to have been achieved by the year 2023.

Long Term

Finally, long-term projects and programmes are those expected to be achieved between six years to ten years

6.2.1. 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.

i). Strategies

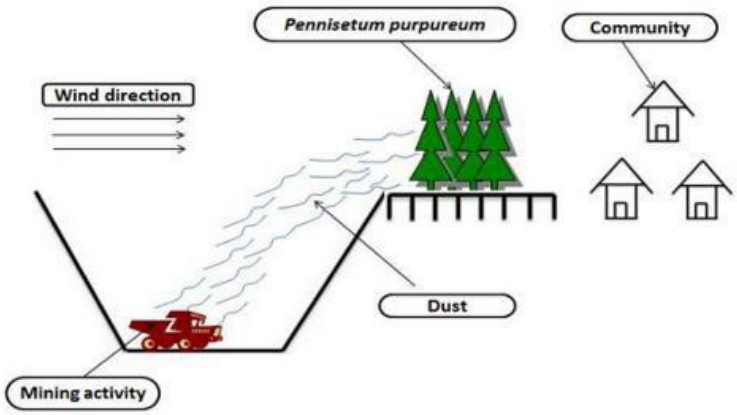
Protect riparian reserves

This is through creation of riparian zones of at least 30 meters. Incompatible land uses such as solid waste disposal sites should be discouraged. Trees and vegetation should be planted within the riparian reserves.

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.

Dust barrier model



Protect water resources

Zoning areas for water conservation and water shed 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.

Protect over extraction of resources.

The government should enforce strict control on quarrying activities including; need for formulation of quarrying by laws by Kajiado County to regulate and manage quarrying and require Environmental Impact Assessments for any new quarrying projects. Enforcement of quarrying standards has been lacking.

Afforestation

The planning area lacks forests and 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

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.

Community sensitization

Communities that live within the proximity of the river, and among 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).

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.

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 10^0 should be considered for development while areas with a slope of 10^0-15^0 should be considered with interventions while development with a slope of more than 15^0 should be considered not suitable for development

Enhance enforcement of environmental laws

Enforcement of Physical Planning Act and related regulations on observation of riparian reserves. This would ensure that riparian reserves are protected from encroachment. Enforcement orders should also be issued out to any new projects without NEMA license. This would discourage operationalization of environmentally negative projects.

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 occurrence of accidents. Annual environmental audits should also be conducted to ensure that the quarries comply to the environmental management plan

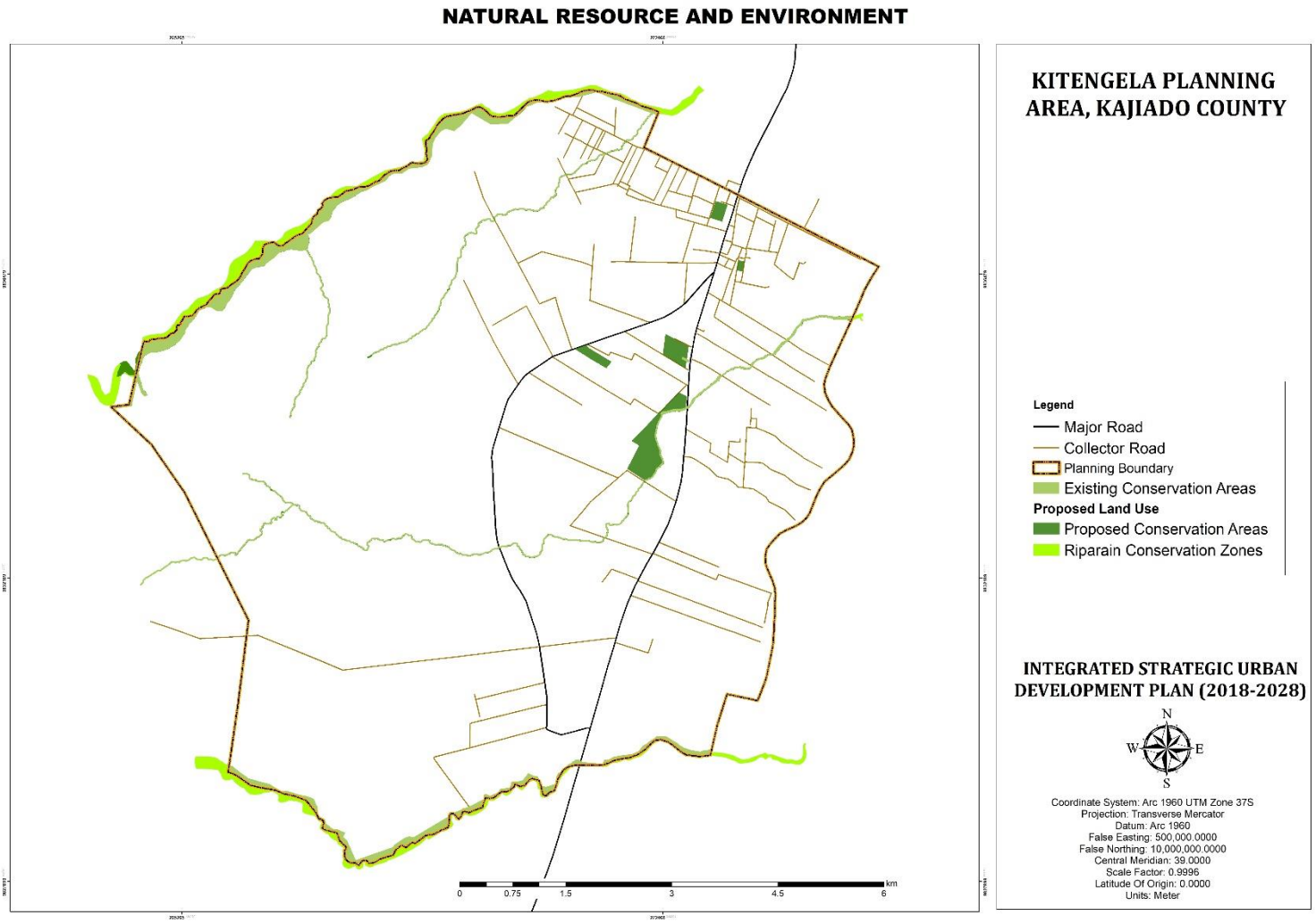


Figure 81: Proposed conservation areas

ii). Programmes & Projects

Goals	Objectives	Program	Projects	Time frame
	To have a proper waste management system; To have regulations on industrial air pollution; To have a physical and social environment which is fit for human beings; To have a friendly town which supports human life.	Solar energy utilization	Installation of solar farms	Short term (0-2)
		Curbing soil erosion	Construction of gabions Planting of *Pennisetum Purpureum plants*	Short term
		Afforestation	Planting of artificial forests at Noonkopir	Long term
		Protection of riparian reserves and rivers	Creating appropriate riparian zones of at least 30 metres.	Short term
			Planting of trees and vegetation along the river banks Creation of buffer zones Planting of gabions along the riverbanks to prevent soil erosion. Community programmes for sensitization on environmental conservation measures	Short term
		Construction of water reservoirs	Installing water harvesting tanks in residential buildings	Short term
			Construction of water pans	Medium term
			Construction of water dams	Long term
		Enforcement of laws	Issuance of enforcement letters(PPA 7) on developments along the riparian reserves Request environmental impact assessments for any new quarrying projects.	Continuous
		Rehabilitation of quarries	Formulation of quarrying by laws by Kajiado County Government to regulate and manage quarrying activities. Reclaim the abandoned quarries and use them for agricultural or sports activities	Short-term (0-2 years)

6.2.2. Physical Infrastructure

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

i). Strategies

Increase water supply

The major water reservoirs should be located at the highest elevation next to the survey pillar (elevation 1674m). Way leaves should be provided to enable gravitation flow to various locations. The plan proposes for increased funding to TANATHI water and sewerage company. Other strategies include; fully utilize permanent and seasonal rivers, assess ground water 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.

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 the ground slopes on either side of the Class A104 highway. An 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. Other proposals are creating composting sites for biodegradable waste at installation of bins along the roads and markets and at the CBD and waste collection facilities.

Construct new drains and missing links

New storm water drains should be developed for management of storm water drainage while the existing drains should be maintained

Storm water drainage

Establishment of surface drainage network

Construct drains along existing and proposed roads.

Construction of new drains and missing links

This will be through the following ways;

a. De-silting and Alignment;
b. Lining and covering of major storm water drains
c. Construction of primary and secondary drains
d. Improve/ repair existing primary and secondary drains
e. Plantations along natural drains

Energy

This ISUDP proposes for establishment of a solar energy and wind panels that will generate power to the residents inorder to solve the power outrages since they are reliable, efficient and economic. This will boost the economic growth within the region.

ii). Programmes & Projects

Goals	Objectives	Sector	Programme	Project	Time frame
	Provide efficient water and sanitation facilities Supply of affordable and sustainable energy To have a proper waste management system;	Water	Water supply	Construction of more water distribution pipes	Short term
			Protection of riparian reserves	Creating appropriate riparian zones of at least 30 metres. Planting of trees and vegetation	
			Construction of water reservoirs	Installing water harvesting tanks in residential buildings	Short term
				Construction of water dams	Long term
				Construction of water pan	Medium term
		Liquid waste	Construction of sewer line and sewer treatment plants	Construction of sewer line near stony Athi Establishment of waste water treatment plant	Medium to long term
		Solid waste	Solid waste management	Installation of bins in the CBD, markets	Short term
				Increase solid waste collection facilities	Short term
				Develop composting sites for biodegradable waste at subsector level	Short term
				Develop incineration facilities in hospitals	
		Storm water management	Improve storm water drainage	De-silting	
				Lining and covering of Namanga, Old Namanga road and all access roads with storm water drains	Medium term
				Construction of primary and secondary drains	Medium term
				Improve/ repair existing primary and secondary drains	Short term
		Energy	Increasing power supply	Installation of wind and solar panels	Medium- long term

6.2.3. 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). Strategies

Education

Creation of more schools

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 45: Projected number of secondary schools

YEAR	POPULATION PROJECTION	NO.OF PRIMARY SCHOOLS PRESENT	ADDITIONAL NO. OF PRIMARY SCHOOLS NEEDED	ACREAGE REQUIREMENT
2018	108,039	5	17	66.3Ha
2020	122,828		25	98 Ha
2022	139,642		29	113.1 Ha
2024	158,758		34	132.6 Ha
2026	180,490		45	175.5 Ha
2028	205,198		51	198.9 Ha

By the end of the planning period, there should be 51 schools. The land requirement for a primary school is 3.9 ha for a catchment population of 4,000 people.

ii. Secondary schools

In 2009, the town required 7 secondary schools (1:8000 people) compared to the existing one school showing a deficit of 6 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 people. Therefore at the end of the planning area, there should be 25 secondary schools and 112.5 ha of land is required for the development of schools

Table 46: Projected number of secondary schools

YEAR	POPULATION PROJECTION	NO.OF SECONDARY SCHOOLS PRESENT	NO. OF SECONADRY SCHOOLS NEEDED	ACREAGE REQUIREMENT
2015	89,125	1	10	45 Ha
2018	108,039	1	13	58.5 Ha
2020	122,828		14	63 Ha
2022	139,642		16	72 Ha
2024	158,758		19	85.5 Ha
2026	180,490		22	99 Ha
2028	205,198		25	112.5 Ha

The schools should be at a walking distance of 500-600 meters. 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 overcrowding problem could easily be addressed through the provision of more public schools. As such, 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

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 10 health centres and a land requirement of 30 ha.

Table 47: Projected Total Number of Health Centre

YEAR	POPULATION PROJECTION	NO.OF HEALTH CENTRES PRESENT	NO. OF HEALTH CENTRES NEEDED	ACREAGE REQUIREMENT
2018	108,039	0	5	15 Ha
2020	122,828		6	18 Ha
2022	139,642		7	21 Ha
2024	158,758		8	24 Ha
2026	180,490		9	27 Ha
2028	205,198		10	30 Ha

Table 48: Projected Total Number of Hospitals

YEAR	POPULATION PROJECTION	NO.OF HOSPITALS PRESENT	NO. OF HEALTH CENTRES NEEDED	ACREAGE REQUIREMENT
2018	108,039	0	2	16Ha
2023	122,828		3	24 Ha
2028	139,642		4	32 Ha

Establish emergency medical services

Procure ambulances for the hospitals.

Ensure sufficient provisions for target group oriented specialized facilities

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

Security Facilities

The town has a police station and three police posts. An additional police post is proposed at Noonkopir area due to 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 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 creation of social halls.

ii). On-Going and Planned Projects

The government rolled out the digital literacy programme to incorporate 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 4.8 M and Kitengela town budgeted for 57.6 M are the planned projects by the government.

iii). Programmes & projects

Goals	Objectives	Sector	Programme	Project	Time frame
	To provide adequate social facilities	Education	Public primary schools	Construction of 51primary schools Set aside 198ha of land for construction of primary schools	Continuous
			Public secondary schools	Construction of 25 secondary schools Set aside 112.5 ha of land for construction of secondary schools	Continuous
			Special needs schools	Construction of two special needs school	Long term
		Community facilities	Construction of public hospitals	Construction of 2 health centres Set aside 6 acres for construction	Short term
				Construction of 3 health centres Set aside 9 acres of land.	Medium term
				Construction of 5 health centres Set aside 15 acres of land.	Long term
			Development of markets	Expansion of the existing market	Short term
				Identification including repossession of grabbed utility plots within	

				Kitengela to build a sizeable market	
			Development of social halls	Construction of 2 halls	Medium term
			Security	Construction of police post at Noonkopir	Long term
			Construction of cemeteries	Construction of two cemeteries	

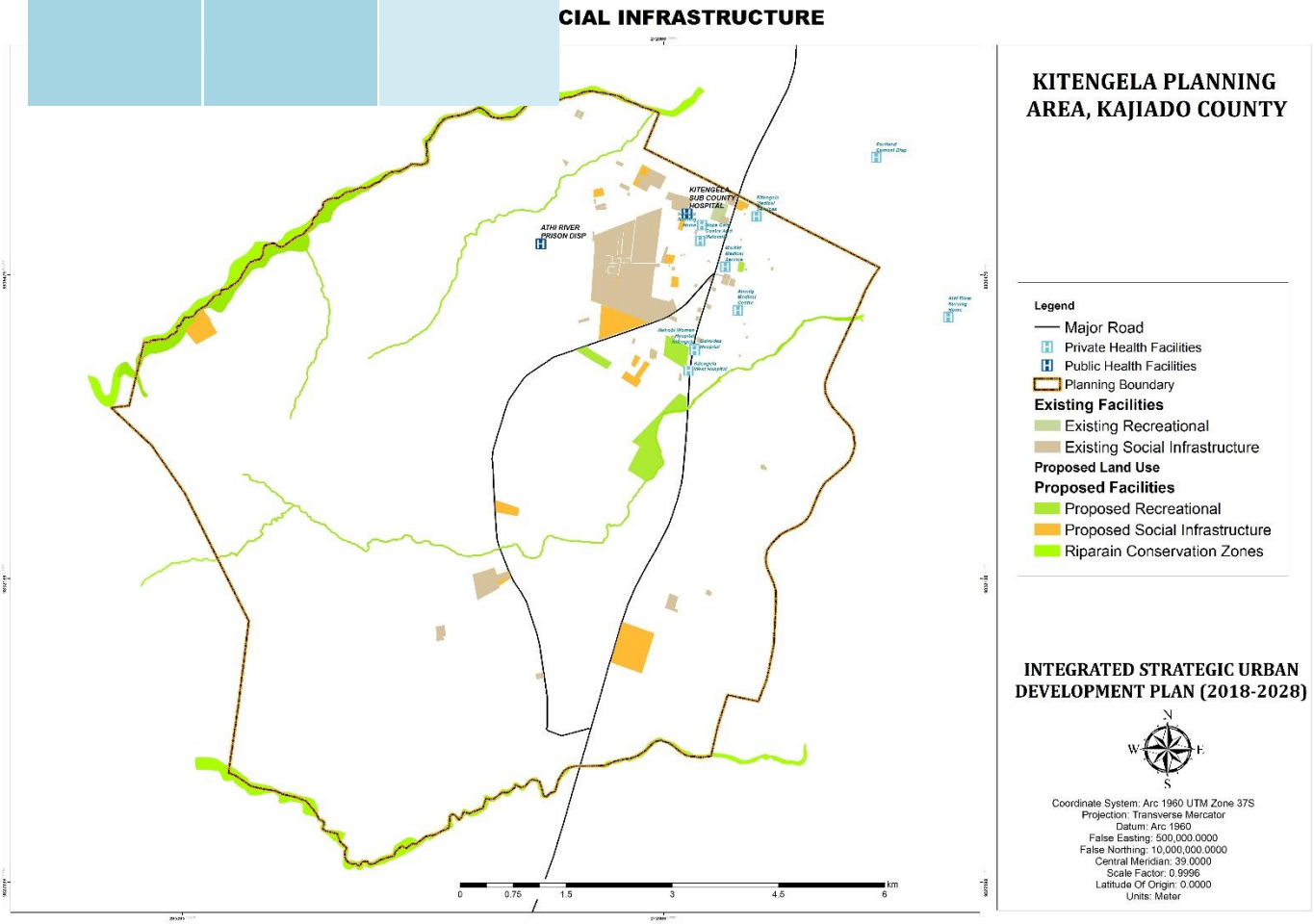


Figure 82: Proposed social infrastructure

6.2.4. Local Economy

i). Strategies

Creation of proper external links to Kitengela town to facilitate 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 organized 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 growth of SMEs sector and promote hi-tech and low volume-high value added industries, which are not labour intensive.

Encourage modernization and technological up-gradation of existing industries required for day-to-day needs of the people of Kitengela and develop Special Economic Zone. 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. On-going and Planned Project

ii). Programmes & Projects

Goals	Objectives	Program	Project	Time frame
	To actualise a 24-hr economy in Kitengela To provide incentives to upcoming investors To improve the road network and accompanying infrastructure.	Establishment of industries	Value addition industries close to the slaughter house	Medium term
			Establishment of a meat processing industry	Long term
		Promote the SME sector	Establish SMEs oriented financial institutions	Medium term
			Establish a service area and an enterprise park	Long term
		Create a Geographical Information System (GIS	Up-date registers of land parcels businesses operating in Kitengela	Medium
		Creating external links to Kitengela	Link Kitengela with its environs i.e. Machakos and Nairobi throught the railway system	Medium

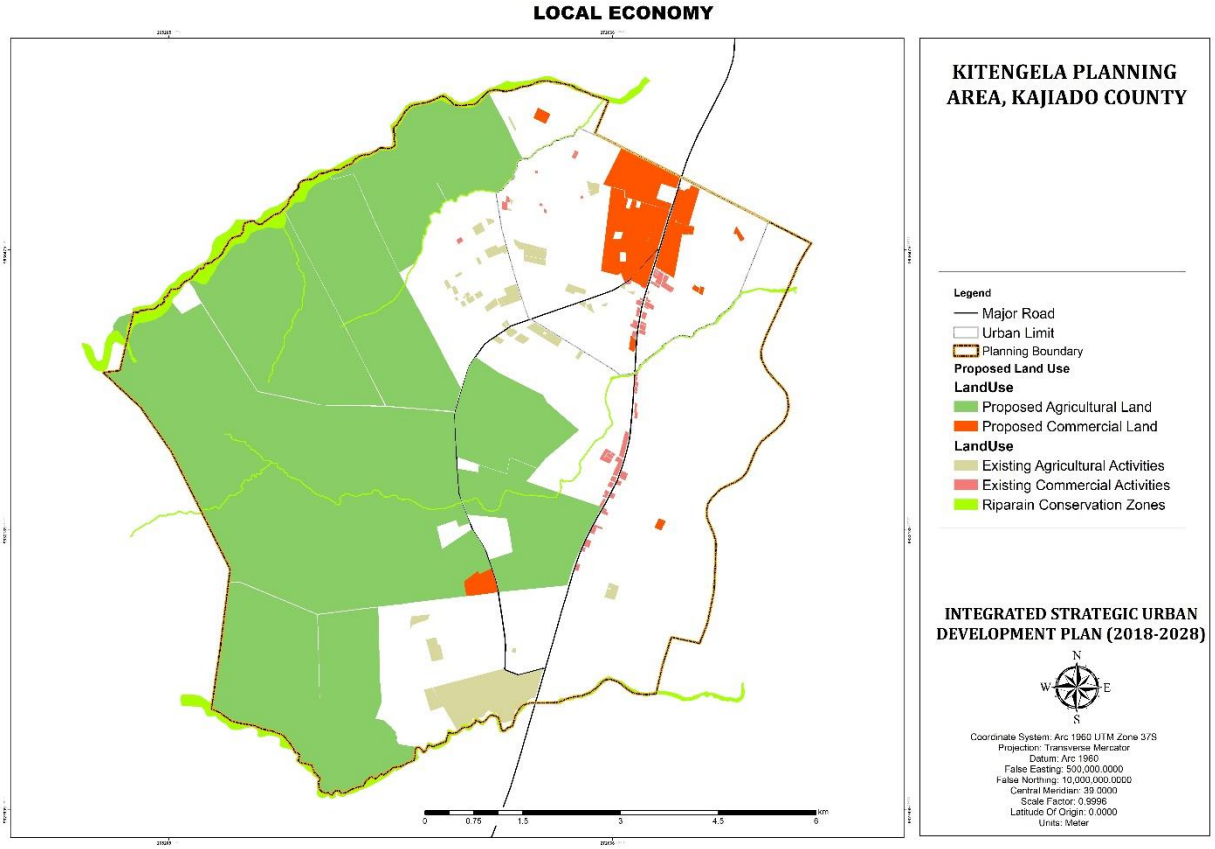


Figure 83: Proposed agricultural and commercial areas

6.2.5. 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.

i). On-going and planned projects

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

ii). 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's 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 provision of adequate housing by the municipality.

High Rise Housing

Where possible, high rise and other forms of high density housing should be 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 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 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

Housing projections

Income level	Housing projections						
	2009	2018	2020	2022	2024	2026	2028
Low	8,491	14,505	16,491	18,748	21,315	24,233	27,550
Middle	3032	5,180	5,889	6,696	7612	8,654	9,839
High	606	1036	1,177	1339	1522	1730	1,967
Totals	**12129**	**20,721**	**23,557**	**26,783**	**30,449**	**34,617**	**39,356**

Land area projections

Income level	Projected Area Cover (Ha.)					
	2018	2020	2022	2024	2026	2028
Low	435	495	562	639	726	826
Middle	233	265	301	342	389	442
High	207	235	267	304	346	393
Totals		**990**	**1130**	**1285**	**1461**	**1661**

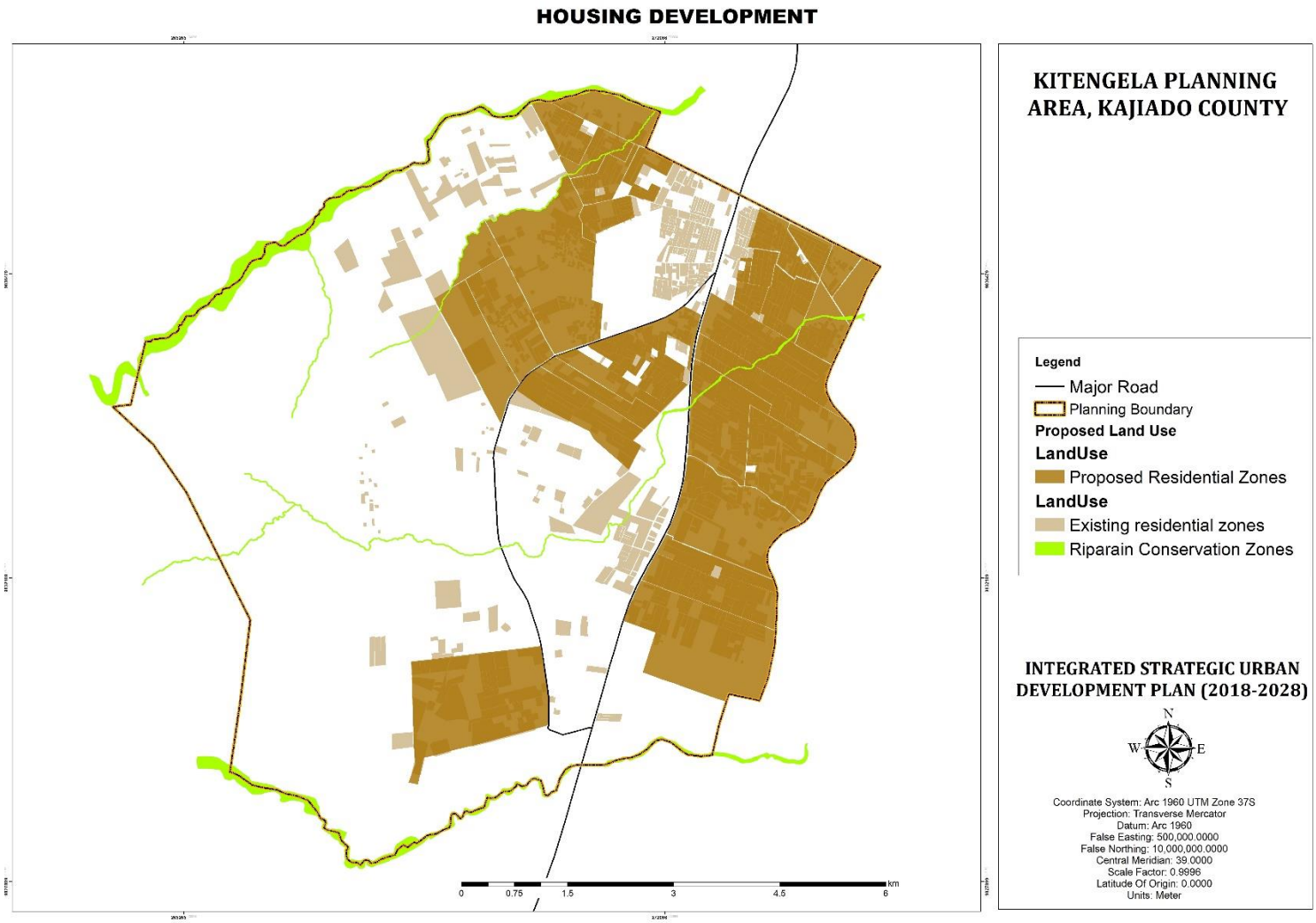


Figure 84: Proposed residential areas

i). Programmes & projects

Goals	Objectives	Program	Project	Time frame
	To enforce residential planning standards	Densification of buildings	Increase plot ratios Construction of high rise buildings at the CBD	Short term
			Set housing by-laws	Short term
		Provision of utilities and amenities	Deferred land should be serviced with adequate housing infrastructure to cater for future development	Medium term

		Use of information technology system	Enroll a digital approval system for land and housing approvals to get rid of the cumbersome and slow processes	Medium term
		Housing development	Development of county houses at Kitengela for future housing demand	Long term

T facilities, poor road conditions, narrow roads, use of Namanga road as the reet furniture and traffic lights. The following strategies shall solve these

oved to enhance intra-connectivity of the area. The county government should acquire funds/land for 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, 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. 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.

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;

1. Old Namanaga road
2. Kwa chief-market road
3. Nyika road
4. Kitengela- Ongata Rongai road
5. Saitoti road
6. Discovery road
7. Balozi road
8. Imani avenue

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

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

Introduction of a commuter rail/BRT network

Buses ply through dedicated BRT lanes and passengers access the buses at the BRT bus stops. The BRT operations 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.

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 a high quality, reliable, comfortable, accessible and affordable public transport system. The city bus service can ply at Old Namanga road

Light rail system

Several cities of Africa including Addis Ababa and Lagos have successfully introduced LRT system. Operating speeds and frequency of a LRT system is higher than other road based transit system. 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.

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 nucleus of center 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 is also proposed both sides of the corridor with a proposed density of 400 persons per hectare. A TOD could be developed based on bus based or rail based transit system . A minimum 60 metre Right of Way (ROW) is proposed for the TOD corridor.

Increase parking facilities

To increase the parking facilities, a multi-storey car parking is proposed to be developed at the Kitengela bus park and at commercial developments. Tuktuk'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 actualized through private and public partnerships. New developments at the CBD should be encouraged to incorporate the multi-storey parking designs.

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 2m 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.

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 bays in the planning area as well as provisions for NMT users will be constructed, especially on the bitumen and gravel roads

Put up road signage road safety measures and a street addressing system

Road signage and safety measures play a critical part in preventing road carnage through guiding road users. The street addressing system gives directions of a particular place which helps pedestrians reach the desired location without any help of enquiry from the people. Proposals are made for monitoring of road safety
features in road design as per road safety audit during or post construction period.

i). 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

Goals	Objectives	Programme	Project	Time frame
	Make roads safer through signage and other platforms Incorporate both motorised and non-motorised transport Enhance transport supply and demand management.	Tarmacking of roads in poor condition	Tarmacking of Old Namanga road, Kwa Chief-Market Road, Discovery Road and Balozi Road.	Short term
		Enhance parking system	Set aside land for parking bays Construction of boda boda and tuktuk parking bays.	Short term
			Construction of multi-storey parking facilities at the bus park and in commercial buildings at the CBD's	Medium term
		Construction of NMT facilities	NMT facilities at all roads access roads	Medium term
		Construction of service lanes	Construction of service lanes at Namanga road and the old Namanga road for bodaboda and tuktuk	
		Reduce traffic congestion	Direct local traffic to use old Namanga road to disperse traffic	Long term
		Open up the access roads	Phasing out 6m access road to 9m	Medium
		Promote high capacity public transport system	Develop a LRT system	Long term
			Establish a TOD for the main road trunks	
			Establish a city bus system	
		Encourage pedestrialization	Create pedestrian pathways of minimum 2m wide. Landscaping and planting of trees at the pedestrian pathways.	Short term

		Enhance road safety	Put road signage and traffic lights and establish a street addressing system	Short term

6.2.7. Informal Settlements Upgrading

i). Strategies

Encouraging integrated and participatory approaches to slum upgrading, including income-generating activities that effectively combat poverty.

ii). Programmes & Projects

Programme	Project	Time frame
Land tenure	Regularization of land tenure	Long term
Improve environmental conditions	Provision of utilities and amenities	Medium term

6.2.8. Tourism and Heritage

Kitengela has inadequate tourism and heritage sites, poor road connectivity and inadequate 5 star hotels.

i). 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 establishment of a maasai cultural centre that will display the maasai artifacts and cultural heritage. In addition, the maasai market at Naivas mall can be boosted through 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 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

ii). Programmes & Projects

Programme	Project	Time frame
Create a **handicraft market**	Creation of maasai market centre. Creation of a maasai cultural centre	Medium term Long term

Develop tourist infrastructure	Creation of 5 star hotels and guest rooms for tourists.	Medium term
	Upgrade and tarmack roads leading to the tourist various destinations	Short term

6.2.9. Disaster Risk Management

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

i). Strategies

To reduce disasters it is proposed to develop better coordination among institutions responding to disaster incidences, integrate disaster risk reduction in building approvals and establish fully equipped disaster management cum rescue centres., acquire fire fighting 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 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.

Implementation of occupation health procedures should be enforced during occupation of a building to access whether it is in a good habitable condition

ii). Programmes and Projects

Programme	Project	Time frame
Develop a disaster management committee.	Prepare Disaster Management plan Develop disaster management policy Identify indicators of disaster risks and disaster prone areas in Kitengela	Short
Fodder production	Establishing fodder crop plantations and storage mechanisms for livestock	Short term
Firestation	Creation of a firestation	Medium term

CHAPTER 7: 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.

Purpose of the 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

Objectives of Urban design

The specific objectives of urban design in Kitengela are;

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

7.1. Action area 1: Kitengela bus park and market area

7.1.1. Issues /challenges

The existing bus park is inadequate to accommodate all the matatus, bodabodas and tuktuk. Therefore the bodabodas and tuktuk's park along the Namanga road. One of the challenges to the growth of businesses and 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.

7.1.2. 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;

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 a critical-mass of people and activities to support walking.

Environmental Conservation/Sustainability

The environment is a key driver to 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.

Conviviality

Urban environments should be social and lively with spaces for personal solace, companionship, family and community.

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.

Compact development/ Densification

It is necessary to use the internal urban potential through the effective use of the limited territorial urban resources. This can be achieved through urban densification/infill densification/urban compaction.

7.1.3. 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.

7.1.4. Kitengela bus park and market area

i). *Site 1 Analysis*

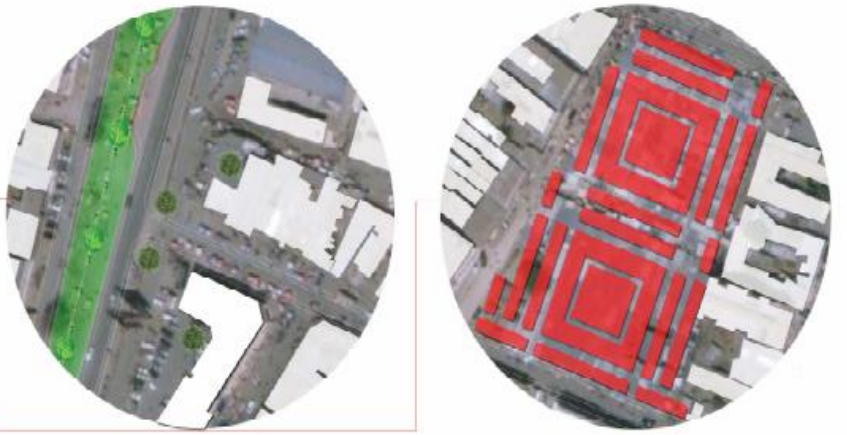
The streetscape in the Kitengela CBD is generally disorganised due to the inadequacy of pedestrian sidewalks, street furniture (such as barriers) and parking areas which results to a lack of definition of spaces for pedestrians and vehicles. Bad road conditions at the interior of the CBD further contributes to the disorganisation of the streetscape. Buildings in the CBD are built in a compact manner in a mixture of 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, tuktuk 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.

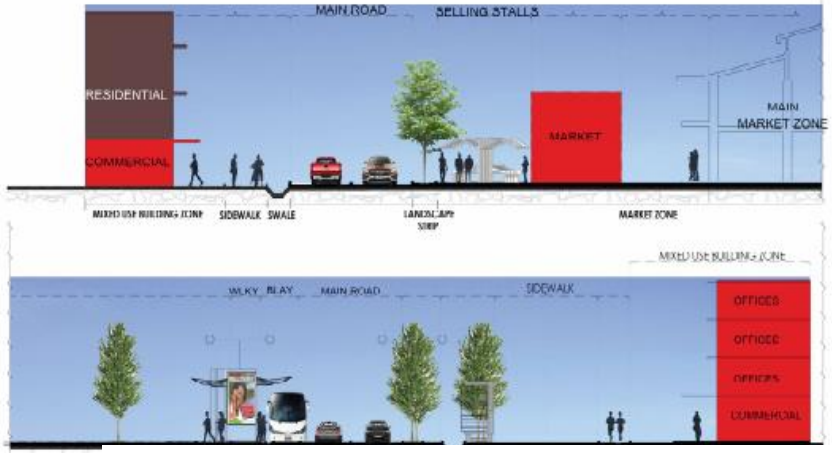
Kitengela market can be accessed through the Kwa Chief-Market Road that links A104-Kitengela open air Market. The 7m wide gravel type road is in poor condition with no drainage and no nmt facilities. The users include the pedestrians, private cars, boda-bodas, human &animal-drawn carts and Freight vehicles 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 make 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



Layouts

Proposal



Road Cross Sections

Figure 85: Kitengela bus park and market area Urban Design Proposal

7.2. Action area 2: Kitengela quarry

7.2.1. 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 Ketengela ISUDP. Quarrying activities have the potential to lead to landslide disasters. In addition to this, the borrow-pits and open quarry sites also affect the scenic beauty negatively. Quarrying sites are a source of noise and air pollution in Kitengela. Inspite of 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

7.2.2. 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.

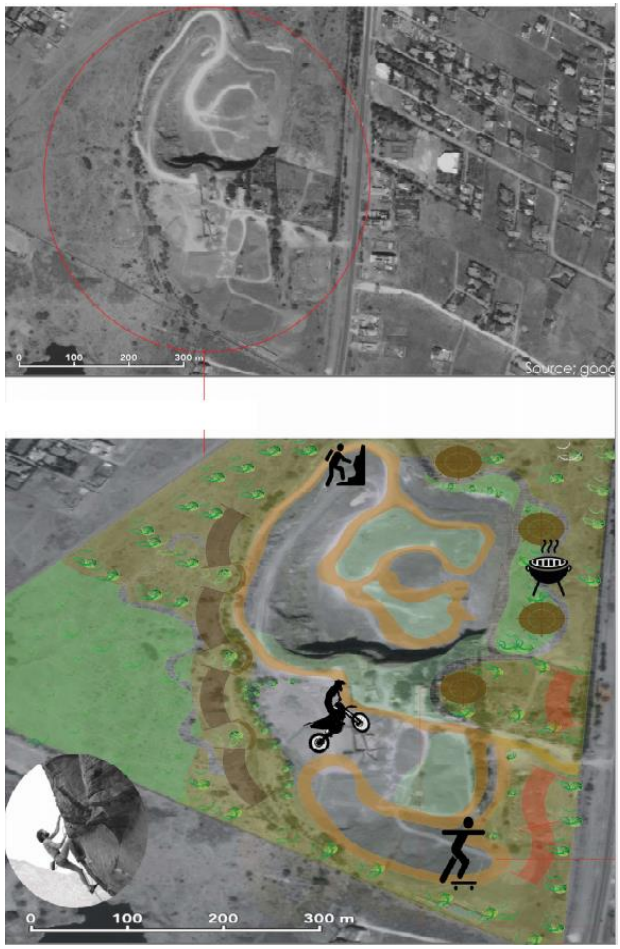
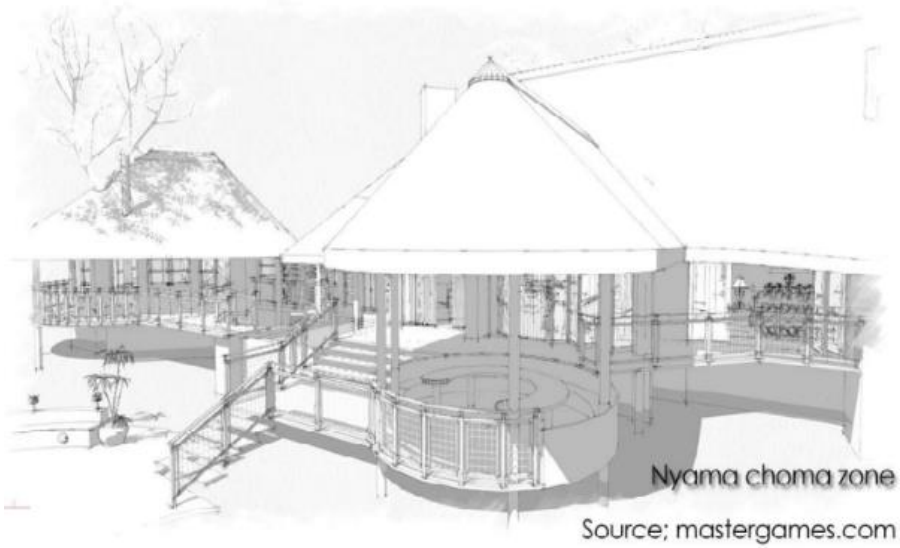


Figure 86: Kitengela quarry urban design proposal 1

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 motorcross zone and the Nyama choma zone, and a roller-skating rink.

These will act as valuable recreation spaces for the residents, areas of companionship and community.

Figure 87: Kitengela quarry urban design proposal 2

7.2.3. 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 has resulted to downstream issues such as difficulty in mobility, hygiene, pollution and a general lowering of the quality of the urban environment.
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 for the tremendous rate of increase in Kitengela's population

Environmental conservation 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.
The proposal will provide services necessary for an urbanizing population such parks and playgrounds.

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.

CHAPTER 8: IMPLEMENTATION PLAN

The Implementation Plan for this ISUDP defines how the plan will be implemented over the 10 year planning period. 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 term, medium term and long terms along with list of government department responsible for implementation.

The sector-wise implementation schedule along with listing of institutions responsibility is shown below.

Natural resources and the environment

Projects	Time Frame			Institution responsible
	Short term	Medium term	Long term	
	2018-2020	2021-2023	2024-2028	
Installation of solar farms				Department of energy Kajiado county
Construction of gabions				Department of environment and water, Kajiado county
Planting of artificial forests at Noonkopir				Department of physical planning, environment, wildlife, NEMA and KWS Kajiado county
Creating appropriate riparian zones of at least 30 metres.				Department of environment and physical planning Kajiado county
Planting of trees and vegetation				Department of environment Kajiado county
Installing water harvesting tanks in residential buildings				Department of physical planning and water, Kajiado county
Construction of water pans				Department of physical planning and water Kajiado county
Construction of water dams				NEMA, Department of physical planning water and public works Kajiado county
Planting of *Pennisetum Purpureum plants*				Department of environment

Physical infrastructure

Sector	Projects	Time Frame			Institution responsible
		Short Term	Medium Term	Long term	
		2018-2020	2021-2023	2024-2028	
Liquid waste	Establishment of sewer systems				
	Establishment of waste water treatment plant				

Water supply	Establishment of water and sewerage company				Department of water and public works
	Creating appropriate riparian zones of at least 30 metres				Establishment of water and sewerage
	Installing water harvesting tanks				Department of water
	Construction of water dams				National government, NEMA, WARMA, Department of water
	Construction of water pans				Department of water, NEMA, WARMA
Storm water management	Lining and covering of major roads with storm water drains				
					Department of public works
	Construction of primary and secondary drains				Department of public works
	Improve/ repair existing primary and secondary drains				Department of public works
	Plantations along natural drains				Department of environment
Energy	Compulsory installation of solar panels for every new building				Department of physical planning and energy
Solid waste management	Installation of bins in the CBD, markets and along the street				Department of environment and physical planning
	Increase solid waste collection facilities				Department of human resource
	Develop composting sites for biodegradable waste at subsector level				Department of environment and NEMA
	Develop incineration facilities in hospitals				County government in Partnership with NGO's and KENGEN

Local economy

Projects	**Time Frame**			**Institution responsible**
	Short term 2018-2020	Medium term 2021-2023	Long term 2024-2028	
Value addition industries close to the slaughter house				Department of trade, economic planning and finance
Establishment of a meat processing industry				Department of trade, economic planning and finance
Establish SMEs oriented financial institutions				Department of economic planning and finance
Establish a service area and an enterprise park				Department of trade and physical planning

Up-date registers of land parcels businesses operating in Kitengela				Department of ICT
Link Kitengela with its environs i.e. Machakos and Nairobi through the railway system				Kenya Railways corporation,

Social infrastructure

Sector	Project	Time frame			Institution responsible
		Short term	Medium term	Long term	
		2018-2020	2021-2023	2024-2028	
Education	Construction of 51 primary schools				Department of education and public works
	Construction of 25 secondary schools				Department of education and public works
	Construction of two special needs school				Department of education and public works
Community facilities	Construction of 2 health centres				Department of health and public works
	Construction of 3 health centres				Department of health and public works
	Construction of 5 health centres				Department of health and public works
	Expansion of the existing market				Department of physical planning and public works
	Construction of 2 social halls				Department of physical planning and public works
	Construction of police post at Noonkopir				Department of internal security
	Construction of two cemeteries				Department of physical planning and public works

Housing

Programmes & Projects	Time Frame			Institution responsible
	Short term	Medium term	Long term	
	2018-2020	2021-2023	2024-2028	
Implementing and enforcement of zoning policies				Department of physical planning enforcement & development control

Increase plot ratios to 4 and the number of floors at the CBD				Department of physical planning and development control
Formulate housing by-laws for Kitengela.				Department of physical planning and housing and development control
Service deferred land with adequate housing infrastructure to cater for future development				Department of housing and public works
Enroll a digital approval system for land and housing approvals to get rid of the cumbersome and slow processes				Department of lands , ICT and housing
Development of county houses at Kitengela for future housing demand				Department of lands, housing

Transportation

Projects	**Time Frame**			**Institution responsible**
	Short term	Medium term	Long term	
	2018-2020	2021-2023	2024-2028	
Upgrading of the gravel roads				Department of roads, transport, survey, public works and KURA
Develop a LRT system				Department of roads, transport, public works, physical planning, GIS, urban development, National government, Kenya Railways Corporations
Establish a TOD for the main road trunks				Department of roads, transport, public works, physical planning, GIS, National government, KENHA, KURA
Establish a city bus system				Department of transport
Construction of multi-storey parking facilities at the bus park and in commercial building at the CBD's				Department of trade, public works and physical planning
Construction of motorcycle taxis waiting bays				Department of transport
Create pedestrian pathways of minimum 2m wide.				Department of planning, roads and transport

Landscaping and planting of trees at the pedestrian pathways.				Department of roads and environment
Construction of a storm water drainage system				Department of public works, water and sanitation
Put road signage and traffic lights				Department of transport, NTSA
Establish a street addressing system				Department of physical planning
Construction of a ring road (Rimpa road) to relieve congestion on Magadi				Department of roads, transport, public works, physical planning, survey, GIS, National government, KURA
Road construction of service roads along Namanga road				Department of roads, transport, public works, physical planning, survey, GIS, National government, KURA

Tourism

Projects	Time Frame			Institutions responsible
	Short term	Medium term	Long term	
	2018-2020	2021-2023	2024-2028	
Creation of maasai market				Department of culture and heritage
Creation of 5 star hotels and guest rooms for tourists.				Department of tourism
Upgrade and tarmack roads leading to the tourist various destinations				Department of tourism and public works and roads
Creation of maasai cultural centre				Department of culture and heritage
Develop a tourist circuit map showing the routes links the tourist sites.				Department of tourism

Disaster Management

Projects	Time Frame			Institution responsible
	Short term	Medium term	Long term	
	2018-2020	2021-2023	2024-2028	

Mapping disaster prone areas				
Formulate disaster management authority				
Training of quarry workers on accident prevention				
Formulate safe quarrying procedures				
Establish a disaster warning information system				
Construction of storm water drains				

8.1.CAPITAL INVESTMENT PROGRAMME

Capital Investment Plans are used identify projects and their budgetary implications. This is a project implementation tool which guides investment into capital assets, in which the government must invest through public funds. The Capital Investment Programme will include estimated costs and responsibilities for implementation of agreed investments, as well as a financing plan.

During the stakeholders' forum, locally prioritized capital projects that are financially realistic and feasible will be identified by the stakeholders for investment by the municipal government.

The capital investment plan is shown below.

8.2.FINANCING/ REVENUE ENHANCEMENT STRATEGIES

8.2.1. Introduction

The Kenya Constitution (2010) under article 209 (5), provides for the County Governments to exercise their taxation power to generate own revenue to supplement the allocation from the National Government.

According to the constitution the main sources to fund the devolved form of government include;

i. Equitable share of at least 15 percent of most-recently audited revenue raised nationally (Article 202(1) and 203(2))
ii. Additional conditional and unconditional grants from the National Government's share of revenue (Article 202(2))
iii. Equalization Fund based on half of one percent of revenue raised nationally (Article 204)
iv. Local revenues in form of taxes, charges and fees collected by the Counties
v. Loans and grants to the counties: However this has to be approved by the National Treasury

According to the Draft National Policy to Support Enhancement of County Governments' Own Source of Revenue, it was noted that many County Governments are experiencing financial challenges in meeting their devolved functions as envisaged in the constitution hence the need to explore new ways to generate more revenue.

8.2.2. County Revenue Sources

Kajiado County Government resources are mainly sourced from the equitable share, grants and county own source revenue which include property rates, natural resources royalties, cess, various service charges and fees.

a) National government allocation

Funds are allocated by the National Government out of the country's share of national tax revenue through the Commission on Revenue Allocation (CRA). The County Government of Kajiado received 5.7 billion from the national government in the financial year 2017/2018. The funds were then allocated to the sub-counties for development. Performance of the equitable share over the plan period ***(2013/14 - 2017/18)*** was progressive and within the targeted amount of Kshs.22 billion

b) Donor funding

Donor funding totaled to Ksh.734 million reflecting 3 percent of the budget financing

c) Own source revenue (OSR)

The county raises revenue arising from property taxes, fees, levies, charges and other revenue sources. The county collected Ksh 680M in the financial year 2017/2018 from its Own Source Revenue.

The main sources of the County own source revenue include ;

1. Single Business Permit (SBP)

Kajiado County is empowered to control the conduct, location and operation of certain businesses, trades and occupations within its area, through issuance of licences and permits. It is also empowered to levy fees on licences and permits it issues to raise funds to pay costs associated with control of business. For ease of collection, the national policy to enhance county own revenue generation encourages consolidation of fees payable on all business activities of an individual entity into one single business permit (SBP).

Businesses licensing is the major source of revenue for the county. Revenue generated through SBP in the financial year 2017/2018 was Ksh 183,838,255.

2. Natural resources fees

Sand fees, limestones/royalties and ballast fees are charged on the companies and individuals extracting the minerals within the county. The county received Ksh 91,273, 811 in the financial year 2017/2018.

3. Development application approvals

The development applications include building plans, change of user applications, building plans resubmission and renewal and occupation certificates. Revenue generated was Ksh 60,623,396 within the 2017/2018 financial year

4. Land Rates and Plot Rent Revenue

Property taxes (or land rates) and land based charges are levied on the owners or users of land situated within town area. The county generated Ksh 48,725,436 in the 2017/2018 financial year.

5. General hospital fee

Revenue generated from the hospital fee was Ksh 34,056,565

6. User fees and charges

Kajiado County Government raises revenue through the following fees and charges for the purpose of financing costs of providing related services to residents of the town

1) Motor vehicle parking

A parking fee of are charged depending on the size and registered use of the vehicles. The county generated Ksh 44,954,780 in the 2017/2018 financial year.

2) Market fees

Traders are charged a daily fee for display and sale of goods at designated market places in the town. Market stall rents are paid monthly for occupation of the county's built-up market spaces for public display and sale of consumer goods. Revenue generated through market fees in the in the 2017/2018 financial year was Ksh 25,716,034

3) Sign posts and adverts

Levies charged on the bill boards and adverts amounted to Ksh 34, 056,565.

Other sources of revenue for the county in the 2017/2018 financial year include;

1. Slaughter fee and livestock cess- Ksh 22, 340,890
2. Public health inspection fee- Ksh 21,087,270
3. Agricultural produce- Ksh 10,399,173
4. Liquor license fee- Ksh 2,565,500
5. Social services fee- Ksh 1,250,300
6. Registration of institutions fee –Ksh 337,980

8.2.3. Fiscal out Turn of 2013/2014- 2017-2018 Financial Years

The County demonstrated a high dependency on the equitable share as a source of revenue to finance the budget at an average of 12 percent in the last five financial years. In 2014/15 Financial Year, local revenue performance was the highest, contributing 17 percent to the total resources for that year. The least performing financial year was 2016/17 reflecting 10 percent of the total resources for the financial year.

Table 49 : Revenue Projection Versus Revenue Received by streams (2013/14 - 2017/18)

Funding Source	**Approved Estimates (Kshs)**					**Revenue Received/Collected**			
	2013 /14	**2014 /15**	**2015 /16**	**2016 /17**	**2017 /18**	**2013 /14**	**2014 /15**	**2015 /16**	**2016 /17**	**2017 /18**
Equitable Share (GOK)	3,525,736,420	3,878,310,062	4,412,625,800	4,761,279,539	5,768,200,000	3,227,409,859	3,865,164,568	4,412,625,800	4,761,279,539	5,768,200,000.00
Local Revenue	516,826,526	959,045,150	984,801,354	1,248,371,716	1,040,784,334	435,532,193	772,577,000	650,928,888	557,094,069	680,000,000.00
Development Partners	0	0	0	0	0	0	0	0	0	0
Total	**4,042,562,946**	**4,837,355,212**	**5,397,427,154**	**6,009,651,255**	**6,758,984,334**	**3,662,942,052**	**4,637,741,568**	**5,063,554,688**	**5,318,373,608**	**6,448,200,000**

Source: Kajiado CIDP 2018- 2022

The figure below illustrates comparison of local revenue performance to the equitable share.

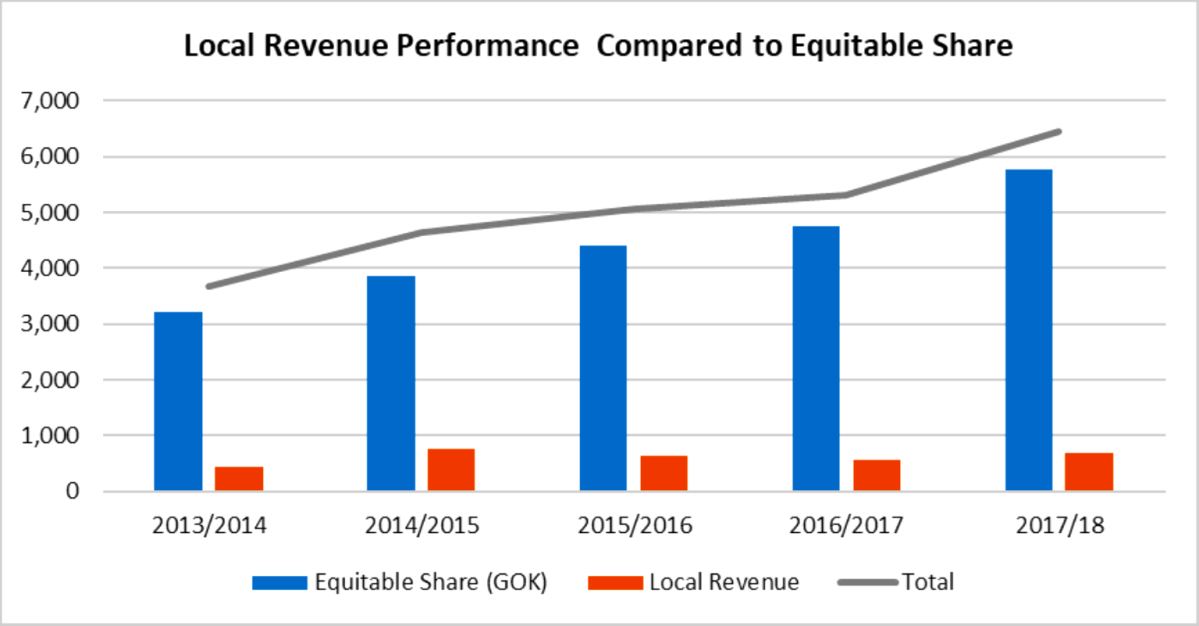


Figure 88: Comparison of local revenue performance to the equitable share

Source: Kajiado CIDP 2018- 2022

The County own source revenue target for 2013/14 to 2017/2018 Financial Years amounts to Kshs.4.7 billion. During the period, the county mobilized Ksh.3 billion reflecting 65.4 percent of the target.

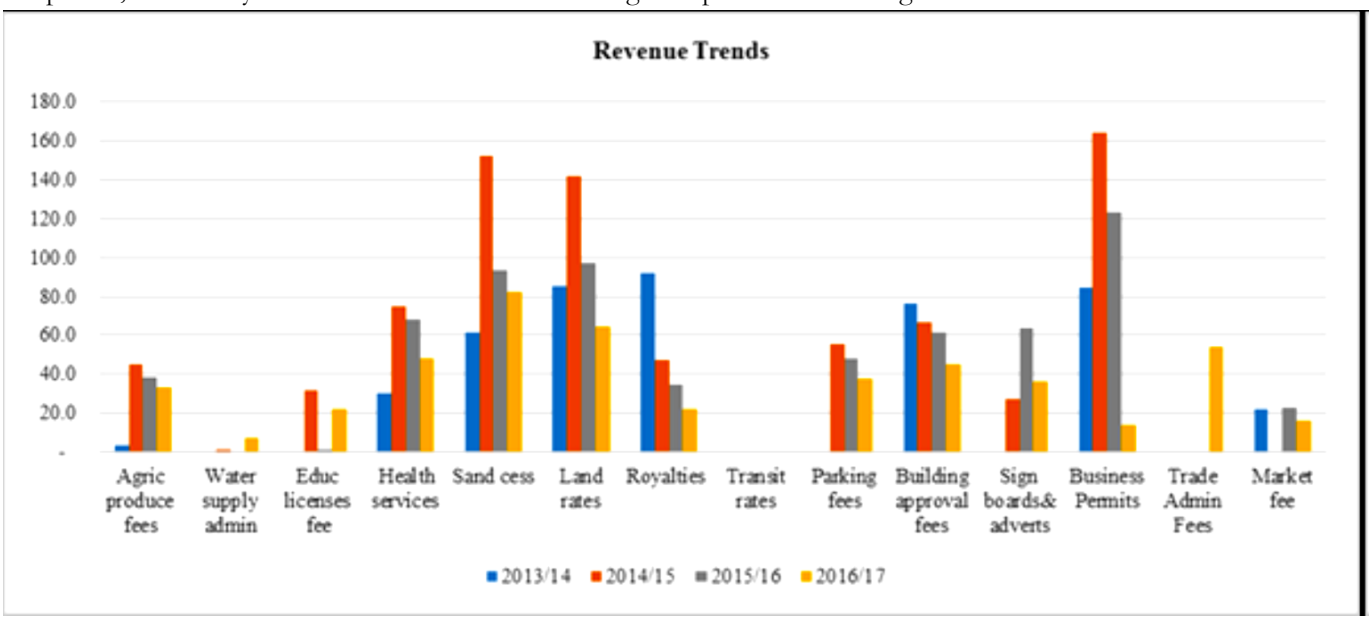


Figure 89: Analysis of County Own Source Revenue per Streams

Source: Kajiado CIDP 2018- 2022

The main sources of own source revenue during the 2013/14 to 2017/2018 Financial Years include the Business Permit (20.4%), Sand Cess (15.3%), Land rates (15.3%), Building plans (10%), Royalties (8.4) and general hospital fees at 8.2% as shown above.

The shortfall in collection of local revenue is attributed to factors such as: Pilferage of revenue and fraud, laxity in compliance among the taxpayers, overreliance on the manual system of revenue collection, under exploitation of

the main revenue sources, weak enforcement of the Finance Act, inadequate capacity in terms of personnel, equipment and funds and structural inefficiencies in revenue administration

However, there has been efforts by the County Government to ensure improvement in revenue collection by putting in place a revenue collection system that ensures maximum collection and minimal losses of revenue. This entails;

1. Automation of the revenue collection system by use of ZIZI information system.
2. Restructuring of the finance and revenue system. The county government has established the following departments each with its own director overseeing its operation
    a) Permits and licenses department
    b) User fee revenue department
    c) Compliance department
    d) Natural resource department
3. Formation of a full ICT unit to enhance automation of systems.

County Expenditure Analysis

During the period under review, the County Government implemented annual budgets amounting to Kshs.17.6 billion out of the allocated budget of Kshs.23.2 billion. This reflects 75 percent absorption of the allocated resources. The shortfall in expenditure is mainly attributed to the under collection of the County Own Source Revenue. The sectors' resource allocation versus utilization for the period 2013/14 to 2016/17 is as shown below.

Table 50: Sectors' Total Resource Allocation versus Utilization (FY 2013/14 - 2016/17)

Sector	Total Allocation	Total Expenditure	Percent Allocation	Absorption Rate
Office of the Governor	680,000,102.00	629,238,328.00	4	93
County Public Service Board	297,481,473.00	275,912,122.00	2	93
Education, Youth, Sports and Culture	2,681,486,355.00	1,604,167,021.00	9	60
Health Services	4,322,912,475.00	3,523,139,638.10	20	81
ICT, Gender and Social Services	506,032,191.00	343,107,572.55	2	68
Agriculture, Livestock Production and Fisheries	917,082,315.00	762,708,416.15	4	83
Water and Irrigation	1,608,325,679.00	895,879,726.25	5	56
Public Works, Roads, Energy and Transport	2,775,386,634.00	1,725,791,209.75	10	62
Finance and Economic Planning	1,840,517,306.00	1,553,725,910.80	9	84
Industrialization and Enterprise Development	875,505,401.00	546,041,623.50	3	62
Lands, Physical Planning, Environment, Wildlife And Natural Resources	732,085,290.00	511,808,946.25	3	70
County Assembly	2,811,473,447.00	2,159,948,633.05	12	77
Public Service, Administration And Citizen Participation	3,215,299,827.00	3,098,217,337.55	18	96
Total	23,263,588,495.00	17,629,686,484.95	100.00	76

8.2.4. Revenue Enhancement Strategies

The county currently receives a minimum of 15% of the National revenue. This amount proves to be inadequate for the county to perform both decentralized government and local government functions as envisaged by the Constitution. The county own revenue for the financial years **2013/2014- 2016/2017** accounted for 64.5%. This goes to show that the county still relies on resources from the national government and that it cannot sustain it operations if the only source of revenue was from its own revenue.

Article 175(b) of the Constitution of Kenya, 2010 recognizes the need for County Governments to have reliable revenue as a key principle of Kenya's devolution. The county government of Kajiado has the following strategies that aim at enhancing revenue generation

1) **Automation**

The county is making efforts to ensure that it has automated all its revenue collection systems to make it possible for the public to honour their financial obligations to the County via electronic means and online platforms. Examples include mobile and web-based applications/ self-management portals, Unstructured Supplementary Service Data (USSD) and use of paybills.

Other strategies that can increase revenue include;

2) **Compliance and enforcement**

a) Incentivize ratepayers by providing information on 'easy-to-pay-options' such as mobile money, credit and debit cards, revenue collection agents and bank transfers. In addition, the 'easy-to-pay-options' shall provide ratepayers with information on clear payment due dates along with adequate time within which to pay and the possibility of paying in instalments.
b) Improvement in service delivery would act as an incentive to the taxpayers to comply.
c) The county could put in place appraisal performance systems with incentives to revenue administrators for good performance.
d) All revenue raising legislation should contain enforcement clauses empowering the county to charge and collect fines and penalties.
e) Entrench in law measures that require twinning of tax compliance with certain County Government services. Examples include tying issuance of the Single Business Permit to production by a business entity of a valid Tax Compliance Certificate (TCC); or, awarding procurement tenders only to firms with valid TCCs.

3) **Effective public participation**

Development of a clear mechanism for receiving feedback from the public and providing information on the revenue raising measures by the County Government is essential. Public participation in County revenue-raising activities will help create awareness, enhance ownership and minimize resistance to imposition of taxes, fees and user charges. In turn, this will improve compliance

4) **Formulation of a Tariffs and Pricing Policy**

This shall provide a rationale for levying fees and charges, as well as a basis for setting fee/charge levels. It also provides citizens with information in understanding and interpreting the taxes, fees and charges they pay and the services that they should expect from the County in return**.**

5) **Improving revenue administration**

This shall be through:

a) **Capacity building to ensure efficiency and effectiveness of human resources**

Deliberate measures to improve efficiency and effectiveness of personnel involved in the revenue function are vital. Appropriate training programmes should be designed and delivered to enhance competency. New personnel should be trained on core revenue management aspects such as planning, collection, inspection, accounting, reporting and legal enforcement.

b) Development of Scheme of Service for the revenue function

It should indicate qualifications to be possessed by all personnel; and a competitive salary and incentive system to retain staff. For purposes of continuous training, the consultant encourages the county to partner with the Kenya School of Revenue Administration (KSRA). The large numbers of under-qualified casual employees currently involved in County revenue collection should be absorbed within or without the department and allocated duties that fit their qualifications.

c) Determining an appropriate structure for revenue administration

The existing legal framework permits only four structures for revenue collection and management at the County level, namely: i) establishment of internal revenue administration departments; ii) establishment of autonomous County revenue authorities/corporation; iii) contracting the KRA; or, iv) contracting private firms and other agents. The Draft National Policy to Support Enhancement of County Government Own Source Revenue provides proposals for the 47 counties on the best structure for revenue collection and management to use.
For Kajiado County, the policy proposes use of the establishment of autonomous county revenue authorities / corporation. The rationale behind the proposal as shown in the table below being that the county has a significant potential of revenue generation and a narrow concentration of the most important revenue streams.

Table 51: Proposed mapping of Counties to revenue administration structures

Structure	County Governments	Rationale
Establishment of internal revenue administration departments	Tana River, Lamu, West Pokot, Mandera, Nandi, Kitui, Siaya, Garissa, Bomet, Wajir, Homa Bay, Migori, Nyamira, Kirinyaga, Marsabit, Makueni, Nyandarua, Elgeyo Marakwet, Trans Nzoia, Kilifi, Vihiga, Turkana, Kwale, Kericho, Baringo, Busia	• Where revenue is still relatively low (probably with no predominant revenue streams) and where economic justification is low for investment in advanced and costly revenue administration systems • This is the structure currently being used in most County Governments
Establishment of autonomous County revenue authorities / corporation	Embu, Uasin Gishu, Laikipia, **Kajiado**, Isiolo, Samburu, Taita Taveta	• Counties with potentially significant revenue, requiring only modestly complex administration (including, due to narrow concentration of the most important revenue streams e.g. park entry fees). Annual expenses of such authorities / corporations should not exceed 2% of estimated revenue in each financial year • Laikipia County has already established a County Revenue Board, which is responsible for collecting and receiving all revenue, administration and enforcement, assessment and accounting, provision of advice to the CEC on all revenue matters, preparation of annual reports, and payment of all revenue into CRF. The Board's funds and assets consist of not more than 2% of estimated revenue to be collected each financial year
Contracting the Kenya Revenue	Nairobi, Mombasa, Kiambu, Narok, Nakuru, Kisumu, Machakos, Nyeri	

Authority (KRA)		• It would be easier for KRA to collect revenue from more urbanized Counties with large formal sectors; this would allow KRA to fully apply its professional skills, personnel and technical resources • Counties with relatively high revenue (including future capacity) but in which revenue collection is potentially both costly and complex (including, due to several important revenue streams) • Kiambu County already has an MoU with KRA to collect property rates, land rent and SBP
Contracting private firms and other agents	Kakamega, Kisii, Bungoma, Meru	• By contracting private firms, these Counties could benefit from professionalized revenue administration and reduced costs, although with progressively enhanced revenue collection, contracting KRA could also be a medium-term option

Source: The Draft National Policy to Support Enhancement of County Government Own Source Revenue

6) Royalty payments

Counties get these monies whenever the National Government or a permitted party exploits natural resources found within the respective county. Normally these are percentages of the net revenues collected upon sale of these resources.

The major mineral that the National Government can explore in this county is limestone and sand and pay royalties to the County Government of Kajiado.

7) Better fiscal management

This calls for prudent measures to manage the collected funds at the point of collection, accounting, auditing and allocation to various expenditures. Some of these measures include

i. Analyze budgets and expenditure to check on affordability
ii. Ensure value for money for goods and services rendered.
iii. Monitor spending habits by only spending allocated funds for intended and priority purposes.
iv. Ensuring transparency and tight spending controls.
v. Avoiding unnecessary wastage on expenditure.
vi. Regular and consistent auditing of financial records.
vii. Reduce handling of money by officers by encouraging online payment.
viii. Encourage compliance by those living or working in the counties to fulfil their financial obligations regularly and in time.

8) Enhance property-related revenue streams

This could be through the following ways;

i. Digitization of land titles and registration of untitled parcels. This will help track non-compliant land owners and impose penalties as well as help to update the land registry.
ii. Develop a comprehensive cadastre, to be regularly updated to include buildings and physical improvements.
iii. Introduce incentives that encourage registration of properties including agricultural land by reducing registration, survey and legal fees. Consideration could be given to make registration compulsory irrespective of the legal status (including informal settlements)
iv. Updating of old valuation rolls and preparation of new valuation rolls by County Governments with oversight by the NLC

v. Trading centre/market centres need to planned, surveyed and registered as a matter of urgency so as to have them rated
vi. Adoption of Computer Aided Mass Valuation system (CAMA) or Automated Valuation Models (AVMs). CAMA system stores cadastral records, increases analytical capabilities, makes routine calculations, and produces reports including property records, assessment rolls, assessment notices, and tax bills

8.2.5. Financial Enhancement Strategies

The Kenya Constitution 2010 and the Public Finance and Management Act empowers the County Governments to use other measures to supplement the national allocation and their own sources of revenue to fund devolved functions. The counties can borrow money under the authorization of the National Treasury and approval by the county assemblies. The counties can also enter into joint agreement with other counties or state corporations to enhance their financial capacity.

The financial strategies include:

1. Public private partnerships

Public Private Partnerships (PPPs) are joint ventures between Government agencies and private sectors which come together to offer services through the appropriate allocation of resources while at the same time, share the risks and rewards risk involved.

The county government must encourage and stimulate Public Private Partnership financing for provision of some public services and infrastructure needed in the municipality. The private sector contributes greatly in implementing capital investment projects such as financing, ensuring efficiency and providing expertise.

In Kenya PPPs are governed by the Public Private Partnership Act of 2013 and the Public Procurement and Disposal Regulations of 2009.

Types of Public Private Partnerships

a) Management Contracts:

They are short-term PPP agreements under which the public sector entrusts private companies with management services on a contract term for a defined period. The public sector retains ownership and control of the capital asset

The County Government of Kajiado can engage in management contracts to outsource private companies and investors in the following area; billing and collection of parking fees, land rates, recreational use fees, public toilets, garbage collection among others. The joint venture will result to efficiency in services provision and increase in revenue generated.

b) Leases:

The county can lease an asset to a private entity on determined periodical rental sum for a specified period of time while the entity manages, operates and maintains the facility in exchange of fees or charges from consumers of the service provided.

The County Government of Kajiado can explore leasing in the following areas: Stadia, schools, health facilities, agricultural land and leasing machinery for road maintenance among others.

c) Concessions:

This is a partnership venture between a public entity and private sector. In this case, the county leases its assets to private investors at a fee and share the profit and the risks involved. The concession period should not exceed 30 years. The private investors are charged with the responsibility of maintaining and enhancing the asset.

This model of partnership is ideal for the county considering the rapid urbanization being experienced in the county. This has resulted to influx in major real estate development in the county. The developers are required to surrender at least 10%

of the total land for public amenities such as health facilities, schools, power substation, fire station etc. The county can enter into a concession with the private sector where it is not in a position to provide these facilities.

d) Build-Own-Operate Transfer (BOOT):

In this type of partnership, the private investors invest, build, operate, own and later transfer the property back to the County Government. This type of partnership mostly involves capital-intensive infrastructural development. The private investors operate the infrastructure until it recovers it fees.

Under this agreement, the County can explore this form of partnership in provision of major infrastructural development such as sewer truck in the rapidly urbanizing areas and exploring solar and wind energy generation plant in area such Kitengela.

e) Build-Own-Operate (BOO):

This is a form of public private partnership model where the private sector invests, builds and permanently owns an asset on public land under contractual terms that secure public interest under county supervision. The County Government can encourage this mode of investment through financial incentives such as tax exemption.

The County Government can use this model to promote provision of recreational facilities in residential neighbourhood, fire station and kindergartens among others. It can also employ the model to promote foreign direct investment in areas such as industrial development within the county.

2. Development partners

The development partners refers to international development organization that partners with the National and County Government to aid in development in various sectors such as education, energy, health, food security, urbanization among others.

The major development partners in Kenya which the County can source funding from include; World Bank, UK Department for International Development, Africa Development Bank, UNICEF, International Monetary Fund (IMF) among others.

Kajiado County can seek development partnership with donor entities like World Bank, IMF and Non- governmental organizations (NGOs) which can implement municipal proposed project through the following channels:

a) Loans/ Borrowing

The Constitution and the Public Finance Management Act 2012 provide conditions under which national and county governments may borrow. Article 212 of the Constitution permits county governments to borrow funds for development provided they obtain a guarantee from their respective county assemblies.

Section 58 of the PFM act confers upon the Cabinet Secretary responsible for finance the power to guarantee loans which must receive county assembly approval.

A good example is whereby the World Bank loaned Kajiado County Government 700M to construct the Ngong market.

b) Grants/Donations:

Grants refers to financial aid given to the County Governments that do not require repayment. The grants are mostly need based. According to the Public Finance Management Act of 2012, the county can enter into agreement with a third party or any entity and obtain grants. The County Executive Member for finance must approve the agreement.

The World Bank has collaborated with the Government of Kenya through Kenya Devolution Support Programme to give grants to County Governments to improve their human resource and performance, civil education, public participation, development plans among others. The county can develop municipalities under the support of WB through KUSP.

3. County Government Corporations and Companies:

Kajiado county government can set up its own county-level corporation e.g. the current water and sewerage company that is wholly owned by the county government.

4. State Corporations

State Corporations are non-profit organizations established by an Act of Parliament. The National Government controls majority of all the shares in state corporation/parastatals. The County Governments can engage or enter into agreement with States Corporation for finances and management services.

For example, the County Government of Kajiado can engage the Kenya Railway Corporation to assist in development of a railway station in Kitengela that will actualize the use of the Kitengela railway.

5. Joint agreements

The Kenya Constitution 2010 under Article 189 (2) provides for cooperation between the national government and the county government. It also provides for cooperation between different counties in endeavors to meet their obligated mandate.

The county can exploit this opportunity to enter into agreement with neighboring counties within Nairobi Metropolitan Region to provide services, which cut across counties such as public transport.

8.2.6. County Investment Strategy

The county government of Kajiado has formed two municipalities i.e. Ngong and Kajiado that will support sustainable urban development and technological upscale within the county. The county has also established an economic development programme through which the county will provide technology, infrastructure i.e. roads, water electricity e.t.c. and finance that enhance investment in the county.

Through World Bank, the county has invested in construction of a four storey market in Ngong that is expected to generate revenue to the county. The county intends to undertake the following investment projects.

1. Construction of Kitengela and Kiserian market that will generate revenue as well as create employment
2. Road construction in partnership with the National Government. This will open up the county both to the local and international investors.
3. Creation of smart pastoralism through a Public private partnership
4. Tomato processing and value addition through livestock production. The county proposes to enter into a Public private partnership whereby the private entity that will undertake production, processing and marketing the produce for the county. This will enhance the county own source revenue.
5. Undertake waste management through decommissioning of Ngong Dumpsite and establishing a waste recycling centre at Vet farm. This will not only enhance environmental sustainability but also create employment and generate revenue.

However, the county encounters the following challenges:

1) Lack of a policy and legal framework to guide investment
2) Poor infrastructural development, which deters investors.
3) Limited financial resources for the county to make major investments
4) Weak linkages with the private sector
5) Poor enforcement of fair trade practices

6) Low support for small and medium enterprises

The following strategies will enhance investments in the county

1. **Creating a conducive policy for engagement with the private sector**

This will be through:

a) Formulation and implementation of sound economic policies to support set up and running of businesses within the county.
b) Promotion of private sector development through enterprise and entrepreneurship development.
c) Engagement with the private sector in round table sessions to address issues affecting them.

2. **Enforce fair trade practices within the county**

The county can promote fair trade practices through consumer awareness, calibration and verification of weight and measures equipment.

3. **Create and strengthen a business-enabling environment**

The county can create an enabling environment through the following ways;

a) Conducting feasibility studies to determine viability of new industries.
b) Improving the "one stop shop" concept where business registration services are offered at a central place.
c) Construction of Jua Kali sheds and preparation of sectoral and strategic plans.
d) Improving infrastructure to support business operation through construction and maintenance of roads, markets and security lights.

8.3.MONITORING & EVALUATION

Monitoring and evaluation systems assess effectiveness of implementation of the ISUDP. Monitoring and evaluation will be used to assess the progress, challenges encountered during the implementation and also provide for any adjustments needed during the implementation. Monitoring and evaluation systems are used to ensure timely implementation of the project and also give indicators of the expected output. The table below gives the expected impacts and indicators during the monitoring and evaluation process.

Sector	Expected outcome	Indicators
Environment	Protection and conservation of the natural environment Re-establishment of the forest cover	Increased forest cover Establishment of riparian reserves and buffer zones Construction of gabions Established quarrying by-laws
Economy	Increased revenue generation Increased employment opportunities Updated land parcel records	Increased jua kali cottages Increased revenue Constructed markets Increased investors

		Established meat processing industry Mapping of land parcels
Social infrastructure	Provision of adequate and accessible social infrastructure	Constructed primary schools Constructed secondary schools Constructed special needs and technical schools Constructed public hospitals Established parks and playground Developed social hall
Physical infrastructure	Provision of adequate and efficient physical infrastructure	Street lights and flood light masts Improved drainage system Water connection Waste recycling centre Dust bins along the roads
Transportation	Effective public transport system	Reduced traffic congestion Developed NMT's Tarmacked roads Use of bus service Widened access roads
Housing	Quality houses with provision of infrastructure	Increased plot ratios Infrastructural provision
Tourism	Increased tourism activities	Developed tourism circuit Developed cultural centre Developed maasai market
Disaster management	Effective management of disasters	Formulated disaster management plan Fire fighting machines Short response time to disasters

BIBLIOGRAPHY

1. Bernstein, J. (2004): *Toolkit for Social Assessment and Public Participation in Municipal Solid Waste Management*. Urban Environment Thematic Group, The World Bank, Washington, D.C press
2. Buchholz, R. A. (1998) *Principles of environmental management: the greening of business (No ed. 2)* Prentice-Hall Inc
3. Charlie Pye-Smith (2012) "Saving the plains: ILRI research team wins Sustainability Science Award for its pastoral research in Masailand", available at http://www.ilri.org/ilrinews/index.php/archives/tag/kitengela, accessed 27th April 2015
4. Constitution of Kenya Review Commission (2002). Draft, The Constitution of The Republic of Kenya, 2002. Daily Nation, October 2, 2002.
5. County Government of Kajiado (2013). *County Integrated Development Plan* 2013-2017.
6. De Kimpe, C.R., & Morel, J. L. (2000) *Urban soil management: a growing concern.* Soil Science, 165(1), 31-40.
7. Elzen M. G. J., J. G. J. Olivier, N. Höhne, and G. Janssens-Maenhout (2013). *Countries' contributions to climate change: effect of accounting for all greenhouse gases, recent trends, basic needs and technological progress. Climatic Change* 121, 397 – 412
8. Government of Kenya (2007). Kenya's Vision 2030. Government Printers, Nairobi.
9. Government of Kenya (2009): The 2009 Kenya Population and Housing Census "Counting Our People for the Implementation of Vision 2030" August 2010, VOLUME IC
10. Government of Kenya (2010). National Constitution, Government Printers, Nairobi
11. Iyer, Anjana (2001): Community Participation in Waste Management: Experiences of a Pilot Project in Bangalore, India. Urban Waste Expertise program, the Netherlands,September
12. Kamau, E.C. (2005). Environmental law and self-management by industries in Kenya. Journal of Environmental Law, 17(2) 229-224 Kenya
13. Kamau, J.M., & Sakwa, G. L. (2012). Environmental Impact Assessment Report: Construction of Sewerage System for Ruiru Municipality (No.E2920 v2rev)
14. Karanja, F.K. and Mutua, F.M. (2000): *Reducing the Impact of Environmental Emergencies through Early Warning and Preparedness - The Case of El nino-Southern Oscillation (ENSO),* Nairobi Kenya
15. Kenya Gazette Supplement Acts 2000, Environmental Management and Coordination Act Number 8 of 1999 *Government printer, Nairobi*

16. Kenya Gazette Supplement Acts Building Code 2000. Government Printer, Nairobi.

17. Kenya Gazette Supplement Acts Land Planning Act (Cap. 303). Government printer, Nairobi.

18. Kenya Gazette Supplement Acts Penal Code Act (Cap.63). Government printer, Nairobi.

19. Kenya Gazette Supplement Acts Physical Planning Act, 1999 Government printer, Nairobi.

20. Kenya Gazette Supplement Acts Public Health Act (Cap. 242). Government printer, Nairobi.

21. Kenya Gazette Supplement number 56. Environmental Impact Assessment and Audit Regulations 2003. Government printer, Nairobi.

22. Kenya National Bureau of Statistics (1999), Kenya Demographic and Health Survey 1993, CBS,

23. Kenya National Bureau of Statistics (2004), Demographic and Health Survey 2003, CBS, Nairobi.

24. Kenya National Bureau of Statistics (2007), Basic Report on Well Being in Kenya, Nairobi.

25. Kenya National Bureau of Statistics (2009), Demographic and Healthy Survey 2008/9, CBS, Nairobi.

26. Kwonyike, A.C, (2004): Towards an Alternative Strategy for Domestic Solid Waste Management in Kabarnet Municipality. M.Phil Thesis, Moi University Nairobi.

27. Mashie, D (2006).ISK/KLA Seminar- Kenya Draft National Land Policy. Key Note Presentation at Nairobi Safari Club on 24th October 2006.

28. Ministry of Lands, Kenya (2007) Revised Draft National Land Policy. National Land Policy Secretariat, Ardhi House, Nairobi

29. Ministry of Lands, Kenya (2009), Sessional Paper No. 3 of 2009 on National land Policy, Government Printer, Nairobi.

30. Ministry of Metropolitan Development (2011) Development of a Spatial Planning Concept for Nairobi Metropolitan Region of Kenya, Government of Kenya Ministry of Metropolitan Development

31. Ministry of Nairobi Metropolitan Development (2008), Nairobi Metro 2030, Nairobi.

32. Ministry of National Planning and Vision 2030 (2008), Kenya Vision 2030, Government Printer, Nairobi District Development plan (2004-2008).

33. Ministry of Planning and National Development. *Government printer,* Nairobi. Spatial Planning Concept for the Nairobi Metropolitan region, Nairobi.

34. Nairobi Metro 2030 Strategy

35. Njogu, W. J. (2011): Challenges and opportunities for sustainable water supply and demand management in Ruiru Municipality, (Dectoral dissertation). Kenyatta University, Nairobi.

36. Panafrican Climate Justice Alliance (2015): *Meteorologists Warn of El nino over East African Region* Report, Ngong road Nairobi.

37. Republic of Kenya (2004), District Environment Profile, NEMA, Nairobi.

38. Republic of Kenya, *Environmental Impact Assessment/Audit Regulations 2003, (Legal Notice No.101)* Government Printer, Nairobi.

39. Republic of Kenya (1999). Environmental Management and Co-ordination Act. No. 8 of 1999. Government Printer, Nairobi.

40. Republic of Kenya, *Factory and Other Places of Work Act, Cap 514*. Government Printer, Nairobi.

41. Republic of Kenya, *Forest Act (2005),* Government Printer, Nairobi.

42. Republic of Kenya, *Legal Notice 31: Factories and Other Work Places (Safety and health committees) Rules, 2004*, Government Printer, Nairobi.

43. Republic of Kenya, *National Water Master Plan: 1980*, MWI, Government Printer, Nairobi.

44. Republic of Kenya, *Public Health Act, Cap 242*, Government Printer, Nairobi.

45. Republic of Kenya (Jun, 2004) Report of the Commission of Inquiry into the Illegal/ Irregular Allocation of Public Land Annexes Volume I and II. Government Printer, Nairobi.

46. Republic of Kenya (1996) Revised Edition. The Physical Planning Act. Cap 286 of Laws of Kenya. Government Printer, Nairobi.

47. Republic of Kenya (1989) Revised Edition. The Registered Land Act Cap 300 of Laws of Kenya. Government Printer, Nairobi.

48. Republic of Kenya (2004), State of Environment Report, NEMA, Nairobi.

49. Republic of Kenya (2010). The Constitution of Kenya. Kenya Gazette Supplement, 2010. Government Printer, Nairobi.

50. Republic of Kenya, *Water Act (2002),* Government Printer, Nairobi.

51. Republic of Kenya, *Water Supply Design Manual (MWI, 2005),* Government Printer, Nairobi.

52. Rogger H (1985), *African Projects: Impacts in the Environment: The social and Environmental impact of Projects at the Local Level: A Case Study of Five Man-Made Lakes in Eastern Africa*, ELCI, Nairobi.

53. *Spatial Planning Concept for NMR*

54. Tchobanoglous, G., Theisen, H., & Virgil, S. (1993). *Integrated solid waste management: engineering principles and management issues*. Mc Gaw-Hill, Inc.

55. *TOR for Interdisciplinary Land-Use and Transport Metropolitan Strategy*

56. UNCHS/HABITAT (1987): Shelter, Infrastructure and Services for the Poor in Developing Countries: Some Policy Options. Nairobi.

57. UNEP and ACTS (2001), *Making of Framework Environmental Law in Kenya*, ACTS Press, Nairobi, 2001.

58. UNHABITAT (2000): *Water and Sanitation Programme.* United Nations Millennium Summit, Millennium Development Goals

59. UNHABITAT (2004): State of the World Cities 2004105. UNHABITAT Report, Nairobi.

60. UN-Habitat (2008). The State of African Cities 2008. A Framework for Addressing Urban Challenges in Africa, UN Habitat, Nairobi.

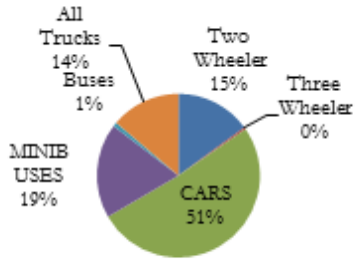
61. UNHABITAT (2013): *Urban Planning For City Leaders, Second Edition.* UN Habitat, Central Office.

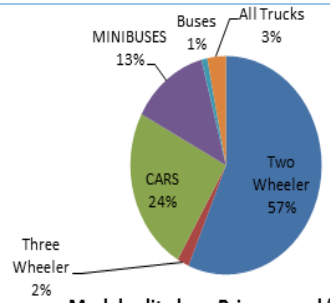
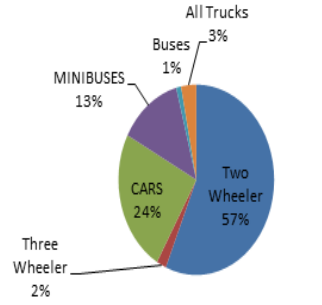
62. United Nations Economic Commission for Europe (1996). Land Administration Guidelines with Specific Reference to Countries in Transition. Geneva

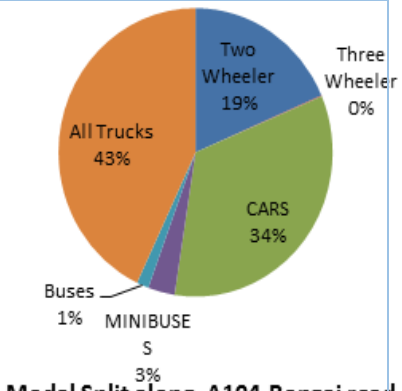
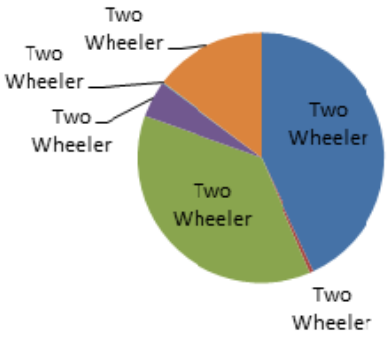
63. World Health Organization (WHO, 1993) *Guidelines for Drinking Water Quality. Second Edition. Volume 3. Surveillance and Control of Community Water Supplies*. WHO. Geneva.

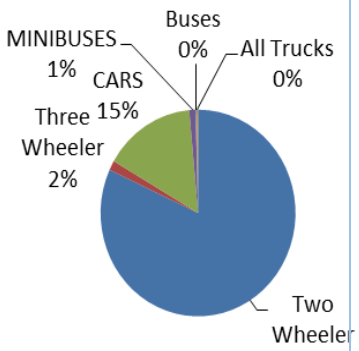
ANNEXES

ANNEX 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.	- Total length: Approx. 5.5 km - road reserve: 60m; - Carriageway width: 7m (it is divided) - 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 freight vehicles, private cars, tuk tuks and boda boda motorcycles. - 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 foot path that is 1.6m wide. It's paved but in a bad condition.	-Traffic composition: matatus, taxis, private cars, freight vehicles, boda boda, tuk tuks and pedestrians. -There is through traffic to Kajiado, Namanga and Tanzania. -On-street Parking: Both parallel and angular are present along the service lanes.	-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 -Onstreet 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 traffic to Namanga]	 **Modal split along A104 road (both directions)**

S. No.	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
				- Side drains: open and heavily silted. Contains waste water. -Road markings are very clear. -Street lights: absent but there are flood masts.			
2	Kitengela prisons Road	The Kenya prisons are located along the road.	-It serves access function to commercial areas, residential, public places (Kitengela Prison and churches), Schools and industries (Kitengela slaughterhouse).	- 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; -Street lights and NMT facilities: absent.	-Traffic composition: boda-boda, taxis, private cars, pedestrians, and human-drawn carts. -Both parallel and angular on - street parking is present.	-Lack of street lights; -Bad stench from the slaughter house; -Poor drainage system; -Poor road condition; -The bus park is very small and is located on a private property; -Encroachment of the road reserve; -Lack of NMT facilities yet there are many schools located along this road.	 **Modal split along Prisons road (both directions)**
3	Old Namanga Road	Kitengela - Isinya	-Provides access to the, commercial and residential areas. -It provides access to commercial, residential areas (Milimani Etate) and public places like	-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 waste water; -Street lights and NMT facilities: absent.	Traffic composition: private cars on the road, motor cycles, animal and human-drawn carts and pedestrians. -On street parking: present (both parallel and angular): due to the congestion in the	-The road becomes impassable during rainy seasons; - PSV park along the road; -The road is a very poor condition.	 **Modal split along Old Namanga road (both directions)**

S. No.	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
			churches and schools.		bus park, PSV park along this road.		
4	Rongai Road	Kitengela - Rongai	- 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),	-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 - Street lights and NMT facilities: absent.	-Traffic: Few private cars, pedestrians, bicycles, freight vehicles (from the quarries) and taxis -On street parking: absent	Lack of street lights; -Lack of NMT facilities and road markings; - The road condition is very poor and it's only passable by 4-wheel drive vehicles.	 **Modal Split along A104-Rongai road (Both directions)**
5	EPZ Road	A104 - EPZ	-It serves commercial, residential and industrial areas. There are undeveloped parcels along the road.	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) buts its condition is poor; -Road markings (lane and edge marking) and informatory traffic signs: present;	-Traffic composition: private cars, *boda boda, tuk tuks,* freight vehicles and pedestrians; -On street parking: Absent.	-The foot path is in a poor condition;	

S. No.	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
				- Drainage: Lined drainage to the left (fromA104) and open drains on the right. They are in a fair condition: - Street lights are present on the left and right.			
6	Kwa Chief-Market Road	A104-Kitengela open air Market	-Provides access function to the Kitengela open air Market, commercial and Public places (the Chief's Camp is located along this road).	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 - Street lights (there is a flood mast near the market) and NMT facilities: absent.	-Traffic: pedestrians, private cars, *boda-bodas,* human &animal-drawn carts and Freight vehicles (to and from the Market).	The presence of heavy vehicles to and from the market The road is very narrow Human and animal drawn carts - The drainage system is not provided for; - Road reserve encroachment.	
7	Nyika Road	Chairman Road-Discovery Road	-It serves access function to educational (Kitengela Girls High School), commercial (Open air market), public places (Catholic Church) areas among others.	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;	-Traffic composition: private cars, *boda boda, tuk tuks,* freight vehicles and pedestrians; -On street parking: present near the bus park (both parallel and angular)	-Poor condition of the road -Lack of street lights; -Lack of NMT facilities and road markings; -Road reserve encroachment near the market.	

S. No.	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
				- Street lights and NMT facilities: absent.			
8	Discovery Road	A104 to New Valley Estate	-Serves access function to commercial (many hardwares), educational and residential areas in New Valley estate	Total Length: 1.98 km -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 - Street lights and NMT facilities: absent.	-Traffic: private cars, freight vehicles (from the hardwares), bodaboda, pedestrians, bicycles, tuk tuks and taxis -On street parking: present (perpendicular)	-It's a very busy road because of the many hardwares located along it. - However it lacks NMT facilities hence endangering people's lives; -Lack of street lights.	
9	Imani Avenue	Ongata Rongai Police station	-Serves access function to public places such as the Police Station, Churches and also residential and commercial areas.	Total Length: 0.43km -Road reserve: 16m - Carriageway width: 6m - Surface Type: CPB paved= 0.1 km Condition: Good 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; - Street lights and NMT facilities: absent.	-Traffic: private cars, bodaboda, pedestrians, bicycles and taxis -On street parking: present to the left hand side from Magadi Road (Both Parallel and angular)	-Lack of NMT facilities; -Lack of street lights; -Poor road condition;	

S. No.	Road Name	Link	Function	Shape	Use	Key issues	Modal Split
10	Balozi Road	A104-Balozi Estate	-Serves access function to commercial, educational, public places and residential areas in Balozi Estate.	Total Length: 1.4 km -Road reserve: 10.4m - Carriageway width: 4m -Surface Type: Gravel Condition: poor - Shoulders: not visible - Drainage: open drains -NMT facilities: absent - Street lights and NMT facilities: absent.	-Traffic: pedestrians, private cars, boda-bodas, tuk tuks and human &animal-drawn carts	- Road reserve encroachment; -Lack of street lights; -Poor road condtion.	
11	Saitoti Road	Juakali Road-Estates	Serves access function to commercial, educational, public places (Kitengela Sub-County Hospital) and residential areas	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 - Street lights and NMT facilities: absent.	-Traffic: pedestrians, private cars, boda-bodas, tuk tuks and human &animal-drawn carts	- Road reserve encroachment; -Lack of street lights; -Poor road condtion.	-

SWOT IDENTIFICATION

Strengths	Weaknesses	Opportunities	Threats
Demography			
• High educational achievement and thus a good human resource base. • Diverse population due to proximity to Nairobi.	• Poverty and inadequate housing • Youthful unemployed population • Inadequate public health facilities especially level 3 facilities in Kitengela planning area	• Youthful and educated population • Economic linkages to the city of Nairobi	• Entrenched crime in the city of Nairobi • National governance challenges including corruption • Poor roads linking planning area to Nairobi

Strengths	Weaknesses	Opportunities	Threats
Natural Resources & Environment			
• Available land for residential and institutional development, • Land for industrial commercial development • Land for agricultural activities such as the flower farms.	• Inadequate waste management system; • Encroachment of riparian and open spaces. • Uncontrolled development • Human-wildlife conflict • Pollution of water resources • Air and noise pollution • Increase of water borne diseases	• Sustainable exploitation of natural resources such as building stones and sand.	• Development of informal settlements • Increase in disasters e.g. floods, fire, industrial emissions etc. • Increase in road accidents.
Economic Activities			
• Existing Real Estate and Industrial Base • Available space for expansion • Well-developed network of commercial, transport and other services • Established Banking Industry • Location advantage • EPZ	• Inadequate physical Infrastructure • Administrative Challenges (Business Hurdles)	• Investment Attractiveness • Proximity to Nairobi • Residential, industrial and tourism hub	• Haphazard Planning
Land Use, Land Economics & Urban Design			
Land Use			
• Housing construction boom • Proximity to Nairobi city and Mavoko town • Robust and mixed-use CBD	• Rapid population growth rate • Ribbon-type development along Nairobi-Namanga Road	• Designated as a Growth Centre (Level III)	• Saturation of Nairobi-Namanga Road • Under-utilisation of land at the interior portion

Strengths	Weaknesses	Opportunities	Threats
• Noonkopir old town already an established residential neighbourhood • Presence of Old Namanga Road to supplement Nairobi-Namanga Road	• Leap-frogging sprawl of gated communities at the interior • Loss of wildlife corridor	• May develop as a residential, industrial, and transport hub and as extension of Mavoko town • May also become a tourism hub with the re-establishment of the wildlife corridor • TOD proposals under NaMSIP	• Incongruous land uses such as a quarries beside residential areas • Urban expansion causing the premature conversion of agricultural lands and open areas
Land Economics			
• Well established land registry at the County • Support by the County Government for land administration • Flexibility of the predominant tenure (private tenure) • Existence of a dynamic land market	• Analogue land registry • Poorly trained land administration staff (carry over from the old system) • Rising land prices – likely to increase cost of development of public utilities • Lack of capacity to monitor land market	• County Government and national support for reform in land administration • Development of appropriate laws at county and national levels • Development of structure plans and zoning regulations for the towns.	• Influx of land speculators from Nairobi distorting the property market • Exploitation and displacement of locals from their land by richer individuals from Nairobi • Emergence of slums and illegal subdivisions due to increased demand for land.
Urban Design			
• Mixed-use compact CBD • Noonkopir as an established residential neighbourhood	• 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	• 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 • Implement a land acquisition programme to be able to develop public open spaces	• Deterioration of the quality of the CBD's and Noonkopir old town's urban environments • Increased roadside friction along major road arteries

Strengths	Weaknesses	Opportunities	Threats
	• Lack of pedestrian sidewalks, cycling tracks, and street lighting • Lack of public open spaces that may commonly be used for recreation		
Transportation			
• Town is well connected by road to Mavoko, Nairobi, Kajiado and Namanga border • There are many public transport operators, including motorcyclists • Dedicated budgets for provision and maintenance of transport facilities available at the County • Close proximity to Mavoko town for connectivity to the Northern economic corridor	• 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; • 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.	• 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 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	• Conflicts and accidents due to high vehicle speeds and volumes along the A104 road • Small and congested bus park that stands on a private property. • High traffic volumes and speeds on A104 road making the CBD unattractive.
Social Infrastructure			
Housing			

Strengths	Weaknesses	Opportunities	Threats
• Ample land for housing development especially for owner occupier housing • Ample supply of quarry stone from within Kajiado County	• High prices of construction steel • Expensive building technology using sand, cement and quarry stones	• Ample supply of sand from within Kajiado County at affordable prices • Close proximity to steel works in Nairobi's industrial areas.	• Tenants from Nairobi unable to own houses • Low income tenants from Nairobi creating demand for informal settlements
Education			
• County government and CDF support for basic education • Deep local people's support for education in the county as shown in high education achievement.	• Insufficient number of public pre-primary and primary schools • Limited public land for new schools during the planning period • Pockets of indigenous Masai populations where education for girls is not emphasized.	• County and national government support to basic education • Free Basic Education Policy at National Level	• Proximity to Nairobi attracts school-going children to the streets to beg • Proceeds from crime in Nairobi attract children from school into crime
Health			
• Available private land to acquire for more health facilities • Funding for health facility construction from Constituency Development Fund and County Government	• 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 • Long distances (more than 5 kilometres) covered by most residents to reach health facilities.	• County government support to health services in the planning area • Free Health Care for All Policy being pursued by the National Government	• Health labour force actions including withdrawals around the country • Inadequate health care personnel being hired and/or retained in the health sector in the country.
Sports and Recreation			
• Ample private land is available for acquisition for the construction of a stadium	• Lack of a stadium in the planning area. • A weak history of sports and use of social halls outside schools in the planning area. • No land designated for a stadium	• Possible funding for sports activities and facilities from the County Government	• Funding for the construction of the stadium may be slow in coming due to demand for similar funding across the country

Strengths	Weaknesses	Opportunities	Threats
• There is a tradition of sports in secondary schools across the planning area which may be built on in future		• Emphasis of sport by the national government with possible support for sports facilities such as stadia	• Limited support and funding for social halls and in-door sports across the country.
Public Parks and Playgrounds			
• Private land is available for purchase to use as public parks in the planning area. • There is an emerging urban population that requires parks and playgrounds in the planning area	• Lack of public parks and playgrounds in the planning area. • A weak history and use of public parks in the planning area.	• Middle class influence from Nairobi will increases demand for leisure and play spaces • Emphasis of sport by the national government with possible support for sports facilities such as stadia	• Funding for the construction of public parks may be slow in coming due to demand for similar funding across the country • Limited support and funding for public parks across the country.
Religious			
• Religious groups use private land for their activities • There is a strong tradition of religious activity in the planning area • Large numbers of adherents in most religious groups	• Inadequate quality of worship facilities in the planning area. • Poor location of worship facilities including many without adequate parking space in the planning area.	• Religious freedom in the country • Widespread support and patronage of religious health and educational institutions in Kenya	• Religious extremism which likely to mar inter-religious harmony in Kenya.
Cemeteries and Burial Grounds			
• Available or acquired land can be used to set up cemeteries for Muslims and for Christians separately. • Private land may be acquired and used as cemeteries • People from the planning area are open to using public cemeteries	• Lack of public cemeteries and burial grounds in the planning area. • Weak support from CDF in setting up cemeteries in the planning area.	• Preference by people to bury the remains of their loved ones in public land to free private land for commercial purposes • Shrinking privately owned land sizes per family.	• Funding for the construction of public cemeteries may be slow in coming due to their not being prioritized across the country • Limited funding for public cemeteries across the country.
Cooperative Societies			

Strengths	Weaknesses	Opportunities	Threats
• Strengthened cooperatives in the public transport sector in the planning area • There are strong cooperative roots in the teaching profession in the planning areas. Hence, people know the benefits of the movement first-hand.	• Cooperatives cover a limited number of sectors mainly public transport and urban entrepreneurship. Other sectors are left out. • Cooperatives especially in the public transport sector pay workers poorly and give cooperatives a bad name due to their strong profit maximization motive.	• More people around the country are interested in cooperatives as they aim to pool resources together and borrow. • National government support for the cooperative movement.	• Competition from banks and micro-finance companies offering similar services at larger scale hence cheaply.
Physical Infrastructure			
Water Supply			
• Available water resources. • Water connection company. • Water treatment. • Water distribution system.	• Limited funding • High cost of water treatment. • High cost of connection. • Water catchment degradation. • Vandalism of water connection pipes. • Population influx.	• Financing opportunities from donors etc. • Affordable means of water treatment. • Capacity building on water and sanitation. • Increased revenue collection. • Expanding accessibility.	• Illegal connections. • Vandalism of water pipes. • Water pollution.
Energy Infrastructure			
• Presence of power sub-station at the junction of Rongai road and A104 • Government's UMEME PAMOJA SCHEME	• 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. • High urban population growth rate also strains the available energy sources and utilities leading to power rationing.	• Development of alternative sources of energy such as energy saving jikos; solar panels; wind mills; and use of biogas	• Low cooperation of citizens in energy conservation programmes
ICT Infrastructure			

Strengths	Weaknesses	Opportunities	Threats
• Serviced by all mobile phone operators • Serviced by various national and local television and radio stations • Extensive use of internet and presence of fibre optic cables in the Town	• Disruption of fibre optic cable and other ICT infrastructure during road maintenance and/or upgrading.	• Expansion of coverage of ICT service providers due to heightened demand; improved services due to business competition	• Lowering of service quality due to over-subscription
Solid Waste Management			
• County Government involvement in weekly collection of waste. • County Government conducts clean-up activities. • River rehabilitation programmes. • Designated dump sites.	• Limited funding • Certain households unable to make payment for solid waste collection. • Informal settlements. • Population influx.	• Recycling of waste. • Increased revenue collection. • Energy form landfill. • Relocation of dump sites. • Funding opportunities. • Supply of refuse collection bags.	• Poorly sited dumpsite e.g. Near riparian areas, commercials, and residential areas. • Delays in collection by the waste collection companies or county government. • Dumpsite may attract avian. • Pollution of water resources. • Blockage of storm drains.
Waste Water Management			
• County Government involvement in expansion of sewerage system. • Available land for expansion of sewerage system. • EIA done before new sewerage system is constructed.	• Constrained sewerage systems. • Limited funding. • Certain households unable to make payment for waste water disposal connection. • Informal settlements. • Population influx.	• Affordable waste treatment. • Recycling of waste water. • Increased revenue collection. • Funding opportunities. • Improvement of waste water infrastructure.	• Sewer bursts hence pollution of the environment e.g. water resources. • Construction on sewer lines. • Contamination of clean potable water. • Water borne diseases such as typhoid, amoeba etc. • Destruction of habitats. • Illegal connections. • Destruction of sewer system during infrastructural developments.

Strengths	Weaknesses	Opportunities	Threats
			• Vandalism of waste water collection pipes.
Storm Drainage			
• County Government involvement in improving storm drainage system. • Available land for expansion of storm drainage system.	• Poorly designed storm drainage system. • Limited funding. • Informal settlements. • Population influx (hence solid waste may block storm drainage system).	• Re-design storm drainage system. • Funding opportunities. • Maintenance of storm drainage system. • Re-location of residents in informal settlements living near storm drainage system. • Informal settlement up-grading programmes.	• Overflow of 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. • Destruction of storm drainage system during major infrastructural developments. • Solid waste blockage and siltation of storm drainage system.
Disaster Risk Reduction & Management			
• County strategies to mitigate effects of climate change and variability. • Global partnerships towards addressing climate change. • Awareness created. • Preparedness strategies.	• Inadequate resources to mitigate effects of climate change and variability. • There is inadequate information on climate change. • Climate change and variability not given priority.	• Carbon market for example tree planting and renewable energy. • Improvement of drainage system. • Capacity building on climate change. • Financing opportunities.	• Geo-hazards such as floods and landslides. • Loss of livelihoods as a result of prolonged droughts. • Loss of lives and property. • Water borne related diseases such as Malaria, diarrhoea, typhoid, among other.