



Department of Physical Planning, Lands and Housing

**CONSULTANCY SERVICES FOR PREPARATION OF INTEGRATED LOCAL
PHYSICAL AND LAND USE DEVELOPMENT PLAN FOR MUKURWE-INI URBAN
AREA, 2020-2030.**



DRAFT PLAN REPORT

MAY, 2022



EXECUTIVE SUMMARY

One of the major problems and challenges facing Kenya is the unprecedented and unchecked rapid urban growth at the expense of rich agricultural land. Most urban areas throughout the country remain unplanned, uncoordinated and uncontrolled. Those that are planned are not aptly implemented thereby causing challenges in conflict of land use as well as proliferation of informalities.

The County Government of Nyeri has embarked on preparing an Integrated Local Physical and Land Use Development Plan for Mukurwe-Ini Urban Area for the general purpose of guiding and coordinating development in the area. The plan's focus is to integrate physical, economic, social, cultural and environmental as well as institutional aspects and tap the potential of Mukurwe-Ini Urban Area. The plan is expected to guide development in the urban area, support urban form and quality of life – accessibility to services, mix of functions, integrated social strata and promote development control.

The planning of the Mukurwe-ini Urban Area is in pursuant to the Constitution of Kenya (2010), County Governments Act (2012), Physical and Land Use Planning Act (2019), Environmental Management and Coordination Act (2015), other related Acts of Parliament and the relevant polices internationally, nationally and at the county level. The aim is to improve the livelihoods of the people in the town, promote proper land use and land management as well as environmental protection.

Mukurwe-ini Urban Area is experiencing several development challenges including;

- Inadequate space for expansion of the town given its hilly characteristics
- Inadequate supportive physical infrastructure, services and facilities,
- Escalation in crime and social distress.
- Lack of a development framework to guide development and protect the fragile environment.

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Other challenges facing the town include excessive and uncoordinated piecemeal subdivisions of privately owned land without planning approvals and uncontrolled developments without requisite and complementary expansion of utilities and services.

It is with this regard that the county government seeks to further the planning discourse of Mukurwe-ini Urban Area in order to arrest the above-mentioned challenges and improve the livelihoods of residents.

This report presents the following sections:

- I. A background introducing the objectives of the assignment, approach and methodology used in undertaking the assignment, the planning context and history, functions of the urban area as well as the set vision for the urban area
- II. A summary of the situation analysis report based on thematic areas
- III. A summary of planning issues alongside identified opportunities and recommendations; these have been invented thematically
- IV. An inventory of the existing development concept, development options and the preferred development form and pattern
- V. A structure plan, a detailed land use plan and a zoning plan alongside development regulations
- VI. An inventory of a detailed action area plan for the core urban area (Kiahungu).
- VII. Identified development strategies in terms of thematic objectives, strategies and projects
- VIII. An implementation framework detailing the nature of projects in terms of implementation period and actors, coordination and community participation frameworks.

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Acronyms

ABTC	Appropriate Building Technology Center
asl	Above Sea Level
ATM	Automated Teller Machine
CBD	Commercial Business District
CIP	Capital Investment Plan
DCI	Directorate of Criminal Investigation
DTF	Decentralized Treatment Facility
DTM	Digital Terrain Model
ECDE	Early Childhood Development Education
F, S, R	Front, Side and Rear Setbacks
FDGs	Focus Group Discussions
Ha	Hectares
HIS	Health Information System
ICT	Information Communication Technology
ILPLUDP	integrated Local Physical and Land Use Development Plan
KCB	Kenya Commercial Bank
KeRRA	Kenya Rural Roads Authority
Km	Kilometres
KMTC	Kenya Medical Training College
KPLC	Kenya Power and Lighting Corporation
LPG	Liquid Petroleum Gas
mm	Millimetres
NG-CDF	National Government Constituency Development Fund
NMT	Non-Motorized Transport
OMWASCO	Othaya Mukurweini Water and Sanitation Company
PCEA	Presbyterian Church of East Africa
PSV	Public Service Vehicle
TSC	Teachers Service Commission
TTI	Technical Training Institute
VTC	Vocational Training College

1 BACKGROUND

This section introduces the purpose, objectives and methodology used in undertaking the assignment. It also details the planning context and history of the town as well as the set vision for the urban area.

History of the Urban Area

The word Mukurwe-ini means a tree from where the origin of the Agikuyu comes from. The tree is a shrine for the Agikuyu and has a strong cultural significance to the people. Mukurwe-ini Sub county was a former district out of the old Nyeri District (one of seven). This was after elevation from a division (formely referred to as South Tetu before independence in 1963) in the year 2008. Kiahungu Township was established as the headquarters of the division and subsequent district in 1945 soon after the Second World War. This has remained so for the centre up until the dispensation of the new constitution where it has evolved as the Sub-County headquarters for the Mukurwe-ini.

Within the planning area there are other distinct places that have both colloquial and cultural significance. These include Gathukimundu and Gikondi.

The name Gathukimundu is a combination of two *Gikuyu* words with *gathuki* meaning the part of a tree that remains when it is cut. *Mundu* means 'human being'. The two words combined together mean a tree remain which resembles a human being. This phrase came from the colonial days whereby the tree remains used to scare the colonialists who often times attached it thinking it was the maumau fighters. This has since then been the name of the village, catholic church and a primary school around the area.

Gikondi on the other hand is synonymous with the Mau Mau fighters during the colonial period. It is the place where the mau mau used to hide in caves and coordinate assisted attacks against the colonialists. The caves offered shelter and a secluded hiding place for the fighters. The area is also home to an execution and burial site for fighters found guilty by the colonial administration. Within Gikondi lies the burial site for a number of former Mau mau fighters and their alleged sympathizers.

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Problem Statement

Mukurwe-ini Urban area is experiencing a myriad of development challenges including inadequate supportive infrastructure and services, high rates of unemployment, escalation in crime and social distress, uncontrolled development without requisite and complementary expansion of utilities and services. These challenges are a manifestation of poor coordination of development efforts from the different governing regimes from the former district and current county.

Ownership of land within the different nodes (Ngoru, Mihuti, Kiahungu, Maganjo, Gikondi and Kamuchuni) has changed hands from the post-colonial period to the present day. The main form of tenure being on a lease basis from the former county council to the county government. The inheriting parties have in return directed their investment efforts to other areas or have inadequate financial capacity leaving these once vibrant nodes to undergo decay overtime. The result has been a corresponding loss of returns in terms of revenue as well as a diminishing lure in investment in the urban area.

Another inhibition to development and investment within the urban area is the rugged and steep terrain of the land. The terrain requires innovation in development, which proportionately increases the cost of construction. The terrain also reduces the space footprint for allowing the urban area to grow.

The need to prepare a plan for the urban area arises from the following concerns:

- The function of Kiahungu Centre as the headquarters for Mukurwe-ini Sub-County and the main centre for service provision.
- The need to demarcate areas that are safe for development.
- An anticipated rise of population within the urban area overtime.
- The need to solve the prevalent challenges faced by residents.
- Outdated and unimplemented previous plans.
- Revitalization of the urban nodes and diversification of livelihoods.

1.1 Purpose of the Plan

This plan will be used to serve the following purposes:

- i. Framework to guide land use within the planning area
- ii. Basis for attracting investment
- iii. Framework for provision of appropriate infrastructure and utility services
- iv. Improving the towns livability index;
- v. Basis for environmental management and conservation;
- vi. Basis of regulating day to day development in the town.

1.2 Objectives of the Plan

The following is a list of what the plan intends to achieve within the span of the planning period of ten (10) years;

- i. Optimize the use of land and land-based resources.
- ii. Spur local economic development
- iii. Integrate land uses and activity areas
- iv. Create a basis for provision of appropriate infrastructure.
- v. Protect and conserve the natural environment while improving the built environment
- vi. Promote good urban governance
- vii. Create a basis for land use management and development control.

1.3 Approach and Methodology used in undertaking the assignment

1.3.1 Approach

Key planning approaches that informed the preparation of the ILPDP for Mukurwe-Ini urban area included;

i. Multi-disciplinary Approach

The preparation of the ILPDP involved a multi-disciplinary approach, where input of various professional backgrounds was utilized including; physical planning, urban design, land surveying, architecture, transportation engineering, water and sanitation engineering,

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environmental expertise, legal expertise, sociology, land economics among others. This ensured delivery of a wholesome ILPDP for Mukurwe-Ini urban area.

ii. Multi-sectoral Approach

The ILPDP preparation process focused on deliberate collaboration of stakeholder groups with interest in a variety of sectors including transportation, physical and social infrastructure, environment youth and gender issues, among others. The plan therefore bears interventions that address planning challenges across the various sectors. Given the participatory nature of the approach, sectoral players will be expected to determine impact of the plan in their own sectoral plans, goals and objectives.

iii. Participatory Planning Approach

During the process, comments and concerns obtained from various stakeholders were incorporated into the Plan as appropriate. This approach helped build consensus on the plan proposals as well as create a sense of ownership of the plan amongst stakeholders. This was achieved through project technical meetings and stakeholder workshops, which were convened in close collaboration with the Client. This helped in preparing a communication strategy for the entire plan preparation process.

iv. Evidence - Based Decision Making

This approach helped ensure that plan proposals formulated during the course of the project were justifiable based on actual data collected and subsequent analysis. This also helped ensure their practicality in addressing identified development challenges in the urban area.

v. Strategic Approach

In preparation of the ILPDP, land budgeting was undertaken based on land availability and prioritization of land use requirements. This was also achieved through land optimization, which ensured that land was put to the most suitable use. Strategic approaches ensured creation of sustainable urban spaces for people to live, work and play.

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vi. **Integrated Development Planning Approach**

The ILPDP preparation process focused on deliberate collaboration of stakeholder groups with interest in a variety of sectors including transportation, local economy, environment and physical and social infrastructure among others. The plan therefore bears interventions that address planning challenges across the various sectors including the physical, economic, social, cultural and environmental as well as institutional aspects.

vii. **Bench Marking for Best Practices**

Benchmarking was undertaken to compare development trends, as well as development potentials opportunities and constraints in the urban area to other urban areas, both nationally and internationally. The purpose for this was to obtain widely acceptable and prescribed interventions that can suitably be applied in preparing the ILPDP.

1.3.2 Detailed Methodology of Undertaking the Assignment

The activities/tasks undertaken during plan formulation are entailed in a phase-based process with the aim of achieving the intended objectives of the assignment. The phases are;

1. Project Design/Preparatory Phase
2. Digital Mapping Phase
3. Urban Study and Analysis Phase
4. Plan Preparation Phase

Table 1-1: Methodology of undertaking the assignment

PHASE	STEPS	ACTIVITIES /TASKS	OUTPUTS
Project Design/ Preparatory Phase	<ul style="list-style-type: none"> ➤ Mobilization ➤ Preparation of data collection tools ➤ Launch of the exercise ➤ Boundary delineation 	<ul style="list-style-type: none"> ➤ Mobilization and Start up Meetings ➤ Collection of Spatial Data (RIMs, Survey Plans, PDPs, Topographical Maps and other available Maps) ➤ Project Reconnaissance ➤ Establishing a Mode of Operation/Action Plan ➤ Stakeholder Identification and Mobilization 	<ul style="list-style-type: none"> ➤ Inception Report ➤ Final boundary

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PHASE	STEPS	ACTIVITIES /TASKS	OUTPUTS
		<ul style="list-style-type: none"> ➤ Launch/Awareness ➤ Undertake the final delineation of the planning area boundary in consultation with the Client and relevant stakeholders 	
Digital Mapping Phase	➤ Digital Topographic Mapping	<ul style="list-style-type: none"> ➤ Project Area Reconnaissance ➤ Acquisition of existing maps, satellite imagery ➤ Establishment of survey control network ➤ Creation of feature layers and feature extraction ➤ Field (ground) verification and map compilation. ➤ Preparation of Geo-referenced base map for the urban area ➤ Creation of a GIS based database 	<ul style="list-style-type: none"> ➤ Control survey network ➤ Satellite imagery ➤ Up-to-date Digital Topographic Maps ➤ Geo-referenced Base Map for the urban area ➤ Thematic Maps
	➤ Digital Cadastral layer	<ul style="list-style-type: none"> ➤ Data preparation and sorting ➤ Data Scanning ➤ Digitization of cadastral information ➤ Cadastral data compilation 	<ul style="list-style-type: none"> ➤ Digital cadastral layer ➤ GIS based database
Urban Study and Analysis Phase	➤ Urban Study	<ul style="list-style-type: none"> ➤ Secondary data collection <ul style="list-style-type: none"> • Literature review ➤ Primary Data Collection <ul style="list-style-type: none"> • Field observations and photography • Administration of household surveys (questionnaires) • Key Informant interviews • Focus Group Discussions (FGDs) • Detailed study of all intended beneficiaries from the Market Centre • Assessment of the Environmental status of the urban area 	<ul style="list-style-type: none"> ➤ Situational Analysis Report ➤ Visioning Workshop Report

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PHASE	STEPS	ACTIVITIES /TASKS	OUTPUTS
	➤ Analysis	<ul style="list-style-type: none"> ➤ Establishing of analysis criteria ➤ Description and illustration of development trends ➤ An account of socio-economic linkages ➤ An identification of potentials, opportunities and constraints ➤ An identification of emerging issues 	
	➤ Stakeholders validation workshop	<ul style="list-style-type: none"> ➤ Validation of situational analysis findings ➤ Visioning Workshop 	
Plan Preparation Phase	➤ Formulation of Draft Plan.	<ul style="list-style-type: none"> ➤ Evaluation of Development models and scenario building ➤ Formulation of Draft Land Use Plan and Policies ➤ Preparation of Draft Zoning Regulations ➤ Formulation of Draft Sector Strategies and Projects including connectivity network for the urban area ➤ Development of Environmental Social Management Plan ➤ Preparation of a Draft Implementation Strategy ➤ Preparation of a Draft Capital Investment Plan (CIP) 	<ul style="list-style-type: none"> ➤ Draft ILPLUDP Report ➤ Draft Land Use Plan, Policies and Sector Strategies ➤ Draft Environmental Social Management Plan ➤ Draft Implementation Strategy ➤ Draft Capital Investment Plan
	➤ Stakeholders' Validation Workshops	<ul style="list-style-type: none"> ➤ Presentation of draft plan to stakeholders. ➤ Critique and validation of draft ILPDP proposals 	➤ Draft Plan Validation Workshop Report
	➤ Analysis	<ul style="list-style-type: none"> ➤ Establishing of identification criteria for beneficiary list ➤ Identification of intended beneficiaries from the Market Centre ➤ Validation of the intended beneficiaries from the Market Centre 	➤ Detailed List of all intended beneficiaries from the Market Centre
	➤ Final Plan preparation	➤ Incorporating comments from stakeholders	➤ Final ILPLUDP Report

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PLAN, 2020-2030**

PHASE	STEPS	ACTIVITIES /TASKS	OUTPUTS
	➤ Plan Approval	➤ Submission to the client i.e. County Government of Nyeri for adoption, approval and implementation	➤ Legally binding ILPLUDP

1.4 Context

1.4.1 Legal and Policy Context

This section gives a highlight of the laws and policies that guided the preparation of the Mukurweini Urban Development Plan. Various sections within the stated laws have been highlighted to show their function to the delivery of the plan.

Legal Context

LAW	ROLE IN PLAN FORMULATION
The Constitution of Kenya, 2010	<ul style="list-style-type: none"> • Section 60 (1) stipulates the principles of land management • Section 61 (2) stipulates the classification of land in Kenya. • Section 66 (1&2) insists on the regulations of land use and property • Section 69 (1) indicates the states' obligation in respect to the environment. • Section 70 (1&2) stipulates the enforcement of environment rights • Section 42 states the right for every person to have a clean and healthy environment
The County Government Act, 2012	<ul style="list-style-type: none"> • Section 5 states the responsibilities of the county government including county planning as provided in the fourth schedule of the constitution. • Section 49 introduces the urban areas and cities act as a tool for management of urban areas and cities. • Section 102 stipulates the principles of planning and development facilitation in a county • Section 104, indicates the obligations to plan by the county

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LAW	ROLE IN PLAN FORMULATION
	<ul style="list-style-type: none"> • Section 115, stipulates the process taken to carry out public participation.
Urban Areas and Cities Act, 2011 and Urban Areas and Cities (Amendment) Act, 2019	<ul style="list-style-type: none"> • Section 5 instructs on the criteria used for classification of urban areas and cities. • Section 11 insists on the principles of governance and management of urban areas and cities. • Section 32 highlights on the service delivery by a town committee • Section 36 stipulates the objectives of an integrated urban area and city development plan.
Physical and Land Use Planning Act, 2019	<ul style="list-style-type: none"> • Section 5 stipulates the principles and norms of physical and land use planning. • Section 10 indicates the responsibilities of the Cabinet secretary in relation to the physical land use planning. • Section 45 describes a local physical and land use development plan: its purpose, preparation, content, notices of objection and approvals as well as the publication of the LPLUDP. • Second schedule part A instructs matters that may be dealt with in a LPLUDP.
Environmental Management & Coordination Act, 1999 & Amendment Act of 2015	<ul style="list-style-type: none"> • Under section 9(2) (c) of establishing and reviewing land use guidelines and examining land use patterns to determine their impact on the quality and quantity of natural resources • Guides the preparation of environmental strategy for the protection and conservation of the environment, provides for public participation in the development of plans and processes for the management of the environment

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Policy Context

POLICY	ROLE IN PLAN FORMULATION
Kenya Vision 2030	<ul style="list-style-type: none"> • Chapter 2, indicates the foundation for socio-economic transformation • Chapter 3, outlines the economic pillars such as tourism, agriculture, wholesale and retail trade, manufacturing, business process outsourcing/offshoring, and financial services. • Chapter 4, outlines the social pillars including education and training, health care delivery, water and sanitation, environmental management, gender youth and vulnerable groups, housing and urbanization and social equity and poverty reduction. <p>Elements such as promotion of agriculture, wholesale and retail trade as well as provision of infrastructure shall be promoted within the urban area in order. These will then act as the spring boards for spurring development of the urban area in keeping up with the policy guidelines of the vision.</p>
The National Land Policy, 2009	As contained in Sessional Paper No. 3 of 2009 recognizes that “development of land in urban and peri-urban areas has been inhibited by poor planning, rapid growth of human settlements and activities, unmitigated urban sprawl and inadequate provision of infrastructure.” The policy, further, notes that proper planning will facilitate coordinated development of urban and peri-urban areas in terms of housing, commercial, industrial and infrastructure development to accommodate changes in lifestyle and economic activities.
Urban Development Policy	The policy objectives include ensuring the legal personality of cities and urban areas; ensuring planned, inclusive, and sustainable urban development that implies the recognition of urban centres as entities that strive to harmonize physical planning with economic development planning and are sensitive to stakeholders’ participation and environment among others.

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POLICY	ROLE IN PLAN FORMULATION
National Spatial Plan, 2015-2045	The policy seeks to achieve promises Kenyans furnished themselves under the new Constitution such as the right to a better economy; the need for balanced development across the country, the right to a clean and healthy environment and the right to property among others. It also lays a foundation for Article 66 of the Constitution on regulation of land uses.

1.4.2 Population

According to spatial analysis, the population covering the entire planning area is estimated at 26,190. A further analysis and projection of the population to the end of the planning period is presented in table 1-2.

Table 1-2: Population Growth Trend

Year	Urban areas growth rate (5.34%)	County growth rate (3.778%)
2019	26,190	26,190
2020	27,589	27,179
2023	32,248	30,378
2026	37,695	33,953
2030	46,415	39,382

Source: consultant's construct, 2021

1.4.3 Locational Context

Mukurweini Urban Area lies on latitude -0.5613° and longitude 37.0509° in Mukurweini Sub County, Nyeri County.

The urban area is located about 143km from the capital city, Nairobi, via Karatina Town. The urban area is approximately 24km from Nyeri Town via Gatitu through Tambaya and approximately 16km from Othaya Town.

The planning area spreads across three wards which include Mukurwe-ini Central, Rugi and Gikondi Ward. Mukurwe-ini Central Ward covers a total area of 13.93km^2 within the planning area while Rugi and Gikondi Wards cover 6.55km^2 and 3.08km^2 respectively. The planning area covers a total of 23.56km^2 . Maps 2-1 and 2-2 show the context of the urban area at a regional

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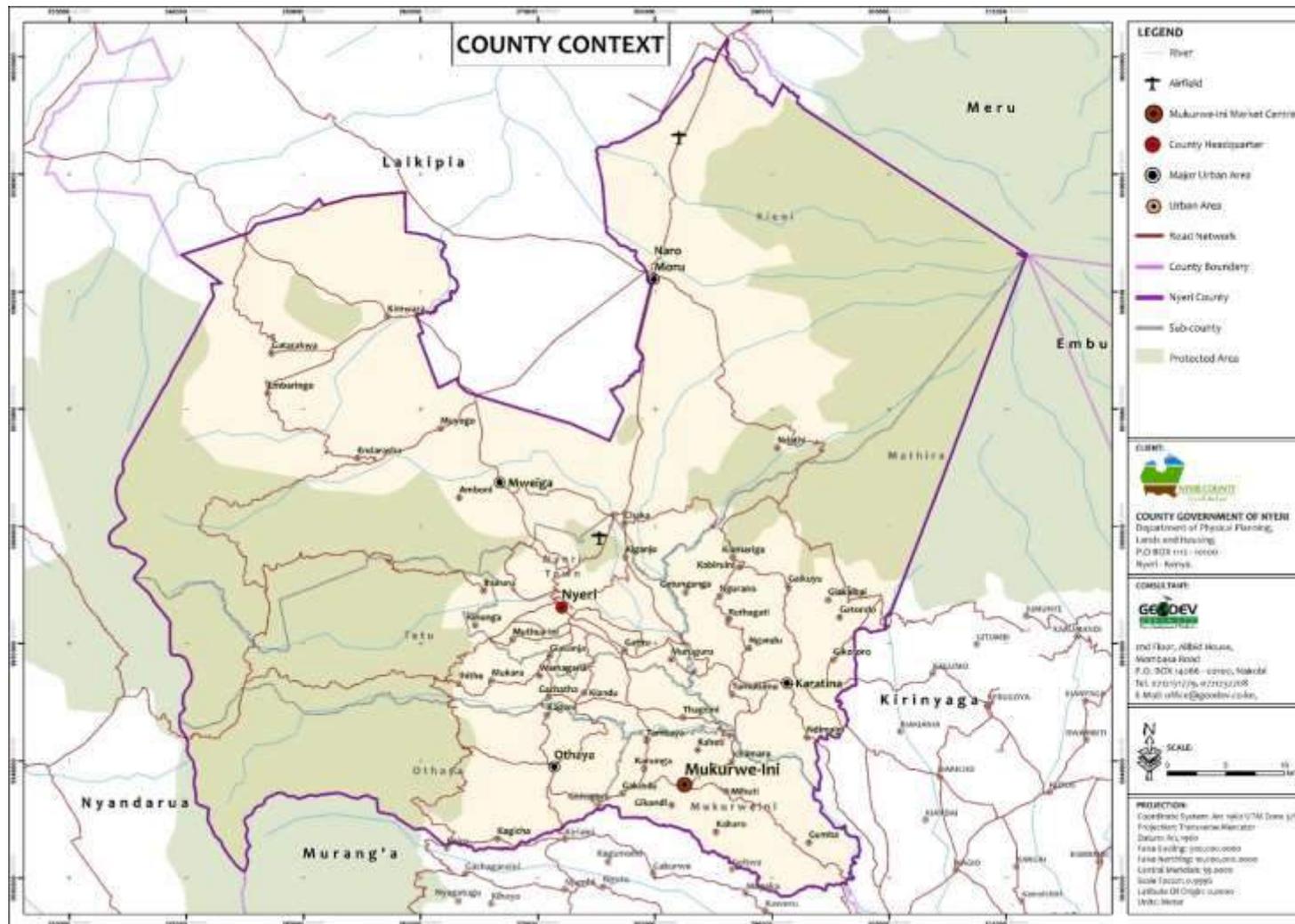
and local scale. The regional scale shows the relationship of the urban area to other local centres while the local context shows the coverage of the wards within the planning area.

Locational Advantages

- The proximity of the town to other local and regional urban areas presents an advantage in terms of market for agricultural produce from the town. Linkage of the urban area locally and regionally is presented on map 1-1.
- There is an opportunity for plan implementation and resource allocation due to spread of the planning area within three wards.

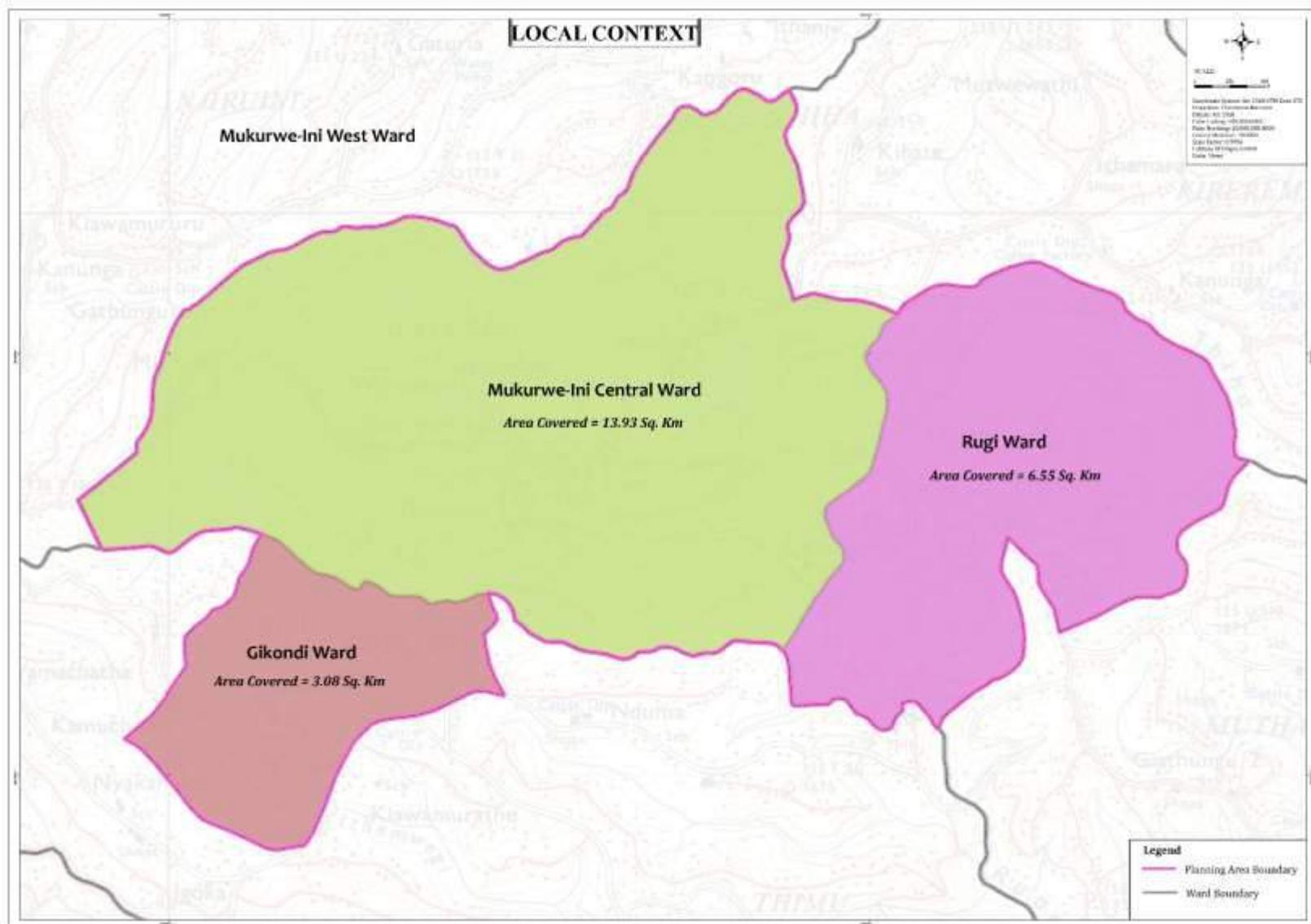
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Map 1-1: Regional Context of Mukurweini Urban Area



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Map 1-2: Local Context of Mukurwe-ini Urban Area



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1.4.4 Physiography

1.4.4.1 Climate

The average annual rainfall received in Mukurwe-ini Sub County is 1,408mm. April and May are the wettest months receiving 327mm and 301mm of rainfall respectively. This forms the long rains season within the Sub-County. The month of October receives 177mm while November receives 212mm of rainfall forming the short rains period. The months of January and February receive 28mm and 35mm of rainfall on average. These are the two driest months within the sub-county. (<https://weather.co.ke/>)

The average annual temperature received within Mukurwe-ini is 18.55°C with the highest temperature recorded at 27.8°C within the months of January and February. The least recorded temperature is 9.3°C during the months of June and July. (<https://weather.co.ke/>)

Implications

- The high rainfall amounts favor agricultural activities for crops such as tea and coffee.
- The low temperatures favor the growth of cash crops like coffee.

1.4.4.2 Geology and Soils

Mukurwe-ini Urban Area is mainly characteristic of basalt type of rocks. These rocks are essential in road construction and may significantly reduce the cost of road construction in the urban area. The rock structure is also favorable in the construction industry as it can serve as a strong base for setting foundations.

The planning area has two types of soils. These are Nitosols and Cambisols. Nitosols are formed within volcanic footbridges. The soils are fertile but very erodible. These soils cover approximately 98% of the planning area.

Cambisols on the other hand are hill soils that are stony and shallow and must be covered by dense vegetation. The soils are excessively drained, moderately deep, red, very friable, sandy clay loam to sand clay, in places rocky.

These soils are good for large scale coffee production due to the altitude of the area as well the average annual temperatures and rainfall received within the sub-county. However, areas

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such as Njege down to Karundu are highly susceptible to landslides and mudslides, although in small scale, due to the type of soils characteristic within Mukurweini Urban Area.

1.4.4.3 Topography

The urban area is characteristic of high ridges and steep escarpments. The top of these ridges are generally flat and can support urban development while most escarpments dip at angles greater than 15° which is unsuitable for sustaining urban development as well as intense agricultural activities.

The planning area is higher on the Western side rising at an altitude of between 1814 to 1860m above sea level (asl).

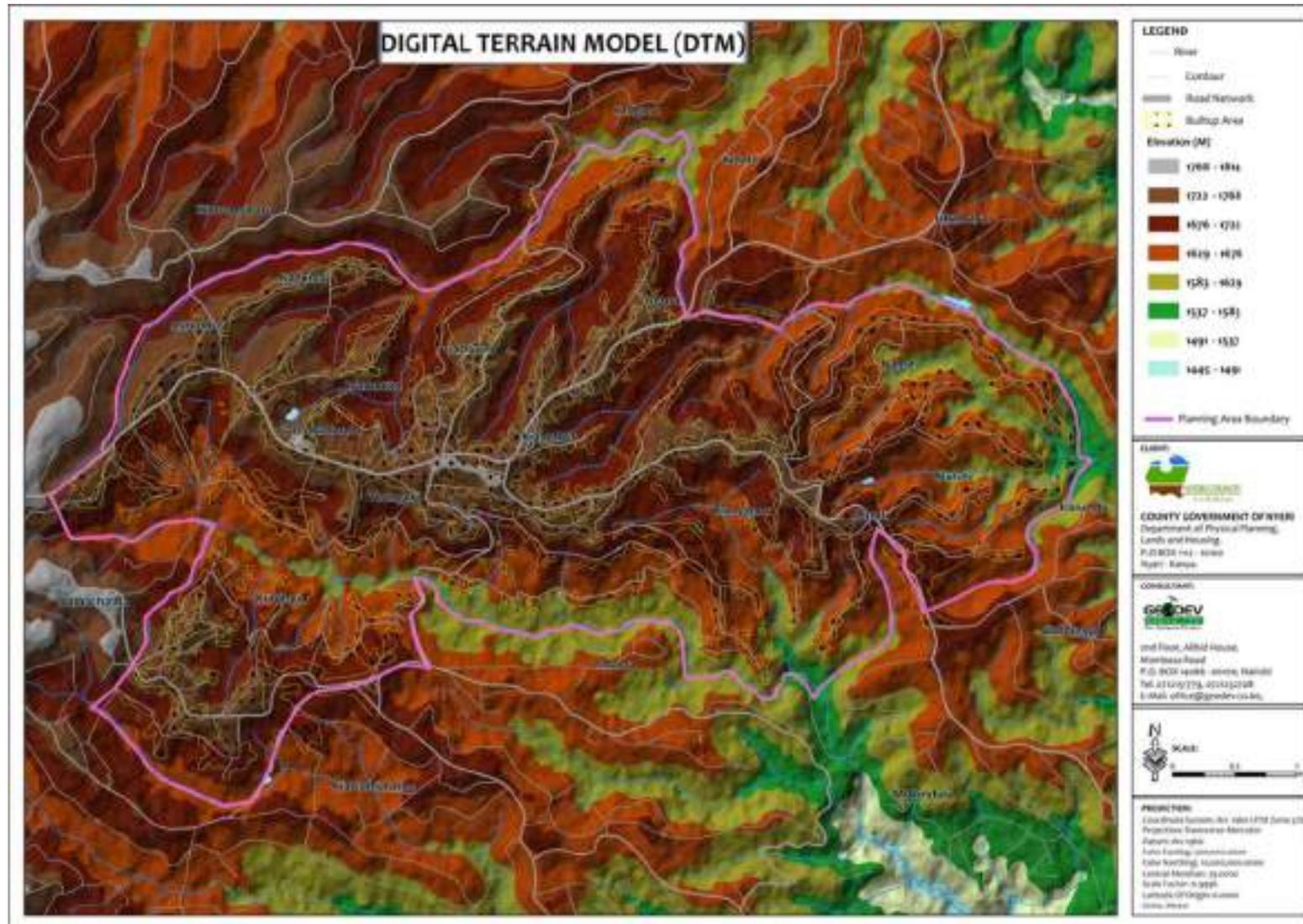
The ridges form a fingerlike shape rising from Mirundu/Kaguma area at an altitude of 1760m asl through Gathukimundu and Kiahungu at the centre of the town. This elevated area also spreads to Ngoru to the North of Kiahungu as well as Muhuti to the East. The lowest areas include Nduma area stretching along the River Rualai to the areas around Mwati Primary School at an altitude of 1575m asl.

Areas around Njege (Weru Primary School) are also low at altitudes of 1555m asl. Map 1-2 presents the terrain model for Mukurweini Town.

The general landform of Mukurweini Urban Area has affected the development patterns in the town with people settling on high grounds only. Settling on lower grounds has exposed some residents to frequent landslides and flooding exposing their lives to danger. This forms a clear indication on the structuring of the town along ridges and protection of the steep escarpments in the future.

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Map 1-3: Digital terrain model of Mukurweini Urban Area



1.5 Planning History

The town has two previous planning interventions. One was done in 1969 and the other in 1982. These plans are as described.

1.5.1 Mukurwe-ini Short Term Development Plan of 1969

The plan covered a total area of 64.86Ha. This consisted of a planned area covering 42.63ha/0.426km² and an area earmarked for possible future expansion of the area covering 22.23Ha/0.222km². The plan was spanning from Muhito Primary School to the north east, the cattle dip adjacent to Gachiro primary school to the north west and Thunguri coffee factory to the south.

The following are the proposals contained within the plan that currently exist on the ground:

- The sub county hospital
- The Kiriti stadium
- The beer hall where the Mukurweini law courts currently exist
- Mihuti primary school
- The coffee factory
- The cemetery
- The cattle dip
- The commercial area along the road to Karatina.

However, some proposals are currently nonexistent or have been replaced by other land uses. These include:

- The police station that is currently located adjacent to Kiriti stadium was initially proposed area on the opposite side of the Karatina-Othaya road.
- Gachiro primary school sits where the proposed dumpsite was to be located.
- The proposed public purpose area is currently located on the same side as the Kiriti stadium. This is opposite the plan's proposal in terms of location.
- The proposed market is directly opposite the existing market within the town.
- The site earmarked for a proposed water supply site is currently occupied by mixed land use developments.

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- The location of the current bus park had been earmarked for residential purposes
- The two proposed urban parks have been replaced by uses including commercial and public purpose.
- The Mukurwe-ini dairy limited sits on the proposed residential area at the junction to the existing law courts.
- The proposed bus station next to the existing law courts has been replaced by a church.
- The proposed slaughter house is currently not existent. Agricultural activities are taking place on the proposed site.

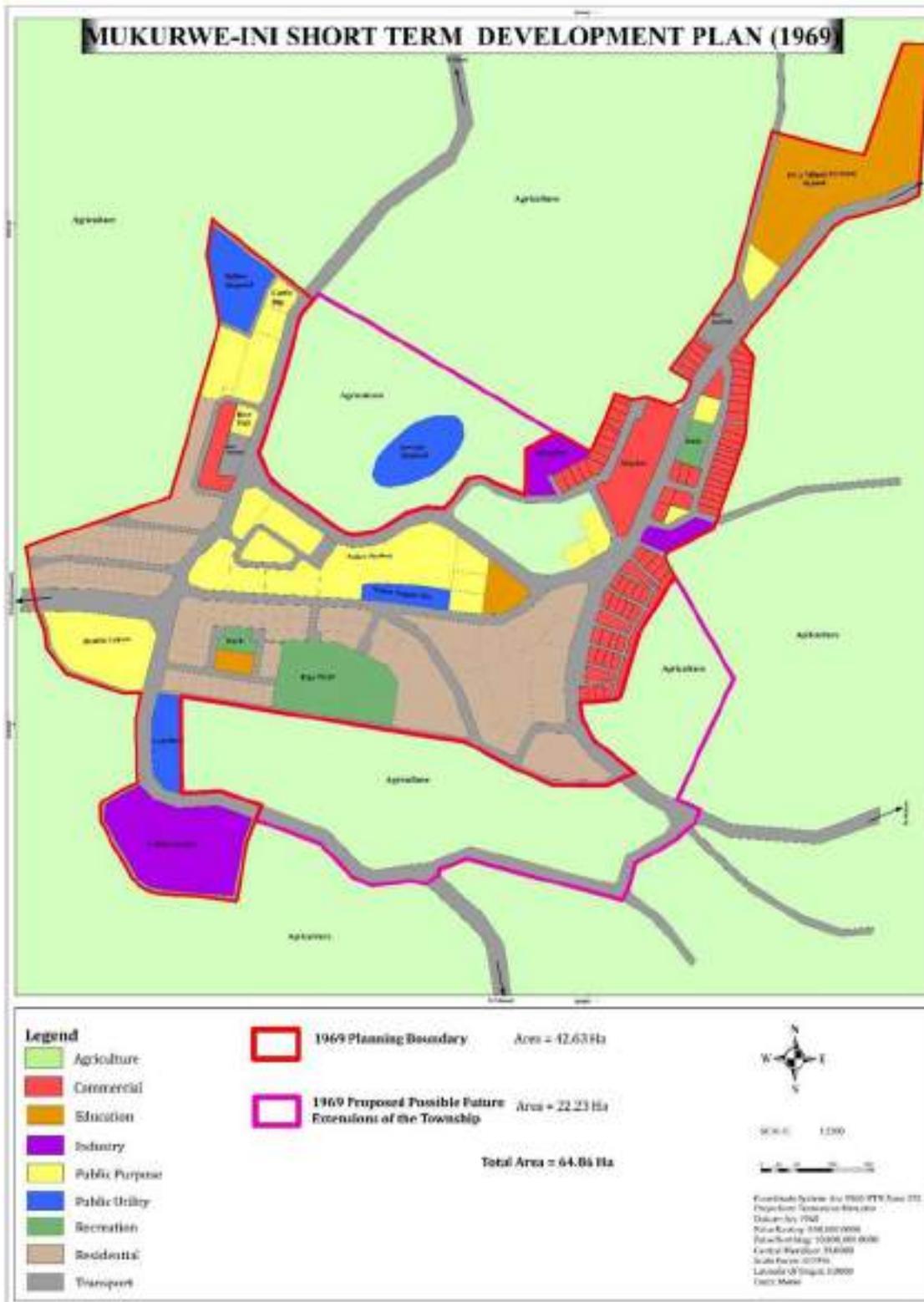
The inadequacy of the plan can be attributed to such factors as;

- The steep, hilly terrain of the land,
- Poor plan implementation by the previous accountable authorities/county council
- The existing demand for scarce developable land within the town for other land uses for residential and commercial purposes.
- Lack of familiarity of the area by the planning authorities of old brought about proposals that could not be actualized on the ground.

It can be inferred that the plan has been 98% ineffective in terms of directing development in the town. Map 1-3 shows the Mukurwe-ini short term development plan of the year 1969.

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Map 1-4: Mukurweini Short Term Development Plan, 1969



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1.5.2 Mukurwe-ini Short Term Development Plan of 1982

The development plan for 1982 depicts to a larger extent the current development situation in the town. The plan covered a total area of 60.66Ha/0.607km². The plan envisaged a linear pattern of development for the town. The linear pattern of development envisaged by the plan is dominantly influenced by major roads as well as the steep terrain of the area. This is in part due to the prevailing physiographical situation in the town that is characteristic of steep slopes.

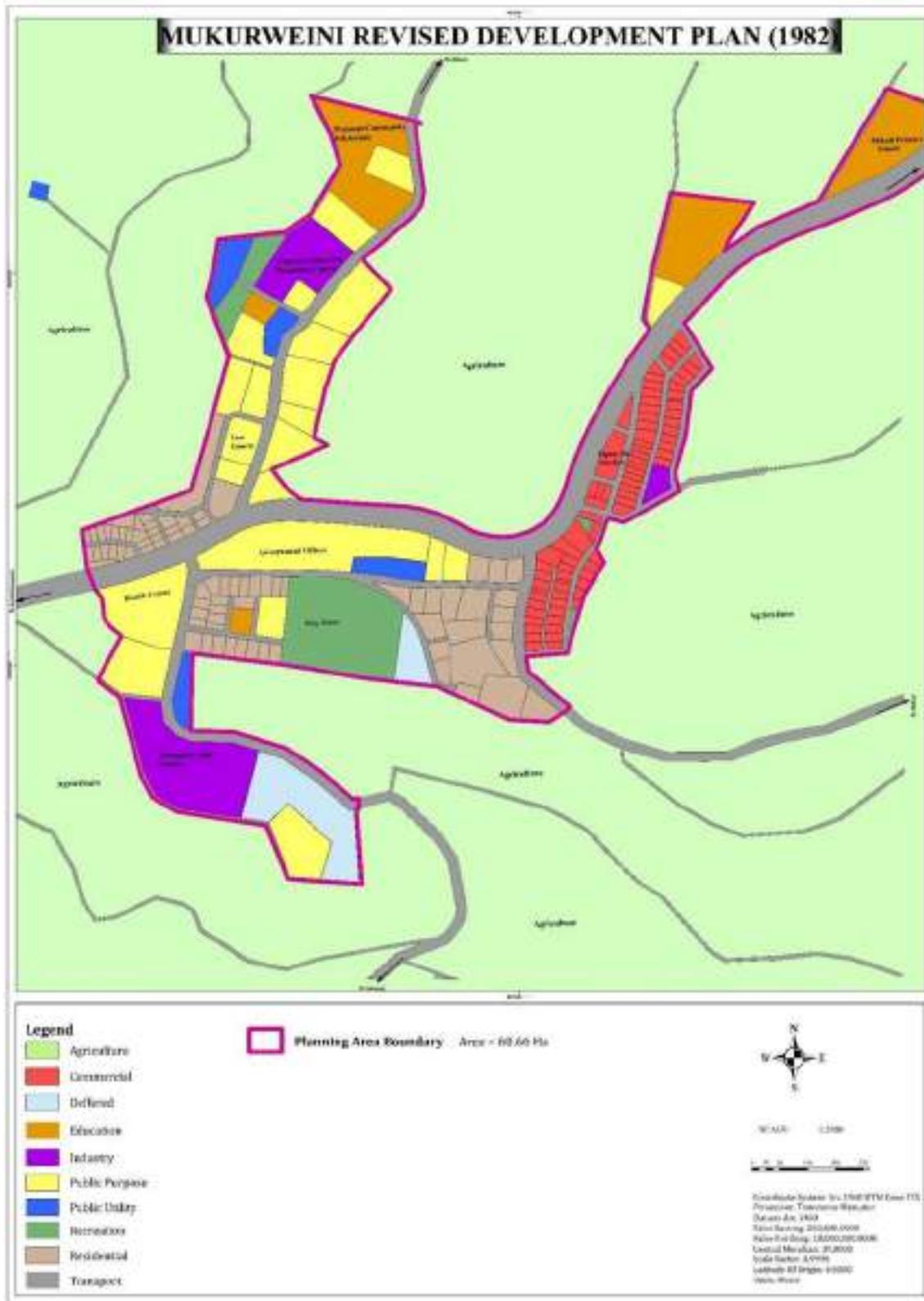
The following are the land uses that are currently present within the town as envisaged in the plan:

- Mihuti Primary School
- The Mukurwe-ini sub-county hospital
- The Mukurwe-ini Law Courts
- The civic area where the current deputy county commissioner's office and the police station are situated
- The Kiriti Stadium
- The commercial area along the road to Karatina past the junction with the road to Mihuti. This commercial area also houses the existing open-air market.
- The Thunguri Coffee Factory
- The residential area adjacent to the Kiriti stadium

The plan, unlike its precursor, has proven to be adequate over the years in directing development within Kiahungu Centre. Map 2-4 shows the development plan of the town as done in the year 1982.

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Map 1-5: Mukurweini revised development plan, 1982



1.6 Major functions of Mukurweini Town

Administrative Function

The town is the sub county headquarters for Mukurweini Sub County. As a result it hosts the offices of the Deputy County Commissioner and various national and county government offices at the sub county level. These offices include public health, trade and revenue offices, TSC offices, agriculture and Physical Planning offices.

Service Function

Mukurweini urban area offers a number of services to its residents including health, water, electricity, education, housing, security, justice and recreation. This has been enabled by the existence of institutions like OMWASCO, KPLC, Mukurweini police station and law courts, Mukurweini Sub County Hospital and Mukurweini Technical Training Institute among others.

Industrial Function

There exist a number coffee and milk processing industries in Mukurweini. These industries are fed by the hinterlands of the urban area where coffee and dairy farming are dominant. The town as well envisages the processing of other farm produce including bananas, avocados and macadamia nuts due to the increasing volumes produced and profitability of the three produces.

Residential and Commercial Functions

Mukurweini has a mixture of residential functions ranging from rental housing within Kiahungu to farm houses within the agricultural area. There also exist a number of commercial establishments in the centre including banks, petrol and service stations, dairy and coffee processing, banks, hotels and restaurants as well as wholesale and retail stores.

1.7 Vision for Mukurweini Urban Area

Visioning is a process undertaken by stakeholders to project the desired end state in relation to the development of an urban area by invoking the imagination of the stakeholders into shaping their future. This vision forms an impetus for the present and future actions. The vision setting process is anchored in public participation which is provided for by chapter 11 of the Constitution of Kenya and Section 87 of the County Government Act, 2010.

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Plate 1-1: Visioning Workshop at the Mukurwe-ini NG-CDF Hall



Resultant from a visioning workshop held in the Mukurwe-ini CDF hall, stakeholders presented visions thematically as presented below.

- I. **Physical infrastructure**- To have the best habitable town in Mukurwe-ini Sub County with adequate drinking water, food, electricity, ICT Literate people and proper sanitation.
- II. **Housing** - To have quality affordable housing serviced with proper infrastructure.
- III. **Governance** - Compete/Well established institutions that can offer satisfactory services.
- IV. **Economy** - To be a clean and industrious town promoting the prosperity of its people.
- V. **Transport**- A well-organized urban area with efficient and safe transport network.
- VI. **Social Infrastructure**- To have the best learning institutions and health facilities that are holistic, affordable, easily accessible and sustainable in Nyeri County by 2030.
- VII. **Land and environment** - To have Sustainable environment and land use activities.

From the above thematic vision, the consultant constructed a general vision for the urban area;

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***‘A well governed, habitable town with infrastructure that can spur economic and social
development while exhibiting sustainable use of land and natural resources’***

2 SITUATION ANALYSIS

This section presents a thematic summary of the existing situation within the planning area based on land, environment, infrastructure, housing, transport, the local economy and governance of the urban area.

2.1 Population

According to the 2019 Population and Housing Census, Mukurweini urban Area had a population of 6,508 residents with 3,115 males and 3,393 females. With a county average intercensal urban population growth rate of 5.34%, the town is expected to have a population of 6,856 as at 2020 and 11,534 by the year 2030 (end of the planning period).

Table 2-1: Population Projection as per 2009 PHC

Population	Number County Urban Growth rate - 5.34%	Number County Growth rate - 3.778%
Population 2019	6,508	6,508
Population 2020	6,856	6,754
Population 2023	8,013	7,549
Population 2026	9,367	8,437
Population 2030	11,534	9,786

However, according to population estimates in the household survey conducted in 2020, the population covering the entire planning area is estimated at 26,190. This population therefore forms the base for population projection for planning purposes in Mukurweini Urban Area. Additionally, the service requirements for the urban area shall be inquired at town level as guided by the First Schedule of the Urban Areas and Cities (Amendment) Act of 2019.

Table 2-2: Population Projection as per Household Survey

Year	Urban areas growth rate (5.34%)	County growth rate (3.778%)
2019	26,190	26,190
2020	27,589	27,179
2023	32,248	30,378
2026	37,695	33,953
2030	46,415	39,382

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2.1.1 Population Structure

The table below shows the population structure of the urban area in terms of numbers and percentages of both males and females in Mukurweini Urban Area as per different age sets.

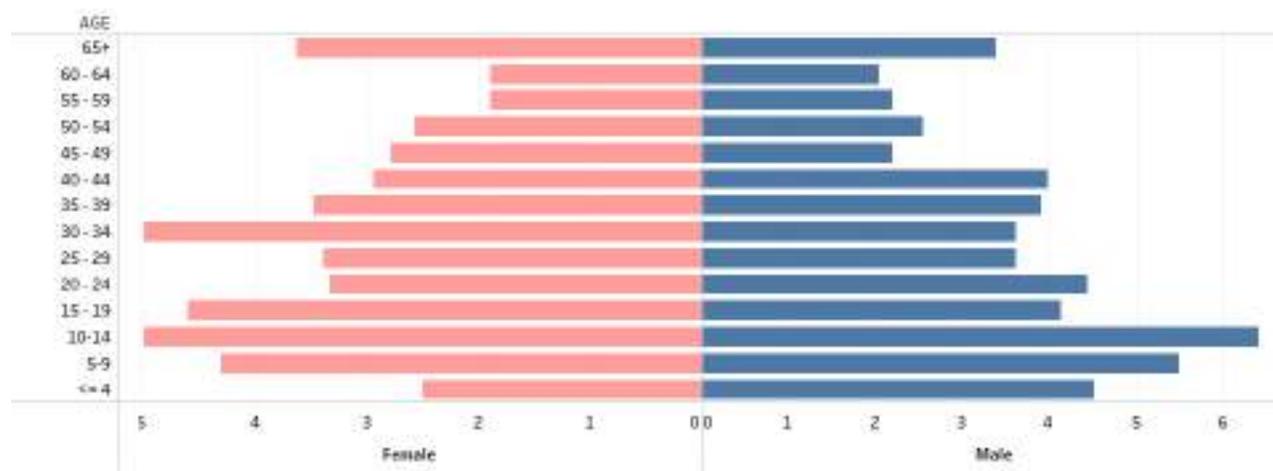
The population pyramid is as presented in the chart following.

Table 2-3: Population Structure as per 2009 PHC

AGE GROUP	MALE (%)	FEMALE (%)	MALE SIZE	FEMALE SIZE	TOTAL	RATIO(M:F)
<= 4	4.52	2.49	1247	687	1934	1.82
5 - 9	5.51	4.30	1520	1186	2706	1.28
10 - 14	6.41	4.98	1768	1374	3142	1.29
15 - 19	4.15	4.60	1145	1269	2414	0.90
20 - 24	4.45	3.32	1228	916	2144	1.34
25 - 29	3.62	3.39	999	935	1934	1.07
30 - 34	3.62	4.98	999	1374	2373	0.73
35 - 39	3.92	3.47	1081	957	2039	1.13
40 - 44	4.00	2.94	1104	811	1915	1.36
45 - 49	2.19	2.79	604	770	1374	0.78
50 - 54	2.56	2.56	706	706	1413	1.00
55 - 59	2.19	1.89	604	521	1126	1.16
60 - 64	2.04	1.89	563	521	1084	1.08
65+	3.39	3.62	935	999	1934	0.94

Source: Population and Housing Census (Vol. 3)

Chart 2-1: Mukurwe-ini Urban Area Population Pyramid



Source: Consultant's construct

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This structure depicts a youthful population in the urban area. This presents the need for the establishment of proper education systems to equip this youthful population with the required knowledge and skills for the labour market.

2.1.2 Implications of Population Structure

Under 1 year

This cohort is represented by 2.4% of the total population and comprises of infants. This indicates is need to provide quality and efficient pre and post-natal health care to cater for this cohort and prevent infant mortality.

Under 5 Years

This cohort is represented by 8.9% of the total population. It comprises of infants and nursery school going children. This implies the need to provide adequate Early Childhood Development (ECD) centres and health centres to cater for the under 5 years. Better health care facilities should also be provided to ensure good health for infants.

Primary school Going Age (6-13 yrs.)

This cohort is represented by 19.7% of the total population and comprises of the primary school going children.

All primary schools should be provided with the relevant learning materials as well as adequate teachers in all public primary schools to meet the recommended teacher pupil ratio of 1:40.

Secondary school Going Age (14-17 yrs.)

This cohort is represented by 7.9% of the total population and comprises of secondary school going children. This implies the need to adequately equip secondary schools with necessary infrastructure including labs, libraries, dormitories etc. Adequate teachers should also be employed in all public secondary schools to meet the recommended teacher pupil ratio of 1:40.

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Youth Population (15-34)

This cohort constitutes 32.2% of the total population in Mukurweini. Individuals in this age group are in the labor market as well as secondary and tertiary colleges. The youth should be equipped with the relevant skills in order to reduce the dependency ratio. There is therefore need for investment in vocational and technical training facilities to equip the youth with the relevant technical and innovative skills. Serviced light industrial areas should also be provided within the urban area to encourage the youth to start workshops, fabrication stations among other self-employment startups. There is also need for sensitization on the use of appropriate family planning methods. Investment in youth development programmes that nurture art and sports talents through provision of relevant facilities including stadiums and community development centres is key.

Female Reproductive Age (15-49)

This group is represented by 25.5% of the population and constitutes the female child bearing population. This indicates the needs for special health care for both newborns and mothers. Investments in health facilities and child care infrastructure should be a priority in ensuring safe and effective reproductive methods and reducing the number of infant and maternal mortality. There is also need for sensitization on the use of appropriate family planning methods.

Labour Force (15-64)

This group accounts for 64.7% of the population capable of providing labor for production of goods and services. It thus implies that 35.3 % of the people are dependents. This scenario portrays a fairly good picture for the economy only if employment opportunities are created to engage the growing labor force so as to support the increasing population of the dependents.

It comprises of skilled, semi-skilled and unskilled labor force in the market. There is need to provide a conducive environment for investment within the urban area to increase employment opportunities, skill development and enhancement through continuous professional development programs. Designate specific areas for *juakali*, workshops, better

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existing markets, serviced industrial parks among others. There is also need to invest in vocational and technical training facilities to equip the youth with the relevant technical and innovative skills.

Aged Population (65+)

Represented by 7 % of the total population, this group comprises of the retired people to the very aged. The cohort requires special medical attention for old age-related health issues. Healthcare for the elderly should be subsidized through formulation of favourable policies. For the very aged population, homes for the elderly are a necessary infrastructure for the wellbeing of this population.

2.1.3 Household Size

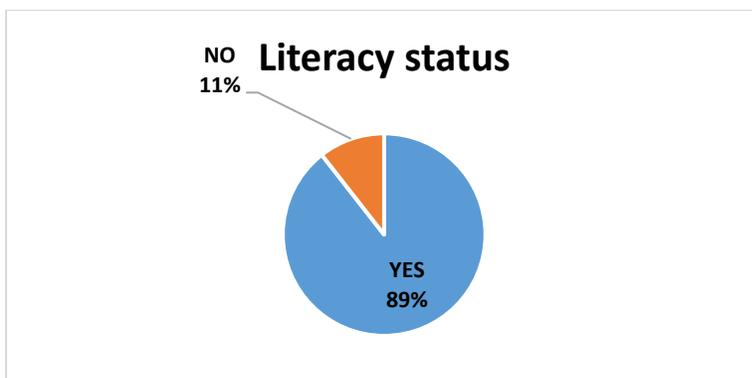
According to field survey 2020, the average household size for Mukurweini Urban area is 3.6 persons.

2.1.4 Demographic Characteristics

Literacy and Education Levels

According to field survey, 2020, 89% of the population was able to read and write while 11% cannot.

Chart 2-2: Literacy Status of Mukurwe-ini Urban Area



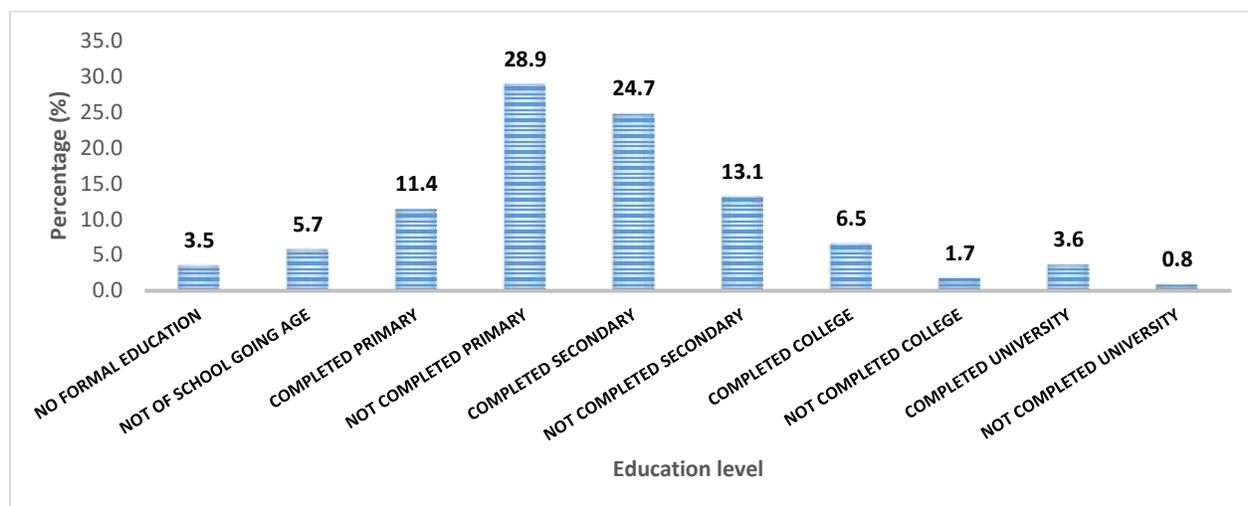
Source; Field survey, 2020

An assessment of highest level of education attained by residents in the urban area revealed that the biggest number of residents (28.9%) had not completed primary education while 24.7% of the residents had completed secondary education. Only 0.8% of the population had

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completed university education while 3.6% were yet to complete university education. A summary of education levels for the urban area is presented in chart 2-3.

Chart 2-3: Education Levels of people in Mukurwe-ini Urban Area



Source; Field survey, 2020

2.1.5 Sex and Income Levels

An analysis of the income levels in the urban area indicated that over 43% of the residents earned above the Kenya's minimum wage of ksh13, 572.0 (trading economics, 2019). An analysis of income levels in the urban area is presented in table 4-7.

Table 2-4: Income levels in Mukurweini Urban Area

Income levels	Male	Female	% total of the population
Below 5000	3173	4773	28.80%
5001-15000	2897	4966	28.50%
15001-25000	2980	1545	16.40%
25001-35000	2897	1462	15.80%
35001-45000	1269	772	7.40%
45001-55000	690	83	2.80%
above 55001	83	0	0.30%

Source; Field survey, 2020

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2.1.6 Population Needs Assessment

Population needs assessment is critical in identification of services and facilities gap provision. Mukurwe-ini Urban Area will be assessed as a town for purposes of planning and as such the services and facilities analysis will be inferred at town level in reference to the Urban Areas and Cities (Amendment) Act, 2019. This assessment will cover the entire span of the plan up to the year 2030. The table below presents the needs assessment for different facilities required by the projected population by the year 2030 in the urban area.

Facilities	Catchment population	Existing No.(2020)	Land requirement (Ha.)	Accumulative demand in number as at 2020 (Pop=27,589)	Gap as at 2020	Area of needed facilities(ha)	Accumulative demand in numbers as at 2030 (Pop=46415)	Gap as at 2030	Total area (Ha)
ECDE	3500	11	0.2	8	-	0	13	2	0.4
Primary Schools	4,000	9	3.9	7	-	0	12	3	11.7
Secondary schools	8,000	9	4.5	3	-	0	6	-	0
Vocational and Technical Training Institutes	15,000	1	1	2	1	1	3	2	2
Level 4 Hospital	100,000	1	4	0	-	0	1	0	0
Level 3 Hospital	30,000	0	2	1	1	2	1	1	2
Level 2 Hospital	10,000	1	1	3	2	2	5	4	4
Level 1 hospital	5,000	0	0.5	6	6	3	9	9	4.5
Funeral parlour	-	1	1	1	0	0	1	0	0
Recreational parks	10,000	2	1	3	2	2	5	3	3
Cemeteries	10,000	1	-	0	0	0	0	0	0
Abattoirs/Slaughterhouses	10,000	2	2	3	1	2	5	3	6
Libraries	10,000	1	0.2	0	0	0	0	0	0

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Facilities	Catchment population	Existing No.(2020)	Land requirement (Ha.)	Accumulative demand in number as at 2020 (Pop=27,589)	Gap as at 2020	Area of needed facilities(ha)	Accumulative demand in numbers as at 2030 (Pop=46415)	Gap as at 2030	Total area (Ha)
Community Centers	50,000	1	0.25	1	0	0	0	0	0
Postal Office	50,000	1	0.12	0	0	0	0	0	0
Police Station	50,000	1	3	0	0	0	0	0	0
Dumpsite	50,000	0	1	1	1	1	1	1	1
Animal control and welfare	50,000	1	0.5	0	0	0	0	0	0
Child care facilities	3,500	0	0.2	8	8	1.6	13	13	2.6
Total area needed						12.6			35.2

2.2 Land

Land is an essential factor of production. This section gives an outlook of how land is being used as a resource within the urban area by presenting the different land uses. This section shall also provide an assessment of the suitability of the land within the urban area to support urban development. The entire planning area covers an area of 23.57 square kilometres.

2.2.1 Land Ownership and Tenure

Land in Mukurweini Urban Area is largely privately owned with some few parcels of public/government. Government land includes land occupied by public educational institutions, public hospitals and both national and county government offices. Private land ownership encompasses land under freehold ownership within the agricultural areas. Land parcels within Kiahungu, Gachiro, Ngoru, Maganjo, Kamuchuni and Gikondi are privately owned under leasehold tenure from the County Council.

The average size of land in Mukurweini Urban Area within the agricultural areas is 1Ha (2.47Acres) while the market centres such as Kiahungu, Gachiro, Ngoru, Maganjo, Kamuchuni and Gikondi have smaller land sizes of approximately 0.045ha (0.11Acres). This is according to the land cadaster for the urban area.

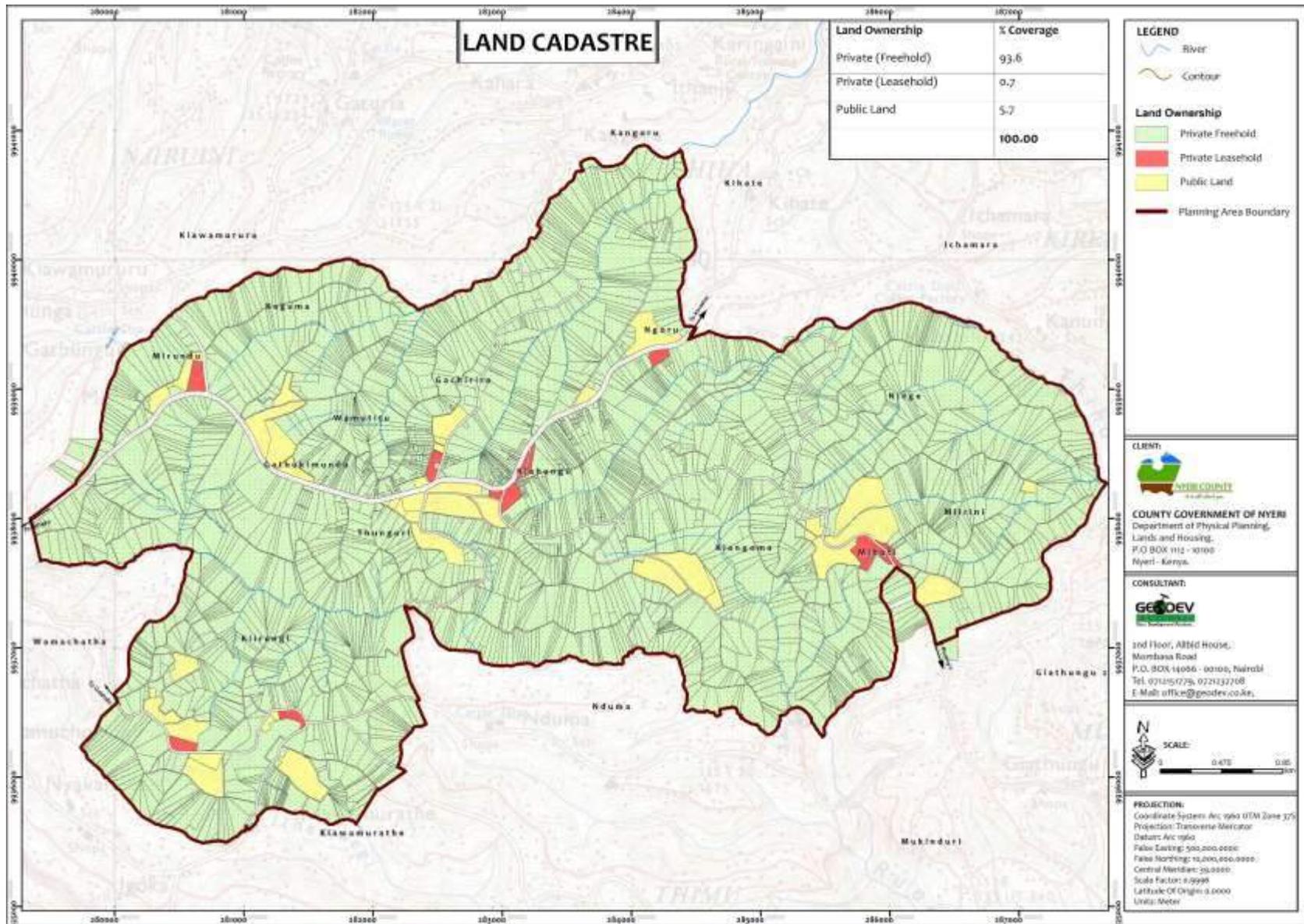
Approximately 93.6% of land within the urban area is under private freehold ownership while 5.7% is under public ownership. Land under leasehold tenure covers approximately 0.7% of the total ownership status within the urban area. The land cadaster for the urban area is as shown in map 2-1. The implications of having an extensive land under private ownership are as captured below.

Implications of private ownership of land

- High cost of acquiring private land for development.
- High rate of land fragmentation
- Poor resource management

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Map 2-1: Mukurwe-ini Urban Area Land Cadastre



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2.2.2 Existing Land Uses for the Planning Area

Land within Mukurweini Urban Area has been utilized for various uses including residential, commercial, public purpose, public utility, agriculture, education and industrial. Table 2-1 shows the areas covered by the different land uses within the town.

Table 2-5: Land uses in Mukurweini

Land use	Area (ha)	% cover
Transport	99.47	4.2
Industrial	18.74	0.8
Public purpose	20.69	0.9
Agriculture	1952.03	82.8
Public Utility	1.93	0.1
Education	48.88	2.1
Commercial	2.92	0.1
Residential (Exclusive and Homesteads)	63.62	2.7
Residential Mixed Use (Residential cum Commercial)	15.5	0.7
Recreation	6.8	0.3
Conservation	102.6	4.4
Area for infill development (undeveloped land)	23.37	1.0
Total	2357	4.2

Source; Field survey, 2020

Agriculture forms the major land use within the town covering 82.8% of the planning area. This is largely due to the hilly land form of Mukurweini Sub County which limits the usage of land for urban development. Agriculture is therefore practiced on the slopes where development cannot easily be done without high-cost implications. The steep/hilly nature of the land is also susceptible to landslides. Residential use on the other hand covers a total of 3.4% of the planning area. Residential use majorly occurs along the ridges where land is favorable to development. The linear pattern of development throughout the planning area has greatly influenced the road network within Mukurweini. Commercial activities are mostly within Kiahungu and the other small market centres such as Gikondi, Mihuti, Ngoru and Maganjo. However, space for extensive commercial activities is limited and therefore mixed

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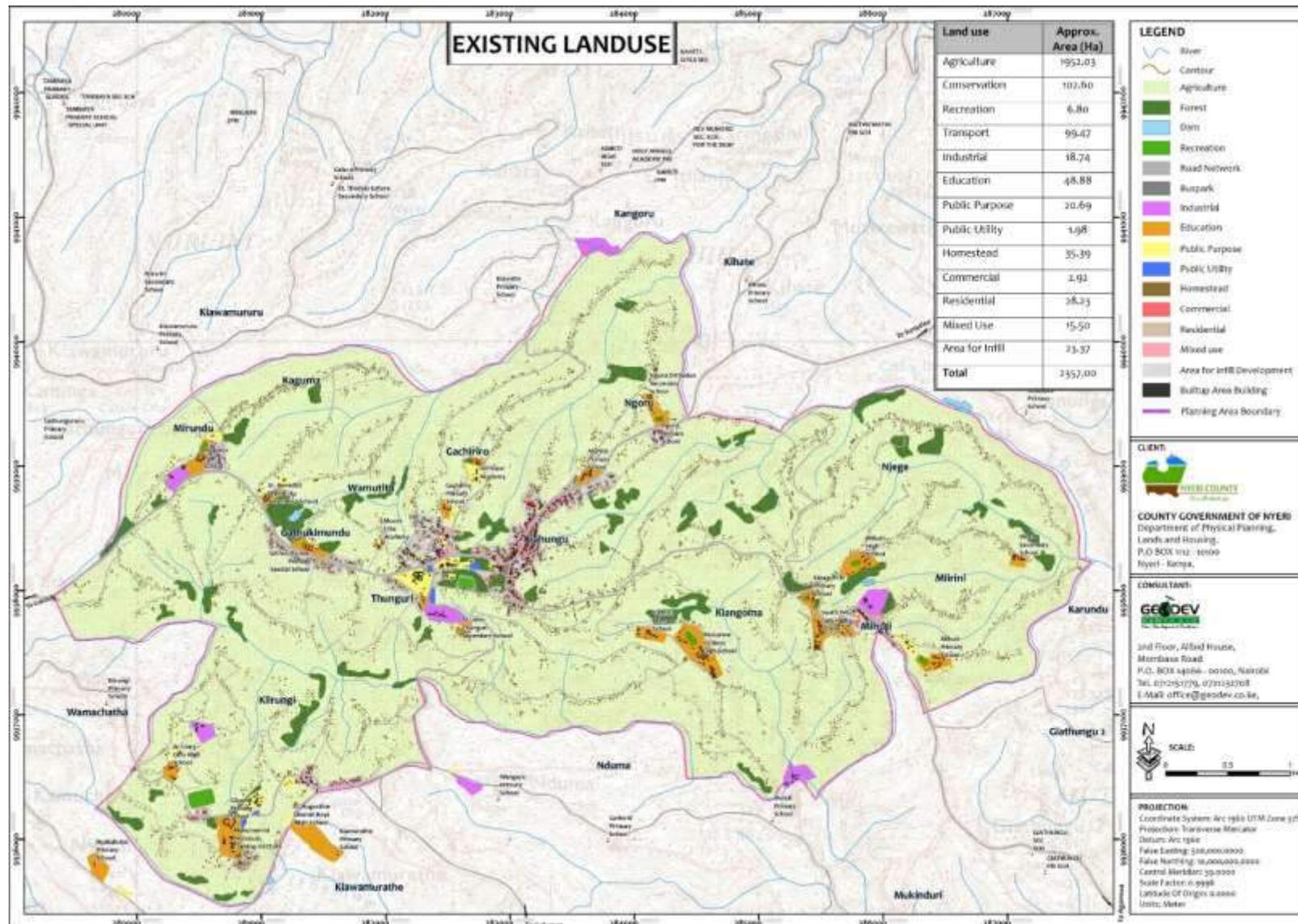
development (Residential cum Commercial) have become a commonplace especially in Kiahungu Centre.

Implications of the Existing Land Use

- Strip development cannot be overlooked as a development concept in the town owing to the hilly topography in Mukurwe-ini. However, emphasis should be directed towards mixed use development in order to maximize on available land.
- Provision of services due to an expansive settlement pattern (linear) will be expensive.
- Agriculture should be promoted through development and promotion of diverse industrial establishments in order to add value to crops produced. This is due to the existing utilization of the land which mostly favors agriculture and therefore it is expected to thrive when development is regulated.

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Map 2-2: Existing Land Use in Mukurwe-ini Urban Area



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Kiahungu Centre Existing Land Use

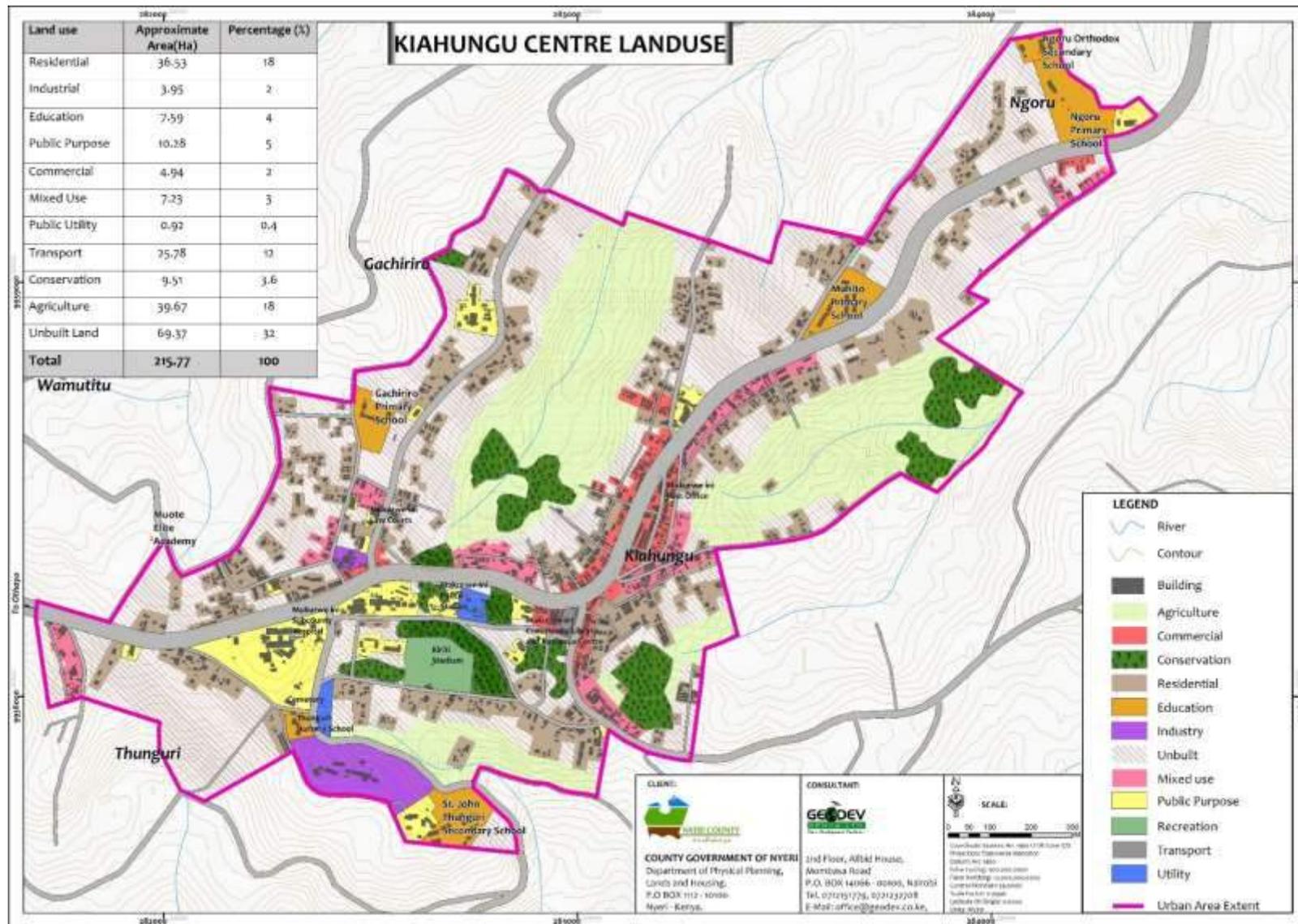
The core urban centre of the planning area is Kiahungu Centre. Most services are found within Kiahungu including administrative, banking, sporting, transport, markets, petrol stations etc. These services highlight the importance of Kiahungu as the major urban centre within the planning area as well as Mukurwe-ini sub-county.

However, given the terrain of the land, utilization of space/land is a challenge. This can be attributed to associated costs involved during development with such measures as stepped development being the only viable option.

Mixed development (commercial cum residential) is prevalent along the main roads passing through the town. The commercial area forms the main activity corridor within the town. Agriculture is practiced within the valleys and escarpments. Approximately 69.37Ha (32%) of prime land within the urban centre remains largely undeveloped/unbuilt. This land shall be used for development purposes in the future in order to ensure sustainable use of land. The aim shall be to fully accommodate a projected population of 11,534 by the year 2030.

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Map 2-3: Kiahungu Centre Existing Land Use



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2.2.3 Land Suitability Assessment

Land suitability assessment is the evaluation of land fitness for a defined land use or support to urban development. The land suitability assessment for Mukurweini Urban area majorly considered the slope (areas having a slope of less than 15°) of the land as well as other factors such as elevation/topography as well as accessibility to infrastructure and services. Unavailable land for development incorporates environmentally sensitive areas such as rivers and steep areas (areas with a vertical slope beyond 15 degrees). Map 2-3 presents the land suitability for Mukurweini Urban area.

The table 2-2 gives a summary of the assessment on land within the urban area.

Table 2-6: Land Suitability

Land Suitability	Approximate Area (Ha)	% of Total Area
Most suitable	558.55	24
Moderately suitable	1058.26	45
Least suitable	584.65	25
Unsuitable	155.54	6
Total	2357	100

Source: Consultant's construct, 2021

Land that is analyzed and found to be most suitable will be given high priority for development projects as well as promoting densification/compact development. The assessment shows the scarcity of land (24% of the urban area) that can be fully primed for intensive urban development. Moderately suitable land will be considered after full utilization of highly suitable land. However, such land should be subject to strict policy regulation in order to ensure safety in any subsequent use. Engineering solutions should also be applied before use of land categorized as moderately suitable. Densification within these areas shall be discouraged.

Least suitable land shall be used for such uses that promote/enhance their fragility. This includes promoting planting of trees, agriculture and riverine development where applicable. Land categorized as unsuitable includes areas having swampy characteristics, steep slopes

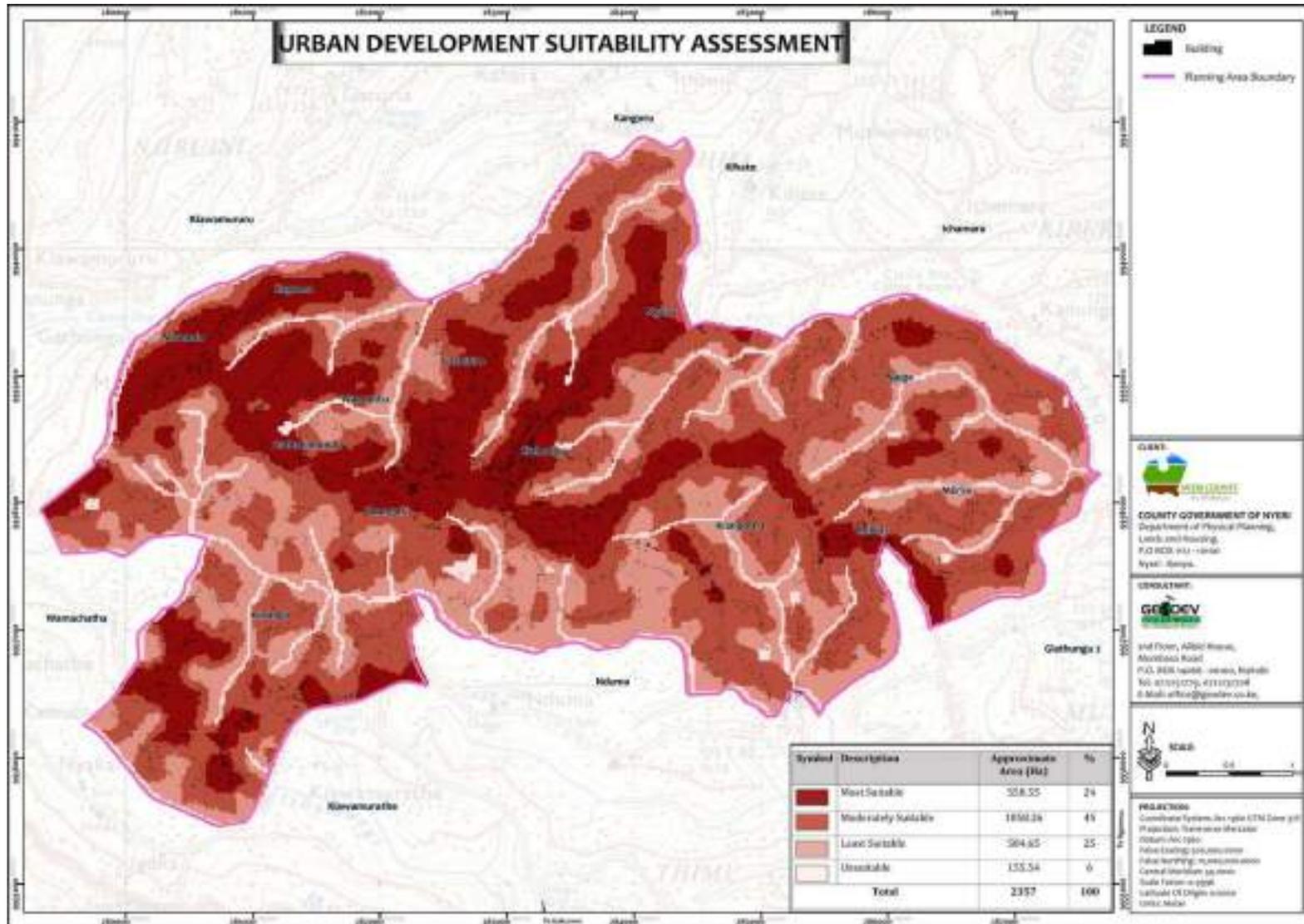
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(above 15°) as well as rivers and their banks. These areas/features should be left in their natural state.

Map 2-4 shows the suitability assessment for the planning area.

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Map 2-4: Mukurweini Land Suitability Assessment



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Kiahungu Centre Suitability Analysis

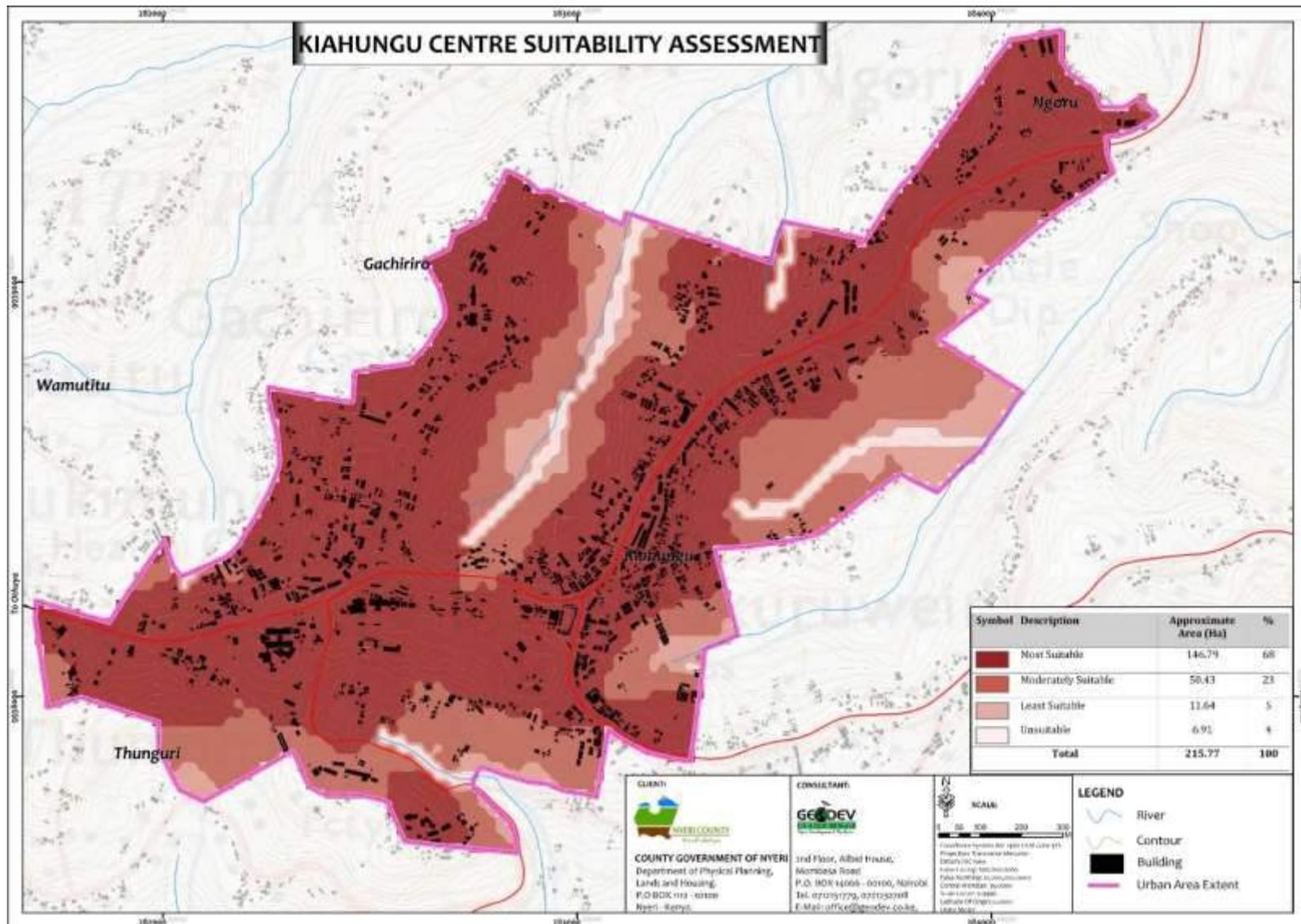
A suitability analysis of Kiahungu Centre reveals that approximately 146.79ha of land is most suitable for supporting urban development. This shall involve promotion of compact development within the urban centre in order to utilize the scarce developable land. This factors the slope of land, ground rock structure as well as the accessibility to services within the centre.

Land assessed to be most suitable land within the centre follows the ridges which have in turn influenced the settlement pattern of the town. Approximately 68% of land within the urban centre can be maximally utilized for development intensification and provision of public purpose facilities. Utilization of this land shall therefore require policy direction to influence development through promotion of infill development (maximum use of space) as well as densification/vertical development. Stepped development should therefore be largely utilized within areas having a slope angle of 10 to 15 degrees.

Approximately 50.43Ha of land is considered to be moderately suitable. It is worth noting that these areas cannot be regarded as physically fit for supporting urban development due to their proximity to the river valleys. Agroforestry shall be promoted within these zones down to the least suitable areas adjacent to the river valleys. Moderately suitable land within the centre shall not be encouraged for intensive development. The river channels shall be conserved and a buffer provided in order to further protect their utility.

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Map 2-5: Kiahungu Centre Land Suitability Assessment



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2.2.4 Structuring Elements

The major structuring element for Mukurwe-ini Urban Area is the topography of the area. The area is characteristic of ridges and steep valleys. This has therefore greatly influenced the road network as well as the settlement pattern that follows a linear pattern. Development is restricted along the ridges and especially so in areas with a favourable land gradient (below 15°).

Areas that are too steep for development are largely being utilized for agricultural practices and tree planting. The effect of this has also influenced the livelihood of the people within the urban area through practicing of agriculture.

2.2.5 Urban Land Requirements

2.2.5.1 The Entire Planning Area

Approximately 225.78Ha of land is required to house of a population of 46,415 by year 2030 within the planning area. Currently a total of 78.72Ha is being utilized for residential use. This therefore means that an extra 147.06Ha of land is required to adequately house the projected population.

An assessment of the population needs up the year 2030 reveals that approximately 35.2Ha of land is required to establish different facilities within the planning area.

In order to adequately house the population as earlier indicated, the residential areas created shall require an elaborate transport network in order to improve mobility within the urban area. Approximately 33.87Ha of an extra road network is required to appropriately service the residential areas (15% of the total residential land requirement).

In total, approximately 216.13Ha of land is required to adequately service a projected population of 46,415 by the year 2030. The table below shows a summary of the urban land requirement (budget) for the projected population within the planning area.

Table 2-7: Land Requirements for Mukurwe-ini Urban Area

Land Requirement	Area (Ha)
Residential Use	147.06

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Land Requirement	Area (Ha)
Road Network	33.87
Facilities (Population Needs)	35.2
Total Land	216.13

This land requirement by the year 2030 can fully be utilized within the areas assessed and categorized as most suitable. The highly suitable areas cover a total of 558.55Ha. However, all this land shall not be encouraged for utilization in order to deter strip development.

Additionally, in order to enhance the livelihoods of the projected resident population, demarcation of areas for exclusive commercial use shall be done. This shall further be complimented by demarcation of industrial areas which shall be used for promotion of value addition for crops that have good yields throughout the year within the agricultural areas such as bananas, arrow roots and avocados.

2.2.5.2 Core Urban Area (Kiahungu Centre)

Kiahungu Centre is projected to house a population of 11,534 (24% of the total population within the urban area) by the year 2030. A total area of approximately 56.04Ha of land is required to adequately house this population with 8.06Ha of land is required to service the residential areas with a reliable road network.

Currently approximately 36.53Ha of land is being utilized for residential purposes. This means that a total of 19.51Ha of land needs to be recruited within the urban area to adequately house the anticipated population by the end of the planning period. An additional 8.06Ha of land is also required to service the expanded residential areas with adequate access.

It is worth noting that the scarcity of land within the urban area presents an opportunity for promotion of vertical and compact development. However, this can only be achieved through provision of facilitative trunk infrastructure such as water and an elaborate sewerage network for the urban centre as it is anticipated to play the major role in development of the urban area and sub-county in the future. The provision of this infrastructure will subsequently provide a basis for encouraging vertical development as a result.

2.3 Agro-ecological Assessment

Mukuwe-ini Urban Area experiences annual rainfall amounts of between 1200 to 1400mm with April and May as well as October and November being the wettest months. The annual average temperature is 18.6°C.

The urban area lies within the UM2 agro-ecological zone which is classified as a main coffee zone. The climate as well as the soils, nitosols, in the area are highly conducive for coffee farming. The area exhibits **very good yield potential** for Arabica Coffee, loquats and mountain pawpaws. Other crops that have a **good yield potential** throughout the year and can be exploited for agribusiness and value addition through industrialization including bananas, citrus fruits, avocados, passion fruits, pineapples, arrow roots and capsicum (Farm Management Handbook of Kenya of 2006, Central Province).

The planning area has two types of soils. These are Nitosols and Cambisols. Nitosols are formed within volcanic footbridges. The soils are fertile but very erodible. These soils cover approximately 98% of the planning area. Cambisols on the other hand are hill soils that are stony and shallow and must be covered by dense vegetation. The soils are excessively drained, moderately deep, red, very friable, sandy clay loam to sand clay, in places rocky. The soils point towards the need for promotion of agroforestry within the urban area in order to protect the soils from excessive erosion.

Currently, owing to the volatility of coffee as a viable cash crop in Kenya, a lot of farmers within Mukurwe-ini have abandoned its farming and instead opted for other feasible crops such as bananas and avocados. Most of the coffee factories within the area are not operating optimally owing to this among other reasons.

It is therefore vital that such crops as bananas, arrow roots and avocados are promoted within the hinterlands (agricultural areas) with advocacy for agroforestry in order to protect the soils of the area from erosion. As such industries that promote value addition for banana, arrow roots and avocado processing and/or packaging should be encouraged within the urban area due to good yields they fetch throughout the year. Irrigation should also be encouraged

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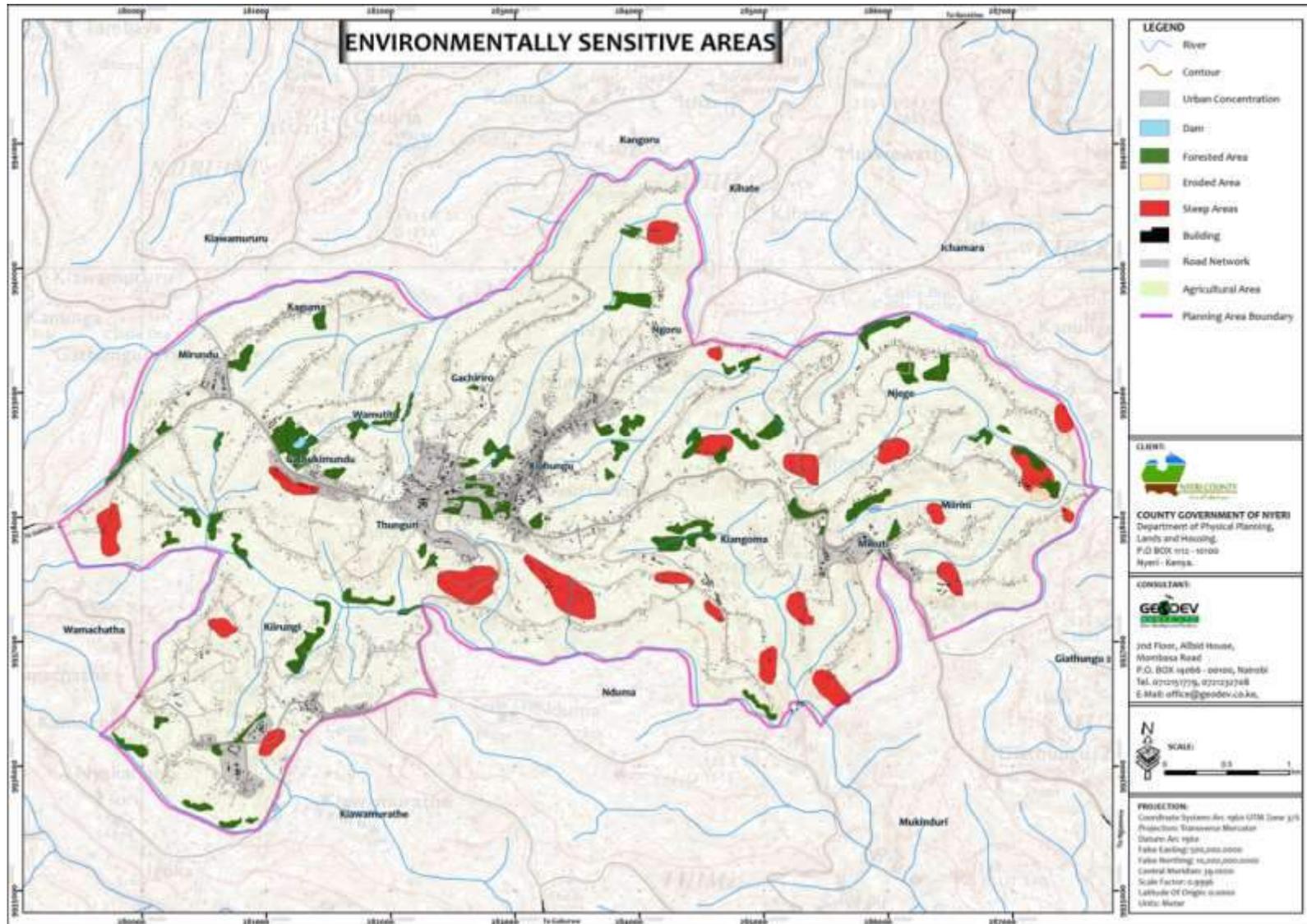
through construction of small dams at focal points along the river valleys. This shall further assist in crop diversification throughout by setting up of agricultural schemes.

2.4 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) simply refer to areas that are significant for sustainable maintenance of biological diversity, soil, water or other natural resources. In Mukurweini Urban Area, notable ESAs include dams, rivers, forested areas and steep slopes. Appropriate land use controls should be employed to protect these areas from unsustainable use. ESAs in Mukurweini are presented in map 2-3.

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Map 2-6: Environmentally Sensitive Areas in Mukurweini Urban Area



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Rivers

Rivers and streams in Mukurweini include Kiro, Ruarai, Thiha, Igutha and Gafuta. These rivers serve as a source of water for agriculture and domestic consumption. Threats facing rivers and streams in the urban area include encroachment of river banks for cultivation with use of farm chemicals, planting of eucalyptus trees, waste water and solid waste directed to the rivers. The rivers need to be protected from adverse harmful threats overtime in order to maintain their utility to the resident population and those downstream.

Plate 2-1: River Ruarai



Source: Field survey, 2020

Dams

Dams in the area include Ichamara, Iria, Ithemugi and Njege. The dams function as key water sources for fish farming as well as providing water for agricultural use. Among the threats facing dams in Mukurweini Town include pollution from farm chemicals and siltation due to uncontrolled human activities.

Plate 2-2: Ichamara Dam



Source: Field survey, 2020

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Forested and Steep Areas

Mukurweini Urban Area has various forested spots especially in areas that are not habitable and are prone to erosion. The overall tree cover in the Mukurweini Urban Area is over 40% since farmers in the area have fully embraced agroforestry. This practice needs to be encouraged in order to further assist in soil conservation and prevention of possible soil erosion and landslides. This shall also help in maintaining the climatic conditions within the planning area and the sub-county.

Plate 2-3: Steep Slope and Tree Coverage



Source: Field survey, 2020

2.4.1 Environmental Problems

Environmental problems established are those that undermine the right to a clean, safe and secure environment. The problems are as discussed below.

2.4.1.1 Poor Waste Management System

Solid Waste

Mukurweini Urban Area does not have an established solid waste management system. Solid waste in the major node (Kiahungu) is collected by county government trucks for disposal in the neighbouring Karatina Town. The urban area doesn't have its own solid waste land fill or dumpsite.

Proper waste management methods should be encouraged and established. Waste skips should be efficiently distributed especially in the urban nodes including Mihuti, Kiahungu, Ngoru, Maganjo, Gikondi, and Kamuchuni. A landfill or transfer station should also be established in the area to ensure that waste within the town is properly managed before

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transportation to Karatina. Additionally, residents should be encouraged to re-use plastic solid waste especially bottles and awareness created on proper waste management methods.

Plate 2-4: Indiscriminate waste dumping



Source: Field survey, 2020

Liquid Waste

According to the field survey, 2020, 85% of the residents use pit latrines to dispose liquid waste. About 13% of the households use septic tanks while other means accounted for 2% of the town's population.

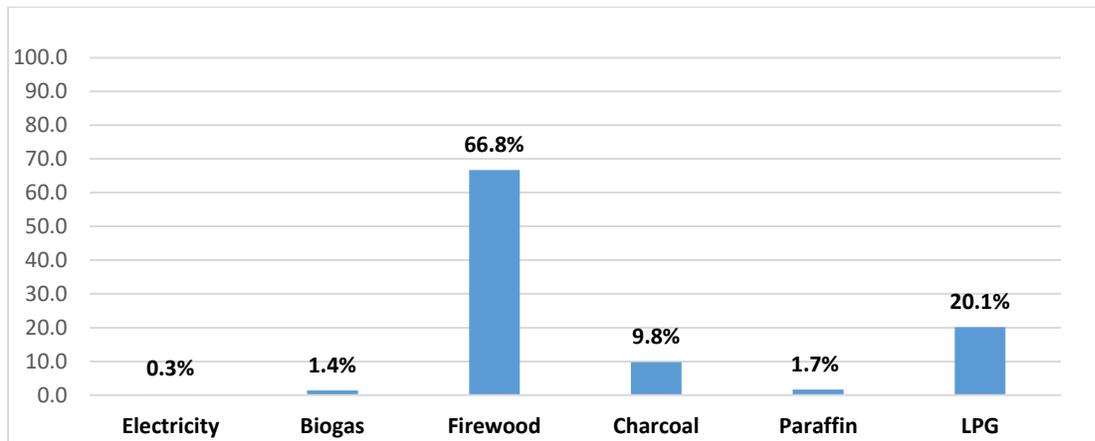
Excessive use of pit latrines may lead to the contamination of groundwater considering the existing number of shallow wells in the urban area which indicates that the area has a high-water table. Residents therefore need to be encouraged on the importance of the use of septic tanks considering that the area receives high amounts of rainfall.

2.4.1.2 Deforestation Cooking Energy Sources

Approximately 76.6% (field survey, 2020) of the residents use wood fuel for cooking while only 21.8% use clean energy sources like electricity, biogas and LPG. Continuous use of wood fuel will lead to a decrease in tree cover and further environmental degradation. Residents need to be educated and encouraged to embrace the use of sustainable and environmentally friendly energy sources like electricity, biogas and LPG.

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Chart 2-4: Cooking energy sources



Source: Field survey, 2020

2.4.2 Environmental Disasters

According to Nyeri County Spatial Plan, 2019-2029, Mukurweini Sub-County is classified as a high-risk landslide zone. Landslides have been reported mostly during the rainy seasons especially in Njege and Miirini areas. These landslides have resulted to massive damaged to land including soil erosion, reduction in soil fertility, loss of natural resources like trees and flooding on lower grounds.

To minimize the occurrence of landslides, extensive sensitization needs to be done to encourage tree planting and agroforestry in all steep areas. Additionally, residents will need to be sensitized to avoid putting up houses on steep sections.

Plate 2-5: Eroded areas near Weru Secondary School



Source: Field survey, 2020

2.5 Infrastructure

2.5.1 Physical infrastructure

This section presents an analysis of the existing physical infrastructure in Mukurwe-ini Town. An examination of the inventory, condition, and establishment of gaps and needs to inform proposals. Components of the physical infrastructure analysed include water supply, electricity and street lighting and solid and liquid waste management.

2.5.1.1 Water Supply Infrastructure

The Othaya-Mukurwe-ini Water Services Company (OMWASCO) is the main water supplier for Mukurweini Urban Area. The distribution network covers the entire planning area as shown in Map 2-4. Water intake is located at Chinga Dam, on Chinga River where the treatment plant is also constructed. The treatment plant has a design capacity of 13,000 m³ per day. The company supplies 25,336 m³ per day in its current area coverage with a total of two thousand six hundred and eighty-one (2,861) total connections as shown in table 2-3 (OMWASCO, 2020). However, the amount of water supplied within the planning boundary is 2,333M³ per day. The company has 25 water distribution tanks with a total capacity of 5,495 m³. The number of connections and quantity of water supplied to different entities is presented in table 2-8.

Table 2-8: Water supply to different entities

Entity	No of Connections	Quantity Supplied (m ³)/Day
Households	2,543	17,475
Industrial	2	3,635
Commercial	122	1,554
Schools	11	872
Hospitals	3	1,800
Total	2,681	25,336

Source: OMWASCO, 2020

Domestic Water Demand and Gap

The total domestic water requirement for Mukurweini Town currently stands at 4,383 m³ while by the year 2030 the town water demand is estimated to be 7,374 m³. This is presented in tables 2-9 and 2-10 respectively.

With a total water supply of 2,333M³ per day, then the current gap in terms of water supply is 2,050M³ per day as at the year 2020 and 5,041M³ per day as at the year 2030.

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Table 2-9: Domestic Water Demand as at 2020

Consumer Water	% Of Total	Consumption	Litres /Day	M ³ /Day
Demand	Population 2020 (27589)	Litres /Head/Day		
Low income	70	75	1,448,422.50	1448.4225
Medium income	25	150	1,034,587.50	1034.5875
High income	5	250	344,862.50	344.8625
Total domestic water demand			2,827,873	2827.8725
Commercial and institutions	30% of the total domestic water demand		848,362	848.36175
Allowance for leakage	20% of the total domestic water demand		565,575	565.5745
Total Water Demand			4,241,809	4,242
Internal usage	5% of total domestic water demand		141,394	141.39363
Total Water Requirement			4,383,202	4,383

Source: Consultant's Estimate, 2020

Table 2-10: Domestic water Demand as at 2030

Consumer Water	% Of Total	Consumption	Litres /Day	M ³ /Day
Demand	Population 2030 (46415)	Litres /Head/Day		
Low income	70	75	2,436,787.5	2436.7875
Medium income	25	150	1,740,562.50	1740.5625
High income	5	250	580,187.50	580.1875
Total domestic water demand			4,757,538	4757.5375
Commercial and institutions	30% of the total domestic water demand		1,427,261	1427.2613
Allowance for leakage	20% of the total domestic water demand		951,508	951.5075

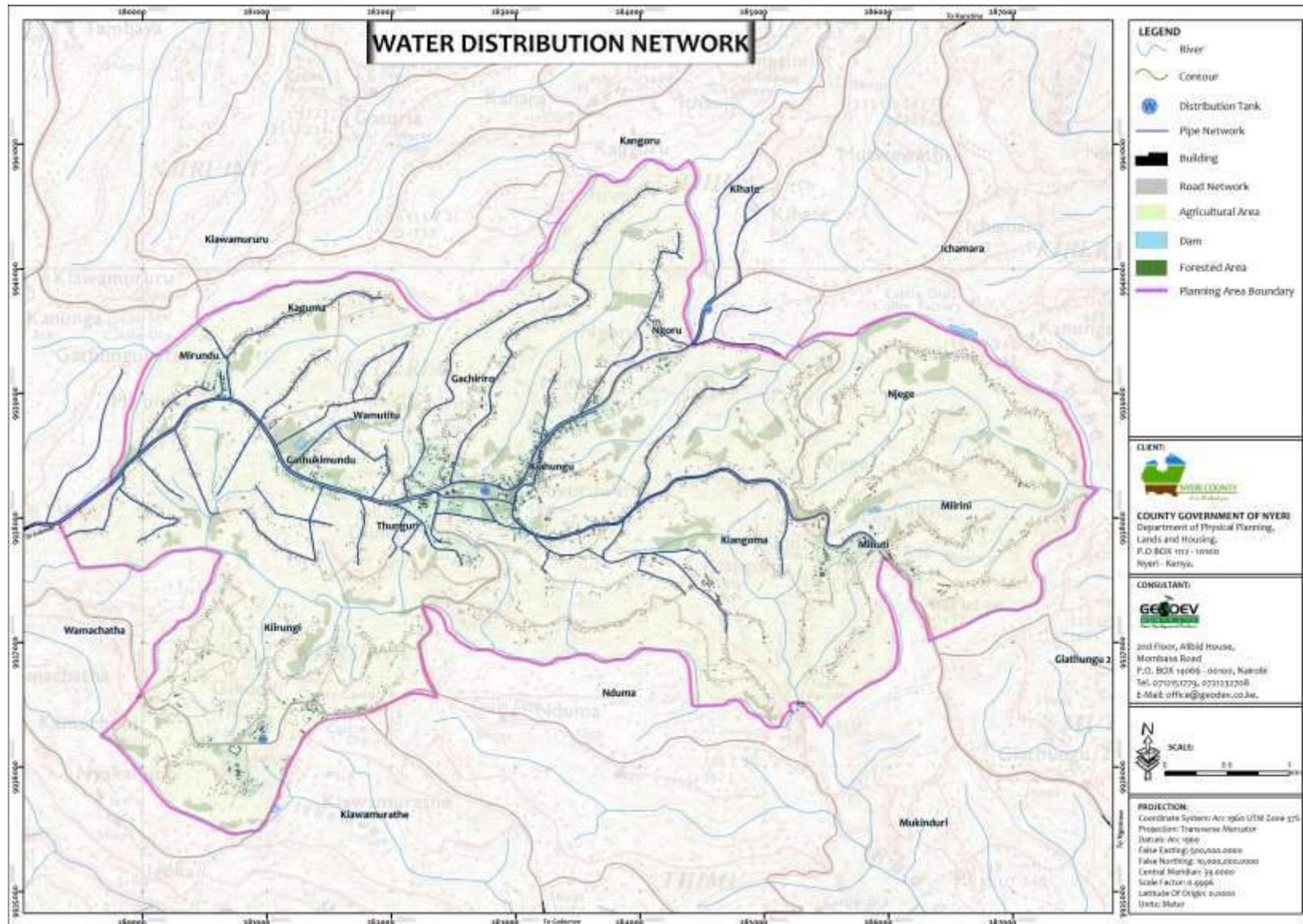
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Consumer Water	% Of Total	Consumption	Litres /Day	M³/Day
Total Water Demand			7,136,306	7,136
Internal usage	5% of total domestic water demand		237,877	237.87688
Total Water Requirement			7,374,183	7,374

Source: Consultant's Estimate, 2020

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Map 2-7: Existing Water Distribution Network



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2.5.1.2 Liquid Waste Management Infrastructure

Mukurwe-ini Town lacks a sewerage system to manage liquid waste, a scenario that influences a high reliance on septic tanks in the core urban and pit latrines in the peri-urban areas. The lack of an integrated sewerage system is a result of poor implementation of the 1969 development plan.

However, a decentralized treatment facility (DTF) for treating liquid waste for the town is currently under construction. The facility is located along River Rualai on a 0.5Acre piece of land. It is designed to have a capacity of about 50,000litres (50m³) of liquid waste. This is an equivalent of 7 exhauster trucks emptying in the facility per day. The DTF facility was planned to adequately cater to a population of 10,000. This highlights the need to establish a bigger liquid waste facility in order to adequately cover the needs of the town which is projected to produce a total of 4032.8m³ per day.

Plate 2-6: Decentralized treatment facility, under construction



Source: Field survey, 2020

2.5.1.3 Solid Waste Management Infrastructure

The total waste collected in the town is approximately two (2) tonnes daily or seven to twelve (7-12) tonnes weekly. A total of 1.5 tonnes of garbage collected is disposed and 0.5 tonnes recycled (*Source: County Health and Sanitation, 2020*). A single person generates approximately 0.74 Kg/per day of solid waste (World Bank, 2016). Currently, this translates to a total of 20.42 tonnes generated on a daily basis within the planning area estimated to rise to 34.35 tonnes of waste produced by the year 2030. It can therefore be estimated that approximately 18 tonnes of solid waste generated remains uncollected or is crudely disposed informing the need to put in place infrastructure and personnel to ensure efficient solid waste management in the town. Although much of this waste is managed at the household/farm

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level, the highly populated areas such as Kiahungu will continue to experience indiscriminate solid waste disposal practices.

Plate 2-7: Indiscriminate dumping of Waste



Source: Field Survey, 2020

The town lacks a designated solid waste disposal/management site. This informs the need for establishing one or ensuring proper coordination of waste management at the local level. In the absence of a solid waste disposal site, Mukurweini Town depends on the dumpsite at Karatina Town. There are seven (7) designated solid waste collection points in the town and solid waste management equipment are deployed from Nyeri and Karatina Towns.

2.5.1.4 Mains Electricity

The entire urban area has a relatively good electricity coverage with approximately 82% of the households reporting connection to the national grid. There exist a 33Kv power substation in Kiahungu which is able to adequately supply power in the entire urban area when loaded with major industrial and commercial enterprises. However, amongst the residents connected to electricity, complaints of high monthly billing charges were dominant while those who had no connections to electricity cited high connection charges. Map 2-14 presents the electricity distribution network in the urban area.

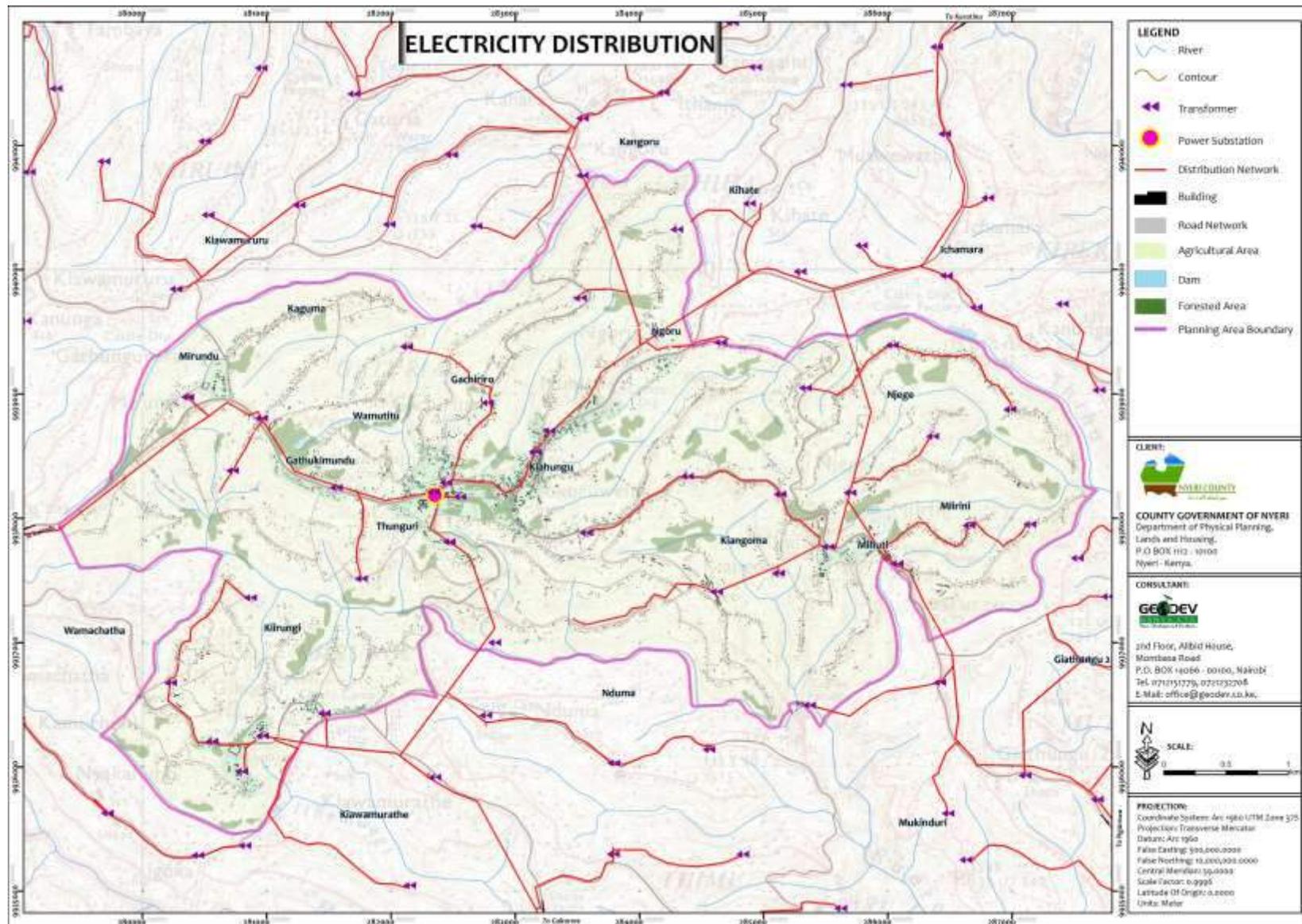
Plate 2-8: Mukurweini Power Sub-Station



Source: Field survey, 2020

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Map 2-8: Electricity Distribution in Mukurweini Urban Area



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2.5.1.5 Street lighting

The town has only two high masts located at Kiahungu Bus Park and fresh produce market. Street lighting is inadequate especially within the peri-urban areas. Street lights in the entire urban area are very few and only limited to the Karatina-Othaya (B27) road. The lights are powered by either Kenya Power Company mains or solar. There is need to establish more street and flood lights in the entire urban area to enhance the safety of the residents and increase night enterprising hours for traders.

Plate 2-9: Street lighting in Kiahungu



Source: Field survey, 2020

2.5.1.6 Telecommunication and ICT

Mukurweini Town is adequately served with telecommunication infrastructure in terms of communication and internet services. Telecommunication providers in the urban area include Safaricom, Airtel and Telkom.

The county government offices in the urban area are well served with the optic fibre connections for ease in service delivery. In centres like Kiahungu and Mihuti, there are cybercafé services done by private individuals and this has also aided in the uptake and use of ICT in the urban area.

2.5.2 Social Infrastructure

Overview

Social infrastructure enhances the social well-being of a community. Social infrastructure in Mukurwe-ini Town includes health, education, community, recreational as well as safety and

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security facilities. This section reports on the number, distribution, condition and gaps with regard to the existing facilities. Social facilities in the town are as presented in Map 2-6.

2.5.2.1 Health Facilities

Mukurwe-ini Town is served by several health facilities namely Mukurwe-ini Sub-County Hospital, Mihuti and Nyakhuo dispensaries, Avenue Hospital, Kimono Medical, Mukurwe-ini Health Services, Mihuti clinic and Biolabs.

Mukurwe-ini Sub-County and Avenue hospitals provide higher-order services such as outpatient and inpatient and laboratory testing. Kimono Medical, Mukurwe-ini Health Services, and Biolabs, which are level 2 health facilities provide basic health care.

Plate 2-10: Mukurwe-ini level 4 and Avenue Hospitals

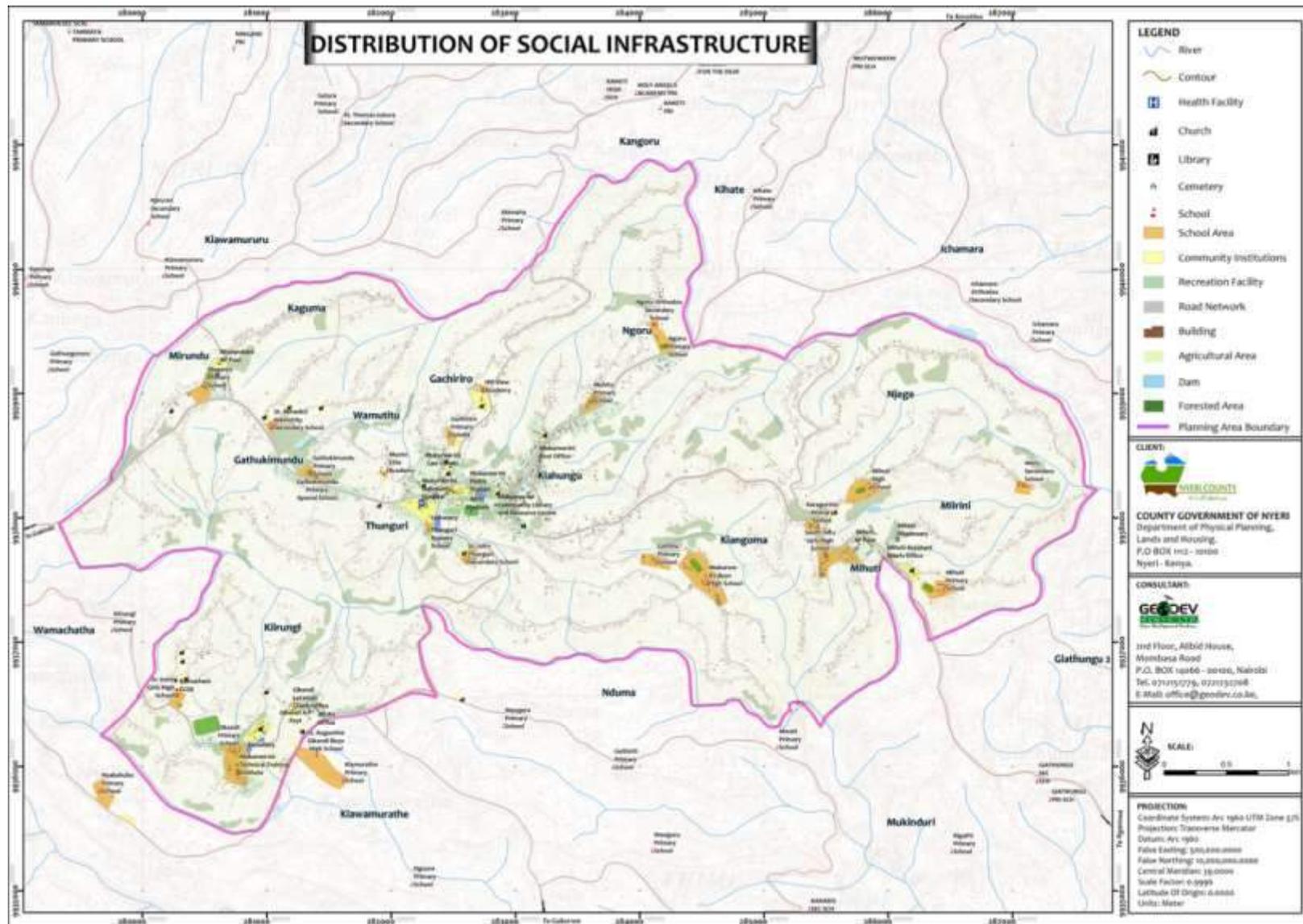


Source: Field survey, 2020

Table 2-4 presents an analysis of the health facilities in the urban area in terms of location, level, ownership, staffing and bed capacities.

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Map 2-9: Distribution of Social Infrastructure



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Table 2-11: Health Facilities analysis

Facility	Location	Level/Category	Services provided	Ownership			Staff				Bed Capacity
				PU	PR	FB	DR	RCO	NR	TECH	
Mukurwe-ini Sub-County Hospital	Mukurwe-ini Town	Level 4	Outpatient and Inpatient					123			138
Mihuti Dispensary	Mihuti	Level 2	Outpatient					-			-
Nyakahuo		Level 2	Outpatient					-			-
Avenue Hospital	Mukurwe-ini Town	Level 3	Outpatient and Inpatient				1	3	3	1	20
Kimono Medical		Level 2	Outpatient						1		-
Mukurwe-ini Health Services		Level 2	Outpatient					1			-
Biolabs		Level 2	Outpatient							1	-
Mihuti clinic	Mihuti	Level 1	Outpatient								

Source: Department of Health and Sanitation, 2020

Gap in Health Facilities

According to field survey, 2020, the average distance covered by residents of Mukurwe-ini Town to access a public health facility is 2.8 km. A spatial analysis of health facilities distribution revealed that all wards spanning the town had access to a health facility.

Quantitative gap analysis based on population established that Mukurwe-ini Town requires two (2) level 2 hospitals as of the year 2020 and 4 more by the year 2030.

Table 2-12: Population Needs Gap, Health Facilities

Facilities	Catchment population	Existing No. (Yr 2020)	Demand in number (Yr 2020, Pop=27,589)	Gap as at 2020	Demand in numbers, 2030 (Pop=46415)	Gap as at 2030
Level 4 Hospital	100,000	1	0	-	1	0

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Facilities	Catchment population	Existing No. (Yr 2020)	Demand in number (Yr 2020, Pop=27,589)	Gap as at 2020	Demand in numbers, 2030 (Pop=46415)	Gap as at 2030
Level 3 Hospital	30,000	0	1	1	1	1
Level 2 Hospital	10,000	1	3	2	5	4
Level 1 hospital	5,000	0	6	6	9	9

2.5.2.2 Educational Facilities

Primary School

According to the Department of Education and Public Service, 2020, Mukurwe-ini Town is served by nine public and two private primary schools. All public primary schools host respective ECDE facilities. There are two stand-alone public ECDE facilities namely Kamuchuni ECDE and Thunguri Nursery School. As a result, Mukurwe-ini Town has a total of eleven (11) ECDE facilities. There is therefore an oversupply of 3 ECDE centres based on the current population of 27,589. However, two more ECDE centres will needed to meet the demand for the year 2030.

Plate 2-11: Gachirero and Gikondi Primary Schools



Source: Field Survey, 2020

Table 2-12 shows the staffing levels of the facilities within the planning area.

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Table 2-13: Public and Private Primary Schools in Mukurwe-ini Town

	Name	Location	Level	Status	Sponsor	Teacher - Student ratio	Area (Ha)	No of streams	No Classroom	Boys Toilet	Girls Toilet	Total Enrolment	GOK TSC Male	GOK TSC Female	PTA BOG Male	PTA BOG Female
1.	Hill View Academy	Muhito	Primary school	Private	Private individual	1:10			8	4	4	88	-	-	-	-
2.	Gachiro Primary School		Primary school	Public	Central government/ DEB	1:38	4.73	1	9	10	8	341	4	5	-	-
3.	Muhito Primary School		Primary school	Public	Religious organization	1:38	11.01	2	20	18	20	791	2	15	4	-
4.	Gathitu Primary School		Primary school	Public	Central government/DEB	1:45	3.84	1	12	10	15	356	2	6	-	-
5.	Muote Elite Academy		Primary school	Private	Private individual	1:16			12	3	3	210	-	-	5	8
6.	Gathukimundu Primary School		Primary school	Public	Religious organization	1:43	7.08	2	13	15	15	344	-	8	-	-
7.	Gathukimundu Primary Special School		Primary school	Public	Religious organization	1:9			1	-	-	9	1	-	-	-
8.	Maganjo Primary School		Primary school	Public	Religious organization	1:38	2.02	2	18	8	12	486	4	9	-	-

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	Name	Location	Level	Status	Sponsor	Teacher Student ratio	Area (Ha)	No of streams	No Classroom	Boys Toilet	Girls Toilet	Total Enrolment	GOK TSC Male	GOK TSC Female	PTA BOG Male	PTA BOG Female
9.	Gikondi Primary School	Gikondi	Primary school	Public	Religious organization	1:39	0.8	1	26	9	6	307	5	3	-	-
10.	Karaguririo Primary School	Giathugu	Primary school	Public	Central government/DEB	1:42	2.42	2	9	9	7	248	3	3	-	-
11.	Mihuti Primary School	Giathugu	Primary school	Public	Religious organization	1:25	6.07	1	22	12	19	194	3	5	-	-

Source: Sub-County Director of Education, Mukurwe-ini, 2020

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Secondary Schools

According to Sub-County Education offices, Mukurwe-ini Town had nine public secondary schools. All Secondary schools in Mukurweini have met the ideal teacher student ratio of 1:40. Currently, there is an excess of six secondary schools based on the estimated population of 27,589. The schools shall however be adequate for the projected population of 46,415 by the year 2030. They shall however require regular upgrading of facilities in order to offer standardized education.

Based on the Physical Planning Handbook, Ngoru Orthodox Secondary School, St. Benedict Wamutitu Secondary School and St. John Thunguri Secondary School have land sizes of 2.4, 4.1 and 0.02 Ha respectively. These schools will require expansion to attain the required size of 4.5Ha for future expansion. The state of these facilities in terms of land size, enrolment, and conditions are presented in table 2-14.

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Table 2-14: State of Secondary Schools in Mukurweini

S/No	Name	Location	Composition	Service	Area (Ha)	Streams	Total Enrolment	Total Teachers	TSC Male Teachers	TSC Female Teachers	Local Authority	PTA Board	PTA Board	Teacher: Student ratio	Wall	Roof	Electricity	Water			
1.	Ngoru Orthodox Secondary School	Muhito	Mixed	Day	2.4	2	245	17	10	6	0	0	1	1:16	Stoney	Iron Sheets	Connected to Grid	Piped and Harvest			
2.	Mukurwe-Ini Boys High School	Giathugu	Boys	Boarding	10.9	5	274	19	10	8	1	0	0	1:16				Piped			
3.	St. Benedict Wamutitu Secondary School	Muhito	Mixed	Day	4.1	2	306	14	7	6	0	1	0	1:24				Piped			
4.	South Tetu Girls High School	Giathugu	Girls	Boarding	7	6	349	19	6	10	0	1	2	1:22				Piped			
5.	Mihuti High School		Mixed		8	1	151	9	4	4	0	1	0	1:19				Piped			
6.	St. John Thunguri Secondary School		Day	0.02	1	139	9	-	-	-	-	-	-	1:16				Piped and Harvest			
7.	St. Irene Girls High School	-	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	-
8.	Weru Secondary School	-	-	Day	4.9	1	168	9	-	-	-	-	-	1:19				Piped			
9.	Gikondi Secondary School	-	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	-

Source: Sub-County Director of Education, Mukurwe-ini, 2020

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Tertiary Institutions

According to field survey 2020, Mukurwe-ini Town has two functional tertiary institutions namely Mukurwe-ini Technical Training Institute (TTI) in Gikondi Ward covering an area of 5.6 Ha and the ECD College in Rugi Ward covering an area of 0.58 Ha. Mukurweini TTI is under the authority of the National Government while the ECD College is under the County Government of Nyeri.

Two other institutions are currently under construction including the Kenya Medical Training College (KMTC) in Wamutitu as well as a constituent college for the Mukurweini TTI opposite Ngoru Market.

Plate 2-12: Mukurweini TTI



Source: Field Survey, 2020

2.5.2.3 Community Facilities

Community facilities in Mukurweini Town include the Mukurweini community library, Gikondi Community Hall, Mukurweini Cemetery and Kiriti stadium. The cemetery measures approximately 1.45 acres. It is not fenced and is highly underutilized.

Plate 2-13: Community Library in Kiahungu/Mukurwe-ini



Source: Field Survey, 2020

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The entire planning area is characterised by a deficit in community facilities like social halls, public *barazas* and play grounds. There is need to establish adequate community facilities evenly in the entire urban area.

2.5.2.4 Other public purpose facilities

Mukurwe-ini Town has one operational magistrate law court and a post office both located in Kiahungu. Additionally, there is a proposed law court under construction. The existing law courts are a national treasure under the Kenya Museums. This was a beer club during the pre-colonial era.

Plate 2-14: Mukurweini law courts



Source: Field Survey, 2020

2.5.2.5 Recreation facilities

Mukurwe-ini Town has two playgrounds in Maganjo, covering an area of approximately 0.82 acres, Kiriti community stadium in Kiahungu covering 3.48Ha and two open spaces in Gikondi and Ngoru covering approximately 5.46Ha and 0.15Ha respectively.

These facilities lack infrastructures critical for supporting sporting activities like properly paved surfaces, changing rooms and benches. They are however used to host ball games such as football and volleyball.

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Plate 2-15: The state of Kiriti Community Stadium



Source: Field Survey, 2020

2.5.2.6 Safety and Security facilities

Mukurwe-ini Town has one police station located in Kiahungu with a Directorate of Criminal Investigation (DCI) office.

There also exist three police posts in Gikondi, Mihuti, and Maganjo. These installations promote and maintain law and order within the town and its surroundings.

Plate 2-16: Mukurweini Police Station



Source: Field Survey, 2020

2.6 Transportation

2.6.1 Existing Road Network

Road is the main mode of transport in Mukurweini. The Karatina – Othaya (B27) road is the main/primary road in the area and connects Karatina and Othaya via urban areas such as Kiahungu, Maganjo, Ngoru, Ichamara etc. The road is of bitumen standard and covers a distance of approximately 6.7 km within the planning boundary.

Plate 2-17: Karatina-Othaya (B27) road



Source: Field survey, 2020

Description of existing roads and their functions

Primary roads are roads with a high traffic volume and link major urban areas. In this case, the Karatina–Othaya (B27) and Mukurwe-ini–Mihuti–Gakonya (C510) are primary roads. These roads inter-connect Mukurweini to Karatina, Othaya and Murang’a County.

Local distributor roads distribute traffic within localities and neighbourhoods. They are characterized by gravel and earth surfaces within Mukurweini urban area.

Collector roads provide access to residential properties. They are collecting traffic from access roads to local distributor roads.

Local access roads are the roads in our urban area that provide direct access to land, households and buildings within neighbourhoods and localities.

Table 2-15 presents an inventory of the roads within Mukurweini urban area. Each classified road in the urban area has been given a function namely primary, secondary, local distributor, collector and access road. Further, maps 2-10 and 2-11 present the existing road network alongside function and surface conditions respectively.

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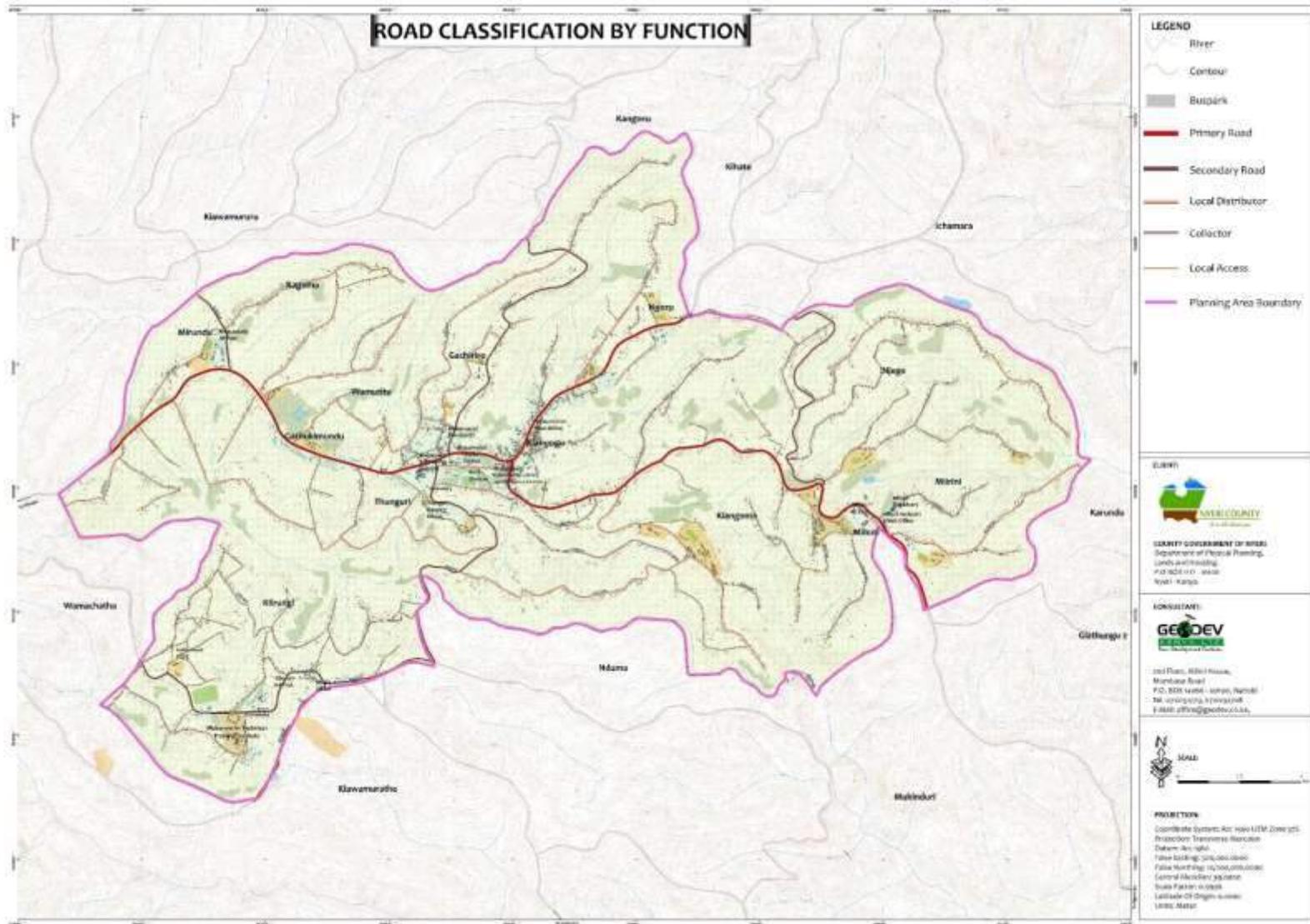
Table 2-15: An inventory of the existing road network

Road name/Class	Road Function	Road reserve	Surface Condition	length (km)
Othaya-Karatina (B27) Road	Primary road	40m	Tarmacked	6.15
Mukurweini-Mihuti-Gakonya (C510) Road	Primary road	21 m	Tarmacked	4.84
Gikondi (D1353) Road	Secondary	18 m	Murram	2.98
Mwireri (E2103) Road	Secondary	18 m	Murram	2.28
(E2104)	Secondary	18 m	Murram	2.78
Gakindu – Gikondi (E2107) Road	secondary	18 m	Murram	2.30
All class G roads (24)	-	-	Murram and Gravel	39.15
All Unclassified roads	-	-	Murram and Gravel	40.13
Total road length				100.61

Source: Field survey, 2020

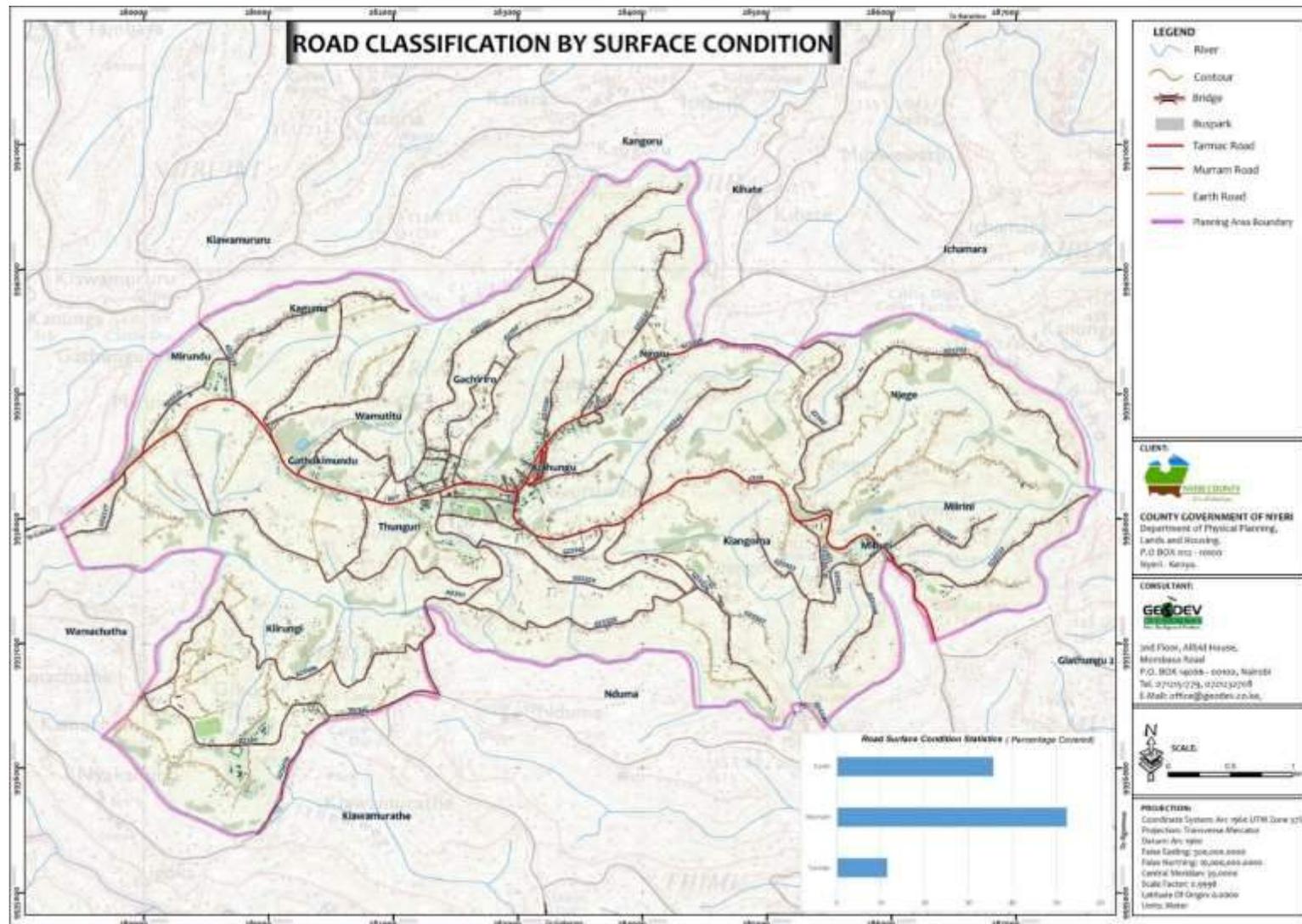
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Map 2-10: Road classification by function



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Map 2-11: Road classification by surface type



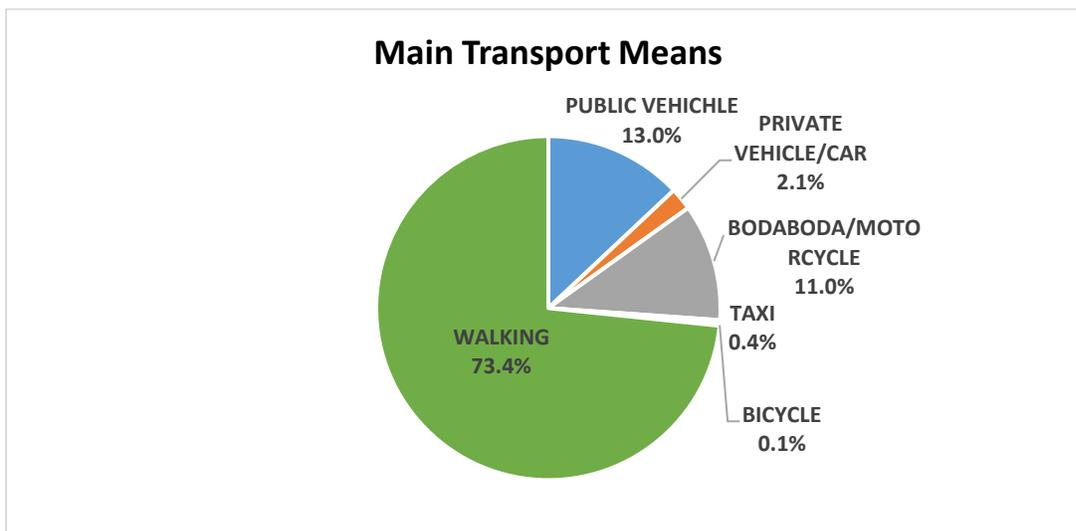
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2.6.2 Means of Transportation

Transport in Mukurweini is both motorized and non-motorized. Non-motorized means of transport in the area include walking and use of bicycles while motorized transport includes the use of public vehicles, private cars, *bodaboda* and taxi.

Non-motorised transport means account for 73% of the population while motorised means account for only 27% of the population.

Chart 2-5: Transport means analysis



Source: Field survey, 2020

The use of non-motorised transport means points to a demand for walkways and functional street lighting along the major roads passing through Kiahungu Centre. This shall promote walkability and improve pedestrian safety within the main urban centre.

2.6.3 Terminal and Parking Facilities

There exists only one operational bus park based at Kiahungu. The bus park is covered with cabro blocks making it easier to absorb rain water thereby improving the drainage within the facility. The area has approximately 40 parking lots. The bus park has toilets but lack parking demarcations and waiting bays for passengers.

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Plate 2-18: Mukurweini Bus Park



Source: Field survey, 2020

There are no marked-on street car parking slots in the Mukurweini Urban Area and this poses a challenge in revenue collection by county revenue officers. More often, conflicts arise between motorists and revenue officers during the collection of parking fees within the urban area due to the lack of well-established and marked on street car parking slots.

Plate 2-19: Sample road section that needs on street parking



Source: Field survey, 2020

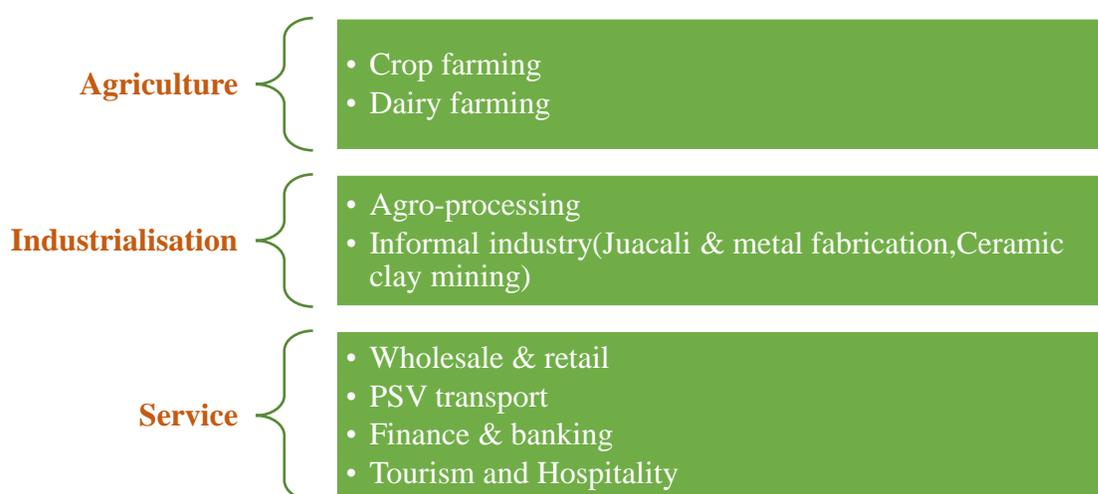
There is a clear deficit of terminal and parking facilities in the urban area. For order, safety and increment in revenue collection, there is need to establish more terminal and parking facilities within the urban area.

2.7 Local Economy

2.7.1 The economic structure of Mukurweini

The economy of Mukurweini Urban Area can be structured into three major sectors which include Agriculture, Industrialisation and Service. Agriculture incorporates crop and dairy farming while industrialization incorporates agro-processing and informal industries including metal fabrication, *juakali* etc. Services on the other hand incorporate PSV transportation, finance and banking, wholesale and retail as well as tourism and hospitality. The economic structure is as presented in figure 10-1.

Figure 2-1: Economic structure of Mukurweini



Source: Consultant's construct, 2021

2.7.1.1 Agriculture

Annual and Perennial Crops

Crop farming in Mukurweini is favoured by optimal climatic conditions, fertile soils and availability of water from rivers such as Kiro, Ithemugi, Rwarai, Gafute, Gathanji, and Gatha. According to the County Agricultural department, the most suitable crops in the town are bananas, coffee, arrow roots, macadamia, and avocados.

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Plate 2-20: Coffee and Maize farming



Source: Field survey, 2020

An analysis of the agro-potential of various crops in Mukurweini is presented in table 2-16.

Table 2-16: Crop Production and Agro-Potential

Crops grown	Agro-potential
Industrial crops <ul style="list-style-type: none"> • Coffee (Arabica SL28, Ruiru 2 and Batian 3) • Macadamia nuts • Avocados – Traditional Hass variety 	Zone UM 2 = Main Coffee Zone Sub-Zone: m/l i m/s
Food crops <ul style="list-style-type: none"> • Bananas • Maize 5 series (short rain) and 6 series (long rains) • Beans – Rose Coco, Mwitemania, Chelalang, KAT B1, Wairimu, Nyota. • Irish potatoes – shangi, hubathuti, Kenya mpya, Asante, and Meru • Roots – arrowroots and sweet potatoes 	1st rainy season: Sunflower like Hybrid S 301 A, maize of H5 series or E.M.C.O. 92 S.R., sorghum, beans, potatoes, sweet potatoes; cabbages, kales, tomatoes, onions, French beans 2nd rainy season: beans like Cuarentino, maize like Katumani, foxtail millet, sorghum, sweet potatoes, sunflower-like H 8998; kales, cabbages, onions, tomatoes, French beans Whole year: Arabica coffee, loquats, mountain pawpaws, bananas, citrus, avocados, passion fruits, pineapples, taro in valleys, macadamia nuts arrowroots, capsicum, cassava, and sugar cane
Vegetables and Horticulture Sukuma wiki, spinach, Amaranthas (Terere), Blacknight shade (manage) pumping leaves (malenges) spring onions	Pasture and forage Napier or Bana grass, banana leaves, glycine forage

Source: Department of Agriculture, Livestock and Fisheries, 2020 & Farm Management Handbook Volume II, 2010

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Agricultural production within Mukurwe-ini is mostly rain-fed, but there are efforts to promote irrigation for crops such as arrowroots using water from dams as presented in plate 2-25.

Plate 2-21: Ithemugi and Njege dams



Source: Field survey, 2020

Animal Husbandry

Animal husbandry in Mukurwe-ini involves the rearing of livestock such as cows (freshian and Ayshire), rabbits, goats, sheep, donkeys, and poultry (kenbro chicken, ducks). Zero grazing is the primary livestock rearing method.

Plate 2-22: Zero Grazing



Source: Field Survey, 2020

Some of the fodder used include napper grass, silage, and processed animal cereals feed. Table 2-17 presents different animal breeds reared in Mukurweini.

Table 2-17: Livestock Rearing in Mukurwe-ini Town

Animal	Breed	Purpose for Rearing
Cow	Friesian	Milk source; Income generation
	Ayrshire	

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Animal	Breed	Purpose for Rearing
Chicken	Indigenous	Meat and eggs source; Income generation
	Layer breed	Eggs source; Income generation
	Broiler	Meat source; Income generation
Goat	Indigenous	Meat source; Income generation
	German Alpine Dairy	Milk source; Income generation
Sheep	-	Meat source; Income generation
Pigs	-	Meat source; Income generation
Rabbits	-	Meat source; Income generation

Source: Field Survey, 2020

Fish Farming

Aquaculture is a relatively underdeveloped in Mukurweini. However, there is an emerging trend of fish farming of species such as tilapia, catfish, and trout. Fish farming is mainly practiced in dams using cages as shown in Plate 2-21.

Plate 2-23: Cage fish farming in Njege



Source: Field Survey, 2020

2.7.1.2 Industrialization

Agro-processing Industry

According to field survey 2020, only 1.7% of the residents were employed in agro-processing industries. Agro-processing industries in the town entail milk processing and coffee pulping. The milk factory is located in Kiahungu/Mukurwe-ini while coffee pulping factories are distributed within the planning boundary. Other food processing industries include two animal slaughter facilities in Mihuti and Gikondi. Agro-processing industries in Mukurweini include;

- Wakulima Dairy Limited
- Market Trademark Royal

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- Bora feed industry
- Rumukia millers
- Thunguri coffee factory
- Mihuti coffee factory
- Igutha coffee factory
- Kirugi coffee factory
- Kangoru coffee factory
- Maganjo coffee factory

Plate 2-24: Thunguri coffee factory



Source: Field survey, 2020

According to field survey 2020, most of the coffee factories are currently not operating optimally due to low coffee production as a result of low prices and poor management of the factories.

The town has unexploited value addition and agro-processing opportunities for agricultural produce and products such as meat, bananas, coffee, arrow roots, Irish potatoes, and sweet potatoes. Comprehensive investments through capital injection to establish and enhance existing industries are needed. There is also a need to create an enabling business environment to stimulate the otherwise dormant and frail agro-processing sector. Such investments will assist in economic growth and development through increased agriculture incomes and more employment opportunities.

Informal Industry

Informal industrial activities are mostly undertaken within Kiahungu centre where such activities as wood and metal fabrication, tailoring, brick making, motorcycle repairs,

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automotive works, ceramics clay mining and shoemaking are inherent. Plate 2-29 presents sample informal industrial activities in the town

Plate 2-25: Informal Industrial Activities in the town



Source: Field survey, 2020

2.7.1.3 Service Industry

Wholesale and Retail

According to a field survey 2020, 16.0% of the residents are in the wholesale and retail business working either formally or informally. The formal businesses were considered as businesses with permits and physical addresses while informal businesses lacked permanent addresses and business permits. Commercial activities in Mukurwe-ini town include Supermarkets, i.e., Central supermarket, wholesale shops, retail outlets, chemists, hotels, and fresh produce markets. Some of the wholesale and retail activities are illustrated in plate 2-26.

Plate 2-26: Retail activities in Kiahungu



Source: Field Survey, 2020

Markets

The urban area has two formal fresh produce markets; one in Kiahungu and another in Mihuti. The Kiahungu market has 250 trade stalls while Mihuti market has 120 trade stalls.

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There is need for expansion of these existing markets and establishment of more in the other nodes so as to host more traders in the area.

There is an informal *mitumba* market in Kiahungu along the Karatina-Othaya road brought about by the inadequacy of space within the fresh produce market. To enhance and promote economic activities, the County government needs to invest in additional markets or redevelop the existing ones to host different trading demands in both fresh and dry produce as well as textile/clothing.

Plate 2-27: Kiahungu Market



Source: Field Survey, 2020

Tourism and Hospitality

According to field survey 2020, 3.3% of residents are employed in the hotel and hospitality industry. Some of the hotel and lodging facilities include Zinc club and hotel, Kihuni lodge and hotel, Kims hotel and Wananchi hotel.

The town however has a great potential in the tourism sector due to the presence of culturally and religiously significant areas including:

- The shrine of *Nyaatha* (Sr. Irene Stefani) located at the Our Lady of Divine Providence church (*Gikondi Catholic Church*).
- *The Kaburi ya Mau* (*Mau Mau mass graves*).
- *The liga Ria Mau* (*the hiding caves for Mau Mau Soldiers*)

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Plate 2-28: The shrine of Nyaatha



Source: Field Survey, 2021

Finance Sector

According to field survey 2020, 2.6% of the residents in Mukurwe-ini Urban Area are employed in the finance sector. Financial institutions in the town include K.C.B bank, Equity bank, Kenya Women Microfinance Trust, Taifa sacco, Biashara sacco and Wakulima Sacco. Others include mobile money agents including Mpesa, Airtel Money, Equity and Co-operative agents. These mobile banking agents have employed a considerable amount of the population within the urban area.

Plate 2-29: Wakulima and Taifa Sacco



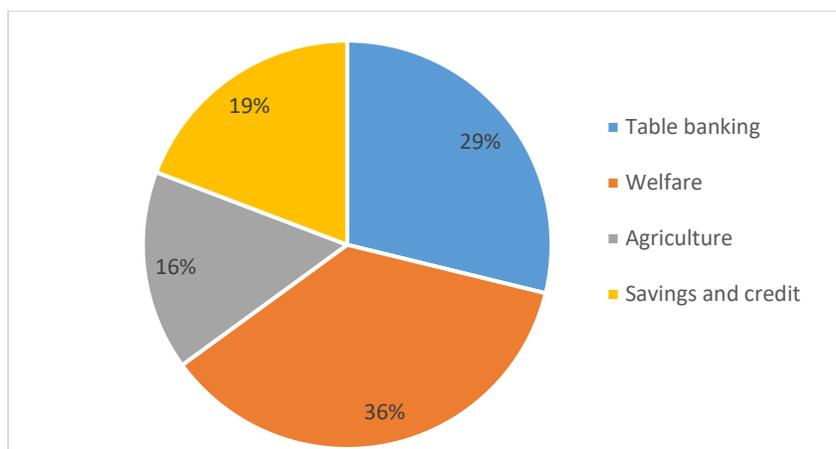
Source: Field Survey, 2020

Informal Community-Based Banking

According to field survey 2020, 52% of households were actively involved in self-help groups while 48% were not. Amongst those in self-help groups, 36% were involved in small savings and credit institutions while 29% engaged in table banking. This is presented in chart 2-6.

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Chart 2-6: Activities in Self-Help Groups



Source: Field Survey, 2020

2.8 The governance of Mukurwe-ini urban area

2.8.1 Existing Governance and Institutional Capacity

The town is operated by institutions from both the national and county government. National government institutions in the town include the offices of the Deputy County Commissioner, Assistant County Commissioners, sub-county administrator, chiefs as well as assistant chiefs. Other government agencies that have mandates within the urban area include the Kenya Power Company, the Kenya Rural Roads Authority and the judiciary.

The County government manages the urban area and has installed offices at the sub county level including planning, agriculture, public health and revenue. All these offices are characteristic of understaffing and inadequacy of vehicles for commuting within the urban area and sub-county.

With an estimated population of 27,589 residents, Mukurwe-ini Urban Area should be classified as a town as provided for in the Urban Areas and Cities (Amendment) Act of 2019.

The Act lays down the principles of governance and management of urban areas including institutionalized active participation by its residents in the management of the urban area, its affairs and efficient and effective service delivery.

Among other provisions such as public participation, the Act requires every city, municipality or town to “operate within the framework of integrated development planning” which shall:

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- a) Give effect to the development of urban areas and cities as required by this Act and any other written law;
- b) Strive to achieve the objects of devolved government as set out in Article 174 of the Constitution;
- c) Contribute to the protection and promotion of the fundamental rights and freedoms contained in Chapter Four of the Constitution and the progressive realization of the socio-economic rights;
- d) Be the basis for—
 - i. The preparation of environmental management plans;
 - ii. The preparation of valuation rolls for property taxation;
 - iii. Provision of physical and social infrastructure and transportation;
 - iv. Disaster preparedness and response;
 - v. Overall delivery of service including provision of water, electricity, health, telecommunications and solid waste management; and
 - vi. The preparation of a geographic information system for a city or municipality or town;
- e) Nurture and promote development of informal commercial activities in an orderly and sustainable manner.

For effective management and execution of mentioned activities, the act also requires that a town committee be established alongside a town administrator to oversee the running and execution of these assignments. Currently, Mukurweini Town doesn't have a town administrator and a town committee to oversee the daily running of the town. The town is currently being administered to directly by the county government.

3 SUMMARY OF ISSUES, OPPORTUNITIES AND RECOMMENDATIONS

This section presents a summary of planning issues, opportunities and recommendations resultant from the situation analysis. It is these planning issues, opportunities and recommendations that shall lead to the development of strategies and projects to resolve the identified issues.

Theme	Issue	Opportunity	Recommendation
Population and demography	<p>I. A high youthful population - Over 32% of the population in the urban area are youths aged between 15-34 years. This stresses on the need for establishment of more institutions to equip the youth with technical and innovative institutions.</p> <p>II. A high labour force - Over 64% of the population is in the labour force. This implies on the possibility of a high rates of unemployment if efforts are not put towards establishment/innovation of</p>	<p>I. The high labour force presents the urban area with readily available local labour force to the agricultural, industrial as well as commercial sectors.</p> <p>II. An increasing population provides a readily available local market for goods and services.</p>	<p>I. Establishment of one technical and vocational institutions to equip the youth with knowledge and skills needed in the labour force.</p> <p>II. Establishment of agro processing industries for such produce as bananas, sweet potatoes and cassava in the area to create more employment opportunities.</p> <p>III. Proper planning to restrict urban growth and control urban sprawl as a result of the ever-increasing population.</p>

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Theme	Issue	Opportunity	Recommendation
	<p>more income generating opportunities.</p> <p>III. High growth rate (5.34%) - The population of the urban area will be almost double by 2030.</p>		
Land	<p>I. The hilly topography of the urban area limits developable land and makes most areas prone to landslides during the rainy seasons resulting to flooding and erosion.</p> <p>II. Limited public land leading to high costs of land acquisition for the establishment of proposed facilities.</p>	<p>I. Availability of land within the built up area that can be utilized for infill development which provides an opportunity for densification.</p> <p>II. The development of this Local Physical and Land Use Development Plan presents an opportunity for effective land optimization within the urban area.</p>	<p>I. Planting of trees in all steep areas to avoid future soil erosion and landslides.</p> <p>II. Land optimization/Proper utilization of available scarce land through encouragement of densification where land is developable.</p>
Environment	<p>I. Over reliance on wood fuel is likely to result in eventual deforestation within the urban area and effectively</p>	<p>I. Environmental assets including rivers that are a major source of water to the urban area.</p>	<p>I. Enforcement of laws regarding the conservation and protection of the environment including</p>

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Theme	Issue	Opportunity	Recommendation
	<p>subject the land to issues of land degradation.</p> <p>II. Encroachment of riverine reserves for cultivation and settlement has led to river water contamination.</p> <p>III. Improper waste management practices including indiscriminate dumping.</p> <p>IV. The occurrence of landslides and loss of soil fertility in areas including Njege and Miirini/Mihuti Areas.</p>	<p>II. Existing laws regarding the conservation and protection of the environment.</p> <p>III. Bodies charged with the mandate of protecting the environment.</p>	<p>cutting/felling of trees within the urban area.</p> <p>II. Awareness creation on sustainable use of environmental assets.</p> <p>III. Provision of a land fill and waste skips as well as awareness creation on sustainable waste management practices at user level.</p> <p>IV. Promotion of the use of environmentally friendly energy sources.</p>
Education	<p>I. Inadequate primary schools and VTCs to serve the population by 2030.</p> <p>II. The high cost of education due to extra expenses introduced by school administrations.</p>	<p>I. Undeveloped land for expansion of existing education facilities that do not meet the recommended land requirements.</p> <p>II. Existence of sub-county education offices from both the national and county</p>	<p>I. Ensure prompt disbursement of bursaries to ease the cost burden and increase funding to serve more residents.</p> <p>II. Eliminate and restrict the imposition of extra charges in schools.</p>

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Theme	Issue	Opportunity	Recommendation
	<p>III. Inadequate teaching staff and learning facilities including classrooms, laboratories, libraries.</p> <p>IV. Inadequate/poor state of sanitation infrastructure such as toilets within the primary schools.</p> <p>V. Inadequate disbursement of bursaries.</p> <p>VI. Small land sizes for education facilities.</p>	<p>governments stationed within the urban area.</p>	<p>III. Employ adequate teaching staff and provide adequate education facilities such as classrooms, desks, laboratories, and learning materials such as books.</p> <p>IV. Establish additional sanitation and hygiene facilities in education facilities.</p> <p>V. Improve the condition of classrooms, ablution blocks, etc.</p>
Health	<p>I. Poor service delivery due to inadequate medical equipment, specialized staff, infrastructure and the low level of automation of Health Information System (HIS) within the public health facilities.</p> <p>II. Inadequate drugs in public health facilities.</p>	<p>I. Availability of undeveloped land to establish more health facilities.</p> <p>II. Existence of the county department of health services.</p>	<p>I. Awareness creation on the significance of the public health insurance policy.</p> <p>II. Ensure availability of drugs for patients in all public health facilities.</p> <p>III. Establish and equip four (4) dispensaries and nine (9) clinics within the urban area.</p>

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Theme	Issue	Opportunity	Recommendation
	<p>III. Poor uptake of the public health insurance policy (NHIF).</p> <p>IV. Inadequacy of level 1 & 2 public health hospitals within the planning area.</p>		<p>IV. Establish and enhance automation of Health Information System (HIS) within all public health facilities.</p> <p>V. Hire more health care workers to improve services delivery.</p> <p>VI. Enhance specialized medical services through installation and provision of surgical services, medical photogrammetry equipment, disease isolation and containment wards, radiology unit in level 4 hospital.</p>
Sanitation	<p>I. Improper management of waste (solid and liquid waste) especially within Kiahungu Centre which produces more waste within the urban area.</p> <p>II. Lack of a sewerage management system to service the urban area.</p>	<p>I. The general topography of the area provides for flow of sewer by gravity from households to treatment points.</p> <p>II. Existence of OMWASCO and the county department of health and sanitation to oversee the implementation</p>	<p>I. Establish decentralized treatment facilities to serve different neighbourhoods in the urban area.</p> <p>II. Establish a solid waste landfill to manage solid waste generated in the urban area.</p>

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Theme	Issue	Opportunity	Recommendation
	III. Lack of a solid waste management land fill for the urban area.	of development projects geared towards improving the sanitation of the urban area.	III. Awareness creation on sustainable waste management practices at household levels.
Housing	<p>I. Inadequate public housing in the urban area vis a vis the increasing population within the urban area.</p> <p>II. Poor quality of housing for the police.</p> <p>III. Inadequate supply of water at household level.</p> <p>IV. Poor management of waste at household level.</p>	<p>V. Promotion of vertical development and infill development within the urban area to accommodate an increasing population.</p> <p>VI. Privatization and/or public private partnerships for housing development within the urban area.</p>	<p>I. Vertical redevelopment of the existing housing stock to accommodate more people</p> <p>II. Adequate supply of water at household level</p> <p>III. Strategic location of waste skips in all housing areas</p>
Community and Recreation facilities	<p>I. Lack of firefighting infrastructure in the urban area.</p> <p>II. Lack of childcare facilities in the urban area.</p> <p>III. Lack of a home for the elderly and rehabilitation</p>	<ul style="list-style-type: none"> • Availability of undeveloped land for the development of the facilities that are not present within the urban area. 	<ul style="list-style-type: none"> • Acquisition of land and establishment of a disaster management centre, child care facility, home for the elderly and recreational parks.

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Theme	Issue	Opportunity	Recommendation
	<p>centre for recovering drug addicts in the urban area.</p> <p>IV. Lack of recreational parks in the urban area.</p>		
Transportation	<p>I. Poor state of access roads. Most of the access roads are of gravel/murram and earth surface. They are rendered impassable during the rainy season.</p> <p>II. Lack of drainage infrastructure on most roads.</p> <p>III. Inadequacy of parking and terminal facilities.</p> <p>IV. Inadequacy of road signage and furniture.</p> <p>V. Inadequate and narrow access roads.</p> <p>VI. Lack of NMT infrastructure on all major/busy roads passing through, Ngoru,</p>	<p>I. Mandate of the County department of Transport, public works, infrastructure and energy to maintain and improve the roads within county.</p> <p>II. Existence of national government road authorities at county level (KeRRa).</p>	<p>I. Upgrading to bitumen standards primary and major roads within the urban area.</p> <p>II. Upgrading to murram standards all secondary roads.</p> <p>III. Installation of proper drainage and infrastructure on all roads.</p> <p>IV. Installation of proper road signage and furniture.</p> <p>V. Establishment of adequate parking and terminal facilities in the urban area.</p> <p>VI. Opening up of all access roads to the required minimum reserves.</p> <p>VII. Develop a framework for regular maintenance of all roads.</p>

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Theme	Issue	Opportunity	Recommendation
	Kiahungu, Mihuti and Maganjo area.		VIII. Installation of adequate NMT infrastructure on major roads with considerable motor traffic.
Local economic development	<p>I. Low prices and inadequate market for agricultural products such as coffee and bananas.</p> <p>II. High cost of farming inputs such as fertilizers, pesticides and herbicides.</p> <p>III. Low-value addition for agricultural produce such as bananas, macadamia nuts etc.</p> <p>IV. Inadequate and poor access to capital to finance agricultural and other business ventures.</p> <p>V. Inadequate extension services for both animals and crop farming.</p>	<p>I. The rich agricultural land within the urban area with a variety of commercially viable agricultural produce such as bananas and avocados.</p> <p>II. Available historic sites that could be marketed as tourism destinations and culturally significant areas.</p> <p>III. Available labour from a youthful population within the urban area.</p> <p>IV. Available local market within the urban area.</p> <p>V. Major transportation corridors that connect the urban area to other major urban areas within the</p>	<p>I. Enhance and promote value addition through the establishment of agro-processing industries for bananas, avocados and macadamia nuts.</p> <p>II. Improve and construct additional market infrastructure to enhance the marketing of farm produce.</p> <p>III. Subsidize the cost of farm inputs including fertilizers and seeds for farmers.</p> <p>IV. Provide proper extension services at the sub-county level to cater for the agricultural needs of residents practicing agriculture.</p> <p>V. Sensitize the community members on soil management interventions including agro-forestry.</p>

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Theme	Issue	Opportunity	Recommendation
	<p>VI. Inadequate irrigation infrastructure.</p> <p>VII. Insufficient soil management measures leading to erosion and soil pollution.</p> <p>VIII. The town lacks a <i>juakali</i> designated site to accommodate the existing informal activities as well as an established agro processing zone to cater for the productivity of the agricultural hinterland.</p> <p>IX. Inadequate investments in the industrial sector within the town leading to low value-addition and insufficient income for farmers.</p> <p>X. Poor management of coffee factories.</p>	<p>county and externally to Murang'a County.</p>	<p>VI. Improve access roads within the town especially peri-urban access roads.</p> <p>VII. Establish irrigation infrastructure to enhance irrigated agriculture.</p> <p>VIII. Establish a <i>juakali</i> designated site to accommodate industrial activities</p> <p>IX. Promote investment in the industrial sector to encourage value addition through establishment of an agro processing zone in the urban area.</p> <p>X. Establish a special economic zone to specifically promote the hotel and hospitality sector.</p> <p>XI. Improve road infrastructure in the area to increase mobility and interconnection.</p> <p>XII. Enhance the business environment through the</p>

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Theme	Issue	Opportunity	Recommendation
	<p>XI. High production cost due to the high cost of energy, rents, and administration charges (high rental costs, licensing fees etc).</p> <p>XII. Unfriendly business environment mostly due to.</p> <p>XIII. Incidences of insecurity within the planning area.</p> <p>XIV. Inadequate market infrastructure to effectively accommodate traders.</p> <p>XV. Lack of parking facilities within the urban area.</p> <p>XVI. Lack of adequate streetlight to enhance security and support night commercial activities.</p> <p>XVII. Non- marketing of the available cultural and religiously significant sites.</p>		<p>establishment of requisite infrastructure and favorable licensing costs.</p> <p>XIII. Enhancing security in the core and peri-urban areas through erection of adequate street and flood lights.</p> <p>XIV. Establish parking facilities within the urban area.</p> <p>XV. The county to increase funding for the Enterprise Development Fund to increase credit access to residents.</p> <p>XVI. Expand the existing markets to accommodate more traders.</p> <p>XVII. Provide for and subsidize prices for loading and parking zones for business in the core urban area.</p> <p>XVIII. Demarcate, designate and market the identified tourist attraction sites within the town.</p>

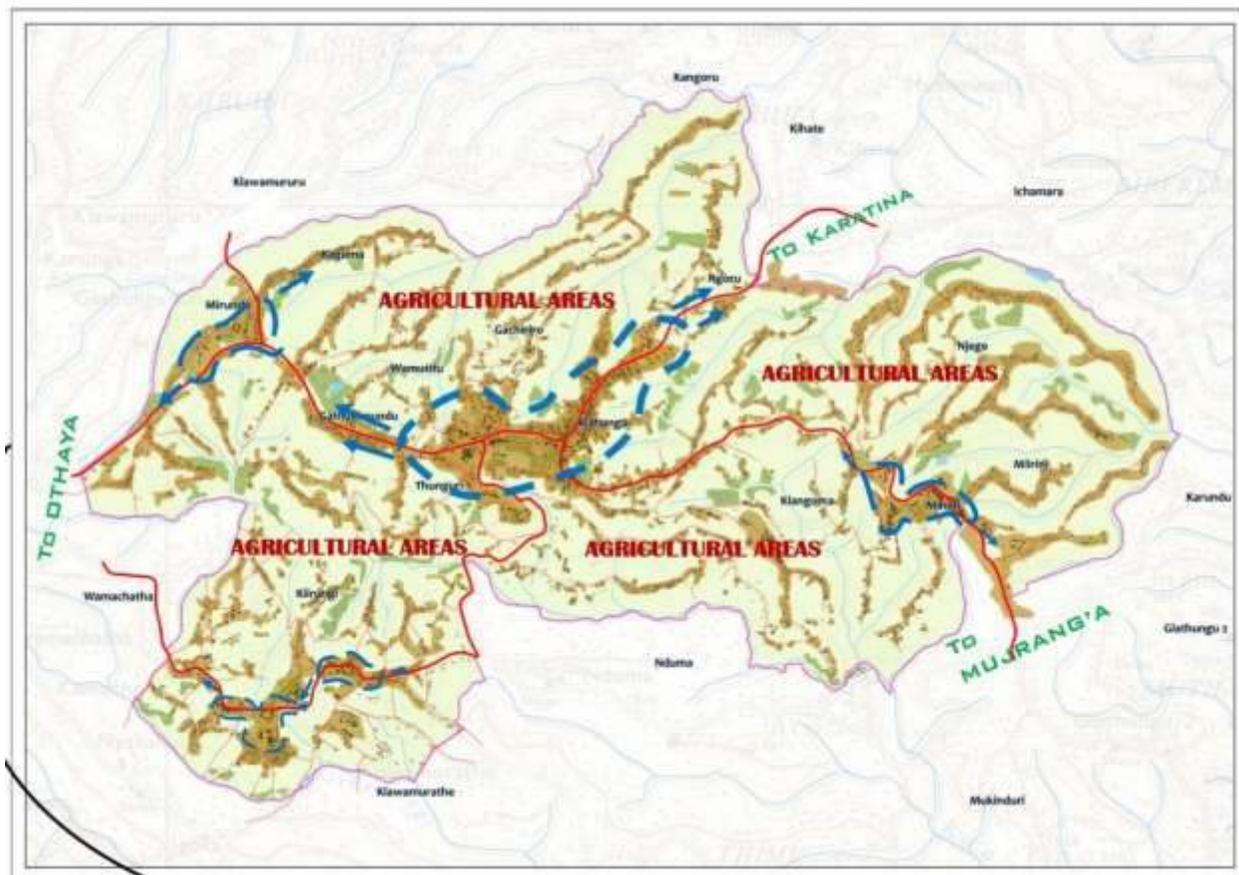
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4.2 Development options

4.2.1 Option 1: Business as usual/Zero intervention

This model assumes that there will be no deliberate intervention to regulate the development form and pattern of Mukurweini urban area. It also assumes that there will be no significant change in approaches and development priorities and as such, the current growth trends are allowed to prevail in a linear manner.

Map 4-2: Business as usual/ Zero intervention



Advantages

- I. Freedom to develop in whichever manner developers find favourable.
- II. Less bureaucracy in the development process due to lack of regulations.

Disadvantages

- I. Conflicting uses of land.
- II. Inefficient use of land.

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- III. Difficulty in service provision due to urban sprawl.
- IV. Skewed development and growth of the urban area.
- V. Sprouting of nodes with undefined roles and functions.
- VI. Undefined urban growth limits may reduce agricultural land.

4.2.2 Option 2: Urban concentration and strict regulation

This model introduces interventions to concentrate development by setting urban growth limits for the core urban area as well as the nodes.

It as well introduces regulations as to the types of development allowed within the set urban limits so as to efficiently utilize the land. It encourages urban densification while preserving the peripherals for other purposes including agriculture and farm houses.

Map 4-3: Urban concentration and strict regulation



Advantages

- I. It promotes conservation of the agricultural land by limiting urban growth limits

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- II. It is Easy to control urban growth due to restricted urban sprawl.
- III. It is relatively cheaper to provide infrastructure and services within a particular set limit.
- IV. There is a lot of land for infill development within the buildup area that can be used for urban densification.

Disadvantages

- I. Inequality in development between the set urban limit and the remainder of the planning area/peripherals. The set urban growth limit is usually given priority in infrastructure and service delivery so as to adequately serve the population within the limit.
- II. Pressure of land along the road corridors due to limitation on land has a subsequent influence on the development pattern. Limiting growth within the set limits will therefore be a challenge.

4.2.3 Option 3: Allowing outward growth of the core urban area and nodes by pointing growth directions

This model allows for expansion of urban growth limits for the core urban area and the nodes while giving specific directions which the urban area will expand towards.

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Table 4-1: Inventory of the preferred development option

Component	Description	Area coverage	Major Function
Agriculture promotion areas	Encompasses agricultural activities and farm houses	1910.62Ha	Agricultural
Conservation Areas	Encompasses environmental assets including rivers, forested areas and steep areas above 15°	123.26Ha	Conservation
Core urban area Kiahungu+Ngoru	Encompasses commercial, residential, administrative and utility areas	215.76Ha	Commercial, Residential and Administrative
	Commercial area	20.41Ha	
	Residential area	70.05Ha	
Satellite Nodes			
Mihuti	Encompasses Commercial, residential and administrative areas	33.36Ha	Commercial, Residential and Educational
	Commercial area	2.43Ha	
	Residential area	2.15Ha	
Kamuchuni/Gikondi	Total urban limit	62.51Ha	Commercial, Residential and Educational
	Commercial area	4.03Ha	
	Residential area	11.09Ha	
	Educational area	19.14	
Maganjo	Encompasses commercial and administrative areas	8.32Ha	Commercial
	Commercial area	2.1Ha	

5 THE STRUCTURE PLAN AND ZONING REGULATIONS

5.1 The Mukurwe-ini Land Use Plan

The proposed structure for Mukurweini urban area has three broad sections namely: the Core Urban Area (Kiahungu), Urban Nodes (Mihuti, Maganjo, Gikondi and Kamuchuni) and agricultural promotion areas. The plan presents the preferred development form and pattern for Mukurweini urban area as well as the set urban limits. Moreover, it specifies the promoted/dominant land uses in each of the urban nodes within the urban area as presented in map 5-1. Details for each individual proposed urban node are as shown in maps 5-2 to 5-5.

Table 5-1 presents the promoted functions in the proposed structure for the urban nodes within the urban area.

Table 5-1: Major promoted functions for the urban nodes

Urban node	Major function
Kiahungu and Ngoru	Commercial, residential and administrative
Mihuti	Commercial, residential and educational
Kamuchuni/Gikondi	Commercial, residential and educational
Maganjo	Commercial

5.1.1 Factors considered in structure development

Land suitability/general topography of the urban area

The urban area is characteristic of high ridges and steep escarpments. The top of these ridges are generally flat and can support urban development while most escarpments dip at angles greater than 15° which is unsuitable for sustaining urban development as well as intense agricultural activities. The topography of the urban area has therefore made it almost impossible to avoid a linear form of development. As a result, urban limits have only been established on highly suitable and medium suitable land giving the structure a general linear form of development. The linear development form presents an advantage in service and

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utility provision due to the proximity of developments on roads. Additionally, it helps in reducing the cost of service and utility provision.

Urban Land Requirements

Key among considerations was the need to accommodate the growing population of Mukurweini Urban Area as well as providing adequate spaces for commercial, administrative, utility and recreation purposes. Opening and expansion of access roads to a minimum 6 metres was also a key consideration in development of the structure.

A calculation of the land budget estimates the minimum land required for residential use at 56.04 Ha. In the proposed detailed urban land use plan, residential use in Kiahungu has been allocated 74 Ha. The difference land allocated indicates the areas that need to be primed for future urban development within Kiahungu Centre. This therefore simulates the reach for which the trunk infrastructure requires to be adequately provided in order to allow expansion of the core urban area.

Cost of land acquisition

The cost of land acquisition in the urban area is high with an acre going for over 6 million Kenyan shillings. As a result, land that is already owned by the county government has been efficiently used to accommodate all key proposals as demanded by the population needs. Only a few projects especially in the nodes need acquisition of land for development. For example, other than constructing more primary schools, addition of extra streams and employment of adequate staff has been proposed especially in schools with only one stream.

Environmental Concerns

Environmental concerns in the urban area include overreliance on wood fuel for cooking as well as pollution of rivers from farm chemicals. Additionally, protection of steep slopes through conservation have been factored in order to ensure safety from any incidents that may occur as a result of landslides especially during the rainy seasons.

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In this structure, rivers have been allocated reserves and forested areas and steep slopes demarcated as conservation areas. Regulations have been put in place to encourage planting of trees on steep slopes as well as the promotion of agroforestry.

Protection of Agricultural Land

Mukurweini Urban Area has rich agricultural soils and favourable climate that favors agriculture. Over 54% of the residents in Mukurweini Urban Area solely depend on agriculture as the main income source.

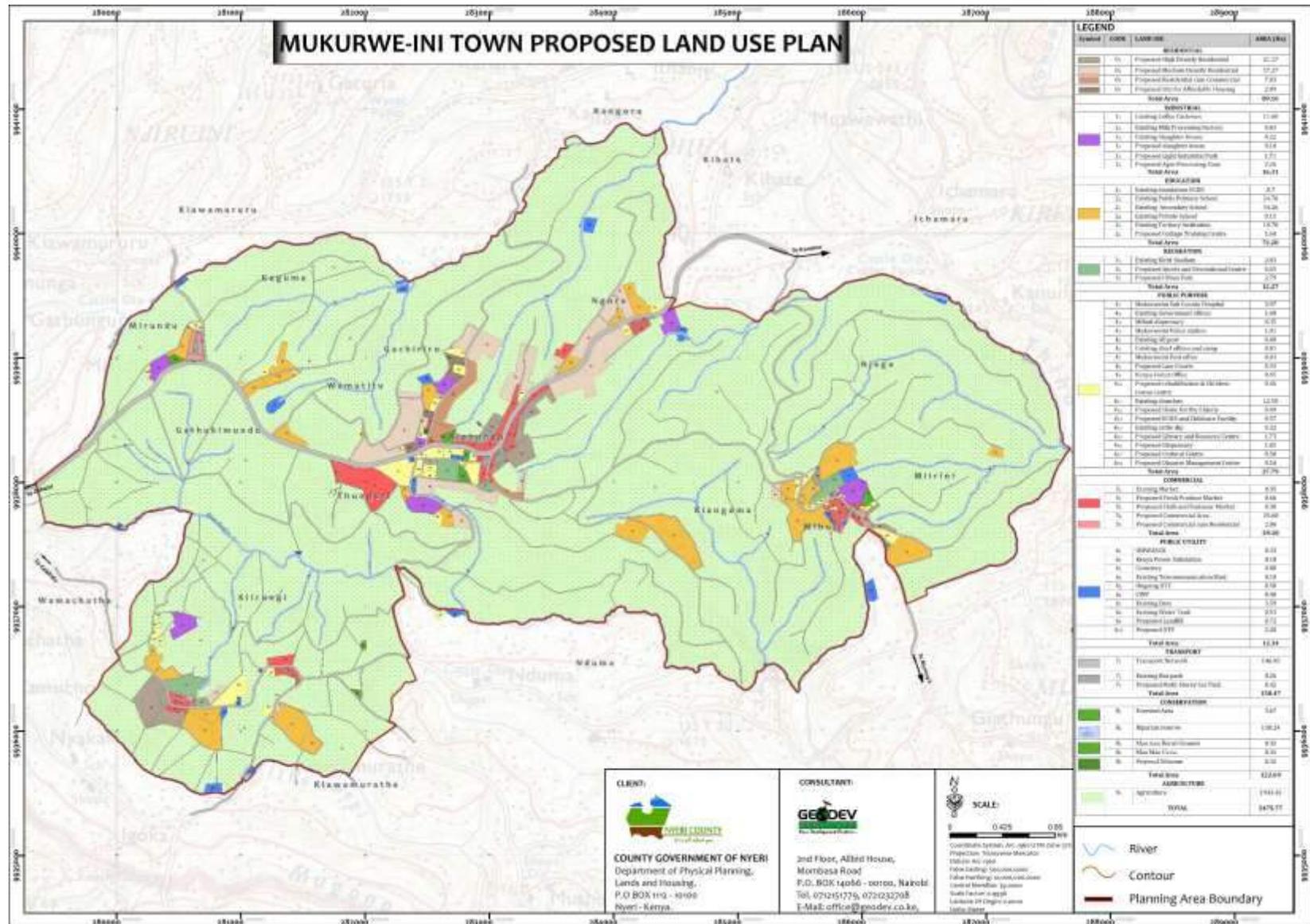
The approach adopted in preparing this structure plan sought to ensure protection of agricultural land by limiting urban sprawl through setting urban limits and promotion of densification within the set limits. This aided in preserving the rural areas for agricultural purposes. The table below shows the land uses as captured in the structure plan. The proposed structure plan for Mukurwe-ini Urban Area is as presented in map 5-1.

Table 5-2: Proposed Land Uses for Mukurwe-ini Land Use Plan

Land use	Approx. Area (Ha)	Percentage of Total Land (%)
Residential	89.16	3.6
Industrial	17.95	0.7
Educational	72.2	2.9
Public Purpose	27.79	1.1
Commercial	29.1	1.2
Public Utility	12.34	0.5
Transportation	150.47	6.1
Conservation	122.69	5.0
Agriculture	1941.79	78.8
Total	2432.20	100.0

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Map 5-1: Mukurwe-ini Proposed Land Use Plan



5.1.2 Description of the Land Use Plan

Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
0 ₁	Proposed High Density Residential	21.17	<ul style="list-style-type: none"> Residential cum commercial developments Typologies consisting of row housing, maisonettes and flats Narrow access roads/No access roads Minimum land size of 0.025Ha. Inadequate street lighting Rampant indiscriminate dumping of solid waste. Lack of a sewer reticulation system 	<ul style="list-style-type: none"> Developments of a max.7 floors upon connection to sewerage and water Densification and Redevelopment Opening up of access roads as proposed to a minimum 6 metres. Location of waste skips at strategic points Provide a sewer reticulation system. Developments connected to a sewerage network, water, and electricity to be allowed to construct up to 7 floors. Purely residential use Provide street lighting within these zones.
0 ₂	Proposed Medium Density Residential	57.27	<ul style="list-style-type: none"> Residential cum commercial developments Typologies consisting of row housing, maisonettes and flats Narrow access roads/No access roads Minimum land size of 0.045Ha. Inadequate street lighting Rampant indiscriminate dumping of solid waste. Lack of a sewer reticulation system 	<ul style="list-style-type: none"> Developments of a max. 4 floors Densification and Redevelopment of old low-density buildings Opening up of access roads to a minimum 6 metres. Location of waste skips at strategic points Provide sewer, water and electricity infrastructure. Purely residential use
0 ₃	Proposed Residential cum Commercial (Mixed Use)	7.83	<ul style="list-style-type: none"> Residential cum commercial developments 	<ul style="list-style-type: none"> Developments of a max.7 floor flats

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
			<ul style="list-style-type: none"> • Typologies consisting of row housing, maisonettes/bungalows and flats • Narrow access roads/No access roads • Minimum land size of 0.025Ha. • Inadequate street lighting • Rampant indiscriminate dumping of solid waste. • Lack of a sewer reticulation system 	<ul style="list-style-type: none"> • Densification and Redevelopment of areas having row housing, bungalows and maisonettes. • Opening up of access roads to a minimum 6 metres • Location of waste skips at strategic points • Provide sewer, water and electricity infrastructure. • Residential cum commercial developments (Dominant use per site to be residential. Commercial use to be reserved for ground and first floors)
O ₄	Proposed Low Cost Housing Area	2.89	<ul style="list-style-type: none"> • Semi-detached government housing units. • Vacant unutilized land. • Areas are close to major roads (primary and secondary) • Lack of sewer reticulation system for government housing units. 	<ul style="list-style-type: none"> • Provide sewer, water and electricity infrastructure to the sites proposed. • Redevelopment of the semi-detached housing units next to wakulima sacco to high rise developments of five (5) floors (ground plus four) • Provide parking spaces on each site. • Provide waste skips at strategic points on each site.
1 ₁	Existing Coffee Factory	11.16	<ul style="list-style-type: none"> • Coffee factory • Underutilized lands 	<ul style="list-style-type: none"> • Revival of factory to process coffee. Maintain use or change to similar industrial use (agro-processing). • Connection to necessary infrastructure including water, sewer and electricity.

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
				<ul style="list-style-type: none"> • Ensure compliance to environmental regulatory statutes (national and local).
1 ₂	Mukurweini Dairy Ltd	0.43	Mukurweini Dairy Factory	<ul style="list-style-type: none"> • Maintain Use. • Ensure compliance to environmental regulatory statutes (national and local).
1 ₃	Existing Slaughterhouse	0.22	<ul style="list-style-type: none"> • Slaughter slab • Lack of piped water to the facility • Privately owned facility 	<ul style="list-style-type: none"> • Maintain use or convert to commercial or residential use upon development application.
1 ₄	Proposed slaughter house	0.1	Agricultural land/use	<ul style="list-style-type: none"> • Land acquisition and development • Fencing of site • Connection to necessary infrastructure including water, sewer and electricity • Construct access roads to facility to a minimum width of 6m. • Ensure compliance to environmental regulatory statutes (national and local).
1 ₅	Proposed Light Industrial Park	1.71	Agricultural Land/Use	<ul style="list-style-type: none"> • Land acquisition and development a industrial park for wood, metal and automobile works. • Connection to necessary infrastructure including water, sewer and electricity • Demarcation and Fencing of site.

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
				<ul style="list-style-type: none"> • Tarmacking of the road leading to the area.
16	Proposed Agro Processing Zone	3.9	Agricultural land/use	<ul style="list-style-type: none"> • Land acquisition and development an agro processing zone for bananas, arrow roots and any other agricultural produce with a good yield year-round in the urban area. • Connection to necessary infrastructure including water, sewer and electricity • Opening up access roads to required minimum width • Ensure compliance to environmental regulatory statutes (national and local).
2 ₁	Existing standalone ECDE	0.7	Education facility	<ul style="list-style-type: none"> • Maintain use • Fence the facilities • Connect the necessary infrastructure including water, sewer and electricity. Install solar panels to augment electricity supply in the institution.
2 ₂	Existing Public Primary School	24.7	Primary school facilities	<ul style="list-style-type: none"> • Maintain use • Provide requisite equipment, infrastructure and facilities • Acquire land and expand all the facilities shown to have a minimum of 3.9Ha or encourage densification of buildings to save on space. • Install solar panels to augment electricity supply in the institution.

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
2 ₃	Existing Secondary School	34.26	Secondary school facilities	<ul style="list-style-type: none"> • Maintain use • Provide requisite equipment, infrastructure and facilities • Acquire land and expand all the facilities shown to have a minimum of 4.5Ha or encourage densification of buildings to save on space. • Install solar panels to augment electricity supply in the institution.
2 ₄	Existing Private School	0.15	Education institution	<ul style="list-style-type: none"> • Maintain use or convert to adjacent medium density residential use upon development application.
2 ₅	Existing Tertiary Institution	10.78	<p>ABTC Centre</p> <ul style="list-style-type: none"> • Offices and building research materials/samples • The site is not frequently used due to inadequacy of facilities and equipment. <p>Mukurweini TTI</p> <ul style="list-style-type: none"> • Vacant Land 	<p>ABTC Centre</p> <ul style="list-style-type: none"> • Maintain use • Upgrade the facility to promote frequent use <p>Provide new and advanced research equipment to enable proper research</p> <p>Mukurwe-ini TTI</p> <ul style="list-style-type: none"> • Construct a modern learning facility to have all the necessary infrastructure including student accommodation, water, electricity and sewerage infrastructure. • Provide requisite equipment and learning facilities • Install solar panels to augment electricity supply in the institution.
2 ₆	Proposed Cottage Training Centre (Kaiguchu Cottage Training Centre)	1.6	Agricultural Land/Use	<ul style="list-style-type: none"> • Construct a modern learning facility to have all the necessary infrastructure

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
3 ₁	Kiriti Stadium	2.83	Stadium/play field	<ul style="list-style-type: none"> • Maintain use • Upgrade facility into a modern stadium. Provide spectator benches, a dias, an ablution block as well as four (4) flood masts. • Connect the facility to water, electricity, and sewerage infrastructure.
3 ₂	Proposed Sports and Recreational Centre	6.65	Existing Playfield	<ul style="list-style-type: none"> • Maintain use • Upgrade facility into a modern stadium. Provide spectator benches, a dais, an ablution block as well as four (4) flood masts. • Connect the facility to water, electricity, and sewerage infrastructure.
3 ₃	Proposed Urban Park	2.79	<ul style="list-style-type: none"> • Agricultural Use • Decaying housing units for the National Youth Service. • Informal and formal Commercial use. 	<ul style="list-style-type: none"> • Fence the land • Establish a standard park with street lighting (solar powered), park benches, litter bins and ablution blocks.
4 ₁	Mukurweini Sub County Hospital	3.97	Health facility	<ul style="list-style-type: none"> • Maintain use • Provide additional requisite infrastructure and staff to offer a wide range of medical services as per its level of health care.
4 ₂	Existing Government offices	1.68	National government and County government offices	<ul style="list-style-type: none"> • Maintain use. • Encourage densification through redevelopment of the existing offices in order to accommodate

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
				more government departments (national and county)
44	Mukurweini Police station	1.01	Police station	<ul style="list-style-type: none"> • Maintain use • Expand the police station • Redevelop the facility to a modern police station and vertically redevelop the police housing into modern quality residential structures to accommodate more officers.
45	Existing AP Post	0.4	Housing Units (tin and permanent) for the Kenya Police	<p>Construct proper housing units for the Kenya police.</p> <p>Service the site with adequate water, electricity and sewerage infrastructure (a septic tank)</p>
46	Existing Chief Office and Police Camp	0.81	Maintain use	Redevelopment of the police housing units and the chief's office in order to adequately utilize the space.
47	Mukurweini Post office	0.03	Post office	Preserve the facility for future public purposes.
48	Proposed Law Courts	0.33	Ongoing development of the Law courts	<ul style="list-style-type: none"> • Develop the law court and provide the necessary infrastructure and services including water, sewerage and electricity. • Install solar panels to augment electricity supply

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
4 ₁₀	Proposed Rehabilitation Centre	0.46	Agricultural land	<ul style="list-style-type: none"> • Develop a modern rehabilitation centre to have a dormitory area, a hall, landscaped outdoors etc. • Equip facility with the electricity, water and sewerage infrastructure. Employ staff to cater for inpatients on a 24-hour basis.
4 ₁₁	Existing churches	12.5	Churches	Maintain use
4 ₁₂	Proposed Home for the Elderly	0.49	Agricultural land	Acquire land and develop a modern Home for the Elderly and provide for requisite infrastructure and services
4 ₁₃	Proposed ECDE and Childcare Facility	0.57	Agricultural land	Acquire land and develop a modern ECDE and Childcare Facility and provide for requisite infrastructure and services
4 ₁₄	Existing Cattle Dip	0.32	Cattle Dip is largely underutilized	<ul style="list-style-type: none"> • Develop the cattle dip to cater for more livestock. • Fence the site. • Construct an office and ablution blocks for animal control on-site.
4 ₁₅	Proposed Library and Resource Centre	1.73	Small Library and CDF offices and Hall	<ul style="list-style-type: none"> • Expand offices and library to modern status in order to cater for diverse needs i.e artists, students etc. • Construct an extra hall on-site to encourage talent nurturing within the urban area.

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
4 ₁₆	Proposed Dispensary	1.85	Agricultural land	Acquire land and develop four (4) dispensaries (Gachiro, Ngoru, MAganjo, Gikondi and Kamuchuni) and provide requisite infrastructure and services as per level of service
4 ₁₇	Proposed Cultural Center	0.3	Agricultural land	Construct a hall and offices on site. Service the site with water and electricity. Ensure proper liquid waste management on site through preferable use of a septic tank.
4 ₁₈	Proposed Disaster Management Centre	0.54	Agricultural land	Develop a modern Disaster Management Centre and provide for requisite infrastructure including a fire engine, water, electricity, among other facilitative equipment.
5 ₁	Existing Market	0.35	Structure for a fresh produce market	<ul style="list-style-type: none"> • Ensure regular clean-up of the market preferably once a week by the county government. • Ensure regular maintenance of facilities and infrastructure within the site. • Construct a parking as well as a loading and offloading area within the site.
5 ₂	Proposed Fresh Produce Market	0.66	Agricultural land	<ul style="list-style-type: none"> • Acquire land and develop a modern fresh produce market. • Provide requisite infrastructure and services including a loading and offloading zone for lorries

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
				and trucks, an ablution block, water, electricity etc.
5 ₃	Proposed Cloth and footwear Market	0.3	Fresh produce market	<ul style="list-style-type: none"> • Change the use of the market from a fresh produce market to a Cloth and footwear Market. • Construct stalls (2.5*2.5m) within the current market structure • Install the necessary infrastructure including washrooms, loading and offloading bay, offices, a store and waste disposal area. • Provide the necessary services including water, electricity and sewerage.
5 ₄	Proposed Commercial Area	25.68	<ul style="list-style-type: none"> • Agricultural land • Commercial buildings • Mixed use developments (residential cum commercial and commercial cum residential depending on the area) • Building typologies include flats, row houses and maisonettes • Narrow/ no access roads • Lack of sewer connection • Indiscriminate dumping of waste 	<ul style="list-style-type: none"> • Developments of a max.7 floor flats. • Densification and Redevelopment for row houses, maisonettes and other low-density housing/development typologies. • Opening up of access roads within built up areas to a minimum 6 metres. • Areas currently under agricultural use and have large land sizes to have access roads of 9 metres upon subdivision.

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
				<ul style="list-style-type: none"> • Location of waste skips at strategic points. • Connection to sewerage infrastructure • Purely for promotion of commercial use upon request for change of user.
5 ₅	Proposed Commercial cum Residential	2.06	<ul style="list-style-type: none"> • Mixed use residential cum commercial developments 	<ul style="list-style-type: none"> • Promotion of middle to high rise commercial development with a mixture of residential use upon change of use.
6 ₁	Water Distribution Company (OMWASCO)	0.33	OMWASCO offices	Maintain use.
6 ₂	Kenya Power Substation	0.18	Kenya power sub station	Maintain use.
6 ₃	Cemetery	0.8	Cemetery	<ul style="list-style-type: none"> • Fence and expand the cemetery • Raise ground • Continuous maintenance of the cemetery
6 ₄	Existing Telecommunication Mast	0.1	Telecommunication mast	<ul style="list-style-type: none"> • Maintain use. • In the event of change in use provide a utility service of a similar function or revert back to original/adjacent use.
6 ₅	Ongoing DTF site	0.5	Development of liquid waste treatment site.	<ul style="list-style-type: none"> • Plant trees along the perimeter to act as a screen for the facility. • Site to be subjected to periodic random sample tests for waste disposed to the River Ruarai.

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
6 ₆	Cattle Watering Points	0.4	Water points for livestock	<ul style="list-style-type: none"> • Develop all the livestock watering points a highlighted. These can serve as possible areas for community water schemes to promote irrigation farming.
6 ₇	Existing Dams/Water reservoirs	3.59	Water reservoirs	<ul style="list-style-type: none"> • Construct water pumping station adjacent to the sites and distribution networks to the areas proximate in order to promote irrigation farming.
6 ₈	Existing Water Tank	0.51	Presence of Water tanks	<ul style="list-style-type: none"> • Maintain use and increase capacity of the tanks over time commensurate with demand
6 ₉	Proposed Land Fill	0.72	Vacant agricultural land	<ul style="list-style-type: none"> • Fence the site • Buffer the facility with trees to act as screens • Construct the site to fit the standards of a land fill • Ensure proper waste handling on site through use of appropriate equipment
6 ₁₀	Proposed DTF	5.2	Vacant agricultural lands	<ul style="list-style-type: none"> • Construct/Develop the six (6) liquid waste treatment sites to service the various centers including Kiahungu, Ngoru, Maganjo, Gikondi and Mihuti and the adjoining agricultural lands.

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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
7 ₁	Road Network	146.95	<ul style="list-style-type: none"> Road network consisting of tarmac, murrum and earth surface. 	<ul style="list-style-type: none"> Maintain use Open up all access roads to minimum recommended widths (6M within the built-up areas and 9m within areas with less subdivisions) Provide for adequate road terminals, furniture and drainage Regular maintenance and upgrading to recommended standards of select roads (details are as captured in the transport strategy).
7 ₂	Existing Bus Park	0.26	Bus Park	<ul style="list-style-type: none"> Maintain use and upgrade facilities including passenger waiting bays, ablution blocks, stalls etc.
7 ₃	Proposed Multi-Storey Car Park	0.42	Agricultural land	Establish a modern parking facility with all requisite infrastructure and services
8 ₁	Forested Area	118.24	Forested areas	Maintain use and encourage reforestation upon harvesting.
8 ₂	Riparian reserve	3	Agricultural activities	Conserve and protect riparian reserves through establishment of a 10 metres reserve on both sides of river channel.
8 ₃	Mau Mau Burial Grounds	0.32	Forested area	<ul style="list-style-type: none"> Fence the site. Maintain the tree cover within the site.

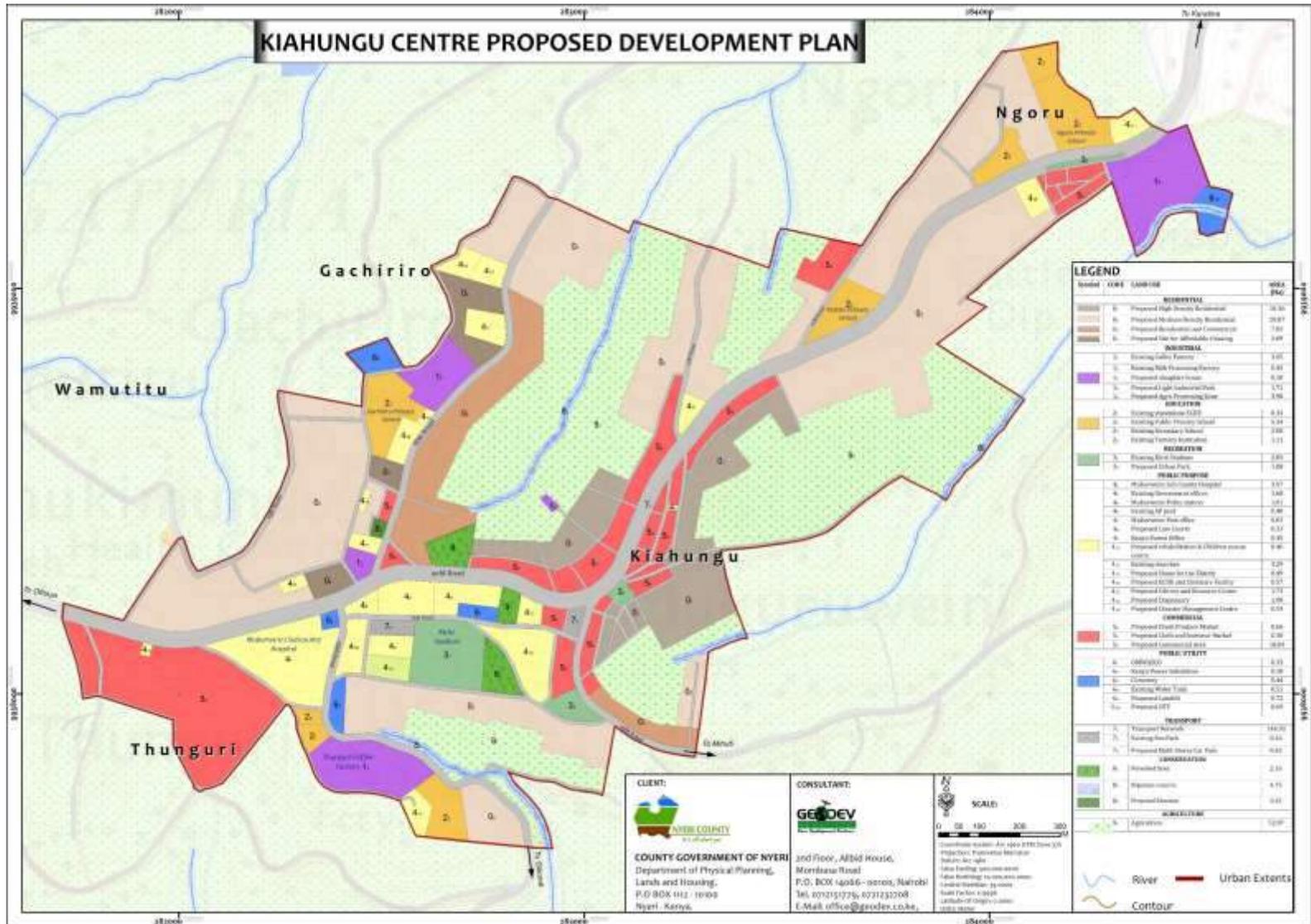
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Code	Land uses	Area (Ha)	Existing condition	Proposed Intervention
				<ul style="list-style-type: none"> • Identify and mark the burial sites • Promote the site as a culturally significant area.
8 ₄	<i>Mau Mau Caves</i>	0.31	Vacant unused land Rock outcrops with caves	<ul style="list-style-type: none"> • Fence the site • Promote the site as a culturally significant area.
8 ₅	Proposed Museum	0.15	Mukurweini Law Courts	Preserve the site and repurpose it as a museum. Furnish the site with culturally significant artifacts and/or illustrations.
9 ₁	Agriculture	1941.79	Agricultural land	<ul style="list-style-type: none"> • Maintain and promote use. • Discourage intense development. • Provide regular extension services to farmers to increase their production capacities. • Subdivision of land to be limited to stipulations within the zoning regulations.

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5.1.2.1 Kiahungu Centre

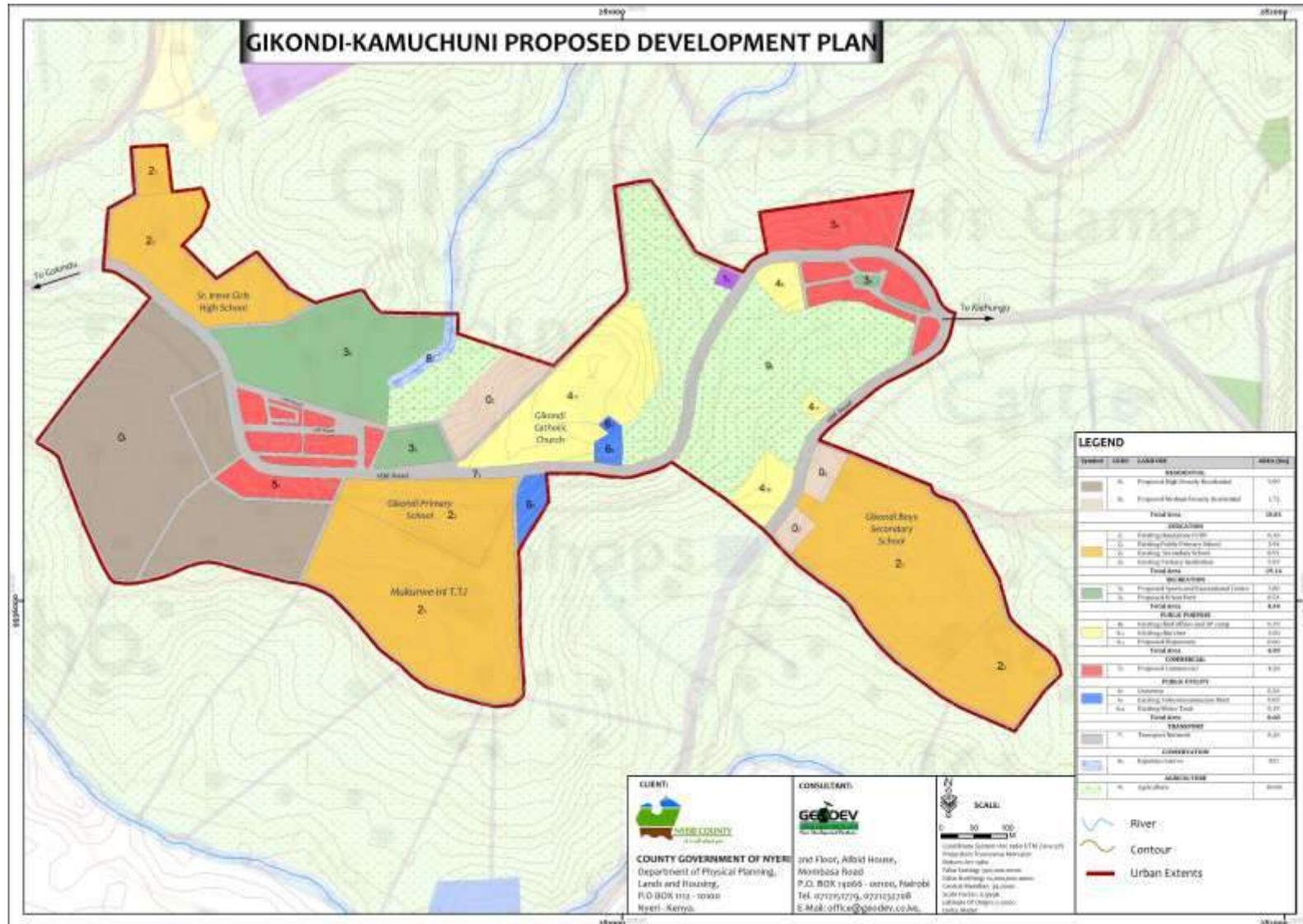
Map 5-2: Kiahungu Proposed Land Use Plan



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5.1.2.2 Gikondi Centre

Map 5-3: Gikondi/Kamuchuni Proposed Land Use Plan



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5.1.2.3 Maganjo Centre

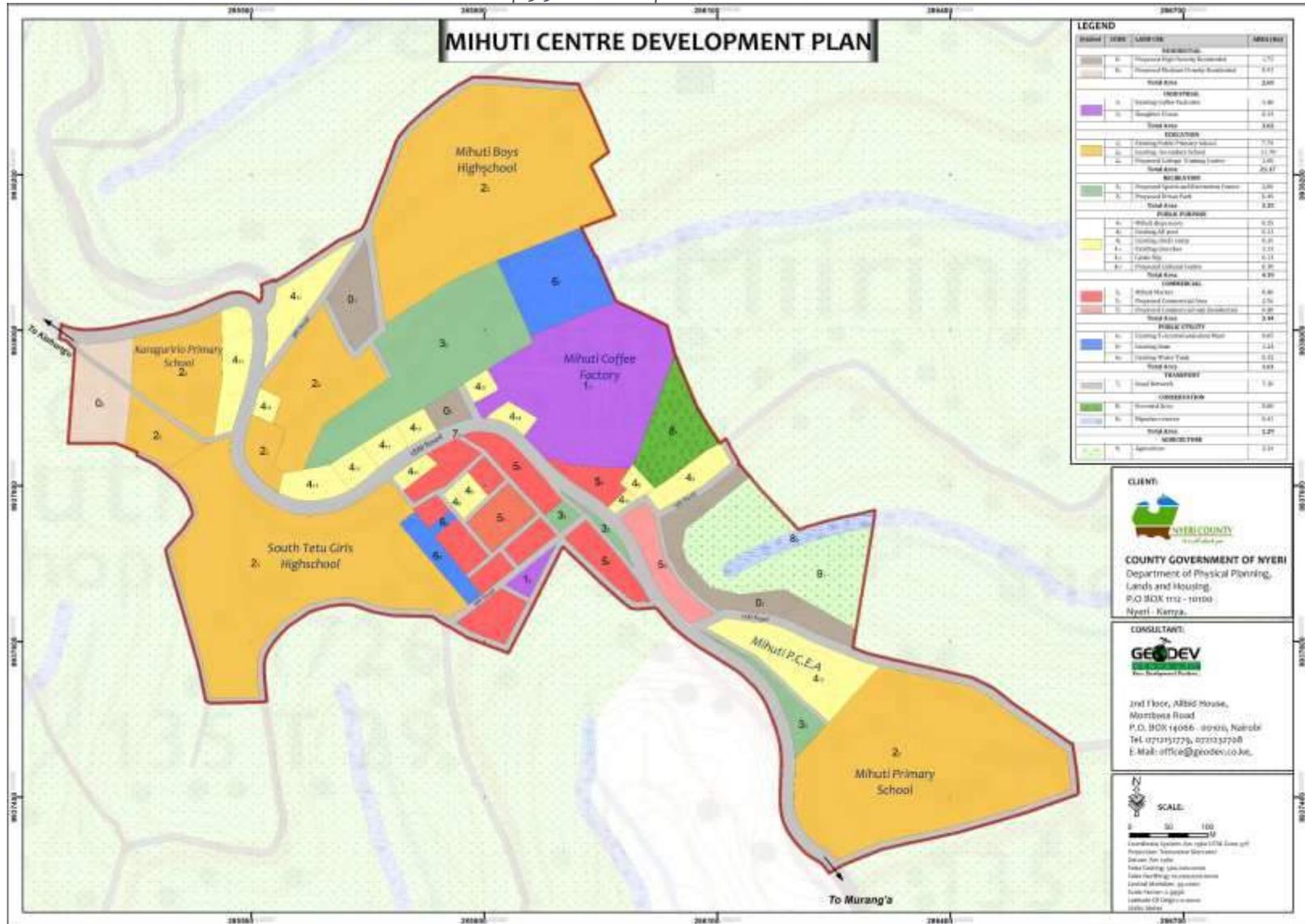
Map 5-4: Maganjo Proposed Land Use Plan



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5.1.2.4 Mihuti Centre

Map 5-5: Mihuti Proposed Land Use Plan



5.2 Proposed Land Use Zones and Regulations

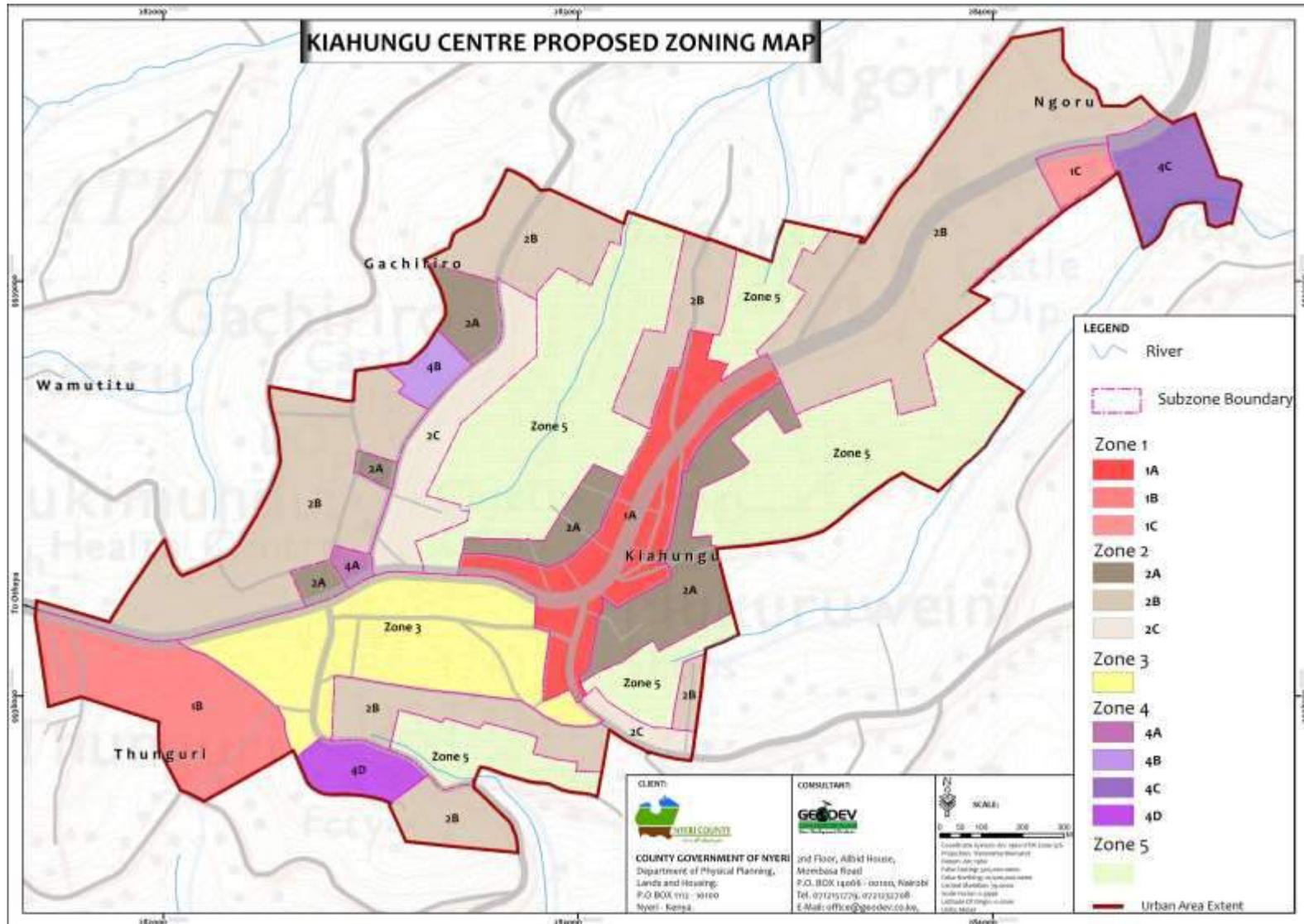
This section provides zoning regulations for specific zones proposed for Mukurweini Urban Area. The zoning regulations shall serve as a basis for development control for the urban area and range from permitted users, unpermitted uses, auxiliary services, minimum plot sizes, setbacks (front, side and rear), levels (building heights), plot coverage and building typologies. The zones have been numbered systematically and the area in which they apply indicated on the zoning map attached. Key terms used in the regulations are described below.

- Minimum Plot Size – Refers to the minimum allowed horizontal land area of a given plot.
- Building Setbacks – The unoccupied open area between the furthestmost projection of a structure and the property line of the plot on which the structure is located. This plan provides for the front, side and rear setbacks.
- Building Height – Refers to the vertical distance between the average finished grade at the base of the building along the side of the building being measured and the top of the building measured in floor levels
- Plot Coverage – The percentage of the ground area of the plot covered by the structure (principal and accessory)

Maps 5-6, 5-7, 5-8 and 5-9 as well as tables 5-3, 5-4, 5-5 and 5-6 in subsequent pages in this section present the zoning maps and regulations for Kiahungu, Kamuchuni/Gikondi, Maganjo and Mihuti respectively.

5.2.1 Kiahungu Zoning Plan

Map 5-6: Kiahungu Proposed Zoning Map



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Table 5-3: Kiahungu centre zoning regulations

Zone	Sub Zone	Standards				Permitted uses	Prohibited uses	Auxiliary services		
		Minimum Plot size (Ha)	Setbacks(M)						Building type & height	Plot Coverage
			F	S	R					
ZONE 1 Commercial	CBD-1A	0.025Ha	3	-	2	Flats- Ground floor +6	80%	<ul style="list-style-type: none"> • Private Offices • Malls/shopping complexes • Repair and service shops • Clinics • Banks/ATM lobbies • Mosques/churches • Bars and adult entertainment places. • Cafes, restaurants and accommodation facilities • Cyber cafes • Post office/courier services • Public toilets • Parking sites • Petrol stations (only to those existing) • Bakeries and confectioneries • Bodaboda sheds 	<ul style="list-style-type: none"> • Warehousing/storage go downs of perishable/inflammable goods • Motor & Vehicle repair • Primary and secondary schools • Slaughter facilities • Bus/truck depots • Sewage treatment plant/disposal work • Water treatment plant • Solid waste dumping yards • Junk yards • Medium and low density developments (Maisonettes and bungalows) 	<ul style="list-style-type: none"> • Piped water to all developments • Sewer connection to all developments • Location of waste skips at strategic points • Emptying of waste skips on a daily basis • Open up all access roads to a minimum 6 m • Install proper drainage within the zone • Install adequate street lighting
	1B(Commercial)	0.5	-	-	-	Flats- Ground floor +6	-	<ul style="list-style-type: none"> • Hotel and conference facilities • Open spaces • Private Offices 		

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Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
			F	S	R					
								<ul style="list-style-type: none"> Malls Cafes, restaurants and accommodation facilities Bakeries and confectioneries Cyber cafes 		
	1C (Ngoru Market)	0.025Ha	3	-	2	Flats-Ground floor +6	80%	<ul style="list-style-type: none"> Offices Clinics ATM lobbies Mosques/churches Cafes, restaurants and accommodation facilities Bars Courier services Public toilets Parking sites Bakeries and confectioneries 		
ZONE 2	2A(High density residential)	0.025Ha	3	-	2	Flats-Ground floor +6	80%	<ul style="list-style-type: none"> High density residential flats Health facilities ECDE centres and Day cares Corner shops Recreational facilities Religious facilities Bodaboda sheds 	<ul style="list-style-type: none"> Heavy/light industries Warehousing/storage go downs of perishable/inflammable goods Motor & Vehicle repair Bars and adult entertainment places. Slaughter facilities Bus/truck depots Sewage treatment plant/disposal work 	<ul style="list-style-type: none"> Piped water to all developments Sewer connection to all developments Location of waste skips at strategic points

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Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
			F	S	R					
								<ul style="list-style-type: none"> Water treatment plant Solid waste dumping yards Junk yards Low density developments (Maisonettes and bungalows) 	<ul style="list-style-type: none"> Emptying of waste skips at least thrice a week Open up all access roads to a minimum 6 m Install proper drainage within the zone Install adequate street lighting 	
	2B(Medium density residential)	0.045Ha	4	1	2	Flats-Ground floor+3	70%	<ul style="list-style-type: none"> Medium density residential Health facilities Education facilities Corner shops Recreational facilities Religious facilities Bodaboda sheds 	<ul style="list-style-type: none"> High- and low-density residential developments Bars and adult entertainment places. Heavy/light industries Warehousing/storage go downs of perishable/inflammable goods Motor & Vehicle repair Bars and adult entertainment places. Slaughter facilities Bus/truck depots Sewage treatment plant/disposal work Water treatment plant 	<ul style="list-style-type: none"> Piped water to all developments Sewer connection to all developments Location of waste skips at strategic points Emptying of waste skips at least twice a week Open up all access roads to a minimum 6 m

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Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
			F	S	R					
								<ul style="list-style-type: none"> • Solid waste dumping yards • Junk yards 	<ul style="list-style-type: none"> • Install proper drainage within the zone • Install adequate street lighting 	
	2C(Mixed use development)	0.025Ha	3	-	2	Flats-Ground floor +6	80%	<ul style="list-style-type: none"> • Residential cum commercial developments • Offices • Malls • Repair and service shops • Clinics • Banks/ATM lobbies • Mosques/churches • Cafes, restaurants and accommodation facilities • Courier services • Public toilets • Parking sites 	<ul style="list-style-type: none"> • Bars and adult entertainment places. • Heavy/light industries • Warehousing/storage go downs of perishable/inflammable goods • Motor & Vehicle repair • Slaughter facilities • Bus/truck depots • Sewage treatment plant/disposal work • Water treatment plant • Solid waste dumping yards • Junk yards • Medium and low-density developments (Maisonettes and bungalows) 	<ul style="list-style-type: none"> • Piped water to all developments • Sewer connection to all developments • Location of waste skips at strategic points • Emptying of waste skips at least thrice a week • Open up all access roads to a minimum 6 m • Install proper drainage within the zone • Install adequate street lighting

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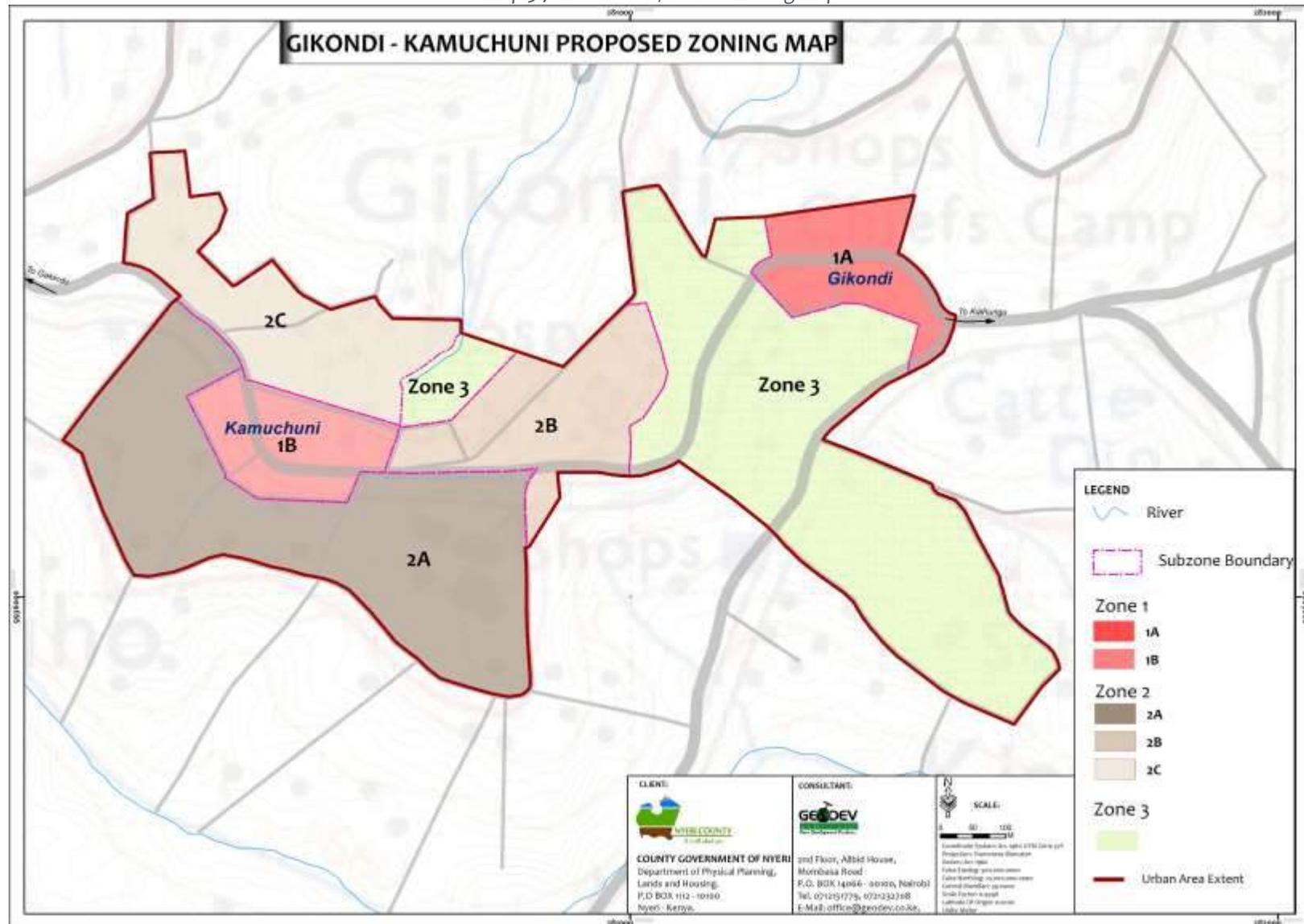
Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
			F	S	R					
ZONE 3 (Civic area)		-	-	-	-	-	-	<ul style="list-style-type: none"> Government offices Stadium Parking facilities Utilities Disaster management centre Education facilities Cemetery 	<ul style="list-style-type: none"> Residential developments Commercial developments Sewage treatment plant/disposal work Water treatment plant Solid waste dumping yards Junk yards 	<ul style="list-style-type: none"> Piped water to all developments Sewer connection to all developments Open up all access roads to a minimum 6 m Install proper drainage within the zone Install adequate street lighting
Zone 4(Industrial)	4A	-	-	-	-	-	-	<ul style="list-style-type: none"> Mukurweini Dairy Ltd Agro-processing industries 	All other uses not related to the daily running of the factory	<ul style="list-style-type: none"> Piped water to all developments
	4B (Light industrial zone)	-	-	-	-	-	-	Light industrial activities including: <ul style="list-style-type: none"> Furniture workshops Garages and auto repair shops Metal fabrication Restaurants 	<ul style="list-style-type: none"> Residential developments Hotels with accommodation facilities Bars and adult entertainment 	<ul style="list-style-type: none"> Sewer connection to all developments Open up all access roads to a minimum 6 m
	4C(Agro-processing Zone and DTF)	-	-	-	-	-	-	-	Agro processing industries and DTF	All other developments and activities not related to agro processing and DTF

MUKURWEINI URBAN AREA INTEGRATED LOCAL PHYSICAL AND LAND USE DEVELOPMENT PLAN, 2020-2030

Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
			F	S	R					
	4D	-	-	-	-	-	-	Thunguri coffee factory	All other developments and activities not related to coffee handling and processing	within the zone <ul style="list-style-type: none"> • Install adequate street lighting • Establish waste skips
Zone 5(Agriculture and Conservation)		0.25	-	-	-	-	-	<ul style="list-style-type: none"> • Agricultural activities • Education facilities • Health facilities • Farm houses • Storage facilities • Conservation • Small shopping centres • Slaughter houses • Sewer treatment facilities 	<ul style="list-style-type: none"> • Factories and Industries • Commercial developments 	Open up access roads to a minimum 6 m

5.2.2 Gikondi-Kamuchuni Zoning Plan

Map 5-7: Kamuchuni/Gikondi Zoning Map



MUKURWEINI URBAN AREA INTEGRATED LOCAL PHYSICAL AND LAND USE DEVELOPMENT PLAN, 2020-2030

Table 5-4: Kamuchuni/Gikondi zoning regulations

Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
F	S		R							
ZONE 1 Commercial	1A(Proposed commercial)	0.025Ha	3	-	2	Flats-Ground floor +6	80%	<ul style="list-style-type: none"> Offices Malls Repair and service shops Clinics Banks/ATM lobbies Mosques/churches 	<ul style="list-style-type: none"> Heavy/light industries Warehousing/storage go downs of perishable/inflammable goods Motor & Vehicle repair Primary and secondary schools Slaughter facilities Bus/truck depots Sewage treatment plant/disposal work Water treatment plant Solid waste dumping yards Junk yards Medium and low-density developments (Maisonettes and bungalows) Educational facilities 	<ul style="list-style-type: none"> Piped water to all developments Sewer connection to all developments Location of waste skips at strategic points Emptying of waste skips on a daily basis Open up all access roads to a minimum 6 m Install proper drainage within the zone Install adequate street lighting
	1B(Proposed commercial)	0.025Ha	3	-	2	Flats-Ground floor +6	80%	<ul style="list-style-type: none"> Bars and adult entertainment places. Cafes, restaurants and accommodation facilities Public toilets Parking sites Petrol stations Bakeries and confectioneries Bodaboda sheds Health facilities 	<ul style="list-style-type: none"> Heavy/light industries Warehousing/storage go downs of perishable/inflammable goods Motor & Vehicle repair Primary and secondary schools Slaughter facilities Bus/truck depots Sewage treatment plant/disposal work Water treatment plant Solid waste dumping yards Junk yards Medium and low-density developments (Maisonettes and bungalows) Educational facilities 	<ul style="list-style-type: none"> Piped water to all developments Sewer connection to all developments Location of waste skips at strategic points Emptying of waste skips on a daily basis Open up all access roads to a minimum 6 m Install proper drainage within the zone Install adequate street lighting

MUKURWEINI URBAN AREA INTEGRATED LOCAL PHYSICAL AND LAND USE DEVELOPMENT PLAN, 2020-2030

Zone	Sub Zone	Standards				Building type & height	Plot Coverage	Permitted uses	Prohibited uses	Auxiliary services
		Minimum Plot size (Ha)	Setbacks(M)							
			F	S	R					
Zone 2	2A(High density residential)	0.025Ha	3	-	2	Flats-Ground floor +4	80%	<ul style="list-style-type: none"> High density residential flats Health facilities Education facilities Corner shops Recreational facilities Religious facilities Bodaboda sheds 	<ul style="list-style-type: none"> Heavy/light industries Warehousing/storage go downs of perishable/inflammable goods Motor & Vehicle repair Bars and adult entertainment places. Slaughter facilities Bus/truck depots Sewage treatment plant/disposal work Water treatment plant Solid waste dumping yards Junk yards Medium and low-density developments (Maisonettes and bungalows) Semi-Permanent housing structures 	<ul style="list-style-type: none"> Piped water to all developments Sewer connection to all developments Location of waste skips at strategic points Emptying of waste skips at least thrice a week Open up all access roads to a minimum 6 m Install proper drainage within the zone
	2B (Residential cum commercial)	0.025Ha	3	-	2	Flats-Ground floor +6	80%	<ul style="list-style-type: none"> Residential cum commercial developments Offices Malls Repair and service shops Health facilities 	<ul style="list-style-type: none"> Bars and adult entertainment places. Heavy/light industries Warehousing/storage go downs of perishable/inflammable goods Motor & Vehicle repair Slaughter facilities 	<ul style="list-style-type: none"> Install adequate street lighting

MUKURWEINI URBAN AREA INTEGRATED LOCAL PHYSICAL AND LAND USE DEVELOPMENT PLAN, 2020-2030

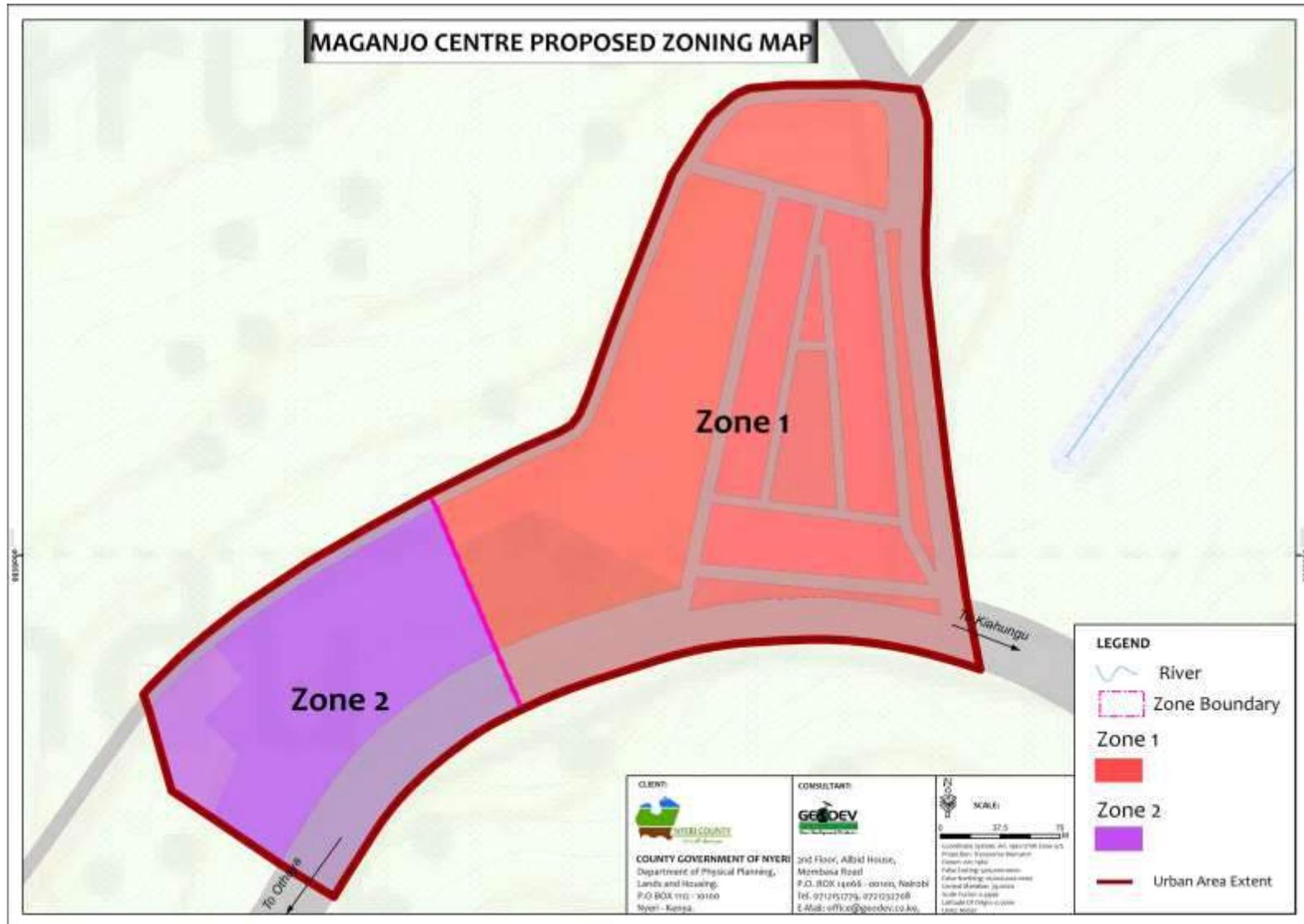
Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services		
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage	
F	S		R								
									<ul style="list-style-type: none"> • Education facilities • Banks/ATM lobbies • Mosques/churches • Cafes, restaurants and accommodation facilities • Post office/courier services • Public toilets • Parking sites 	<ul style="list-style-type: none"> • Bus/truck depots • Sewage treatment plant/disposal work • Water treatment plant • Solid waste dumping yards • Junk yards • Medium and low-density developments (Maisonettes and bungalows) • Semi-Permanent housing structures 	
	2C (Medium density residential)	0.045Ha	4	1	2	Flats-Ground floor+3	70%	<ul style="list-style-type: none"> • Medium density residential • Health facilities • Education facilities • Corner shops • Recreational facilities • Religious facilities • Bodaboda sheds 	<ul style="list-style-type: none"> • High- and low-density residential developments • Bars and adult entertainment places. • Heavy/light industries • Warehousing/storage go downs of perishable/inflammable goods • Motor & Vehicle repair • Bars and adult entertainment places. • Slaughter facilities • Bus/truck depots • Sewage treatment plant/disposal work 		

MUKURWEINI URBAN AREA INTEGRATED LOCAL PHYSICAL AND LAND USE DEVELOPMENT PLAN, 2020-2030

Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
F	S		R							
								<ul style="list-style-type: none"> • Water treatment plant • Solid waste dumping yards • Junk yards • Semi-Permanent housing structures 		
Zone 3(Agriculture and conservation)		-	-	-	-	-	-	<ul style="list-style-type: none"> • Agricultural activities • Education facilities • Health facilities • Farm houses • Storage facilities • Conservation • Small shopping centres • Slaughter houses • Sewer treatment facilities 	<ul style="list-style-type: none"> • Factories and Industries • Commercial developments 	Open up access roads to a minimum 6 m

5.2.3 Maganjo Centre Zoning Plan

Map 5-8: Maganjo Centre Zoning Map



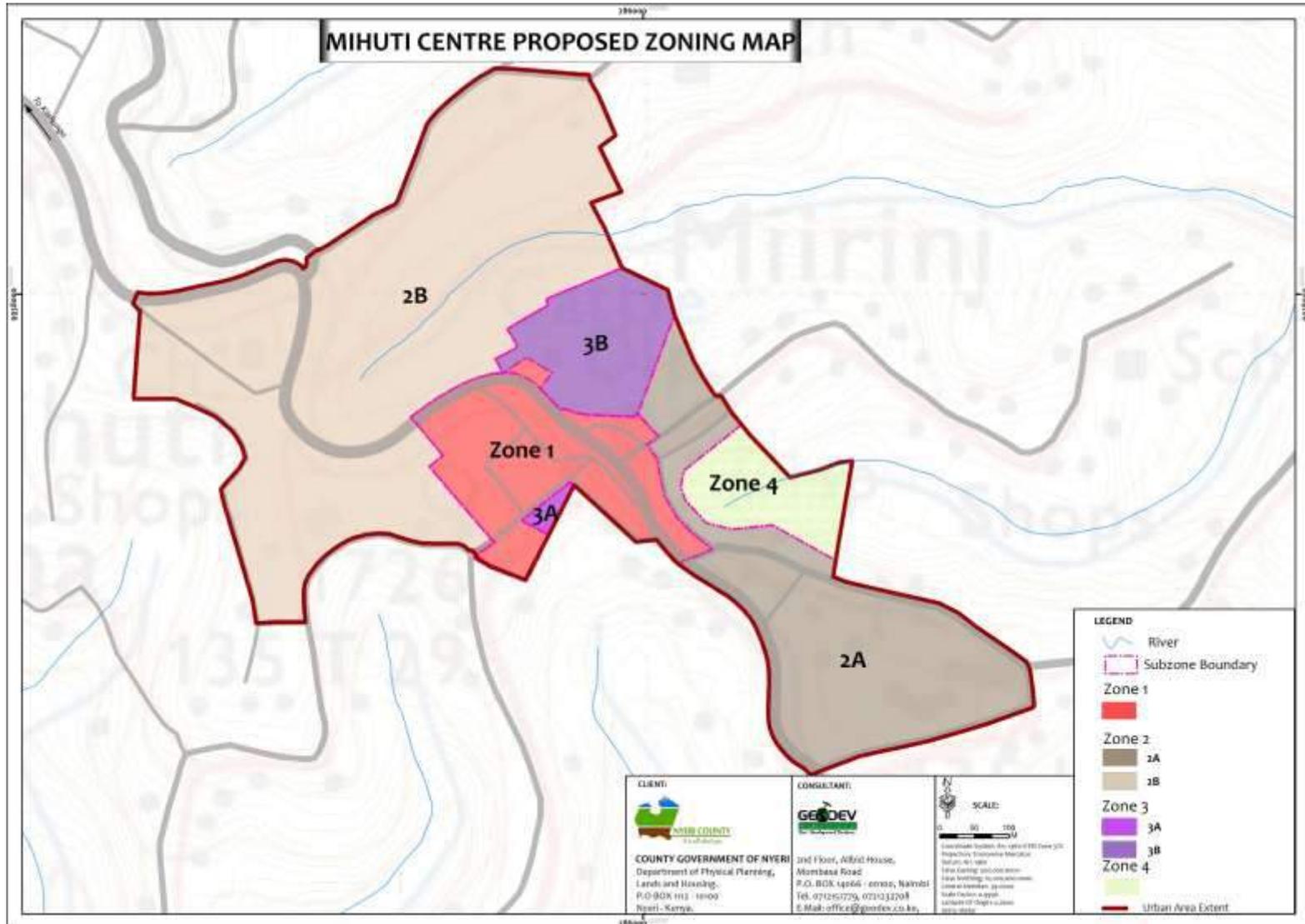
MUKURWEINI URBAN AREA INTEGRATED LOCAL PHYSICAL AND LAND USE DEVELOPMENT PLAN, 2020-2030

Table 5-5: Maganjo Zoning regulations

Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
			F	S	R					
ZONE 1- Commercial	-	0.025Ha	3	-	2	Flats- Ground floor +6	80%	<ul style="list-style-type: none"> • Offices • Malls • Repair and service shops • Clinics • Banks/ATM lobbies • Mosques/churches • Bars and adult entertainment places. • Cafes, restaurants and accommodation facilities • Public toilets • Parking sites • Petrol stations • Bakeries and confectioneries • Bodaboda sheds • Health facilities 	<ul style="list-style-type: none"> • Heavy/light industries • Warehousing/storage go downs of perishable/inflammable goods • Motor & Vehicle repair • Primary and secondary schools • Slaughter facilities • Bus/truck depots • Sewage treatment plant/disposal work • Water treatment plant • Solid waste dumping yards • Junk yards • Medium and low-density developments (Maisonettes and bungalows) • Educational facilities 	<ul style="list-style-type: none"> • Piped water to all developments • Sewer connection to all developments • Location of waste skips at strategic points • Emptying of waste skips thrice a week • Open up all access roads to a minimum 6 m • Install proper drainage within the zone
Zone 2- Industrial	-	-	-	-	-	-	-	Maganjo coffee factory All other developments/activities not related to coffee handling and processing	<ul style="list-style-type: none"> • Install adequate street lighting 	

5.2.4 Mihuti Centre Zoning Plan

Map 5-9: Mihuti Zoning Map



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Table 5-6: Mihuti zoning regulations

Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
F	S		R							
ZONE 1- Commercial	-	0.025Ha	3	-	2	Flats- Ground floor +6	80%	<ul style="list-style-type: none"> • Mixed use developments • Offices • Malls • Repair and service shops • Clinics • Banks/ATM lobbies • Mosques/churches • Bars and adult entertainment places. • Cafes, restaurants and accommodation facilities • Public toilets • Parking sites • Petrol stations • Bakeries and confectioneries • Bodaboda sheds • Health facilities 	<ul style="list-style-type: none"> • Heavy/light industries • Warehousing/storage go downs of perishable/inflammable goods • Motor & Vehicle repair • Primary and secondary schools • Slaughter facilities • Bus/truck depots • Sewage treatment plant/disposal work • Water treatment plant • Solid waste dumping yards • Junk yards • Medium and low-density developments (Maisonettes and bungalows) • Educational facilities 	<ul style="list-style-type: none"> • Piped water to all developments • Sewer connection to all developments • Location of waste skips at strategic points • Emptying of waste skips thrice a week • Open up all access roads to a minimum 6 m • Install proper drainage within the zone • Install adequate street lighting
ZONE 2	2A (High density residential)	0.025Ha	3	-	2	Flats- Ground floor +6	80%	<ul style="list-style-type: none"> • High density residential flats • Health facilities • Education facilities • Corner shops • Recreational facilities 	<ul style="list-style-type: none"> • Heavy/light industries • Warehousing/storage go downs of perishable/inflammable goods • Motor & Vehicle repair 	<ul style="list-style-type: none"> • Piped water to all developments • Sewer connection to all developments

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Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
F	S		R							
	2B (Medium density residential)	0.045Ha	4	1	2	Flats- Ground floor+3	70%	<ul style="list-style-type: none"> Religious facilities Bodaboda sheds 	<ul style="list-style-type: none"> Bars and adult entertainment places. Slaughter facilities Bus/truck depots Sewage treatment plant/disposal work Water treatment plant Solid waste dumping yards Junk yards Medium and low-density developments (Maisonettes and bungalows) 	<ul style="list-style-type: none"> Location of waste skips at strategic points Emptying of waste skips at least thrice a week Open up all access roads to a minimum 6 m Install proper drainage within the zone Install adequate street lighting

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Zone	Sub Zone	Standards					Permitted uses	Prohibited uses	Auxiliary services	
		Minimum Plot size (Ha)	Setbacks(M)			Building type & height				Plot Coverage
			F	S	R					
								<ul style="list-style-type: none"> • Junk yards 		
ZONE3	3A	-	-	-	-	-	-	<ul style="list-style-type: none"> • Slaughter house 	<ul style="list-style-type: none"> • All activities/developments related to animal slaughter and byproducts processing 	<ul style="list-style-type: none"> • Piped water to all developments • Sewer connection to all developments
	3B	-	-	-	-	-	-	<ul style="list-style-type: none"> • Mihuti Coffee factory 	<ul style="list-style-type: none"> • All other developments/activities not related to coffee handling and processing 	<ul style="list-style-type: none"> • Location of waste skips at strategic points • Open up all access roads to a minimum 6 m • Install proper drainage within the zone • Install adequate street lighting

6 ACTION AREA PLAN

Action area plans are part development plans used to make planning decisions on development proposals and policies for the development of specific areas in a larger urban scope. They present the detailed layout of proposed development in the Action Area, which may stipulate the land use permitted on each plot, and the extent to which the building operations may be undertaken on each plot.

Action areas are selected based on priorities, the existing challenges, opportunities and potential of specific areas. In this case, the core urban area (Kiahungu) was selected as the main action area for the urban area based on the potential exhibited by the centre well as the existing challenges.

6.1 The current state of the core urban area; Kiahungu

Kiahungu serves functions including commercial, residential, educational and service. The major transport corridor traversing the centre is Karatina-Othaya (B27) road. The centre is characteristic of commercial, residential and administrative blocks with a lot of infill land and narrow/no access roads.

Table 6-1 presents key interest areas within the core urban area that need action.

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Table 6-1: Key interest areas, conditions and recommended actions

Interest Area	Challenge/current condition	Action
Mukurweini Bus Park	<ul style="list-style-type: none"> The bus park is small and has no parking markings and passenger waiting bays 	<ul style="list-style-type: none"> Expansion of the bus park Marking the parking bays and provision of adequate passenger waiting bays
The Karatina-Othaya (B27) road	<ul style="list-style-type: none"> Inadequate road signage and furniture including speed limit signs and bumps The road doesn't have either foot paths or cycle lanes The road has no provisions for on street car parking Poor drainage system 	<ul style="list-style-type: none"> Establishment of adequate road signage and furniture Establishment of foot paths and cycle lanes Provision of marked on street car parking Installation of proper drainage infrastructure
The existing fresh produce market	<ul style="list-style-type: none"> The market is too small The access road to the market is encroached and narrow Poor waste management 	<ul style="list-style-type: none"> Conversion of the market into a cloth and footwear market. The fresh produce market is to be relocated next to PCEA Church Mukurwe-ini. Expansion of the access road to 9 metres
Commercial area	<ul style="list-style-type: none"> Narrow/no access roads Poor state of roads Poor utilization of land Inadequate parking spaces 	<ul style="list-style-type: none"> Open up all access roads to a minimum 6 metres Establish adequate on street car parking spots Tarmacking of all access roads within the CBD

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Interest Area	Challenge/current condition	Action
	<ul style="list-style-type: none"> • Lack of a sewerage system • Improper waste management • Encroachment on road reserve 	<ul style="list-style-type: none"> • Vertical development of buildings up to 6 floors (ground plus 6). • Connection to a sewer system. • Provision of waste skips at strategic points and emptying of the same on a daily basis. • Demolition of buildings that have encroached road reserves and establishment of a 3 metre front setback for buildings along roads.
Residential areas	<ul style="list-style-type: none"> • Narrow/no access roads • Poor state of access roads • Poor utilization of land • Lack of a sewerage system • Improper waste management • Encroachment on road reserve 	<ul style="list-style-type: none"> • Open up all access roads to a minimum 6 metres • Establish adequate on street car parking spots • Tarmacking of all access roads within the residential zone • Vertical development of buildings up to 6 floors (ground plus 6) for high density residential areas and up to 3 (ground plus 3) floors for medium density residential areas • Connection to a sewer system • Provision of waste skips at strategic points and emptying of the same at least twice a week

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Interest Area	Challenge/current condition	Action
		<ul style="list-style-type: none"> Demolition of buildings that have encroached road reserves and establishment of a 3 metre front setback for buildings along roads
Public housing	<ul style="list-style-type: none"> Underutilization of land 	<ul style="list-style-type: none"> Fencing and Vertical development (up to 6 floors) of the public housing to accommodate a larger population.
Existing cemetery	<ul style="list-style-type: none"> The cemetery is small and poorly maintained 	<ul style="list-style-type: none"> Expansion, fencing and raising of ground Proper maintenance of the cemetery
Kiriti Stadium	<ul style="list-style-type: none"> The stadium doesn't have a carpet, benches and lighting 	<ul style="list-style-type: none"> Carpeting and establishment of stadium benches and lighting
Proposed urban park	Undeveloped landm	<ul style="list-style-type: none"> Fencing of the land and construction of a modern park with trees, benches and utilities including ablution blocks and smoking zones
Proposed fresh produce market	Undeveloped land	<ul style="list-style-type: none"> Construction of a modern fresh produce market with utilities including ablution blocks Establishment of a loading and offloading zone for trucks and lorries within the fresh produce market
Proposed parking facilities	Undeveloped land	<ul style="list-style-type: none"> Development of a multilevel parking facility

6.2 An illustration of best practices along key interest areas in the CBD

I. Positioning of buildings as per zoning regulations

Plate 6-1: Positioning of a building in high density area

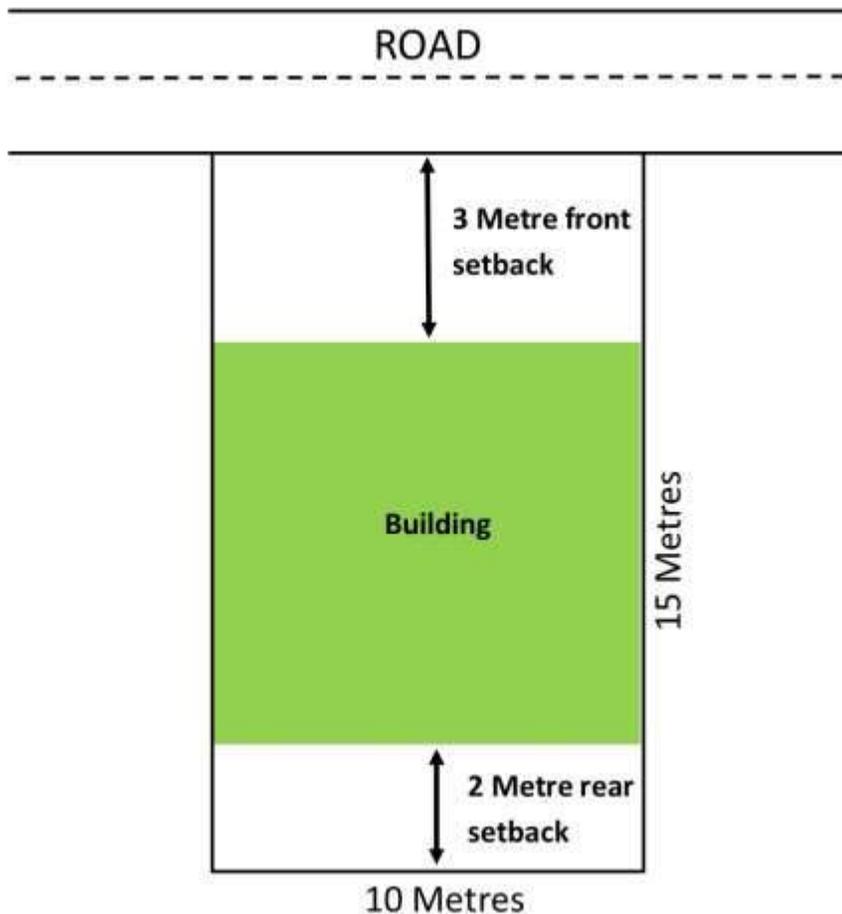
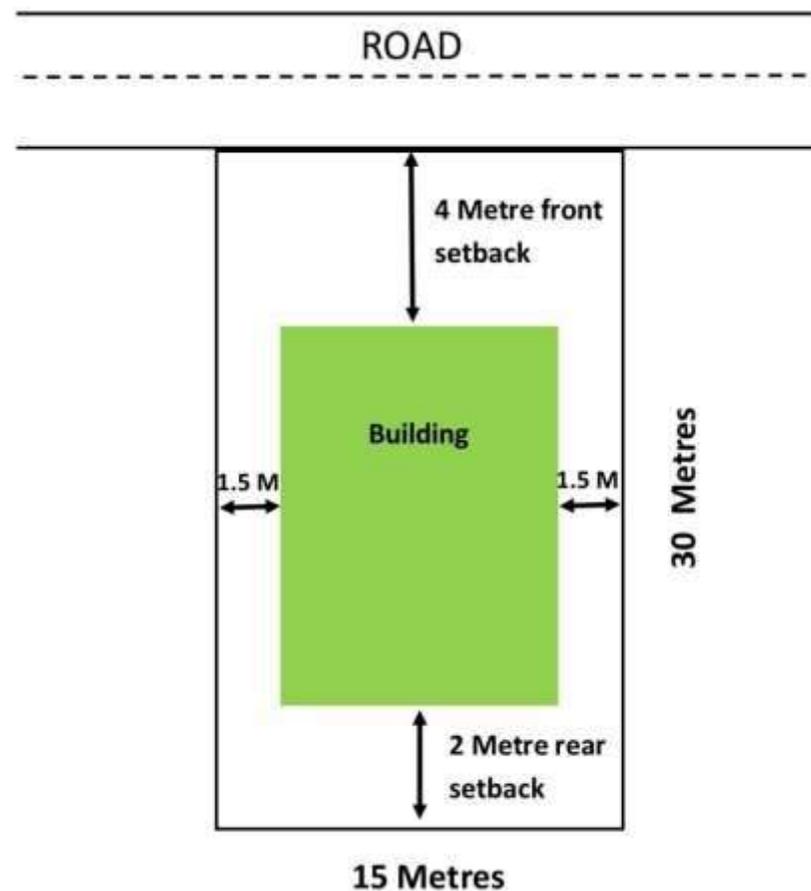
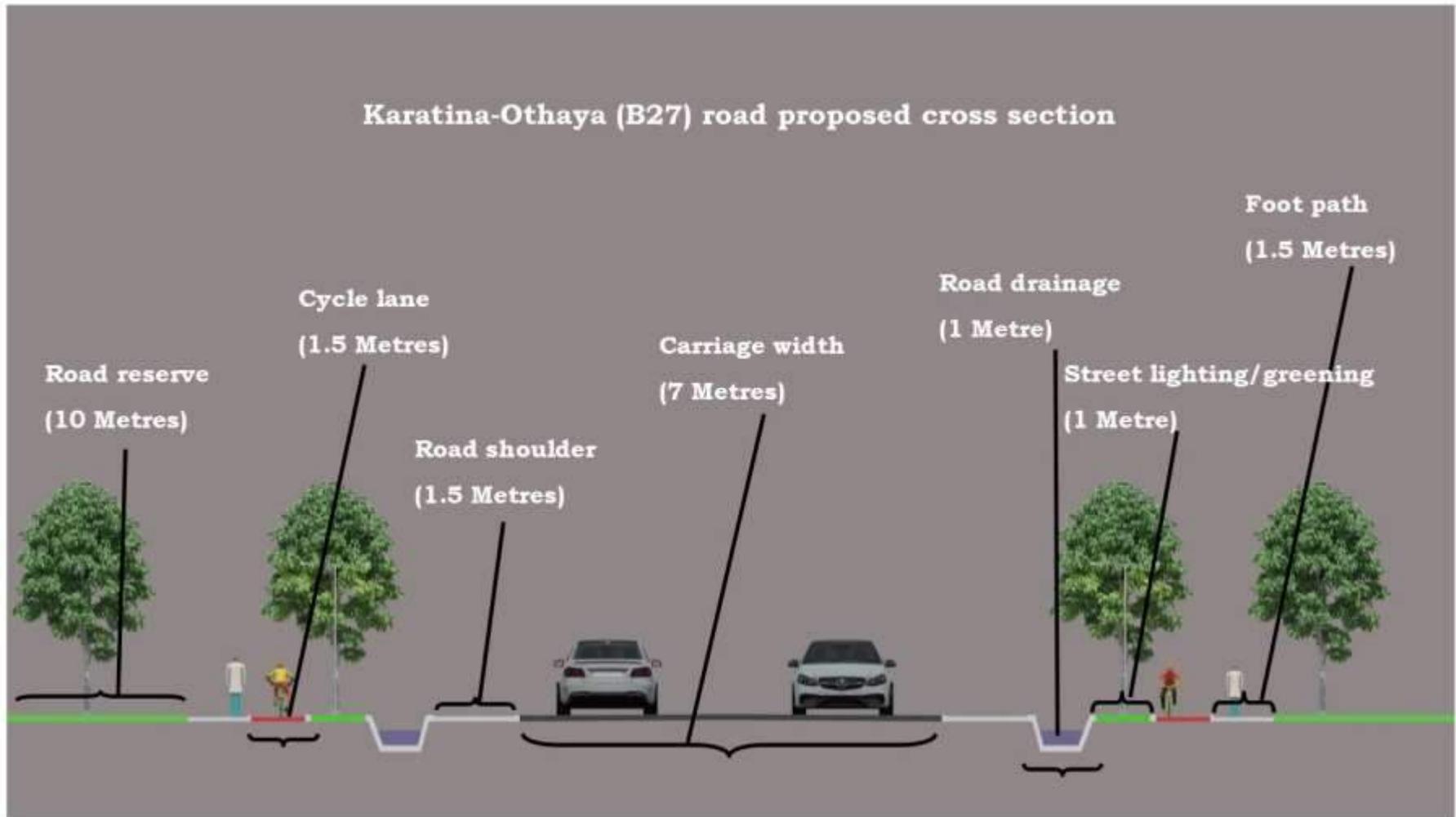


Plate 6-2: Positioning of a building in a medium density area



II. The Othaya-Karatina (B27) road cross section



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III. The proposed recreational park



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IV. The proposed multilevel car parking



V. The proposed fresh produce market



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VI. The proposed cloth and foot wear market



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VII. Proposed Affordable Public Housing



VIII. The general outlook of the CBD



7 URBAN IMPROVEMENT STRATEGIES

This section provides sector specific objectives and strategies for Mukurweini urban area. The sectors include education, health, transportation, environment, urban governance, local economy, housing and sanitation. To achieve the said objectives, specific projects have also been proposed.

7.1 Education

Objective

To offer quality education to the residents of Mukurweini.

Strategy

Establishing adequate education facilities and equip them accordingly.

Projects

- i. Employ adequate teaching staff in all primary schools to meet the standard teacher student ration of 1:40(Karanguriri Primary, Gathukimundu Primary, Gathitu primary)
- ii. Establish a standalone ECDE centre that incorporates a child care facility in Kiahungu (as denoted by code 4₁₃ in the land use plan).
- iii. Establish additional streams in Gachiro, Muhito and Mihuti primary schools to accommodate more pupils by 2030.
- iv. Acquire land for primary and secondary schools that do not have adequate land to meet the standard requirement of 3.9 and 4.5Ha respectively. Primary schools that require expansion include Maganjo, Gikondi and Karaguririo. Secondary schools such as Ngoru Orthodox and St. Johns Thunguri also require more land to guarantee future expansion.
- v. Provide for solar power within all educational institutions to substitute electricity during power blackouts.
- vi. Establish a framework for renovation and maintenance of all educational institutions within the sub-county.

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- vii. Expand the existing library to accommodate over 200 occupants and incorporate an ICT hub.

7.2 Health

Objectives

To offer quality, affordable and easily accessible health care to all residents.

Strategy

Establish adequate and well-equipped health facilities within Mukurwe-ini Urban Area.

Projects

- i. Acquire at least one hectare of land and construct four (4) more dispensaries as proposed in Maganjo, Ngoru, Gikondi and Kiahungu near Gachiro Primary School.
- ii. Employ adequate staff in all existing and proposed health facilities. Equip them with requisite infrastructure to suite their assigned functions by the level of health care.
- iii. Enhance specialized medical services through employment of specialised doctors and installation and provision of surgical services, medical photogrammetry equipment, disease isolation and containment wards, radiology unit within Mukurweini Sub County Hospital.

7.3 Transportation

Objective

To provide for a well-connected, safe and convenient transportation network for all.

Strategy 1: Road surface upgrading and maintenance

- i. Upgrade to bitumen standards the following roads:
 - a. Mukurweini-Gikondi road
 - b. Mukurweini-Kaheti road
 - c. Maganjo-Kaguma-Wamutitu road
 - d. Road passing through and the CDF offices
 - e. Road heading to Mukurweini Boys' High School.

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- ii. Murrum the following roads:
 - a. Road passing through Karaguririo Primary, Mihuti High School, and Weru Secondary School.
 - b. All local distributor and secondary roads not earmarked for tarmacking.
- iii. Ensure regular maintenance of all murrum roads especially after the two rainy seasons of March-May and October-December.
- iv. Upgrade to bitumen standards all access roads within Kiahungu CBD.
- v. Open up all access roads in the urban area to a minimum width of 6 metres within the heavily built-up areas. All other areas should have a recommended width of 9m upon expansion or subdivision of large parcels of land.

Strategy 2: Pedestrianization and parking

- i. Establish permeable walkways along Karatina-Othaya (B27) road, Mukurweini-Mihuti-Gakonya (C510) Road, Mukurweini law courts(E2104) road.
- ii. Establish a multi-storey car parking facility adjacent to Kiriti Stadium.

Strategy 3: Establishment of road furniture

- i. Install proper drainage on all murrum roads.
- ii. Establish road furniture including speed bumps and zebra crossings on all necessary road sections.
- iii. Establish on street car parking along Karatina-Othaya (B27) road and Mukurweini-Mihuti-Gakonya (C510) Road.
- iv. Install street lighting and ensure frequent maintenance on all major roads passing through the urban area including Mukurweini-Gikondi road, Karatina-Othaya road and Mukurweini-Mihuti-Gakonya (C510) Road.

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Plate 7-1: A Sample Cycle Lane and Footpath



7.4 Environment

Objective

To protect and conserve the environment.

Strategy

To enforce regulations relating to the protection of the environment and its assets.

Projects

- i. Enforce all regulations relating to the protection of the environment and its assets.
- ii. Create awareness on the significance of protection and sustainable use of our natural resources including rivers and forests.
- iii. Promote the use of environmentally sustainable energy sources including solar, LPG and biogas
- iv. Create awareness on proper waste disposal methods and promotion of the same.
- v. Street greening on sections in between road carriage widths and walkways. i.e. on all roads earmarked for walkways.
- vi. Areas experiencing erosion such as Njege and Miirini should be reinforced with gabions and extensive tree planting and agroforestry encouraged.

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Plate 7-2: Example of On-street greening



7.5 Urban Governance

Objective

To offer quality and efficient urban governance to the residents of Mukurweini Urban Area for better service provision.

Strategy

Improve public participation and offer quality and satisfactory services to the residents of Mukurweini.

Projects

- i. Deploy adequate key staff from the county headquarters to the sub county.
- ii. Redevelopment of the county government offices to accommodate more staff. Such offices include the department of agriculture and veterinary services, physical planning/sub-county administrator's office, revenue among others
- iii. Expand the existing police station towards the Othaya-Karatina (B27) road.
- iv. Apply for the conferment of the urban area to a town status as prescribed by the Urban Areas and Cities Amendment Act, 2019.
- v. Establish a town administrator and committee for the urban area. The town administration is encouraged to undertake constant consultations with the county government, the national government, government agencies, development

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- organizations and the general public. This shall assist in streamlining development within the urban area.
- vi. Create awareness on the importance of public participation in community projects.
 - vii. Create awareness on the significance of being members of self-help groups.
 - viii. Hold continuous professional development for relevant staff to enhance the capacity of plan implementation.
 - ix. Establish an efficient and functional public information management system cascading from the town to the county level to facilitate the sharing of knowledge between authorities and residents (citizen fora).
 - x. Establish a disaster management centre opposite the Mukurweini level 4 Hospital along the Mukurweini-Gikondi road. Employ adequate staff and procure the requisite equipment including a fire engine, tents etc to manage disasters in the region. Establish water hydrants at key points within the urban area.
 - xi. Establish early warning or information systems for such occurrences as drought, heavy rains, fires among other disasters within the sub-county.
 - xii. Establish an automated administration system to streamline revenue collection, development applications, parking fees etc. within the town to ensure efficiency and transparency in service delivery.
 - xiii. Set up community policing units to collaborate with all concerned national and county security installations.

Plate 7-3: Example of Firefighting trucks and personnel



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Figure 7-1: Management of a town under UACA



7.6 Local Economic Development

Objective

To stimulate the economic drivers of Mukurweini Urban Area.

Agriculture Development

Strategy

Promotion of optimal agricultural production and industrialization.

Projects

- i. Train farmers on good agricultural practices and agribusiness through regular training or field days throughout the year.
- ii. Establish a framework for offering extension services to farmers in the region and ensure implementation of the same.
- iii. Establish a fresh produce market opposite the current bus park.
- iv. Establish an agro-processing zone within the urban area for processing and/or packaging of bananas, avocados and arrow roots. The site located at Ngoru.
- v. Offer incentives such as price review for milk in order to encourage dairy farming at an intensive scale.
- vi. Construct small dams along all permanent rivers within the urban area. The dams shall form irrigation schemes throughout the planning area to ensure year-round agricultural production.
- vii. Aggressive marketing of agricultural produce from the sub-county to external markets.
- viii. Improve access to credit to self-help groups.
- ix. Increase funding for the Enterprise Development Fund to increase access to credit for residents.

Tourism

Strategy

Explore the potential of tourism in the urban area.

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Project

- i. Demarcate, designate and market the *Mau Mau* caves and cemetery as tourism destination sites as well as the Shrine of *Nyatha* in Gikondi Catholic Church.

Revenue collection

Strategy

Enhance revenue collection within the urban area.

Projects

- i. Proper management and expansion of existing markets.
- ii. Create on street parking slots within Kiahungu to service the commercial areas as well as increase revenue collection.
- iii. Employ adequate revenue collection staff in the urban area.
- iv. Purchase adequate vehicles to aid staff at the sub county in mandate execution for various sectors including agriculture, revenue collection among others.

Facilities development

Strategy

Enhance the business environment within the urban area.

Projects

- i. Convert the existing fresh produce market in Kiahungu to a clothes and footwear market.
- ii. Construct a market for fresh produce opposite the existing bus park.
- iii. Install adequate street lights in the urban area to help increase business hours and improve the overall security of the urban area.
- iv. Provide adequate supply of water and electricity to all commercial areas in the urban area.
- v. Acquire land and establish a *juakali* designated site (along the road to Ichamara) to accommodate various lower order industrial activities such as welding, carpentry among other cottage industries.

7.7 Housing

Objective

To offer quality and affordable housing to the residents of Mukurweini.

Strategy

Promote densification and service provision within the urban area.

Projects

- i. Vertical redevelopment of public housing area next to the Wakulima Sacco, former public works grounds/offices and Mukurwe-ini Parish.
- ii. Proper enforcement of zoning regulations to minimize land use conflicts and ensure efficient use of land.
- iii. Provide waste skips at strategic areas within all housing areas.
- iv. Provide adequate water and electricity to all housing areas.
- v. Establish a county framework for maintenance and renovation of the housing stock.

Plate 7-4: Sample vertical housing developments



7.8 Sanitation

Objective

To improve waste management in the urban area.

Strategy

Provide adequate waste management infrastructure within the urban area.

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Projects

- i. Establish a waste management policy at the county level to guide on waste management within the urban areas of the county.
- ii. Provide solid waste skips at strategic points (preferable areas with high human traffic such as the bus station etc) in residential and commercial areas.
- iii. Establish a solid waste landfill in Kiahungu near Gachiro primary school.
- iv. Establish six (6) decentralized treatment facilities (DTF) in the following areas: Kiahungu, Maganjo, Gikondi, Mihuti and Wamutitu area. These shall adequately service the urban area.
- v. Construct a sewer reticulation system to service the core urban area; Kiahungu Centre.
- vi. Procure ten (10) waste exhausters to service the urban area and dispose the liquid waste within the sites proposed for the DTFs.
- vii. Create awareness on the significance of using septic tanks as opposed to pit latrines at household levels.
- viii. Create awareness on sustainable methods to handle solid waste at household levels.
- ix. Enforce regulations relating to discharge of waste into the river.

7.9 Community Facilities

Objective

To enhance the wellbeing of the residents of Mukurwe-ini Urban Area.

Strategy

Provide facilities for enhancing the welfare of residents.

Projects

1. Expand the existing library to accommodate up to 200 people per given time and establish an ICT Hub within it to enhance the use of internet within the urban area.
2. Establish and landscape two urban parks in Kiahungu (the parks are denoted as 3₃ on the land use plan).
3. Construct two modern stadiums within the urban area. The Kiriti is to be renovated while the other shall involve the development of the Gikondi playfield. This shall incorporate

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development of spectator stands, toilets, fencing of the facilities, installation of flood masts as well as landscaping and levelling of the playgrounds.

4. Construct a rehabilitation and child rescue centre within Gachiro area and employ the necessary staff to assist in management of the facility.

8 IMPLEMENTATION FRAMEWORK

This section provides a description of the projects proposed in the urban area with the aim of sequencing the projects in order to effectively achieve the set objectives. A description of the expected timelines for completion of each project together with the anticipated actors/implementers are provided.

Frameworks detailing the coordination, financing and participation in these projects are discussed to ensure efficient implementation of these projects.

Additionally, a further analysis presents an implementation matrix in terms of projects, their location, actors and timeframe.

8.1 Strategic projects

Strategic projects are discussed in terms of those projects that are facilitative, productive and Perceptive.

Facilitative projects enable the productive sector to operate effectively and efficiently. Productive projects produce goods and services directly and lead to generation of employment and income while perceptive projects improve the image and beauty of the town and have the potential to attract investors and give the town unique identity.

8.1.1 Facilitative projects

Transportation

- i. Upgrade to bitumen standards the following roads:
 - a. Mukurweini-Gikondi road
 - b. Mukurweini Kaheti road
 - c. Maganjo-Kaguma-Wamutitu road
 - d. Omwasco road
 - e. Mukurweini boys' road
 - f. Mihuti-Ichamara (E2103) road
- ii. Murram the following roads:
 - a. Karaguririo primary-Mihuti high school-Weru Secondary school road

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- b. All local distributor and secondary roads not earmarked for tarmacking
- iii. Undertake regular maintenance of all murrum roads.
- iv. Establish walkways along Karatina-Othaya (B27) road, Mukurweini-Mihuti-Gakonya (C510) Road, Mukurweini law courts (E2104) road.
- v. Open up all access roads in the urban area to a minimum width of 6 metres within the heavily built-up areas. All other areas should have a recommended width of 9m upon expansion or subdivision of large parcels of land.

Local Economy

- i. Train farmers on good agricultural practices and agribusiness
- ii. Establish a framework for offering extension services to farmers in the region and implementation of the same
- iii. Establish a fresh produce market opposite the current bus park.
- iv. Provide adequate supply of water and electricity to all commercial areas in the urban area

Sanitation

- i. Provide for solid waste skips at strategic points in residential and commercial areas.
- ii. Establish six (6) decentralized treatment facilities (DTF) in the following areas: Kiahungu, Maganjo, Gikondi, Mihuti and Wamutitu area. These shall adequately service the urban area.
- iii. Construct a sewer reticulation system to service the core urban area; Kiahungu Centre.

8.1.2 Productive Projects

Local Economy

- i. Acquire land and establish a *juakali* designated site to accommodate small scale industrial activities.
- ii. Acquire land and establish an agro-processing zone within the urban area at Ngoru.

8.1.3 Perceptive projects

Environment

- i. Street greening and provision of walkways on sections especially along all major roads passing through Kiahungu.

Community and Recreation Facilities

- i. Establish recreational parks in each of the following areas: Ngoru, Gikondi, Kiahungu, Mihuti

8.2 Quick wins

Quick wins are those projects that can be achieved immediately preferably within a period of 100 days to one year. These projects have high perceptibility and serve the purpose of rallying support for subsequent planning activities. They also require low funding. They are as presented below.

Education

- i. Establish a framework for renovation and maintenance of all educational institutions.

Urban Governance

- i. Establish an efficient and functional public information management system at the county level to facilitate the sharing of knowledge between authorities and residents.
- ii. Apply for the conferment of urban area to a town status as prescribed by the Urban Areas and Cities Amendment Act, 2019.
- iii. Establish a town administrator and committee for the urban area.

Local Economy

- i. Establish a framework for offering extension services to farmers in the region and implementation of the same.

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Housing

- i. Establish a framework for maintenance and renovation of all public houses and implement the same.

Sanitation

- i. Establish a waste management policy at the county level to guide on waste management in the county urban areas.

8.3 Capacity Building Projects

These are projects that enhance the ability of actors in project implementation during planning period. They are usually continuous projects and include:

Urban governance

- i. Hold continuous professional development for relevant staff to enhance the capacity of plan implementation.
- ii. Establish a town administrator and committee for the urban area.

Local Economy

- i. Train farmers on good agricultural practices and agribusiness.

Sanitation

- i. Create awareness on the significance of using septic tanks at household levels.
- ii. Create awareness on sustainable methods to handle solid waste at household levels.

8.4 Coordination Framework

Coordination is important at the implementation level of projects in society. With good coordination between project implementers, interested parties and beneficiaries, then conflicts and disasters can be avoided and projects implemented in the most efficient manner.

An effective coordination framework should not fall short of the following parameters:

- i. A good understanding of population needs and projects by the government and all interested parties.

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- II. Negotiations between interested parties and the government to create conditions that favour the approval of projects.
- III. Right channels of communication between relevant departments in either the county, national government or both.
- IV. Prioritization of financing facilitative and productive projects
- V. Prioritization of quick win projects to pave way for the short term and medium-term strategies that will ultimately prepare a way for the long-term objectives.

8.5 Financing Framework

The ability of project actors to implement the plan greatly depends on their financial capacity. This therefore provides the fundamental basis for having well-organized and coordinated departmental structures and organizations for proficient financing of projects.

8.6 Community Participation Framework

Among the provisions of the Constitution of Kenya 2010 and other supporting legislature such as the County Governments Act, 2012, is the incorporation of public participation in the development agenda. Public participation aids in information dissemination about projects to residents, obtaining feedback from residents on alternatives or decisions as well as ensuring that the concerns of residents are considered throughout the decision process.

More importantly, it ensures that the public is empowered by placing final decision-making authority in their hands. In the long run, this helps in ensuring that project implementers are accountable to ensure that what is established on the ground is up to the required standards as requested by the residents and that all the input of the residents are considered. This may in turn help reduce corruption levels by making sure that substandard infrastructures are not established.

As a result, it is called for that:

1. Project implementers continuously communicate to residents on pipeline projects within the urban area.

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2. Project implementers continuously call for public participation (based on stakeholder mapping) forums before commencement of projects.
3. The public continuously monitors development projects in the urban area.
4. The public continuously raise alarms using the right channels when they observe poor implementation of projects.

8.7 Implementation Matrix

This matrix presents the proposed projects, their location, actors and the time required to implement the said projects

8.7.1 Education

Project	Location	Actor	Timeframe
i. Employ adequate teaching staff in all primary schools to meet the standard teacher student ration of 1:40(Karanguriri Primary, Gathukimundu Primary, Gathitu primary)	All understaffed primary schools including Karanguriri Primary, Gathukimundu Primary, Gathitu primary	Teachers Service Commission	Short term (2021-2023)
ii. Establish additional streams in Gachiro, Muhito and Mihuti primary schools to accommodate more pupils by 2030	Gachiro, Muhito and Mihuti primary schools	Ministry of Education	Medium term (2024-2026)
iii. Establish a standalone ECDE centre that incorporates a child care facility in Kiahungu	Kiahungu	County Department of Education and Sports	Medium term (2024-2026)
viii. Establish a technical training institute within Kiahungu	Kiahungu	County Department of Education and Sports	Long term (2027-2030)
iv. Provide enough land for all primary and secondary schools to meet the standard requirement of 3.9 and 4.5Ha.	• Maganjo, Gikondi, Karaguririo primary schools	Ministry of Education	Long term (2027-2030)

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Project	Location	Actor	Timeframe
	<ul style="list-style-type: none"> • Ngoru Orthodox, St. Benedict Wamutitu and St. John Thunguri secondary schools 		
v. Provide for solar power within all educational institutions to substitute electricity during power blackouts	All institutions without solar power	<ul style="list-style-type: none"> • County Department of Education and Sports • Ministry of Education 	Short term (2021-2023)
vi. Provide adequate education facilities such as classrooms, desks, laboratories, and learning materials such as books.	All education institutions	<ul style="list-style-type: none"> • County Department of Education and Sports • Ministry of Education 	Medium term (2024-2026)
vii. Establish a framework for renovation and maintenance of all educational institutions.	-	<ul style="list-style-type: none"> • County Department of Education and Sports • Ministry of Education 	Quick win

8.7.2 Health

Project	Location	Actor	Timeframe
i. Acquire land and Construct 4 more dispensaries in Maganjo, Ngoru, Gikondi and Kiahungu near Gachiro primary school	Maganjo, Ngoru, Gikondi and Kiahungu near Gachiro primary school	County department of Health Services	Short term to medium term (2021-2026)
ii. Employ adequate staff in all proposed and existing health facilities and equip them with requisite infrastructure, equipment and drugs	All proposed and existing health facilities	County department of Health Services	Short term (2021-2023)
iii. Enhance specialized medical services through employment of specialised doctors and installation and provision of surgical services, medical photogrammetry equipment, disease isolation and containment wards, radiology unit Mukurweini Sub County hospital	Mukurweini Sub County hospital	County department of Health Services	Short term (2021-2023)

8.7.3 Transport

Project	Location	Actor	Timeframe
i. Upgrade to bitumen standards the following roads: <ul style="list-style-type: none"> i. Mukurweini-Gikondi road ii. Mukurweini Kaheti road iii. Maganjo-Kaguma-Wamutitu road iv. Omwasco road v. Mukurweini boys' road 	Individual earmarked roads	County department of Transport, Public Works, Infrastructure and Energy	Long term (2027-2030)
ii. Murram the following roads: <ul style="list-style-type: none"> a. Karaguririo primary-Mihuti high school-Weru Secondary school road b. All local distributor and secondary roads not earmarked for tarmacking 	Individual earmarked roads	County department of Transport, Public Works, Infrastructure and Energy	Medium term (2024-2026)
ii. Regular maintenance of all murram roads	All murram roads in the urban area	County department of Transport, Public Works, Infrastructure and Energy	Long term, Continuous

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Project	Location	Actor	Timeframe
v. Expand the existing bus park to settle along Mukurweini-Mihuti-Gakonya (C510) Road, Mukurweini law courts(E2104) road	The existing bus park in Kiahungu	County department of Transport, Public Works, Infrastructure and Energy	Short term (2021-2023)
v. Establish walkways along Karatina-Othaya (B27) road, Mukurweini-Mihuti-Gakonya (C510) Road, Mukurweini law courts(E2104) road	Individual earmarked roads	County Department of Transport, Public Works, Infrastructure and Energy	Medium term (2024-2026)
vi. Open up all access roads in the urban area to a minimum width of 6 metres	All access roads	County department of Transport, Public Works, Infrastructure and Energy	Short term (2021-2023)
ii. Install proper drainage on all murram roads	All murram roads	County department of Transport, Public Works, Infrastructure and Energy	Medium term (2024-2026)
ii. Establish road furniture including speed bumps and zebra crossings on all necessary road sections	<ul style="list-style-type: none"> • Karatina-Othaya (B27) road 	<ul style="list-style-type: none"> • KeRRA • County Department of Transport, Public 	Short term (2021-2023)

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Project	Location	Actor	Timeframe
	<ul style="list-style-type: none"> Mukurweini-Mihuti-Gakonya (C510) Road 	Works, Infrastructure and Energy	
x. Establish on street car parking along Karatina-Othaya (B27) road and Mukurweini-Mihuti-Gakonya (C510) Road	<ul style="list-style-type: none"> Karatina-Othaya (B27) road Mukurweini-Mihuti-Gakonya (C510) Road 	County department of Transport, Public Works, Infrastructure and Energy	Short term (2021-2023)
x. Upgrade to bitumen standards all access roads within Kiahungu CBD	Kiahungu	County department of Transport, Public Works, Infrastructure and Energy	Medium term (2024-2026)

8.7.4 Environment

Project	Location	Actor	Timeframe
i. Enforce all regulations relating to the protection of the environment and its assets	Entire urban area	NEMA	Long term, Continuous

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ii.	Create awareness on the significance of protection and sustainable use of our natural resources including rivers and forests	Entire urban area	Department of Water, Irrigation, Environment and Climate Change	Long term, Continuous
iii.	Promote the use of environmentally sustainable energy sources including solar, LPG and biogas	Entire urban area	Department of Water, Irrigation, Environment and Climate Change	Long term, Continuous
iv.	Create awareness on proper waste disposal methods and promotion of the same	Entire urban area	County Department Health and Sanitation	Long term, Continuous
v.	Street greening on sections in between road carriage widths and walkways. i.e. on all roads earmarked for walkways	<ul style="list-style-type: none"> • Karatina-Othaya (B27) road • Mukurweini-Mihuti-Gakonya (C510) Road 	Department of Water, Irrigation, Environment and Climate Change	Short term (2021-2023)

8.7.5 Urban Governance

Project	Location	Actor	Timeframe
i. Deploy adequate key staff from the county headquarters to the sub county	–	Relevant County Departments	Short term (2021-2023)

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Project	Location	Actor	Timeframe
ii. Create awareness on the importance of public participation in community projects	Entire urban area	County Department of Public Service	Short term (2021-2023)
i. Establish a town administrator and committee for the urban area	Kiahungu	<ul style="list-style-type: none"> • County Department of Public Service • County Department of Lands, Physical Planning, Housing and Urban Development 	Short term (2021-2023)
ii. Create awareness on the significance of being members of self-help groups	Entire urban area	County Department of Trade and Cooperative Development	Long term, continuous
iii. Improve access to credit to self-help groups	Entire urban area	County Department of Trade and Cooperative Development	Short term (2021-2023)
iv. Hold continuous professional development for relevant staff to enhance the capacity of plan implementation	–	Relevant County Departments	Long term, continuous

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Project	Location	Actor	Timeframe
v. Establish an efficient and functional public information management system at the county level to facilitate the sharing of knowledge between authorities and residents	–	County Department of Public Service	Quick win
vi. Expand the existing police station towards the Othaya-Karatina (B27) road	Mukurweini Police Station	Ministry of Interior & Coordination of National Government	Medium term (2024-2026)

8.7.6 Local Economy Agriculture Development

Project	Location	Actor	Timeframe
Train farmers on good agricultural practices and agribusiness through regular training or field days.	Entire Urban Area	County Department of Agriculture, Livestock and Fisheries	Long term, continuous
Establish a framework for offering extension services to farmers in the region and ensure implementation.	Mukurwe-ini Sub County	County Department of Agriculture, Livestock and Fisheries	Long term, continuous
Construct a fresh produce market.	Kiahungu next to existing bus park	County Department of:	Long Term by 2030

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Project	Location	Actor	Timeframe
		<ul style="list-style-type: none"> • Agriculture, Livestock and Fisheries • Trade and cooperative development 	
Establish an agro processing zone within the urban area.	Next to Ngoru Market Centre	County Department of: <ul style="list-style-type: none"> • Agriculture, Livestock and Fisheries • Trade and cooperative development 	Long Term by 2030
Offer incentives such as price review for milk in order to encourage dairy farming at an intensive scale.	Mukurwe-ini Sub County	<ul style="list-style-type: none"> ✓ Wakulima Dairy Limited ✓ County Department of: 	Long term, continuous

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Project	Location	Actor	Timeframe
		<ul style="list-style-type: none"> ○ Agriculture, Livestock and Fisheries ○ Trade and cooperative development 	
Construct small dams along all permanent rivers within the urban area.	Mukurwe-ini Urban Area	County Department of: <ul style="list-style-type: none"> ● Agriculture, Livestock and Fisheries ● Public Works and Infrastructure ● Water and Irrigation 	Short Term by 2023

Tourism, Facilities Development and Revenue Collection

Project	Location	Actor	Timeframe
i. Proper management and expansion of existing markets	Kiahungu and Mihuti Market	County Department of Trade and Cooperative Development	Short term (2021-2023)

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Project	Location	Actor	Timeframe
ii. Designate a special economic zone within Kiahungu to promote the hotel and hospitality industry	Kiahungu	County Department of Lands, Physical Planning, Housing and Urban Development	Short term (2021-2023)
iii. Provide adequate supply of water and electricity to all commercial areas in the urban area	All commercial areas	<ul style="list-style-type: none"> • OMWASCO • KPLC 	Short term (2021-2023)
iv. Convert the existing fresh produce market in Kiahungu to a clothes and footwear market	Kiahungu	County Department of Trade and Cooperative Development	Short term (2021-2023)
v. Establish a fresh produce market in Kiahungu next to Muhito PCEA	Kiahungu	County Department of Trade and Cooperative Development	Short term (2021-2023)
vi. Create on street parking slots within Kiahungu to increase revenue collection	Kiahungu	County Department of Transport, Public Works, Infrastructure and Energy	Short term (2021-2023)

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Project	Location	Actor	Timeframe
vii. Employ adequate revenue collection staff in the urban area	Kiahungu	County Department of Trade and Cooperative Development	Short term (2021-2023)
viii. Purchase adequate vehicles to aid staff at the sub county in mandate execution	–	Relevant County Departments	Medium term (2024-2026)
ix. Install adequate street lights in the urban area help increase business hours and improve security	Core urban area and nodes	County Department of Transport, Public Works, Infrastructure and Energy	Short term (2021-2023)
x. Increase funding for the Enterprise Development Fund to increase access to credit	–	County Department of Trade and Cooperative Development	Short term (2021-2023)
xi. Establish a <i>Jua kali</i> designated site to accommodate industrial activities	Kiahungu	County Department of Trade and Cooperative Development	Short term (2021-2023)
xii. Demarcate, designate and market the <i>Mau Mau</i> caves and cemetery as tourism destination sites	Gikondi	County Department of Trade and Cooperative Development	Short term (2021-2023)

8.7.7 Housing

Project	Location	Actor	Timeframe
i. Vertical redevelopment of public housing in the urban area to accommodate more people	Kiahungu(public housing including police housing)	County department of Transport, Public Works, Infrastructure and Energy	Medium term (2024-2026)
ii. Proper enforcement of zoning regulations to minimize land use conflicts and ensure efficient use of land	Entire urban area	County Department of Lands, Physical Planning, Housing and Urban Development	Long term, Continuous
iii. Provide waste skips at strategic areas within all housing areas	All housing areas	County Department Health and Sanitation	Short term (2021-2023)
iv. Provide adequate water supply and electricity to all housing areas	All housing areas	<ul style="list-style-type: none"> • KPLC • OMWASCO 	Short term (2021-2023)
v. Establish a framework for maintenance and renovation of all public houses and implement the same	–	County Department of Lands, Physical Planning, Housing and Urban Development	Quick win

8.7.8 Community and Recreational Facilities

Project	Location	Actor	Timeframe
i. Establish and landscape two urban parks (the parks are denoted as 3 ₃ on the land use plan).	Kiahungu Centre	County Department of Transport, Public Works, Infrastructure and Energy	Medium Term (2024-2026)
ii. Construct a rehabilitation and child rescue centre within Gachiro area and employ the necessary staff to assist in management of the facility.	Kiahungu	County Department of Transport, Public Works, Infrastructure and Energy	Medium term (2024-2026)
iii. Establish and landscape two urban parks in Kiahungu (the parks are denoted as 3 ₃ on the land use plan).	Ngoru, Gikondi, Kiahungu, Mihuti	<ul style="list-style-type: none"> County Department of Transport, Public Works, Infrastructure and Energy County Department of Lands, Physical Planning, Housing and Urban Development 	Short term (2021-2023)

8.7.9 Sanitation

Project	Location	Actor	Timeframe
i. Establish a waste management policy at the county level to guide on waste management in the county urban areas	–	County Department Health and Sanitation	Quick win
ii. Provide for solid waste skips at strategic points in residential and commercial areas	All residential and commercial areas within urban limits	County Department Health and Sanitation	Short term (2021-2023)
iii. Establish a solid waste landfill in Kiahungu near Gachiro primary school	Kiahungu	County Department Health and Sanitation	Short term (2021-2023)
iv. Establish 6 decentralized treatment facilities in the following area: Kiahungu, Maganjo, Gikondi, Mihuti and Wamutitu area	Kiahungu, Maganjo, Gikondi, Mihuti and Wamutitu area	OMWASCO	Long term (2027-2030)
v. Create awareness on the significance of using septic tanks at household levels	Entire urban area	OMWASCO	Long term, continuous
vi. Create awareness on sustainable methods to handle solid waste at household levels	Entire urban area	County Department of Public Service and Solid Waste Management	Long term, continuous

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Project	Location	Actor	Timeframe
vii. Enforce regulations relating to discharge of waste into the river.	Entire urban area	NEMA	Long term, continuous

8.7.10 Disaster management

Project	Location	Actor	Timeframe
i. Establish a disaster management centre opposite the Mukurweini level 4 hospital along the Mukurweini-Gikondi road	Kiahungu	County Department of Youth and Public Service	Medium term (2024-2026)
ii. Employ adequate staff to manage disasters in the urban area	Kiahungu	County Department of Youth and Public Service	Medium term (2024-2026)
iii. Procure adequate equipment for the disaster management centre including a fire hydrant and tents	Kiahungu	County Department of Youth and Public Service	Medium term (2024-2026)
iv. Establish water hydrants at key points in the urban area	Kiahungu	County Department of Youth and Public Service	Medium term (2024-2026)

9 Capital Investment Plan

9.1 Overview

A capital investment plan is a tool, spanning several years, that identifies capital projects for investment based on priority and scale of impact to bettering lives of people. Capital investment planning includes capital investment by the government itself or investment by the private sector through public-private partnerships (PPPs). It inter-relates asset management and financial management. A CIP is therefore a link between spatial planning aspects and financial capacities and realities. In order for a capital investment plan to prove its effectiveness over time the following are the key considerations:

- i. The local government needs to have responsibility and authority to plan and make capital investments for a set of specified functions.
- ii. The local government should have economic autonomy that enables it to raise funding for its capital investment either through local taxes, fees, and other local sources or through borrowing or involving the private sector i.e. have influence over outside funding
- iii. The local government should have the authority to independently carry out its budgeting process in order to align the capital investment plan to the local budgeting cycle.

The above-mentioned considerations are characteristics of the devolved governance system in Kenya thereby underlining the need to have implementable capital investment plans that are linked to the annual local budgeting process. The CIP is intended to provide practical and realistic guidance regarding the next steps in implementing the capital development aspects of this plan.

In order to be realistic, this CIP is built upon two principles:

- i. Affordability within the current budgetary conditions and
- ii. Effectiveness in responding to the aspirations and expectations of the people of Mukurwe-ini Urban Area.

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The product of this CIP is a multiyear program of capital investment projects prioritized by year with anticipated beginning and completion dates, annual estimated costs, and proposed financing methods.

9.2 Process of Development of the CIP

The development of this CIP was undertaken through objective project selection in a series of six steps as outlined below:

- Step 1:** Preparation of a catalogue -of all proposed projects
- Step 2:** Establishment of Project selection/prioritization criteria
- Step 3:** Project selection/prioritization
- Step 4:** Costing of the selected projects
- Step 5:** Matching the selected projects with available funding and financing options

9.3 List of Select Capital Investment Projects for Mukurwe-ini Urban Area

The following is a list of the selected capital investment projects chosen for the development of the municipality:

- i. Acquire land and construct four (4) more dispensaries as proposed in Maganjo, Ngoru, Gikondi and Kiahungu near Gachiro Primary School.
- ii. Upgrade to bitumen standards the following roads:
 - f. Mukurweini-Gikondi road
 - g. Mukurweini-Kaheti road
 - h. Maganjo-Kaguma-Wamutitu road
 - i. Road passing through and the CDF offices
 - j. Road heading to Mukurweini Boys' High School.
 - k. Mihuti-Ichamara (E2103) road.
- iii. Establish a disaster management centre opposite the Mukurweini level 4 Hospital along the Mukurweini-Gikondi road.
- iv. Establish a fresh produce market in Kiahungu next to the existing bus park.
- v. Vertical redevelopment of public housing area next to the Wakulima Sacco.

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- vi. Construct a sewer reticulation system to service the core urban area; Kiahungu Centre.

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Table 9-1: The Capital Investment Plan

Project	Description of Works	Number of Units	Estimated Cost	Financing Options
Construct a sewer reticulation system to service the core urban area; Kiahungu Centre	<ul style="list-style-type: none"> Hydrogeological survey Construction of the trunk sewer lines Construction of oxidation ponds 	<ul style="list-style-type: none"> Length of Sewer lines 9km. 1Ha sewer treatment plant to be developed in a phased based process 	<ul style="list-style-type: none"> Construction of sewer lines KShs378,000,000 (estimated cost of construction per km – Kshs40,000,000) Construction of oxidation ponds – Kshs4,000,000 	<ul style="list-style-type: none"> Development Partners/Donors Public Private Partnerships County Government through the Department of Transport, public works, infrastructure and energy OMWASCO
Acquire land and construct four (4) more dispensaries as proposed in Maganjo, Ngoru, Gikondi and Kiahungu near Gachiriro Primary School.	<ul style="list-style-type: none"> Acquisition of land Construction of offices, clinics, waiting areas/bays, laboratories, toilets, incinerators and pharmacies 	<ul style="list-style-type: none"> Acquisition of land dependent of the current market prices For each dispensary, construct: <ul style="list-style-type: none"> ✓ 3 offices ✓ 4 clinics, ✓ 1 laboratory ✓ 4 toilets ✓ 2 wards ✓ 1 incinerator ✓ 1 pharmacy <p>Total number of units for construction; 16 units</p>	Kshs40, 000, 000	County Department of Health Services
Upgrade to bitumen standards the following roads:	Distance for Tarmacking a. Mukurweini-Gikondi road – 6km	Total distance for Tarmacking – 15.55km	Kshs1,007,500, 000 (Cost of construction of 1 km to equal kshs65,000,000)	<ul style="list-style-type: none"> County Department of Transport, Infrastructure, Public works and Energy.

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Project	Description of Works	Number of Units	Estimated Cost	Financing Options
a. Mukurweini-Gikondi road b. Mukurweini-Kaheti road c. Maganjo-Kaguma-Wamutitu road d. Road passing through and the CDF offices e. Road heading to Mukurweini Boys' High School.	b. Mukurweini-Kaheti road – 3km c. Maganjo-Kaguma-Wamutitu road – 3.5km d. Road passing through and the CDF offices – 0.55km e. Road heading to Mukurweini Boys' High School. – 2.5km Works to include: <ul style="list-style-type: none"> • Cutting and filling • Fine grading • Tarmacking • Installation of drainage infrastructure 			<ul style="list-style-type: none"> • KURA
Establish a disaster management centre opposite the Mukurweini level 4 Hospital along the Mukurweini-Gikondi road.	<ul style="list-style-type: none"> ➤ Construction of <ul style="list-style-type: none"> • Fire station • Offices • storage hall ➤ Procurement of a fire engine 	Construction of 5 buildings dependent on function and size; <ul style="list-style-type: none"> • 3 offices • A Storage Hall • the fire station 	Kshs100,000,000	County Department of Transport, Infrastructure, Public works and Energy.

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Project	Description of Works	Number of Units	Estimated Cost	Financing Options
Establish a fresh produce market in Kiahungu next to the existing bus park.	Construction of market, toilets, storage space	3 units	Kshs45,000,000	County Department of Trade, tourism, culture and cooperative development
Vertical redevelopment of public housing area next to the Wakulima Sacco	<ul style="list-style-type: none"> • Survey of existing plot boundary • Enlistment of households to be affected • Resettlement of the residents affected • Demolition of houses • Construction of apartment blocks 	<ul style="list-style-type: none"> • 7 housing blocks Each block housing a total of 15 households • Total number of units - 105 	Kshs241,500,000 (Estimated cost of each unit Kshs2.3M)	<ul style="list-style-type: none"> • County Department of Lands, Physical Planning, Housing and Urban Development • National Government through NHC

Appendices

Appendix I: Minutes of the Draft Plan Presentation

MINUTES ON THE DRAFT PLAN PRESENTATION TO STAKEHOLDERS HELD AT THE NG-CDF HALL, MUKURWE-INI, ON THURSDAY 20th MAY, 2021 AT 11:00 PM.

MEMBERS PRESENT

List Attached.

AGENDA

- Introductions
- Presentations
- Questions, Answers and Comments
- Closing

Min 1/20/5/21: Introductions

Planner Joseph G. Njomo, Physical Planner, Nyeri County, called the meeting to order at 11:00PM and invited a resident to open the meeting with a word of prayer.

The planner then informed members present of the day's business after which each stakeholder present was invited to introduce themselves. Subsequently, the County Director Physical Planning, C.K. Beatrice, was invited to make her opening remarks after which she invited the lead consultant from Geodev (K) Ltd, Professor George. N. Ngugi to take over with the day's agenda.

Min 2/20/5/21: Presentations

Professor Ngugi started the presentation by iterating on the importance of the presentation and how it was of great necessity that residents pointed out any missed proposals, arising from the previous suggestions during the situation analysis presentation, that were deemed of great significance. He informed the residents that it was at that stage where residents had the opportunity to plan for themselves with guidance from the consultant. After his remarks, he invited Planner Jabu Salim to continue.

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Planner Jabu Salim expounded on the importance of the plan. He insisted that this was not the final plan but just a draft and that changes were allowed up until its approval by the county assembly. He presented a recap of the situation analysis report and focused mainly on the needs of the projected population for the year 2030 in terms of service and facility provision as addressed by the draft plan after which he invited planner Xavier Bwire to the floor.

Planner Xavier Bwire presented the draft plan proposals, development strategies, a sample form of the implementation matrix as well as a graphic simulation of the plan. He then opened the floor for questions and comments.

Min 3/20/5/21: Questions, Answers and Comments

Comments

Residents present made the following comments:

1. There is a need for a child rescue centre within the urban area.
2. There is need to make a proposal for tarmacking the road joining Mihuti and Nduma
3. There is about three acres of land in Gachiro earmarked as a *juakali* centre
4. There is need to establish irrigation infrastructure to boost agricultural production within the urban area. This should be explicitly addressed by the plan.
5. The consultant to check on the viability of upgrading Mihuti Dispensary to a health centre.
6. There is need for constructing a livestock market in Gachiro at the existing cattle dip. The cattle dip is currently non-functional and therefore should be replaced with a similar or complimentary use.
7. It was important to capture Karindi MTTI and include it in the plan
8. Land had been allocated in Ngoru for Mukurwe-Ini Technical Training Institute and the area needed to be captured in the plan.
9. Construction of Maganjo KMTC on a 7 acre piece of land is ongoing and should therefore be captured in the plan.

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Questions and Answers

Questions	Answers
What happens when I build outside the urban extend?	One will have to cater for their own services including connection to water and sewerage
There are other faculties being introduced in Mukurweini TTI, what happens when the faculties are place outside the planning boundary	We can keep it as such or simply expand the boundary
What is expected for the registration of beneficiaries occupying government land?	Copy of identification card and proof of ownership. Owners should present themselves at registration centres
How shall development control be enforced?	It is upon local administration to inform relevant county authorities of unsafe developments for enforcement
There are people who are beneficiaries but parents (first owners) are deceased. What happens?	It's upon the county to determine real beneficiaries for the plot. A single plot can be co-owned by several family members

Min4/20/5/21: Closing

The county director in charge of physical planning, C.K. Beatrice, thanked stakeholders present for their participation in the plan making process and dedicating their time for the day's business. After that, she invited the Sub County Administrator, Asha B. Kiringa, to make her closing remarks. She averred on the importance of the forthcoming registration of beneficiaries occupying government land within the urban area and communicated the dates for the exercise in each select market.

Afterwards, a resident closed the meeting with a word of prayer at 2:50PM.

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Signed and Approved by:

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Consultant (Geodev (K) Ltd

.....

Date

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Client (Physical Planning, Lands and Housing)

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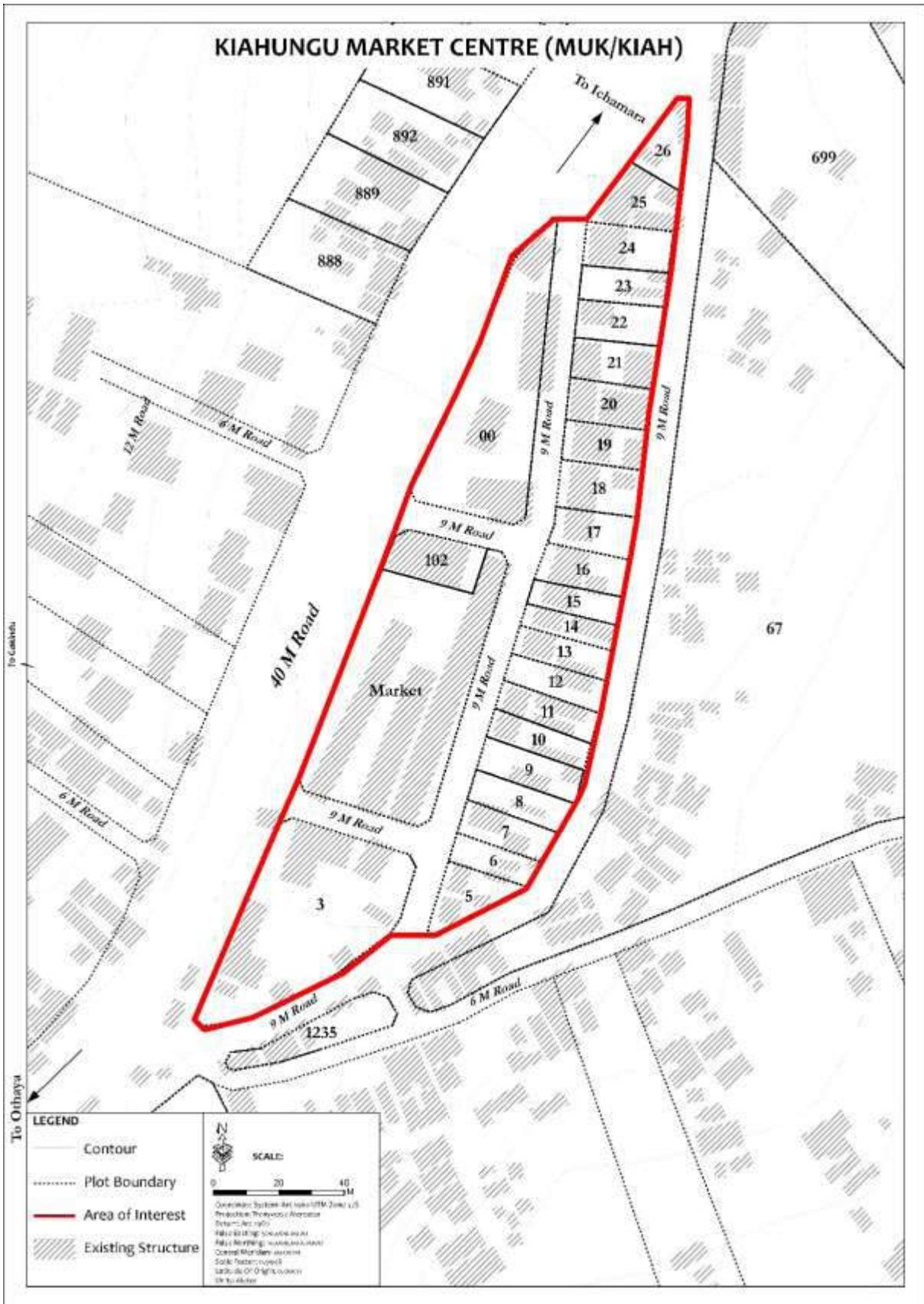
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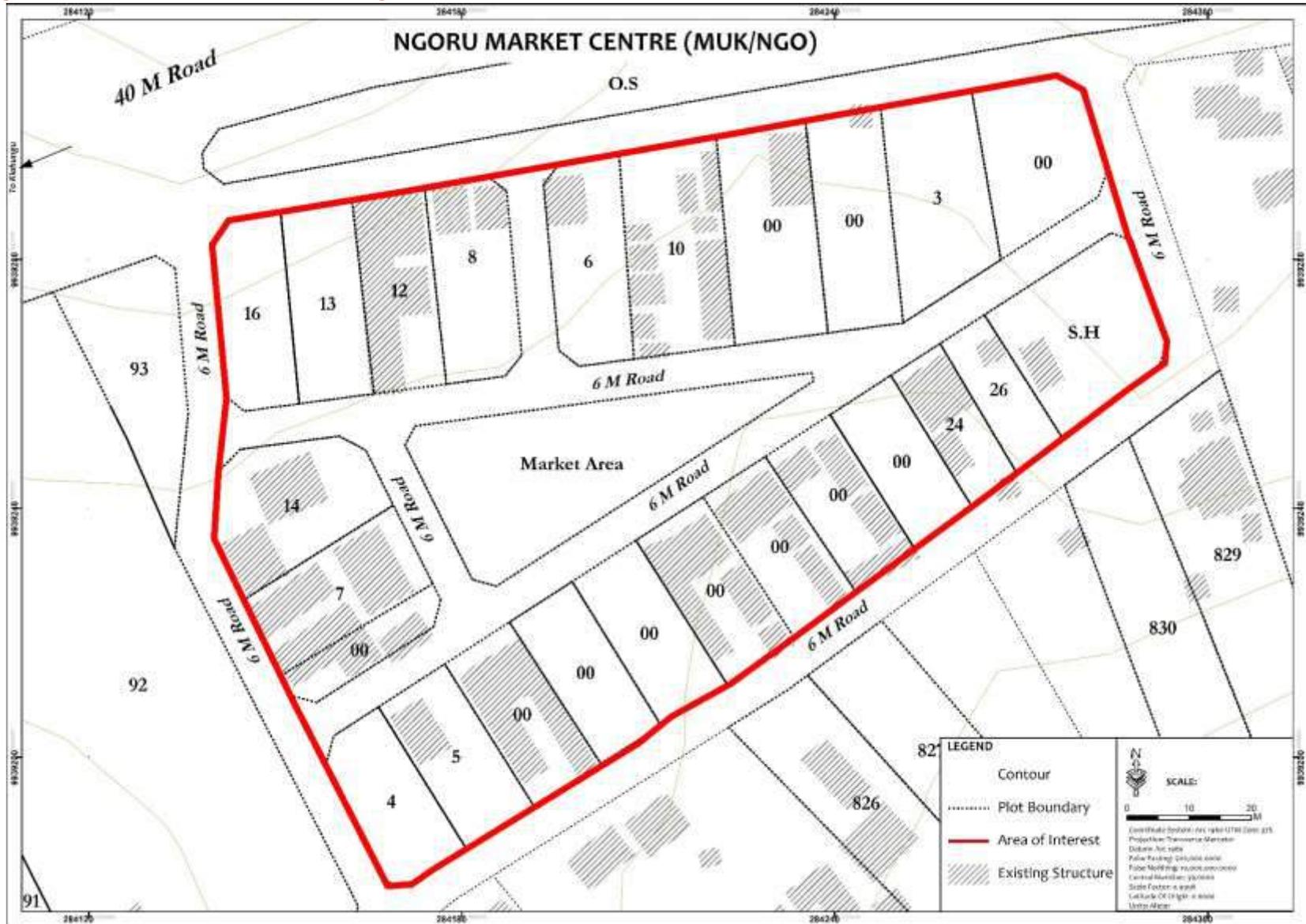
Appendix III: Pictures of the Draft Plan Presentation



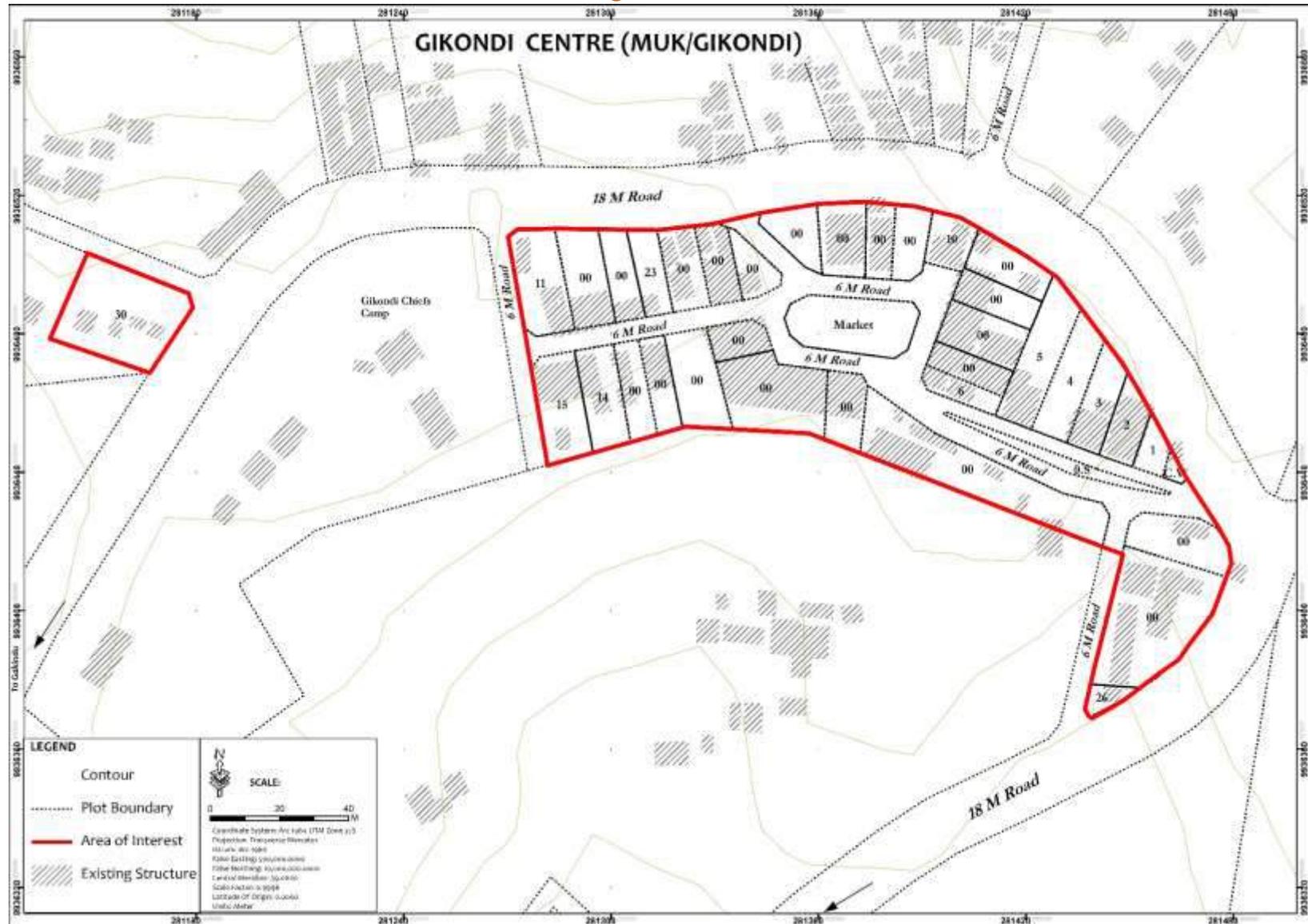
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Ngoru Market Plots and Findings of Beneficiaries



Gikondi and Kamuchuni Market Plots and Findings of Beneficiaries



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