

JUJA

Integrated Strategic Urban Development Plan

A Vibrant Knowledge, Commercial and Service Hub

2020 - 2030



CERTIFICATION

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

Signed: _____ Date: _____

PLAN. PAUL CHEGE

Registered Physical Planner

Signed: _____ Date: _____

HANNAH N. MARANGA

County Director of Physical and Land Use Planning

Signed: _____ Date: _____

SALOME WAINAINA

**County Executive Committee Member-Land, Housing and Physical Planning, Municipal
Administration & Urban Development**

APPROVAL

This Plan has been approved as per requirements of the Physical and Land Use Planning (Local Physical & Land Use Development Plan), Regulations, 2021 Sec 13, Urban Areas & Cities Act, 2011 (Revised 2019) and County Governments Act No. 17 of 2012.

Hansard No. _____

Signed: _____ Date: _____

JOHN MUTIE

Clerk to the County Assembly

Approved Development Plan No.

3

PREFACE



I am glad to introduce Juja Integrated Strategic Urban Development Plan 2020-2030, which is a road map on development of the town. This is the first comprehensive spatial plan for Juja Urban Area and it has been prepared at a time when the County is grappling with the challenges of rapid urbanization. The recent past has seen a deterioration in the quality of our urban areas due to uncontrolled development and increasing congestion. This Integrated Strategic Development Plan gives us the tools to rectify the situation, and establish a system that will give the County the powers that it needs to direct development to the most appropriate locations and improve service delivery. Most importantly it provides a guidance into how we can make Juja a more attractive and an efficient town.

I am happy to note that this Plan has been prepared in a participatory manner considering the contributions of various stakeholders whose role in the implementation of the proposals as detailed in this plan is fundamental.

Kiambu is the 3rd most urbanized County after Nairobi and Mombasa and has witnessed rapid urbanization in the last few decades with people moving in to settle, set up businesses and other development activities. Juja has witnessed population growth and increased economic activities over the last ten years since the onset of the devolved government. However, most of the urbanization is happening in the peri-urban areas where barely little planning takes place. These are areas that are also characterized by piecemeal and disjointed subdivision coupled with a haphazard conversion of agricultural land that consistently distorts urban planning processes. In addition, due to an absence of a plan to guide and manage this sprawl, the town is suffering from uncoordinated growth, land-use conflicts, inadequate basic infrastructure facilities and services, poor housing, and loss of rich agricultural land, amongst other challenges.

In order to cope with this scenario, the County therefore is expected to commit resources to guide and manage urbanization and growth in a more efficient manner. The increased population needs to be accommodated in a suitable environment, with ease of movement, adequate physical and social infrastructure, and employment opportunities.

This plan is prepared within Kenya's global commitments for sustainable development, and existing policy and legal framework which includes inter-alia, Kenya's Vision 2030, Constitution of Kenya (2010), County Governments Act (2012), Urban Areas and Cities Act (2011), the Physical and Land Use Planning Act, 2019, and other applicable statutes which form the legislative framework within which the County will be able to implement this ISUDP. It therefore gives the County the necessary tools to address current development challenges.

The plan has taken into cognizance the many opportunities and resource potentials that the town has and needs to exploit when addressing its development needs while ensuring that resources are sustainably utilized. Implementation of the plan will therefore enable the County to not only improve service delivery but also direct development to the most appropriate locations. Sectoral programs and projects form key components of the plan, whose objective is to ensure integration and coordination of development priorities.

Institutionalizing the County Planning Unit (CPU) as provided under Clause 105 of the County Government Act (2012), will ensure consistency across the entire planning and implementation cycles. In the end, sectoral strategies will be implemented within a spatial framework and, in turn, reflect the socio-economic analysis across the entire town. The plan has also identified several action areas and quick-win projects, which are to be implemented within the first year of the project cycle, hence ensuring fast-tracking of the implementation of the identified priorities and set the pace for realization of the medium and long-term projects.

My administration acknowledges with appreciation the support of the World Bank in the preparation of this Plan. I commend the National Government through the Ministry of Transport, Infrastructure, Public Works, Housing and Urban Development; Directorate of Nairobi Metropolitan Development for providing technical and supervisory roles. I also appreciate the efforts of other stakeholders, including professional bodies; resident associations; the business community; community-based organizations; and the wananchi for their engagement and valuable inputs during various stages of the preparation of the plan. My government pledges to ensure during implementation of this plan, the involvement of and collaboration with all stakeholders to achieve its full realization. It is hoped that the implementation of the plan will produce positive changes and improvements in our peoples' lives.

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



H.E. Dr. Kimani Wamatangi

Governor, Kiambu County

FOREWORD



Juja Integrated Strategic Urban Development Plan is a ten-year geographical information-based database system plan that will guide the spatial development of Juja town from 2020 to 2030. This development blueprint is a statutory requirement, as outlined in Section 111 of the County Governments Act, 2012(CGA).

Section 36 (1) of Urban Areas and Cities Act (UACA) further states that an ISUDP shall be basis for development control; preparation of environmental management plans; preparation of valuation rolls for property taxation; provision of physical and social infrastructure and transportation; preparation of annual strategic plans for an urban area; disaster preparedness and response; and overall delivery of service including provision of water, electricity, health, telecommunications and solid waste management.

The ISUDP is a tool for efficiently controlling and managing the use of space over the next ten years in a sustainable manner. The Plan will serve as a base for all future physical development plans within the urban area. The Plan also aims to help coordinate implementation of sectoral projects and programs, especially to reduce wastage of scarce resources and to avoid the duplication of efforts.

This ISUDP forms part of the Nairobi Municipal Services Improvement Programme (NaMSIP) which is a World Bank funded project. The Juja Integrated Strategic Urban Development Plan reflects the desired spatial form for Juja and the preferred land use zoning within the 2020-2030 plan period. The desired patterns of land use have been synchronized to other existing regional, national and other county plans. Indeed, the plan reflects the objectives and aspirations of the County as outlined in the County Integrated Development Plan (CIDP) for the said period.

The ISUDP provides strategies for conservation, use and management of natural resources. In addition, the spatial structure of the population, existing infrastructure, economic activities and human settlements have been mapped. Similarly, the challenges and opportunities for tapping into these resources have been identified. I also take note that the Plan has identified areas where priority strategic intervention and funding is required. Equally important, the Plan has considered the rights of all special groups within the County within the constitutional requirements for participatory planning and development.

The preparation of this Integrated Strategic Urban Development Plan was carried out through a participatory process as per the requirements of the County Governments Act 2012 as well as the Physical and Land Use Planning Act, 2019. The process involved representation from the general public, the County

Government and National Government stakeholders as well as with consultation with special interest groups.

I believe that this Plan will be an important pillar in stimulating agricultural production, infrastructural investment and social-economic development in Juja towards the desired Vision. I am further confident that this plan will become an important guide for investments for the County. I therefore take this opportunity to appeal to the people of Juja to participate in the implementation of this Plan as part of the County transformation agenda towards improved livelihoods.



SALOME WAINAINA

County Executive Committee Member-Land, Housing and Physical Planning, Municipal Administration & Urban Development

ACKNOWLEDGEMENTS



The preparation of the Juja Urban Area ISUDP is a milestone in the Physical Planning Department, and I would like to express my gratitude to everyone who was instrumental in making this assignment a success.

Thanks to the County Government of Kiambu especially to His Excellency the Governor of Kiambu, Hon. Dr. Kimani Wamatangi for his support in the preparation and approval of this Plan.

My gratitude also goes to the Kiambu County Assembly for their leadership in overseeing and adopting this Plan which will guide the planning and development of Juja Urban Area.

I would like to acknowledge efforts of staff of the Ministry of Transport, infrastructure, Housing, Urban Development and Public Works (MoTIHUD & PW), the State Department for Housing and Urban Development and the Nairobi Metropolitan Services Improvement Project- NaMSIP (under the Department of Metropolitan Development) for supervising, and supporting the entire preparation of this Plan. Special thanks go to the NaMSIP Project Coordinator, Engineer Benjamin Njenga, Planner Ann Mugo (Project Supervisor), as well as Planner Esther Muthoni, Planner Mutisia Mutua, Engineer Anthony Moire, Alex Maroko, Kevin Onjiko Kevin Gitau, Michael Ibabu, Mercy Kirema and Kelvin Ruto.

I also wish to acknowledge the team from Kiambu County's Physical Planning Department who include Martin Kang'iri (Chief Officer); Jane Mwaniki (Director Urban Development), Nicholas Waweru (Deputy Director Urban Development), Deputy Directors Physical and Land Use Planning:- Dennis Abuya and Salome Ng'igi, Assistant Directors Physical and Land Use Planning:- Charles Mugambi, James Ndung'u and Daniel Murage, Eric Matata (Assistant Director Municipal Administration), Physical Planners:- Christine Kamau, Charles Mwangi, Judith Nyamongo, Rehema Nyabuga, Stephen Njiraini, Wallace Mochu, Peter Mwenga, Eston Kibutu, George Maina, Hilda Mwai, Christine Njeru, Beth Njoroge, Alex Waweru, Rachael Gachara, Onesmus Ng'ang'a, Evelyn Kanana, Martin Kung'u; Sharon Gitahi, Francis Ndugo, Alex Gitau, and Daniel Waweru; Cartographer Lucy Muiruri, Surveyors Jennifer Mueni, Hellen Gathiani and Carlos Gikonyo and Deborah Biwott.

The County Government of Kiambu is grateful to VisionRI and Urban Lines Consultants led by Arch./Plan. Requito Bellosillo (Team Leader), Plan. Paul G. Chege (Deputy Team Leader, Cluster Planning Team members which include Plan. Alice Menya, Plan. David Gatimu, Ephraim Njogu, Mark Nyamu, Mr. Jitender Pal Singh Economist/Business Analyst, and Joan Watetu who worked together with Kiambu's Department

of Planning to prepare this Plan. The Plan's preparation was supported by thematic experts including; Dr Joseph K. Kurauka and Evelyn Amile (Environmentalists); Dr Luke Obala and Abigail Gacheru (Land Economists); Elijah Kimani Mutuango (Social Expert); Mr Imtiyaz Ahmed and Peninnah Ndegwa (Transportation Planners); Francis Muchiri (Communications); and Dennis Wakaba (Urban Design).

Further gratitude goes to the different State and County Departments and Agency members, who patiently met the members of the study team, and provided useful information that was essential in carrying out this planning exercise. To this, we say thank you all.

We also express profound gratitude to the Food and Agriculture Organization of the United Nations (FAO) and the European Union (EU) for generous financial and technical support. Special Thanks to Mr. Josphat Kariuki for mobilizing and coordinating support from the Digital Land Governance Programme (DLGP).

Finally, I wish to thank the people of Juja for sharing their proposals during the county-level stakeholders' workshops. It was their contributions that shaped this advisory plan.



HANNAH N. MARANGA

County Director of Physical and Land Use Planning

EXECUTIVE SUMMARY

The Juja Integrated Strategic Urban Development Plan (ISUDP) for the period 2020-2030 has been prepared by the County Government of Kiambu in collaboration with the National Government through the Nairobi Metropolitan Services Improvement Project (NaMSIP), Ministry of Lands, Housing and Urban Development. The plan was prepared within the framework of the Kenya Constitution 2010, County Government Act 2012, Urban Areas and Cities Act 2011 and the Physical and Land Use Planning Act 2019, among others. The plan is guided by Kenya Vision 2030, National Spatial Plan 2015-2045, National Land Use Policy 2018, and the National Land Policy 2009.

The purpose of the plan is to define the vision and spatial structure of the centre up to the year 2030. Specifically, the plan intends to achieve the following objectives: provide a basis for infrastructure and service provision for present and projected population over the plan period; determine demographic changes in the last ten years and those expected over the life of the plan, and how these relate to economic changes, welfare and administrative shifts; identify environmental issues and concerns affecting Juja; identify development potentials of the planning area (social, economic and environmental profiling); provide a basis for development control and investment decisions; allocate sufficient space for various land uses to ensure efficient function and convenience of users and accommodate future growth; provide for adequate land for recreation and open spaces; enhance and promote safety and security; and to uphold innovative civic and urban design that enhances its character and form.

The ISUDP was prepared in a participatory process bringing together all actors, including the local community, Kiambu County Government, and NaMSIP. The planning process began with the notice of intention to plan, inception workshops, reconnaissance survey, delimitation of planning boundaries and base map preparation. The planning team used both secondary and primary data for the planning process. Consultative meetings and workshops with all stakeholders were held for purposes of visioning, validation of situational analysis, presentation of draft plans and validation of the same. The planning area was delineated to cover approximately 32,309.49 hectares, in five wards and seven sub-locations. The planning area includes Juja Town, Kalimoni, Murera, Theta, and Witeithie. Juja's population as of the 2019 census was 300,948. The Plan has evaluated land and administration issues surrounding the Sub-County's land management, which shows that 80% of the land is privately owned. The land tenure system is on either freehold (mostly for agricultural land) or leasehold (for 33 years to 99 years) for residential and commercial development.

The Juja's land availability is principally dominated by land buying companies. Developments are characterised by the lack of coordinated planning or subdivisions without due regard to existing regulations. The Plan has also evaluated Juja's urban design and morphology, transportation system, physical and social infrastructure, and systems for disaster risk reduction and management. Juja's overall development strategy, complete with a vision and driving objectives were developed through stakeholders' consultations. The vision agreed on by stakeholders reads, "To be a vibrant knowledge, commercial and service hub".

The Plan has advanced varied spatial development models that provided alternatives to contain urban sprawl; manage emerging linear development along the Thika-Nairobi Superhighway; protect and conserve ecologically sensitive areas, while establishing sustainable development control strategies. The Plan envisions to provide adequate infrastructure to support current and future developments across Juja. The Plan has also identified three action areas that will require immediate intervention, including Juja CBD, Gachororo informal settlement, and Ndarugu Riverfront development. The Plan explores the County Government of Kiambu's revenue picture from previous years with a view to forecast the future economic planning strategy outlining future revenue streams. It is believed that a strong monitoring and evaluation framework will be required to ensure the efficacy of implementing the Plan, and to measure the outcomes and outputs.

Finally, the Plan provides an analysis for effectively delivering the proposed interventions in its concluding chapter. This recognises the position of the Juja in the County and provides the tenets that anchor it into the full realisation of the vision.

The Integrated Strategic Urban Development Plan (ISUDP) is structured in four (4) parts as follows: -

Part I: Introductory and Planning Context

Part One consists of chapter one and two. Chapter one which presents the background covers the purpose of the plan, the planning challenges, objectives, scope, deliverables of the plan, and the organizational structure that presents the plan.

Chapter two presents the planning context which describes the National, Regional and Local context, the policy and legal framework guiding the ISUDP process. It provides linkages to other relevant plans i.e., CIP and previous planning interventions in the town and explains the methodology and approach employed in preparing the ISUDP.

Part II: Situational Analysis

Part two consists of chapter three to twelve, covering the different aspects of situational analysis.

Chapter three discusses the physiographic characteristics with focus on terrain, slope, geology, soils, hydrology, vegetation, and how they affect development:

Chapter four discusses the population and demographic characteristics of the town; focusing on population size and structure, population projections, morbidity and mortality, poverty levels as well as employment data.

Chapter five analyses the land uses in the planning area, land tenure details, land administration arrangements as well as land suitability analysis for the planning area.

Chapter six analyses the environment with focus on key natural resources found in the planning area, as well as environmentally fragile areas within the area. The chapter also looks at environmental challenges related to waste management, as well as climate change.

Chapter seven analyses housing and human settlements within the planning area, with focus on settlement patterns for rural and urban areas, housing typologies, housing demand, as well as housing materials used with the planning area.

Chapter eight analyses the physical infrastructure systems within the planning area, with focus on transportation infrastructure, water and sanitation supply infrastructure, waste management infrastructure, energy as well as communication infrastructure within the planning area.

Chapter nine analyses the social infrastructure, looking at education facilities (primary, secondary and tertiary), health facilities, recreation, administrative, as well as religious facilities.

Chapter ten analyses the economic characteristics of the planning area, looking at key economic drivers (agriculture, industries, trade and commerce, mining, among others)

Chapter eleven analyses the governance and administrative framework that is relevant for the implementation of this plan, and what is required for effective implementation of the plan.

Chapter twelve synthesizes all the issues discussed with the aim of laying the framework for the plan formulation process.

Part III: Plan Formulation

Part three details the plan formulation process and the contents of the plan. It consists of chapters thirteen to Eighteen.

Chapter thirteen analyses the different scenarios for achieving the vision of the plan, looking at nil intervention scenario against scenarios for economic development, green growth as well as integrated approach to development.

Chapter fourteen highlights the different strategies for achieving the preferred scenario.

Chapter fifteen presents the spatial development propels in the form of a structure plan, presenting the different land use options recommended for attainment of the vision.

Chapter sixteen presents the zoning plans to guide the spatial development proposals outlined in the structure plan. It also presents action plans within the structure plan.

Chapter seventeen presents the plan implementation matrix, outlining the actions, the actors and the time frames for implementing the different strategies. It also presents a capital investment plan outlining the cost implications for implementing the plan. Further, it presents the Capital Investment Plan, outlining the projects, costs, actors and time frame.

Chapter Eighteen presents the Monitoring, Evaluation and Reporting, outlining the projects, targets, indicators, actors and time frame.

CONTENTS

CERTIFICATION	
APPROVAL	ii
PREFACE	i
FOREWORD	ii
ACKNOWLEDGEMENTS.....	v
Executive Summary	vii
Contents.....	x
List of Tables.....	xviii
List of Maps.....	xx
List of Figures	xxi
Abbreviations and Acronyms	xxiii
PART I INTRODUCTION & PLANNING CONTEXT	1
1. Introduction.....	2
1.1 Background.....	2
1.2 ISUDP concept.....	3
1.3 Purposes of the Plan.....	4
1.4 Specific Planning challenges	4
1.5 Objectives of the Plan	4
1.6 Scope of the Plan	5
1.6.1 Geographical scope.....	5
1.6.2 Planning scope	5
1.7 Deliverables of the plan	5
1.8 Vision and Mission	6
1.9 Methodology	6
1.9.1 Preparatory Stage.....	6
1.9.2 Sensitisation	6
1.9.3 Data collection	7
1.9.4 Plan Formulation	9
1.9.5 Plan Approval	10
2 Planning Context.....	11
2.1 Historical Development of Juja Town.....	11

2.2	Geographical Location and Size	11
2.2.1	Juja in National Context.....	11
2.2.2	Juja in Regional Context	12
2.2.3	Juja in Local Context.....	12
2.3	Administrative Units	12
2.4	Legislative Context.....	18
2.4.1	National Laws.....	18
2.4.2	County Laws.....	22
2.4.3	Other Related Legislations	22
2.5	Policy Context.....	24
2.5.1	Global Policies.....	24
2.5.2	National Policies	25
2.5.3	Other Relevant Policies.....	27
2.6	Planning Policy Linkages	28
2.6.1	The National Spatial Plan.....	28
2.7	Regional Policies.....	29
2.7.1	Nairobi Metro 2030.....	29
2.7.2	Spatial Planning Concept for Nairobi Metropolitan Region	30
2.8	County Policies	33
2.8.1	Kiambu County Spatial Plan.....	33
2.8.2	Kiambu County Integrated Development Plan	34
2.9	Institutional Framework.....	35
2.9.1	Core Planning Mandate	35
2.9.2	Cross-Cutting Stakeholders	37
2.10	Cluster Potential.....	39
2.11	Key Planning Issues	41
PART II SITUATIONAL ANALYSIS		42
3	Physiographic Characteristics	43
3.1	Overview.....	43
3.2	Base Map	43
3.3	Topography	43
3.4	Geology & Soils.....	43
3.5	Hydrology & Water Sources	48
3.6	Flora	48

3.7	Fauna	49
3.8	Climatic conditions.....	51
3.8.1	Rainfall	51
3.8.2	Average Wind speeds.....	52
3.8.3	Evaporation	54
3.8.4	Relative Humidity	54
3.8.5	Temperature.....	54
3.9	Key Planning Issues	55
4	Natural Environment, Climate Change and Disaster Risk Reduction.....	56
4.1	Overview.....	56
4.2	Natural Environment	56
4.3	Environmentally Sensitive Areas.....	56
4.4	Greenery and Open Spaces.....	59
4.5	Air and Water Pollution	59
4.6	Climate Change.....	60
4.6.1	Effects of Climate Change:.....	60
4.6.2	Resilience Adaptation Measures	61
4.7	Disaster Risk Reduction and Management	62
4.7.1	Analysis of Disaster Risk Reduction	63
4.7.1	Mitigation Strategies for Disasters and Climate Change Adaptation	64
4.8	Key Planning Issues	65
5	Population and Demography.....	66
5.1	Overview.....	66
5.1	Population Size	66
5.2	Population Distribution and Density.....	67
5.2.1	Population Distribution.....	67
5.3.2	Population Density.....	67
5.3.3	Population Structure.....	69
5.3	Population Projections	70
5.4	Demography	71
5.5	Key Planning Issues	72
6	Land Analysis	73
6.1	Overview.....	73
6.2	Land Ownership and Tenure Systems	73

6.3	Land Administration and Management.....	73
6.4	Land Use Patterns and Trend Analysis	76
6.5	Land Availability and Suitability in Juja Sub-County	80
6.6	Land Values and Markets	80
6.7	Measures to Address Land Administration Problems.....	83
6.8	Strategies and Recommendations related to Land Issues.....	83
6.9	Summary of Key Issues	84
7	Urban Development and Human Settlements	85
7.1	Overview.....	85
7.2	Urbanisation	85
7.3	Hierarchy of existing centres and their functions	86
7.4	The Nodes and Corridors.....	86
7.5	Formal Settlements.....	86
7.6	Informal Settlements	86
7.7	Housing	87
7.7.1	Introduction.....	87
7.7.2	Housing Situation in Juja Sub-County:	88
7.7.3	Building Materials and Construction Sub-sector	88
7.7.4	Housing Typologies and Building Materials.....	88
7.7.5	Housing Tenure	91
7.7.6	Housing Stock and Projections.....	92
7.8	Key planning issues.....	93
8	Physical Infrastructure	95
8.1	Overview.....	95
8.2	Transportation	95
8.2.1	Regional Connectivity	95
8.2.2	Inter-connectivity and Intra-connectivity	95
	Source: 95	
8.2.3	Trip Generation.....	98
8.2.4	Modal Split.....	98
8.2.5	Means of Transport	98
8.2.6	Travel Demand.....	102
8.3	Water.....	103
8.3.1	Water Supply Infrastructure in Juja Sub-County.....	103

8.3.2	Distribution.....	105
8.3.3	Demand and Supply.....	106
8.4	Waste Management	108
8.4.1	Solid Waste Management	108
8.4.2	Liquid Waste Management	111
8.4.3	Disposal mechanisms and management.....	113
8.5	Storm Water Management.....	115
8.5.1	Emerging Issues	115
8.6	Energy Infrastructure	115
8.6.1	Sources of energy.....	115
8.6.1	Key planning issues.....	119
8.7	Information and Communications Technology (ICT)	120
8.8	Emerging Issues	120
9	Social Infrastructure	122
9.1	Overview.....	122
9.2	Education Facilities	122
9.2.1	Early Childhood Development Education (ECDE) Facilities	124
9.2.1	Primary School Facilities	127
9.2.3	Public Secondary Schools	129
9.2.2	Adult Education Centres	132
9.2.3	Universities	132
9.2.4	Technical Vocational Education and Training (TVET) Programme	134
9.2.7	Emerging issues	134
9.3	Health Facilities	135
9.4	Sports and Recreation	135
9.5	Public Parks and Playgrounds.....	136
9.6	Heritage.....	138
9.7	Cemeteries and Burial Grounds	138
9.8	Cooperative Societies.....	138
9.9	Security.....	139
9.10	9.10 Key Planning Issues	139
10	Economic Analysis	141
10.1	Overview.....	141
10.2	Urban Agriculture	141

10.2.1	Land for Urban Agriculture	141
10.3	Floriculture	143
10.4	Trade	143
10.5	Quarrying	144
10.6	Education	146
10.7	Industries.....	146
10.8	Economic Catalysts.....	147
10.4	Economic bottlenecks in the Sub-County	148
10.5	Key Planning Issues	149
11	Governance & Stakeholders Participation	150
11.1	Governance	150
11.2	Institutional Framework/Administrative Structure	150
11.3	Mandate and Role of the County Government.....	150
11.3.1	The County Assembly	151
11.3.2	The County Executive	151
11.3.3	Boards of Municipalities	151
11.4	Legislations and Enforcement Mechanisms.....	152
11.5	Mechanisms of Participation.....	152
11.6	Stakeholders Profiling	154
11.6.1	Inclusivity (Minorities and People Living with Disabilities (PLWDs)).....	155
11.6.2	Stakeholder Concerns	155
11.6.3	Mode and Level of Engagement	155
11.6.4	Stakeholders Issues and Concerns.....	156
11.7	Key Planning Issues on Governance and Stakeholders Participation.....	156
12	Synthesis of Emerging Issues	158
12.1	Overview.....	158
12.2	Summary of Key Sectoral Issues	158
12.3	SWOT Analysis	162
12.3.1	Strengths and Opportunities.....	162
12.3.2	Weaknesses and Threats.....	162
PART III PLAN FORMULATION		166
13	Scenario Building and Conceptual Framework	167
13.1	Overview.....	167
13.1.1	Principles, Vision, Objectives, Opportunities	167

13.2	Strategic Development Directions	167
13.3	Alternative Development Models.....	168
13.3.1	Nil scenario	168
13.3.2	Alternative 1: Multi Nodal Transit-Oriented Development Model.....	169
13.3.3	Alternative 2: Knowledge City Model.....	172
13.3.4	Alternative 3: Green Infrastructure Model	172
13.3.5	Evaluation of Alternative Models	173
13.4	Preferred Model	173
14	Physical Development Plans	179
14.1	Land Use Plan.....	179
14.1.1	Proposed Land Use Plan for Juja Sub-County by 2030	179
14.1.2	Development Control Regulations	185
14.1.3	Zoning Regulations	185
14.2	Detailed Action plans	197
14.2.1	Action Area 1: Revitalisation Juja CBD	197
14.2.2	Action Area 2: Ndarugo Quarrying Site Action Area	212
14.2.3	Action Area 3: Juja Farm Green Zone Action Area	219
15	Sectoral Strategies and Measures	222
15.1	Sectoral measures and strategies.....	222
15.1.1	Residential Development Strategy	222
15.1.2	Transport Strategies	222
15.1.3	Natural Resources and Environmental Conservation Strategy.....	233
15.1.4	Physical Infrastructure	234
15.1.5	Social Infrastructure.....	236
15.1.6	Education facilities	236
15.1.7	Health Sector	238
15.1.8	Other social facilities	239
15.1.9	Promoting Strategies of Local Economy	239
15.1.10	Agriculture Strategies.....	240
15.1.11	Revenue Enhancement and Finance Management	241
16	Integration of Strategic Environmental and Social Assessment.....	249
PART IV: IMPLEMENTATION, MONITORING, EVALUATION AND REPORTING.....		254
17	Plan Implementation and Capital Investment	255
17.1	Overview.....	255

17.2	Institutional and Coordination Framework for Plan Implementation	255
17.2.1	Role of the County Planning Unit (CPU).....	255
17.2.2	Plan Implementation at the Decentralised Units	257
17.2.3	Capacity Building Framework.....	257
17.3	Human Resource Framework	260
17.4	Capital Investment: Programmes and Projects Matrix	264
17.5	Proposed Capital Investment Financing	279
18	Monitoring, Evaluation and Reporting	280
18.1	Procedure for Monitoring.....	280
18.2	Monitoring Unit	281
18.3	Planning Indicators of Progress.....	281
18.4	Financial Monitoring.....	282
19	Conclusions	283
	References.....	285
	Annexure 1: Stakeholders Participation	289
	Annexure 1.1: Stakeholders Profiling	289
	Annexure 1.2: Participants in the stakeholder's forums	290
	Annexure 2: SWOT Analysis	292
	Annexure 2.1: SWOT Outputs of Natural Resources and Environment Grp.....	292
	Annexure 2.2: SWOT Outputs of Local Economy	292
	Annexure 2.3: SWOT Outputs of Land use and Urban Design Group.....	293
	Annexure 2.4: SWOT Outputs of Social Infrastructure Group	293
	Annexure 2.5: SWOT Outputs of Transport Group	293
	Annexure 2.6: SWOT Outputs of Physical Infrastructure Group.....	294
	Annexure 2.7: SWOT Outputs of Governance Group.....	295

LIST OF TABLES

Table 1-1: Stakeholder forums held in a summary	8
Table 2-1: Sub-location and wards units	12
Table 2-2: Other Relevant Legislations.....	22
Table 2-3: Other Relevant Policies	27
Table 2-4: Relevant National Spatial Plan Strategies	29
Table 2-5: Economic Targets for Urban Centres	31
Table 2-6: Proposed Settlement Hierarchy for NMR, 2030 Concept for NMR.....	31
Table 2-7: Relevant Strategies in Kiambu County Spatial Plan.....	33
Table 2-8: Relevant CIDP Strategies.....	34
Table 2-9: Roles and responsibilities of the levels of Government.....	35
Table 2-10: Key Sectoral Government Agencies.....	37
Table 2-11: Assessment for adopting Cluster-based Planning Strategy.....	40
Table 2-12: Key issues regarding the Planning Context	41
Table 3-1: Soil Variations in the Planning Ecosystem.....	48
Table 3-2: Rainfall Data.....	51
Table 3-3: Evaporation Data	54
Table 3-4: Temperature Data	55
Table 3-5: Key planning issues on Physiographic Characteristics.....	55
Table 4-1: SWOT Analysis of DRRM and Resilience	63
Table 4-2: Key planning issues on the Environment.....	65
Table 5-1: Population by Ward	66
Table 5-2: Proportional Population Growth by Wards Between 2009-2019	66
Table 5-3: Population Density by Ward	67
Table 5-4: Population by Age in Juja Sub-County (2019).....	69
Table 5-5: Projected Population, 2019 to 2030	71
Table 5-6: Demographics of Juja Sub-County	71
Table 5-7: Key Planning Issues in Population and Demography	72
Table 6-1: Key Actors and Roles in Land Administration and Management.....	74
Table 6-2: Major land uses in Juja Sub-County.....	77
Table 6-3: Indicative land values between 2015 and 2019 for Juja Sub County	82
Table 6-4: Key issues on land administration and management	84
Table 7-1: Population Trends 2009 – 2018	86
Table 7-2: Sources of Selected Building Materials	88
Table 7-3: Housing Stock and Projections into 2030	92
Table 7-4: Key planning issues on Urban Development and Human Settlements	93
Table 8-1: Road Connectivity	95

Table 8-2: Transport mode shares under three scenarios	103
Table 8-3: Water Supply and Demand Sources within the Sub-County in 2019 per day.....	104
Table 8-4: Water demand and deficit within the Sub-County	108
Table 8-5: Solid waste generation projection for Juja Sub-County	111
Table 8-6: Liquid waste generation projection for Juja Sub County	112
Table 8-7: Sanitation works specifications for Juja Sub-County	113
Table 8-8: Main Sources of Energy	116
Table 8-9: Key planning issues on Physical Infrastructure	120
Table 9-1: Schools in Catchment	127
Table 9-2: Secondary Schools Enrolment in Juja.....	129
Table 9-3: Number of streams in the secondary schools in Catchment Population	129
Table 9-4: Key planning issues on Social Infrastructure	139
Table 10-1: Key planning issues on the Local Economy	149
Table 11-1: Stakeholder Profile.....	154
Table 11-2: Key Planning Issues on Governance and Stakeholders Participation.....	156
Table 12-1: Summary of Emerging Issues	158
Table 13-1: Merits and Demerits of TOD	170
Table 13-2: Key features and driving forces of the model	172
Table 13-3: Merits and Demerits of Knowledge City Model	172
Table 14-1: Indicative Land Use Distribution for Juja Sub-County by 2030.....	182
Table 14-2: Planning Standards and Development Control Regulations for Juja ISUDP.....	189
Table 15-1: Transport Implementation Guidelines: Designing safe and accessible roads for everyone....	225
Table 15-2: Projected Water demand within the Sub-County	235
Table 15-3: Demand and deficit for education facilities	237
Table 15-4: Land requirement for education facility	237
Table 15-5: Demand for Health Facilities	238
Table 15-6: Generated Sub-County revenue	242
Table 16-1: Summary of impacts, mitigation measures and interventions	250
Table 17-1: Proposed Optimal Staffing Level	264
Table 17-2: Quick Win/High Impact Projects	265
Table 17-3: Detailed Projects Implementation Matrix	267
Table 18-1: Physical Planning Indicators.....	281

LIST OF MAPS

Map 2-1: Location of Sub-County in the National Context	14
Map 2-2: Location of the Sub-County in the Region.....	15
Map 2-3: Location of the Sub-County in the County Context	16
Map 2-4: Ward Boundaries within Sub-County	17
Map 3-1: Juja Base Map	44
Map 3-2: Elevation Map	45
Map 3-3: Contour Map	46
Map 3-4: Soil Map within Juja Sub-County	50
Map 3-5: Average annual rainfall	53
Map 4-1: Environmentally Sensitive Areas and Land Suitability Map.....	57
Map 5-1: Population distribution map	68
Map 6-1: Aerial view of uncontrolled land subdivision in Juja/Kalimoni area.....	78
Map 6-2: Existing Land Use	79
Map 8-1: Nairobi Metropolitan Region Connectivity	96
Map 8-2: Intra-Sub-County Connectivity	97
Map 8-3: Water reticulation across Juja Sub-County	107
Map 8-4: Juja Sub-County sewerage reticulation map	114
Map 8-5: Juja Power Connection Network	118
Map 9-1: Distribution of ECDE and Primary Schools in Juja Sub-County	126
Map 9-2: Accessibility of primary schools (1km Walking Distance)	128
Map 9-3: Distribution of secondary schools	130
Map 9-4: Accessibility of secondary schools (3km Walking Distance)	131
Map 9-5: Distribution of Health Facilities in Juja	137
Map 10-1: Distribution of Households Rearing Livestock and Fish	143
Map 12-1: Juja Sub-County Opportunities Map	164
Map 12-2: Juja Sub-County Problem Map	165
Map 14-1: Proposed Land Use Plan.....	184
Map 14-2: Proposed Juja CBD Plan	200
Map 14-3: Site selected for riverfront development	214
Map 14-4: Juja Farm Green Zone Action Area	220
Map 15-1: Proposed right of way & classification	224

LIST OF FIGURES

Figure 2-1: Economic and Social Aspects in Vision 2030	25
Figure 2-2: Institutional linkages between National and County Government stakeholders	36
Figure 3-1: Rock Age Pyramid for Juja Sub-County	47
Figure 3-2: Wind speed Data.....	54
Figure 4-1: Cross Section A-B	58
Figure 4-2: Cross Section C-D	58
Figure 4-3: Collapsed building in Juja and fire outbreak	63
Figure 5-1: Male-Female Ratio.....	67
Figure 5-2: Juja Population Pyramid	70
Figure 5-3: Juja Sub-County's Labour Force	72
Figure 7-1: Urbanisation Trend 2003-2020	85
Figure 7-2: Roofing materials	89
Figure 7-3: Wall construction material	90
Figure 7-4: Floor construction material.....	90
Figure 7-5: Distribution of Owned Households by Mode of Acquisition.....	91
Figure 7-6: Distribution of Rented/ Provided Households (%).....	92
Figure 7-7: Housing Typologies in Juja.....	93
Figure 8-1: Modes of Transport	98
Figure 8-2: Photo showing heavy pedestrian movement in Juja Town	99
Figure 8-3: Poorly maintained footpath in Juja (L). Footpath along Thika Super Highway (R)	99
Figure 8-4: Photo showing Juja Town stage ostensibly as a bus park	100
Figure 8-5: Boda boda operators operating next to the bus stop in Juja Town 2019	101
Figure 8-6: Railway line in Juja Town.....	102
Figure 8-7: Kariaini Dam in Juja Farm.....	104
Figure 8-8: Water Vendors at Nyacaba centre	105
Figure 8-9: Mode of Solid Waste Disposal	109
Figure 8-10: Poor solid waste disposal mechanism	111
Figure 8-11: Modes of Human waste disposal	112
Figure 8-12: Poor stormwater drainage systems in Witeithie	115
Figure 8-13: Types of cooking fuel.....	117
Figure 8-14: Power Sub Station and Electricity Distribution Lines at Witeithie 2018	117
Figure 8-15: Types of lighting fuel.....	119
Figure 9-1: Highest Level of Education Completed	123
Figure 9-2: Juja Sub-County School Attendance Status	124
Figure 9-3: Jomo Kenyatta University of Agriculture and Technology.....	132
Figure 9-4: Zetech University	133

Figure 9-5: St. Dominic Technical training Institute and Production Centre	134
Figure 9-6: The Italian Prison of War Camp in Ndarugo Ward at Juja Sub-County.....	138
Figure 10-1: Distribution of Types of Crops Grown by Households.....	142
Figure 10-2: Quarrying activities in Ndarugo.....	146
Figure 10-3: Selecta Flower Industry	147
Figure 11-1: Organogram of the County.....	150
Figure 13-1: Transit-Oriented Development Model	171
Figure 13-2: Knowledge-City Development Model.....	176
Figure 13-3: Alternative 3: Green Infrastructure Model.....	177
Figure 13-4: The Preferred Model.....	178
Figure 14-1: TOD Principles	180
Figure 14-2: Juja access thoroughfare.....	201
Figure 14-3: Road cross-section for 9m road reserve	202
Figure 14-4: Road cross-section for 12m road reserves.....	202
Figure 14-5: Road cross-section for 15m road reserves.....	203
Figure 14-6: Road cross-section for 60m road reserves.....	203
Figure 14-7: Juja CBD current parking state	204
Figure 14-8: Aerial Road Profile.....	205
Figure 14-9: Pedestrian Flow Profile	206
Figure 14-10: Street within the residential areas	207
Figure 14-11: Rehabilitated Street within the residential area.....	208
Figure 14-12: Intervention 5 – Intermodal Transport	210
Figure 14-13: Desired pedestrian flow	211
Figure 14-14: Shared vehicular and pedestrian overpass within Juja town.....	211
Figure 14-15: Suitable intersection design	212
Figure 14-16: Activities adjacent to Ndarugo River.....	215
Figure 14-17: Proposed Ndarugo River Waterfront Development design	216
Figure 14-18: Rehabilitation into recreation spaces 1.....	217
Figure 14-19: Rehabilitation into recreation spaces 2.....	218
Figure 14-20: Priorities areas and indicators.....	221
Figure 15-1: Juja Sub-County Revenue Sources FY 2017/2018	241
Figure 17-1: County Planning Unit (CPU)	256
Figure 17-2: Framework for Plan Preparation and Implementation.....	258
Figure 17-3: County Services & Processes	259
Figure 17-4: Capacity Building Framework	260
Figure 17-5: Human Resource Framework.....	262
Figure 17-6: Human Resource Framework for Kiambu's Housing Lands & Physical Planning Ministry....	263

ABBREVIATIONS AND ACRONYMS

CBD	Central Business District
CIDP	County Integrated Development Plan
CoK	Constitution of Kenya 2010
CSP	County Spatial Plan
DoNMED	Directorate of Nairobi Metropolitan Development
ECDE	Early Childhood Development Education
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GIS	Geographic Information System
GoK	Government of Kenya
ICT	Information and Communications Technology
ISUDP	Integrated Strategic Urban Development Plan
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KNBS	Kenya National Bureau of Statistics
KPLC	Kenya Power and Lighting Company
Kshs	Kenyan Shilling
KUSP	Kenya Urban Support Programme
KWCL	Kiambu Water & Sewerage Company Ltd
MoTIHUD&PW	Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works
NaMSIP	Nairobi Metropolitan Service Improvement Project
NEMA	National Environment Management Authority
NLC	National Land Commission
NMR	Nairobi Metropolitan Region
NMT	Non-motorised Transport
PLUPA	The Physical and Land Use Planning Act, 2019
PPP	Public-Private Partnership
ROW	Right-of-Way
RUJWASCO	Ruiru/Juja Water and Sewerage Company
SPC	Spatial Planning Concept
SWOT	Strengths-Weaknesses-Opportunities-Threats
TOD	Transit-Oriented Development
TOR	Terms of Reference
TVET	Technical-Vocational, Education and Training
UACA	Urban Areas and Cities Act
WHO	World Health Organisation
WRA	Water Resources Authority

PART I

INTRODUCTION & PLANNING CONTEXT

1. INTRODUCTION

This chapter presents the background of the Juja Sub-County Integrated Strategic Urban Development Plan (ISUDP) 2020-2030, the planning context, methodology basis for its preparation, the vision it aims to achieve, its scope, key planning challenges, and objectives.

1.1 Background

The preparation of Juja Sub-County ISUDP or the Plan 2020 - 2030 is part of Component 1 on Institutional Reform and Planning of the Nairobi Metropolitan Service Improvement Project (NaMSIP). NaMSIP is part of a development initiative by the National Government and development partners to address issues of urban governance, growth, and improved environmental management.

The Nairobi Metropolitan Region (NMR) continues to be a strategic national, regional and international centre for education, commerce, transport, regional cooperation, and economic development. It connects eastern, central and southern African countries, and plays a significant role in the global, regional and local economy. The NMR is the centre of international diplomacy, finance, banking and commerce.

The population of NMR stood at 10,411,220 according to the 2019 population census. The NMR covers Nairobi, Machakos, Murang'a, Kajiado and Kiambu counties, with several urban areas including Nairobi City, Machakos town, Mavoko, Tala/Kangundo Towns, Ngong/Ongata Rongai/Kiserian Towns, Kitengela, Kiambu Town, Thika, Juja, Ruiru, Karuri, Kikuyu, Limuru, Gatundu, Githunguri, and Kimende. These urban centres within the NMR are experiencing overwhelming challenges in the provision of civic services and utilities, diminishing returns on investment, and ensuring sufficient access to basic needs.

Kiambu County, where Juja Sub-County is part of, is the third most urbanised County after Nairobi and Mombasa. Some of the major urbanisation challenges facing the County include high population growth, uncontrolled urban growth, declining urban environment and inadequate infrastructure services. Juja Sub-County which is located along the Thika-Nairobi Superhighway corridor is faced with several development challenges amongst them inadequate housing, unemployment, environmental degradation, and inadequate infrastructure, services and facilities. Other problems include piecemeal subdivisions of privately-owned land without planning approval and uncontrolled developments without requisite provision of utilities and services.

In light of the above, an urgent need to look at urban development of Juja Sub-County from a perspective that integrates physical, economic, social, cultural, and environmental as well as institutional aspects was identified. This requires a major shift in planning by embracing a “strategic planning approach” which is a more flexible and development-oriented tool.

Thus, this ISUDP has identified various sectoral programmes which will contribute to the growth agenda by improving the competitiveness and economic growth of Juja Sub-County. Some of the areas targeted for improvement in the ISUDP include promoting local economy through industrial and commercial activities, and improvement and expansion of transport systems, housing, stormwater management, water and sanitation, solid waste management, education and health facilities, cultural centres and recreation parks, among others.

The ISUDP has identified good governance and enhanced resource mobilisation as key to the realisation of its strategic objectives.

1.2 ISUDP concept

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

The strategic planning approach mentioned above, in turn, involves the identification of “priority programmes and projects that can transform the project towns into vibrant well-planned satellite towns of Nairobi that tap on the advantages of their proximity to the capital city” (Project ToR). It is focused on identifying means to improve living and working environments, generate more employment opportunities, enhance local government revenues, create efficient transport systems, exploit opportunities for industrial growth and urban linkages, and imbue towns with unique urban form and character through innovative urban design.

The key planning principles that underlie plan preparation are also provided in Project ToR as follows:

- Consultative/participatory process that allows for public participation and ownership of plans as the basis for shared responsibility for implementation;
- Strategic process which requires a focused approach, and a systematic search for the most appropriate and effective solution, keeping in mind available resources, and overall policy guidelines and principles;
- An integrated approach, which requires thinking and acting holistically across conventional sectorial boundaries. Functional integration with the purpose of improving availability and accessibility by reducing travel and transport needs; and improving convenience for those with fewer resources;
- The plan should provide equal access to services and facilities; provide for functional, socio-economic, cultural and ethnic interaction; provide for economic development and employment; facilitate institutional cooperation; and encourage community participation;

- Create a balance between natural and physical environments, viable economic systems and greater integration, equity and responsibility; and
- Promote gender mainstreaming to incorporate the needs and aspiration of men and women.

1.3 Purposes of the Plan

The general purposes of this Plan are:

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

1.4 Specific Planning challenges

Some of the key planning issues facing Juja are:

- Unplanned and uncoordinated urban growth corridor development along Thika Nairobi Superhighway and Kenyatta Road;
- Inadequate infrastructure services and facilities, which are characterised by narrow roads, and lack of sewer, water supply, waste disposal and stormwater drainage systems;
- Poor quality housing and inadequate community services such as schools, health facilities, community halls and recreation areas;
- Lack of an updated development plan that could form the basis for planning decisions;
- Uncontrolled land subdivisions which do not meet planning and development standards;
- Proliferation of informal settlements;
- Weak coordination amongst relevant government authorities and other actors on planning and project implementation causing duplication and disjointed efforts;
- Ineffective participation in planning and development by local communities and the private sector; and
- Quarrying activities causing environmental degradation and encroachment on riparian reserves and other fragile areas.

1.5 Objectives of the Plan

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

The specific objectives of this Plan include:

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

1.6 Scope of the Plan

1.6.1 GEOGRAPHICAL SCOPE

The Scope of the Plan covers Juja Sub County with an approximate area of 32,309.49 hectares. This includes the major urban nodes and rural areas.

1.6.2 PLANNING SCOPE

This Plan is a medium-term spatial urban development framework with a planning period of 10 years from 2020-2030 subject to five-year review. The planning process as defined in the ToR covers the following scope: a detailed analysis of legal and policy framework, population and demographic issues, natural and physical environment, land and human settlements, economic analysis, urban development, governance, physical infrastructure, and social infrastructure.

1.7 Deliverables of the plan

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

- Contextual analysis of Juja Sub-County and its environments as per thematic areas;
- Detailed base map showing existing spatial information;
- Legal and policy analysis informing the preparation of the Plan;
- Assessment of transport, physical and social infrastructure needs;
- Assessment of housing and community facility needs;
- Structure plan to guide the spatial development of Juja Sub-County for 10 years;

- Zoning plan indicating detailed development densities and guidelines;
- Area which requires action area plans;
- Central business district (CBD) re-development strategies and programmes and future growth limits;
- Sectoral programmes and projects within the Sub-County and their spatial distribution;
- Revenue and financial enhancing strategies for the Sub-County; and
- Implementation strategies and framework for proposed sectoral projects.

1.8 Vision and Mission

The vision for Juja Sub-County is to be “***a Vibrant Knowledge and Commercial hub***”. This vision underpins the importance of Juja as an educational hub and also as a vibrant town with potential to provide commercial services within the metropolitan region.

The mission statement is to enhance the role of Juja as a knowledge centre and promote vibrant commercial activities. The Sub-County will maximise on the opportunities provided by educational institutions such as Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenyatta University Campus, and several middle-level colleges as well as its commercial and services potentials.

1.9 Methodology

1.9.1 PREPARATORY STAGE

The preparatory stage in the preparation of this Plan involved profiling, transect surveys, and preparation of the Inception Report and Project Design Report. Profiling involved scanning general aspects of Juja Sub-County to appreciate the challenges and opportunities. The outputs were the refinement of the problems and objectives of the Plan. Transect surveys involved undertaking reconnaissance surveys of the planning area. The output at this stage were: identification and appreciation of the Sub-County’s major planning issues, challenges and opportunities in line with metropolitan spatial development plan; delineation of the planning area and consolidation of the base maps as provided for by the Directorate of Nairobi Metropolitan Development (DoNMED) and County; and preparation of the Inception Report. The Project Design Report involved fine-tuning of the scope and timeframe of the ISUDP, and preparation of the detailed work plan.

1.9.2 SENSITISATION

Sensitisation of key stakeholders was carried out through publication of a Notice of Intention to Plan. This was done in collaboration with the Director Metropolitan Planning & Environment (DoNMED), Director of Physical Planning (Land) and the County. This was followed by stakeholder’s engagement through direct interviews, focused groups discussions that led to stakeholders’ workshops where wider ranges of stakeholders were involved in validating the situational analysis and, later, the draft plan.

1.9.3 DATA COLLECTION

The preparation of the ISUDP was first based on the confirmation of planning area boundaries. This was followed by detailed primary and secondary data collection based on relevant thematic issues. Field data collection stage was preceded by preparation and testing of data collection tools and training of field staff. The other processes of data collection involved the following activities:

- i. **Mapping:** This stage involved the preparation of the base map. The process involved the collection of digital maps and survey plans from the County Government of Kiambu and Survey of Kenya. During this phase, the consultant reviewed existing plans and cadastral data. Other activities that were undertaken during this stage included the establishment of ground control points, positioning with GPS, the establishment of photo control points, survey reconnaissance, postmarking and concreting GPS, GPS computations, ground control reporting, aerial triangulation and field verification. The following information was captured as shapefiles which gave important information for planning purposes:
 - Physical infrastructure;
 - Social infrastructure;
 - Natural resource mapping;
 - Water resources and drainage systems;
 - Land uses/economic activities;
 - Depiction of terrain characteristics; and
 - Names and annotations.
- ii. **Primary data:** This consists of raw data collected directly from the field and interaction with different stakeholders. The approach of primary data collection entailed:
 - **Key Informant Interviews:** Key informant interviews were conducted to obtain a good understanding of the existing situation. The data formed a sound basis for understanding the Sub-County, its developmental problems, and challenges prior to the formulation of development proposals. Some of the key informants included the following: County Director of Planning, County Department heads, Sub-County Finance officer, Kiambu County Water and Sewerage Company Managing Director, Government agency such as Kenya Urban Roads Authority, Kenya National Highways Authority, and Kenya Roads Board.
 - **Focus Group Discussion:** This involved the identification of key stakeholder groups. The groups commented and gave proposals on various issues such as land use, physical environment, and infrastructure, amongst others. The concerns and responses given by the respondents were recorded and analysed. Some of the key stakeholders involved in the focus group discussion include:

- Public health & environment;
 - Business community;
 - Transport & utility service providers; and
 - Educational institutions.
- **Stakeholders Forums Workshops:** The Juja Sub-County Strategic Planning Workshop was held on 1st August 2018 at Centurion Hotel located along Thika Superhighway at Highpoint, Juja Sub-County. The Workshop was organised by the County Government of Kiambu in conjunction with VisionRI and NAMSIP. The purpose of the Workshop was to present the key findings of the thematic studies to key stakeholders for orientation of stakeholders, refinement of planning issues, visioning and objectives setting. The table below indicates the stakeholder forums held.

Table 1-1: Stakeholder forums held in a summary

No.	Stakeholder Forum	Date	Venue	Purpose
1.	Juja Sub-County 1 st Stakeholders Workshop	1/08/2018	Centurion Hotel, Juja	Orientation of stakeholders, presentation of key findings of the thematic studies, refinement of initially identified challenges of the Sub-County, and visioning and objective setting.
2.	Kiambu County Technical Working Group	07/09/2018	Centurion Hotel, Juja	Presentation of key findings to stakeholders, and presentation, evaluation and selection of alternative development proposals.
3.	Presentation to Kiambu County representatives and external consultant	18 th & 19 th July 2019	Castle Gardens	Review meeting of the Juja Sub-County Base Map, ADPS, and Land Use.
4.	Juja Sub-County 2 nd Stakeholders Workshop	21 st February 2020	Centurion Hotel, Juja	Review of the draft proposed land use plan and draft ISUDP report.

Source: VisionRI, 2020

- **Field Observations:** The Consultant gathered field information and verified these through interviews and questionnaires. Examples of data that were collected using this technique include road surface condition and type, traffic volumes, physical infrastructure, and social infrastructure, amongst others.
- **Photography:** Photographs were taken to show the existing situation in the Sub-County. Photographs also captured resources available in the Sub-County.

- **Traffic Survey:** These involved random sampling of major roads within the Sub-County. Traffic counts were administered to establish vehicular flow, level-of-service (LoS) and non-motorised transport (NMT) movement in the Sub-County in order to plan for transportation.
- **Origin-Destination (O-D) Studies:** These were undertaken to determine the nature of traffic and the present volume of freight and passenger movements. The O-D studies were also used to establish the current traffic flow pattern, and to use the data to forecast future patterns. Other information obtained included the number of trips into, within, and through a connection; and time of day, mode of travel and number of occupants in a vehicle during a trip; current travel patterns; areas that generate the most traffic; and adequacy of transport facilities; and flow rates and road safety; and people's perception of the transport system.
- **Inventory and condition surveys:** These involved determining the surface type of the roads (e.g. paved or gravel), surface condition (e.g. good or fair), road classification (e.g. Class A) and lengths. It also involved determining conditions of other utilities such as water, drainage and sewer systems.
- **Structured transect surveys:** These were carried out through the following processes:
 - Initial transect (appreciation) survey;
 - Environments transect survey;
 - Infrastructure & Facilities inventories and conditions survey; and
 - Land use pattern & urban design characterisation survey.
- **Thematic group discussion:** Thematic groups were identified to validate and contribute to the data collected by the consultants. Five thematic groups were formed which included economic, environmental and natural resources, physical and social group, land use and governance. The discussions were held during the stakeholders' planning workshops.
- **Secondary Data:** Data were collected through desktop studies from previous planning reports and publications on the area. This was done before site visits to identify planning issues beforehand. Secondary data reviewed included the following: National Spatial Plan, Vision 2030, National Land Policy, Land Use Policy, Spatial Planning Concept for the Nairobi Metropolitan Region, County Integrated Development Plan, and Kiambu County Spatial Plan, amongst others.

1.9.4 PLAN FORMULATION

The formulation of the Plan was based on thematic studies which involved in-depth studies and data collection. The output included a detailed analysis of secondary and primary data and identification of critical

issues for planning. These key findings of the thematic studies were presented to key stakeholders for validation. Based on the validated situational analysis, a draft plan and development proposals were prepared. Findings and conclusion of studies were modelled and presented in a spatial context showing desired outcomes, alternatives, strategies, and programmes. The output was presented to the stakeholder forum for comments. This was followed by the formulation of alternative development proposals and selection of preferred alternative to inform land management and investment decisions. A stakeholder meeting focussing on the presentations of the draft plan proposal and preferred models was then organised to gain consensus on preferred plans and strategies for approval.

1.9.5 PLAN APPROVAL

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

2 PLANNING CONTEXT

This chapter covers the Plan's details in relation to the planning area's location within the national, regional and local contexts. It briefly describes the Sub-County's historical development, and its constitutional, policy and institutional framework, as well as the relevant linkages of this Plan with national, regional and county-level plans.

2.1 Historical Development of Juja Town

The history of Juja dates back to 1900 when Lord William Northrop Macmillan bought approximately 19,000 acres of land in the area. According to local legend, Lord Northrop had two statues named Ju and Ja and he named the area Ju-Ja Farm. The two idols were later buried in Ndarugo Valley and the area continued to be referred to as Juja.

During the colonial period, the area was inherited by European farmers who set up large-scale sisal, tea and cattle farms. Till the 1980s, Juja was known as a major sisal producer with Eastern Africa Bag and Cordage being a major processing factory in Juja Town. Following the affrication of land in Kenya after independence, most farms were bought by land-buying cooperative groups and individuals who, later in the 1980s and 1990s, subdivided the land amongst its members. This changed the settlement pattern with more people settling-in due to availability of cheap land.

The other key transformative feature of Juja was a result of the establishment of the Jomo Kenyatta College of Science, Agriculture and Technology, later the current Jomo Kenyatta University of Agriculture and Technology (JKUAT), on land that was donated by the country's first President Mzee Jomo Kenyatta. Today, Juja can be described as a University Town as a result of the dominance of JKUAT on its economy and social life. Other major education institutions which have set up in the planning area include, amongst others, Kenyatta University Campus located in Ruiru Town, and Nairobi Institute of Business Studies (NIBS) along Thika Super Highway at Kimbo Junction.

Juja Town has transformed from a small market centre which was home to factory and farmworkers to a fast-growing town which has been envisioned in the Nairobi Metro 2030 to play a key economic function as a "service intermediary town."

2.2 Geographical Location and Size

2.2.1 JUJA IN NATIONAL CONTEXT

Juja is located in Kiambu County. Kiambu County borders Nairobi and Kajiado Counties to the south, Machakos to the east, Murang'a to the north and northeast, Nyandarua to the northwest, and Nakuru to the west as indicated on Map 2-1. The County lies between latitudes 00 25' and 10 20' south of the equator and longitude 360 31' and 370 15' East.

The mapped location of Juja Sub-County in relation to the national context is shown on Map 2-1 below.

2.2.2 JUJA IN REGIONAL CONTEXT

Juja Sub-County is within Kiambu County which is one of the five counties within the Nairobi Metropolitan Region (NMR). It plays an education hub role within the region, hosting one of the country's main public universities – Jomo Kenyatta University of Agriculture and Technology.

Juja is well connected to other major towns through the national trunk road A2 (Thika Superhighway) which passes through it. Thika Superhighway is also known as part of the Great North Road. The road is the gateway of Kenya to Ethiopia and Somalia after joining A3. In Kenya, it links the capital city of Nairobi with the counties of Muranga, Kirinyaga, Nyeri, Laikipia, Isiolo and Marsabit. Map 2-2 below shows the regional connectivity of Juja with other main towns within the NMR.

2.2.3 JUJA IN LOCAL CONTEXT

Juja Sub-County lies on latitudes -1.1833° and Longitude 37.1167° and is approximately 32,309.49 hectares (323,094,900 m²). It forms part of Thika Municipality in Kiambu County and borders Thika Sub-County to the north, Gatundu South on the west, Ruiru on the south and Machakos County to the east. The major urban centre is Juja Town which is about 10 km southeast of Thika Town, 12 km northwest of Ruiru, and about 30 km north of Nairobi.

The main access to the planning area is through the A2 (Nairobi – Thika Superhighway) and the Nairobi-Nanyuki railway line. Some of the major features include Komu river, Theta-Thiririka rivers, and Nairobi-Athi rivers which form the northern, southern and eastern boundaries, respectively. Map 2-4 below shows the planning area's location in the local context.

2.3 Administrative Units

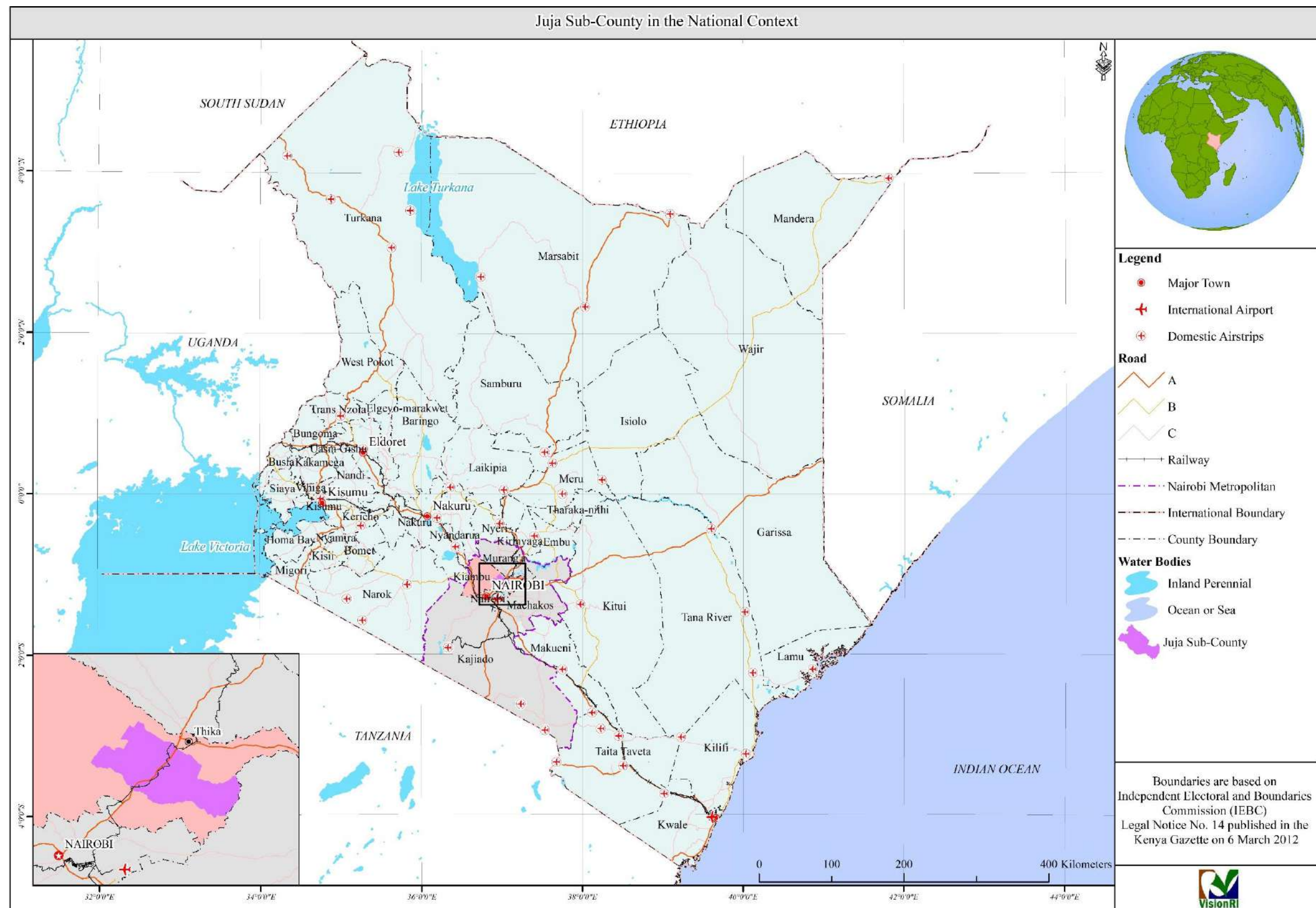
Juja covers approximately 32,309.49 hectares and has five wards and seven sub-locations whose respective land areas are presented in the table below.

Table 2-1: Sub-location and wards units

Ward	Sub-location	Area in Hectares		Share in %
		Ward	Sub-location	
Juja		4,411.00		13.54%
	Kiaora		2,393.00	
	Marimaini		2,018.00	
Kalimoni		12,175.00		37.36%
	Kalimoni		12,175.00	
Murera		6,668.00		20.46%
	Mugutha		6,668.00	

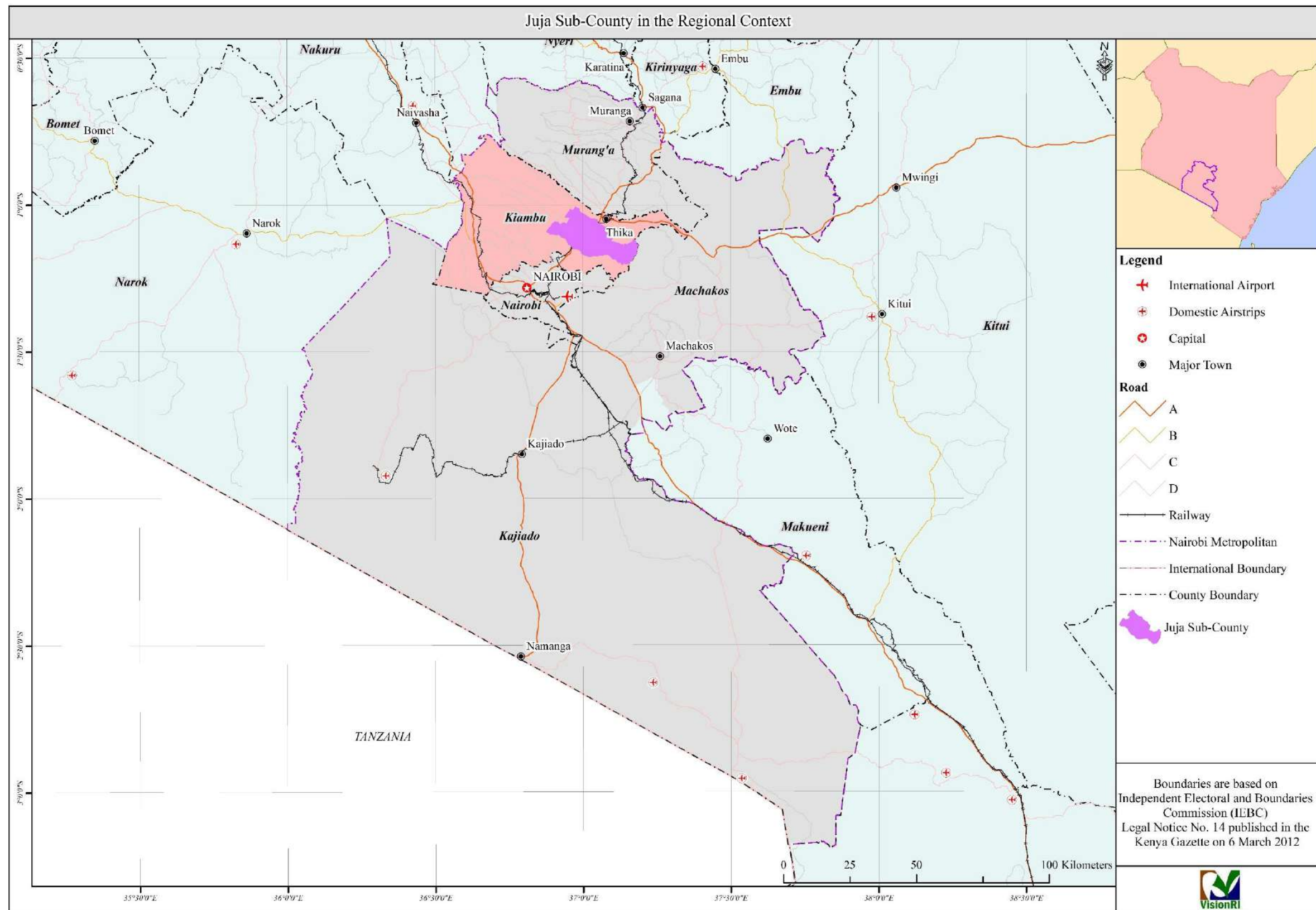
Theta		2,540.00		7.79%
	Theta		2,540.00	
Witeithie		6,792.00		20.46%
	Komu		2,979.00	
	Witeithie		3,813.00	
Total		32,309.49	32,309.49	100%

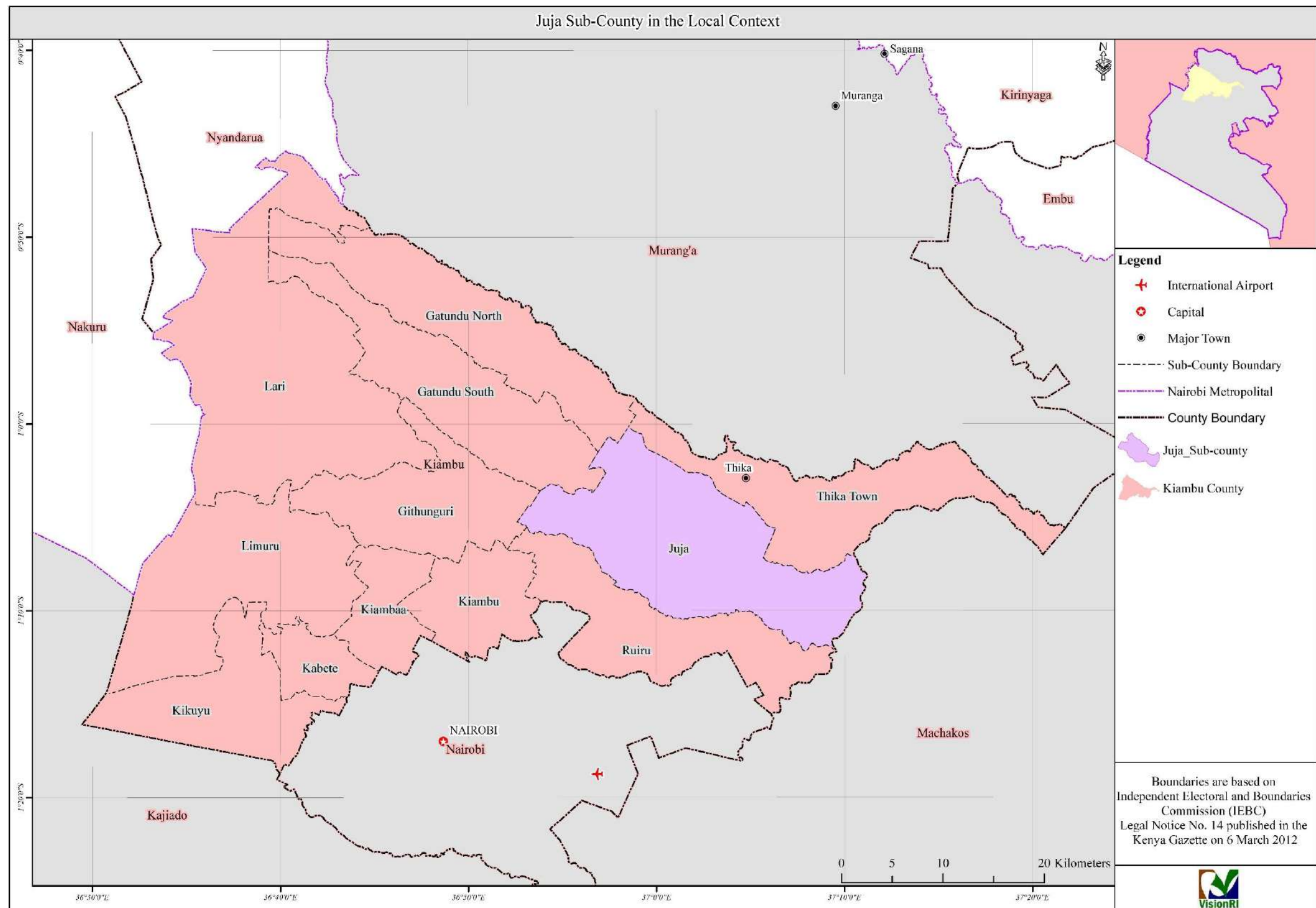
Source: VisionRI



Map 2-1: Location of Sub-County in the National Context

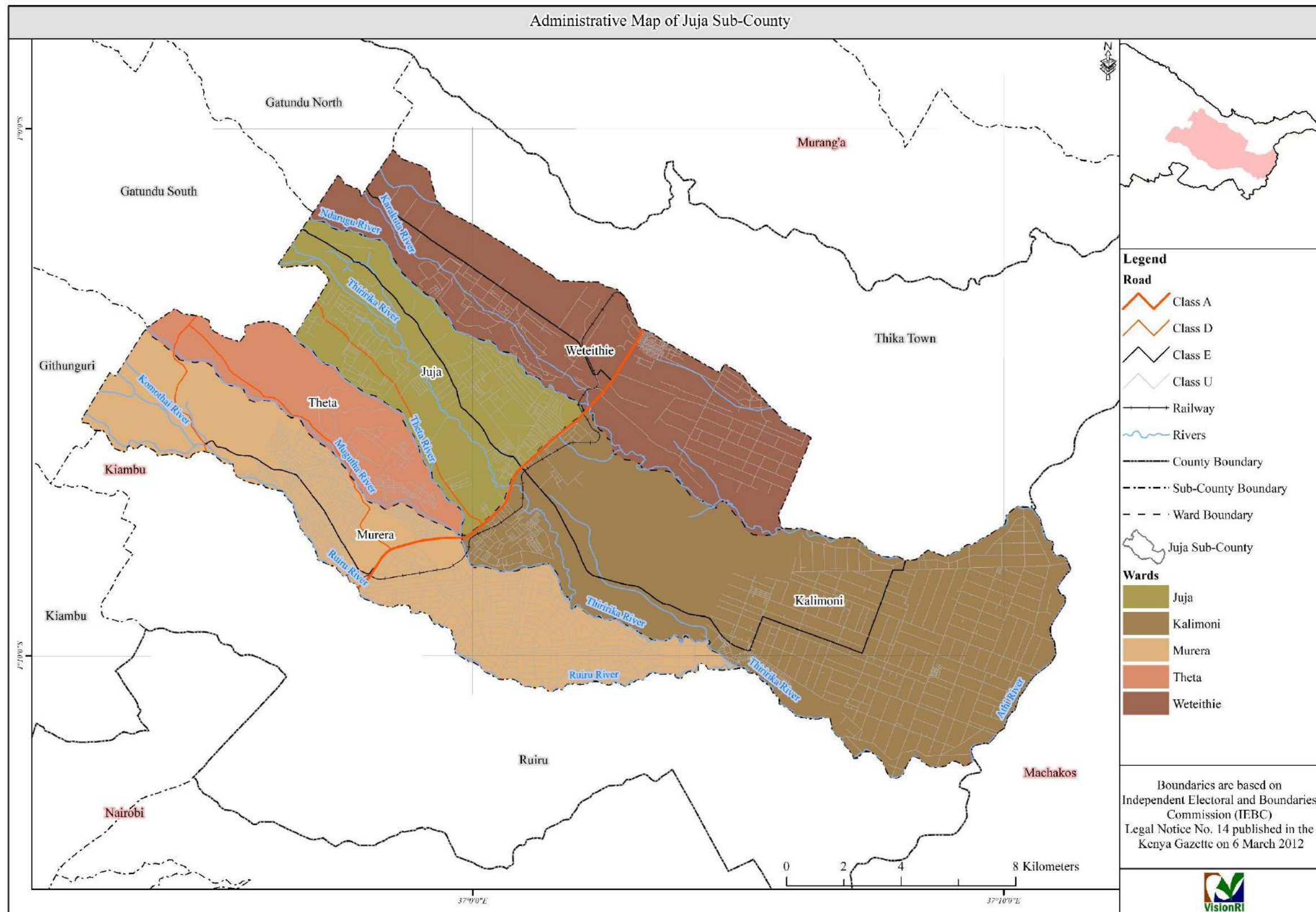
Source: VisionRI





Map 2-3: Location of the Sub-County in the County Context

Source: VisionRI



Map 2-4: Ward Boundaries within Sub-County

Source: VisionRI

2.4 Legislative Context

2.4.1 NATIONAL LAWS

- i. **The Constitution of Kenya, 2010:** The Constitution of Kenya, 2010 provides the overarching legislation that guided the preparation of this Plan. Through the objects of a devolved system of government, the Constitution places planning functions both at the national and county levels. Pursuant to the Fourth Schedule of the Constitution, the National Government is mandated to formulate the general principles of land use planning and co-ordinate planning by the counties. In turn, counties are in charge of preparing county and urban area physical and land use plans and carry out development control within their areas of jurisdiction.

Pursuant to Article 10 of the Kenya Constitution (2010), the preparation of this Plan was guided by the spirit of participation of the people, human dignity, equity, social justice, inclusiveness, equality, human rights, non-discrimination and protection of the marginalised with the overall goal of attainment of sustainable development.

With regards to achieving the objectives of Article 60 of the Constitution, this Plan has observed and achieved various principles such as (a) security of land rights; (b) sustainable and productive management of land resources; and (c) sound conservation and protection of ecologically sensitive areas such as forests, swamps and wetlands.

Subject to Article 66 of the Constitution of Kenya, this Plan has been prepared under the supervision of the County Government of Kiambu (established under Article 176) in a bid to support the overall state mandate of regulating the use of any land, or any interest in or right over any land, in the interest of defence, public safety, public order, public morality, public health, or land use planning.

Lastly, the overall implementation of this Plan will be overseen and monitored by the National Land Commission (NLC) established under Article 67. Other functions to be performed by NLC with regards to the implementation of this Plan include, amongst others: to manage public land on behalf of the County Government of Kiambu; to conduct research related to land and the use of natural resources and make recommendations to appropriate authorities; to initiate investigations, on its own initiative or a complaint, into present or historical land injustices; and recommend appropriate redress and well as to encourage the application of traditional dispute resolution mechanisms in land conflicts within the County.

- ii. **County Governments Act 2012:** This Act requires that County Governments prepare their respective county integrated plans for areas under their jurisdiction as a pre-requisite for fund

allocation from the national treasury to finance their activities. The Plan is supposed to integrate economic, physical, social, environmental and spatial aspects. The Act further states that a County Planning Unit shall prepare the plans and they will be binding to all sub-units within the County.

Section 103 of the Act also establishes the County Executive Committee whose role is to monitor the process of planning, formulate and adopt integrated development plans within the County. In accordance with the Act, the County Government has an obligation to prepare plans and no public funds for development shall be issued outside a planning framework. Such plans include County Spatial Plan, Integrated Strategic Urban Development Plans (Local Physical and Land Use Development Plans, see PLUPA 2019), and County Integrated Development Plan. These plans shall be approved by the respective County Assemblies in accordance with their respective procedures

In Part, 11 under County Planning, a County Planning Unit is charged with the responsibility of ensuring integrated planning and for implementation of the same within their respective areas of jurisdiction. The principles and objectives of planning are also laid out. Principles such as effective resource mobilisation for sustainable development guided the preparation of this Plan.

The roles of the County Planning Unit as outlined in the Act include:

- Coordinate integrated development planning;
- Ensure integrated planning within the County;
- Ensure meaningful engagement of citizens in the planning process;
- Ensure the collection, collation, storage and updating of data and information suitable for the planning process; and
- Ensure the establishment of a GIS-based database system.

- iii. **Urban Areas and Cities Act, No. 13 of 2011:** This Act provides for the management of cities, municipalities, towns and other urban areas. It also provides the criteria for the classification of urban areas. According to the Act, an area can be classified as a city if it has the following characteristics: (i) a population threshold of 250,000 residents; (ii) an integrated development plan; (iii) capacity to effectively and efficiently deliver essential services; (iv) the ability to generate its revenue; (v) an active platform for public participation; (vi) sufficient space for expansion; (vii) adequate physical infrastructure facilities; and (viii) a functional waste disposal mechanism.

The Act also outlines the requirements for an area to be classified as a municipality. The requirements include: (i) at least 250,000 residents; (ii) an integrated development plan in accordance with the Act; (iii) has demonstrable revenue collection or revenue collection

potential and capacity to generate sufficient revenue to sustain its operations; (iv) has the capacity to effectively and efficiently deliver essential services to its residents; (v) has institutionalised active participation by its residents in the management of its affairs; (vi) has sufficient space for expansion; (vii) has infrastructural facilities, including but not limited to street lighting, markets and fire stations; and (viii) has functional and effective waste disposal.

In accordance with this Act, every City, Municipality and town is expected to operate within the framework of an integrated development plan. This Plan is thus timely since it will be a ready platform for the County Government to use for the aforementioned purposes as it is within Thika Municipality. The management of the municipality will be carried out by the County Government through the Municipal Board as outlined in the Act. The First Schedule of the Act provides for the facilities a city, municipality and town are supposed to provide.

- iv. **Physical and Land Use Planning Act of 2019:** This Act regulates physical planning activities in Kenya. It empowers County governments to regulate development within their areas of jurisdiction. Further, it empowers the Director-General of Physical Planning to prepare various types of physical and land use development plans. In addition, the Director-General formulates National, Inter-Counties (Regional) and local physical development policies, guidelines and strategies.

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

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

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

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

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

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

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

- v. **Environment Management and Co-ordination Act (EMCA), 1999:** The Environmental Management and Co-ordination Act is the legislation that governs the management of the environment in the country. It upholds the importance of environmental protection.

Section 58 of the Act recommends that an Environmental Impact Assessment (EIA) be undertaken for every development that is likely to have an impact on the environment. The EIA should be submitted to the National Environment Management Authority (NEMA) for approval before the development is undertaken regardless of other licenses. The Second Schedule of the Act also requires that any activity that is out of character with its surroundings, or that leading to major changes in land use, as well as any structure of a scale not in keeping with its surroundings, undergo an EIA.

This Act established an independent body, the National Environmental Management Authority (NEMA), to ensure the effective enforcement and implementation of its provisions. The Act also provides for public involvement in any major development decisions, which have an environmental bearing. The public shall have recourse to law and shall be involved. The Act also has provisions for addressing environmental offences and establishes a tribunal to deal with such offences.

- vi. **National Land Commission Act, 2012:** Section 5 (2) of this Act gives the National Land Commission (NLC) the responsibility of managing and administering all unregistered trust land and unregistered community land on behalf of the County government. The NLC ensures that all unregistered land is registered within 10 years from the commencement of the Act. The

NLC has an active presence in every County and is thus an important stakeholder in all land related matters within the Sub-County as well as the entire County.

2.4.2 COUNTY LAWS

- i. **The Kiambu County Valuation and Rating Act, 2016:** This Act is meant to affect the implementation of Article 209 (3) (a) of the Constitution of Kenya, that involves valuation and rating of land and for connected purposes. The purpose of this Act is to provide a framework for valuing and rating land in order to: ensure efficiency, accountability, and transparency in the administration of valuation of land for rating; promote economic development; ensure equity and fairness in land valuation and rating system; and ensure compliance with payment of rates related to land. The Act has established the Directorate of Valuation and Rating whose functions include undertaking valuation; preparing the draft valuation and supplementary valuation rolls; administering the draft valuation rolls; preparing the schedule of rates; as well as advising the Executive Committee Member on the appropriate methods of rating amongst other functions.
- ii. **The Kiambu County Community and Neighbourhood Associations Engagement Act, 2016:** This Act gives statutory recognition to community and neighbourhood associations and effect to their initiatives in complementing County Government service delivery; to enable structured co-operation between the County Government, residents and businesses; to facilitate the activities of the associations and organisations; and to give further effect to Articles 10 and 174 of the Constitution as regards the principle of participation of the citizens and for connected purposes.

2.4.3 OTHER RELATED LEGISLATIONS

Other legislations that are relevant to this Plan are outlined below.

Table 2-2: Other Relevant Legislations

Laws	Purpose
The Land Laws Amendment Act, No. 28, 2016	To amend laws relating to land in order to align them with the Constitution; to give effect to Articles 68(c)(i) and 67(2)(e) of the Constitution; to provide for procedures on evictions from the land; and for connected purposes.
The Kenya Roads Act, 2017	To provide for the classification, management, construction and maintenance of public roads; to establish the Kenya National Highways Authority, Kenya National Urban Roads Authority and Kenya National Secondary Roads Authority; and to provide for their functions and powers; and for connected purposes.

The Government Lands Act, Cap 280	An Act of Parliament to make further and better provision for regulating the leasing and other disposals of Government lands, and for other purposes.
The Registration of Titles Act, Cap 281	An Act of Parliament to provide for the transfer of land by registration of titles.
The Land Titles Act, Cap 282	To make provision for the removal of doubts that have arisen in regard to titles to land and to establish a Land Registration Court.
The Registered Land Act, Cap 300	To make further and better provision for the registration of title to land, and for the regulation of dealings in land so registered, and for purposes connected therewith.
The Wayleaves Act, Cap 292	Relating to wayleaves, and the processes involved in their establishment and management.
The Dairy Industry Act, Cap 336	To provide for the improvement and control of the dairy industry and its products.
The Land Acquisition Act, Cap 295	To make provision for the compulsory acquisition of land for the public benefit.
The Land Act, 2012	To give effect to Article 68 of the Constitution, to revise, consolidate and rationalise land laws; to provide for the sustainable administration and management of land and land-based resources, and for connected purposes.
The Land Registration Act, 2012	To revise, consolidate and rationalise the registration of titles to land, to give effect to the principles and objects of devolved government in land registration; and for connected purposes.
The National Land Commission Act, 2012	To make further provision as to the functions and powers of the NLC, qualifications and procedures for appointments to the Commission; to give effect to the objects and principles of devolved government in land management and administration; and for connected purposes.
The Special Economic Zones Act, 2015	To provide for the establishment of special economic zones; the promotion and facilitation of global and local investors; the development and management of enabling environment for such investments; and for connected purposes.
Agriculture, Fisheries and Food Authority Act, (2013)	Provides the confines within which to make proposals on agriculture promotion and conservation of soils and fertility for sustainable agriculture and optimisation of land use.
Water Act (2002)	Provide guidelines on plan proposals touching on management, conservation, use and control of water resources, water supply, and sewerage services.
Land Act, 2012	Provides for sustainable administration and management of land and land-based resources nationally.

National Land Commission Act, 2012	Provides for County Land Management Boards which are critical in processing development applications and allocation of public land as well as NLC that will monitor and have oversight responsibilities over land use planning throughout the country.

Source: VisionRI

2.5 Policy Context

2.5.1 GLOBAL POLICIES

- i. **Sustainable Development Goals:** The World Agenda for Sustainable Development Goals (SDG) came into effect after the expiration of the Millennium Development Goals. The SDGs are the world's blueprint in its endeavours to achieve a better and more sustainable future for all. They address common global challenges such as poverty, inequality, climate change, affordable housing, environmental degradation, peace, and justice, amongst others. The SDGs were ratified by all members' states and government under the United Nations umbrella.

This ISUDP aims at achieving the SDGs such as eradication of poverty, promoting clean water and sanitation, enhancing the use of affordable and clean energy, promoting sustainable cities, promoting peace, and fostering industrial growth.

- ii. **New Urban Agenda 2017:** The New Urban Agenda 2017 is a common global vision to promote sustainable urbanisation. It is estimated that by the year 2050, the world urban population will have doubled making urbanisation a major issue in the 21st century. To tackle the challenges of urbanisation, the New Urban Agenda aims at promoting safe and sustainable cities for all.

The guiding principles of the New Urban Agenda to achieve sustainable urban development include:

- Urban equity and eradicating poverty;
- Sustainable and inclusive urban prosperity and opportunities for all; and
- To foster ecological and resilient cities and human settlement.

The ISUDP endeavours to meet the vision of the New Urban Agenda 2017 by ensuring sustainable urbanisation within Juja Sub-County.

- iii. **Africa Union Agenda 2063:** This Agenda, published in 2015, promotes unity amongst African states with the aspirations to achieve a prosperous Africa based on inclusive growth and sustainable development, an integrated and politically united continent, good governance, democracy and respect for human rights and the rule of law, a peaceful and secure Africa, a continent with strong cultural identity, people-driven development, and a strong united and influential global player. The Juja Sub-County ISUDP is aligned with these aspirations.

2.5.2 NATIONAL POLICIES

- i. **Kenya Vision 2030:** Kenya's Vision 2030 outlines the country's blueprint on its planning strategy, while the Medium-Term Plan acts as its accompanying implementation plan, for achieving economic, political, and social transformation. The vision aims to transform Kenya into a modern, globally competitive, middle-income country providing a high quality of life to all its citizens. With this, the economy is projected to grow at 10% per year. The Vision is anchored on three key pillars: economic, social, and political. The economic pillar aims to maintain sustained economic growth of 10% per annum over the next 25 years. The social pillar seeks to build a just and cohesive society enjoying equitable social developments in a clear and secure environment. The political pillar aims at realising an issues-based, people-centric, result-oriented, and accountable democratic political system.

Six economic sectors, i.e., tourism, agriculture, manufacturing, trade, information technology and financial services have been emphasised in the strategy. The social pillar concerns education, health, environment, water and sanitation, population, urbanisation and housing, and gender, vulnerable groups, and the youth. Finally, the political pillar addresses efforts to improve governance and the rule of law along with decentralisation plans. The pillars rest on crosscutting themes, which constitute the foundation of the envisaged economic transformation. The themes include investments in physical infrastructure and information and communications technology; land and public sector reforms; human resource development, labour and employment; and security, peacebuilding, and conflict resolution. The crosscutting themes are intended to nurture the economic transformation and assist in creating international competitiveness through more efficient productivity at the firm and household level, with government support.

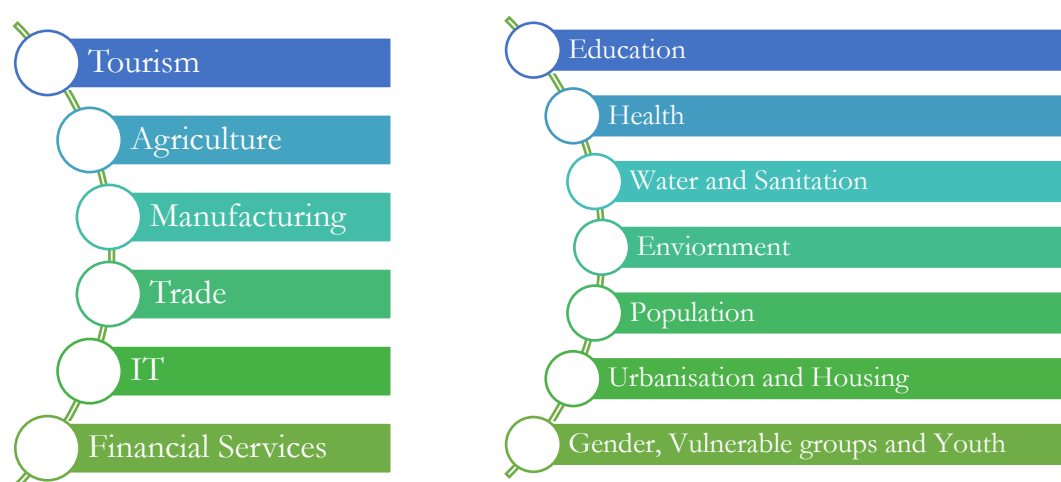


Figure 2-1: Economic and Social Aspects in Vision 2030

Source: The Big Four Agenda, 2018

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

This ISUDP aims at giving direction for the development of urban areas and rural centres as envisaged in the vision and making Kenya an industrialised, middle-income country by 2030.

- ii. **National Land Policy Sessional Paper No. 3 of 2009:** The land question has manifested itself in many ways including fragmentation, breakdown in land administration, disparities in land ownership, and poverty. This has resulted in environmental, social, economic and political problems including deterioration in land quality, squatting and landlessness, disinheritance of some groups and individuals, urban squalor, under-utilisation and abandonment of agricultural land, and tenure insecurity and conflict.

To address these land problems, the Government embarked on the formulation of a National Land Policy through a wide consultative process with the aim of producing a policy whose vision was to guide the country towards sustainable and equitable use of land. This Plan endeavoured to adhere to the principles outlined in the policy in the use and management of land within Juja Sub-County. The Plan has promoted and encouraged a multi-sectoral approach to land use, provision of social, economic and other incentives and put in place an enabling environment for investment, agriculture, livestock development and the exploitation of natural resources.

- iii. **National Land Use Policy Sessional Paper No. 1 of 2017:** This policy emphasises the importance of land as a resource for the economic life of a majority of people in Kenya. The way people handle and use land resource is decisive for their social and economic well-being as well as for the sustained quality of land resources. In tandem with this policy, this Plan seeks to strike a balance between satisfying human livelihood needs and sustainable use of resources for posterity. This has been taken into consideration in this Plan through (a) anchoring the Sub-County's land development initiatives that will respond positively to the market demands; (b) environmental management and sustainable production initiatives in the utilisation of land resources; (c) coordination and integration of institutional linkages in planning at sectoral and cross-sectoral levels to foster collaboration and decision making amongst different land users; and (d) optimum utilisation of land resources to meet governance, social-economic, political and cultural obligations of the people of the county and Kenya at large.

- iv. **National Environment Policy, 2013:** With regards to the provisions of National Environment Policy, 2013, the ISUDP recognises the importance of the link between development and

sustainable environment by (a) addressing environmental degradation issues and challenges facing the Sub-County. Notable drivers of environmental degradation are high rates of population growth, use of inappropriate technology, unsustainable consumption and production patterns, increased incidences of poverty and climate change; (b) providing a framework for an integrated approach to planning and sustainable management of Kenya's environment and natural resources; (c) ensuring sustainable management of the environment and natural resources, such as unique terrestrial and aquatic ecosystems, for both county and national economic growth and improved livelihoods; and (d) promoting and enhancing cooperation, collaboration, synergy, partnerships and participation in the protection, conservation, sustainable management of the environment and natural resources.

- v. **The Big Four Agenda:** The Big Four Agenda is the new blueprint that is guiding development in the country in the next five years (2018-2022). The Agenda aims at improving the well-being of Kenyans as it endeavours to become a middle income and industrialised country by the year 2030. The Big Four Agenda has given priority to four sectors which include affordable housing, food security, health care and manufacturing. This Plan is aligned with the National Government Agenda to act a basis for the implementation of the Big Four Agenda in the Sub-County.

2.5.3 OTHER RELEVANT POLICIES

Other relevant policies that this Plan has considered and integrated are summarised in Table 2-3 below.

Table 2-3: Other Relevant Policies

Policy	Relevance
Housing Policy Sessional Paper No. 3 of 2004	That comprehensive land-use planning is a major component of housing in facilitating the provision of adequate shelter and a healthy living environment at an affordable cost to all socio-economic groups in Kenya in order to foster sustainable human settlements.
National Information & Communications Technology (ICT) Policy, 2016	Seeks to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services.
National Climate Change Response Strategy, 2010	Seeks to strengthen and focus nationwide actions towards climate change adaptation and greenhouse gas (GHG) emission mitigation.
Integrated National Transport Policy Sessional Paper No. 2 of 2012	Aims to develop a world-class integrated transport system that is responsive to the needs of people and industry since the Government recognises the transport sector as one of the critical enablers in achieving Vision 2030.

Sessional Paper No. 2 of 2009 on Forest Policy	Requires County Governments to establish and maintain arboreta, mini-forests, or mini-recreational parks within their areas of jurisdiction and during the construction of housing estates by the public and private investors.
Energy Policy, 2012	Seeks to ensure adequate, quality, cost-effective, and affordable supply of energy to meet development needs while protecting and conserving the environment.
Public Health Policy, 1994	Focuses on the essential priority packages based on the burden of disease and the required support systems to deliver service amongst major players in the health sector include the government represented by the Ministry of Health and the county government, private sector and non-government organisations (NGOs).
National Urban Development Policy	Creates a framework for sustainable urban development in the country and addresses the following thematic areas: urban economy; urban finance; urban governance and management; national and county urban planning; land, environment and climate change; social infrastructure and services; physical infrastructure and services; urban housing; urban safety and disaster risk management; and marginalised and vulnerable groups.

Source: VisionRI

2.6 Planning Policy Linkages

2.6.1 THE NATIONAL SPATIAL PLAN

The National Spatial Plan (NSP) (2015-2045) is an integrated plan that strives to achieve balanced and sustainable national development. The NSP anchors its framework on Vision 2030 and this ISUDP provides comprehensive strategies and policy guidelines to deal with issues of rural and urban development. The ISUDP also focusses on issues of modernising agriculture, infrastructure, energy production, mining and industry, as well as sustainable human settlements.

The specific objectives of the NSP include:

- Creating a spatial planning context that enhances economic efficiency and strengthens Kenya's global competitiveness;
- Optimising utilisation of land and natural resources for sustainable development;
- Creating liveable and functional human settlements in both urban and rural areas;
- Securing the natural environment for a high quality of life; and
- Establishing an integrated national transportation network and infrastructure system.

Based on the characteristics of the Sub-County, the key strategies outlined in the NSP that have been integrated into this Plan are as presented in Table 2-4.

Table 2-4: Relevant National Spatial Plan Strategies

Objective	Strategies
Promoting regional balance include	• Promoting industrialisation and value addition; • Encouraging equitable exploitation and sound management of mineral resources; • Promoting investment in tourism including eco-tourism aspects; • Developing appropriate transport and infrastructural facilities and services; • Promoting rural industrialisation; • Promoting commercial and large-scale livestock production practices; and • Promoting urban containment to reduce the effects of urban sprawl into rich agricultural land.
Urbanisation strategies	• Strengthening urban-rural linkages through the provision of integrated physical infrastructure; • Creating an enabling environment for commercial and industrial developers; • Providing alternative areas for the development of urban centres by the provision of services and infrastructure; and • Promoting the development of centres as per their potentials and population.
Environmental conservation and protection	• Intense forest cover through afforestation and reforestation; • Controlling water abstraction; • Putting flood mitigation measures in place; and • Ensuring optimal utilisation of available natural resources.
Transport infrastructure	• Develop transport and infrastructure management plan; • Integration of the various modes of transport; and • Expand and upgrade roads.

2.7 Regional Policies

2.7.1 NAIROBI METRO 2030

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

Nairobi Metro 2030 envisions the Nairobi Metropolitan Region (NMR) to become a “world-class African metropolis” characterised by world-class working environment, living environment, business environment and governance. Its key result areas are the following:¹

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

2.7.2 SPATIAL PLANNING CONCEPT FOR NAIROBI METROPOLITAN REGION

The Spatial Planning Concept (SPC) for NMR provides the physical direction for the region’s development in support of Kenya Vision 2030 and Nairobi Metro 2030. It provides a holistic “conceptual framework” that defines the future spatial growth of the NMR and thus provides a guide in the preparation of local development plans. The concept promotes a land-use system intended to ensure the development of an “environmentally sustainable region” that will:²

- Build an internationally competitive and inclusive economy for prosperity;
- Deploy world-class infrastructure and utilities for the region;
- Optimise mobility and accessibility through effective transportation;
- Enhance the quality of life and inclusiveness in the region;
- Deliver a unique image and identity through effective place branding;
- Ensure a safe and secure NMR; and
- Employ world-class Metropolitan Governance Systems.

Key parameters that are provided in the NMR Spatial Plan that guided the development of this ISUDP is Juja’s is envisioned economic function of being a “Service Town” and its role in the proposed settlement hierarchy for NMR 2030 of being an “Intermediary Town.”

¹ Nairobi Metro 2030, Chapter 4, pp. 45-80

² Spatial Planning Concept for NMR, Page ix

Table 2-5: Economic Targets for Urban Centres

Spatial Units	Envisaged Function
Ruiru	Trading Town
Thika	Industrial Town
Limuru	Agro-based Industrial Town
Kiambu	Administrative -cum- Agro based Industrial Town
Juja	Service Town
Kikuyu	Agro-based Industrial Town
Karuri	Agro-based Industrial Town
Githunguri	Agro-based Industrial -cum- Administrative Town
Gatundu	Administrative Town
Machakos	Administrative -cum- IT Industrial Town
Mavoko	Industrial Town
Kangundo/Tala	Trading Town
Kathiani	Service Town
Ngong	Industrial Town
Kitengela	Service Town
Ongata Rongai	Service Town
Kiserian	Service Town
Namanga	Trading Town
Isinya	Service Town
Bissil	Service Town
Kajiado	Administrative -cum- Service Town
Loitoktok	Administrative Town
Sultan Hamud	Transit Town
Magadi	Industrial Town

Source: Spatial Planning Concept for NMR

Table 2-6: Proposed Settlement Hierarchy for NMR, 2030 Concept for NMR

Level	Settlement hierarchy	Settlements	Characteristics
I	Regional Complex	Nairobi- Ngong- Ongata Rongai- Ruiru Complex	• Highest administrative functions; • Specialised & world-class facilities; and • Tertiary activities.

II	Sub-Regional Centre	Thika, Kikuyu, Kiambu, Machakos, Tala/ Kangundo, Kajiado	• Administrative function/County headquarters; • Higher-level infrastructure; • Secondary & tertiary activities; and • Strong industrial base.
IIA	Priority Town	New Towns	• Planned to decongest Nairobi & developments in the surrounding regions; • Designed with specialised facilities based on world-class norms; and • To be planned as special packages and special focus for development.
III	Growth Centre	Limuru, Karuri, Juja, Mavoko, Kitengela, Loitoktok	• Intermediary towns; • Important role in promoting rural development and in achieving a balanced distribution of the urban population; and • Provide functional linkages between the smaller towns and Sub-Regional Centre.
IV	Market Centre	Gatundu, Githunguri, Kathiani, Kiserian, Namanga, Isinya, Bissil, Sultan Hamud Magadi	• Small towns having linkages with immediate rural hinterlands; and • Is the higher-order village having central location and potential for development within its catchment area with relatively better services and facilities in terms of education, health, communication, accessibility and has the capacity to serve a group of basic villages.
V	Central Village Centre	To be identified as part of sub-regional plans	• Would cater to the rural hinterland as an agro-service centre in the collection and distribution of agricultural goods and services with processing, marketing, warehousing and storage facilities.
VI	Basic Village	All villages	

Source: Spatial Planning Concept for NMR

2.8 County Policies

2.8.1 KIAMBU COUNTY SPATIAL PLAN

The Kiambu County Spatial Plan (CSP) 2016-2026 has its strategic focus on land use planning, multi-modal transportation planning, informal settlements, and zonal planning. Other elements that have been focused on include environmental protection, heritage conservation and physical and social infrastructure management planning. The (CSP) views Kiambu as a rapidly urbanising County with rapid outward growth from its core. The CSP is inextricably linked to the County Integrated Development Plan (CIDP) having a key focus on optimal utilisation of resources and ensuring infrastructural development in the region. The Sub-County will have its plans and programmes mainly pegged on Kiambu CSP and Kiambu CIDP. These act as the base for the articulation and formation of action area plans and zoning plans for the ISUDP. Below are the key programmes and strategies of the CSP.

Table 2-7: Relevant Strategies in Kiambu County Spatial Plan

Sectors	Strategies
Agriculture and Rural Development	• Promotion of agriculture, livestock, and fisheries development; • Ensuring proper access to infrastructure and utilities; and • Ensuring the promotion or marketing of agricultural, livestock and fisheries products.
Urbanisation	• Creation of employment opportunities in rural centres; • Promotion of development of strategic growth centres; • Densification of residential areas to avoid urban sprawl; • Provision of adequate sewer and solid waste disposal infrastructure in urban centres; and • Promotion of efficient linkages and connectivity within and between urban centres.
Industrialisation	• Provision of an enabling environment for industrial growth; • Promotion of innovative technologies; • Revival of collapsed industries and promote the establishment of <i>jua kali</i> and other light industries; and • Strengthen and promote community-based financial institutions.
Tourism and Environmental Conservation	• Conservation and sustainable use of the environment and natural resources; • Support for protection and sustainable management of water resources; • Conservation of natural heritage and indigenous cultural sites; • Diversification and improvement of tourist attraction sites/products; • Infrastructure planning and development; and • Promotion of tourism investment opportunities in the region.

Source: Kiambu CSP, 2016=2026

2.8.2 KIAMBU COUNTY INTEGRATED DEVELOPMENT PLAN

Kiambu CIDP 2013-2017 has five main pillars that are meant to steer development in the County. These pillars are security, employment, education, health and urban planning. The Juja ISUDP has integrated relevant strategies as provided in the CIDP with a key focus on projects that have already been planned for or are ongoing. Some of the programmes and projects in Kiambu CIDP relevant to this ISUDP are summarised in Table 2-8.

Table 2-8: Relevant CIDP Strategies

Sectors	Strategies
Agriculture and Rural Development	• Ensuring Small Scale Holder Horticulture and Promotion Unit Programme (SHEP-UP); • Promoting livestock production and curbing parasites and diseases; • Laying out proper physical infrastructure in agricultural zones linking them properly to the markets; • Improving livelihoods of the community adjoining forests while providing alternative income sources; and • Improving forest cover for biodiversity and water catchments.
Energy, Infrastructure, and IT	• Supporting ICT infrastructure development hence ensuring efficiency inaccessibility; • Creating incentives for service providers to deploy services in rural and underserved areas; and • Ensuring proper physical infrastructure layout to ensure proper connectivity between land uses enhancing mobility and accessibility.
Environment Conservation and Water	• Reclaiming the riparian reserve and maintaining them through planting vegetation cover; • Providing adequate portable water within the County; • Ensuring proper solid and liquid waste disposal mechanisms; and • Increasing the forest cover in the County mainly through afforestation and reforestation.
Community Facilities	• Ensuring proper distribution of educational facilities within the County; • Improving sanitation in schools at all levels; and • Improving health services in the hospitals by equipping the health centres, increasing the number of staff as well as the number of health centres.

Source: Kiambu County CIDP, 2013-2017

2.9 Institutional Framework

2.9.1 CORE PLANNING MANDATE

Institutional mandates for planning in Kenya are examined in relation to urban planning at various scales. Schedule Four of the Constitution of Kenya (2010) distributes planning functions across two-tiers of government: national and county governments with provisions for coordination across the two levels. Planning roles and responsibilities at both the national and county governments are governed by the Constitution of Kenya 2010 under Chapter 5: Land and Environment, particularly Article 66. The Fourth Schedule Part 1 (21) and (32) forms the foundation of national government planning mandates while Part 2(8) of the schedule forms the foundation of county governments planning mandates.

At the county level, planning mandates are governed by the County Governments Act, 2012 Part XI: County Planning (Section 102-115) and Urban Areas and Cities Act, 2011 Part V: Integrated Development Planning (Section 36-42). The Physical Planning Act Cap 286 of 1996 (under review) governs the planning framework under Schedules 1, 2, 3 and 5 (matters to be considered in spatial planning); Part V (framework control for development control) and Section 16, 17 and 24 (purpose and content of spatial plans).

Intergovernmental Relations Act No.2 of 2012 forms a basis in planning mandates under Part III: Transfer and delegation of powers, functions, and Competencies (Section 24-29) and Part IV: Dispute Resolution Mechanisms (Section 30-36). Moreover, statutory instruments (Physical and Land Use Planning Act (PLUPA) 1, 2, 5, 6 & 7) serves as a tool for development control. The following shows table for allocation of planning mandates from the aforementioned powers.

Table 2-9: Roles and responsibilities of the levels of Government

Level of Government	Roles and Responsibilities
National Government	• Formulating general principles, policies, standards, and guidelines of land planning; • Preparation and approval of the National Physical Development Plan, national policies, i.e., land use; • Planning at international boundaries within Kenya borders amongst Tanzania, Uganda, Somalia, South Sudan and Ethiopia; • Coordination of Regional Spatial Plans/Inter-County Spatial Plans; • Capacity building and technical support to counties; and • Planning research at the national level.
County Government	• Preparation, approval and implementation of County Spatial Development Plans, Local Physical Development Plans, County Integrated Development Plans, Integrated Strategic Urban Development Plans, Sectoral Plans, development control and enforcement;

	• Formulating county-specific policies; • Implementing national policies, standards and guidelines; and • Planning Research at the county level.
County Assembly	• Approval of plans

Source: VisionRI

The National-County Government Operational Linkages in planning are further presented in Figure 2-2.

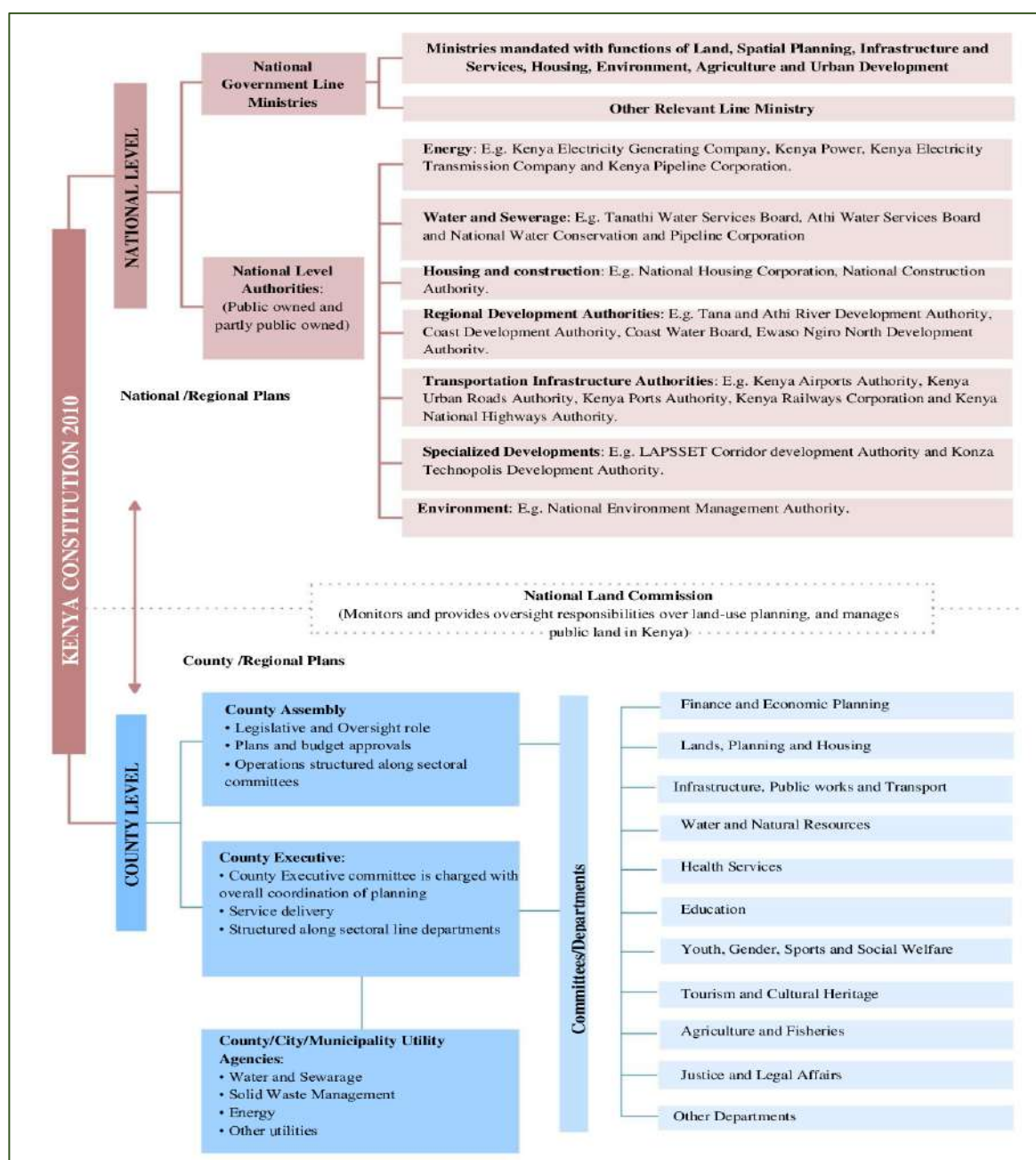


Figure 2-2: Institutional linkages between National and County Government stakeholders

Source: Urban Planning for City Leaders Handbook

2.9.2 CROSS-CUTTING STAKEHOLDERS

Key stakeholders usually include government agencies; civil societies that include civil society organisations themselves, residents' associations, community-based organisations, non-governmental organisations, and the community at large; the private sector; developers and property owners (donor agencies or development partners); and local businesses, inter alia. Stakeholders should be spatially mapped to ensure that there is even representation across Juja Sub-County. Public participation whether in form of public consultation and decision-making is to entail leaders and stakeholders. Likewise, the public shall be engaged in budget and policy formulation, planning and social service delivery priority setting. These are vested from the powers provided by the Constitution of Kenya, 2010 (Articles 174, 201 and 232); County Governments Act, 2012 (Section 47, 91, 99-100); Public Finance Management Act, 2012 (Section 125, 128, 131 and 137) and Urban Areas and Cities Act, 2011 (Section 21 and 22).

Table 2-10: Key Sectoral Government Agencies

Institutions/organisations	Roles and responsibilities
National Treasury	Responsible for managing Kenya's national government finances.
Ministry of Lands and Physical Planning	Charged with the following functions: National Lands Policy and Management; physical planning; land transactions; survey and mapping; land adjudication; settlement matters; rural settlement planning, i.e., eco-village; land reclamation; land registration; national spatial infrastructure; land and property valuation services administration; administration of public land as designated by the constitution; and land information systems.
Ministry of Transport, Infrastructure, Housing & Urban Development	The Ministry consists of the following five State Departments: State Department for Transport; State Department for Infrastructure; State Department for Housing and Urban Development; State Department for Maritime and Shipping Affairs; and State Department for Public Works. These departments have various roles and responsibilities. For example, the State Department for Housing and Urban Development is responsible for amongst others housing policy management; development and management of affordable housing; management of building and construction standards and codes; shelter and slum upgrading; and urban planning and development.
Ministry of Environment & Natural Resources	The main functions of the Ministry include environment and natural resources policy formulation and review; sustainable management of mineral resources and environmental conservation; continual development of a geodatabase for integrated natural resources and environmental management systems; promoting environmental

	management activities; and enforcing compliance with regulations and guidelines, amongst others.
National Land Commission (NLC)	Established under Article 67 of the Constitution of Kenya, 2010. Responsible for, amongst others, managing public land on behalf of the National and County Governments; recommending a national land policy to the national government; advising the national government on a comprehensive programme for the registration of title in the land throughout Kenya; and monitoring and oversight responsibilities over land use planning throughout the country.
National Environment Management Authority (NEMA)	Established by the Environment Management and Coordination Act, No. 8 of 1999. Key agency in charge of the coordination of environmental management activities; ensure compliance with environmental guidelines; and advise the government on legislative measures concerning environment management.
Kenya National Highways Authority (KeNHA)	State corporation, established under the Kenya Roads Act 2007 under section 3, 4 and 5 with the responsibility for the management, development, rehabilitation and maintenance of international trunk roads linking centres of international importance and crossing international boundaries or terminating at international ports.
Kenya Urban Roads Authority (KURA)	State Corporation established by the Kenya Roads Act 2007 under Section 9, 10, 11 and 12 with the core mandate of management, development, rehabilitation and maintenance of national urban trunk roads.
Kenya Forest Service (KFS)	Established under the Forest Act of 2005. Mandated to conserve, develop and sustainably manage forest resources for Kenya's social-economic development.
Water Resources Authority (WRA)	Established under the Water Act, 2002. State Corporation under the Ministry of Water and Irrigation mandated in nation-wide water resources management.
Council of Governors of Kenya (CoG)	Established under Section 19 of the Intergovernmental Relations Act (2012) with the mandate to provide a mechanism for consultation amongst County Governments, share information on the performance of the counties in the execution of their functions, facilitate capacity building for governors and consider reports from other intergovernmental forums on national and county interests, amongst other functions.

County Government Entities	• Constitutes of County Assembly and County Executive Committee with responsibilities outlined under Constitution 2010 Part 2 (Fourth Schedule, Article 185 (2), 186 (1) and 187 (2); • The responsibilities of the County Assembly include exercising the powers of enacting laws at the county level; acting as an oversight on the County Executive; and approval of plans and policies for smooth operation and management of resources and county institutions; and • The County Executive is charged with the responsibility of exercising executive power at the county level, implementing laws for the administration of the county as well as carrying out other executive functions of the county.
Kenya Investment Authority (Ken Invest or KIA)	A statutory body established in 2004 through an Act of Parliament (Investment Promotion Act No. 6 of 2004). Mandated in promoting investments in Kenya. Responsible for facilitating the implementation of new investment projects, providing after-care services for new and existing investments, as well as organising investment promotion activities both locally and internationally.
Micro and Small Enterprise Authority (MSEA)	A state corporation established under the Micro and Small Enterprise Act No. 55 of 2012. The Act was developed through a stakeholder's consultation process. Tasked in financing, training, infrastructure development and policy development.
Kenya Industrial Estate Ltd (KIE)	Established as a limited liability company (Companies Act, Cap 486) of the laws of Kenya to address indigenisation of businesses, capital formation, regional dispersion of wealth, exploitation of local resources, undertake special government projects and offer business advisory services.

Source: VisionRI

2.10 Cluster Potential

While pointing out to the lack of an integrated approach to development in the NMR, the SPC for NMR suggests that the region should consider using the cluster development strategy as an economic tool for enhancing competitiveness. Considering this, the likelihood of and potential for adoption of cluster development strategy was assessed. This assessment found that the defined four clusters in Consultant's terms of reference have got some economic logic, as summarised in Table 2.11.

The key industry verticals within each of the four clusters fit in with the economic priorities of the NMR and fulfil specific economic roles essential to the growth and development of the entire region. The identified key economic planks in each town and urban corridor within the four clusters may be linked to one or more

of the NMR Missions under Vision 2030 as described previously. The clusters, therefore, collectively complete the NMR economy and would serve as key economic drivers of the capital city and the metropolitan region.

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

Table 2-11: Assessment for adopting Cluster-based Planning Strategy

Cluster no.	Town/corridor	Existing economic activities	Identified economic planks	Economic clustering potential
One	Juja	Agriculture, quarrying, small-scale businesses, manufacturing industry	Education, real estate	• Education; • Real estate; and • Transport hub.
	Ruiru	Small and medium-scale businesses, agriculture, industry including jua kali.	Education, real estate.	
	Nairobi-Thika	Education, transport, real estate.	Education, real estate, agri-business, transport/freight services.	
Two	Kiambaa	Agriculture, small and medium-scale businesses-jua kali, transport services, real estate.	Agriculture, eco-tourism, real estate.	• Farming; • Agro-industry; and • Manufacturing.
	Kikuyu	Agriculture, fish farming, small and medium-scale businesses, transport services, real estate, industry.	Farming, agro-industry.	
	Limuru	Agriculture, manufacturing, small and medium-scale businesses, transport services.	Farming, agro-industry, manufacturing.	
Three	Kitengela	Services, real estate, agriculture, transport services, tourism.	Real estate, industrial, tourism.	• Real estate; • Tourism; and • Services.

	Ngong-	Services, agriculture, transport, hospitality, small-scale industry.	Real estate, tourism	
	Ongata Rongai and Kiserian	Services, agriculture, transport, industry.	Real estate, services.	
Four	Mavoko	Services, manufacturing, transport.	Industry, logistics and transportation.	• Administrative hub; • Industry; • Logistics and transportation; and • IT education and services.
	Nairobi-Malili	IT services, commercial, transport services.	Real estate, logistics and transportation, IT education and services.	

Source: VisionRI 2020

2.11 Key Planning Issues

Table 2-12: Key issues regarding the Planning Context

	Key Highlights	Opportunities
Location	The area is strategically located within the NMR and County.	It enjoys international, national, and local connectivity hence a strategic location for investment.
	Connectivity.	Roads like Limuru road, Northern and North Western Bypasses, Kiambu road – ease of movement.
Legal and Policy	Enabling legal and policy framework.	Favourable laws and policies supporting institutional growth, good governance and citizen participation.
Urban Management	Teething institutional capacity; Low human and technical capacity; Unclear mandates between the county and municipalities; and Weak and unclear financial mechanisms.	Local Municipal Formations to offer urban services; Metropolitan Coordination – inter-municipality policy strategies and operational linkages: Land-use planning; Housing; Water supply & sewerage services; and Transportation. Delegated mandate under Urban Areas and Cities Act (UACA).

Source: VisionRI

PART II

SITUATIONAL ANALYSIS

3 PHYSIOGRAPHIC CHARACTERISTICS

3.1 Overview

The chapter provides a base map, physiographic characteristics in terms of topography and landform, geology and soils and hydrology, vegetation and climatic conditions in the planning area.

3.2 Base Map

The Juja base map captures topographic features, transportation networks, water bodies, facilities, and major landmarks. The preparation entailed the use of Registry Index Maps (RIMs) showing the land subdivisions, administrative maps, existing and proposed road networks, rivers, and forests. High-resolution satellite imagery and GPS devices, and ground-truthing were used to fill in the gaps. This Map as shown on Map 3-1 below also shows the administrative boundaries. This has used to inform the preparation of land use proposals, amongst other planning considerations.

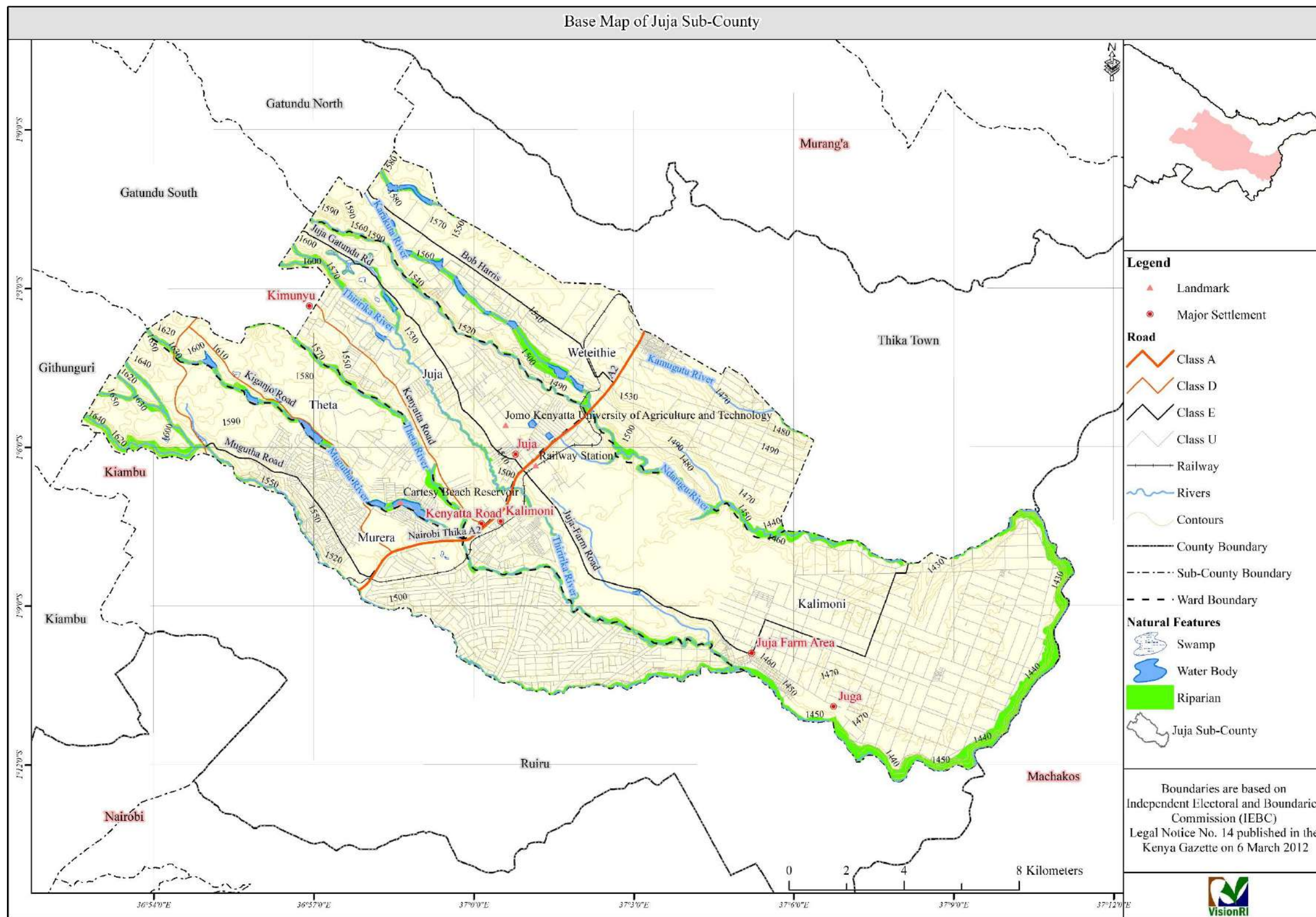
3.3 Topography

Generally, the planning area slopes gently from an altitude of 1,560m at the western boundary down to 1,440m a.s.l towards the eastern edge. To the West of the Nairobi-Thika Superhighway (A2), there are undulating coffee plantations with many large, scattered trees. A major part of the undeveloped area to the east of the Nairobi-Thika Superhighway (A2) is uncultivated plains with scattered trees and shrubs. The slope is generally gentle at below 10% grade (less than 5%) as shown on the map below. This makes the area quite suitable for urban development. Maps 3-2 and 3-3 below shows the elevation and contours in the Sub-County.

3.4 Geology & Soils

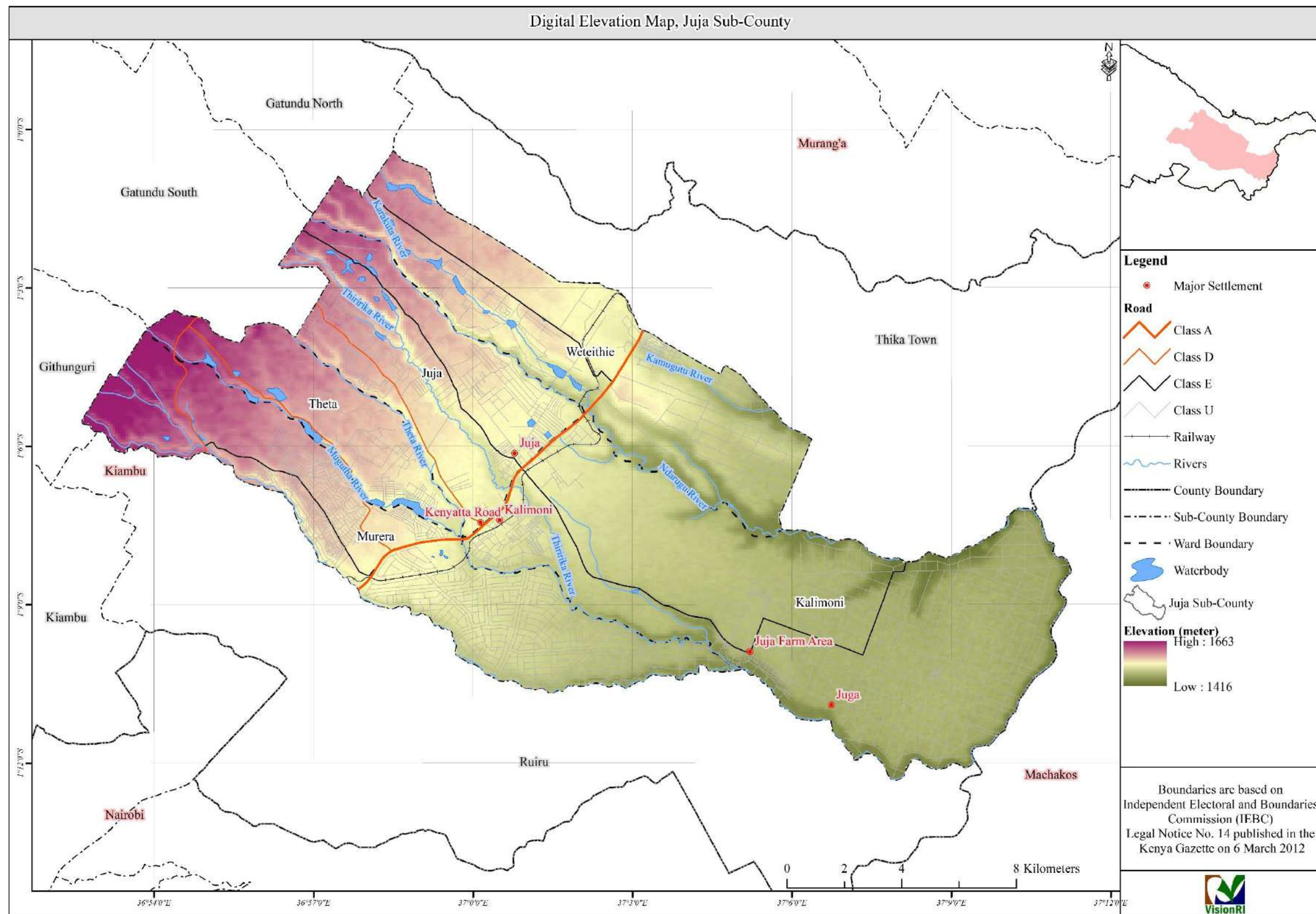
Geology: The geology of Juja is comprehensively described in Saggerson (1991). The surface rocks exclusively comprise Pleistocene and Tertiary volcanic material. The intense tectonic activity associated with the formation of the Great Rift Valley, led to a series of widespread eruptions and lava flows, which occurred from Mid-Miocene to Upper Pleistocene times. The thick volcanic sheet is underlain at great depths (probably more than 700 m) by metamorphic rocks of the Basement complex (gneisses and schists) of the Mozambican system. The eastern side of Juja is formed by Archean rocks which form the basement system, whilst to the west is mainly composed of lavas, pyroclastic rocks and sediments from fluvial and aeolian processes of the tertiary age which are exposed. In general, the rock formation in Juja can be divided into three main age groups:

- i. Archean age: Basement System.
- ii. Tertiary age: Volcanic and Sediments.
- iii. Recent age: Soil and Alluvial Deposits.



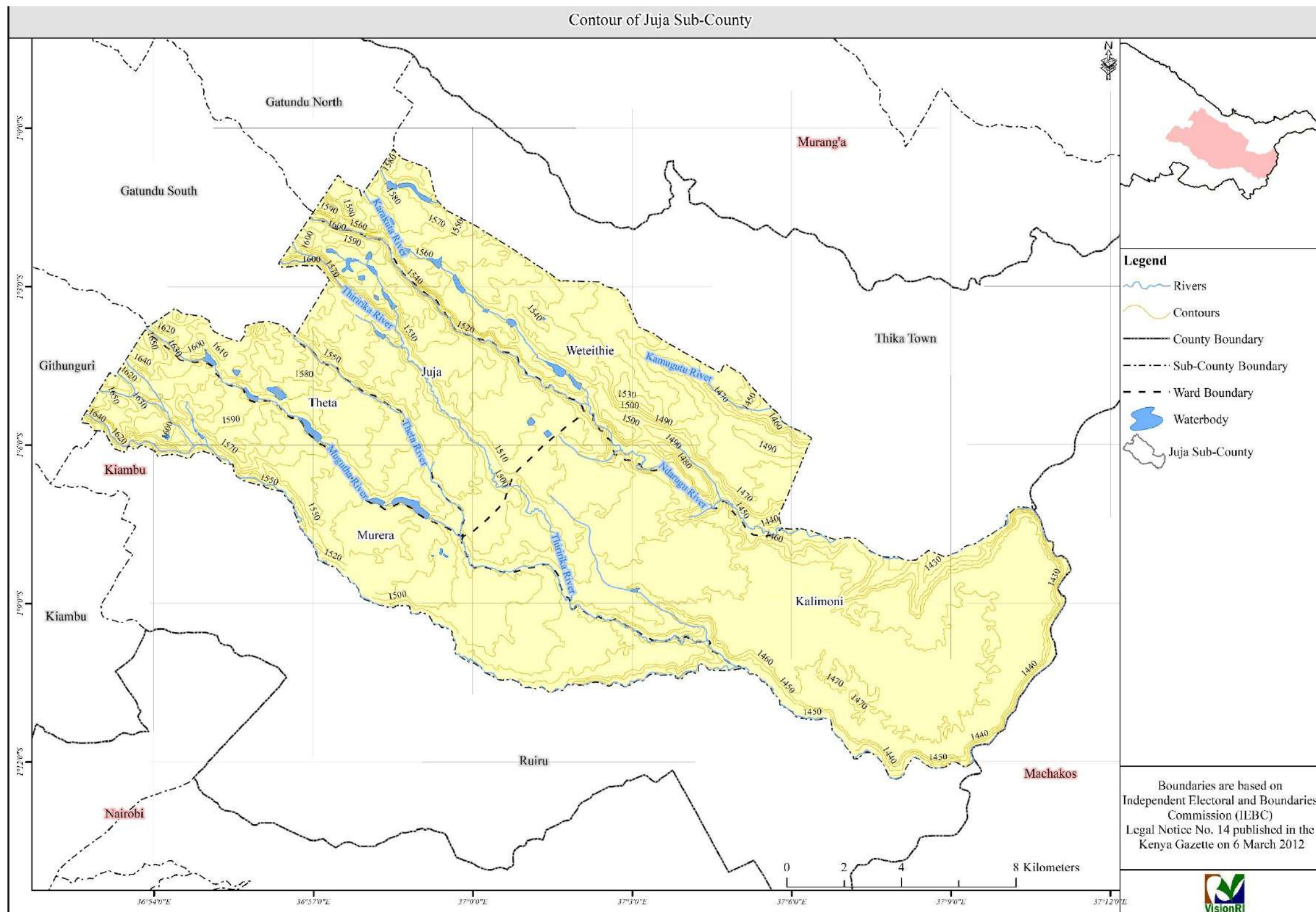
Map 3-1: Juja Base Map

Source: VisionRI



Map 3-2: Elevation Map

Source: ASTER Data



Map 3-3: Contour Map

Source: Derived from ASTER Data

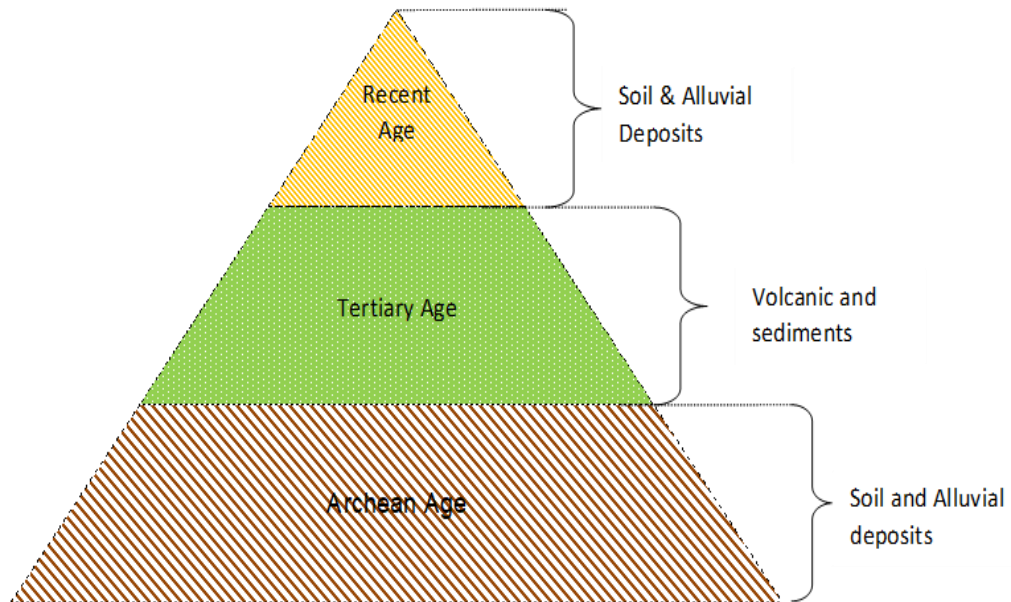


Figure 3-1: Rock Age Pyramid for Juja Sub-County

The Archean Basement System is believed to represent an original sedimentary series of limestones, shales, and sandstones, into which basic magma has been intruded. Intense compression with rising temperatures has resulted in these rocks being transformed into a highly folded metamorphic series. The tertiary age volcanic and sediments occur in the western half of the area, forming the plains south of the Sub-County. The volcanic and sediments are probably all of the tertiary age but, as no fossils are available and no age determination have been made, it is not known whether they range into Pliocene. The term “building stone” is used to describe the series of massively bedded, fine-grained tuffs or clay stones occurring in the area.

- **Soils:** Recent deposits in the area include soils and alluvial sand deposits. The soils are normally residual weathering deposits, whose composition is controlled more by the physical conditions of formation than by the type of rock from which they were derived. In general, the well-drained soils are sandy, and the badly drained soils are black cotton soils. On the basement system, red lateritic soils are the most common, but in places, they give way to sandier soils and even black cotton soils. The variation of soils on the volcanic rocks is not so great, the principal soils being black and grey clays.

Another important feature of the soils on the plains south of Thika is the development of mound topography. The mounds are usually about 20 to 50 m in diameter, and on top of the mounds, the underlying rock, which is usually composed of cemented brecciate material, is exposed or covered by only a few centimetres of soil. In between the mounds, the soil cover is much deeper.

- **Soil Conditions:** The depth to rock or non-penetrative hard soil level varies considerably throughout the area. The total variation in depth is 0-3.9 m with an average of 1.2 m. The soil layers are deeper to the west of the Nairobi-Thika Superhighway, with a variation of 0.35-3.9 m and an average of 1.75 m, and on the plain south-east, the total variation is 0-3.8 m with an average of 0.95 m.

Table 3-1: Soil Variations in the Planning Ecosystem

Location	Total variation range	Average variation
Juja area	0-3.9m	1.2m.
West of Nairobi-Thika road	0.35-3.9m	1.75m
South-east	0-3.8m	0.95m

In most of the area, there is a topsoil layer of 0.1m containing some humus. Underneath the topsoil, there is reddish-brown clay or grey-black clay. In the deeper layers, the soil is mixed with murram or weathered rock material. Map 3.4 below shows the distribution of the soils in Juja.

3.5 Hydrology & Water Sources

- **Groundwater:** Within the volcanic areas, where the volcanic rocks rest on an old, bevelled land surface, an aquifer is provided by the weathered gneiss of that surface. Numerous boreholes have been sunk in within the area, particularly through the volcanic rocks. In general, it may be said that boreholes sited on volcanic areas are more successful than those sited in Basement System rocks.
- **Rivers:** Main sources of surface water in Juja Sub-County include Ndarugo River, Thiririka River, Athi River Theta River, Komu River, etc. which emanates from Aberdare ranges.
- **Dams:** Most of the dams within Juja County are on the north-west of the Sub-County. These dams were mainly used in the coffee and tea estates and are fed by water from the various permanent rivers mentioned above.

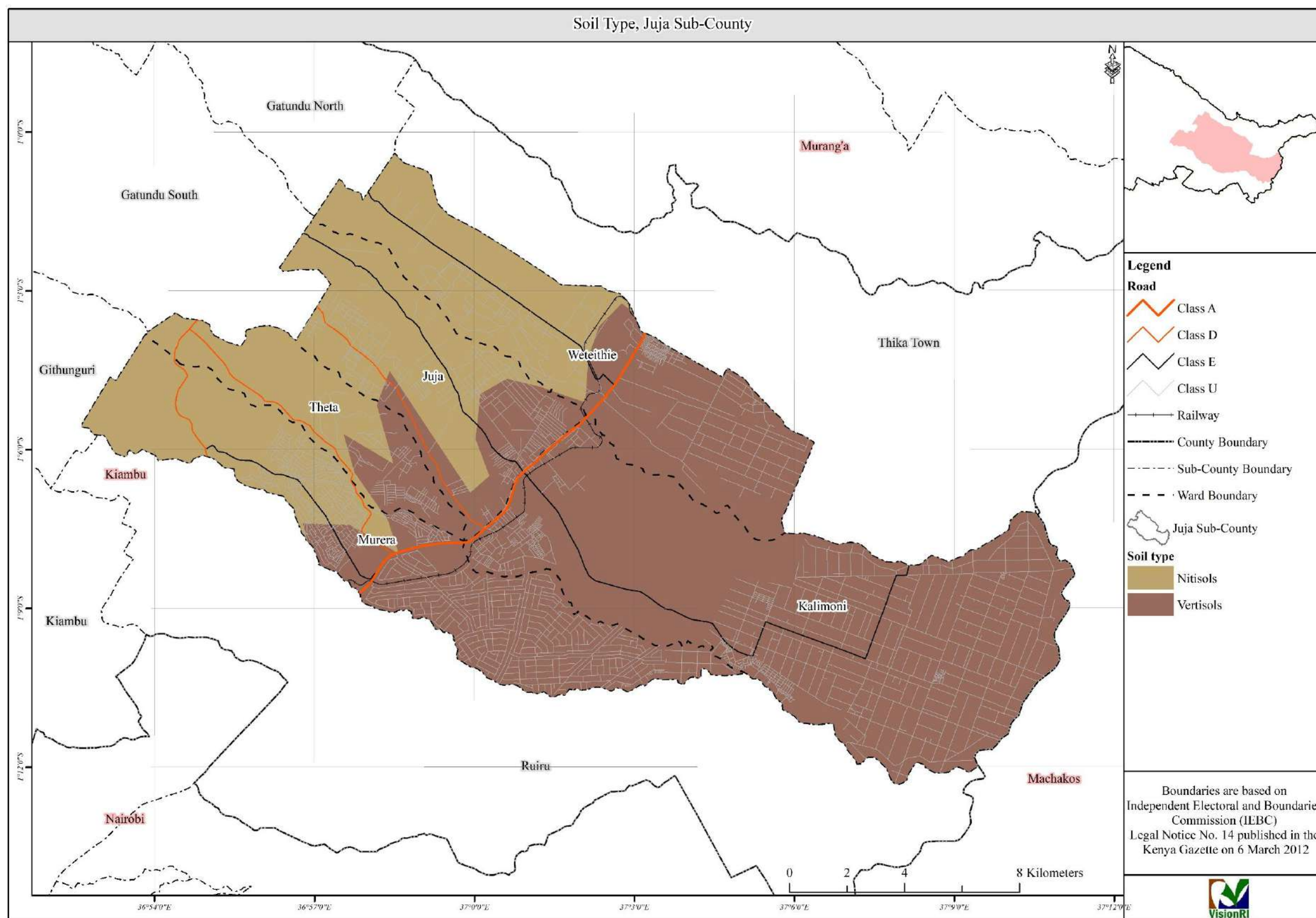
3.6 Flora

Juja Sub-County is characterised by a variety of vegetation cover. Tree species reported to be dominant are as follows: *Acacia* species, *Azadirachta indica*, *Calliandra calothyrsus*, *Senna siamea*, *Casuarina equisetifolia*, *Cordia Africana*, *Croton megalocarpus*, *Cupressus lusitanica*, *Eucalyptus* species, *Ficus* species, *Grevillea robusta*, *Mangifera indica*, *Moringa oleifera*, *Senna siamea*, *Sesbania sesban*, *Terminalia brownie*, *Schefflera actinophylla*, and *Spathodea camulanata*, amongst others. However, due to the increased human activities, the vegetation cover is decreasing rapidly.

3.7 Fauna

Juja Sub-County is situated within a predominantly agricultural area, whereby human activities have altered the natural habitat for wildlife over the years. Consequently, there are no major animals in the environs except maybe gazelles, dik-dik, birds, insects, small rodents, as well as some species of birds which include sparrows, doves, eagles, and guinea fowls, amongst others. They have been pushed away from their natural habitat.

The displacement of wildlife especially in the eastern side of the Sub-County due to human settlement and anthropogenic activities have been reported by most residents interviewed. For example, one of the key informants had the following to say: *“Before the year 2000 when I first settled in this area of Juja, we used to find wildlife such as antelopes, warthog, hyenas, hares, gazelles, impala, wild pigs, zebra, bushbuck, olive baboon, Columbus monkeys, velvet monkey, bush pig, reedbuck, bush-baby, porcupine, mongoose, python and monitor lizard, dik-dik, and several bird species. Nowadays, we do not find these animals in this place mainly due to human settlement, quarries and agricultural activities (Director, KIOF).”*



Map 3-4: Soil Map within Juja Sub-County

Source: Kenya Farming Handbook

3.8 Climatic conditions

Generally, the climatic conditions of the Sub-County are controlled by the large-scale pressure systems of the Indian Ocean and adjoining continents. Day-to-day weather is related to the very considerable variation in the detail of these pressure systems. In addition, differences in topography lead to a diversity of climates due to the tendency for greater cloudiness and precipitation at higher altitudes and on windward slopes, and lower temperatures with increasing altitude. In the Sub-County, the year can be sub-divided on the basis of predominant wind direction and general weather characteristics into four well-marked seasons, namely:

- **North-East Monsoon:** This season runs from December to March and is warm, clear and sunny with persistent north-easterly winds and occasional showers.
- **Rainy Season “Long Rains”:** The “Long Rains” usually run from late March to May bringing warm rainy weather with light winds varying from north-easterly to south-easterly by the end of the period.
- **South-East Monsoon:** From June to September, weather is usually cool and overcast with persistent south-easterly winds, little rain drizzle which becomes heavier towards the end of the season.
- **Rainy Season “Short Rains”:** The “Short Rains” usually occupy the month of November when the weather is warm, sunny and showery, with a light wind changing from south-easterly to north-easterly during the month.

There are two meteorological stations at Thika that monitor climatic conditions. These include the Thika Horticultural Research Station (0° 50'S and 37° 04'E; altitude, 1549m) and Thika Agromet Research Station (1° 01'S and 37° 06'E; altitude, 1477m).

3.8.1 RAINFALL

Precipitation in the planning area is mainly bimodal. The mean annual rainfall measured was 987.43mm. The mean monthly rainfall in the wettest month (April) was 262.5mm. There is usually no rainfall during the months of July, August, and September.

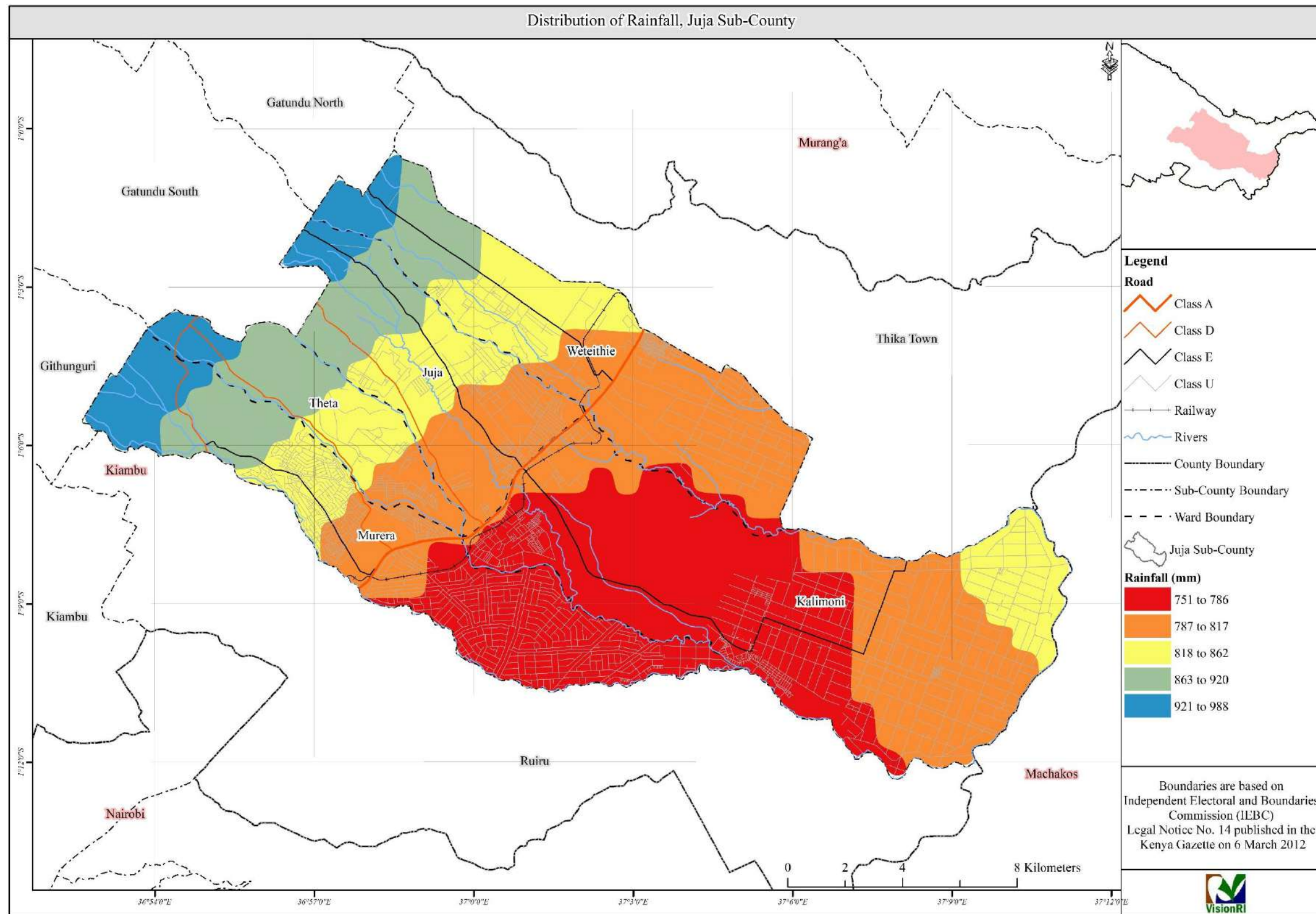
Table 3-2: Rainfall Data

Rainfall Data	Annual Rainfall	Mean Monthly Rainfall
Juja – 2014 data	987.42 mm	262.5 mm

Source: Kenya Meteorological Department

3.8.2 AVERAGE WIND SPEEDS

Wind speeds in Juja vary annually. The maximum wind speeds recorded within the period May 2017 to May 2018 was +12.5 mph whereas the minimum was +2.5 mph. A study conducted by Wandia et al., (2016) at around JKUAT showed that wind speed characteristics at 10 m and 30 m were found to be 2.54 m/s and 3.04 m/s, respectively. The wind shear exponents and roughness parameters were analysed and found to be 0.1652 and 0.0374, respectively. The study concluded that Juja has the capability of wind power generation by use of small horizontal axis wind turbines such as Modern Vestas turbines with a cut-in speed of 2.5 m/s. The generated power can be used for activities such as battery charging and water pumping.



Map 3-5: Average annual rainfall
Source: Kenya Meteorological Department

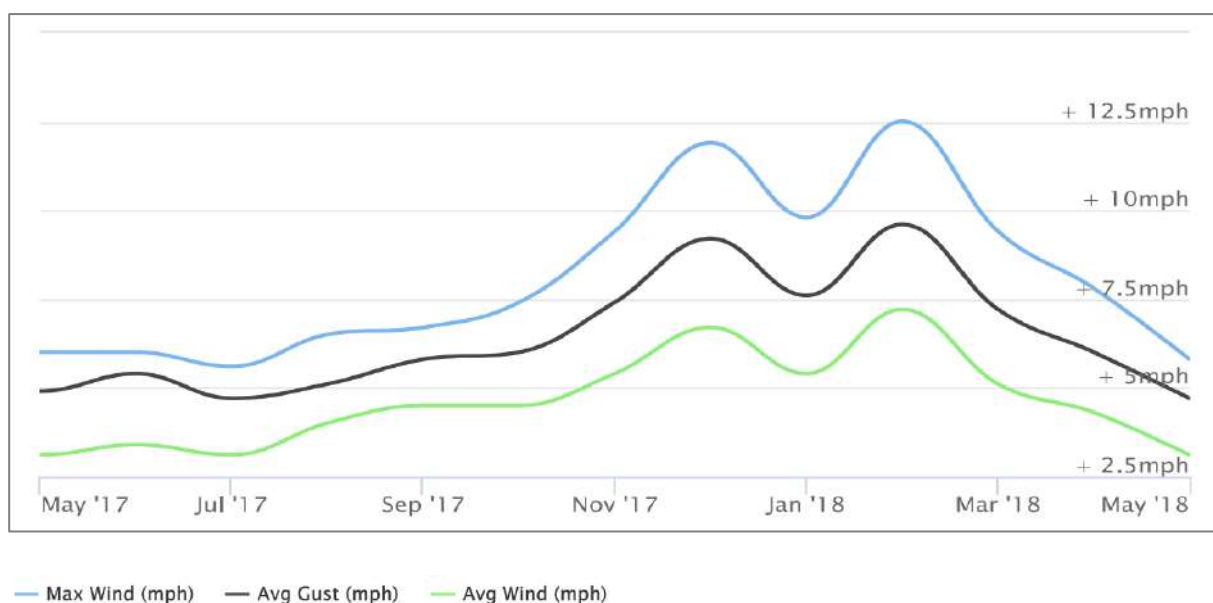


Figure 3-2: Wind speed Data

Source: Kenya Meteorology Department

3.8.3 EVAPORATION

The annual mean evaporation is 1,452 mm, with a mean monthly maximum of 182 mm in March. The daily net evaporation rate is 3.98 mm.

Table 3-3: Evaporation Data

Evaporation Data	Annual Evaporation	Mean Monthly Maximum	Daily Net Evaporation
Juja – 2014 data	1,453mm	182mm	3.98mm

Source: Kenya Meteorological Department

3.8.4 RELATIVE HUMIDITY

The relative humidity in percentages is measured between 0600 and 1200 for 2011. The average annual values are 78.3% in the morning and 49.6% in the afternoon. There is not a great monthly variation in humidity with the highest reading being around 84.3%.

3.8.5 TEMPERATURE

The mean annual temperature averages between 18°C-20°C. Temperatures are highest on average in March, at around 21.0 °C. In July, the average temperature is 17.3 °C which is the lowest average temperature in the whole year.

Table 3-4: Temperature Data

Juja Temp.	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Avg. Temperature (°C)	20	20.6	21	20.9	19.9	18.3	17.3	17.7	19.2	20.5	19.9	19.6
Min. Temperature (°C)	12.4	12.3	13.5	14.6	13.8	12	11.3	11.5	12	13.3	13.8	13.1
Max. Temperature (°C)	27.6	28.9	28.6	27.2	26	24.7	23.4	24	26.5	27.7	26.1	26.1

Source: Kenya Meteorological Department

3.9 Key Planning Issues

Table 3-5: Key planning issues on Physiographic Characteristics

	Key Highlights	Opportunities
Topography	The planning area has gently sloping topography.	Suitable for urban development.
Hydrology	Permanent rivers.	There is an opportunity to harness water for domestic, agricultural, industrial and leisure usage.
Vegetation	Human development and redevelopment pose risks to natural vegetation.	Sensitisation on the need to preserve natural vegetation through discouraging deforestation and encouraging afforestation.
Wildlife	Displacement of wildlife.	Preservation of wildlife through the creation of an animal rescue park/orphanage.
Climatic conditions	Adequate rainfall and moderate temperatures.	Sustained agricultural productivity; and Encourages human settlement and development.

Source: VisionRI

4 NATURAL ENVIRONMENT, CLIMATE CHANGE AND DISASTER RISK REDUCTION

4.1 Overview

This chapter discusses the natural environment, the ecologically sensitive areas, greenery and open spaces, and climate change and disaster risk reduction in the planning area.

4.2 Natural Environment

Natural environment refers to the non-human-made surroundings and conditions in which all living and non-living things exist on Earth. These include land and water bodies.

The land is the basis for agriculture encompassing soils, climate, vegetation, topography and other natural resources (United Nations Food and Agriculture Organisation). Juja Sub-County falls in a hinterland, with fertile soils that are well-drained and great for agricultural activities.

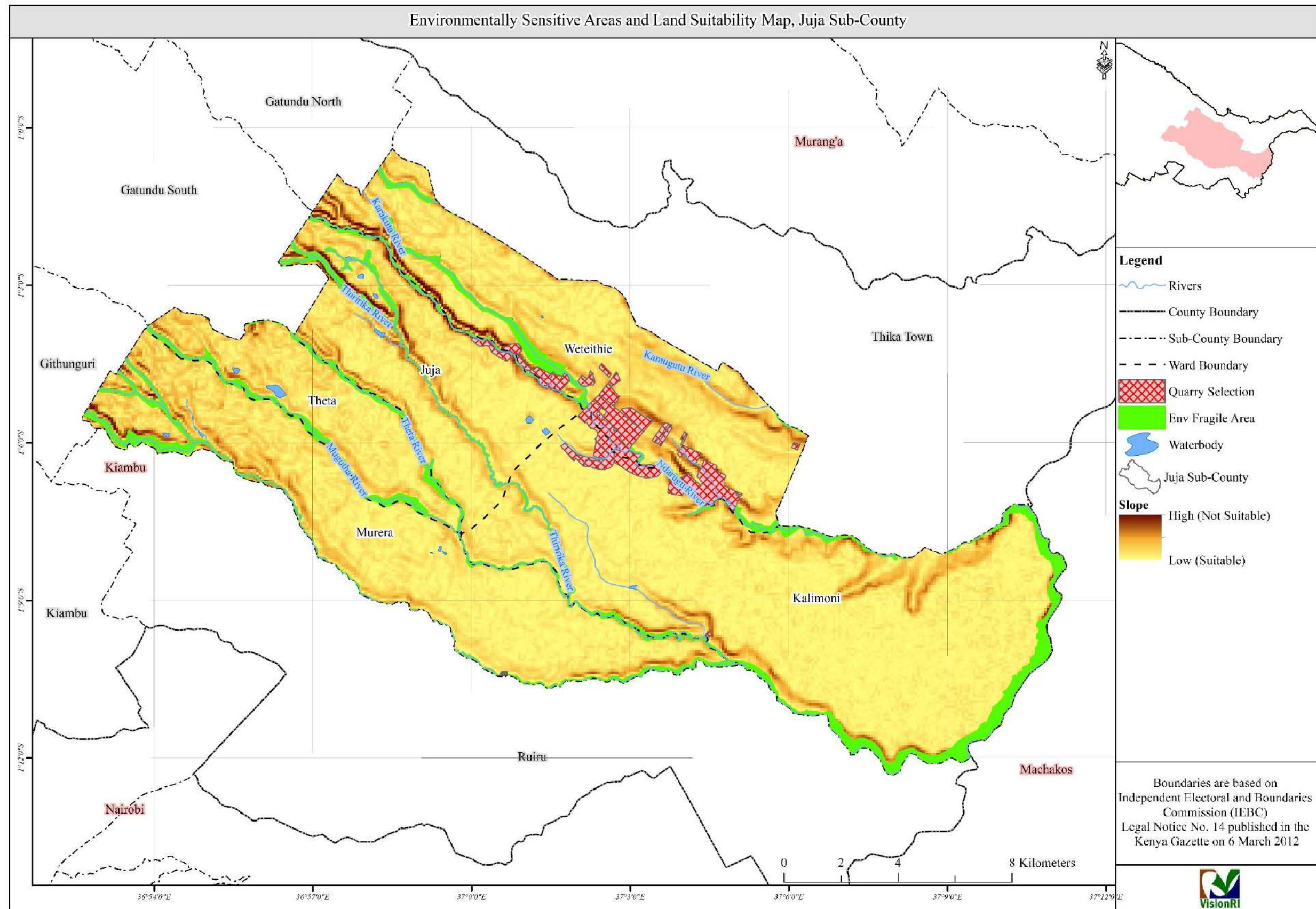
The only type of water body found in the study area is rivers. Four main rivers pass through the planning area which includes Koski, Rui-Ruaka, Ruini and Karura. They are permanent rivers and emanate from the Aberdare ranges and form the Athi River drainage system.

4.3 Environmentally Sensitive Areas

Environmentally sensitive areas refer to places or elements, which are vital for long-term maintenance of the natural environment. In Juja Sub-County, the key environmentally sensitive areas include rivers, water bodies such as swamps, quarry areas in Ndarugo, and areas with steep terrain. These elements have been used to prepare the Sub-County's environmentally sensitive areas and land suitability map which shown below as Map 4-1. The land suitability map considers the following:

- Establishment of green corridors along the major rivers in the Sub-County;
- Delineation, mapping and protection of all wetlands and riparian reserve within the Sub-County; and
- Protecting Kamuguti springs/wetland.

In terms of slope, about 90% of the planning area is developable as per the analysis done. Part of the 10% which is not developable is found on the western/upper part. These are located in areas such as Mirimaini which has many rivers gorges and quarries. On the other hand, the lower sides of the planning area are characterised by gentle slopes. This dictates that development of buildings should be encouraged on the lower side while the upper part to be left for agricultural activities. Figures 4-1 and 4-2 below shows examples of cross-sections of the terrain in different areas.



Map 4-1: Environmentally Sensitive Areas and Land Suitability Map

Source: VisionRI using ASTER Data



Figure 4-1: Cross Section A-B

Source: VisionRI Adapted from Google Earth



Figure 4-2: Cross Section C-D

Source: VisionRI Adapted from Google Earth

From the elevation profile illustrated in Figures 4-1 and 4-2, it can be deduced that the western region of the planning area has undulating terrain with a slope gradient difference of 62 m across the surface. The upper part is well-drained as shown in Figure 4-2 where development may be confined within the ridges but has challenges in infrastructure provision. The lower side of the planning area as shown in Figure 4-2 is generally flat which may bring in the issue of flooding.

4.4 Greenery and Open Spaces

Open spaces are areas reserved for parks, green spaces, and other open areas. These provide areas for recreation, have aesthetic value, and create positive health impacts.

There are inadequate open spaces in the planning area. This indicates a major gap according to the United Nations recommendation that for every 5,000 people, 1.5 hectares of open space should be provided.

For overall human development, this Plan proposes setting aside land for the purpose of open spaces.

4.5 Air and Water Pollution

- **Air pollution:** The Sub-County experiences air pollution that is mainly due to increased motor vehicle traffic, emission from processing factories, and dust from quarries. The term air emissions or air pollution describes the phenomenon of health hazardous gases and particles, which are put into the air or emitted by various sources. The sources within Sub-County could be mobile (e.g., cars, trucks, buses) or stationary (e.g., power plants such as electric generators, factories, refineries etc.), as well as indoor sources (e.g., some building materials mainly asbestos and cleaning solvents). The components of the emission include carbon dioxide (CO₂), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), and sulphur dioxide (SO₂).

It is, therefore, imperative that Air Emission Pollution levels are constantly monitored by the relevant institutions (NEMA and County Government) and the necessary mitigations put in place, should they be found to be above permissible levels.

- **Water Pollution:** Water pollution is a major challenge that is experienced by most poor households within Juja Sub-County who cannot afford clean potable water for drinking and other domestic uses. The main causes of water pollution include the prevalent use of septic tanks/soak pits in residential and other commercial premises as well as by open sewers and poor drainage system in the Sub-County. In some cases, wastewater is released into Ndarugo River due to poor waste management and inadequate sewerage system. Athi River is also one of the most polluted rivers within the Sub-County due to it being fed by water from the neighbouring Nairobi County where the rate of people releasing raw sewerage to the rivers is very high. In other cases, there is the use of undeveloped plots as garbage dumpsites within the Sub-County. The disposal of sewer water into the open drainage system is also another

major challenge facing the Sub-County. There are also numerous agricultural activities in the water catchment areas, therefore, a lot of siltation and pollution of water resources due to the use of agrochemicals.

Heavy metal pollution in the rivers is increasing due to sources such as lead usually from lubricating agents, lead-acid batteries, and metal alloys, amongst others. The main sources of zinc are galvanised steel, paints, metal alloys, roofing material, gutters, printing inks, plastics, waste combustion and sewage sludge. The result of metal levels in the water reflects the impact of anthropogenic activities on the environment in the quest for economic development within the Juja Sub-County.

In certain areas of Juja Sub-County, there exist a lot of construction activities along the riverbanks and wetlands making these areas prone to water pollution and low water quality which has, in turn, resulted in various health hazards such as diarrhoea, cholera, amoeba and typhoid. The water serves domestic purposes and at the same time is exposed to risks due to proximity to latrines. Residents along these riparian areas and wetlands are also facing challenges of flooding during rains. This is coupled with settlements amongst the poor who are not able to pay for rent in secure locations as well as agricultural activities and quarrying that do not observe the six-meter rule of developments from the river boundary as set by the Urban Rivers Restoration Program department at the Ministry of Water and Irrigation and WRA. The impacts of these activities result in various kinds of pollution in various forms from solid siltation to metal pollutants in the attached rivers.

4.6 Climate Change

Climate Change is a long-term shift in temperatures and weather patterns. This has been occasioned by human activities and lack of holistic planning.

70% of cities and urban areas are experiencing extreme effects of climate change such as Global Temperatures, Floods, Droughts, Storm water.

To address climate change effects, climate proof approach is required to give solutions or redress mechanisms which include Mitigation and Adaptation measures.

4.6.1 EFFECTS OF CLIMATE CHANGE:

4.6.1.1 *Drought:*

Long periods without rainfall results to drought whose indicators are:

- Reduced arable land productivity
- Lower yields
- Insecure fresh water availability

- Increased water related diseases

4.6.1.2 *Flooding:*

Extreme Weather/rainfall results in floods which also lower yields/productivity

4.6.1.3 *Temperatures:*

Rising Temperatures as a result of climate change results in;

- Water Security and Pollution
- Heat Stress
- Food insecurity

4.6.2 RESILIENCE ADAPTATION MEASURES

4.6.2.1 *Water Management;*

- Water Recycling
- Use of Grey water
- Improved Storm and runoff water
- Alternative source of water
- Expand storage facilities

4.6.2.2 *Food Security;*

- Support Urban and Peri-urban agriculture
- Improve efficiency of markets
- Access of cheaper food
- Cash transfer measures
- Alternative food sources

4.6.2.3 *Housing: Improved through;*

- Quality; affordable; located housing in environments which are not fragile
- Green zones, consider wind corridors,
- Rezoning some of the areas that can mitigate the issues
- Improve building standards
- Need for funding of adaptation measures and strategies
- Public Private Partnerships, Grants

4.7 Disaster Risk Reduction and Management

The disaster landscape in Kenya is characterised by various natural and human-induced hazards, particularly drought, floods and fires. Other common hazards include landslides, epidemics, HIV/AIDS and human conflict. Over time, the frequency and intensity of disasters have increased due to a number of factors including climate change, widespread poverty and rapid population growth, especially in the urban centres. Despite the exposure to recurrent natural and human-induced hazards in Kenya, a disaster management strategy has largely remained reactive. The Government is often compelled to redirect development resources to address emergency response and reconstruction needs at the expense of development programmes. This state of affairs is replicated in the Sub-County.

According to Kiambu CIDP 2018-2022, disaster management and special programmes within Kiambu County are under the Department of Administration and Public Service. The core functions of this unit are:

- To improve disaster preparedness and management services;
- To enhance safety;
- To increase resilience; and
- To build a more sustainable society.

The main disaster occurrences in Juja Sub-County include floods, fires, un-rehabilitated quarries, road accidents and the collapse of buildings. Floods occur due to natural factors like heavy rainfall. They also occur due to human encroachment to watersheds, drainage basins, flood plains and lack of proper drainage systems. In some instances, floods have occurred in the river basins even with normal rains because of excess surface water run-off occasioned by deforestation, land degradation upstream and clogged stormwater drains as well as development on waterways and wetlands.

Fires commonly occur in built-up residential, commercial, and industrial establishments. These result from accidents or deliberate arson. The County Fire Brigade generally responds to fires within the Sub-County. However, the response is sometimes hampered by inaccessibility in informal settlements where narrow roads impede the entry of fire engines. The Sub-County also lacks a fire station.

The collapse of buildings in Juja is mainly caused by the use of substandard building materials, poor structural design, and poor workmanship.

Inadequate enforcement on non-compliant buildings further exacerbates the situation.

Best practice ratio (internationally):

- 1 fire fighter = 2,000 citizens

Deficit:

- Kiambu county ratio
- County population divided by firefighters
- 2.4 million divided by 79 = 30,379 citizen
- 1 firefighter - 30,379 citizens
- Deficit 1,200 - 79= 1,121 firefighters and operators



Figure 4-3: Collapsed building in Juja and fire outbreak

Source: Kiambu County Fire Department

4.7.1 ANALYSIS OF DISASTER RISK REDUCTION

The table below shows a Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis of disaster risk reduction and management (DRRM) in Juja Sub-County.

Table 4-1: SWOT Analysis of DRRM and Resilience

Strengths	Weakness
Existence of the disaster management committee and emergency funds.	Poor road maintenance.
Good road networks.	Poor enforcement of traffic rules and regulations.
Presence of good health facilities.	Poor disaster management skills.
Existence of traffic rules and regulations.	- Lack of disaster warning signs; and - Weak enforcement department.
Presence of programmes and funding agencies on disaster management.	Increased population.
Draft Disaster Management Policy.	- Unpredictable weather; - Global warming and climate change; and - Quarrying.

Source: Kiambu County's Annual Development Plan 2018/19

4.7.1 MITIGATION STRATEGIES FOR DISASTERS AND CLIMATE CHANGE

ADAPTATION

- Use of Solar/renewable energy to tap the solar energy
- E-mobility/Walkable neighborhoods/ to address carbon emissions through compact and mixed use developments to reduce car ownership and usage
- Retrofit buildings to make them adaptable with weather changes
- Rain harvesting during rainy seasons and smart agriculture
- Identification and mapping ecosystems prone to climate related disasters
- Incorporate climate adaptation strategies during preparation of physical and land use development plans
- Loss of Biodiversity can be mitigated through identification and mapping of areas at high risk of biodiversity loss, prepare special area plan for biodiversity management and designate sites for biodiversity research reserves/ farms
- Flooding mitigation through prohibiting development on areas prone to flooding and water sheds, develop appropriate flood management plans for river basins, designate sites for water collector tunnels, water recharge basins, dams, water pan and construction of flood protection structures such as dykes, canals and identify and map flood prone areas
- Environmental degradation mitigation through identification and map environmental degradation areas conduct an Environmental Social Impact Assessment.
- Soil erosion should be mitigated through identification and map areas prone to soil erosion, encourage greening, afforestation and agroforestry.
- Resource conflicts should be mitigated through prepare a land use plan for sustainable use of the resource, provide buffer zones between different uses, integrate participatory planning approaches in preparation of plans and management of resources, promote alternative livelihoods, sensitization on sustainable use of resources.
- On Fire outbreaks; there is need to get mitigation measures through Identify and map fire prone areas, develop appropriate fire management plans, introduce fire breaks, designate sites for fire stations, water hydrants, fire engine routes, evacuation sites and routes and other appropriate fire management related facilities.
- Deforestation should be mitigated through identification and delineation of forest boundaries, prohibit developments in forest areas except for the purpose of eco-tourism, research and physical infrastructural developments, provide buffer zones around forests, encourage agroforestry and conservation of forests.

4.8 Key Planning Issues

Various environmental issues were identified by the Kiambu County Environment Department. The department has already made some recommendations to deal with these issues which are outlined in Table 4-2.

Table 4-2: Key planning issues on the Environment

	Key Highlights	Opportunities
Natural Environment	Permanent rivers.	There is an opportunity to harness water for domestic, agricultural, industrial and recreational usage.
Environmentally Sensitive Areas	• Encroachment of riparian reserves; and • Extensive quarrying activities.	• Formulation and implementation of a legal and policy framework on the preservation of ecologically sensitive areas; and • Development of a Natural Resource Management Policy.
Greenery and Open Spaces	The planning area does not have adequate open public and green spaces.	Segmentation and allocation of public parks and green spaces.
Air and Water Pollution	Rampant pollution through domestic and industrial waste.	Favourable laws and policies at national and county levels to curb pollution and encourage environment-friendly practices.
Disaster Risk Reduction	Fire outbreaks, building collapse.	Detailed disaster management policy, quarry decommissioning and rehabilitation development control.

Source: VisionRI

5 POPULATION AND DEMOGRAPHY

5.1 Overview

This chapter describes the population size, distribution, densities, structure, projection, demography, and social analysis in the planning area.

5.1 Population Size

According to 2019 population census data, Juja Sub-County's population was 300,948³. This is an increase of 61% from the 2009 population census when the population was 117,138 people. This rapid growth has been driven by the high rate of urbanisation coupled with natural population growth. The most populated Ward is Witeithie with 128,294 people. Murera is the least populated with 21,310 people.

Tables 5-1 and 5-2 below show the population size and growth per ward.

Table 5-1: Population by Ward

Wards	Population
Murera	21,310
Theta	63,512
Juja	37,859
Witeithie	128,294
Kalimoni	49,973
Total	300,948

Source: Kenya National Bureau of Statistics (KNBS) Kenya Population & Housing Census 2019

Table 5-2: Proportional Population Growth by Wards Between 2009-2019

Wards	2009	2019	% change
Juja	33,540	37,859	11
Kalimoni	19,572	49,973	61
Murera	15,846	21,310	26
Theta	22,420	63,512	65
Witeithie	25,760	128,294	80
Total	117,138	300,948	61

Source: KNBS Kenya Population & Housing Census 2009 and 2019

³ Kenya Population and Housing Census Report, 2019

5.2 Population Distribution and Density

5.2.1 POPULATION DISTRIBUTION

The population distribution by gender constitutes females at 51% and males at 49% as shown in Figure 5-1 below.

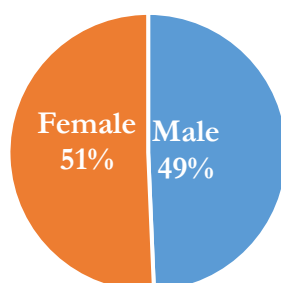


Figure 5-1: Male-Female Ratio

Source: KNBS Kenya Population & Housing Census 2019

Most of the people in Juja live in clustered nodes in commercial and residential areas such as Witeithie, Juja Town, Kenyatta Road, Toll, Kimbo, Gwa Kairu, and JKUAT. However, due to the high rate of land subdivision, there is an emerging trend of sparsely settled areas since the plot owners are preferring to settle on their land as opposed to renting. This has an effect in the provision of services in the newly settled and scattered populated areas. Map 5-1 below illustrates the population distribution in Juja.

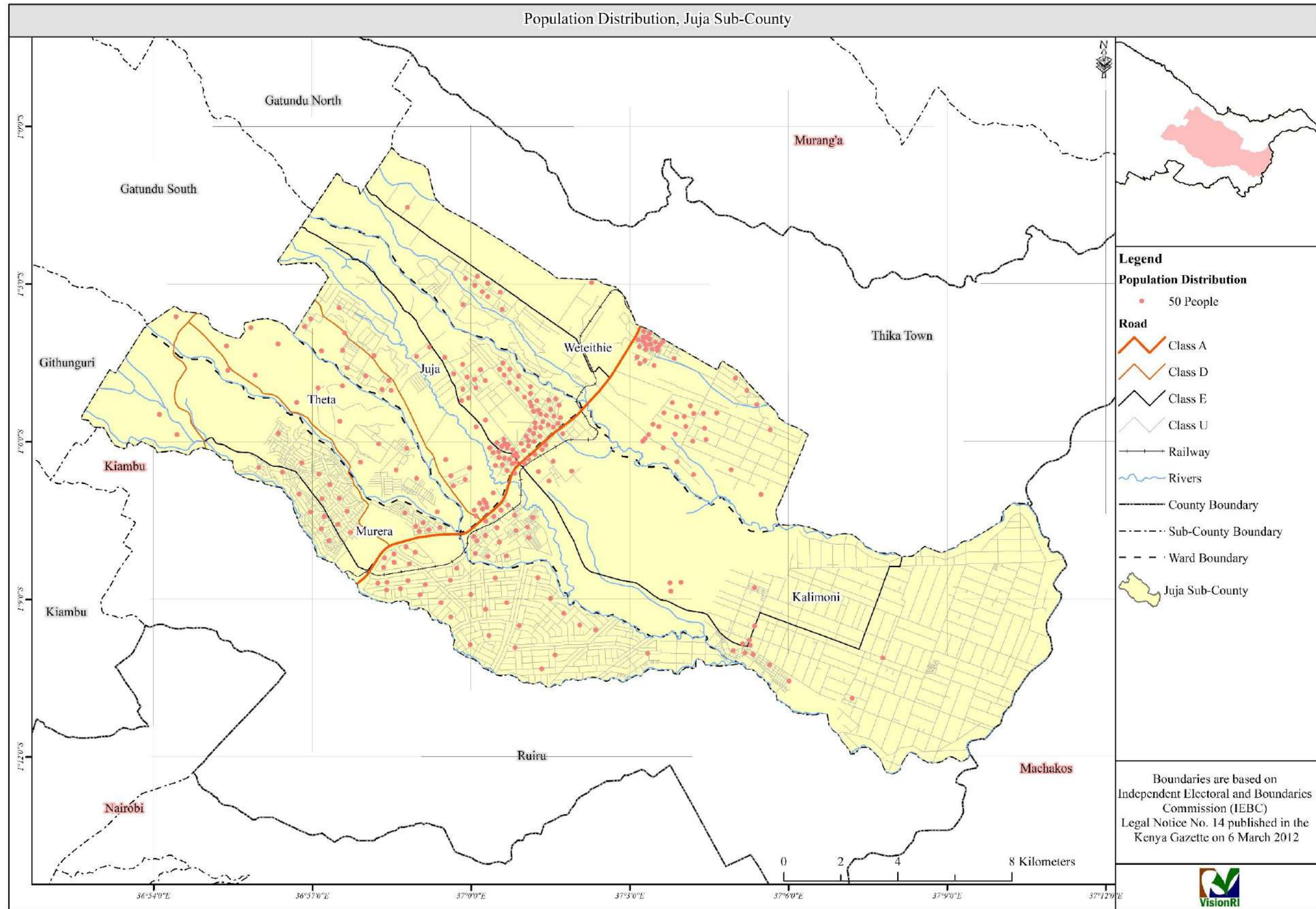
5.3.2 POPULATION DENSITY

Population density is defined as population per unit area, usually measured in a square kilometre or square mile. According to the 2019 population census, with a population of 300,948 people and a land area of 323.2km², the population density of the Sub-County is at 931 persons per km². Table 5-3 below presents the population density by ward with Theta and Witeithie being the most densely populated and Murera the least densely populated.

Table 5-3: Population Density by Ward

Population density		Land area	Density
Wards	Total	Sq. km	Persons per sq. Km
Juja	37,859	45.6	830
Kalimoni	49,973	120.1	416
Murera	21,310	66.5	320
Theta	63,512	25.4	2500
Witeithie	128,294	66.5	1929

Source: KNBS Kenya Population & Housing Census 2019/ GIS Primary Data



Map 5-1: Population distribution map
Source: Kenya Population & Housing Census 2019

5.3.3 POPULATION STRUCTURE

The planning area's population structure demonstrates that 56.7% of the population falls under the age bracket of 0-29 years. This means that there is a huge demand to cater to this youthful population with regards to healthcare for those under five years old, education facilities, housing for new families and creation of employment, amongst other needs.

Table 5-4: Population by Age in Juja Sub-County (2019)

Age	Male	Female	Total
0-4	18,140	18,052	36,192
5-9	15,382	15,283	30,665
10-14	13,508	13,627	27,135
15-19	11,747	13,775	25,522
20-24	18,664	21,907	40,571
25-29	17,880	17,771	35,651
30-34	14,212	14,634	28,846
35-39	11,136	11,405	22,541
40-44	9,208	8,514	17,722
45-49	7,036	6,252	13,288
50-54	4,754	4,227	8,981
55-59	3,129	2,719	5,848
60-64	1,613	1,516	3,129
65-69	939	1,086	2,025
70-74	592	698	1,290
75-79	245	414	659
80-84	141	241	382
85-89	73	173	246
90-94	26	108	134
95-99	11	48	59
100+	7	29	36
Total	148,443	152,479	300,948

Source: KNBS 2019 Population Census Reports

From the recent population census, the dependency ratio representing the non-working young population of age group 0 – 14 years as a share of the labour force (15 – 59) is calculated at 57% while the old-age dependency ratio (age group 60 and over) is much lower at 9%.

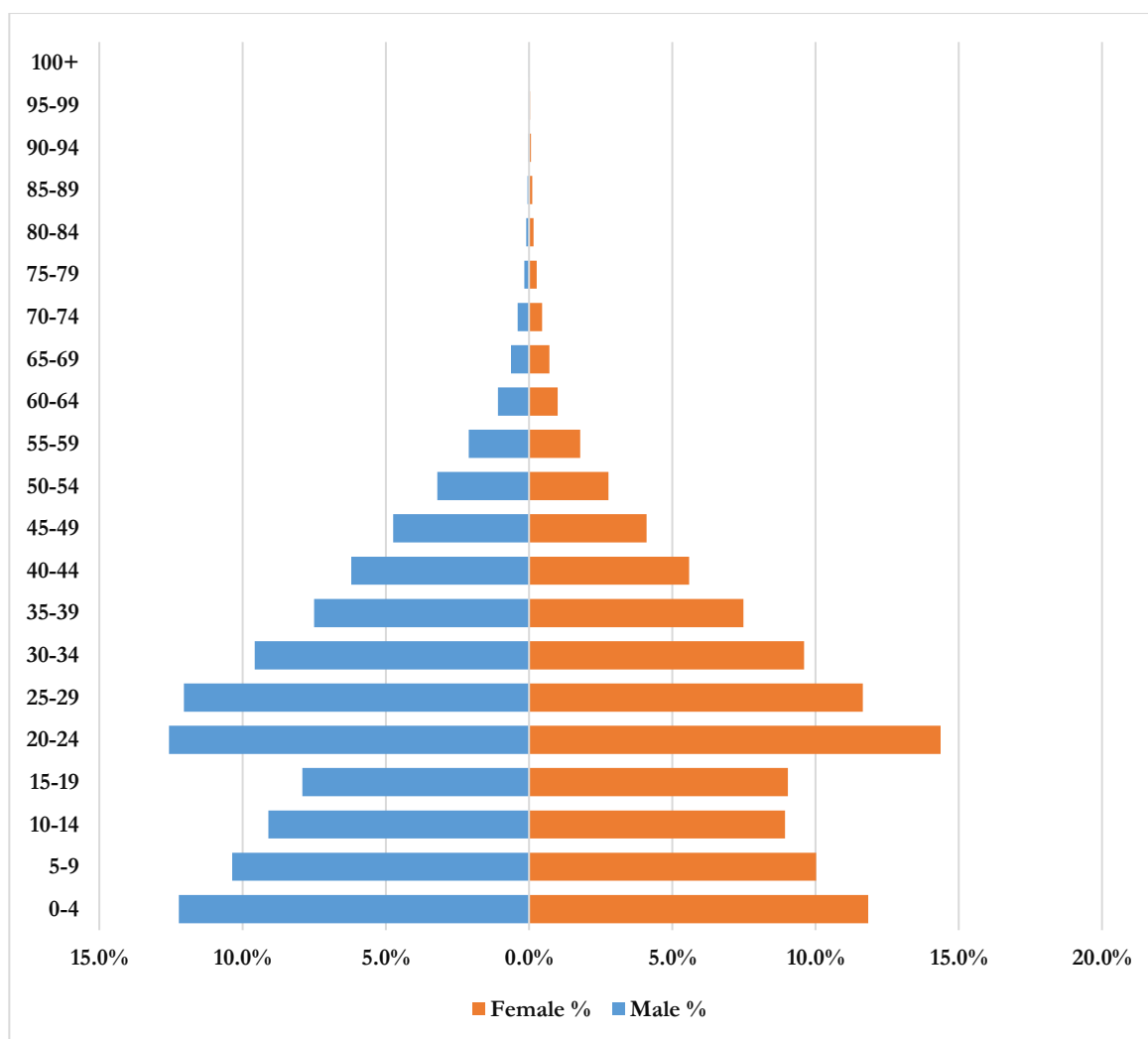


Figure 5-2: Juja Population Pyramid

Source: Derived from KNBS 2019 Population Census Reports Vol. III

5.3 Population Projections

Juja's population is expected to rapidly increase given its current characteristics. This plan projects the population to rise to 804,948 by 2030. The table below presents the projections based on the current population census figures.

Population growth rate formula

$$PGR = \frac{P(t) - P(t_0)}{(P(t_0) * (t - t_0))}$$

The formula for Exponential Population Projection

$$P_T = P_0 e^{k\Delta t}$$

Previous Population: P_0

e: Exponential constant

k: Growth rate

Δt : Elapsed time in years from time zero

Current Population: P_t

Table 5-5: Projected Population, 2019 to 2030

Wards	2009	2019	2025	2030
Juja	33,540	37,859	39,629	41,962
Kalimoni	19,572	49,973	86,489	138,868
Murera	15,846	21,310	25,690	30,390
Theta	22,420	63,512	118,431	200,404
Witeithie	25,760	128,294	340,982	771,495
Total	117,138	300,948	611,221	1,183,119

Source: Based on KNBS, 2009 & 2019 Census Reports

5.4 Demography

This section looks at the three main dynamics that define the population which are births, deaths, and migration trends.

When looking at births, a key statistic is that of fertility. It is defined by the total number of live births a woman can have during her productive years. It is influenced by factors including the age of sexual debut, access to education, social practices including female genital mutilation (FGM), teen pregnancy, health factors and access to contraceptives. Kiambu has one of the lowest fertility rates in the country at 2.7 compared to the national figure of 3.9 per woman. In 2009, the County's age-specific fertility rate for girls aged between 15 – 49 years was at 47 births per 1000 girls which is half the national rate of 96.

Table 5-6 shows the demographics features of the planning area with total fertility at 2.7 and life expectancy at 66.44 years amongst other features.

Table 5-6: Demographics of Juja Sub-County

Particulars	Status
Total fertility	2.7
Mortality rate = infant mortality rate (per 1000 live births)	33.9
Mortality rate = under-five mortality rate (per 1000 live births)	72
Life expectancy = 66.44 years	66.44
Age-sex ratio (male to female)	1:1.04
Children below 1 year = Kiambu	59,053

Source: VisionRI 2020

An additional demographic statistic that can be analysed is that of the working population. Juja sub-county has a total working population of 263, 538 people of whom, 129,633 are male, and the females slightly more at 133,884. About 23,949 who represent 9% of the working population are unemployed. This is relatively high in comparison to the national statistic of 2.64% as of 2019.

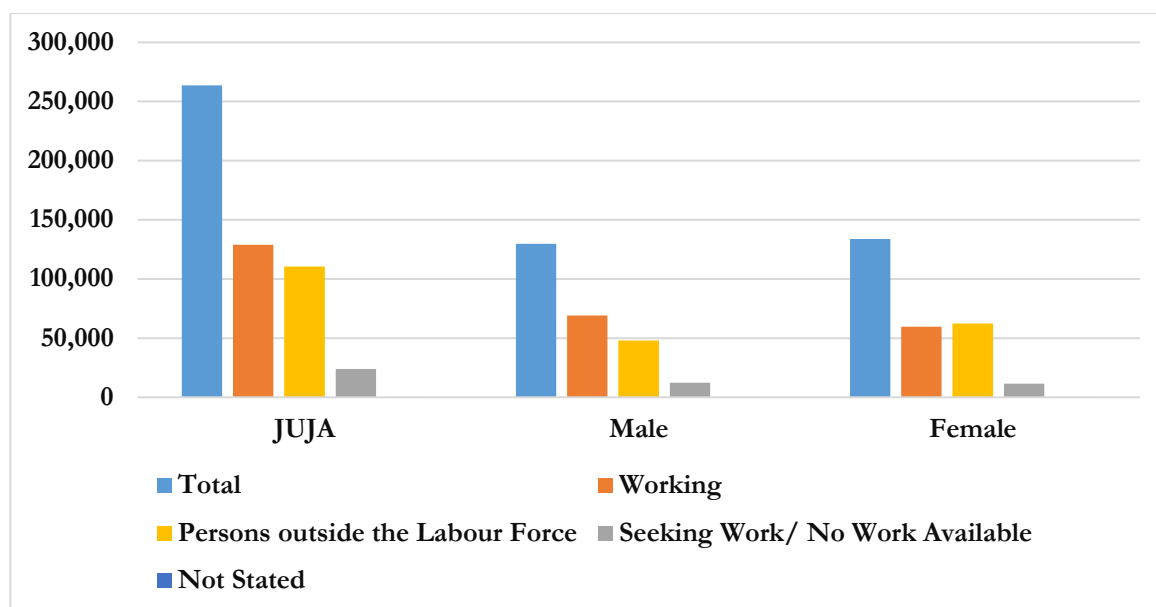


Figure 5-3: Juja Sub-County's Labour Force

5.5 Key Planning Issues

Table 5-7: Key Planning Issues in Population and Demography

Aspect	Key Highlights	Opportunities
Population and demography	• High youth population; • Unemployment; • High life expectancy; and • High literacy levels.	• Social capital – youthful & skilled population; • Need to plan for services that serve all including an elderly population; and • Literate population easy to engage in the development agenda.
Rapid Urbanisation	• Uncoordinated planning and urban sprawl; • Infrastructure deficit; and • Lack of safety and security.	• Strategic metropolitan location; • Globalisation (trade) – local, regional, and beyond; • ICT–Employment centres; and • Urban convenience.

Source: VisionRI 2020

6 LAND ANALYSIS

6.1 Overview

This chapter presents issues related to land tenure, land administration and management, land availability and land suitability within the planning area against a background of rapid urbanisation fuelled by social, environmental, economic, political and technological transformations. Key amongst the factors is rural-urban migration, declining agricultural productivity and climate change.

6.2 Land Ownership and Tenure Systems

There are three types of land categories in Kenya as outlined in Article 61 of Kenya Constitution 2010 and the National Land Policy. They include private land which is held by an individual under freehold or leasehold tenure system or any other land described as private by any other Act. Public land is held by the government or state agencies while community land is held by a community on the basis of ethnicity, culture or other similar interests.

Juja has a total of 32,309.49 ha of land, with 80% (25,847.592 Ha) privately owned, while 20% (1,615.6 Ha) is public land. Public land constitutes of land owned by National and County governments and are earmarked for public utilities and facilities for education, social services, county and national governments administrative offices, and transportation amongst others. Land held in private ownership is divided into two categories: leasehold ownership mostly found within the CBD and market centres, and freehold ownership which is mainly agricultural land.

6.3 Land Administration and Management

Land administration and management in Kenya has generally been reformed following the promulgation of the New Constitution in 2010. The constitution has created a devolved land governance system with shared responsibilities between the national and county governments.

Land administration and management in Juja is carried out by both the National Government and Kiambu County Government. The national government's roles include, amongst others, land registration, surveying and valuation. Further to that, the National Land Commission is responsible for managing all public land belonging to both national and county governments. On the other hand, the County Government's mandate includes management of county land which involves land use planning and development control and carrying out a valuation for rating purposes. The National Land Commission is the trustee of public land within the county.

The lead agencies in land administration and management at the National and County level are provided in Table 6-1 below:

Table 6-1: Key Actors and Roles in Land Administration and Management

	Key Actors	Roles	Guiding Legislation
National Government	National Land Commission	Amongst other functions of the National Land Commission, the main ones are: • Manage public land on behalf of National and County Governments; • Monitor and have oversight responsibilities over land use planning in the country; and • Alienate public land.	• Kenya Constitution 2010 Article 67; and • National Land Commission Act of 2012.
	Director-General of Physical Planning	According to the Physical and Land Use Planning Act 2019, the Director has the following functions: • Advise government on strategic physical and land use planning matters; • Formulate policies, guidelines and standards; and • Capacity building and technical support on county planning staff.	• Physical and Land Use Planning Act of 2019.
	Director of Survey	• Establish and maintain a national geodetic control network to facilitate other surveys and research; • Produce and maintain plans of property boundaries in support of land registration; • Produce and continuously update national topographical basic maps; • Maintain national and international boundaries; and • Prepare and publish the National Atlas of Kenya, as documentation of National Heritage and promotion of Nation's identity.	• Survey Act
	Director of Land Administration	Functions of the office include the following: • Establish and manage land control boards; • Process and approve development applications e.g., issuance of consents to charge, lease or transfer; • Process ownership documents such as titles/grants for both public and community; • Setting apart land for public use; • Custody and maintenance of land records; and • Document public land and preservation of fragile ecosystems e.g., wetlands and water catchment areas for purposes of conservation.	• Land Act of 2016; and • Land Registration Act of 2012.
	Principal Land Registrar/Chief Land Registrar	• Registers land titles, and leases.	• Land Registration Act of 2012; and • Community Land Regulations of 2017.

	Key Actors	Roles	Guiding Legislation
County Level	County Executive Committee Member of Lands and Physical Planning	• Formulation and implementation of policy and strategies on land use management; and • Advise County on all matter related to land use and management.	• Land Act of 2016; • Land Registration Act of 2012; • Land Control Act Cap 302 (Revised) 2017; • County Government Act of 2012; • Physical and Land Use Planning Use Act 2019; • Urban Areas and Cities Act; and • Survey Act.
	County Director of Land Use and Physical Planning	• Come up with sustainable strategies on urban and rural development and management; • Formulate, implement and review various policies in the Department; • Promote and facilitate the development of decent housing; and • To achieve timely delivery of planning decisions on private sector and community development initiatives.	• Urban Areas and Cities Act; and • County Government Act, 2012.
	County Director of Survey	• Carry out a survey on public land; • Develop a Geographic Information System and Land Information System database for spatial data management; and • Provide efficient land and property management for effective county land documentation and land taxation.	• County Government Act of 2012; and • Survey Act.
	Land Control Board	• Issue consent to carry out transactions such as sale, subdivision, transfer of agricultural land (freehold land) based on ownership and other family-related matters; and • Approve transactions such as sale, transfer or mortgage of shares in private companies or cooperative societies that own agricultural land.	• Land Control Act Cap 302 (Revised 2017).
Other Key players	Registered Physical Planners	• Development applications to the county; and • Advise county on innovations in the land and planning sector.	• Physical and Land Use Planning Act, 2019; • Physical Planners; Registration Act, 2019; • Land Act, 2012 (Amended 2016); • Water Act, 2002; and • Urban Areas and Cities Act, 2011
	Registered Land Surveyors	• Boundary confirmation; • Beaconsing of approved subdivision and amalgamation scheme; • Amendment of RIM; and • Preparation of deed plans.	• Survey Act, 1961 (Revised 2012).

Source: VisionRI

Some of the challenges facing land administration and management in the planning area include:

- Lack of updated local physical and land use plan to guide the development process. The approval of this plan will provide a land-use zoning framework and regulations to guide development such as land subdivisions and management. Juja has witnessed land subdivision without due planning especially where the land buying companies subdivide and sale land and fail to process the titles. This has led to double allocation and land conflicts;
- Poor coordination between the Land Control Board, National Government Departments and County Government especially on subdivisions of private land. This is due to inadequate compliance with the processes and procedures of planning, surveying and registration;
- The existing national land registers in Kiambu, Thika, Ruiru and Gatundu are in analogue form making it difficult to access information related to land and monitor land transactions. This makes land transactions lengthy and cumbersome;
- Physical and land use planning has been overtaken by developments in both urban and rural areas resulting in uncontrolled development;
- There are many allocations which were done using part development plans (PDP) some were not approved but nevertheless, development went ahead;
- Land subdivisions through mutation form and subsequent registration without following planning standards with some plots measuring 1/16 of an acre rendering them undevelopable;
- Conversion of some land category (freehold to leasehold) and one user to another without planning input;
- Large tracts of land were bought by land buying companies to benefit their members but planning inputs and registration were not initiated leaving members with share certificates; and
- In recent years, there has been an upsurge of land subdivisions done by land buying companies or individuals who are selling without planning input and registration.

Map 6-1 below shows the emerging subdivision trend within the Sub-County area of Witeithie and Kalimoni.

6.4 Land Use Patterns and Trend Analysis

The dominant land use in the planning area is agricultural land which accounts for 55.47%. Residential land accounts for 25.63% followed by riparian reserves and recreational at 10.25%. Other land uses include commercial, industrial, educational, quarrying, transportation, public purpose, and public utility. Table 6-2 illustrates the existing land uses in the Sub-County.

Table 6-2: Major land uses in Juja Sub-County

No.	Land Use	Existing	
	Classification	Area in Hectares	%
0	Residential	11,481.42	25.63%
1	Industrial	142.84	0.38%
2	Education	332.94	0.94%
3	Recreation	111.12	0.35%
4	Public Purpose	138.52	0.52%
5	Commercial	129.30	0.40%
6	Public Utility	5.47	0.08%
7	Transport	1,046.23	3.24%
8	Quarry	868.57	2.69%
9	Agriculture	17,922.90	55.47%
10	Mixed Commercial & Residential	37.11	0.11%
	Total	32,309.49	100.00%

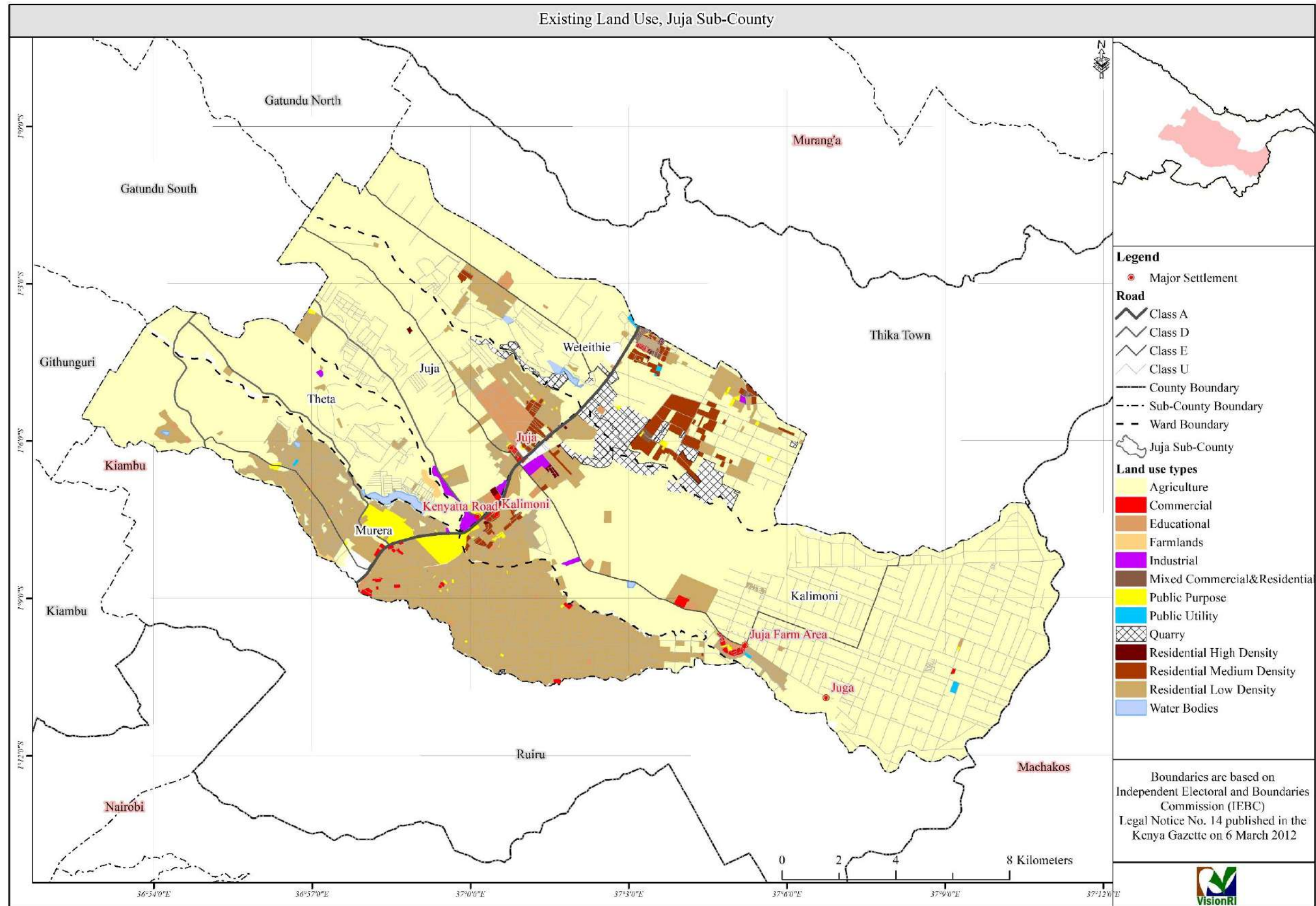
Source: Vision RI 2020

Over the last three decades, Juja has witnessed rapid changes in land use pattern due to the rapid population increase driven by people migrating in the area who were attracted by the availability of affordable land for residential development. Juja Town has a high concentration of residential and commercial development while Nairobi-Thika Superhighway has linear development with intense residential development at Witeithie, Kimbo, Hakairu, Kenyatta Road and Mugutha area. Map 6-2 shows the existing land use in the planning area.



Map 6-1: Aerial view of uncontrolled land subdivision in Juja/Kalimoni area

Source: VisionRI – Adapted from Survey of Kenya



Map 6-2: Existing Land Use

Source: VisionRI

Other areas such as Kenyatta and Kiganjo roads have seen increased development of medium density residential housing. There are however areas that can be described as transitional and these include Juja Farm which is transforming from agricultural to residential use. The upper part of Juja neighbouring Gatundu and Githunguri is still under large agriculture use.

6.5 Land Availability and Suitability in Juja Sub-County

Juja Sub-County has seen an influx of real estate companies who have significant control over the land market. The companies are buying huge tracts of land and later subdividing and selling to individuals. A good point of reference is the Nyakinyua Women Group which initially owned the land in Murera Sisal, Murera Coffee Area and Juja Farm.

They later subdivided the land parcels and sold these to interested purchasers. Other actors in the land market within the Sub-County include Urithi and Gakuyo, amongst others. The large farm estates, which were predominantly covered by coffee plantations, are fast diminishing paving the way for subdivisions to smaller land units for residential and commercial purposes.

6.6 Land Values and Markets

Land values in Juja have increased with time due to the high rate of urbanisation indicated by improved social and physical infrastructure. This has seen many people want to settle in the area and, as a result, prices of land have increased as shown in Table 6-3 below.

The high rate of migration to Juja has led to increased pressure on land, the existing infrastructure, high rates of unemployment and social problems. Because of the Nairobi-Thika Superhighway, many townships along the highway including Juja are witnessing heightened real estate activity. Property developers have taken advantage of this opportunity and are rushing to set up various residential and commercial projects. The former vast coffee estates are being transformed into residential estates, mainly gated residential communities. As a result, the prices of land have skyrocketed as demand increased with improved road travel from Nairobi and Thika.

The rapid and uncontrolled development in the Sub-County has led to cases of unplanned land subdivisions with some plot sites being unable to harbour standard housing units. Original subdivision plots were 50-acre portions, but currently, massive subdivisions have been taking place. In many cases, these occurred without regard to procedures, standards and guidelines set by the County Government. The subdivisions have been accompanied by the change of user applications.

It was observed, however, that property developers have not been keen on applying for change of land use except for areas near main highways and urban areas. Consequently, land in the hinterland has either been developed with rental housing units but without an official application for change or extension of use. While the land use on the title is agricultural, in reality, land parcels in the hinterland of the urban areas or main urban

centres/towns have adopted mixed uses, that is, agricultural and rental housing development. Other uses such as commercial and industrial are rare in the hinterland.

The adoption of mixed land uses has largely been driven by poor returns from agricultural production. Indeed, farmers across the Sub-County argued during community consultations that rental housing was their major source of income. As a consequence, there is an increased desire by households to move from agriculture into real estate development as it presents better returns. However, the cost of entry is prohibitive. There is thus a need to develop alternative and/or innovative approaches to land acquisition by private developers.

Table 6-3: Indicative land values between 2015 and 2019 for Juja Sub County

Locality	Land use	2015				2019			
		Size in acres				Size in acres			
		1	0.5	0.25	0.125	1	0.5	0.25	0.125
Juja Town	Single dwelling					14,400,000	7,200,000	3,600,000	1,800,000
	Multi-dwelling	16,000,000	8,000,000	4,000,000	2,000,000	25,000,000	12,500,000	6,250,000	3,125,000
	Commercial					64,000,000	32,000,000	16,000,000	8,000,000
	Industrial								
	Agricultural					10,000,000	5,000,000	2,500,000	1,250,000
Juja Farm	Single dwelling	4,000,000	2,000,000	1,000,000	500,000	12,000,000	6,000,000	3,000,000	1,500,000
	Multi-dwelling	5,600,000	2,800,000	1,400,000	700,000	14,400,000	7,200,000	3,600,000	1,800,000
	Commercial	12,000,000	6,000,000	3,000,000	1,500,000	36,000,000	18,000,000	9,000,000	4,500,000
	Industrial								
	Agricultural	2,160,000	1,080,000	540,000	270,000	1,700,000	850,000	425,000	212,500
Murera	Single dwelling	8,000,000	4,000,000	2,000,000	1,000,000	8,000,000	4,000,000	2,000,000	1,000,000
	Multi-dwelling	8,000,000	4,000,000	2,000,000	1,000,000	46,000,000	23,000,000	11,500,000	5,800,000
	Commercial	25,000,000	12,500,000	6,250,000	3,125,000	32,000,000	16,000,000	8,000,000	4,000,000
	Industrial					22,000,000	11,000,000	5,500,000	2,750,000
	Agricultural	6,720,000	3,360,000	1,680,000	840,000				

Source: Kiambu County Valuation Office (2020)

Reports from the County Valuation Office indicate that residential, commercial, and industrial property prices have increased. Residential property prices grew by a margin of 9.4 per cent to 12.5 per cent per annum between 2015 and 2019, respectively. However, commercial property prices rose at fairly lower rates. On the other hand, industrial and agricultural property prices are fairly static.

The results confirm the notion that there are dormitory towns for the city of Nairobi. Besides, there are very limited commercial activities taking place in the Sub-County due to its proximity to Nairobi.

6.7 Measures to Address Land Administration Problems

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

- Capacity building in the Lands office including surveying, mapping, valuation, town planning and land management processes and departments;
- Need to develop clear guidelines and procedures for land subdivision and change of use. In addition, sensitise both county staff and private practitioners on the same;
- Increase human capital;
- Come up with a one-stop-shop for all land transactions. This will reduce the number of departments/personnel handling an application hence hasten the process;
- Digitisation of land registries to enhance effectiveness, monitor land transactions and reduce the loss of revenue;
- Include a private registered physical planner in the Land Control Boards to provide professional support in land planning matters; and
- Organise community land planning clinics to increase public awareness of the importance of planning.

6.8 Strategies and Recommendations related to Land Issues

Given the existing land issues in the Sub-County, the following strategies are recommended for the planning period:

- In order to achieve orderly development, the Sub-County may enhance the capacity of the County Government staff and Town Boards to be able to implement planning regulations and laws; this will help in reducing land-use conflicts amongst other ills;
- There is a need to map out all land parcels in the Sub-County with their attributes spelt out, such as use, size, ownership, rent, value, and the number of units, amongst others. The issues that may also need to be highlighted include ownership dispute details. This will be useful in partly enhancing the revenue for the County and developing an appropriate response to land invasions in the Sub-County;
- Registration of all land buying and selling properties companies by the Ministry of Lands under the National Government;

- Registration and licensing of buying companies at the County Government level under the Department of Lands and Physical Planning;
- Require all the buying and selling land companies to engage a licensed planner who shall give advice on planning regulations;
- Land banking: Due to the scarcity of public land and increasing prices of land, the County Government in consultation with the National Government may consider acquiring land for future public projects. The land so acquired should be protected from further allocation to private individuals by successive County and/or National Governments;
- There is a need to encourage and/or develop an appropriate legal framework to facilitate collaborative development and/or partnership for land acquisition by private developers. This is to ensure that land is acquired at reasonable prices and the original landowner cum seller also benefits. This will also ensure that housing prices and rents are reasonable and the cost of living within the Sub-County remains manageable;
- Adoption of equitable rating approaches in order for the County to sustainably undertake the tasks proposed to encourage orderly, responsive development of infrastructure to support increasing housing, commercial activities, urban expansion and management of land within the Sub-County; and
- Development of low-cost housing to ensure that the poor have access to housing.

6.9 Summary of Key Issues

Table 6-4: Key issues on land administration and management

Land Analysis	
Key Issues	Opportunities
Land subdivisions without approvals and failure to meet planning regulations.	Simplified approval process with advanced technology such as E-DAMS at the County level.
Failure by the land buying companies to deliver on the issuance of titles making it difficult for the plot buyers to apply for approvals.	Regularisation of land ownership by the issuance of titles where share certificates had been given.
Inadequate development control practices leading to the illegal development of residential and commercial areas.	Enforcement of fines and penalties on illegal development.
Fraudulent practices such as fake titles leading to loss of significant amounts of money.	Registration and regulation of land buying companies.

Source: VisionRI

7 URBAN DEVELOPMENT AND HUMAN SETTLEMENTS

7.1 Overview

This chapter analyses urban development in the planning area by showing urbanisation trends in some parts of the planning area between 2003-2020. It also discusses the human settlements found in the planning area, both the formal and the informal ones.

7.2 Urbanisation

Juja Sub-County is one of the fastest-growing urban centres within the NMR. According to the SPC for NMR, it is one of the leading urban centres in terms of population increase. The Nairobi-Thika Superhighway, Jomo Kenyatta University of Agriculture and Technology, and availability of relatively cheap land are the key driving forces behind urbanisation in the Sub-County.

Figure 7-1 shows the urbanisation trend between 2003-2020 in Juja Town, Kenyatta Road and Toll/Kimbo area.



Figure 7-1: Urbanisation Trend 2003-2020

Source: VisionRI 2020 (Adapted from Google Maps)

7.3 Hierarchy of existing centres and their functions

Juja Town is the major urban centre within the planning area. However, along the Thika-Nairobi corridor, there is an emerging mixed-use development comprising of residential, commercial, light industries and transportation. The other notable market centre is in Juja Farm. Juja lacks a hierarchy of urban centres.

7.4 The Nodes and Corridors

The main node within the planning area is Juja Town. Other emerging nodes include Kenyatta Road, Toll station, Kimbo (Thika superhighway and Kiganjo road junction), Gwa-kairu at the border between Juja and Ruiru, Nyacaba, and Kuraiha. The emerging urbanisation trend in Juja-Sub County is ribbon driven, and urban developments are moving into the former coffee and sisal plantation areas.

7.5 Formal Settlements

Juja is attracting housing developments that are being carried out by real estate developers and individuals. Some of these notable developments are in Mugutha, Murera, Kalimoni and Kenyatta road. There are also high-density formal settlements in Juja Town and along the Thika-Nairobi Transport Corridor.

7.6 Informal Settlements

The main informal settlements in the Sub-County include Gachororo and Mirimani.

Gachororo Settlement: The informal settlement was started in 1969 on 50 acres of public land. The settlement had a total population of 19,670 in 2009 with the plot sizes less than 1/8 of acres. Majority of residents have allotment letters.

Table 7-1: Population Trends 2009 – 2018

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
19,670	20,000	22,100	25,000	28,670	30,000	33,800	35,000	36,000	37,000
2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
40,000	43,000	46,000	52,000	58,500	65,812	74,037	83,289	93,697	105,405

Source: Gachororo A Leaders' Focus Group Discussion (FGD), 2015 and VisionRI Estimated Projection

7.7 Housing

7.7.1 INTRODUCTION

Housing is a critical component of any development agenda because it consumes the highest amount of space within urban areas. As a result, most of the urban challenges to revolve around the housing sector. There are a number of formal documents that acknowledge the inadequacy of decent housing for households and other related challenges. Kenya draws its housing policy from these formal documents in the form of statutes, policies, and international agreements.

Kenya is amongst the 190 countries which are dedicated to the attainment of the SDGs aimed at fighting poverty, inequality and impediments to growth and human development. SDG number 11 aims to “make cities and human settlements inclusive, safe, resilient and sustainable”. This goal is informed by the fact that at least 50% of the world’s population in 2015 lived in urban settlements and that urbanisation is growing in many developing countries. Target 1 of Goal 11 urges governments to “ensure for all adequate, safe and affordable housing and basic services and to upgrade slums.”

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

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

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

The World Bank Report (World Bank Group, 2018) indicated that the main cause of housing deficit in Kenya is the high rate of rural-urban migration and population growth versus few housing units that are built annually. “The 50,000 housing units built in Kenya annually are far below the required amount of 250,000 units annually to cope with the high population growth in urban centres,” it noted. The cause of this low

turnover of new housing units, according to the report, is affordability, lack of finances for developers, prohibitive land rates, laws that make foreign investors shy away, and lack of prioritisation by the government in ensuring that its citizens live in comfortable houses.

7.7.2 HOUSING SITUATION IN JUJA SUB-COUNTY:

Juja Sub-County is characterised by urban and rural elements with mixed housing typologies depending on the neighbourhood. In urban areas and along Thika Superhighway, most of the housing units are medium-rise residential apartments and flats while single dwelling units are common in transitional areas and within upcoming low and medium-density neighbourhoods.

According to the 2009 Kenya Population and Housing Census Report Vol. II, approximately 83% of households in Thika Municipality, of which Juja is a part, had permanent houses made of stone, and brick/block walls. Nonetheless, there are scattered poor rural housing units made of timber/mud walls and corrugated iron sheet roofs.

7.7.3 BUILDING MATERIALS AND CONSTRUCTION SUB-SECTOR

Juja has a good local supply of quarry stones that are used in the construction industry. Cement is a more expensive aspect of construction projects and timber is also largely imported from other counties mainly Nyeri, Muranga and Meru. Sand is also mainly imported from Machakos County.

7.7.4 HOUSING TYPOLOGIES AND BUILDING MATERIALS

The character of many housing units in Juja Sub-County especially along main roads is storeyed apartments made of quarry stone and tiles. There are also single-unit homes and townhouses of similar construction, especially along Thika Road and near Juja Town. In the outlying rural areas of Karakuta, Juja Farm and Theta, timber/mud-walled and iron sheet roofed houses dominate.

Table 7-2: Sources of Selected Building Materials

Material	Source	Remarks
Quarry Stones	Local Juja.	Large amounts in the Sub-County.
Sand	Machakos County.	Large deposits not too far from Juja.
Timber	Meru, Nyeri & Murang'a.	Expensive due to high demand and limited supply.
Steel	Nairobi Industrial areas.	30-50 kilometres away.
Galvanised Iron Sheets	Local Hardware Shops.	Locally available with industries within 10-20 km. radius.

Source: Discussions with key informants and FGD participants, 2015

7.7.4.1 Roofing Materials

The roofing materials vary from household to household across the Sub-County. The most common roofing material amongst 69.8% of residents is iron sheets. About 24.2% of roofs are made of concrete/cement while asbestos sheets and decra/versatile roofing comprise 2.4% and 2.1%, respectively. Notably, less than 1% of the households have roofs made of nylons/cartons/cardboards, shingles and tin cans.

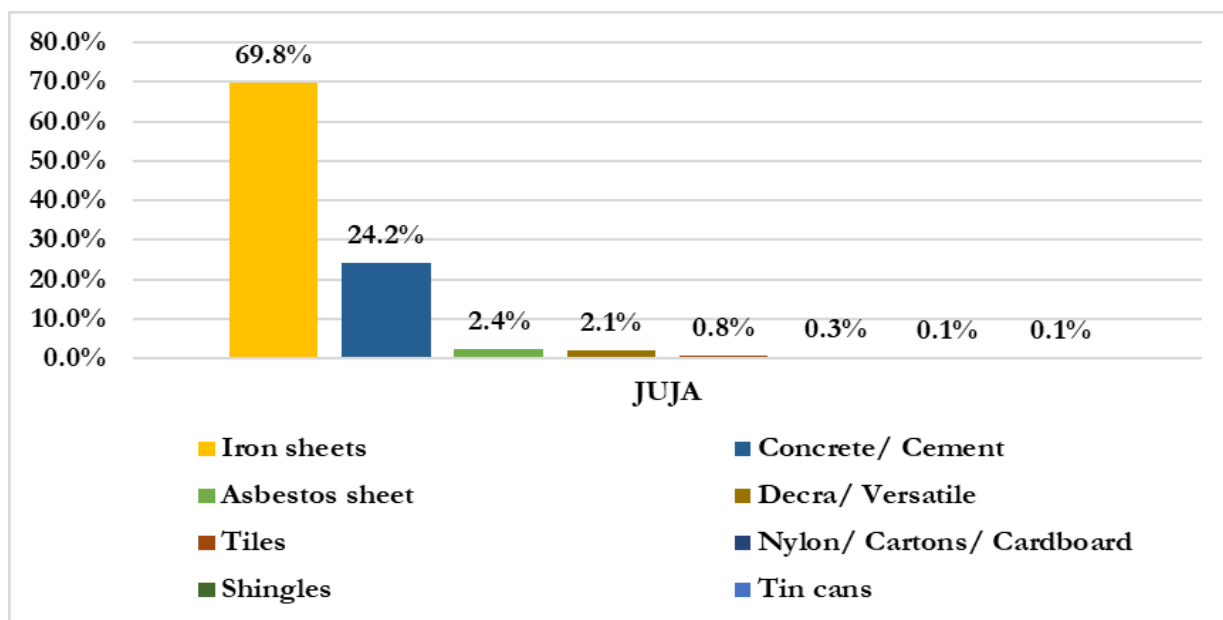


Figure 7-2: Roofing materials

Source: 2019 Kenya Population and Housing Census

7.7.4.2 Wall Materials

Approximately 61% of houses have a stone with lime/cement walls while 28.9% have concrete walls. About 5.5% of households have iron sheet walls with 1.8 % having bricks. Covered adobe makes up 1.3% of wall materials with stone with mud, uncovered adobe, timber and mud constituting less than 1% each.

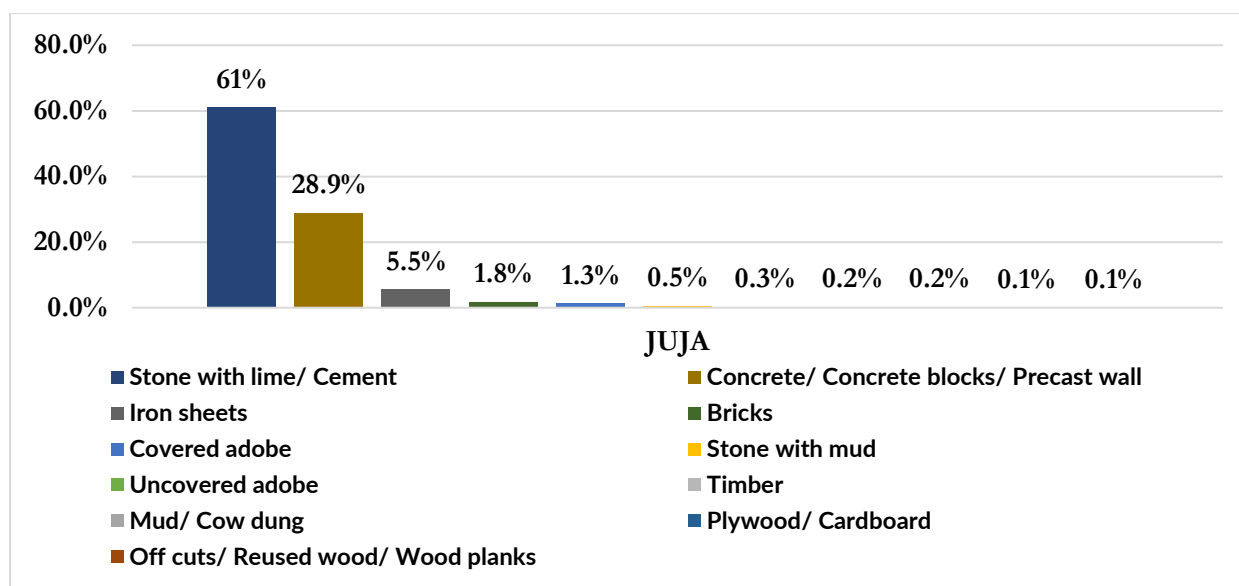


Figure 7-3: Wall construction material

Source: 2019 Kenya Population and Housing Census

7.7.4.3 Floor materials

Most houses have 58.6% of their floors made of cement/terrazzo while 30.4% have ceramic tiles. About 6.4% have earth/sand floors with 3.9% of the floors being covered by wall-to-wall carpets. Timber, polished wood, vinyl and dung add up to less than 1%.

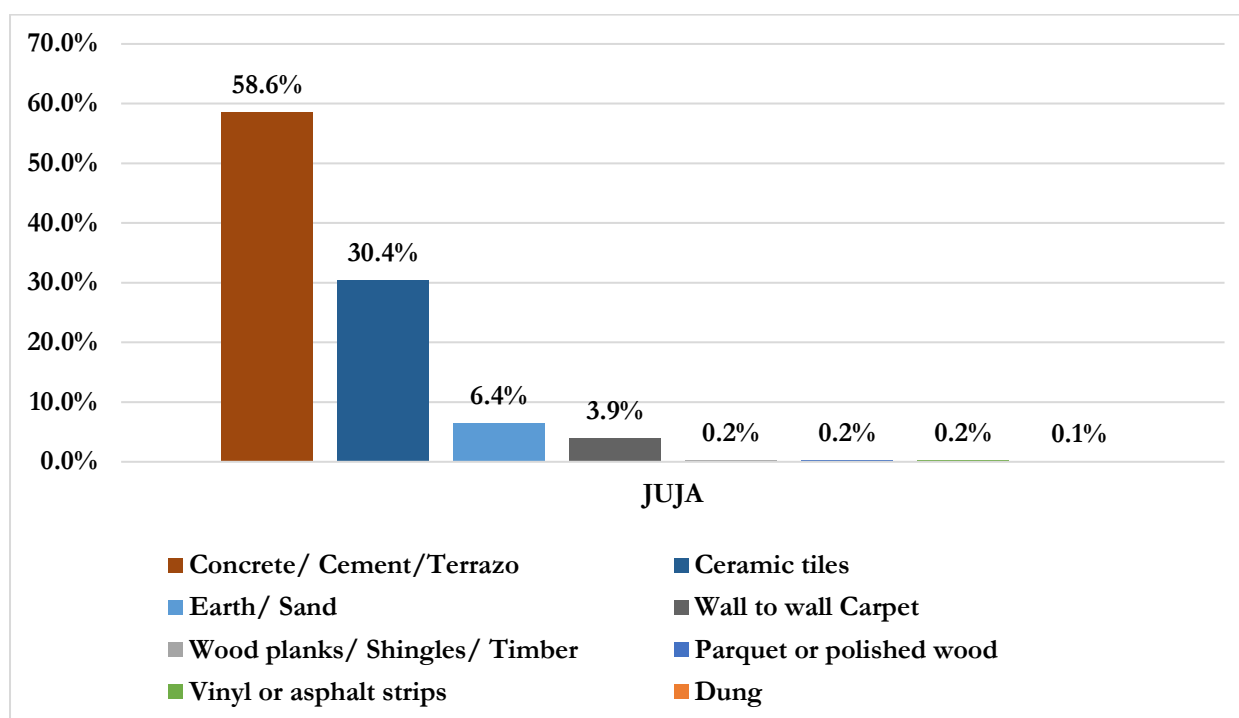


Figure 7-4: Floor construction material

Source: 2019 Kenya Population and Housing Census

7.7.5 HOUSING TENURE

According to the Kenya Housing and Population Census 2019, out of a total household count of 104,301, 70.8% of the residents live in rented housing units while 29.2% live in owned units. Figures 7-4 and 7-5 below illustrate the different modes of distribution by mode of acquisition of owned and rented/provided households.

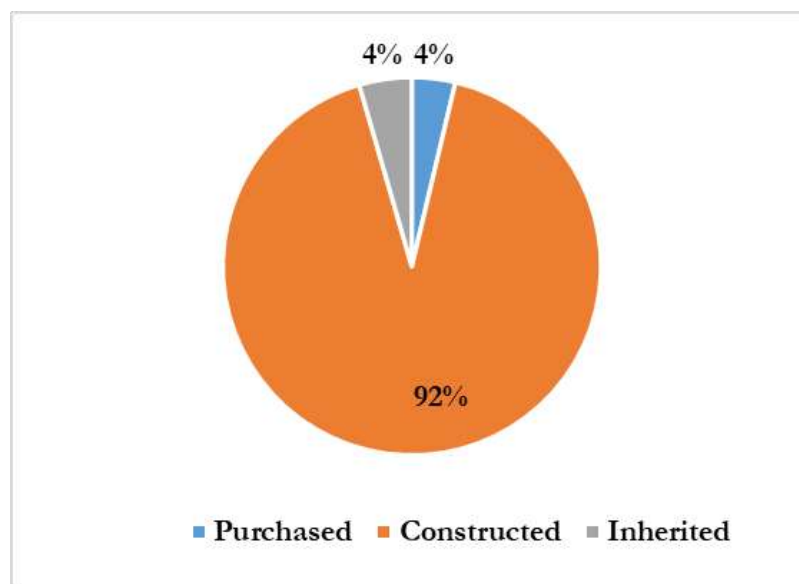


Figure 7-5: Distribution of Owned Households by Mode of Acquisition

Source: 2019 Kenya Population and Housing Census

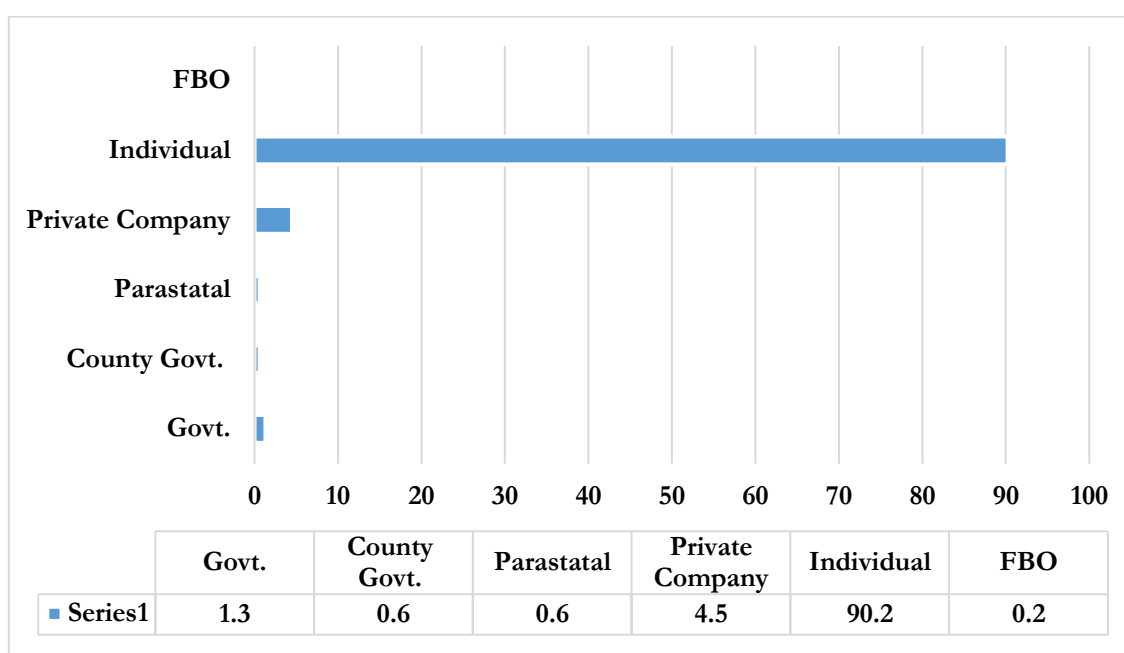


Figure 7-6: Distribution of Rented/ Provided Households (%)

Source: 2019 Kenya Population and Housing Census

7.7.6 HOUSING STOCK AND PROJECTIONS

The housing stock is derived from the 2009 Population and Housing Census Report Volume 2 page 300, which indicates that about 83% of the households had permanent houses. The stock and projections are as shown in the table below.

Table 7-3: Housing Stock and Projections into 2030

Wards	2009	2016	2018	2021	2025	2028	2030
Murera	2,638	3,658	3,801	4,017	4,309	4386	4,627
Theta	3,841	5,326	5,535	5,850	6,274	6387	6,738
Juja	5,667	7,858	8,166	8,631	9,258	9425	9,943
Witeithie	4,280	5,934	6,167	6,518	6,991	7117	7,508
Kalimoni	3,298	4,573	4,752	5,022	5,387	5484	5,786
Total	19,724	27,349	28,421	30,038	32,219	32799	34,603

Source: Based on 2009 & 2019 Population and Housing Census Report and Consultants' Estimate for 2030

The housing stock as of 2009 represents a 17% deficit given the population levels at that time. Subsequent projections are based on the total required housing units given the projected population and number of households.



Flats in Gachororo



Semi-permanent houses in Gachororo



Maisonettes at Juja South Estate



Dekoma informal settlement

Figure 7-7: Housing Typologies in Juja

Source: Field Survey, 2018

7.8 Key planning issues

Table 7-4: Key planning issues on Urban Development and Human Settlements

Sector	Key Highlights	Opportunities
Urban form, structure and morphology	- Developments tend to occur along transport corridors e.g., Kenyatta Road has witnessed rapid spatial growth due to massive land subdivision along the road; and - Lack of defined urban designs.	- Real estate investment and development; - Integrate the transit-oriented development (TOD) model to improve planning and development proposals; and - Integrate urban design principles while undertaking projects.
Urban limit and edge	The urban limits of the towns are majorly defined by existing roads and natural features like rivers.	Use the existing structuring elements in defining urban edges.

Urban-rural linkage	• The urban nodes are physically connected to the hinterlands and peri-urban areas by existing roads and functionally as they are the service areas where the latter obtain their low and high order goods.	• Existing road connections.
Human settlements	• Human settlements are intensive in nodes and along the road corridors.	• Availability of land away from main roads presents an opportunity for densification in areas like Juja Farm.
Housing	• About 90.2% of residents live in individual rented/provided housing; and • The government has contributed to only 1.3% as of 2019.	• In the spirit of the Big Four affordable housing agenda, the government may create a conducive environment where the private sector can invest in the sector and increase the housing stock; and • Government Housing Projects.

Source: VisionRI

8 PHYSICAL INFRASTRUCTURE

8.1 Overview

This chapter analyses the availability and adequacy of the physical infrastructure in the Sub-County. These include the infrastructure used in road mobility, the transmission of water, and for managing waste and stormwater.

8.2 Transportation

8.2.1 REGIONAL CONNECTIVITY

Juja is well connected to the major national trunk road A2 Thika Superhighway also known as part of the Great North Road. The road is the gateway of Kenya to Ethiopia and Somalia after joining the A3 Road. In Kenya, it links the capital city Nairobi with counties of Muranga, Kirinyaga, Nyeri, Laikipia, Isiolo and Marsabit. Map 8-1 below shows the connectivity of Juja Sub-County within the NMR context.

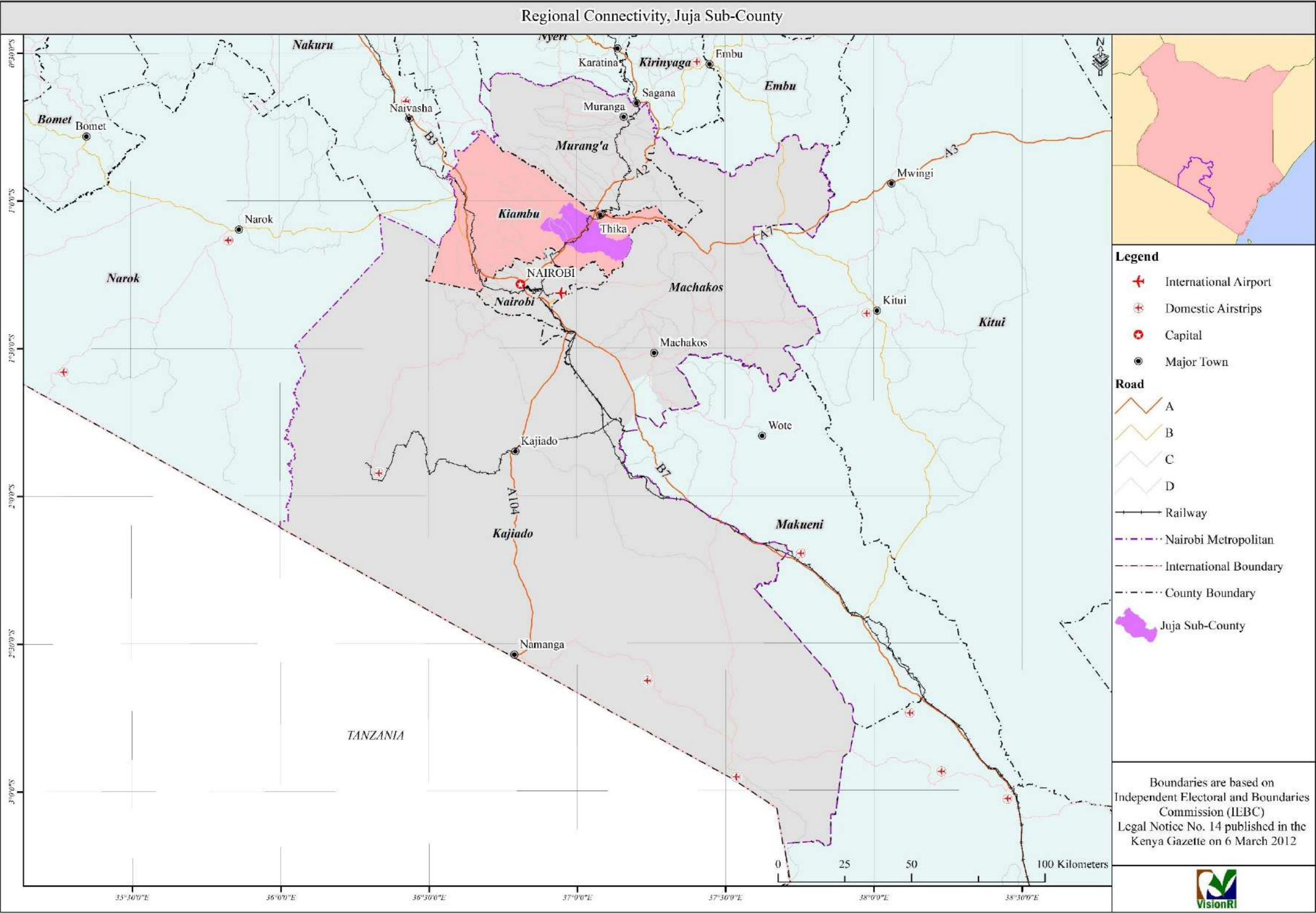
8.2.2 INTER-CONNECTIVITY AND INTRA-CONNECTIVITY

Map 8-2 below shows the other intra-county roads of lower hierarchy that connect different neighbourhoods within Juja such as Witeithie, Kenyatta Road, and Gachororo, amongst others. The condition and surface type of the various roads are indicated in Table 8-1 below.

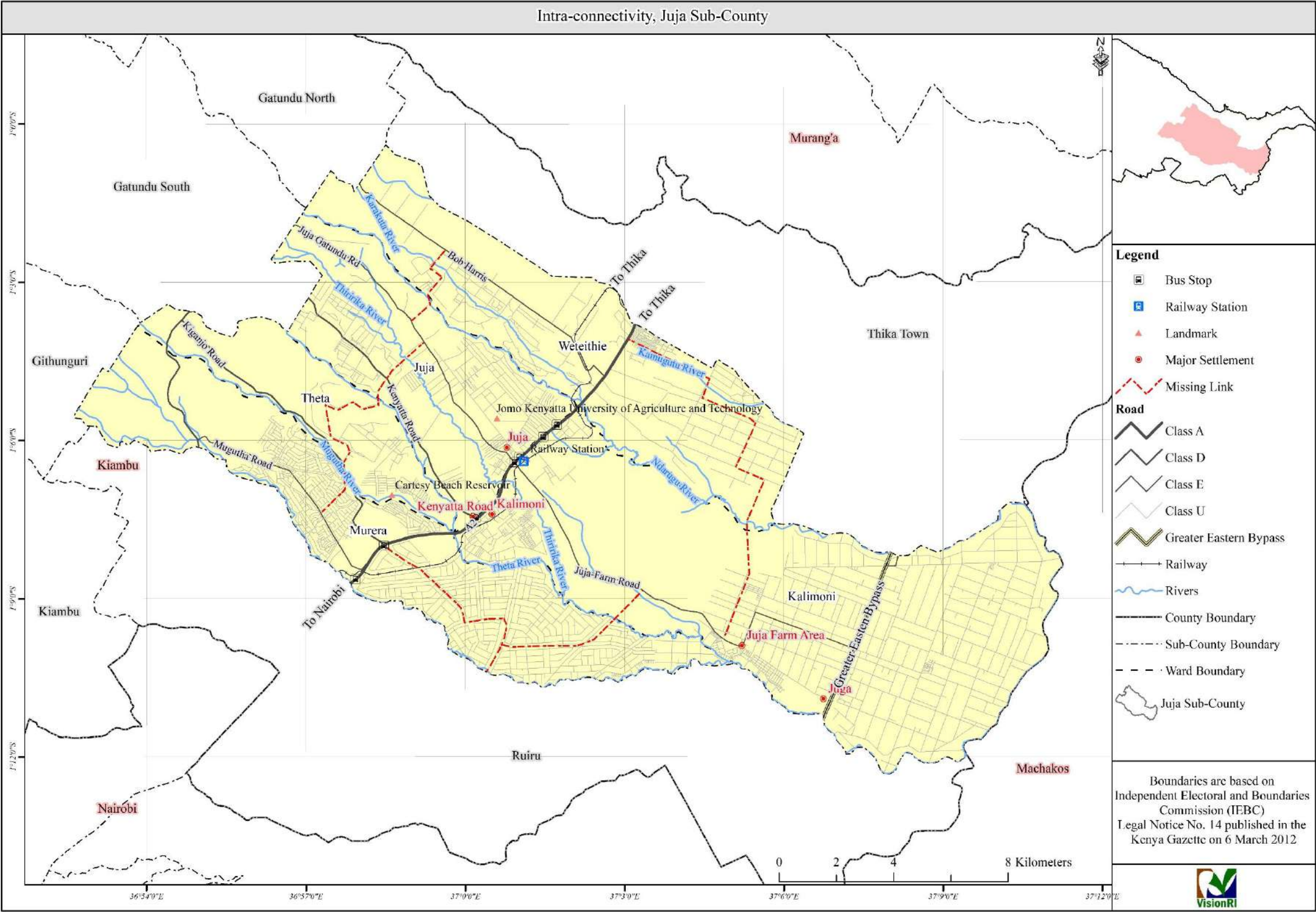
Table 8-1: Road Connectivity

Road Name	Link	Surface Type	Condition	Average daily trip Volumes (both directions)	
				NMT	MT
Kenyatta Road	A2 to Gatundu	Bituminous	Fair	503	2756
Juja - Gatundu Road	A2 (Juja) to Gatundu	Gravel	Fair	5303	4275
JKUAT Entry	A2-JKUAT	Bituminous	Good	2847	5453
Bob Halice Road	A2 to Quarry	Gravel	Fair	-	-
A-2	Nairobi to Moyale	Bituminous	Very good	-	-
Murera Road	A2 to Murera	Gravel	Fair	-	-
Kiganjo Road (D395)	A2 to Kiganjo	Bituminous	Good	-	-
Witeithie- Maraba Road	A2 to Witeithie	Gravel	Fair	-	-
Nyachaba Road	A2 to Ndarugo quarries	Gravel	Poor	-	-
Juja Farm Road	A2 to Juja Farm	Bituminous	Poor	3839	3930
Mwiga-ini Road	A2 to Mwiga-ini	Gravel	Fair	-	-

SOURCE: VisionRI



Map 8-1: Nairobi Metropolitan Region Connectivity
Source: VisionRI 2020



Map 8-2: Intra-Sub-County Connectivity

Source: Roads Department- Juja Sub-County Road Report

8.2.3 TRIP GENERATION

Juja Town is a convergence of routes within Juja Sub-County. Hosting JKUAT as well as other colleges including Dykann College, a lot of traffic is generated from the residential areas of Gachororo, Witeithie, Kenyatta Road, Thika and Ruiru. Being along a major trunk road, external traffic is generated from neighbouring counties such as Nairobi, Meru, Murang'a and Nyeri, which passes through the Sub-County.

8.2.4 MODAL SPLIT

According to the Institute of Development Studies (IDS) (2016), the modal split for Ruiru is as follows: walking 37%, matatus 36%, motorcycle 17%, cycle 7%, car 2%, 1% other (railway). This modal split will be used as representative typical trends in towns across Kiambu County, i.e., Juja, Juja, Limuru, and Kiambaa.

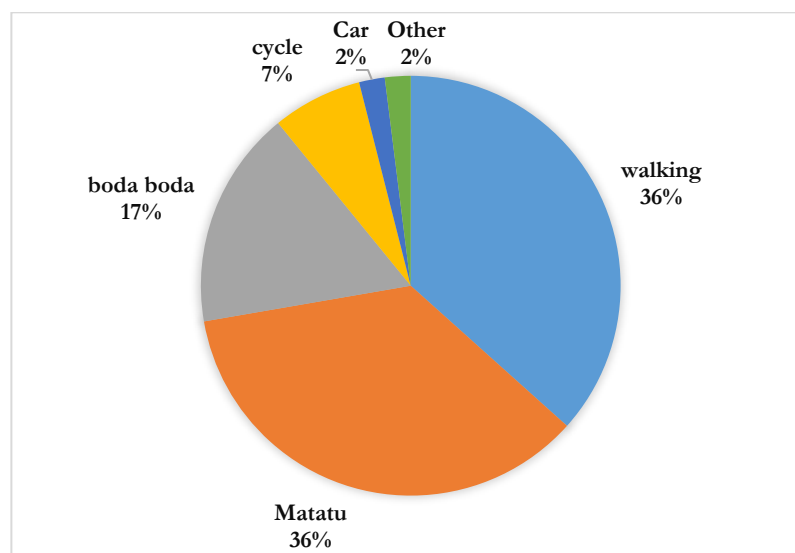


Figure 8-1: Modes of Transport

Source: Institute of Development Studies (2016)

8.2.5 MEANS OF TRANSPORT

8.2.5.1 *Non-motorised transport*

As indicated above, 43% of trips in Juja are made by walking and cycling. Unfortunately, the demand does not meet the infrastructural provision as most streets lack non-motorised transport (NMT) facilities. Where NMT facilities exist, they are in poor quality due to poor maintenance and are often encroached by vendors and parked cars. This results in a high number of pedestrians walking on the carriageway conflicting with moving cars. Additionally, there are a few safe pedestrian crossings in Juja. In some parts along Think road, they have provided a footbridge. Though usable, the footbridge is not comfortable for pregnant women, elderly, and persons carrying heavy luggage. Inadequate pedestrian crossings expose pedestrians to high risks of accidents making it unsafe especially for school-going children. Cycle lanes are completely absent

in Juja. This explains the lower number of cyclists in the area. Furthermore, there are no designated safe and secure cycle parking in Juja CBD. This makes it hard to secure bicycles in town.



Figure 8-2: Photo showing heavy pedestrian movement in Juja Town

Source: Field Survey 2019



Figure 8-3: Poorly maintained footpath in Juja (Left). Footpath and a footbridge along Thika Super Highway (Right)

Source: Field Survey 2019

8.2.5.2 Motorised Transport

Public Transport

After walking, public transport is the second most commonly used transport mode in Juja. Public transport is largely provided by privately owned minibuses and buses known as matatus. The National Transport

Safety Authority (NTSA) has registered over three matatu savings and credit cooperative organisations (SACCOs) in Juja Sub-County. These SACCOs have approximately 200 vehicles with the majority being 14-seater matatus. The matatus ply routes within Kiambu County to areas such as Juja Farm, Gatundu, Kenyatta road as well as the neighbouring county of Nairobi. Juja lacks a designated bus park and hence matatus are forced to operate along the service lanes of A2-Thika Superhighway. This leads to traffic congestion and increased conflict with pedestrians as some of the matatus park on pedestrian footpaths as they await passengers.

The matatus are demand-driven and this is seen in their fierce competition for the customers. At the terminal, the matatu only departs when all seats are full. This inconveniences majority of passengers waiting for public transport at the intermediary stages. Fares are not regulated and often increase by some percentage during peak hours.



Figure 8-4: Photo showing Juja Town stage ostensibly as a bus park

Source: Field Survey 2019

Boda Bodas

They serve short trips within town centres and improve last-mile connectivity to public transport and paratransit. According to the County Government of Kiambu, Juja Sub-County has the highest number of boda bodas within the county comprising of approximately 8,425. The high number can be attributed to inadequate public transport within Juja Sub-County due to poor connectivity and poor road conditions.

Motorcycle boda bodas operate from 'stands' within the Juja CBD, in residential areas, trading centres, at commercial centres and passenger service stops along main and minor roads. The stands are manned by informal stage managers. The operators typically pay a stage fee ranging from Kshs. 250-350 per month.

There are two types of operating structures which are dependent on a 'stand': compete for clients or queue and go in turns. The boda boda is organised in SACCOs and are largely regulated by NTSA. The prices are not fixed and are dependent on the distance covered and operator. There is a growing use of technology in the area such as Uber boda bodas, Safe Boda, Bolt, etc.



Figure 8-5: Boda boda operators operating next to the bus stop in Juja Town

Source: Field Survey 2019

Taxis

Taxis provide door-to-door services without intermediate stops. They serve short trips within town centres and improve last-mile connectivity to public transport. The taxi operators have adopted modern taxi service technologies such as Uber, Little Cab and Taxify. They are mainly registered and regulated in SACCOs under the County Government.

Parking

Parking in Juja is largely unregulated. Most streets in Juja Town lack any physical definition of space for different street uses, such as pedestrian movement, vending and parking. Parking in the CBD is mainly through undesignated areas along the roads. Since parking rules are not defined, enforcement is arbitrary, and many vehicles elude parking fees. Parking management has centred on raising revenue for the local authority while keeping fees low in an attempt to make the town centre attractive for visitors. As a result, there many incidents of double parking as well as encroachment into pedestrian facilities. Less attention has been paid to the potential role of parking in managing travel demand.

Currently, the County Government charges parking fees, and the revenue is collected by parking attendants who are also mandated to ensure that drivers follow parking regulations on public streets, and that parked vehicles have paid the necessary parking fees. Attendants use point-of-sale (POS) terminals to record the

vehicle number plate and issue a parking receipt to be displayed on a vehicle. However, the system is not capable of verifying the payment status of a vehicle or issuing fines.

Railway:

The railway branch-line to Central Kenya passes through Juja. However, it does not serve local transport as there is no station within the Sub-County. The Nairobi Commuter Rail Development Master Plan proposes a commuter rail network, which will be developed within the existing railway corridors to provide commuter rail services between Nairobi Railway Station and Ruiru.



Figure 8-6: Railway line in Juja Town

Source: Field Survey 2020

8.2.6 TRAVEL DEMAND

Without significant improvements in public transport and walking and cycling networks to cater to the growing travel demand, the general trend of increasing car ownership is bound to continue. According to the Master Plan for Nairobi, the city experiences a 5% annual growth in car ownership⁴. Considering that Kiambu County is a dormitory for Nairobi city, it may be assumed that the trend in Kiambu is similar to

⁴ JICA 2014, Integrated urban development masterplan for Nairobi City County

<https://www.jica.go.jp/english/news/field/2015/c8h0vm0000966zqy-att/c8h0vm0000966zvu.pdf>

Nairobi City County. Using the modal split of as representative of the typical trends in towns across Kiambu together with population and car growth forecasts, simple modal share predictions to glean potential impacts of shifting transport investment priorities to more sustainable modes can be made as shown in the chart below:

Table 8-2: Transport mode shares under three scenarios

Mode	2016	2030
Walk	37%	40%
Cycle	7%	10%
Public transport (Matatus + city Bus + BRT)	36%	40%
Motorcycle	17%	5%
Private car	2%	3%
Other/tuk tuks,	1%	2%
Total	100%	100%

Source: VisionRI

Under the sustainable mode, the scenario is made with an assumption that the proposed bus rapid transit (BRT) system in Nairobi and part of Kiambu county, as well as investment in NMT facilities, will be implemented by 2030 increasing the ridership of public transport, walking and cycling hence reducing the ridership in the use of private cars.

8.3 Water

The main sources of water in Juja Sub-County are:

- Rivers (Ndarugo and Thirika rivers);
- Boreholes;
- Piped water provided by Kiambu County Water and Sewerage Company;
- Rainwater;
- Kariaini Dam (see figure); and
- Nairobi City Water and Sewerage Company through Ngethu pipeline (480 m³/day)

8.3.1 WATER SUPPLY INFRASTRUCTURE IN JUJA SUB-COUNTY

Juja Sub-County is served by the Ruiru/Juja Water and Sewerage Company (RUJWASCO) which was established as a private company under the Companies Act, Cap 486. It is wholly owned by the Kiambu County and services both Ruiru and Juja Sub-Counties.



Figure 8-7: Kariaini Dam in Juja Farm

Source: Field survey, 2018

According to the Water Resources Authority (WRA), the water supply deficit in the Sub-County based on 2009 population is 4,240 m³ which has increased to 18,983 m³ in 2019 per day given that the current supply is 7,500 m³ per day.

Table 8-3: Water Supply and Demand Sources within the Sub-County in 2019 per day

Scheme	Water Resource	Component	Status
Juja water supply Supply -7,500m ³ /day Current demand 12,000m ³ /day. Demand deficit 4,500m ³ /day	Juja water supply - Ndarugu River	Source	Ndarugu river abstraction right 6,000m ³ /day.
		Treatment works	Design capacity of treatment works is 6,000m ³ /day. Current production/utilisation is 7,500m ³ per day.
		Treatment type	2 treatment plants: Full conventional treatment, composite filtration units.
		Pumping	6 sets of high lift pumping units: 250m ³ /h, 63m ³ /h, all operational.
		Rising main	2.5 km DN 315mm-225mm ferrous iron and PVC pipeline.
		Storage	450 m ³ storage at the treatment plant.
		Distribution	106 km assorted sizes of pipelines.

Source: Integrated Strategic Urban Development Plans for Ruiru and Juja Water Company Areas

In addition, water vending is also common in areas where there are no connections, and human carts are used as a major mode of transportation. In order to enhance water supply, the Kiambu Water and Sewerage Company (KIWASCO) plans to extend water connection to unserved areas of Juja Farm; Matangini; Komo; Tora; Nyacaba and Hakairu. A feasibility study will also be carried out to determine other urgent areas which require connections.



Figure 8-8: Water Vendors at Nyacaba centre

Source: Field Survey, 2018

During the field survey, it was established that areas such as Nyacaba and Juja Farm are water-scarce. Most residents in these areas rely on water vendors for potable water. According to Kiambu County Spatial Plan, these areas have been identified as suitable for construction of water pans and dams.

8.3.2 DISTRIBUTION

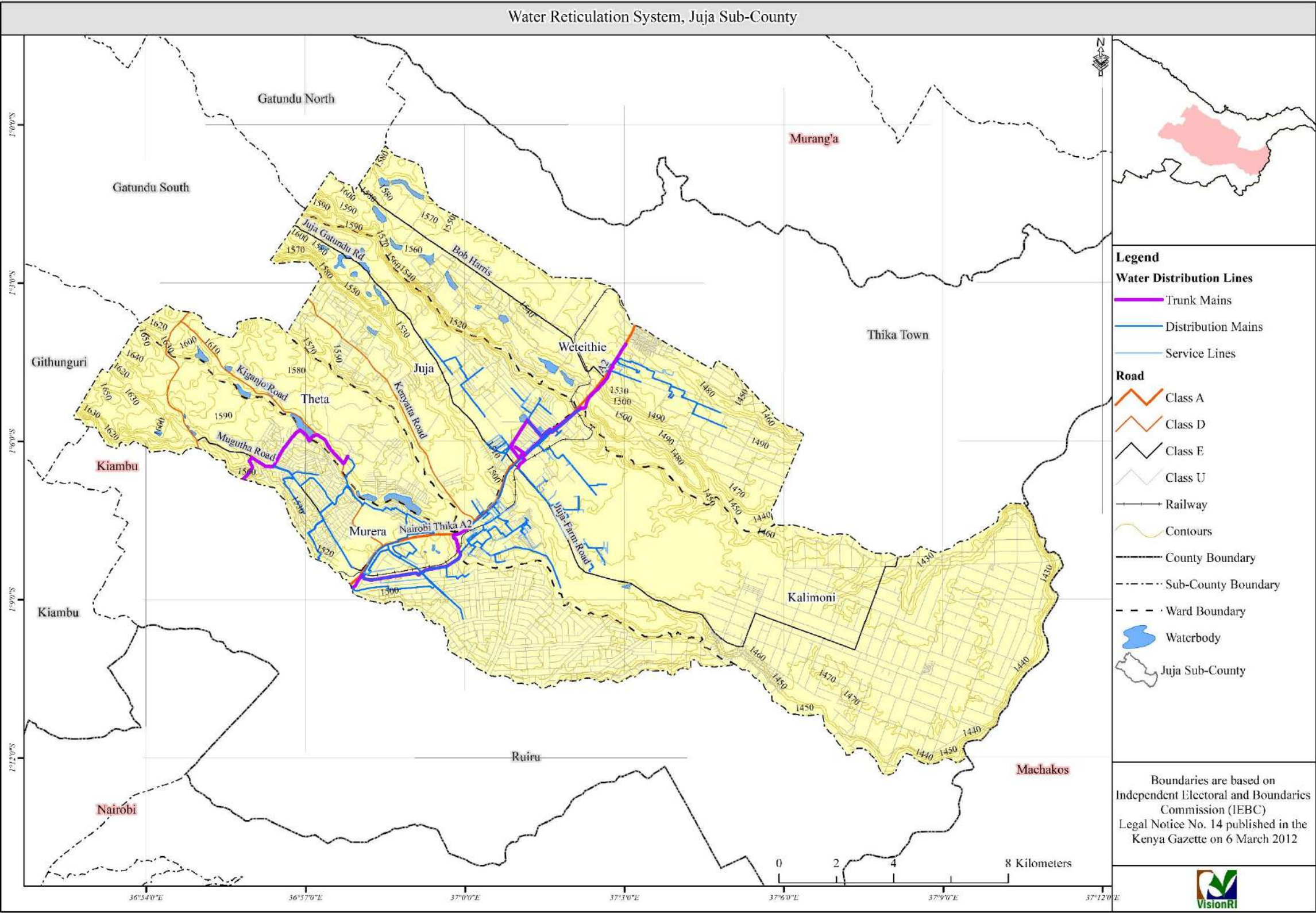
During the interview with the water company's Managing Director, it was found that only 30% of the Sub-County is currently connected to their water service. These areas are experiencing illegal connections and significant water losses. According to Kiambu County Water and Sewerage Company, the underserved areas which require consideration include Juja Farm within Kalimoni ward, Nyacaba area, Matangini area, Komo, and Tora area.

Map 8-5 below shows the water reticulation system within Juja Sub-County.

8.3.3 DEMAND AND SUPPLY

RUJWASCO operates two main water supply systems in Ruiru and Juja, with a combined production capacity of 24,000 m³/day. Juja water supply system produces 7,500 m³/day of treated water. The total area of water supply coverage as provided by the Water Services Regulatory Board (WASREB) is 528 km² and water coverage is at 70%.

The company is currently connected to 2,000 households and institutions. Water demand over the plan period is based on analysis of the current consumption patterns in the planning area, observed patterns in the County as well as the projected changes in demographic patterns. According to Water Design Manual for Water Supply in Kenya (2005), for design purposes domestic water demand is estimated at 250, 150, 75, and 30 litres per capita per day (l/c/d) for high, medium, low cost, and peri-urban settlements. However, WHO (1978) recommends a global rate of 65 l/c/day for planning purposes



According to the Ministry of Water and Irrigation's (MWI) design manual guidelines, an average figure of 100 l/c/day* is used to derive global water demand for the planning area.

Table 8-4: Water demand and deficit within the Sub-County

Scheme	Supply (m ³ /day)	Demand (m ³ /day)	Deficit (m ³ /day)
Juja water supply	7,500	26,483	18,983

Source: Integrated Strategic Urban Development Plans for Ruiru and Juja Water Company Areas

The projected water demand for the Sub-County will not be met if the current water production is maintained. The current water production capacity is 10,980 m³ per day. There is a need to expand the existing water supply coverage and explore other means to meet the demand such as drilling boreholes and employing water harvesting techniques.

According to the MWI's Water Design Manual for Water Supply in Kenya (2005) published by the, approximately 70-80% of water demand is translated into wastewater. Hence, appropriate channels should be put in place to convey wastewater into the existing wastewater treatment plants. The Sub-County is not well-served by a sewer trunk system. The area around Witeithie is covered with the ongoing construction of sewer trunk in Kiambu County but the connection has had not yet be made.

8.4 Waste Management

8.4.1 SOLID WASTE MANAGEMENT

Solid waste management in Juja Sub-County remains a major challenge. This is characterised by the disposal of solid waste in undesignated areas such as road reserves open spaces, abandoned quarries and water bodies.

The County Government of Kiambu, which has the responsibility of waste collection and disposal, is understaffed and lacks adequate facilities to collect waste. According to records at the County Department of Water, Environment, Energy and Natural Resources, Juja Sub-County has one environmental officer, 33 support staff, two garbage trucks, one skip and one chaff cutter. Serving a population of 300,948, there is thus need for private sector support in solid waste management. As per the county records, there are only eight licensed private waste collectors in Juja Sub-County. Most residents contract private garbage collecting companies who are not licensed by the County.

The County is in the process of ensuring that all the waste in Juja will be collected and disposed at the new Kang'oki landfill site in Thika. The landfill operates with the modern Fukuoka method which refers to

mechanisms where leachate (wastewater) is quickly removed from waste materials, allowing for faster decomposition and reduction of methane gas production. However, effective collection systems such as waste bins at the household level; transfer stations at strategic locations, and community awareness are yet to be implemented.

During the field survey, it was observed that residents dispose of their waste in open spaces, riparian, areas and along the roadside. Other modes of solid waste disposal in the Sub-County include garbage pits, burning and turning organic waste into manure for farm gardens. Stakeholders raised this as a serious environmental concern that should be addressed during the implementation of proposed urban plans. Participants in the focused group discussions mentioned the following:

“There are various environmental concerns in the Sub-County such as poor waste disposal, pollution of rivers and wetlands, quarrying activities, traffic congestion at Juja bus stage, sprawling of informal settlements, and lack of proper zoning of towns hence the growth of unplanned structures (Juja FGD 1).”

According to the 2019 Kenya Population and Housing Census, the distribution of the various modes of solid waste disposal from 104,042 conventional households in the Sub-County is illustrated in the chart below:

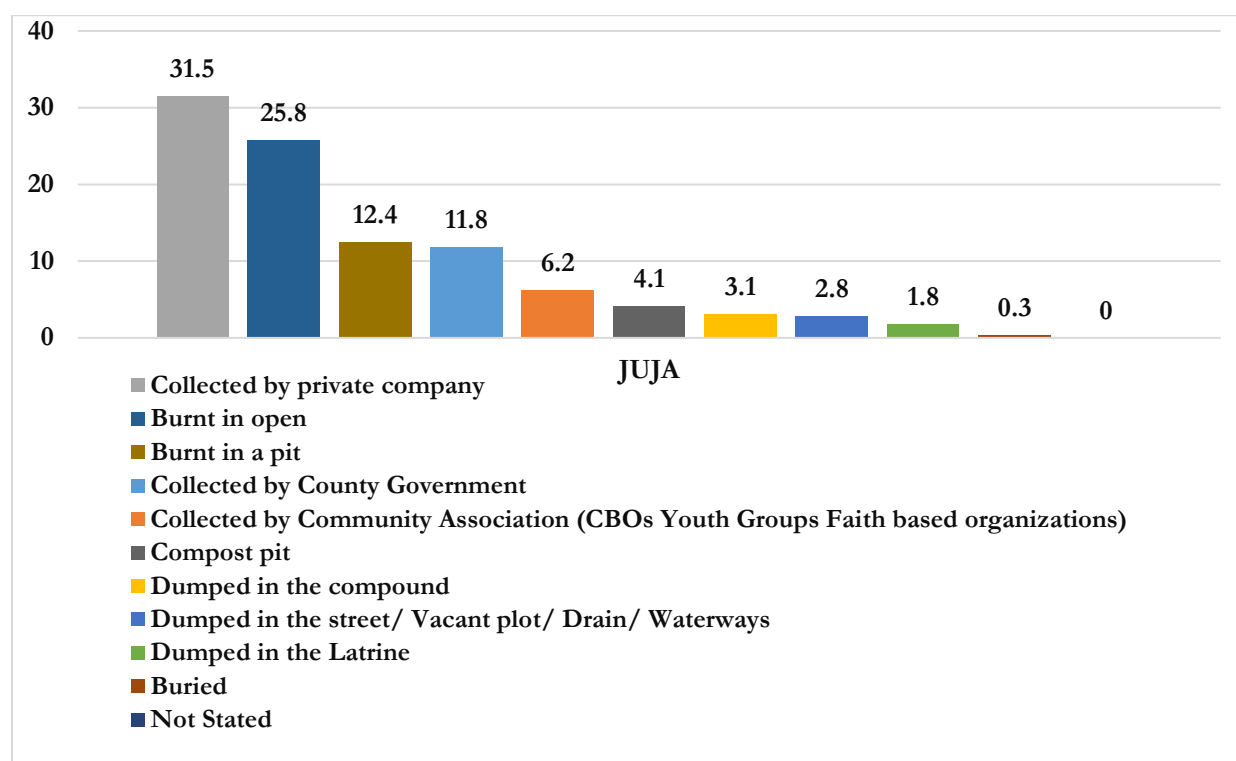


Figure 8-9: Mode of Solid Waste Disposal

Source: Kenya Housing and Population Census 2019

The problem of solid waste management in Juja Sub-County may be through efficient collection, segregation, recycling, and reuse. The service collection area may also be expanded to eliminate dumping of wastes in open spaces and along riverbanks.

8.4.1.1 Types and Source

Solid waste in Juja Sub-County emanates from the following sources:

- i. **Domestic waste:** This emanates from household activities and contains food remains, dirt from sweeping, clearing of obsolete/unwanted clothing, utensils, furniture, or other materials. Other household activities that produce domestic waste are gardening and disposal of packaging and reading materials. The category may contain hazardous waste such as paint cans, plastics, radioactive wastes, and perfume cans.
- ii. **Commercial waste:** This emanates from shops, retail stores, service stations, entertainment centres, offices, restaurants, and hotels as well as markets. The waste comprises of packaging materials, office supplies, food waste, as well as hazardous components such as contaminated hazardous materials, radioactive elements, corrosive, and combustible wastes.
- iii. **Municipal waste:** This includes street waste from street sweeping, spilt loads, animal manure, and dead animals. Street waste may also comprise both commercial and domestic waste, especially where waste collection from these two sources is poor. Other categories of municipal waste include waste from markets, landscaping, and parks as well as junk and train waste.
- iv. **Institutional waste:** This includes waste from schools, government offices, hospitals, prisons, and other institutions. Waste from hospitals constitutes infectious and hazardous materials. Most hospitals in the Sub-County have their waste management strategies.
- v. **Industrial waste:** This comes from processing and non-processing industries. Industrial waste constitutes manufacturing wastes, construction and demolition wastes as well as food and chemical wastes.
- vi. **Agricultural waste:** This emanates from animal and crop husbandry such as manure and crop remain. It may constitute of hazardous wastes such as chemical containers.

8.4.1.2 Volumes of waste produced

Solid waste in Juja consists of 80% food and other organic wastes, 10% plastics, 2% metal and glass, and 3% mixed refuse. Solid waste production is less than 0.5 kg/person/day and the average household population is size people. The waste contains a low level of toxic substances. Majority of the households produce less than 3 kg per day, which translates to less than 0.5 kg/person/day. The table below shows the solid waste generation projections for Juja Sub-County.

Table 8-5: Solid waste generation projection for Juja Sub-County

	2019	2022	2025	2028	2030
Population	300,948	321,250	342,923	366,057	478,130
Waste generated (tons)	195,616	208,813	222,900	237,937	24,852,165

Source: VisionRI

The County Department of Water, Environment, Energy and Natural Resources conducted a baseline survey on the industrial waste that revealed that some factories had not been paying waste tipping charges and consequently, the County had been losing a substantial amount of revenue. To address this, the department initiated a regulatory mechanism whereby industries and factories must provide the following before the issuance of a business permit:

- A copy of a valid license to transport waste for the current year, issued by the County Government;
- A copy of the logbook of the licensed waste transporting vehicle; and
- Invoices/receipts issued by the licensed waste transporter, as tracing documents on waste.

**Figure 8-10: Poor solid waste disposal mechanism**

Source: Field Survey, 2018

8.4.2 LIQUID WASTE MANAGEMENT

From the information obtained from RUJWASCO, about 2,640 households are connected to a public sewer which is 16% of the sewerage connection. The rest of the population which is 84 % disposes of their liquid waste through onsite sanitation technologies (pit latrines, soak pits, etc).

According to the 2019 Kenya Population and Housing Census, the use of covered pit latrine is the most common mode of human waste disposal in Juja Sub-County with about 35.9% of residents using it. On the other hand, about 35.2% of households dispose of waste using septic tanks while 17.2 % use VIP latrines. The percentage distribution of the various modes is illustrated below:

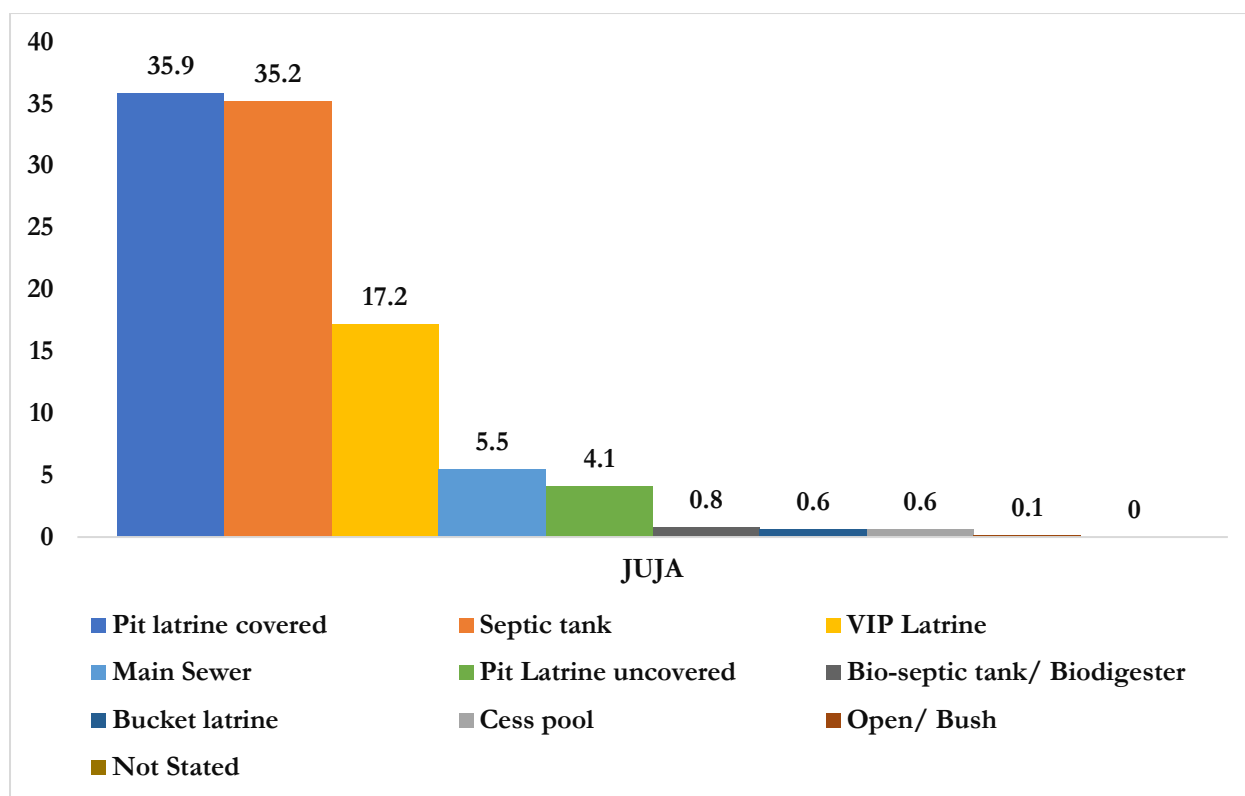


Figure 8-11: Modes of Human waste disposal

Source: 2019 Kenya Population and Housing Census

There are three main sources of liquid waste in Juja Sub-County. These are residential, commercial, and agro-industries. Stormwater is also a source of liquid waste. Liquid waste from domestic sources can be classified as blackwater, which contains excreta, and greywater, which does not. The table below shows the liquid waste generation projection for Juja Sub-County.

Table 8-6: Liquid waste generation projection for Juja Sub County

	Year				
	2019	2022	2025	2028	2030
Population	300,948	321,250	342,923	366,057	478,130
Quantity of wastewater in litres	1,805,688	1,927,500	2,057,538	2,196,342	2,294,046
Assumptions:					
1 person uses a minimum of 7.5 litres a day; and - About 80% of the water used results in wastewater.					

Source: VisionRI

8.4.3 DISPOSAL MECHANISMS AND MANAGEMENT

Juja Sub-County has benefited from the ongoing construction of the sewerage system within Kiambu County. The project under the Juja-Thika South project is being funded by GoK in collaboration with the World Bank. There are four main trunks being done in Juja Sub-County namely: Theta, Thiririka, Mugutha and the main interceptor trunk. The works that will be executed in the Sub-County in accordance with the construction contract are presented in the table below.

Table 8-7: Sanitation works specifications for Juja Sub-County

Trunk	Length
Mugutha River TS DN450/350 mm	4 km
Theta River TS DN 525/450 mm	6.3 km
Thiririka TS DN 525/450 mm	8.7 km
Interceptor TS DN 750 mm	4.3 km
Reticulation for Juja	21.9 km

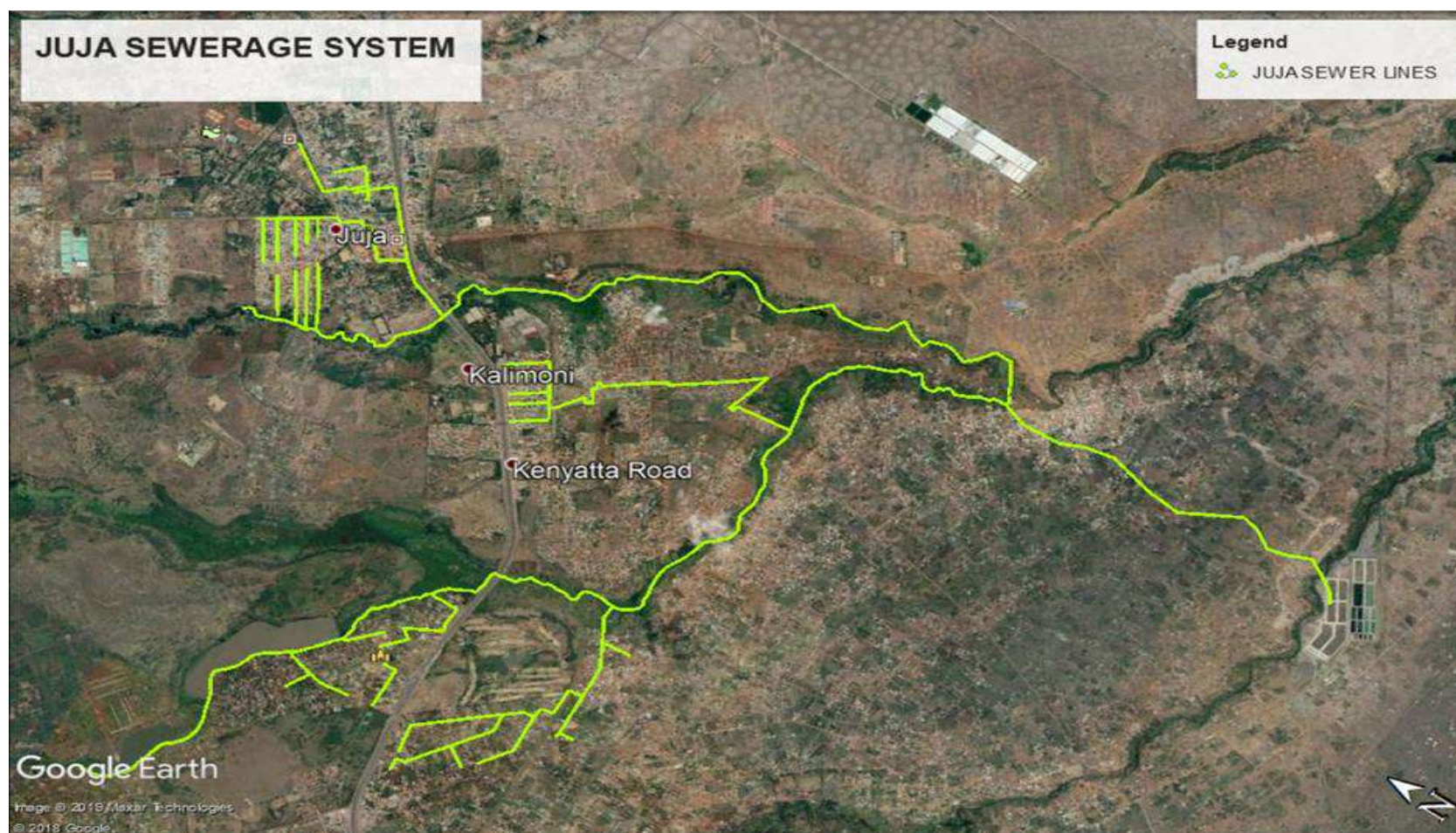
The system comprises of a wastewater treatment plant designed for 10,500 m³/day and sewer collection network of 45 km serving the following areas: Mugutha, Kenyatta Road, Juja CBD and Murera areas. Map 8-4 below indicates the Juja sewerage reticulation map.

Despite the above project, the majority of the residents are not connected to the public sewer system which has resulted to discharge of dirty water on road reserves and drainage systems. Other modes of waste liquid disposal within the Sub-County include septic tanks and Pit latrines. This has led to the pollution of major rivers such as Ndarugo, Thiririka, Ruiru, Athi, and Theta.

KIWASCO intends to extend the sewer systems to Matangini and Hakairu areas. During the interview with the Managing Director of KIWASCO, it was established that a high percentage of development have not yet connected to the main sewer.

The key planning issues are:

- High percentage of developments are not connected to the main sewer line;
- The upcoming urban nodes are not served with sewer line systems; and
- Waste generation has been increasing due to industrial and population growth in Thika Municipality.



Map 8-4: Juja Sub-County sewerage reticulation map

Source: RUJWASCO (Adapted from Google Earth)

8.5 Storm Water Management

There are existing drainage channels which are in a very poor state in the major centres of the Sub-County such as Juja and Witeithie. Most stormwater drainage channels are clogged with solid waste. Proposed developments in Juja may be designed to provide for internal drains to collect surface run-off and safely dispose to the area drainage system. Areas that are poorly drained and prone to flooding are Murera, Muigai-Inn (Rurii), Juja police station area, High point, Juja Farm and Mirimaini.



Figure 8-12: Poor stormwater drainage systems in Witeithie

Source: Field Survey 2018

8.5.1 EMERGING ISSUES

The key planning issue identified was that well-articulated stormwater drains are missing in major areas in the Sub-County.

8.6 Energy Infrastructure

8.6.1 SOURCES OF ENERGY

Kenya's total power generation in 2015 was 2,295 MW that was generated by 42 power plants. These were from Geothermal 593 MW, Hydro 827 MW, and wind 26 MW, Fuel oil 751 MW, Biomass 38 MW, and Gas turbine 60 MW. By 2020, Power Africa's report shows an increase of 45% power generation from 85 plants

installed. This is envisaged as follows: Geothermal 1,984 MW, Hydro 921 MW, and wind 786 MW, Fuel oil 751 MW, Solar 430 MW, Biomass 108 MW and Gas turbine 60 MW.

In Juja Sub-County, the main source for energy for lighting, industrial and commercial purposes is provided by Kenya Power and Lighting Company (KPLC). The main sources of energy in Juja Sub-County are summarised in the table below:

Table 8-8: Main Sources of Energy

Cooking	%	Lighting	%
Gas -LPG	73.3%	Mains Electricity	91.2%
Charcoal	2.1%	Pressure lamp	0.1%
Kerosene	13.5%	Solar Panels	2.3%
Firewood	9.7%	Lantern	2.4%
Electricity	0.9%	Tin Lamp	1.6%
Biogas	0.4%	Torch/Spotlight-Solar Charged	0.4%
Solar	0%	Candle	1.5%

Source: Kenya Power

Electricity in the area is supplied by Kenya Power. There is a power substation within the Juja and Witeithie areas that supplies electricity within Juja and its environs. About 47.3% of consumers in the Sub-County are within the power grid and have been connected. However, the percentage is lower in the rural areas while in urban areas the connection is almost 90%. Map 8-5 shows the power network within Juja Sub-County.

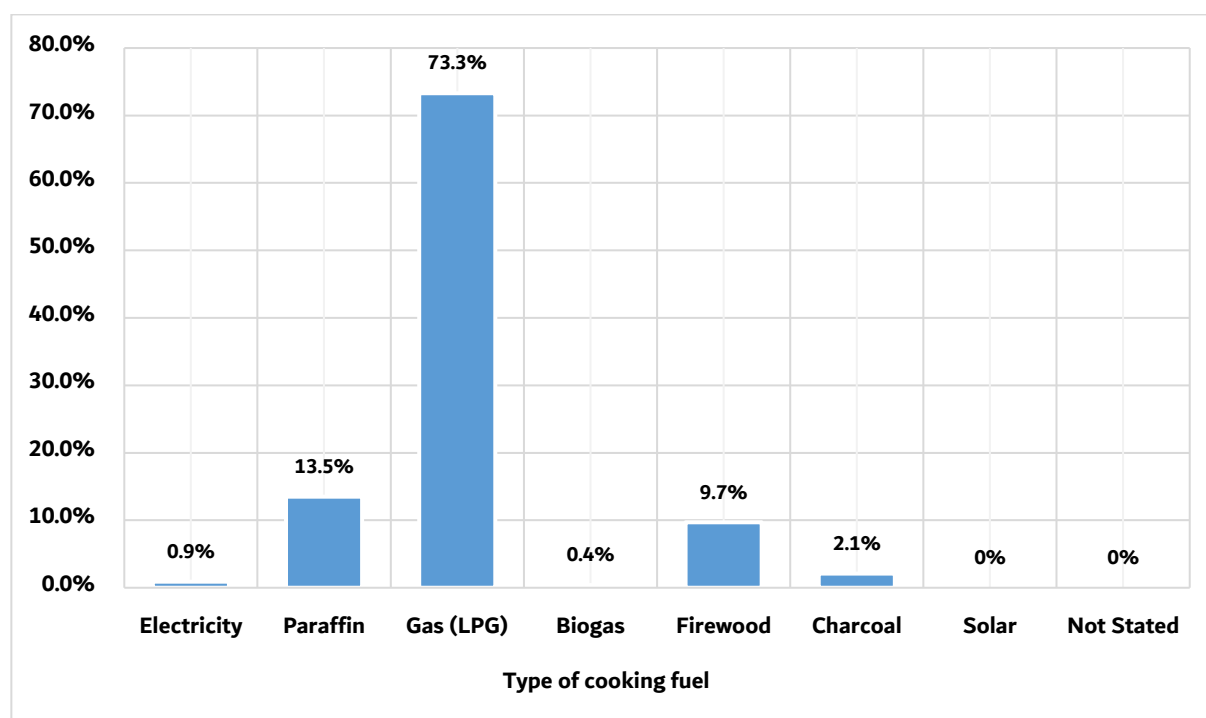


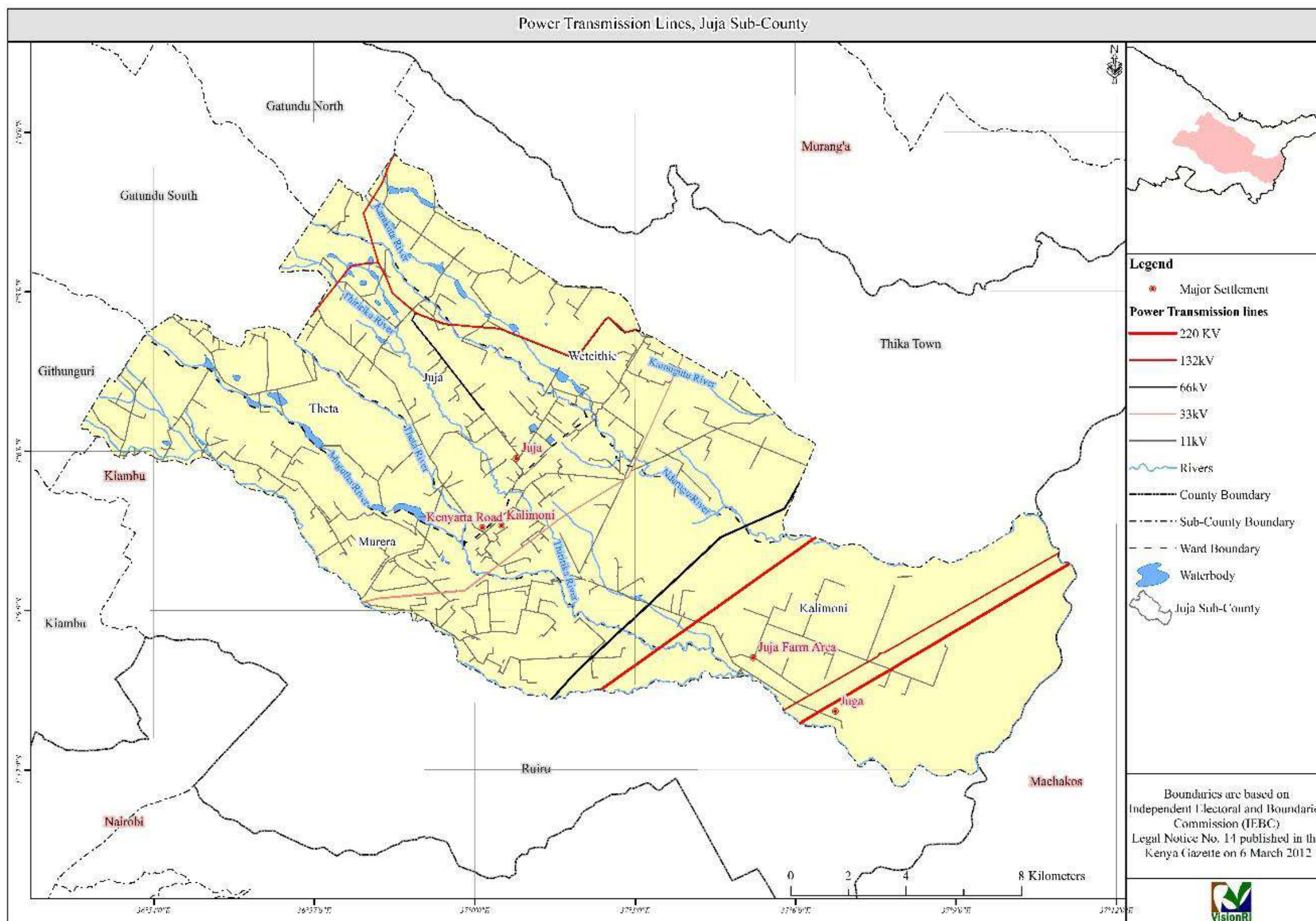
Figure 8-13: Types of cooking fuel

Source: 2019 Kenya Population and Housing Census



Figure 8-14: Power Sub Station and Electricity Distribution Lines at Witeithie

Source: Field Survey 2018



Map 8-5: Juja Power Connection Network

Source: Kenya Power and Lightening Company (KPLC)

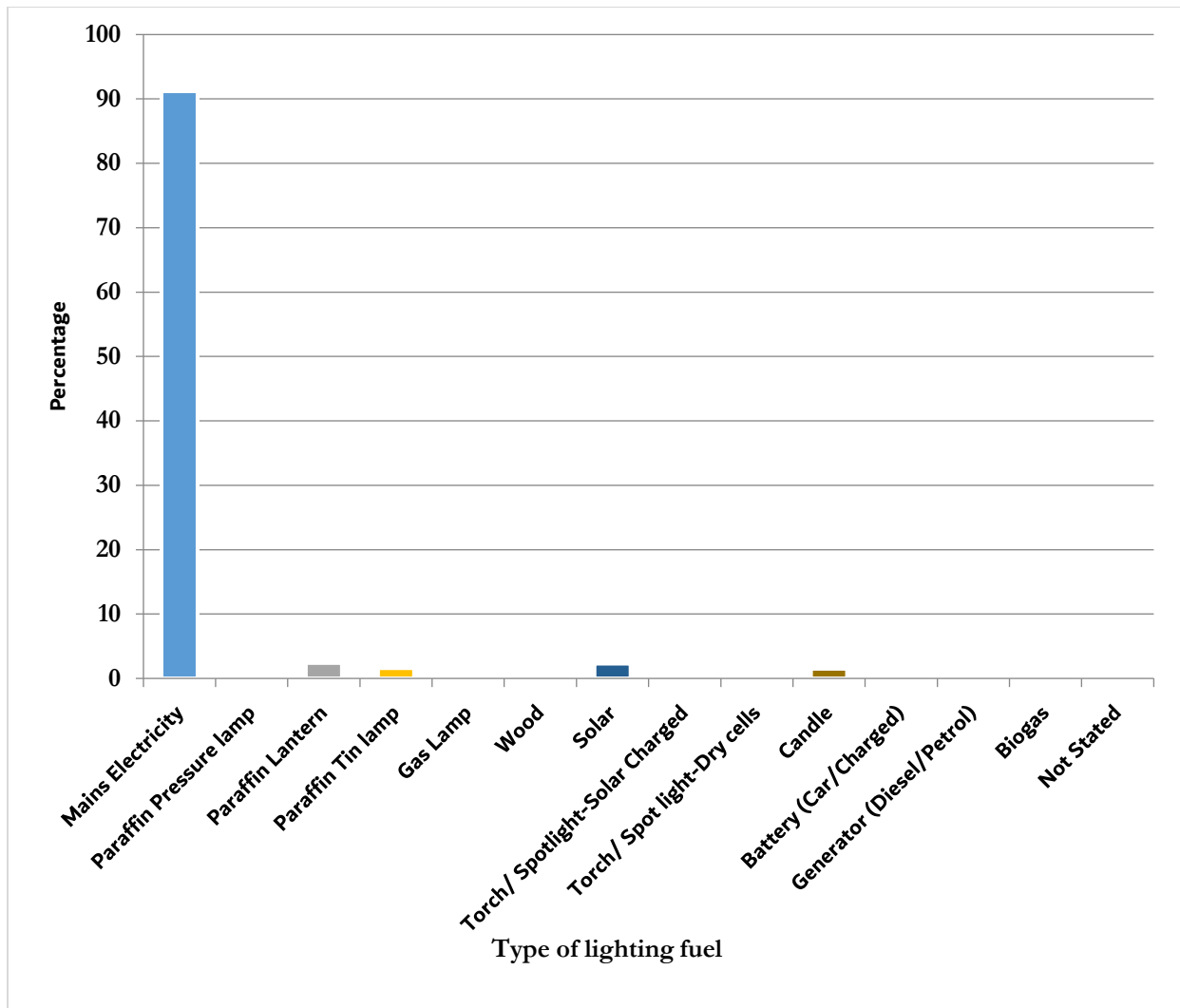


Figure 8-15: Types of lighting fuel

Source: 2019 Kenya Population and Housing Census

8.6.1 KEY PLANNING ISSUES

- Installation of streetlights in Juja Town and within local centres;
- Solar energy harnessing in Juja Farm;
- Enforcing the Energy Regulatory Commission's regulations on renewable energy;
- Promoting the use of renewable energy; and
- Promoting last-mile household connection.

8.7 Information and Communications Technology (ICT)

Juja is well served by ICT infrastructures such as mobile phone service providers including, Safaricom, Airtel, Telkom Equitel and others. This has increased access to services like mobile money transfer, e-commerce, e-banking and internet services. This has created business and employment opportunities in cybercafés, Mpesa shops and other related services. The Sub-County also enjoy the presence of JKUAT's ICT centre, which is located in Juja Town. Juja Sub-County is a potential centre for innovation in ICT. Other ICT infrastructure in the Sub-County includes:

- **Television and radio transmission stations:** Various national and local television and radio stations are broadcasted in the area.
- **Internet:** Internet use is evident due to numerous cybercafés, local internet service providers, and computer learning institutions. Institutions such as JKUAT are using Wi-Fi. The main internet service providers include Zuku, Access Kenya, Safaricom, Airtel and Telkom. In addition, fibre optic cables have been laid in Juja town.
- **Postal service:** Kenya Postal Service has a functioning Post Office Juja Town. However, the facility is facing stiff competition from other means of communication such as mobile phones, internet, and courier services.

8.8 Emerging Issues

Table 8-9: Key planning issues on Physical Infrastructure

	Key planning Issue	Opportunities
Water	• Inadequate water supply to meet the current demand.	• Presence of rivers and groundwater sources.
	• Unaccounted-for-water (UFW) due to aged supply network.	• Availability of modern technology to monitor UFW.
	• Interruption of water supply due to the breakdown of motors and pumps used in boreholes.	
	• High operational costs due to vandalism and theft of equipment/trucks; • Inadequate human, machinery and equipment resources; • Lack of enforcement and surveillance support; • Informal structures on the reserves of the stormwater drain, green spaces and roads; • Land grabbing and encroachment; • More than 50% of the Sub-County is underserved by main water supply lines;	• Additional water sources to be developed for future and ultimate water demand; • Measures should be put in place to curb the high UFW; • Explore the possibility of using alternative power sources e.g., solar power to lower power bills; • Use of "Nyumba Kumi" initiative to curb water infrastructure vandalism;

	• Illegal connection along the main water supply lines; • The Sub-County has not yet fully embraced water harvesting techniques; • Lack of adequate household awareness on the importance of water conservation and wastewater recycling; and • Water scarcity in the area such as Nyacaba and Juja Farm.	• Recruitment of staff and procurement of equipment; • Establish strong enforcement and surveillance systems; • Demolish informal structures; and • Reclaim grabbed/encroached land; and • Sensitize community on proper waste management.
Transportation	• Congestion at the Juja flyover • Inefficiencies in the provision of NMT; • Inadequate parking management; and • Poor internal roads.	• Investment opportunities; • Application of TOD centred development approaches; • Preparation of a comprehensive transport management plan; and • Enhancement of the parking management system.
Solid Waste Management	• Poor solid waste management systems; • Indiscriminate disposal of solid waste; • Non-separation of solid waste at the source; • Unlicensed and unregulated private waste collectors (small and medium-scale enterprises); and • Lack of household awareness on waste recycling.	• Effective collection systems at the household level; • Establish solid waste transfer stations at strategic locations; and • Increase community awareness on best waste management practices.
Liquid Waste Management	• Inadequate sewer connection coverage; and • Water pollution.	• Increase sewer reticulation coverage; and • Incorporate best management practices to prevent pollution of rivers and streams.
Information, Communication and Technology (ICT)	• Inadequate service coverage of fibre optic cables.	• Investment opportunity in fibre connectivity provision.

Source: VisionRI

9 SOCIAL INFRASTRUCTURE

9.1 Overview

Social infrastructure facilities play a major role in making a place safe and liveable. The facilities enhance unity, instils a sense of care, and encourages high morals, visionary and competitiveness. They act as the platform for socialisation, sharing of information and innovation. The County Government has the mandate to ensure these facilities are provided for the resident by allocating land for their development. Social infrastructure ranges from educational facilities, health facilities, recreational facilities, fire stations, libraries, parks community centres and security.

Goal:

To have adequate, accessible and affordable social amenities which are well equipped for the wellbeing of the people.

Objectives:

- To repair, maintain and upgrade existing social infrastructure facilities;
- To equip schools and hospitals with necessary requirements, e.g., furniture, staffing amongst others;
- To allocate and secure land for social infrastructure facilities; and
- To involve the community in the provision of social infrastructure facilities.

Strategies:

- Upgrading and maintenance of existing social infrastructure facilities;
- Promoting private-public partnership in the provision of social infrastructure facilities such as health facilities, education facilities etc.;
- Equipping facilities with qualified staff;
- Encouraging public participation in the maintenance and management of the social infrastructure facilities; and
- Mapping all social infrastructure facilities to identify locations which are not well serviced.

9.2 Education Facilities

The thrust of the education policy in Kenya is based on the Constitution of Kenya 2010 which promises access to education for all and which is in practice pursued through the Free Primary Education Program (FPEP). This has the target of removing all levies previously imposed on primary school children with a view to making education free and compulsory.

According to the 2019 population census, 85,218 of Juja Sub-County's residents have attained the secondary level of education, 92,608 have attained primary education, and 8,556 have only reached pre-primary. This clearly shows that the level of literacy is very high. However, 18,981 of the residents who form 7% of the population of 3 years and above, have no formal education as shown in the 2019 KNBS Census report.

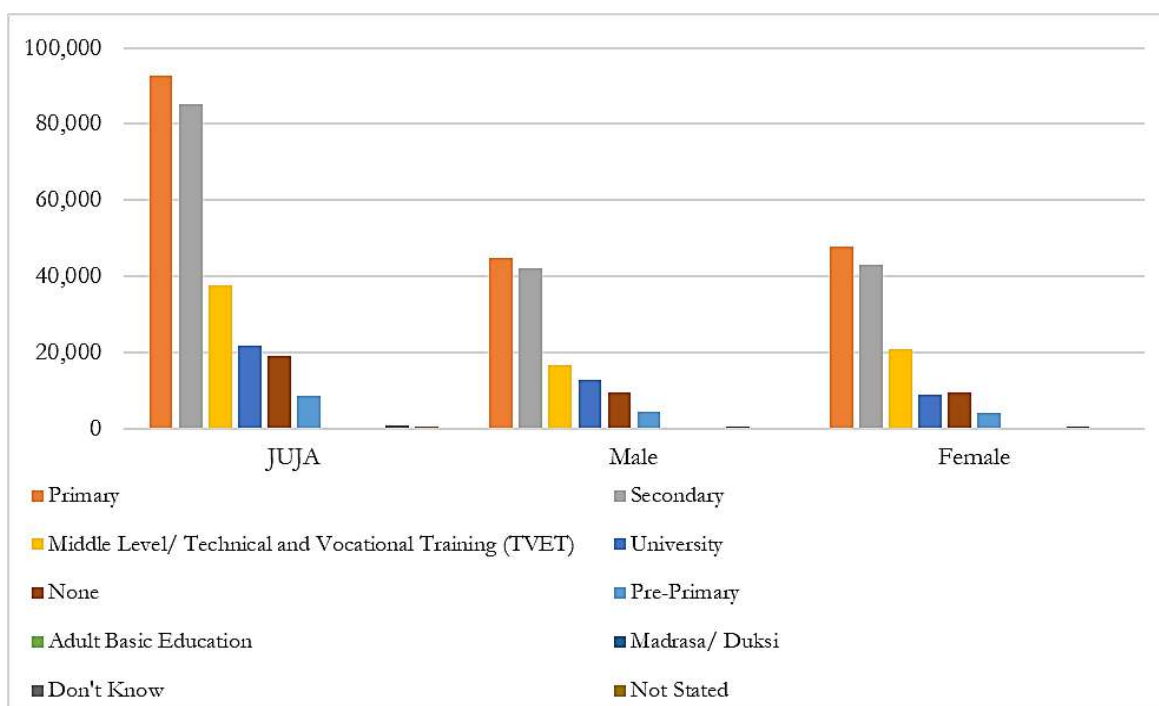


Figure 9-1: Highest Level of Education Completed

Source: KNBS 2019

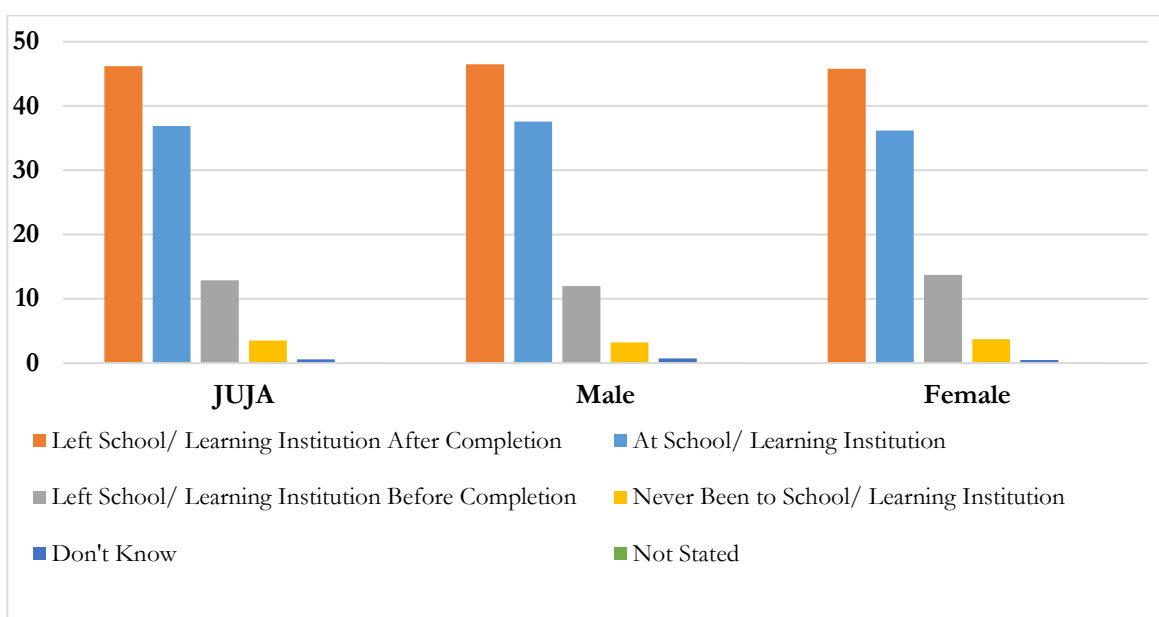


Figure 9-2: Juja Sub-County School Attendance Status

Source: KNBS 2019

The figures above illustrate that a larger percentage of the population, i.e., 92,608 has completed their education up to primary school level, followed by a population of 85,218 who have completed their studies up to secondary school level. This may be attributed to the high rate of people migrating into the area in search of housing and employment. About 14% and 8% have completed their education to middle level/Technical-Vocational Education and Training (TVET) and university levels, respectively. It is important to note that 7% have not attained any level of education.

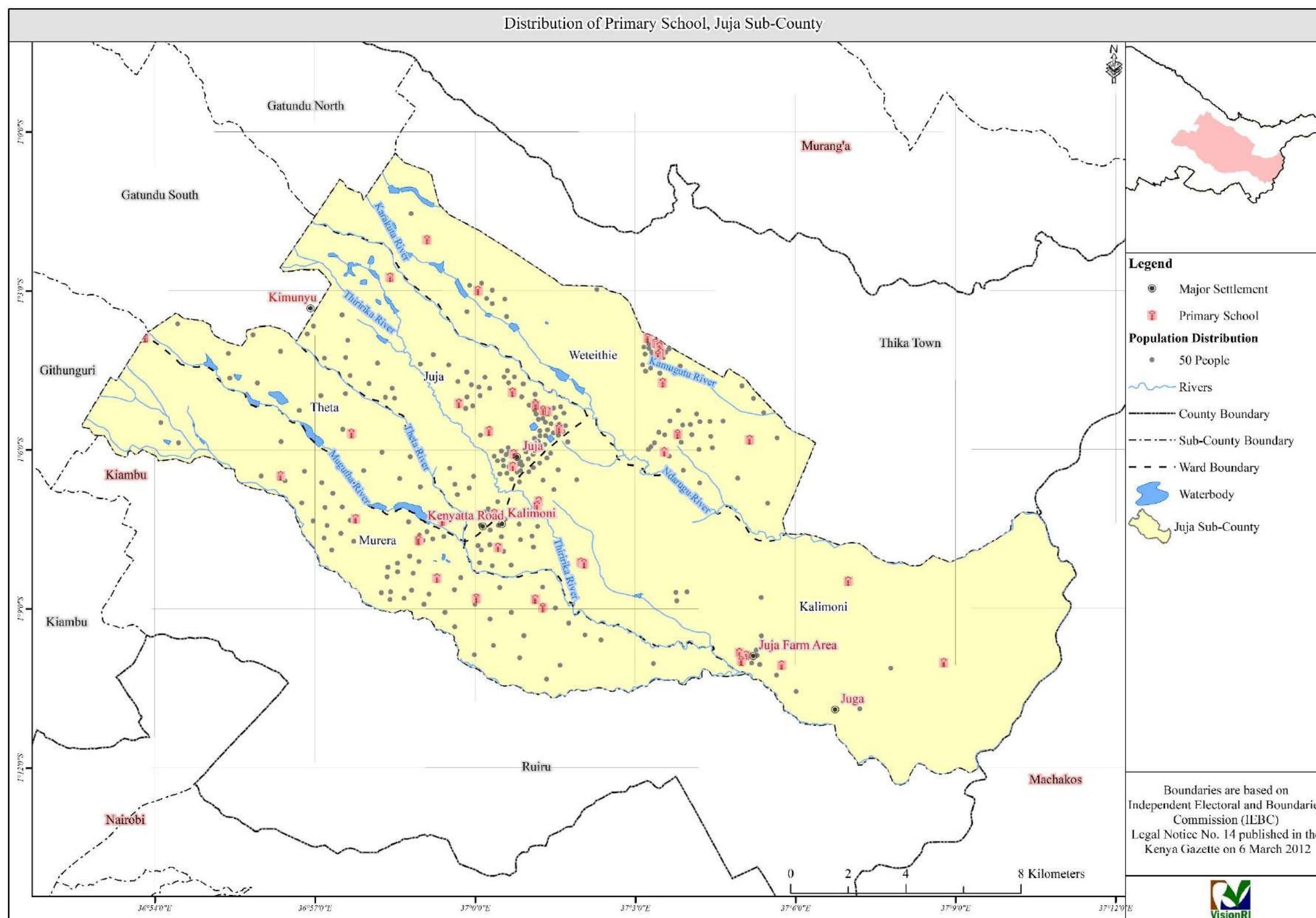
Juja is termed as an educational hub due to its strategic location hosting major higher learning institutions such as JKUAT, Kenya Institute of Organic Farming (KIOF), and upcoming primary and secondary facilities. The student population in the area has formed a substantial percentage of the customers to various businesses therefore making Juja Town a commercial hub. The population has made industries such as food, accommodation, formal and informal financial institution and entertainment to thrive in the area and create job opportunities.

Studies have shown that education improves the life chances of workers' children, as it is a key factor in levelling the field of opportunity. By learning to read and write and acquiring technical or professional skills, people increase their chances of obtaining decent, better-paying jobs and therefore an opportunity to earn the demographic dividend. Some social challenges that education can address include social stratification and segmentation. This is because inequalities in quality and access to education might translate into less opportunities in employment which may create social classes amongst residents. Planning should focus on enhancing equal access to a well-functioning education system. Areas in the Sub-County which are underserved by educational services should be determined, and appropriate strategies to fill the gap should be put in place.

9.2.1 EARLY CHILDHOOD DEVELOPMENT EDUCATION (ECDE) FACILITIES

Quality education is one that works for every child and enables all children to achieve their full potentials. The United Nation Children's Fund's (UNICEF) 2009 manual for child-friendly schools emphasises on the design, construction, and maintenance of child-friendly schools as safe, welcoming environments in which children can learn, emphasising links with the community, the influence of pedagogic considerations, cost-effectiveness and sustainability (Safety and environment of an ECDE facility are important because young children are vulnerable to many risks. The location of the institution and the distance children cover from their homes to the facility is a key determinant of access. Therefore, the distance between schools and home affects the advancement of education by young children because parents are always afraid to let the young ones, especially girls walk alone, and they may be kept out of school unless there was someone to accompany them.

According to the Physical Planning Handbook, the recommended distance from home to an ECDE facility is 300-500 metres. There are 81 ECDE in Juja Sub-County and according to the Physical Planning Handbook, it is desirable that an ECDE is attached to every primary school which is the case in the planning area. Notwithstanding, the Sub-County has a deficit of ECDE centres which may increase due to the population growth.



Map 9-1: Distribution of ECDE and Primary Schools in Juja Sub-County
 Source: County Director of Education, Gender, Culture and Social Services

9.2.1 PRIMARY SCHOOL FACILITIES

Access to education is a key factor in the quality of the service. The distance a child covers from home to school has a direct relation with the enrolment, performance, retention and therefore transition from primary to secondary school. The Physical Planning Handbook provides that a primary school should serve a catchment population of 4,000 and should be between 500 m-2 km walking distance distant. While the Handbook recommends that a single school occupy at least 3.4 ha, it also encourages schools to build storied buildings.

Table 9-1: Schools in Catchment

Catchment Population	No. of Primary School	Area (ha)	Walking Distance
5,000	1	3.25	500m – 2km

Source: Physical Planning Handbook

There are 33 public primary schools in Juja Sub-County as per data from the Education Department in 2020. These schools had a total enrolment of 7,420 pupils between standard four and eight in 2014. According to the Physical Planning Handbook⁵, there should be provision for one primary school for every 5,000 people (population catchment). Given the 2019 population of 300,948, there is a deficit of 27 public primary schools in the Sub-County.

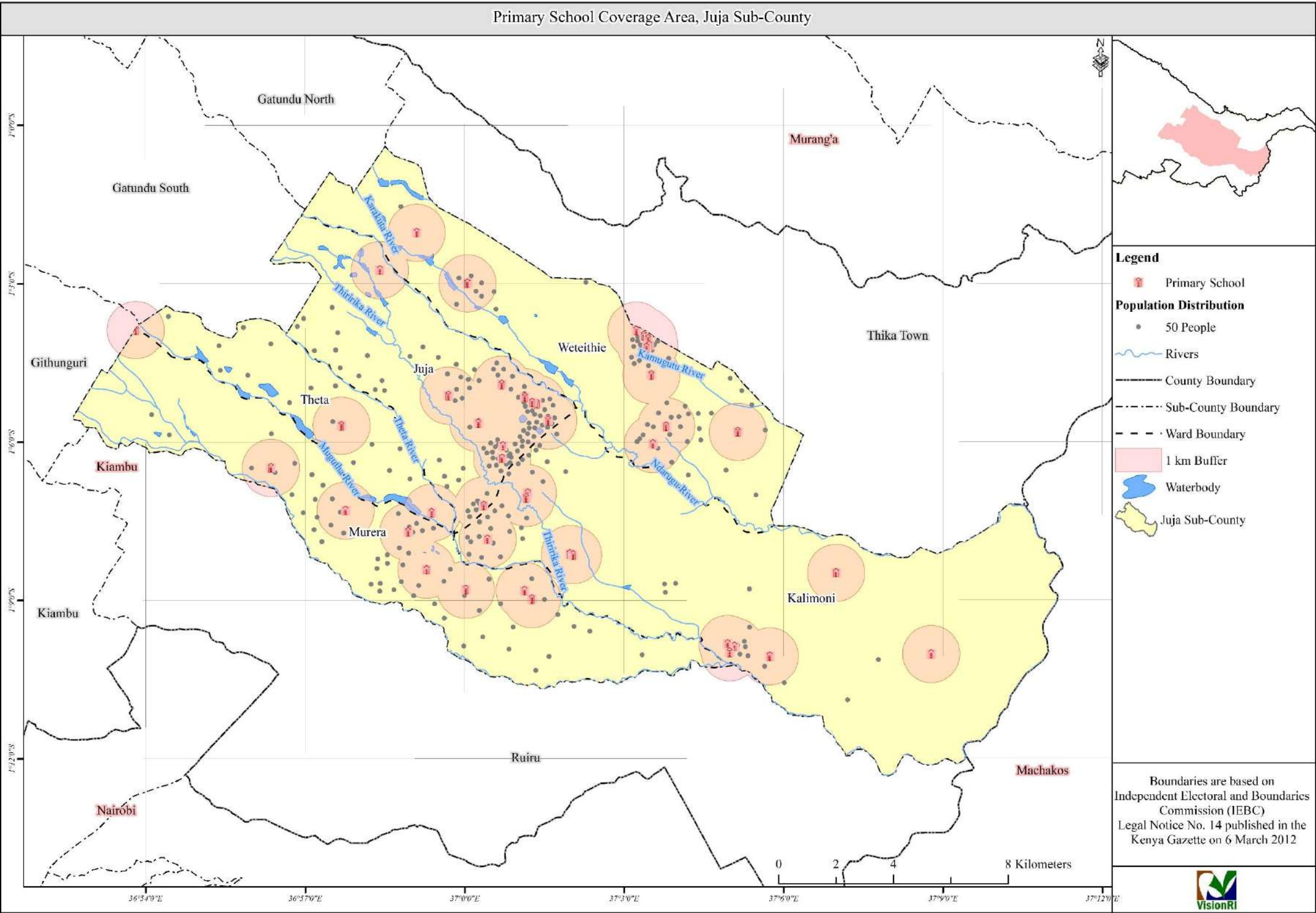
It is worth noting that the private sector has stepped in to provide primary schools within the Sub-County. According to the Ministry of Education (MOE), the private sector has provided 66 facilities in the Sub-County.

The estimated land area required to meet the current deficit is 88.37 hectares while the estimated land area required by 2030 with the projected population is 523 hectares.

Kiambu County has an average of 1,843 Early Childhood Development (ECD) teachers, 21,090 primary school teachers and 3,479 secondary school teachers with a teacher-pupil/student ratio of 1:40 for ECD, 1:38 for primary schools and 1:25 for secondary schools. Juja Sub-County, on the other hand, has an enrolment of 18,703 for pre-primary, 46,421 for primary school and 20,203 for secondary school.

The figure below shows the distribution of primary schools in the area and accessibility in relation to walking distance.

⁵ Physical Planning Handbook, 2007



Map 9-2: Accessibility of primary schools (1km Walking Distance)
Source: County Director of Education, Gender, Culture and Social Services

From the Map 9-2, it is clear that primary schools are concentrated in neighbourhoods along the Nairobi-Thika Superhighway where most people are settled. More primary schools need to be provided in Kalimoni and Juja Farm especially due to the anticipated population growth in these areas. The north-western parts of the Sub-County lack schools which is due to the presence of large coffee estates.

9.2.3 PUBLIC SECONDARY SCHOOLS

There were five public secondary schools in Juja Sub-County in 2018. The schools and their respective levels of enrolment are listed in the table below:

Table 9-2: Secondary Schools Enrolment in Juja

School	Enrolment		
	Male	Female	Total
Mang'u High	1,225	0	1,225
Gachororo Secondary	172	166	338
Juja Farm Secondary	171	150	321
Athi Secondary	62	73	135
Juja Secondary	244	213	457

Source: Kiambu County Education Office

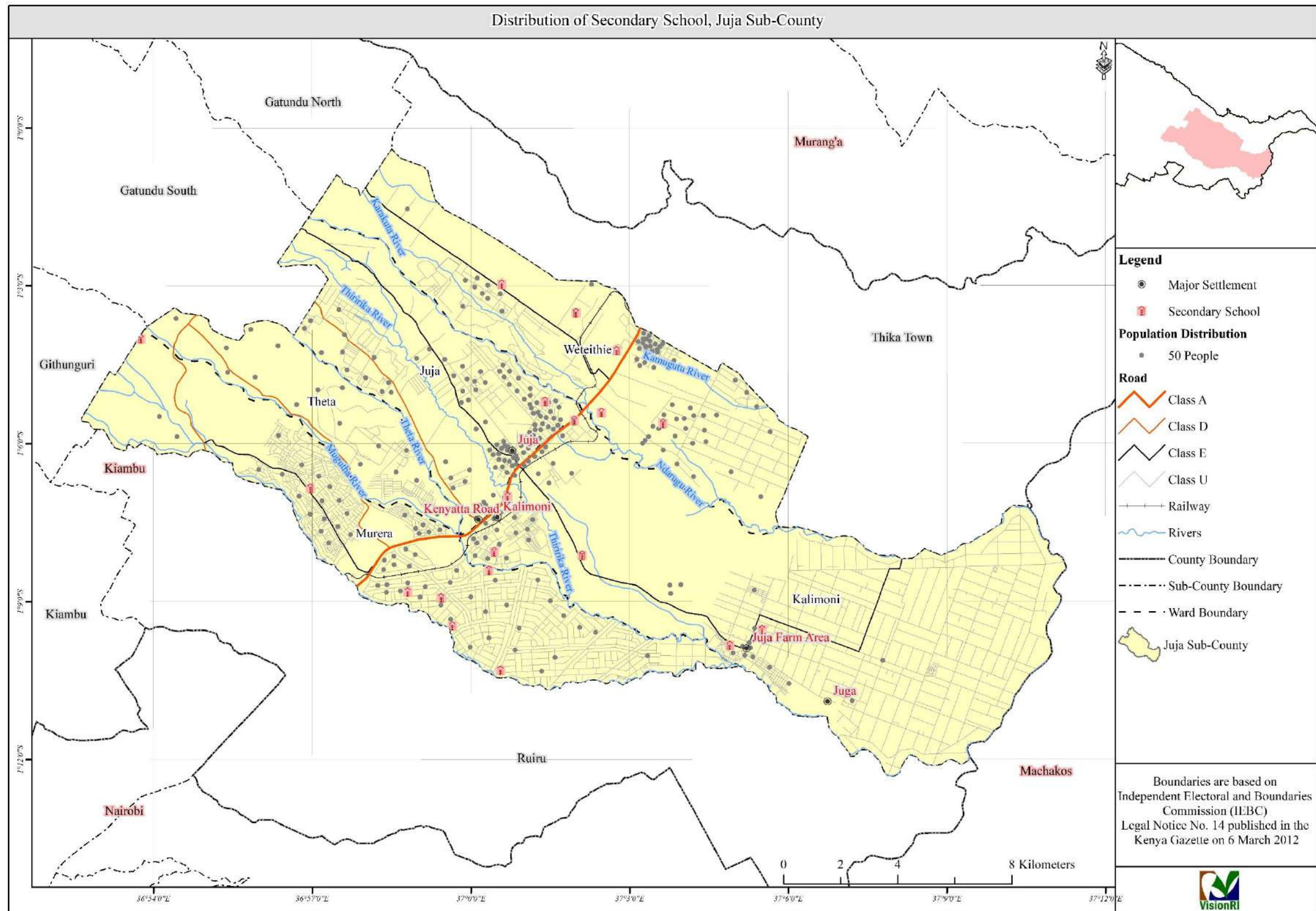
Table 9-3: Number of streams in the secondary schools in Catchment Population

Catchment population	No. of primary school	No of Streams	Area (Ha)	Walking Distance
8,000	1	1	3.4	500 m – 3 km
		2	3.5	
		3	4.5	

Source: Physical Planning Handbook

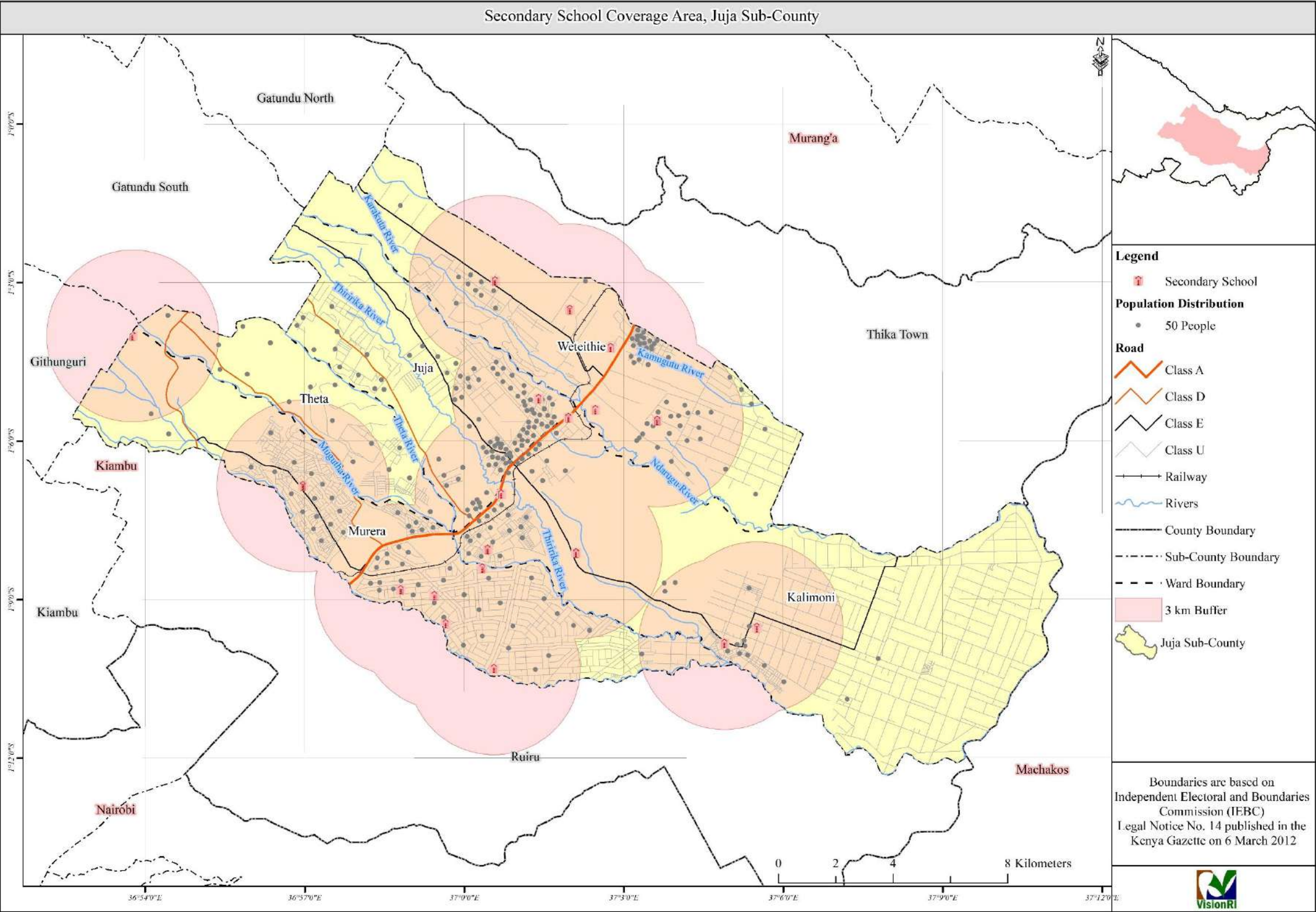
While the number of public secondary schools is important, their location determines access to education. With regard to spatial distribution and accessibility of secondary schools, the Physical Planning Handbook recommends that the walking distance to a secondary school should range between 500 m-3 km. The Handbook also provides that a secondary school should serve a population of 8000 within a radius of 3 km.

The figure below shows the distribution of secondary schools in the area and accessibility in relation to walking distance. From the Map 9-3, it is clear that secondary schools are concentrated in the eastern parts of the Sub-County such as Juja Town, Kalimoni and Juja Farm. The western parts of Theta, Juja and Witeithie Wards are under-provided. Whereas Juja Farm has a secondary school, there is a need to provide additional secondary schools given the anticipated population growth in the area. Juja Farm has the potential to become a critical service centre within the Sub-County.



Map 9-3: Distribution of secondary schools

Source: County Director of Education, Gender, Culture and Social Services



Map 9-4: Accessibility of secondary schools (3km Walking Distance)

Source: County Director of Education, Gender, Culture and Social Services

9.2.2 ADULT EDUCATION CENTRES

The Constitution takes cognisance of the fact that all citizens have a right to basic education. It is important to note that adult education facilitates this by providing avenues for those who are not within the formal school set up to reap the fruits of education. Other than improving one's professional qualifications, they aim at achieving civic, social, moral and cultural attitudes as well as skills necessary in order to progress in every sphere of life. For this to be achieved, there is a need to have adult education programmes consciously designed to meet specific learning needs. The FGDs identified two adult learning centres at Gachororo and Dekoma. These are not sufficient for the whole Sub-County. This poses a hindrance to adults who would want to acquire basic knowledge. There is a need to increase the number of facilities to improve on access.

9.2.3 UNIVERSITIES

There are two public universities in Juja, namely JKUAT and a satellite campus for Kenyatta University. FGD participants did not propose any additional university during the planning period. However, the need for this may be reassessed within the next 10 years.



Figure 9-3: Jomo Kenyatta University of Agriculture and Technology

Source: Field Survey



Figure 9-4: Zetech University

Source: Field Survey



Figure 9-5: Nairobi Institute of Business Studies

Source: Field Survey

9.2.4 TECHNICAL VOCATIONAL EDUCATION AND TRAINING (TVET) PROGRAMME

The TVET programme is key in the attainment of Kenya's Vision 2030 because they provide skills that meet the needs of the workplace as well as self-employment. The goal of the TVET programme is to provide relevant and adequate skills and competencies in strategic disciplines for spurring industrial and economic development. The GoK has put in place strategies and policies to revive the existing TVET institutions and to construct new ones. The TVET Policy, which has a target of gross enrolment rate of 30% by the year 2030, places emphasis on enhancing access to these institutions. In order to guarantee access, the Sub-County will need one TVET institution in each ward.



Figure 9-5: St. Dominic Technical training Institute and Production Centre

Source: Field Survey

Participants in the Stakeholder's Workshops proposed a polytechnic within Juja Farm and vocational training institute in Juja Town.

9.2.7 EMERGING ISSUES

- Inadequate number of public primary schools and ECD facilities;
- Inadequate number of secondary schools;
- Inadequate number of TVET institutions;
- Lack of special education facilities in the Sub-County; and
- Lack of adult education centre.

9.3 Health Facilities

The right to health is a fundamental human right guaranteed in the Constitution of Kenya. Article 43 (1) (a) of the Constitution provides that every person has the right to the highest attainable standard of health, which includes the right to health care services, including reproductive health care. It is the practice around the country for sub-counties to have at least one public hospital of level 4 status to manage referrals from dispensaries and health centres⁶. Key to these standards is the requirement for a hierarchy of health facilities of level 2, 3 and 4 in a Sub-County in order to facilitate referrals. The Kenya Health Policy (KHP) 2014 – 2030 proposes that all people in Kenya should ideally live within at least 5 kilometres of a health facility⁷. According to the Physical Planning Handbook, 2007, any major urban centre in the Sub-County that serve a catchment of 5,000 people or more qualifies for a dispensary. The World Health Organisation (WHO), on the other hand, in its World Health Report 2010, set out the standard of 34.5 skilled health professionals per 10,000 people. The achievement of these national and international standards of practice require a combination of staffing and facility development.

Public health facilities include JKUAT hospital and Gachororo Level 3 Hospital. Other facilities include Kalimoni Mission Hospital; and private facilities such as Juja Modern Hospital and Maternity, Aga Khan Hospital Clinic and many small privately-owned clinics. Some of the underserved areas include Juja Town, Juja Farm, and Nyacaba area.

Juja Sub-County lacks a level four hospital with inpatient services. The residents rely on Thika Level 5 Hospital and Gatundu Hospital.

Juja Sub-County, therefore, lacks adequate health facilities to cater for in-patient care services and thus there is a need to upgrade and construct new facilities to cater for the growing population. Map 9-5 shows the distribution of health facilities in Juja.

9.4 Sports and Recreation

Like in other parts of the country, the Sub-County lacks sports and recreational facilities. There is no stadium in the Sub-County, nor is there a social hall with in-door games. The Sub-County only has institutional playgrounds, which can only be accessed by students. The only recreational sports facility is Ruiru Golf Course and Club which is exclusive to members.

The following issues were identified during the field survey:

- Lack of sports and recreational facilities; and
- Lack of adequate social and cultural centres.

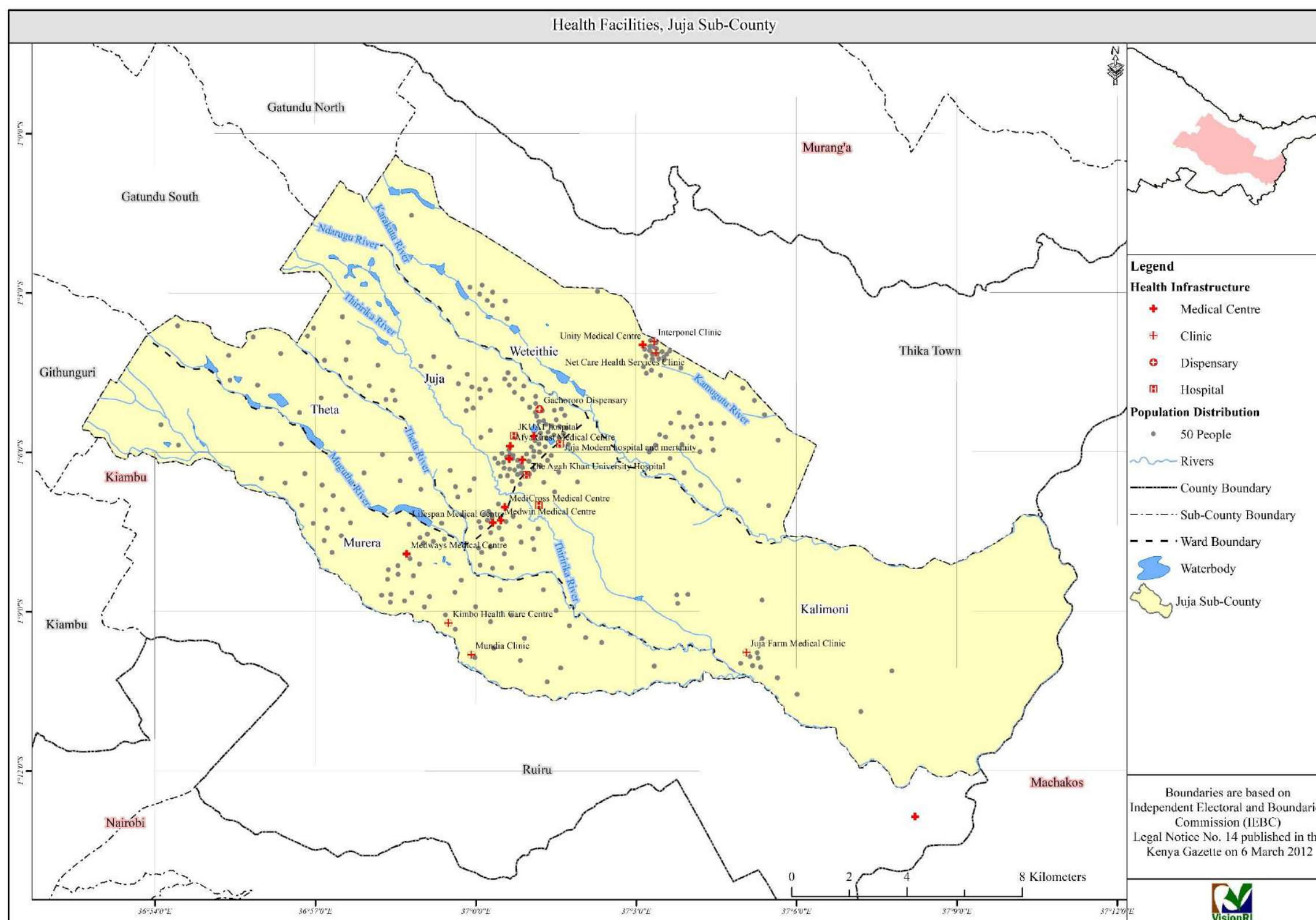
⁶ The Kenya Health Policy (2014), page 40, provides that these will become Level 3 County Hospitals by 2030.

⁷ This requirement is reflected in the Physical Planning Handbook, 2007.

9.5 Public Parks and Playgrounds

The Sub-County has no public park and playground of any description for local people to use except for playgrounds within schools where only enrolled students have access to. Public parks are proposed for the main centre in each of the wards namely Theta, Murera, Juja, Witeithie and Kalimoni.

The key issue identified in the planning process was that public parks are missing in all wards in the Sub-County.



Map 9-5: Distribution of Health Facilities in Juja

Source: Sub- County Health Department

9.6 Heritage

Juja was part of the 'White Highlands' where colonial settlers carried out agricultural and livestock keeping activities. Because of this, the native Africans who occupied the area during the pre-colonial period were displaced very early in the colonial period. This means that most of the cultural sites were wiped out by colonialists as part of their dispossession strategy.

Nonetheless, the people who live there have cultural practices that require certain artefacts which should be preserved for future generations. The only remaining heritage attraction site within the Sub-County is the Old Italian Church and Italia prisoners of war camp.



Figure 9-6: The Italian Prison of War Camp in Ndarugo Ward at Juja Sub-County

Source: Field Survey, 2018

9.7 Cemeteries and Burial Grounds

There is no public cemetery in Juja Sub-County and most local people bury their dead on private land. Those who do not own freehold property in the Sub-County or own property in the towns always transport their dead to their ancestral homes for burial. During the Stakeholders' Workshop, a public cemetery was proposed to be established within the Sub-County.

9.8 Cooperative Societies

There are many cooperatives in Juja Sub-County. Majority of them are in public transport and include motorcycle transport operators. The sectoral character of the cooperatives is shown in the Table 9-6.

Table 9-6: Distribution of Cooperatives by Sector

S. No.	Sector	Number	Approx. Membership
1.	Education Sector	2	15000
2.	Micro-credit and Finance	15	500
3.	Urban Entrepreneurship	16	160
4.	Public Service Vehicles	4	250
5.	Motorcycle Transport	9	900
6.	Agriculture (coffee)	1	500
7.	Housing co-operative societies	2	400
	Total	49	17,310

Source: Juja FGD and Key Informant Interviews 2018

The cooperatives are well spread in most sectors in the urban and rural economy. During the planning period, the main thrust of action should be solidifying the movement through capacity building especially of new cooperatives in sectors such as transport including motorcycles to ensure that they gain traction, add value to the Juja economy, and create jobs for the unemployed youth.

9.9 Security

The Kenya Constitution 2010 Chapter 11 outlines the structure of the national government in securing the life and the properties of Kenyan Citizen from internal and external attack. According to Physical Planning Handbook, each neighbourhood should have at least one police post while a town centre with more than 2,000 people should have one police station.

According to Kiambu County Spatial Plan, Juja Sub-County has seven police facilities. They include:

- A police station at Juja Town;
- A police post (Nyacaba-Kimbo); and
- Chief camps and Administration Police lines.

The community has also embraced other security strategies such as Nyumba Kumi initiatives and community policing. Some residents hire private security guards and install security cameras in their premises.

9.109.10 Key Planning Issues

Table 9-4: Key planning issues on Social Infrastructure

Sector	Key Highlights	Opportunities
Education	• The private sector is a major player in education in the Sub-County.	• To fully exploit this, the County needs to encourage more private investment in the sector; and

		• Government intervention in the provision of TVETs and Adult Education centres.
Health	• Juja has several health facilities although some areas are not adequately covered by private-sector health providers.	• Use of Kenya Health Policy guidelines to inform the distribution and provision of health facilities; • Active private and faith-based sectors in health provision; • Availability of land to upgrade existing facilities; and • Strong County health delivery system.
Other facilities	• Inadequate social facilities to support rapid population growth; • Encroachment on public land by private developers; • Mushrooming of religious centres in residential areas causing noise pollution; • Fire disasters; • Few burial sites; and • Culture of people burying their dead in their plots.	• Government intervention in the provision of social facilities; • Use community and NLC to identify illegally occupied public land; • Adherence to planning and environmental guidelines; • Upgrading of fire stations, equipment and personnel; • Availability of planning standards and guidelines in the provision for land for these services.

Source: VisionRI

10 ECONOMIC ANALYSIS

10.1 Overview

This chapter discusses the economic activities carried out in the planning area, and the economic catalysts and driving forces. It also outlines the economic bottlenecks in the Sub-County.

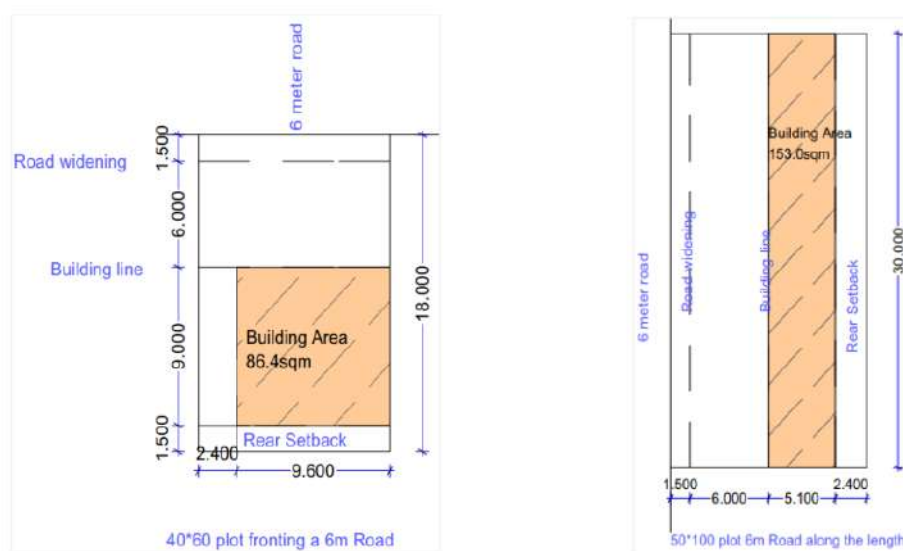
10.2 Urban Agriculture

Urban agriculture can be a tool for political bargain and inclusiveness. The economic importance of urban agriculture point to an increase in households' incomes at the micro level and contribute to Gross Domestic Product upon value addition at the macro level and lead to job creation. At the household level, it will lead to reduction in the cost of food and enhance health by quality food. It will also lead to food security of the people and enhance neighborhood ties.

Urban agriculture can also be a way of sharing knowledge and skills on farming among the urban residents. It can also be an avenue for practical learning for students, parents, and general public. The aesthetic value and the fact that it can act as a carbon sink and enhances urban design and spatial planning in the urban set up. Upon well articulation into the society, urban agriculture can influence policy, regulations, and legislation to protect its interests.

10.2.1 LAND FOR URBAN AGRICULTURE

Introduction of zero-acre farms that involve vertical farming, rooftop farming, green wall cultivations and indoor greenhouses. Zero-acre farms are best captured by integrating them with architecture. They utilize wastewater, human waste, waste heating and organic waste.



Land available for urban agriculture

According to the 2019 population census, over a third of the population in Juja was employed. People living in Juja Farm practice small scale agriculture with vegetable products being the most widely produced. This gives rise to a small export-based vegetable industry to the urban areas of the Sub-County such as Juja Town, Murera, Mugutha, etc. As per data from the 2019 population census illustrated in the table below, most people grow maize, beans, kales and bananas with a few of the residents growing cabbages, cassavas and sugarcane.

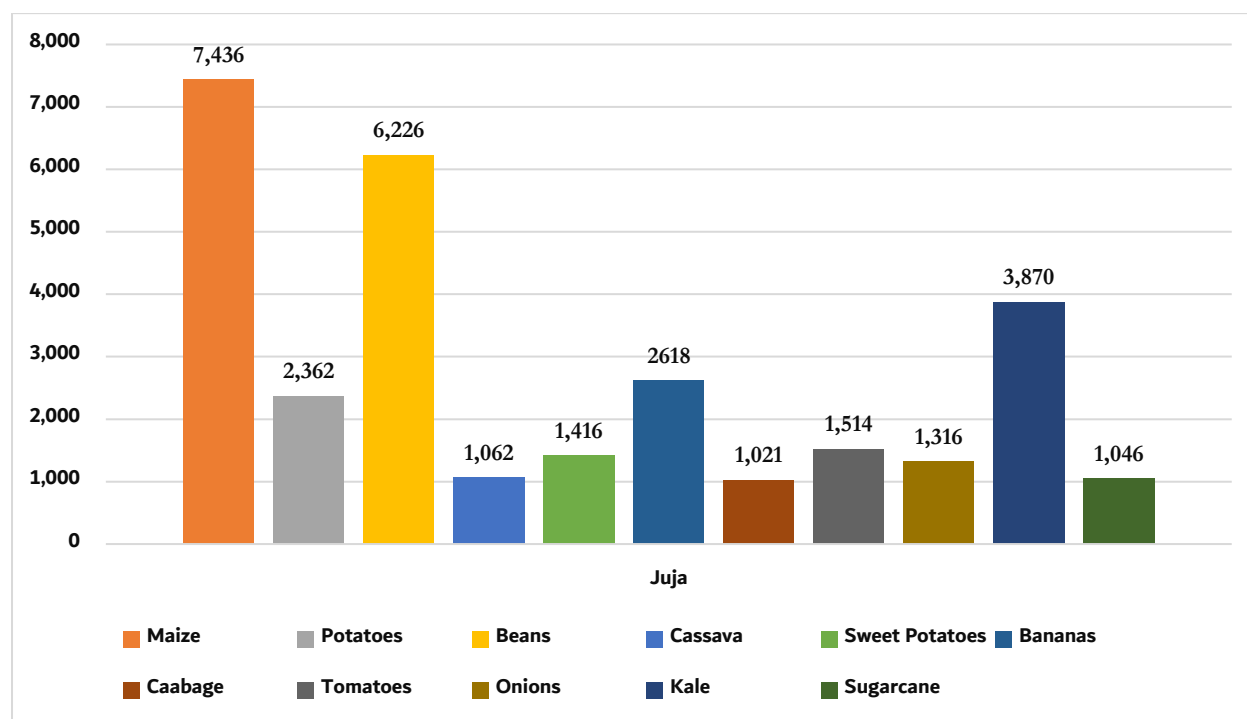
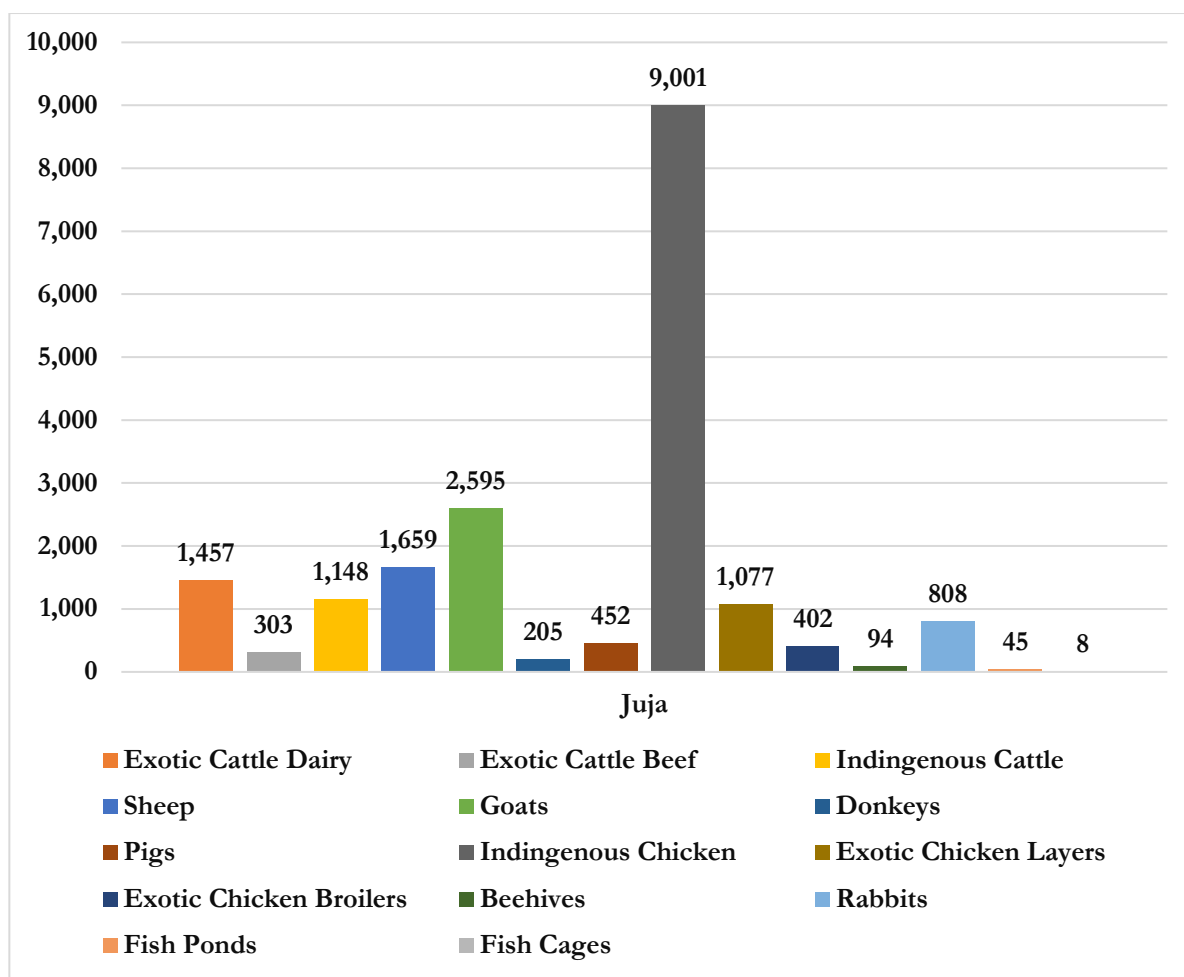


Figure 10-1: Distribution of Types of Crops Grown by Households

Source: Kenya Population and Housing Census, 2019

Additionally, the Sub-County has large coffee estates/plantations under cash crop farming which account for 27% of the total area under agricultural use. These are in the very upper parts/western region of the planning area especially along Juja-Gatundu Road, Kiganjo Road and Bob Harris Road.

In terms of livestock farming, indigenous chicken, exotic cattle dairy farming, indigenous cattle, goats and sheep are reared in large scale while fish and beekeeping are also practised albeit at smaller scales and normally within households.



Map 10-1: Distribution of Households Rearing Livestock and Fish

Source: 2019 Kenya Population and Housing Census

Due to rapid urbanisation in the Sub-County, the agricultural sector is diminishing, and sustainable measures need to be adopted to safeguard the sector. Agricultural use is expected to reduce to 16.83% from the current 55.47% as the area continues to urbanise.

10.3 Floriculture

Juja Sub-County is home to several floriculture industries such as Selecta and Pentas. Kenya's floricultural sector continues to dominate in Africa and Europe. These provide a platform for investment in the sector to promote economic growth in Juja Sub-County.

10.4 Trade

The key employing sectors in Juja Sub-County include the service sector which supports the high student population by providing basic needs such as commercial, residential and grocery requirements. Other

sectors include mining, floriculture, industries, jua kali, small-medium enterprise, and urban agriculture, amongst others.

Along with projected population growth, it is expected that the employment ratio will grow multiple times by the year 2030. The number of employed people is expected to rise to almost 57,000, 40% of which would be formally employed. These projections are reinforced by the large-scale construction activities currently taking place in and around Juja, potentially giving rise to jobs. As the town grows and commercial activities in Juja start building up, the current trade-off faced

Key Commercial Activities: Current State

Small-scale Businesses: Hotels; retail shops selling food products, paraffin, mobile phone accessories, shoes, books and school uniforms; bars; posho mills; and butcheries.

Farming: Poultry, horticulture, fish, pig and dairy farming- all done at a small scale.

Quarrying: Extraction and sale of construction stones to real estate developers.

Industries such as plastic, premier bags, Vegpro, Alcohol, Coffee, *Jua Kali* and carpentry.

by its residents of being employed in Juja against other places may be resolved. Juja has good potential to become attractive employment and residential hub, encouraging people to take up jobs and start businesses in the Sub-County.

There are numerous commercial establishments in the Sub-County such as Juja city mall and Spur mall as well as small-scale businesses such as restaurants, retail shops, bars, posho mills and butcheries are thriving especially along streets in Juja Town and residential neighbourhoods. Juja market within Gachororo is the main market in the Sub-County. There is an informal market in Witeithie along the Nairobi-Thika highway where vendors sell their wares in an open area.

Under the Directorate of Trade and Markets, the Department was able to construct and rehabilitate a few Markets within the county and Juja market is one of them.

10.5 Quarrying

The extraction and sale of construction stones to real estate developers is one of the most significant economic activities in Juja. Given the trend in real estate development in and around Juja, there is a rising demand for construction materials. With limited land available for quarrying and construction companies competing to acquire materials from the owners, prices have risen. A large number of the agriculturists in Juja Sub-County, therefore, has resorted to quarrying for sustenance.

Although it is possible that individual profit may be higher in quarrying than in farming, collective quarrying will render large lands unusable for years, giving rise to the classic 'Tragedy of the Commons' problem where the outcome will be sub-optimal from society's point of view.

The County, in collaboration with NEMA, has been working toward enforcement of the Environmental Management and Co-ordination (Amendment) Act, 2015 and the Environmental Impact Assessment and Audit Regulations, 2003. The County has also been encouraging private quarry owners to backfill abandoned quarries and plant trees as one of the measures to curb disasters.

They have gone ahead to form an Environmental and Social Impact Assessment (ESIA) Evaluation Committee that reviews the quarry ESIA report submitted through NEMA to ensure that all social and environmental issues are fully addressed in accordance with Environmental Management and Co-ordination (Amendment) Act, 2015 and the Environmental Impact Assessment and Audit Regulations, 2003.

The County is also planning to develop a Natural Resource Management Policy and thereafter develop regulations on quarrying activities which will include management of quarries during operation and their manner of decommissioning.





Figure 10-2: Quarrying activities in Ndarugo

Source: Field survey, 2018

10.6 Education

Besides being home to JKUAT, Juja has several public and private learning institutions – for instance, Kenyatta University Ruiru campus, Mang'u High School, NIBs College, and others. There is a high demand for student accommodation in private hostels leading to the proliferation of out of campus and colleges accommodation and other auxiliary services. There is an opportunity for affordable purpose-built student accommodation.

10.7 Industries

- **Formal Industries:** These are key sources of employment in Juja. They mainly include agro-based and flower industries such as Selecta in Juja Farm, Premier and Cordage in Juja Town, Juja Pulp and Paper Milling Industry in Mirimaini.
- **Jua Kali Sector:** This comprises small-scale metal fabrication and carpentry establishments, and mechanics, amongst others. There is no designated area for jua kali artisans in the Sub-County thus they mostly occupy road reserves.



Figure 10-3: Selecta Flower Industry

Source: Field Survey, 2018

10.8 Economic Catalysts

The future prospects for the business and economic activities, particularly in the education and housing sector in the Sub-County are positive due to the following determining factors:

- Population Growth:** The rate of birth in Juja is very high compared to the mortality rate. This differential, along with the influx from other towns, has led to a growing market size for various goods and services in the Sub-County. The incoming population, setting up their businesses—often more innovative than the local businesses – has been fostering innovation and healthy business competition.
- Availability of Space for Expansion:** Juja Sub-County has not been fully exploited in terms of construction, and the available space can accommodate increased construction and more residents. The land is still affordable compared to other Sub-Counties, thus favouring construction of houses, apartments and commercial space.
- Banking Industry in the area is well developed:** The presence of banks has given rise to a number of financial institutions – specialising in the agriculture sector - often providing small-scale loans and technical advisory to farmers in the Sub-County. Such services are also expected to thrive for other businesses and activities in the coming years.
- Investment Attractiveness:** With Infrastructural development, such as the traverse of Thika Superhighway and the Standard Gauge Railway passing through the Sub-County, accessibility within and from Juja to other Sub-Counties will be made more convenient, thus encouraging Juja's growth as a key investment hub for the private sector. Public services too, such as police is comparatively considered adequate in the Sub-County, hence attracting more investors.
- Transport Oriented Development (TOD):** TOD planning in the NMR will lead to high-density development around key mass transit stations, enhancing the economic and financial viability of businesses and commercial activities in the region. Juja is expected to gain immensely out of the TOD

approach to urban planning in the NMR, due to its proximity to central Nairobi, location along the Nairobi-Thika Corridor and other infrastructural factors. Transport infrastructure development in and around Juja would thus catalyse the local economy.

10.4 Economic bottlenecks in the Sub-County

- **Decline in agricultural activities:** Agricultural activities are the backbone of the Kenya economy. In recent times the sector has witnessed a rapid decline due to merging economic dynamics. In the Sub-County, the decline in agricultural activities is one of the economic bottlenecks in the area. The Sub-County has witnessed rapid urbanisation which has resulted in land fragmentation of the former large-scale agricultural land to residential land. For instance, the sisal large scale plantation which was carried out in the Sub-County is no longer there. The entire Sub-County is rapidly changing from being the agricultural-based area to one driven by real estate developments.
- **Unemployment:** According to the SPC for NMR, employment in the formal sector continues to decrease in the county. It is estimated that 17% of the population is unemployed while the major employer is the informal sector (Jua Kali). The Sub-County is experiencing a high rate of unemployment which has resulted to increase in crime and drug abuse which are detrimental to economic productivity.
- **High population growth rate:** Juja Sub-County is experiencing high population growth rate. The current population stands at 300,948 people and is expected to increase to 1,183,119 by the year 2030. This has resulted in and will continue to exert pressure on existing infrastructure and cause continuous land fragmentation.

Inadequate Infrastructure:

- **Lack of proper drainage system:** There is no proper drainage system in the entire Sub-County which often leads to serious problems of water stagnation on the limited roads. Whilst flooding discourages small-scale businesses like hostels, the lack of adequate drainage system as a whole is a huge discouragement for investors.
- **Poor waste management:** The collection of garbage by the County Government is sub-optimally done due to the lack of garbage trucks in Juja. In addition, poor feeder roads in the Sub-County make it difficult for lorries to pass and collect the garbage.
- **Inadequate lighting:** There is a shortage of streetlights, and most of the existing ones are often not functional. Poor lighting in most areas has led to an increase in crime rates, mostly emanating from the unemployed youth. Shopkeepers and other businesspersons usually shut businesses before sunset due to the insecurity associated with late hour operations.
- **Poor road network:** Juja Sub-County is currently underserved by road infrastructure, which is a catalyst for development. Currently, the Sub-County has only Thika Superhighway (as the main

tarmacked road), Kenyatta Road and Kiganjo Road. Most access roads within the Sub-County are earth roads which make it difficult for investors. The roads are narrow, never surfaced with murrum and very poorly constructed and maintained. Whilst during the dry season these roads are very dusty, rains make them muddy and often impassable. Inadequate road infrastructure, therefore, slows down the movement of people and goods from one place to another, hindering the growth of the local economic activities.

- **Scarcity of water:** The main water sources are boreholes and rivers – both of which are seasonal. Limited water supply in the Sub-County hinders many economic activities, particularly those related to agriculture.
- **Shortage of market space:** The only market in Juja Town has never been constructed. There are no shades, and this often forces shopkeepers to move out of their shops onto roads to sell their products. This often causes congestion, traffic jams and accidents.

10.5 Key Planning Issues

From the analysis, the following were identified as key issues in the local economy:

- A shrinking agriculture sector; and
- Lack of adequately serviced land to attract investors despite the availability of land.

Table 10-1: Key planning issues on the Local Economy

Sector	Key Highlights	Opportunities
Agriculture	• Shrinking agriculture sector due to threat of urbanisation by conversion of land; and • Dependence on rain-fed agriculture.	• Preservation of agricultural land; • Lack of public awareness on best irrigation scheme practices; and • Ready market for crop and livestock products in the NMR.
Commerce	• Lack of adequate modern markets and Jua Kali sheds.	• Quick win projects to enhance trade and commerce structures; • Proximity to Nairobi and NMR; and • ICT developments to support trade and commerce.
Industry	• Land availability; • Presence of light industrial activities; and • Good road connectivity to neighbouring towns like Thika, Ruiru, Kiambu and Nairobi.	• Development of industrial parks; and • Investment in Special Economic Zones.

Source: VisionRI

11 GOVERNANCE & STAKEHOLDERS PARTICIPATION

11.1 Governance

The County Government's administrative structure comprises of the County Assembly and County Executive Committee, headed by the Governor and Deputy Governor, as illustrated in Figure 11-1 below. In Juja Sub-County, the Sub-County Administrator and Ward Administrators coordinate development projects at the Sub-County level. Juja Sub-County consists of five wards, namely Witeithie, Kalimoni, Juja, Theta, and Murera.

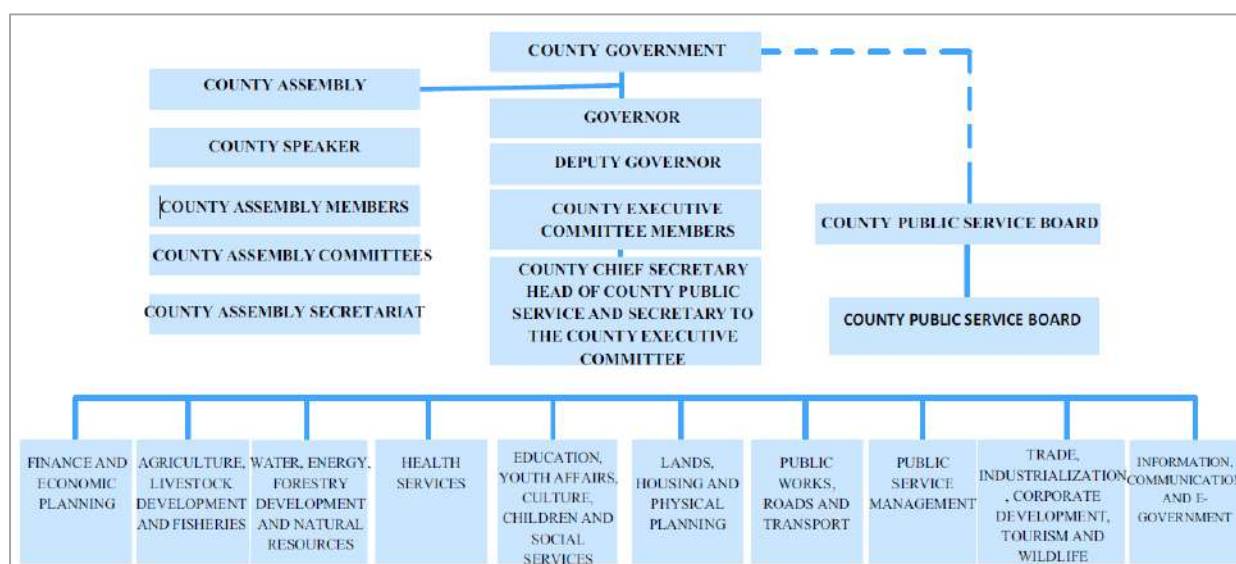


Figure 11-1: Organogram of the County

Source: VisionRI

11.2 Institutional Framework/Administrative Structure

The Sub-County's development projects are deliberated and agreed upon by all stakeholders; government, organisations, and residents prior to implementation ensuring that all urban issues are addressed. Stakeholder participation in County development ensures inclusivity, transparency and accountability.

11.3 Mandate and Role of the County Government

The Constitution postulates that there are two levels of government: National and County. Distinct as they may be, they are interdependent and given that government in Kenya is unitary, the two levels are required to observe and adhere to the provisions of the Constitution. The County Governments are the embodiment of devolution achieved through decentralised units and structures provided under Articles 174 and 175 of the Constitution. The County Government institutional structure comprises of the two arms, namely County Assembly and County Executive.

11.3.1 THE COUNTY ASSEMBLY

The responsibility of the County Assembly includes being an oversight instrument over the County Executive, enacting laws at the County level, and approving plans and policies for the day-to-day operations and management of resources.

11.3.2 THE COUNTY EXECUTIVE

The County Executive Committee is the implementing organ of programmes and projects that have been approved by the County Assembly. The County Service Board provides both human capacity and development Municipality at all levels. Figure 11-1 shows the Kiambu County organogram, indicating the placement of the County Executive in the governance structure.

At the Juja Sub-County level, the following departments are represented:

- Health Services;
- Finance, Economic Planning and ICT;
- Agriculture, Crop Production, Irrigation and Marketing;
- Education, Youth, Sports, Gender and Social Services;
- Livestock and Fisheries;
- Trade, Tourism, Co-operative and Enterprise Development;
- Roads, Transport, Public Works and Utilities;
- Environment Energy and Natural Resources;
- Housing, Physical Planning and Urban Development; and
- Public Service and Communication.

The implementation of this Plan will be carried by the above departments.

11.3.3 BOARDS OF MUNICIPALITIES

The Urban Areas and Cities Act states that the management of a city and municipality shall be vested in the County Government and administered on its behalf. The role of the Municipal Boards is guiding urban growth, regulating development and setting priorities for urban environmental action. The key principle in the devolution system is the recognition of the fundamental relationship between the Boards and their respective County Governments. In other words, they operated on delegate authority from the County Government. There is an existing Municipal Board which was formed in 2018.

However, during the time of preparation of this ISUDP, it was found that though the Board was established, they are experiencing some teething challenges which include the lack of an existing delivery structure to enable it to perform its functions. Apart from the Municipal Manager, the rest of the technical and support directorates have not been fully established. There is still a reliance on the Sub-County Executive to execute the Municipal Board functions.

11.4 Legislations and Enforcement Mechanisms

Constitution of Kenya (2010) distributes planning functions across a two-tier government: National and County Governments with provisions for coordination across the two levels. Planning roles and responsibilities at both the national and county governments are governed by the Constitution of Kenya 2010 under Chapter 5: Land and Environment, particularly Article 66. The Fourth Schedule Part 1 (21) and (32) forms the foundation of national government planning mandates while Part 2 (8) of the schedule forms the foundation of county governments planning mandates.

The County Governments Act (CGA) 2012 prescribes the powers, functions and responsibilities of County Governments for the delivery of services and associated purposes.

The Kiambu County Integrated Development Plan (CIDP) 2018-2022 describes the goals and objectives, implementation plan, strategies and impacts, and monitoring and evaluation procedures for the county. The CIDP in association with the County Governments Act 2012, ensures that the County Government plans and implements urban development projects and programmes. All projects, programmes and County budgetary cycles are affixed to the CIDP.

The Kiambu County Citizen Petition and Participation Act 2015 prescribes conditions for public participation in the administration and management of the County for its development and associated purposes.

11.5 Mechanisms of Participation

This framework is underpinned by Part VIII on Citizen Participation of CGA No.17 of 2012 and Kiambu County Citizen Petition and Participation No. 9 of 2016. The two acts generally highlight the principles of citizens' participation in counties.

Part VIII on Citizen Participation of the County Governments Act No.17 of 2012 stipulates that citizen participation in County Governments shall base upon the following principles:

- Timely access to information, data, documents, and other information relevant or related to policy formulation and implementation;
- Reasonable access to the process of formulating and implementing policies, laws, and regulations, including the approval of development proposals, projects and budgets, the granting of permits and the establishment of specific performance standards;
- Protection and promotion of the interest and rights of minorities, marginalised groups and communities and their access to relevant information;
- Legal standing to interested or affected persons, organisations, and where pertinent, communities, to appeal from or, review decisions, or redress grievances, with particular emphasis on persons and traditionally marginalised communities, including women, the youth, and disadvantaged communities;

- Reasonable balance in the roles and obligations of County Governments and non-state actors in decision-making processes to promote shared responsibility and partnership, and to provide complementary authority and oversight;
- Promotion of public-private partnerships, such as joint committees, technical teams, and citizen commissions, to encourage direct dialogue and concerted action on sustainable development; and
- Recognition and promotion of the reciprocal roles of non-state actors' participation and governmental facilitation and oversight.

Citizens are allowed to raise petitions in writing form and the County Government has the responsibility to respond expeditiously to the issues raised.

The CGA 2012 Section 115, prescribes the following mechanisms of public participation:

- Information communication technology-based platforms;
- Townhall meetings;
- Budget preparation and validation fora;
- Notice boards: Announcing jobs, appointments, procurement, awards and other important announcements of public interest;
- Development project sites;
- Avenues for the participation of peoples' representatives including but not limited to members of the National Assembly and Senate; or
- Establishment of citizen fora at the County and decentralised units.

The Kiambu County Citizen Petition and Participation No. 9 of 2016 states that the County Government should provide a budget to support public participation. Actors involved in the public participation process include the County Executive and County Assembly, who have the responsibility to promote public participation. The Act further provides for an Office of Public Participation and Citizens Petitions under the office of County Public Service. The citizen's rights and responsibilities with regard to public participation are also spelt out. Under the Act, three different forums are to be organised at least once every year, these include; County Leadership Forum, County Stakeholders Forum and the Ward Citizen's Forum. The guidelines on petitions and participation in this Act borrow from the stated principles of the CGA No.17 of 2012.

Public participation is a key component in the plan preparation process. In the preparation of this ISUDP, various methods were employed to involve the public which included:

- Notice to the public on the intention to plan;
- Focus group discussion;
- Stakeholders' forums; and
- Engagement of County Technical Working Group.

In respect to the above mechanisms, the County planning authority invited the public to review its plans through the following ways:

- Planning clinics within the Sub-County's wards and villages, facilitated by their representatives. The participants are given an opportunity to comment on the proposed County developments and programmes. Comments are noted and considered by the County planning authority.
- Development applications, for example, change of land use notifications through print media and on-site advertisements. Anyone with objections is invited to avail their comments to the county planning authority.
- Meetings with Sub-County associations in the following categories:
 - Neighbourhood;
 - Professional – health, built and urban environments, economic and finance etc.;
 - Sectoral – industries, business communities, agriculture, health, hospitality etc.;
 - Education and Research Institutions; and
 - Non-Governmental Organisations (NGOs) and Community Based Organisations (CBOs) – religious centres.
- Use of communication technology through the county websites, television and radio channels, social media and daily newspapers.

11.6 Stakeholders Profiling

The identification of stakeholders invited to the workshops was guided by the initial Stakeholders Identification Matrix provided in the Consultant's Project Design Report. The final list of stakeholders invited to the Strategic Planning Workshop was identified through several discussions between the Consultant and County and Sub-County Planners. The final list of the participants is provided in Annexure 1.

Table 11-1: Stakeholder Profile

National Government	Public health and environment
County Government	Utility Service providers
Government Agencies/Parastatals	Informal businesses
Area Member of Parliament	Residential Associations
Sub-County Administrator	Non-Governmental Organisations
Ward Administrator	Community- Based Organisations
MCAs	Religious Institutions
Area Chiefs	Transport Sector
Deputy County Commissioner	Farmers
Sub-County departments	Traditional & cultural centres

Local Community	Minority and marginalised groups
Professionals from the private sector	Youth
Business community	Women

Source: VisionRI

11.6.1 INCLUSIVITY (MINORITIES AND PEOPLE LIVING WITH DISABILITIES (PLWDS))

The CGA 2012 Section 97 prescribes mechanisms to protect the marginalised and minorities within counties pursuant to Article 197 of the Constitution.

- Protection of marginalised and minority groups from discrimination and treatment of distinction of any kind, including language, religion, culture, national or social origin, sex, caste, birth, descent or other status;
- Non-discrimination and equality of treatment in all areas of the economic, educational, social, religious, political and cultural life of the marginalised and minority groups;
- Special protection to vulnerable persons or those who may be subject to threats or acts of discrimination, hostility, violence and abuse as a result of their ethnic, cultural, linguistic, religious or other identity under section 83 of CGA 2012;
- Special measures of affirmative action for marginalised and minority groups to ensure their enjoyment of equal rights with the rest of the population;
- Respect and promotion of the identity and characteristics of minorities;
- Promotion of diversity and intercultural education; and
- Promotion of effective participation of marginalised and minority groups in public and political life.

11.6.2 STAKEHOLDER CONCERNS

Comments raised by the public in the planning clinics, land development applications and through associations in the Sub-County, are noted and reviewed by the county planning authorities with the County Executive Committee.

11.6.3 MODE AND LEVEL OF ENGAGEMENT

- **Focus Group Discussion:** Focus Group Discussions in Juja Sub-County were held on 7th and 8th of April 2015. The number of group discussions held was two. During the discussions, the engagement level entailed discussions on socio-economic issues within the Sub-County including the social setting of communities particularly in informal settlements, the main economic activities in the Sub-County, economic drivers of the Sub-County, and their expectation on the growth of the Sub-County.
- **1st Stakeholders Planning Workshop:** The Juja Sub-County 1st Strategic Planning Workshop was held on 1st August 2018 at Centurion Hotel located along Thika Superhighway at Highpoint, Juja Sub-County. The Workshop was organised by the County Government of Kiambu in conjunction with the

Consultant and NAMSIP. The aim of the Workshop was to create awareness of the plan, present the baseline information for validation, identification of SWOT analysis and formulation of vision, mission statements

- **Kiambu County Technical Working Group:** The Consultant engaged the County Government of Kiambu in all planning process stages to ensure the ownership of the plan before submitting the same to the stakeholders. The meetings were organised by NAMSIP together with the Consultant.
- **2nd Stakeholders Planning Workshop:** The second Stakeholders Planning Workshop was held on the 21st of February at Centurion Hotel, Juja Sub-County. Organised by the County Government of Kiambu in conjunction with the Consultant and NAMSIP, the aim of the Workshop was to present the plan proposals to the stakeholders for review.

11.6.4 STAKEHOLDERS ISSUES AND CONCERNS

During the Stakeholders Planning workshop for Juja Sub-County, the following issues and concerns were raised by the stakeholders:

- Provision of special schools;
- Provision of secondary boarding school;
- Designating an area for Jua Kali and informal sector businesses;
- Provision of vocational and tertiary institutions;
- Provision of a Level four hospital;
- Provision of recreational parks; and
- Integrating the new education curriculum in the Plan.

SWOT analysis was carried out by the stakeholders with help from the Consultant. The stakeholders present were divided into six groups each representing the six thematic areas. The SWOT outputs are annexed in this report.

11.7 Key Planning Issues on Governance and Stakeholders Participation

Table 11-2: Key Planning Issues on Governance and Stakeholders Participation

Focus Areas	Key Highlights	Opportunities
Governance Structures	• Weak coordination especially on physical planning matters due to lack of an approved plan.	• Approval of the ISUDP to assist in coordinating the project implementation.
Mechanisms of Participation	• Low levels of awareness on planning and other County operations.	• Use existing mechanisms to mobilise and educate the community on planning matters.

Focus Areas	Key Highlights	Opportunities
Inclusivity	• Challenge in effectively reaching to PLWDs especially the deaf, dumb and the blind; and • Low levels of awareness on planning and other County operations.	• Use of PLWD-friendly modes of communication; • Continuous updating of the stakeholders' database; and • Use of innovative social media information dissemination.

Source: VisionRI

12 SYNTHESIS OF EMERGING ISSUES

12.1 Overview

This chapter provides the key sectoral challenges facing the Sub-County that are addressed by the ISUDP as well as its potentials that could serve as platforms of growth. These challenges and potentials are then synthesised to identify the Sub-County's crosscutting strengths and opportunities that may be capitalised upon to sustain its development over the planning period. The weaknesses of and possible threats to such sustainable development are identified.

In planning, public participation is a key approach, which should not be overlooked. With the assistance of Juja Sub-County's Department of Social Services, various stakeholders were identified who represented various groups, agencies and government departments (list of attendants in Annexe 1). The first stakeholders' Workshop was then organised at the Centurion Hotel on 1st August 2018 where the consultant presented the findings on the situational analysis.

Uncaptured issues in each sector were brought out in the deliberations as well as some of the interventions that stakeholders felt should be included in the planning proposals. Following the preparation of the draft report, a meeting with the County Technical working Group was organised to evaluate the proposed development model and share their thoughts on the same. This was held on 7th September 2018 at Centurion Hotel in Juja. The issues raised have been incorporated in this Plan.

12.2 Summary of Key Sectoral Issues

The emerging planning problems are presented alongside the potential, according to the sectors under analysis. These are summarised in the table below:

Table 12-1: Summary of Emerging Issues

Focus Areas	Key Highlights	Potentials
Population	- Juja is host to JKUAT and is in that sense a university town. As student numbers increase so does the demand for housing in the Sub-County; - Population growth and differentiation in Juja will most likely lead to the rise of new informal settlements and the expansion of old ones; and - As the urban population increases so will poverty arising from unemployment especially in the face of limited social networks in urban settings.	- The youthful population in the Sub-County can drive business and technological innovation especially buoyed by research in the local university; and - The diverse urban population brings new ideas and practices that may challenge inefficient local practices and lead to higher productivity in the economy. This is particularly applicable to agricultural activities.

Focus Areas	Key Highlights	Potentials
Local economy	• Inadequate formal spaces for informal sector activities; and • Quarrying activities threaten environmental quality.	• Infrastructural growth and TOD planning; • Good quality public services; • Established the banking industry; • Investment attractiveness; • Proximity to Nairobi; and • Existing market for education.
Land use	• Inadequate provision of physical infrastructure and services; • Residential developments occurring haphazardly and are going into areas of higher elevation northwest of Juja Town; • Urban areas expanding to inadequately serviced land; • Urban expansion causing the premature conversion of agricultural lands and open areas; and • Intensifying linear urban developments along the Nairobi-Thika Highway.	• Dynamic relationship between CBD and JKUAT; • Presence of two secondary nodes, Kalimoni and Witeithie, creates opportunities for nodal growth; • Presence of suitable agricultural lands at the northwest to support agri-based economic activities; • Availability of land suitable for urban expansion at the southeast to support residential and industrial developments; and • Presence of several waterways that can serve as green corridors.
Land Administration and Management	• Increasing number of land buying and selling companies; • Complex land administration and management process; and • Fraud in land ownership due to the presence of land cartels in the area.	• Private land tenure system; and • Potential for improvement of land registry so that land records are accessible to all stakeholders in real-time at the lowest costs.
Urban design	• Disorganised streetscape in the CBD and secondary nodes due to lack of definitive division between spaces for vehicles and pedestrians; • Weak urban character due to lack of identifying features of gateways, landmarks and corridors; • Lack of public open spaces that may commonly be used for common recreation; and • Significant portions of rural areas have already been subdivided into small residential and farm plots.	• CBD is already mixed-use, and developments are increasing in density will facilitate the development of a compact and walkable town; • Open areas at the fringe of the CBD could be used for lower intensity use such as vehicular parking space; • Rivers traversing the entire length of the Sub-County provides sufficient space for the design of green corridors; and • Large vacant land offers flexibility to design and implement a desired urban form.
Transportation	• Poor road condition whereby most roads are very dusty during dry seasons and difficult to use during rainy seasons. Such roads include, but not limited to, Juja Farm road, and Ndarugo-Tora road;	• Sub-County situated along the Nairobi-Thika Highway in close proximity to Ruiru and Thika; • There are still large tracts of land that may be acquired for the future expansion of the transport system;

Focus Areas	Key Highlights	Potentials
	- The roads are narrow as they lack shoulders and there are no provisions for pedestrian and cyclists; - Disorderly public transport coupled with lack of a designated bus park and bus bays; - Traffic congestion within the central areas of Juja Town; - Lack of safe crossing facilities for pedestrians and cyclists across the highway; - There are many accidents caused by public service vehicles. The main black spots are Kwa Maina, High Point and Ndarugo; and - Urban sprawl from Nairobi and Thika bringing more traffic to the Sub-County.	- The town's location at the intersection of Nairobi – Thika highway and the Juja – Gatundu road makes the town a potential interchange hub to towns like Gatundu (and to the A104 road) to the west and Tala-Kangundo (to the A109 road) to the east, as a regional orbital; and - Location and facilities (commuter rail; mass transit systems) support the development of a multi-modal transport hub to serve the urban and neighbouring rural areas.
Informal settlements	- Land ownership in the informal settlements is contested as there are multiple claims on each parcel; - The roads into the informal settlements are either too narrow or are of very poor quality; - Inadequate services to informal settlements such as electricity, water supply and street lighting; - High rates of crime in the informal settlements; and - Poor business environment as a result of the prevailing poverty and poor infrastructure.	- Business acumen in the informal settlements where people carry out some successful small business that sustains their livelihoods; - National and international support to slum upgrading programmes; and - Some of the poor housing units that pass as informal settlements are on private land. County by-laws requiring minimum standards for housing on private land may address the problem.
Energy	- High cost of accessing and using energy sources amongst the poor; and - Vandalism, which results in power surges and blackouts.	- Presence of power substation within Juja Town; 90% of electricity consumers in Juja Town are within the gridline and have been connected; - Biogas generation plant at JKUAT; and - Sensitisation on the use of energy-saving jikos by Plan International.
ICT	Disruption of fibre optic cable and other ICT infrastructure during road maintenance and/or upgrading.	- Serviced by all mobile phone operators; - Serviced by various national and local television and radio stations; and - Extensive use of the internet and the presence of fibre optic cables in Juja Town.

Focus Areas	Key Highlights	Potentials
Solid waste	• Inadequate solid waste management infrastructure to service the increasing population; • Poorly sited dumpsite, e.g. near the riparian, commercial, and residential areas; and • Delays in the waste collection by the waste collection companies or County government.	• Available land that can be acquired by the County Government to construct dumpsites and a landfill; • Promote waste re-use; re-cycling; recovery e.g. energy; and treatment; and • Construction of bio-centres especially in the informal settlements and institutions to mitigate human waste.
Wastewater disposal	• Inadequate operational public sewer system that leads to environmental degradation; • Constrained sewerage systems; • Limited funding to expand wastewater disposal system; • Certain households unable to make payment for wastewater disposal connection; • Growth of informal settlements; • Population influx in the Sub-County; • Sewer bursts hence pollution of the environment e.g. water resources; and • Construction on sewer lines.	• County Government involvement in the expansion of the sewerage system; • County Government involvement in the monitoring of the sewerage system and give reports occasionally; • Construction of more treatment plants/systems; and • Re-use of wastewater.
Stormwater	• Overflow of the storm drainage system, hence pollution of the environment e.g. water resources; • The spread of water-borne diseases such as typhoid, amoeba etc.; • Destruction of the storm drainage system during major infrastructural developments; and • Solid waste blockage and siltation of storm drainage system.	• County Government involvement in improving storm drainage system; and • Available land for expansion of storm drainage system.
Disaster Risk reduction	• Inadequate strategies to mitigate geo-hazards such as floods and landslides; • Climate change issues are not fully mainstreamed in the county development programmes; • Inadequate funding to mitigate disasters; and • Inadequate capacity building on disasters linked to climate change issues.	• There is progress in formulating County strategies to mitigate the effects of climate change and variability; • Global partnerships towards addressing climate change; • Awareness created on disasters associated with climate change and variability; and • Preparedness strategies at the County and National level.

Source: VisionRI

12.3 SWOT Analysis

12.3.1 STRENGTHS AND OPPORTUNITIES

Comparative advantages and agglomerations of economics should be used as a platform for the growth of Juja Sub-County. The following are the key driving forces behind the growth of the Sub-County:

- **Education Hub:** Juja Sub-County has a potential for becoming an education hub within the NMR due to the following factors:
 - Existing market for education due to the existing pool of institutions, students and education services.
 - Proximity to Nairobi and the entire NMR making it highly accessible to the rising young population of the metropolis
 - Growing infrastructure such as the building of roads and improved transport networks to include rail and air links that can connect it to other parts of Kenya and internationally.
 - A dynamic banking industry that could help develop student loan programmes; and
 - A growing commercial and business sector which can feed into the education sector and vice versa. This strategy directly supports a key objective of vision 2030, which is to develop NMR into a 'regional and global research and education hub.'
- **Residential Hub:** Juja has also been attracting investments in the real estate sector, mainly because of its proximity to NMR, improved accessibility due to the completion of the Nairobi-Thika Superhighway, and relatively lower cost of land. These advantages are complemented by the availability of construction inputs like stones (which are available in the Sub-County) and cement (which are obtained from nearby Machakos County). Future growth will be anchored on further supporting the Sub-County's large student community and the increasingly growing population of professionals in the NMR.
- **Indigenous Industries:** Juja should capitalise on its existing pool of manufacturing industries which are becoming prime sectors of employment. These range from firms that deal with plastics, premier bag, vegetable products, alcohol, and coffee and jua kali.

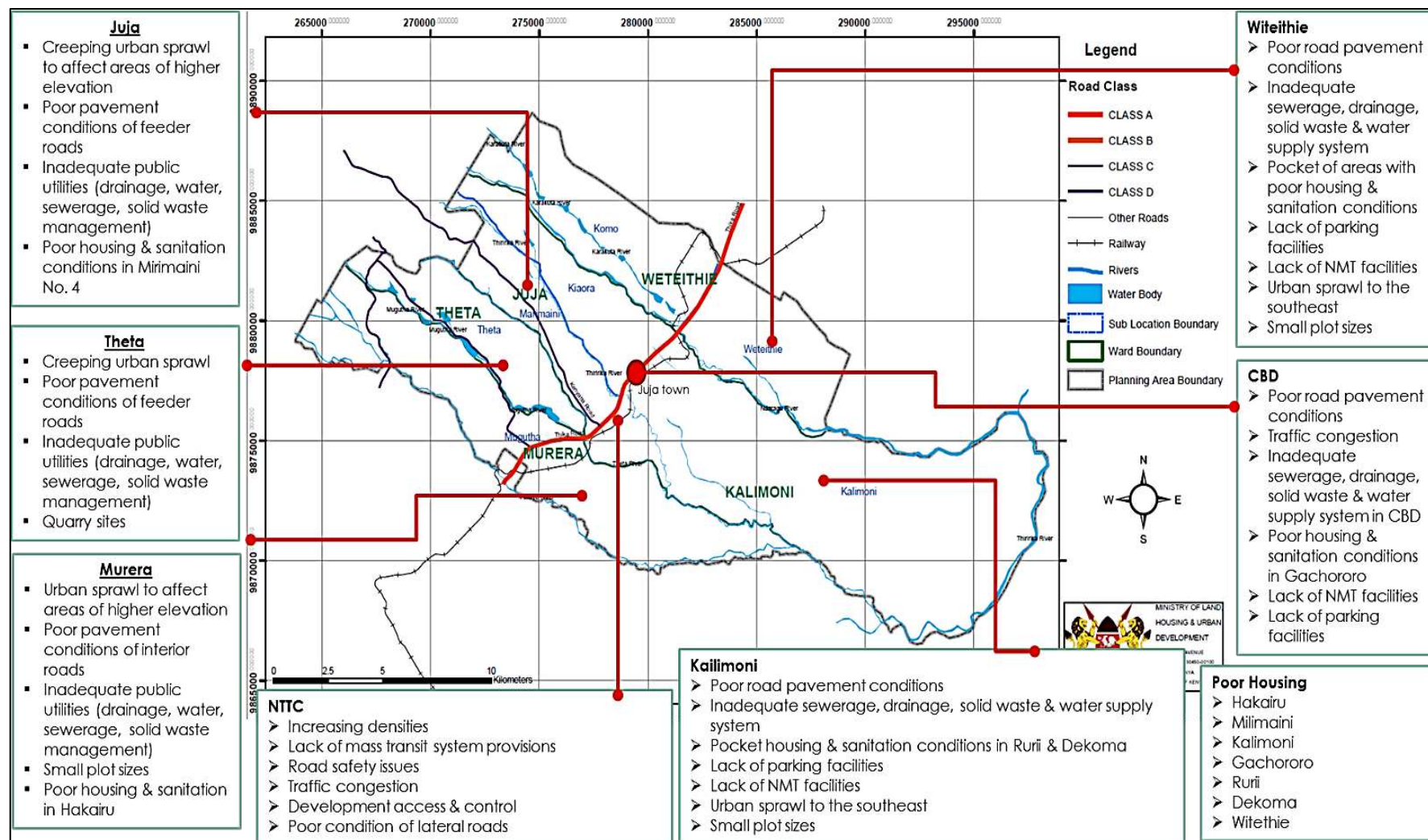
12.3.2 WEAKNESSES AND THREATS

Key inefficiencies that the Plan addressed in order to properly realise Juja's growth potentials include the following:

- **Weak transport infrastructure:** Road transportation is the only mode of transport in Juja. At present, only the Nairobi-Thika Superhighway (A2) is in good condition and the rest of the roads are poor and difficult to use especially during rainy seasons. This hinders the growth of local

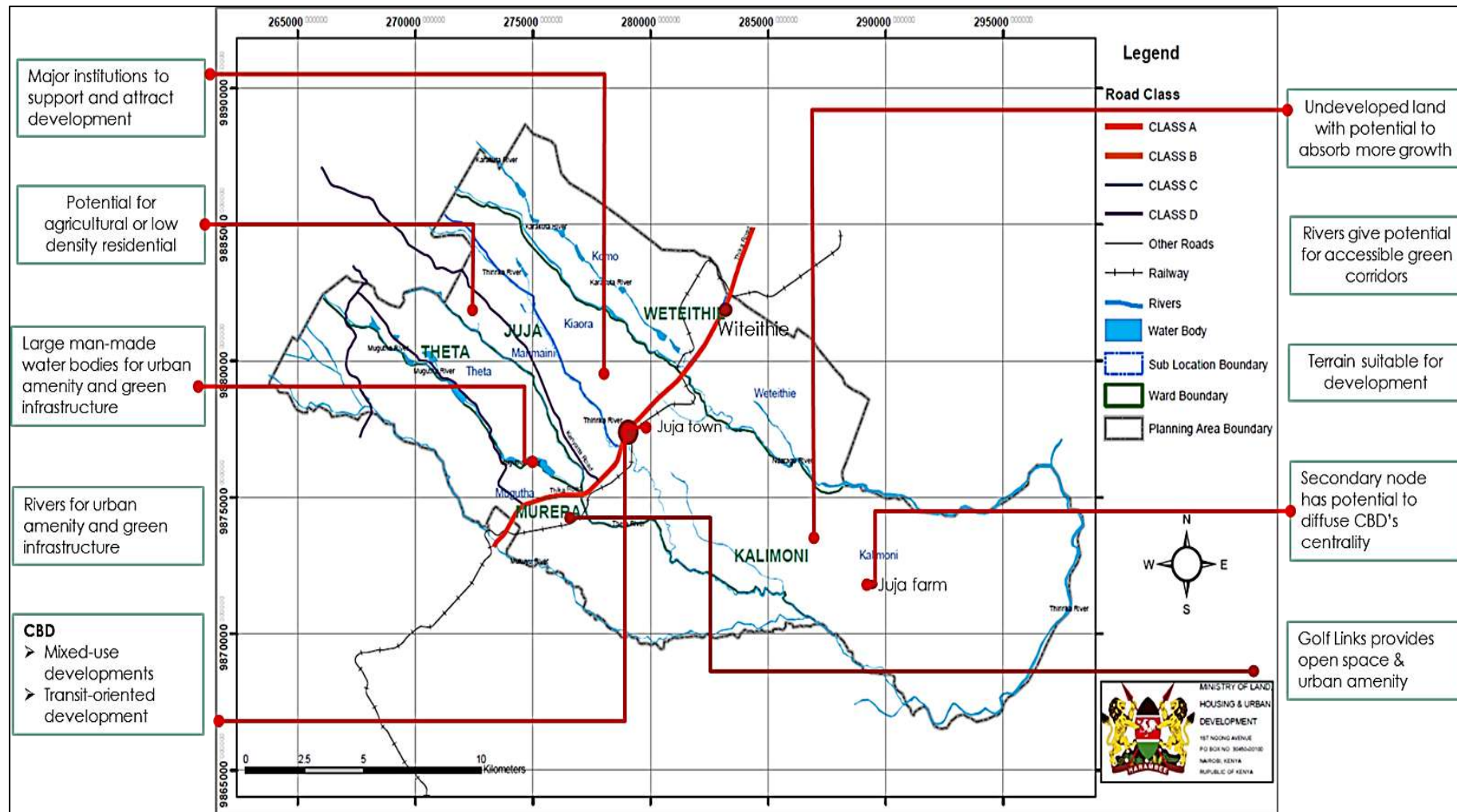
economic activities as the movement of people, goods and services from one place to another are slowed down.

- **Backlogs in physical and social infrastructure:** Juja has inadequate sewer, drainage, potable water supply, and solid waste management infrastructure. Not only do these discourage business investors, but they are also a major cause of environmental degradation and the lowering of the quality of the urban environment. The Sub-County also has backlogs in health, education, and recreational facilities, amongst others, which are detrimental to the welfare of residents.
- **Leapfrogging settlement pattern:** Urban growth has largely been market-driven and occurred under a weak urban planning and development control context. The result is a leapfrog pattern of settlements, which creates a multitude of short-term challenges, such as premature loss of valuable agricultural lands, encroachments on environmentally sensitive locations, lack of service infrastructure, etc. If left unchecked, this pattern of growth will lead to long-term challenges such as the eventual emergence of a featureless urban sprawl as the disparate settlements coalesce, worsening traffic conditions as the Sub-County becomes car-dependent since developments were totally unrelated to each other, and strains to the County Government in providing extensive and under-utilised public infrastructure.



Map 12-1: Juja Sub-County Opportunities Map

Source: VisionRI



Map 12-2: Juja Sub-County Problem Map

Source: VisionRI 2020

PART III

PLAN FORMULATION

13 SCENARIO BUILDING AND CONCEPTUAL FRAMEWORK

13.1 Overview

This section discusses the spatial development alternatives developed for the growth of Juja Sub-County and the key structuring elements. The alternatives were informed by the Sub-County vision and the stakeholders' outputs.

13.1.1 PRINCIPLES, VISION, OBJECTIVES, OPPORTUNITIES

Vision: "A Vibrant Knowledge and Commercial hub" within the NMR.

This vision underpins the importance of Juja as an educational hub and as a vibrant town with potential to provide commercial services within the metropolitan region.

Mission: The mission of this Plan is to enhance the role of Juja as a knowledge centre and promote vibrant commercial activities. The Sub-County will maximise on the opportunities provided by educational institutions such as JKUAT, Kenyatta University Campus, several middle-level colleges and also the commercial and services potentials.

The objectives to realise the above vision and mission are as follows:

- To promote a vibrant economy by providing a workforce with relevant modern skills and technology to improve the well-being of society;
- To provide a safe, efficient and well-integrated transportation system;
- To provide adequate, quality, affordable and well distributed social amenities and services;
- To ensure a well-planned, affordable and sustainable physical infrastructure; and
- To ensure transparency and inclusiveness in the governance of the Sub-County.

13.2 Strategic Development Directions

The key structuring elements influencing the development of Juja Sub-County include major transportation corridors and routes which include Nairobi-Thika Superhighway, Kenyatta Road, Kigango Road and Gatundu-Juja Road and the railway line; JKUAT; major rivers traversing the Sub-County such as Thirika River, Ndarugo River, Theta River, Athi River and Mugutha River; and quarry sites. These elements define the growth pattern of Juja Sub-County.

- **Thika-Nairobi Transport Corridor:** The Thika Superhighway, which traverses the Sub-County has catalysed developments along the corridor. The emergence of urban centres such as Witeithie, Kenyatta road and Kimbo is because of this transport corridor.
- **Jomo Kenyatta University of Agriculture & Technology:** JKUAT is a major driving force behind the spatial growth of the Sub-County. Residential and commercial activities have emerged within Juja

Town with the major target group being the university students whose annual population is approximately 24,000.

- **Development Trends:** Juja Sub-County is one of the fastest-growing urban centres within the NMR. According to the SPC for NMR, it is one of the leading urban centres in terms of population increase. The Nairobi-Thika Superhighway, JKUAT, and availability of relatively cheap land are the key driving forces behind urbanisation in the Sub-County.

13.3 Alternative Development Models

The preparation of spatial development models was informed by the following: NaMSIP Spatial Concept, situational analysis based on thematic studies, analysis of existing land use patterns, and stakeholders' participatory workshops, amongst other factors. Based on the analysis the emerging development spatial needs for Juja Sub-County include:

- Need to contain urban sprawl;
- Need to manage the emerging linear development pattern along the Thika-Nairobi Superhighway;
- Need to protect and conserve ecologically sensitive area;
- Come up with sustainable development control measures/strategies; and
- Need to provide adequate infrastructure to support current and future developments in the Sub-County.

Based on the above issues, the Plan proposes three alternative development proposals to guide the spatial and socio-economic growth of the Sub-County as outlined below.

13.3.1 NIL SCENARIO

Nil Scenario: Maintaining the Status Quo

This scenario looks at what will happen in the next 10 years if planning intervention is not carried out based on the projections. It projects the situation of the planning area by maintaining the status quo, that is, without proposing new planning interventions. In this case, no appropriate action is taken to address the current development challenges and those which could predictably take place in the future. It is a strategic planning tool for mapping situations currently and projecting them into the future. Therefore, without intervention the various scenarios in Juja Sub-County may include:

- **Intensive subdivision of land:** One of the main problems facing development planning in Juja Sub-County is uncontrolled intensive subdivision and conversion of land from agriculture to urban uses mainly for residential purpose. Unreserved land transfers have resulted in a reduction in the size of land owned by households. Without intervention, this will not only lead to the disinheritance of landowners but also reduced agricultural land and therefore lower productivity. Additionally, this will lead to increased food insecurity, poverty and crime.

- **Uncontrolled quarrying activities along Ndarugo River:** The interfaces between land and the rivers in Juja Sub-County have been encroached by quarrying activities, farmlands in rural areas and buildings within urban centres. The continued un-befitting practices will result to pollution and contamination of the rivers which, if unchecked, may result to excessive erosion of the river banks which reduces the potential of the cultivated land nearby; risk to public safety as property and settlers around are susceptible to flood damages; reduction of open spaces and aesthetics; as erosion occurs, toxic substances are carried into the rivers thus reducing the water quality; and increase in infiltration resulting to reduction in water quantity.
- **Dispersed human settlement patterns:** Dispersed forms of human settlements are mostly evident in Kalimoni, Juja Farm, Nyacaba, Mugutha, Murera and Kiahuria where residents erect housing without adherence to planning guidelines. This practice and resultant human settlements pattern have limited the socio-economic development of the area as follows:
 - Limited access to key infrastructural services as majority of the residents have to walk long distances to access markets, children walking over 1 km to access both primary and secondary schools, and inconvenience especially to the elderly and sick while accessing medical care;
 - Increased household costs as they spend more on transporting their agricultural goods to the markets and on accessing other services;
 - Local businesses and enterprises increased costs of purchasing and transporting products which limit economic growth;
 - Depletion of natural resources especially due to the quarrying activities near the rivers;
 - Increased manifestation of poor waste management and environmental pollution due to rapid urbanisation to areas that are not served by physical infrastructure such as sewer; and
 - Unequitable distribution of social amenities like schools and health facilities. The available ones are only found in the major nodes.

13.3.2 ALTERNATIVE 1: MULTI NODAL TRANSIT-ORIENTED DEVELOPMENT MODEL

The model entails the application of transit-oriented development concept within various nodes with defined functions. Juja Town is the hub with mainly commercial, transport activities, residential, light industries with JKUAT being its driving force of development. Before the establishment of the university, Juja Town was a small trading centre. Due to the rapid urbanisation of Juja Sub-County, other emerging nodes such as Juja Farm, Witeithie and Gwa Kairu have experienced tremendous growth over the past few years. Thika Superhighway has led to the emergence of junction nodes such as Kenyatta Road and Kimbo stage. This model is best placed to guide development patterns within these nodes and the Sub-County at large.

In order to effectively manage urban growth in the Sub-County, this model proposes to integrate the suitable nodes to promote the existing transportation system and contain urban sprawl. In this model, the

proposed nodes will be developed with unique functions and linked with the mass transport system. The model will also heavily rely on the protection of ecologically fragile areas, and provision of infrastructure. The table below indicates the merits and demerits of the model.

Table 13-1: Merits and Demerits of TOD

Merits	Demerits
• Promotes urban compaction adjacent to high-quality public transport; • Efficient and dependable public transport; • Less car dependency; • Increased overall accessibility; • Promotes mixed-use development; • Promotes a walkable neighbourhood; • Potential for freeing areas for green and open spaces; and • Creates a dense network of streets and paths.	• High cost of implementation (land acquisition and the establishment of requisite infrastructure); and • High energy consumption.

Source: VisionRI

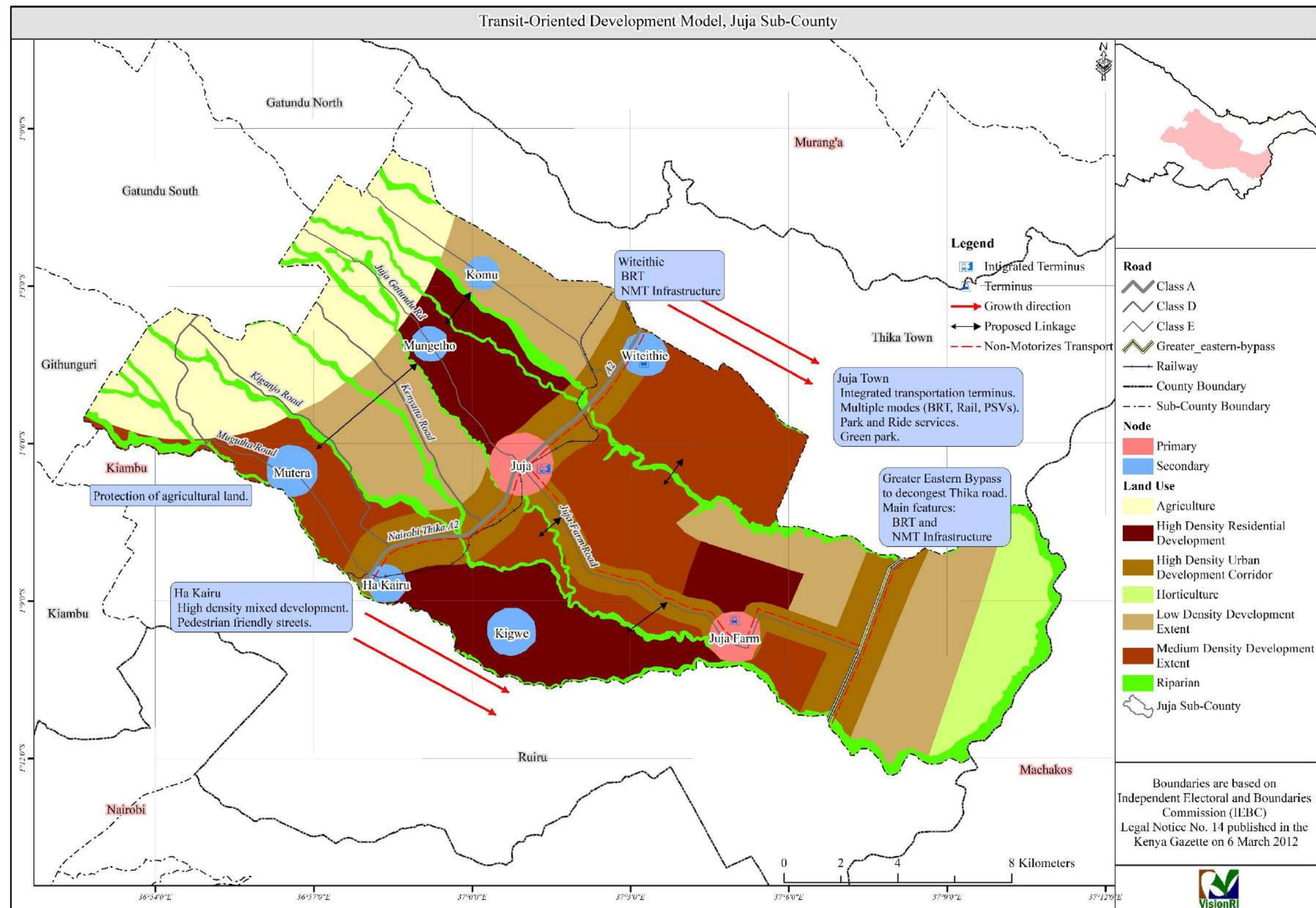


Figure 13-1: Transit-Oriented Development Model

Source: VisionRI

13.3.3 ALTERNATIVE 2: KNOWLEDGE CITY MODEL

The growth of Juja has largely been driven by JKUAT, KU (Ruiru Campus) and other middle-level colleges e.g., NIBS and other facilities including Juja Preparatory, Mang'u, Compuera College and adjacent upcoming high-end schools.

Based on the current driving forces behind the growth of Juja Sub-County, the Knowledge City Model is seen as an ideal alternative. The model proposes the establishment of another national institution in Juja Farm to spur development within the Sub-County and another middle-level college in Witeithie. The model will also rely on the existing institution as reference points of growth. The Knowledge City Model entails facilitating continuous interactions of knowledge amongst agents such as universities, research institutes, companies, etc. to spur the growth of the Sub-County.

Table 13-2: Key features and driving forces of the model

Key features	Driving forces
• Presence of major tertiary education institutions; • Presence of research institutes; • Presence of local and international firms; and • Presence of a technological centre.	• Public-private partnership; • Advanced communication networks; • Good transport network and linkages; • Adequate and well maintained physical; and • Adequate and well-maintained social infrastructure.

Source: VisionRI

Table 13-3: Merits and Demerits of Knowledge City Model

Merits	Demerits
• Encourages learning and knowledge creation; • Possesses a knowledge-driven economy; and • Foster cooperation between the public and private sector, universities, business and other civil society actors.	• High cost of ICT infrastructure installation.

Source: VisionRI

13.3.4 ALTERNATIVE 3: GREEN INFRASTRUCTURE MODEL

Juja Sub-County is endowed with natural and manmade features. The Sub-County has approximately seven rivers within its jurisdiction. They include River Ndarugo, Theta, Mugutha, Thirika, and Athi, amongst others. Other features within the area are quarry sites within Ndarugo area and large tracts of land which are fertile

for agricultural activities. Based on the above ecologically sensitive features, green infrastructure development model may be used to guide the spatial growth of the Sub-County. The model is based on environmental conservation and integration of open and green spaces within the built environment.

The key elements of the model include:

- Integrate environmental conservation with human settlements within the Sub-County;
- Hospitality and recreation service;
- Protection of fertile farmlands;
- Protection of wetland areas; and
- Rehabilitation of the quarries.

Table 13-5: Merits and Demerits of the Green City Model

Merits	Demerits
• Promotes a safe and healthy environment; • Potential for eco-tourism; • Promotes environmental conservation; and • Preserving areas suitable for agriculture.	• More land needs to be released for green infrastructure.

Source: VisionRI

13.3.5 EVALUATION OF ALTERNATIVE MODELS

The alternative models were subjected to the Goal Achievement Matrix to facilitate the selection of the preferred alternative. The County Technical Working Group (CTWG) ranked each alternative based on the sectoral goals and ability of the alternative to meet the overall vision of the Sub-County. The results were later consolidated to find the preferred model. The output of the analysis is indicated below in Table 13-6.

13.4 Preferred Model

After consultation with the CTWG, an integrated model was agreed to be the preferred development proposal but to incorporate all the key aspect of the other models to achieve the vision of Juja Sub-County. This model integrates environmental conservation, knowledge city model and multi-nodal TOD. The land use and functions that this model is envisaged to promote are:

- **Specialisation of nodal functions:** The urban areas in the Sub-County were classified into primary and secondary nodes. Juja Town and Juja Farm centre will constitute the only primary urban nodes in the Sub-County. The secondary nodes include Witeithie, Murera, Mugutha, Mirimaini, Gwakairu and Komu. These nodes function co-dependently and are linked to each other by roads and rail.
- **Mixed-use development:** Mixed-use development in close proximity to the commercial/shopping centres and public transport transfer points shall be promoted. Reduced and managed parking inside 10-minute walk circle around the nodes shall be provided.

- **Industrial development:** Establishment of industrial districts to take advantage of the rail and road networks shall be promoted particularly in Juja and Ndarugo. These will include light and medium industrial industries such as warehouses/godowns, and logistics centres.
- **Multi-modal transport:** This shall be encouraged through the integration of road, rail and NMT systems. An integrated transport terminus may be provided in Juja Town where road and rail transport modes shall terminate journeys. Park and ride services at main transport terminus shall be provided to discourage the use of private vehicles into Nairobi and Thika towns. Public park or squares fronting main transport terminus shall be established.
- **NMT (walkable design and cycling):** Highest priority will be given to pedestrians and cyclists. A network of pedestrian walkways and cycle paths will be provided along the highway, collector streets and neighbourhood streets. Provisions for high-density walkable districts within a 10-minute walk around transport transfer stations/bus stops shall be made.
- **Improved and developed infrastructure:** Physical linkages between the different levels of urban nodes and within the residential and industrial districts will mainly be provided through roads. Collector support transit systems including high-capacity buses shall be encouraged and collector streets upgraded to bituminous standard to facilitate smooth transit.
- **Specialised retail spaces at stations serving commuters and locals:** Spaces shall be provided to accommodate small groceries and other retail shops near transport terminus in Witeithie, Juja Town and Juja Farm.
- **Formulation of land use plans and development control regulations:** This will involve zoning of land uses to encourage compact development and densification at activity nodes by prescribing regulations that promote vertical densification and landscaping regulations.
- **Greenways:** This will involve a comprehensive landscaping program and tree planting along rivers in the Sub-County. Urban design schemes shall be done for purposes of designing waterway fronts and wetland areas to facilitate the use of these areas for recreation.

Table 13-6: Goal Achievement Matrix

Goals	Assigned weight	Alternative development proposals					
		Alternative 1		Alternative 2		Alternative 3	
		Knowledge City Development Model	Sub-Total	Multi Nodal Transit-Oriented Development Model	Sub-Total	Green Infrastructure Development Model	Sub-Total
To ensure optimal utilisation of natural resources in an environmentally sustainable manner	0.17	1	0.17	0.4	0.07	2.4	0.4
To promote a vibrant economy by providing a workforce with relevant modern skills and technology to improve the wellbeing of society	0.17	3	0.5	1.2	0.2	0.2	0.03
To ensure a safe, efficient and well-integrated transportation system	0.17	1.4	0.23	2.8	0.47	0.8	0.13
To provide adequate, quality, affordable and well distributed social amenities and services.	0.17	1.6	0.27	1.4	0.23	1.2	0.2
To ensure a well-planned, affordable and sustainable physical infrastructure.	0.17	1.2	0.2	2.75	0.46	1	0.17
To ensure transparency and inclusiveness in governance of the Sub-County	0.17	0	0	0.6	0.1	-0.8	-0.13
Total Score	1		1.37		1.52		0.8

NB: As per the rating of GAM Alternative 2 was selected as the preferred alternative.

Source: VisionRI

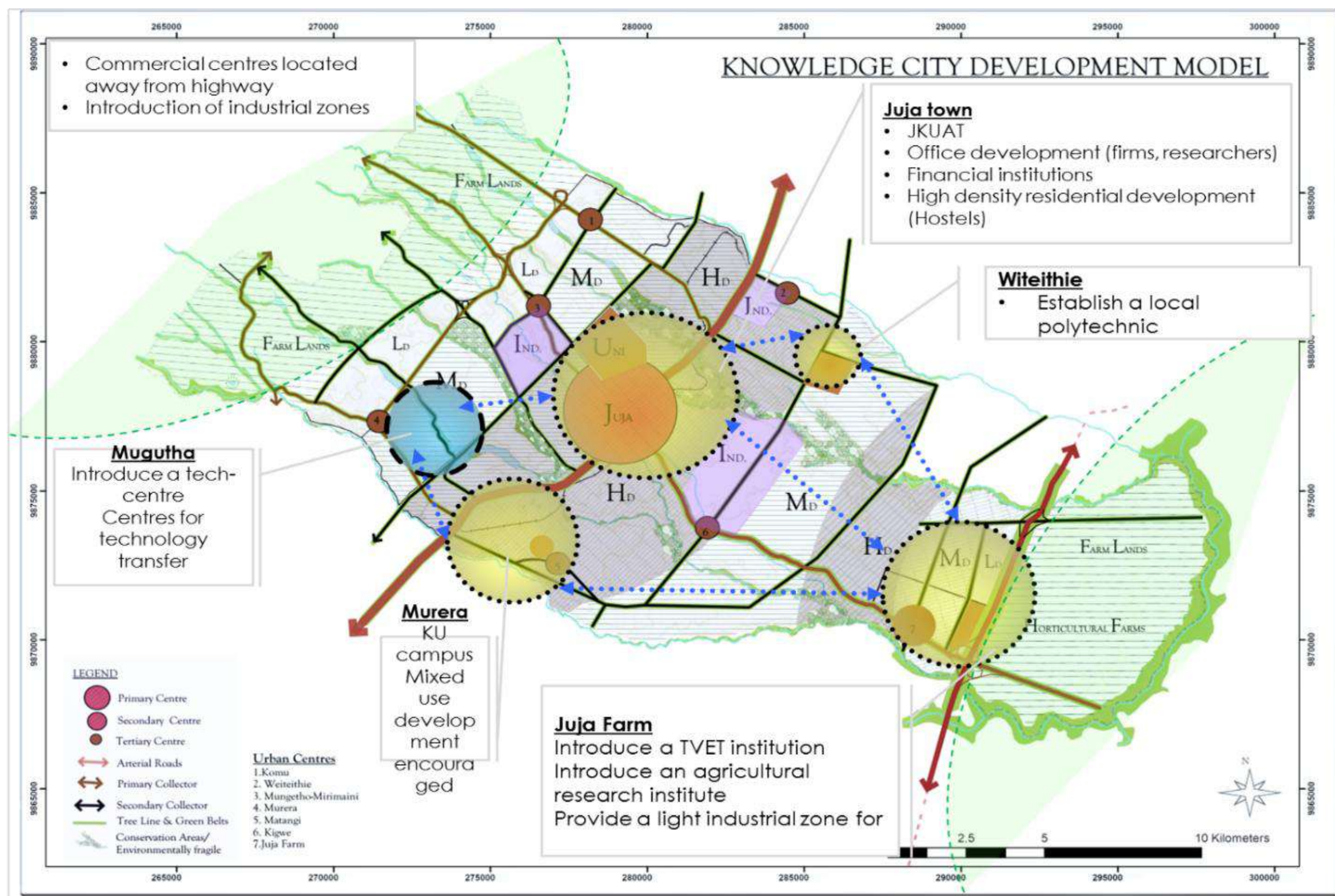


Figure 13-2: Knowledge-City Development Model

Source: VisionRI

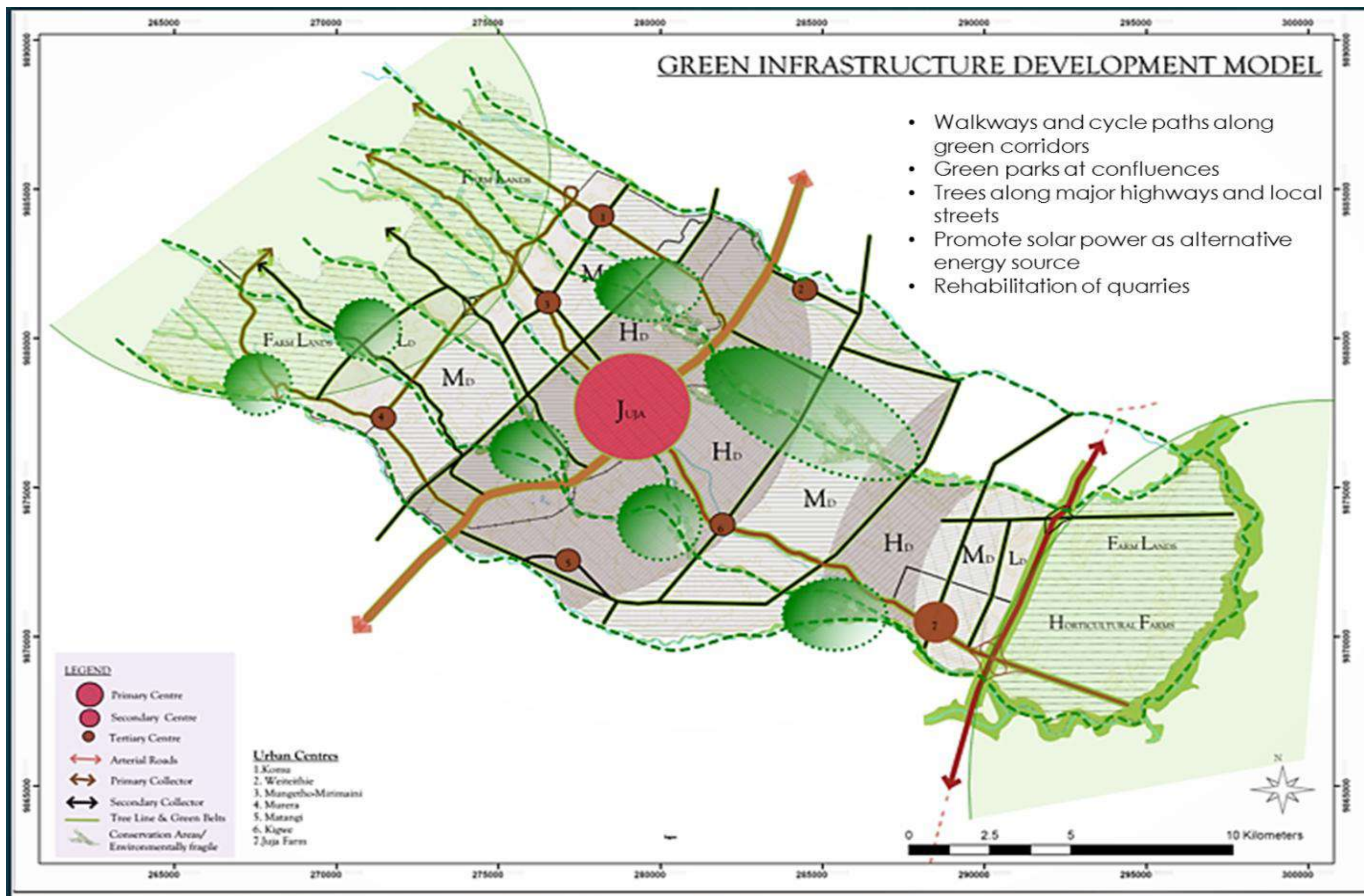


Figure 13-3: Alternative 3: Green Infrastructure Model

Source: VisionRI

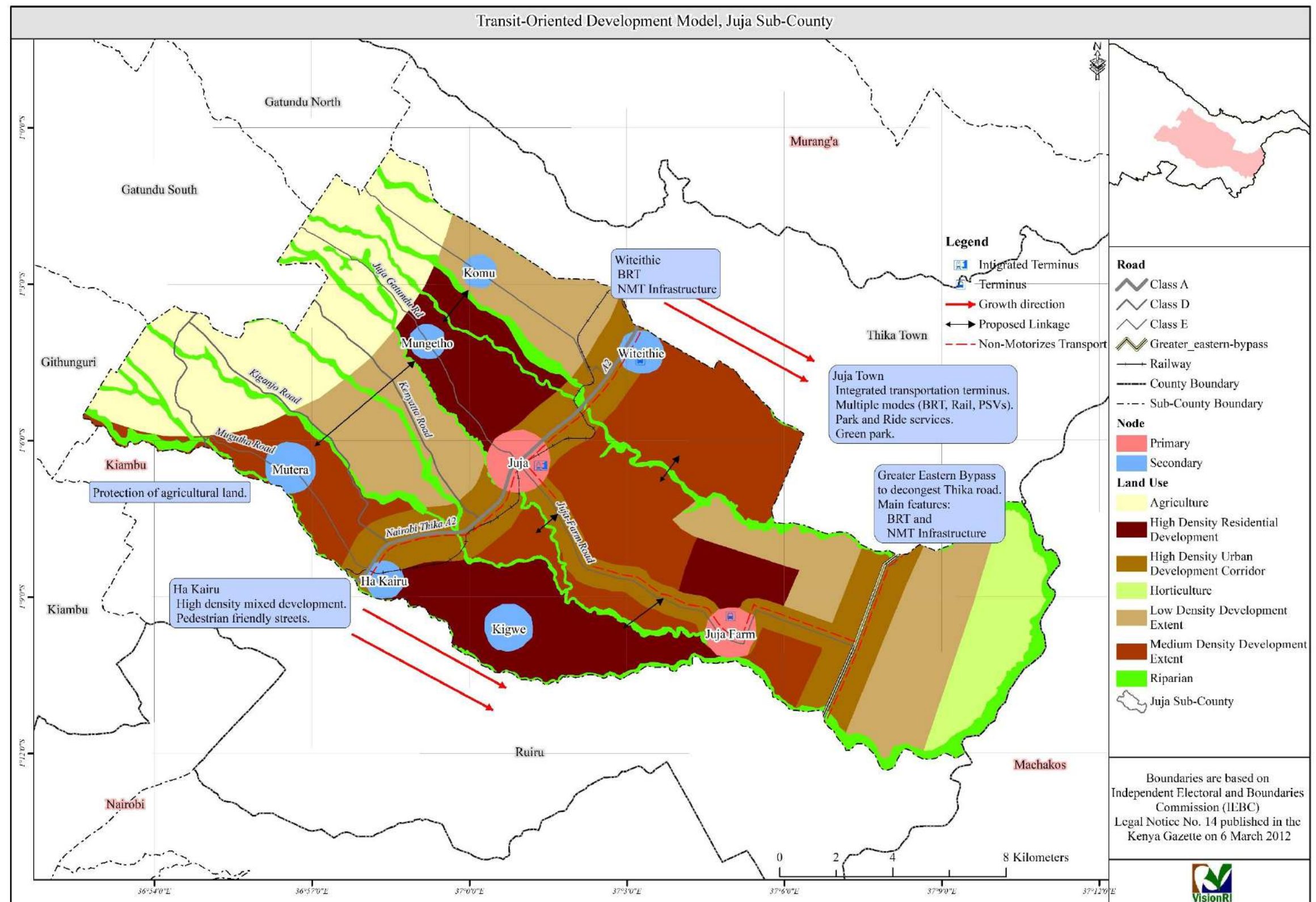


Figure 13-4: The Preferred Model

Source: VisionRI

14 PHYSICAL DEVELOPMENT PLANS

14.1 Land Use Plan

This chapter provides a detailed analysis of the proposed land uses and outlines development regulations in terms of density, minimum plot size, allowable developments, plot ratio, ground coverage and other relevant details. Land in Juja Sub-County has been categorised according to the following: residential (0), industrial (1), educational (2), conservation (3), public purpose (4), commercial (5), public utilities (6), transportation (7) and agricultural (9). The land-use allocation was informed by the current development trends in the Sub-County, NMR concept of Juja as a service town, multi-nodal TOD concept, and the views and vision of the stakeholders.

- **Existing and emerging land uses:** The current dominant land use in the Sub-County is residential which are concentrated along the major road spines. Residential use is projected to occupy the highest percentages of the proposed land uses in the Sub-County. The multi-nodal TOD concept has been applied which has resulted in concentration and densification of residential use and other land use within the nodes that are supported by efficient public transport.
- **Juja Town as a service town:** According to the SPC for NMR, Juja was identified to become a service town. In this context, the following land uses has been considered to enhance the planning are as a service town: hospitality, recreational, education, commercial, logistics centre, residential, and transportation, amongst others.
- **The integrated model:** The integrated model was chosen as the preferred model to guide and control spatial growth in the Sub-County. The model prioritises densification, mixed-use development, walkable neighbourhoods, NMT facilities, and efficient public transport. The principles of the model influenced the land use distribution in the Sub-County within the primary and secondary nodes. The image below illustrates the visual impression of compact development within the nodes.

Residential land use will be in demand considering the rapid population growth in the Sub-County. The land-use plan has considered the possible attraction points and zoned the area considering their respective needs. Currently, areas such as Juja Farm are sparsely populated but are expected to urbanise rapidly by the year 2030.

14.1.1 PROPOSED LAND USE PLAN FOR JUJA SUB-COUNTY BY 2030

The proposed land-use plan delineates Juja Sub-County into 22 zones as illustrated in Map 14-1. The land use zones are briefly described below:

- **Residential land use:** The current residential land use occupies a total land area of 35%. Its coverage is expected to increase as the population in the Sub-County increase. The Plan proposes compact developments and promotes vertical development. Residential land uses are categorised into three categories within the Plan (high, medium and low-density residential developments).

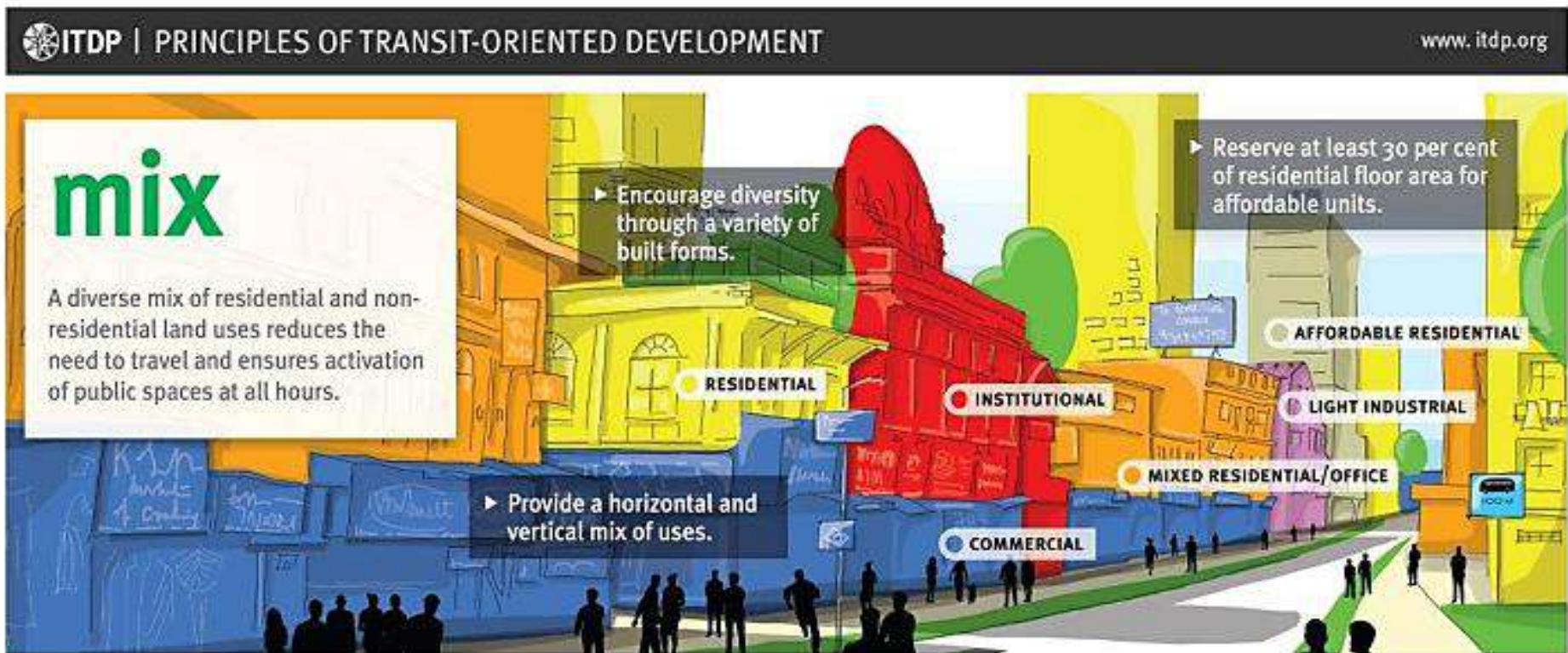


Figure 14-1: TOD Principles

Source: ITDP, 2018

- **High-density residential:** These are areas within commercial zones and major transportation hub where residential developments shall be from eight to ten-storeys. The existing areas zoned for high-density residential development includes part of Juja CBD, Ali Juja Kalimoni, Wakigwe and Gwakairu. The proposed area to be densified includes Juja farm, Malaba, Turco, High Point and Waroma.
 - **Medium density residential:** The medium density residential zones cover the largest residential area within the Sub-County. The existing areas under medium density residential include Milimani, Komo, Nyacaba, Kalimoni, Muigaini Estate, Theta, Matangini, Mugutha, Daykio, and Twiga, amongst others. The proposed area to be of medium density residential include Mugutha, Matangini, Theta, and along Kenyatta road.
 - **Low-density residential:** Low-density residential development zones cover the least percentage of residential use. The current area under low-density residential development includes Kuraihia, Bustani and Twiga Estates. The proposed low-density residential zones include Kuraihia and part of Juja Farm.
- **Education use:** The Sub-County has a total population of 117,138 which is expected to increase to 412,465 by 2030. This will result in a demand for more educational facilities. Currently, there are 20 ECDs, 20 primary schools, and 6 secondary schools. There is a need to utilise the existing educational facilities through vertical development and setting aside land for additional facilities. The private sector will also play a major role in meeting the gap from the public educational facilities.
 - **Industrial land use:** The current industrial area in the Sub-County is 122.84 ha. This proposed land use plan extends this to 1,370.62 ha. Two types of industries namely light and medium are proposed in Juja Sub-County.
 - **Light Industries:** These industries are less capital intensive and more consumer-oriented and producer of smaller consumer goods. These industries entail jua kali, furniture and shoemaking, clothing and home appliances, amongst others. Light industries have been proposed to be located within Juja Industrial Park, Ali Juja, Juja Farm and Mirimaini. The minimum plot size proposed under light industries is 0.05 ha.
 - **Medium Industries:** Medium industries within the Sub-County mainly exist within the industrial park in Mirimaini and part of Juja Farm. The minimum plot size for medium industries is 2 ha. The proposed industries are meat processing, and leather processing, amongst others.
 - **Public purpose:** The Sub-County is underserved by public purpose facilities. Currently, the Sub-County relies on Ruiru and Thika Sub-County for facilities such as Level 4 hospital, stadium, and public parks amongst others. There is a need to allocate more land for public facilities while at the same time

enforcing the public purpose surrender for major comprehensive development within the area. The current area under public purpose is 0.26% and is expected to increase to 0.55% by the year 2030. Public purpose land use will be integrated with residential and commercial developments.

- **Commercial use:** High density and compact commercial areas are proposed at the major nodes within the Sub-County such as Juja CBD, Juja Farm, Kenyatta Road and Kimbo area. The existing commercial area is 0.4% of the total planning area. This area is proposed to increase to about 0.82% of the total planning area by 2030. The proposed land allocation to commercial is relatively low compared to other land uses as the commercial area are expected to be densified hence extending vertically instead of horizontally. The proposed main commercial nodes in Juja Sub-County include Juja CBD and Juja Farm.
- **Recreation use:** The Sub-County has only one recreational within its area of jurisdiction Ruiru Golf Club, which is for members only. The Plan proposes to provide adequate recreational facilities by utilising the riparian reserves and reclaiming the quarry area at Ndarugo as recreational sites.
- **Transportation use:** The total area occupied by transportation is proposed to increase from the current 3.30% to 6.18% by the year 2030 to cater to the rapid growth in road transport and expansion of existing roads. The minimal increase in road areas is since the majority of the Sub-County is well networked with roads with only a few areas requiring new roads. The major developments in the road's subsector will be expansion and upgrading of key road links and maintenance of other smaller roads.

Pedestrian safety measures shall be incorporated along transportation system include:

- Pedestrian crossing bridges;
- Traffic calming measures such as speed bumps and traffic lights;
- Provision of sidewalks separated from the carriageway;
- Street lighting; and
- Zoning guidelines which limit residential developments along major roads.

Table 14-1 below outlines the current and the proposed land use classification within the Sub-County.

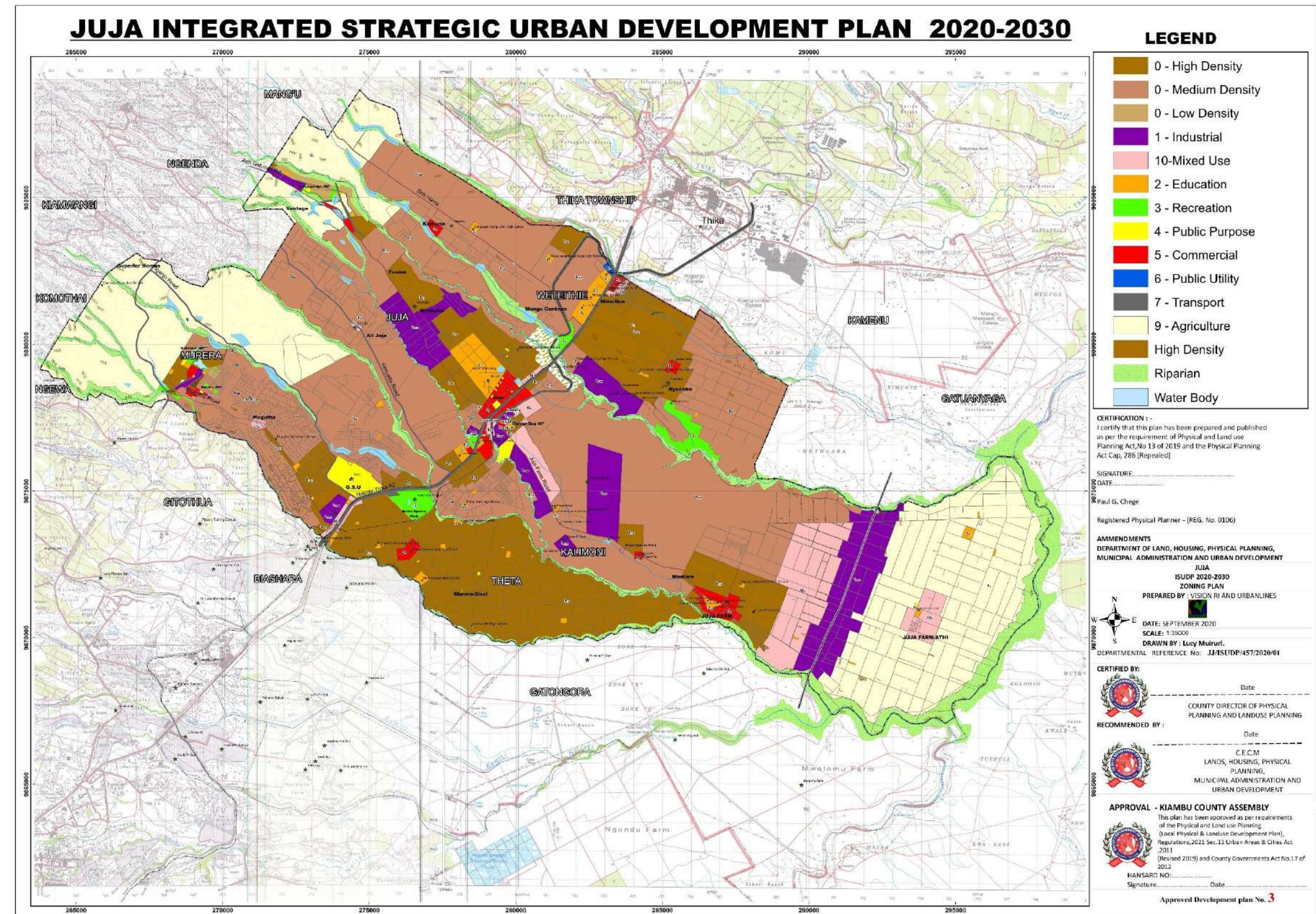
Table 14-1: Indicative Land Use Distribution for Juja Sub-County by 2030

No.	Land Use	Existing		Proposed	
	Classification	Area in Hectares	%	Area in Hectares	%
0	Residential	11,481.42	25.63%	20,977.39	64.9%
1	Industrial	142.84	0.38%	1,715.46	5.3%
2	Education	332.94	0.94%	951.00	2.9%
3	Recreation	111.12	0.35%	125.71	0.4%

4	Public Purpose	138.52	0.52%	165.70	0.5%
5	Commercial	129.30	0.40%	248.17	0.8%
6	Public Utility	5.47	0.08%	5.86	0.0%
7	Transportation	1,046.23	3.24%	1,701.83	5.3%
8	Quarry	868.57	2.69%	0.00	0.00%
9	Agriculture	17,922.90	55.47%	6,072.96	18.8%
10	Mixed Commercial & Residential	37.11	0.11%	345.41	1.1%
	Total	32,309.49	100.00%	32,309.49	100.00%

Source: VisionRI 2020

Map 14-1: Proposed Land Use Plan



Source: VisionRI

14.1.2 DEVELOPMENT CONTROL REGULATIONS

Below Table 14-2 indicates the proposed zoning regulations to guide developments within Juja. The guidelines were adopted in collaboration with the CTWG and considering the proposed land uses as per the Kiambu County Spatial Plan.

14.1.3 ZONING REGULATIONS

14.1.3.1 *Residential Use/Permitted Uses*

- Residences-Bungalow, maisonette, multi-family dwelling (multi-storey flats/ apartments), row housing, detached, semi-detached, and residential-cum-work;
- Hostels, renting houses, old age home, community hall, police post, and guesthouses (not exceeding 200 m² in floor area);
- Day-care centre, kindergartens, and parks and playground;
- Corner shops, small shopping centres, and health facilities (dispensaries, nursing home, etc.); and
- Educational buildings, religious premises, library, gymnasium, park, technical training centre, exhibition and art gallery, clubs, banks/automated teller machines (ATM), matatus stop/Boda-Boda stand (not exceeding 100 m² in floor area), post offices, and hostels of non-commercial nature, etc.

14.1.3.2 *Restricted Uses/Uses Permitted with Special Sanction of the Competent Authority*

- Night shelters, petrol pumps, motor vehicle repairing workshop/garages, household industry, bakeries and confectionaries, storage of LPG gas cylinders, burial grounds, restaurants and hotels (not exceeding 200 m² in floor area), and small butchery;
- Printing press, cinema hall, auditoriums, markets for retail goods, weekly markets (if not obstructing traffic circulation and open during non-working hours), informal markets, multipurpose or junior technical shops, municipal, county and central government offices, and police stations; and
- Public utility buildings like electrical distribution depot, water/sewerage pumping stations, waterworks, fire stations, telephone exchanges/mobile tower, and matatus station/boda-boda stand (occupying a floor area not exceeding 200 m²).

14.1.3.3 *Prohibited Uses*

- All uses not specifically permitted as above are prohibited in residential zones including the following:
 - Heavy, large and extensive industries: noxious, and obnoxious and hazardous industries;
 - Warehousing, storage go-downs of perishables, hazardous, and inflammable goods;
 - Workshops for matatus/boda-boda/buses etc.;
 - Slaughterhouses;
 - Waste treatment plants; and Shooting range.

14.1.3.4 Amendments to uses permitted

The County Government may from time to time add to or amend the above list by considering overall land use compatibility through notification. The land-use regulations in terms of plot size, plot coverage, density, plot ratio and set-backs are presented in Table 14-3.

14.1.3.5 Parking norms for residential development

The general principle to be followed is one car parking space per 100m² gross built area (refer to 'Car Parking in Buildings' of Kenya Planning and Building Regulations 2009) and considering the different bedroom dwelling units in the town, the following parking norms have to be followed for parking in residential areas:

- 1 parking space per 2 (1-bedroom dwelling unit);
- 1 parking space per 1 (2-bedroom dwelling unit); and
- 1.5 parking space per 1 (3-bedroom dwelling unit).

14.1.3.6 Dead-end streets (cul-de-sac)

A dead-end-street should be aligned in such a way that it shall give access to not more than 8 to 10 residential plots and it should not exceed 60m in length and shall have a turning radius of at least 15m hammerhead.

14.1.3.7 Land use regulations for schools, health facilities and administrative use

Table 14-4, 14-5, 14-6 show the required land and the regulations guiding the development of primary schools which include a nursery school and secondary schools.

14.1.3.8 Commercial Use

- **Permitted uses:** The permitted uses in commercial areas include: shops, convenience/neighbourhood shopping centre, local shopping centres, cluster centre, sub-CBDs, professional offices, workplaces/offices, banks, stock exchange/financial institutions, bakeries and confectionaries, cinema halls/theatres, malls, banqueting halls, guest houses, restaurants, hotels, petrol pumps, warehousing, general business, wholesale, hostel/boarding housing, banks/ATM, auditoriums, commercial service centres/garages/workshop, wedding halls, weekly/informal markets, libraries, parks/open space, museums, police stations/posts, matatu stands, boda-boda stands, parking sites, post offices, and government/institutional offices, etc.;
- **Restricted uses:** Non-polluting, non-obnoxious light industries, warehousing/ storage go-downs of perishable, inflammable goods, coal, wood, timber yards, bus and truck depots, gas installation and gas works, poly-techniques and higher technical institutes, junkyards, railway stations, sports/stadium and public utility installation, religious buildings, and hospitals and nursing homes; and

- **Prohibited Uses:** All uses not specifically mentioned above are prohibited in this zone.

14.1.3.9 *Industrial Use*

- **Permitted uses:** The following uses will be permitted for the main purposes and accessory uses: all use permissible in the industrial use zone with the special sanction of the authority except residential uses;
- Residential buildings for security and other essential staff required to be maintained in the premises;
- Police posts or security company offices; and
- All kinds of industries, public utilities, parking, loading, unloading spaces, warehousing, storage and depot of non-perishable and non-inflammable commodities and incidental use, cold storage and ice factory, gas go-downs, cinema, workshop, wholesale business establishments, petrol filling stations with garage and service stations, parks and playgrounds, medical centres, restaurants, matatu station, etc.

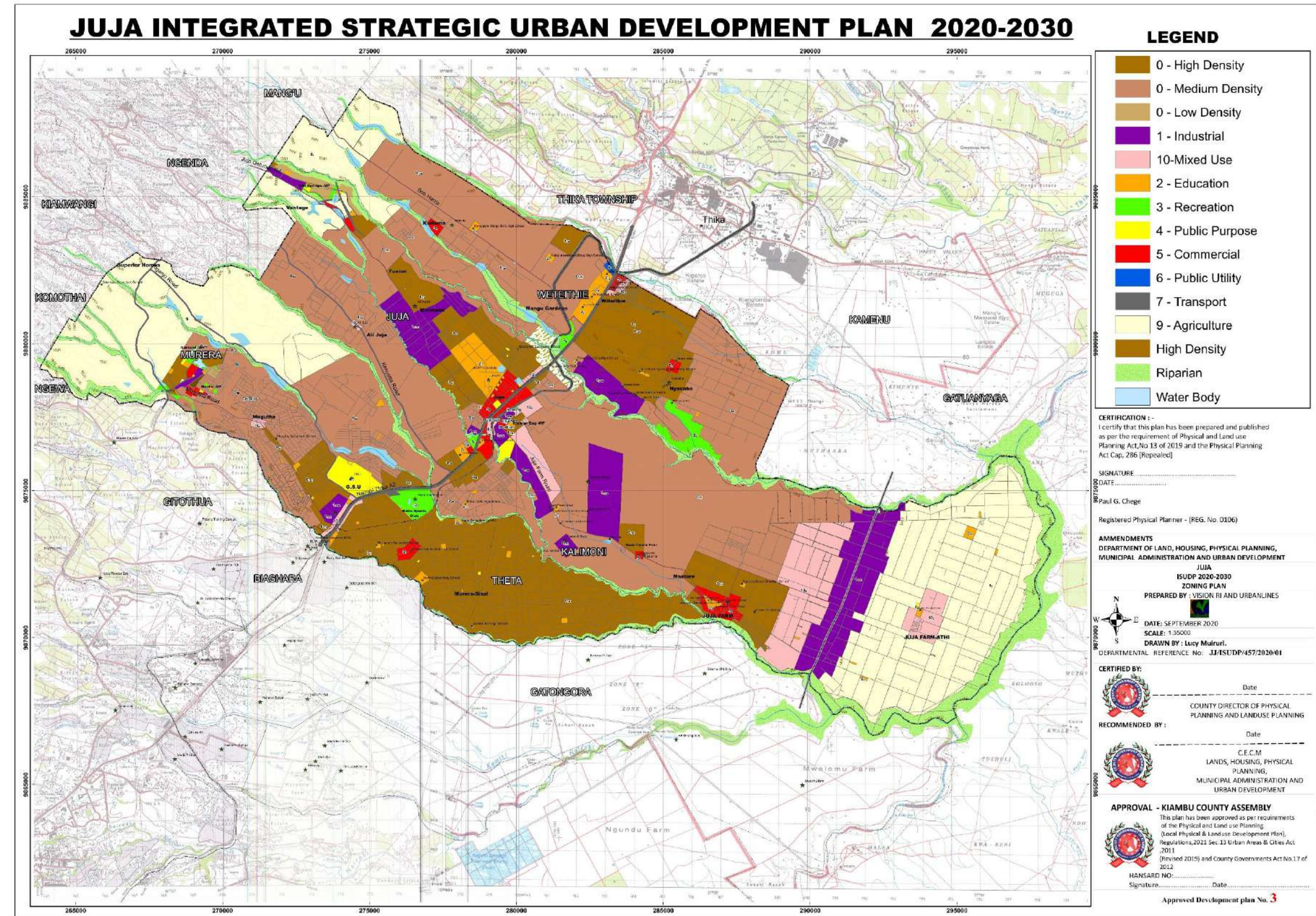


Table 14-2: Planning Standards and Development Control Regulations for Juja ISUDP

Designated Land Use	Zone Description	Zone No. JJA	Local Name	Permitted Land Use(s)	Minimum Plot size (Ha)	Ground Coverage (GC) %		Plot Ratio (PR)		Minimum Setbacks (meters) (Front: Side: Rear)			Minimum Frontage Road Width (meters)	Building Line (metres)	Building Height (No. of Floors)	Special Conditions/Notes
						S	U	S	U							
RESIDENTIAL (0)	High Density (1)	JJA0 _{1H}	Juja CBD, Gachororo, Highpoint,	Highrise apartments; studios; bedsitters; Hostels; event gardens; Parks; residential hotels Conditional: Light & medium industry; colleges; churches; schools Prohibited: Heavy industry	0.1 ≥	65	60	9.7	9.0	6	2.4	1.2	12	6	G+14	Single-room developments not permitted For plots of 0.2ha and above, the proposal shall provide for social amenities e.g. recreational; shopping; green areas; kindergarten; security; power; circulation & other utilities according to needs assessment A service lane of 6m to be provided/surrendered for plots fronting 18m road and above. Pent house shall not be more than 30% of the typical floor plan Parking spaces/slots shall be provided as follows: 1 slot for every two- bedroom unit; 1 slot for two (2) one-bedroom units; 1.5 slot for three- bedroom dwelling unit.
					0.08≥0.1	65	60	6.5	6.0	6	2.4	1.2	12	6	G+10	
					0.06≥0.08	65	60	5.2	4.8	6	2.4	1.2	12	6	G+8	
					0.045≥0.06	65	60	4.5	4.2	6	2.4	1.2	9	3	G+7	
		JJA0 _{2H}	Mirimaini		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA0 _{5H}	Waroma/Juja Mall		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA0 _{9H}	Komo/Tora/ Kuraihia		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA0 _{10H}	Witeithie/ Maraba/ Nyacaba		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA0 _{3H}	Wakigwe		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA0 _{4H}	Kalimoni Estates,		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA0 _{7H}	Theta/Gwa Kairu		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA0 _{8H}	Mugutha/Murera(Low-rise Apartment – From PEFA Church Mukuyu to Mugutha Mixed Use Zone)		0.045≥	65	60	5.2	2.4	3	2.4	1.2	9	3	G+4	
		JJA0 _{6H}	Toll Area		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA0 _{11H}	Juja Farm		0.045≥	65	60	5.2	2.4	3	2.4	1.2	9	3	G+4	
	Comprehensive Developments within High Density zone		All areas within high density zones	Highrise blocks	1.2	65	60	5.2	2.4	3	2.4	1.2	9	3	G+4	a) Land surrender & reservation for support infrastructure shall be provided (roads; parking; water; onsite sewer; educational; recreational) commensurate to the needs assessment within the locality anchored on PLUPA, 2019 b) Provide for alternative green energy use e.g. solar, wind power c) Shall provide for water harvesting/roof tanks/underground collection d) Provide for recycling of wastewater through adoption of new technology e) Shall consider urban design considerations: orientation towards maximum solar capture, lighting and ventilation; consider direction of wind; movement of wildlife/protection of rare ecosystem/protection of heritage sites (sacred trees, structures) f) Shall ensure adoption of locally available & environment friendly construction materials
	Medium Density (2)	JJA0 _{7M}	Komo/Tora/ Kuraihia	Permitted: Single family houses; townhouses; semi-detached; duplexes Conditional: Convenient shops; club house; gym; nature trails; low level clinics/health centres;	0.045	60	50	1.2	1	4.5	2.4	3	9	6	G+1	a) One Single-Dwelling only per plot. b) Typology: Maisonettes & Bungalows; townhouses c) One (1) DSQ shall be allowed. Not more than 15% GC of ground floor plinth of the main house. d) Attic house shall not be more than 30% of the typical floor plan
		JJA0 _{8M}	Witeithie/ Maraba/ Nyacaba		0.045	60	50	1.2	1	4.5	2.4	3	9	6	G+1	
		JJA0 _{1M}	Wakigwe		0.045	60	50	1.2	1	4.5	2.4	3	9	6	G+1	
		JJA0 _{3M}	Kalimoni Estates		0.045	60	50	1.2	1	4.5	2.4	3	9	6	G+1	

Designated Land Use	Zone Description	Zone No. JJA	Local Name	Permitted Land Use(s)	Minimum Plot size (Ha)	Ground Coverage (GC) %		Plot Ratio (PR)		Minimum Setbacks (meters) (Front: Side: Rear)			Minimum Frontage Road Width (meters)	Building Line (metres)	Building Height (No. of Floors)	Special Conditions/Notes
						S	U	S	U							
		JJA0 _{2M}	Muigai-In Estates	event gardens; schools; church	0.045	60	50	1.2	1	4.5	2.4	3	9	6	G+1	e) Provide for min 10% greenery/tree cover. Provide at least one fruit tree
		JJA0 _{5M}	Mugutha/Murera	Prohibited: Highrise apartments; heavy industry; clubs	0.045	60	50	1.2	1	4.5	2.4	3	9	6	G+1	f) Provide for alternative green energy use e.g. solar, wind power
		JJA0 _{8M}	Ali Juja		0.045	60	50	1.2	1	4.5	2.4	3	9	6	G+1	g) Shall provide for water harvesting/roof tanks/underground collection
		JJA0 _{9M}	Juja Farm		0.045	60	50	1.2	1	4.5	2.4	3	9	6	G+1	h) Provide for recycling of wastewater through adoption of new technology i) Designated refuse collection points j) Provide for parking -2 private vehicles k) Shall consider urban design considerations: orientation towards maximum solar capture, lighting and ventilation; consider direction of wind; movement of wildlife/protection of rare ecosystem/protection of heritage sites (sacred trees, structures) l) Shall ensure adoption of locally available & environment friendly construction materials m) For comprehensive developments on areas with minimum subdivision of 0.2Ha, each unit to be on plot size of 1000sm per dwelling together with auxiliary amenities, for those on min. subdivision of 0.045 Ha, each unit to occupy minimum 375 square metres
			Medium density within or around agricultural zones eg Zuri Spring, Oakland area		0.1	55	50	1.2	1	6	3	3	12	6	G+1	Minimum sub-division shall be at 0.1ha Comprehensive development on residential should zone: Each unit to occupy half of permitted min subdivision level ie 0.045Ha For comprehensive developments on areas with minimum subdivision of 0.2Ha, each unit to be on plot size of 1000sm per dwelling together with auxiliary amenities, for those on min. subdivision of 0.045 Ha, each unit to occupy minimum 375 square metres Provide adequate and evenly distributed amenities commensurate to the introduced population The dominant land use should reflect the zone land use. Master plan in agricultural zones to priorities land for urban agriculture and industrial land use. Land surrender & reservation for support infrastructure shall be provided (roads; parking; water; onsite sewer; educational; recreational among others commensurate to the needs assessment within the locality anchored on PLUPA, 2019
		Comprehensive for medium density All areas within Medium Density except those within agricultural zones in Oakland and Zuri Springs/Within predominant Agricultural Zone		Townhouses: Detached; semi-detached	1.2	60	50	1.2	1	4.5	2.4	3	9	6	G+1	a) Minimum allowable sub-division shall be at 0.045ha b) Comprehensive development on residential should zone: c) Each unit to occupy half of permitted min subdivision level d) Provide adequate and evenly distributed amenities commensurate to the introduced population e) The dominant land use should reflect the zone land use. f) Master plan in agricultural zones to priorities land for urban agriculture and industrial land use. g) Land surrender & reservation for support infrastructure shall be provided (roads; parking; water; onsite sewer; educational; recreational

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						S	U	S	U								
																among others commensurate to the needs assessment within the locality anchored on PLUPA, 2019 h) Shall provide for Non-Motorized Transport (NMT) facilities: provision of friendly pedestrian walkways, cycling lanes, footbridges, zebra crossings, pick and drop points, etc i) Provide for alternative green energy use e.g. solar, wind power j) Shall provide for water harvesting/roof tanks/underground collection k) Provide for recycling of wastewater through adoption of new technology	
		JJA0 _{4M} JJA0 _{6M}	Daykio Bustani Kays Estate	Permitted: Single family houses; townhouses; Conditional: Convenient shops; club house; gym; nature trails; low level clinics/health centres; event gardens; schools; church Prohibited: Highrise apartments; heavy industry; clubs	0.2 0.2	50 50	40 40	1 1	0.8 0.8	6 6	2.4 2.4	3 3	12 12	6 6	G+1 G+1	One Single-Dwelling only per plot. Typology: Maisonettes & Bungalows One DSQ shall be allowed. Not more than 15% GC of ground floor plinth of the main house. Provide for min 10% greenery/tree cover At least one fruit tree Provide for alternative green energy use e.g. solar, wind power Provide for recycling of wastewater through adoption of new technology Provide for parking -2 private vehicles	
	Low Density (3)																
	Low Density Zones		Areas created from master plans or comprehensive schemes as low-density zones Townhouses: Detached; semi-detached; duplexes		1.2	50	40	1	0.8	4.5	1.2	3	9	6	G+1	a) One Single-Dwelling only per plot. b) Typology: Maisonettes & Bungalows c) One DSQ shall be allowed. Not more than 15% GC of ground floor plinth of the main house. d) Provide for min 10% greenery/tree cover At least one fruit tree e) Provide for alternative green energy use e.g. solar, wind power f) Provide for recycling of wastewater through adoption of new technology g) Provide for parking -2 private vehicles	
	Comprehensive developments within low density (Masterplans)		All areas within the low density /agricultural zones		1.2	50	40	1	0.8	6	1.2	3	12	6	G+1	a) Minimum sub-division shall be at 0.2ha. b) For comprehensive, plot size of 1000sm per dwelling together with auxiliary amenities c) Land surrender & reservation for support infrastructure shall be provided for roads; parking; water; onsite sewer; educational; recreational among others commensurate to the needs assessment within the locality anchored on PLUPA, 2019 d) Provide for alternative green energy use e.g. solar, wind power e) Shall provide for water harvesting/roof tanks/underground collection f) Provide for recycling of wastewater through adoption of new technology	
	Ambassadorial Homes		Mansions		0.2	40	30	0.8	0.6	6	1.2	5	12	9	G+1	proposed in medium and low-density residential zones	
	Governor’s residence		Mansions		1.2	40	30	1.6	1.2	6	1.2	5	12	9	G+3	Proposed in medium and low-density residential zones	
	INDUSTRIAL (1)	Light Industry (1)															
		PSS	Along transit routes/corridors		Permitted: Parking; garages; warehouses; go-downs; indoor storage; workshops; jua-kali; petrol service & filling stations	0.2	40	30	1.6	1.2	9	3	3	15	9	G+3	Must meet environment, health & safety conditions as set out in EPRA regulations Location: Must be sited clear of residential blocks Provide 3.0m setback/buffer all round Provision of acceleration & deceleration; clear indication of entry and exit
			Within CBD			0.1	40	30	0.8	0.6	9	3	3	15	6	G+3	
PFS		Within CBD		0.045		40	30	0.8	0.6	6	3	3	15	6	G+1		
		Along transit routes/corridors		0.045		40	30	0.8	0.6	6	3	3	15	6	G+1		
Electrical Vehicle Charging (EVC)		Along transit corridors/CBD		0.25		40	30	1.6	1.2	9	3	3	15	9	G+3		

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						S	U	S	U	S	S	R					
	Gas Station	Along transit corridors/CBD			0.2	40	30	1.6	1.2	9	3	3	15	9	G+3	Ancillary facilities allowed: mini-marts; restaurant; offices; service bays; ATM; coffee shops Satellite clinics & hospitals prohibited Fire break after every 20m Must meet health & safety conditions as set out in EPRA regulations All Petroleum and Gas Products to align with EPPRA, Road Agencies Standards, Regulations and Recommendations.	
	Hybrid 1 (Fuel +EVC)	Along transit corridors/CBD			0.4	40	30	1.6	1.2	9	3	3	15	9	G+3		
	Hybrid 2 (Fuel +Gas)	Along transit corridors/CBD			0.4	40	30	1.6	1.2	9	3	3	15	9	G+3		
	Storage/packaging Go-Downs			0.1	50	40	2.0	1.6	9	3	3	15	9	G+3			
	Medium Industrial (2)																
	Go-Downs			Permitted: Agro-based millers; meat & milk processing plants; Brewery; Bakery; Bottling & canning; Food & Beverage; Coffee roaster: Honey processing	0.4	50	50	1.2	0.9	9	3	3	15	9	G+2	Clear indication of entry and exit Loading docks to be located to the rear of the building Loading area to be screened from residential users For comprehensive schemes, approval & execution of civil works (roads; water; sewer; drainage channels; street lighting) shall be mandatory before implementation of proposed development. That is, provision of infrastructure Detailed masterplan & comprehensive topographical survey maps shall be provided accompanying the proposed developments	
	County aggregation centres (agro-processing)				4.0	50	50	2.0	1.6	12	6	6	18	12	G+3		
	Heavy Industrial (3)																
	Go-Downs			Permitted: Heavy processing; manufacturing; quarrying; vehicle assembly plant; power generation; recycling plant; Distillery; concreting; bulk storage of hazardous substances; slaughterhouses; oil & natural gas processing; technological engineering 0.2	4.0	40	30	1.5	1.2	12	9	9	18	12	G+2	Clear indication of entry and exit Loading docks to be located to the rear of the building Loading area to be screened from residential users No outdoor storage	
	Industrial Parks	1 ₁	Existing Industrial Park (Jua Kali)		50	40	1.5	1.2	12	9	9	18	12	G+2	G+2		
		1 ₂	Proposed Industrial Park		2.0	50	40	1.5	1.2	9	6	6	18	12	G+2	- Provide 3 - 6 M green zone as a buffer - To provide loading and offloading zones - Provide auxiliary services (Restaurant, clinic and recreational facility). - Provide mothers daycare.	
	- Light and Medium Industrial Zones are Mirimaini Industrial, St. Teresa Catholic Church Area- Juja Farm Road Industries, Space & Style Industries, Athi Industries, Vipe Fun Park-Mugutha Industries, Witeithie Industries. - Juja Industrial Park-High Density																
	EDUCATIONAL (2)	Educational															
		Daycare (Below 3 years)	Single			0.1	50	40	1.0	0.8	9	3	3	9	6	G+1	
		Pre-Primary (Playground; PP1; PP2; Nursery; Kindergarten)	Single			0.1	40	30	1.2	0.9	9	3	3	9	6	G+2	
			Double			0.2	40	30	1.2	0.9	9	3	3	9	6	G+2	
Triple			0.4	40		30	1.2	0.9	9	3	3	9	6	G+2			
Single			0.8	40		30	2.0	1.5	9	3	3	12	6	G+4			
Primary School		Double		1.6		40	30	2.0	1.5	9	3	3	12	9	G+4		
		Triple		2.4		40	30	2.0	1.5	9	3	3	12	9	G+4		
		Other facilities that take up the remaining land are soccer field; netball; athletic track; swimming; hockey field; gymnasium; circulation & other supporting infrastructure															
Junior Secondary School (JSS)		Single			0.4	40	30	2.0	1.5	9	3	3	12	6	G+4		
		Double			0.8	40	30	2.0	1.5	9	3	3	12	6	G+4		
		Triple			1.6	40	30	2.0	1.5	9	3	3	12	9	G+4		
Senior Secondary School		Single			0.8	40	30	2.0	1.5	9	3	3	12	6	G+4		
		Double			1.6	40	30	2.0	1.5	9	3	3	12	9	G+4		
		Triple			2.4	40	30	2.0	1.5	9	3	3	12	9	G+4		
		Quadruple			3.0	40	30	2.0	1.5	9	3	3	12	9	G+4		
For boarding schools, additional land requirement of 50% of the minimum land requirement																	
Youth Polytechnic/TVETS				0.3	40	30	2.8	2.1	9	3	3	12	6	G+7			
College				2	40	30	4.0	3.0	9	3	3	12	9	G+9			

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						S	U	S	U	S	S	R							
	University				20	40	30	4.8	3.6	12	3	3	18	12	G+12				
RECREATIONAL (3)	Stadium				2	30	20	0.3	0.3	9	6	6	18	9	G+3	Allow only buildings supporting recreational use Add variety & activity by allowing mini shops & coffee cafeterias Provide for centralized parking area Provide ancillary services e.g. water, sanitation, lighting			
	Playground				0.2	20	10	0.1	0.1	9	6	6	9	6	G+1				
	Recreational Garden				0.4	20	10	0.2	0.2	9	6	6	12	6	G+3				
	Park				0.4	20	10	0.1	0.1	9	6	6	12	6	G+3				
	Private Zoo				4	20	10	0.2	0.2	9	6	6	12	9	G+2				
	Amusement Park				0.2	30	20	0.1	0.1	9	6	6	12	9	G+2				
	Amphitheatre				0.4	60	40	3.0	2.0	9	6	6	12	9	G+5				
	Botanical Garden				1.2	15	10	0.45	0.30	9	6	6	12	9	G+2				
	Driving Range				2.0	50	40	1.5	1.2	9	6	6	12	9	G+2				
	Campground				0.8	30	20	1.2	0.8	9	6	6	12	9	G+3				
	Shooting Range				2.0	20	10	0.8	0.4	9	6	6	12	9	G+3				
	Exhibition Ground				1.6	30	20	1.2	0.8	9	6	6	12	9	G+3				
	Golf Course/Mini Golf				4.0	20	10	0.8	0.4	9	6	6	12	9	G+3				
	PUBLIC PURPOSE (4)				1. Health Facilities														
Level 6 -National Referral & Teaching Hospitals					20	40	30	8.4	8.4	15	5	10	25	15	G+14				
Level 5 -County Referral Hospitals					8	40	30	4.4	4.4	9	5	5	18	9	G+9				
Level 4 -Hospitals					1.6	40	30	2.4	2.4	9	3	5	15	6	G+7				
Level 3 -Health Centres with Maternity wing					1	40	30	4.4	4.4	6	2.5	5	12	6	G+7				
Level 2 -Dispensaries & clinics					0.1	40	30	2	2	6	2.5	3	9	6	G+3				
Specialized clinics with inpatient wing e.g. palliative care					0.2	40	30	4.4	4.4	6	2.5	5	12	4.5	G+7				
Level 1 -Community facilities/Health clubs/Rehab centres					0.1	40	30	1.5	1.5	3	2.5	3	9	4.5	G+3				
2. Other Public Purpose facilities																			
Police Station				1.2	40	30	1	1	9	6	6	12	9	G+7					
Police Post				0.1	50	40	1.5	1	6	2.5	2.5	9	6	G+3					
Patrol Base				0.045	50	40	2	1	6	2.5	2.5	9	6	G+3					
High Court				1.2	50	40	2	1	9	6	6	15	9	G+7					
Magistrate Court				0.4	50	40	1	1	6	6	6	9	6	G+3					
Prisons				16	40	30	0.25	0.25	20	20	20	15	20	G+4					
Religious Institutions/Church				0.1	50	40	1	1	4.5	2.5	2.5	9	4.5	G+3					
Cultural Centre/Art Gallery				0.2	40	40	1.5	1.5	6	6	6	9	6	G+3					
Fire Station				0.4	40	30	0.5	0.5	6	2.5	4.5	12	9	G+5					
Library				0.1	50	40	0.5	0.5	6	2.5	4.5	9	6	G+7					
Museum				0.2	60	50	3.0	2.5	6	2.5	4.5	12	9	G+5					
Home for the Elderly				0.2	40	30	0.5	0.5	9	6	6	9	6	G+2					
Funeral Homes/crematorium				0.2	30	20	0.5	0.5	9	6	6	12	12	G+2					
Community/Social Hall				0.1	40	30	1.5	1.5	9	6	6	9	6	G+4					
Youth Centre				0.1	50	40	1.5	1.5	6	3	3	9	6	G+4					
Private Clubs & Lodges				0.2	40	30	2.8	2.1	6	3	3	12	9	G+7					
Cemetery/Graveyard				1	20	10	0.1	0.1	9	6	6	12	9	G+3					
Children's Home/Orphanages				0.1	60	50	2.0	2.0	9	6	6	12	6	G+5					
Innovation Hub				0.045	60	50	2.0	2.0	9	6	6	9	4.5	G+3					
Abattoirs				1	40	30	1.5	1.5	9	6	6	9	9	G+2					
Slaughter slab				0.2	40	30	0.8	0.8	9	6	6	9	9	G+1					
Administration Offices				0.2	60	50	3.0	2.5	9	6	6	12	9	G+5					
COMMERCIAL (5)				Commercial Business Districts (CBD) /Urban Cores															
				Juja CBD	Permitted: Modern markets; multi-storey developments; shopping complexes; office buildings; showrooms; retail & wholesale shops; hotels;	Commercial/ Offices	0.1 ≥	75	70	10.5	9.8	6	2.4	1.2		12	6	G+14	a) Commercial centres shall have service lanes for loading & offloading of goods. All plots without service lanes must have a pre-determined building line and reduced ground coverage
	Witeithie Shopping Centre	0.08≥0.1	75	70			10.5	9.8	6	2.4	1.2	12	6	G+10					
	Juja Farm Shopping Centre																		
	Salama Shopping Centre																		
	Maraba Shopping Centre																		
Theta Shopping Centre																			

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						S	U	S	U							
	Kiahuria Shopping Centre		eateries; professional offices; hostels; transport yards; public facilities; parking silos		0.06≥0.08	75	70	10.5	9.8	6	2.4	1.2	12	6	G+8	b) Heights shall be guided by skylines, plot sizes, PR, and infrastructure present in the zone c) The CBD shall have well defined building lines to enhance safety, aesthetics and order d) Building frontage to be left open for ease of loading/offloading/ pedestrian movement. Grills/perimeter walls in the CBD prohibited e) Double volume in heights encouraged especially for ground floor f) 1 parking lot per 100sm g) Additional parking shall be provided in basements or top floors h) Shall create space for recreational amenities e.g. kids playing area i) Public facilities such as toilets, watering holes, solid waste collection points shall be provided for j) Provide for green areas of min 20% in the lot and landscaping along the streets k) Provide mechanical ventilation for the building l) Provide both lift & ramps for ease of access m) Hostels: must have support facilities; must have common areas e.g., entertainment room, rest room, convenient shopping, courtyard; 1 parking slot per 4 units 5b. Smaller Commercial Nodes/Cores (Secondary Centres) a) Commercial centres shall have service lanes for loading & offloading of goods. All plots without service lanes must have a pre-determined building line and reduced ground coverage b) Heights shall be guided by skylines, plot sizes, PR, and infrastructure present in the zone c) The CBD shall have well defined building lines to enhance safety, aesthetics and order d) Building frontage to be left open for ease of loading/offloading/ pedestrian movement. Grills/perimeter walls in the CBD prohibited e) Double volume in heights encouraged especially for ground floor f) 1 parking lot per 100sm g) Additional parking shall be provided in basements or top floors h) Shall create space for recreational amenities e.g. kids playing area i) Public facilities such as toilets, watering holes, solid waste collection points shall be provided for j) Provide for green areas of min 10% and landscaping along the streets
					0.045≥0.06	75	70	10.5	9.8	6	2.4	1.2	9	3	G+7	
				Shopping mall	0.4	70	60	3.5	3.0	4.5	1.2	6	9	9	G+5	
				Supermarket/wholesale	0.1	70	60	3.5	3.0	4.5	1.2	6	9	6	G+5	
				Mini mart/stalls	0.045	70	60	3.5	3.0	4.5	1.2	3	9	3	G+5	
				Retail shop/dukawalla	0.045	70	60	3.5	3.0	4.5	1.2	3	9	3	G+5	
				Offices/Banks/ICT	0.045	70	60	3.5	3.0	4.5	1.2	3	9	3	G+5	
				Hotels	0.045	60	50	3.5	3.0	4.5	1.2	3	9	3	G+5	
				Public facilities	0.045	60	50	3.5	3.0	4.5	1.2	3	9	3	G+5	
				Serviced apartments/Hostels	0.1 ≥	65	60	9.7	9.0	6	2.4	1.2	12	6	G+14	
					0.08≥0.1	65	60	6.5	6.0	6	2.4	1.2	12	6	G+10	
					0.06≥0.08	65	60	5.2	4.8	6	2.4	1.2	12	6	G+8	
					0.045≥0.06	65	60	4.5	4.2	6	2.4	1.2	9	3	G+7	
				Light industry/showrooms	0.045	70	60	3.5	3.0	4.5	1.2	3	9	3	G+3	
				Open air markets	0.1	60	50	3.5	3.0	4.5	1.2	3	9	3	G+5	
				Modern storey markets	0.1	70	60	3.5	3.0	4.5	1.2	3	9	3	G+5	
				PUBLIC UTILITIES (6)												
Power Sub-Station					0.1	20	10	0.8	0.4	9	3	3	15	9	G+3	
Data Centres					0.2	60	50	3.0	2.5	9	3	3	15	9	G+5	
Telecommunication facility					0.2	60	50	3.0	2.5	9	1.2	2.4	15	9	G+5	
BTS Communication masts					0.045	80	60	1.6	1.2	9	1.2	2.4	12	4.5	G+1	
Solid Waste Transfer Stations					0.4	30	20	1.2	0.8	12	3	3	12	9	G+3	
Solid waste recycling centers					0.2	30	20	1.2	0.8	9	3	3	12	6	G+3	
Scrap/Junk Yard					0.1	30	20	1.2	0.8	9	3	3	12	6	G+2	

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						S	U	S	U							
TRANSPORTATION (7)	Waste Treatment Plant				0.1	20	10	0.2	0.2	12	3	3	12	6	G+2	
	Water Towers				0.1	30	20	1.5	1.5	12	3	3	9	6	G+2	
	Water Hydrants				0.045	50	40	1	1	12	3	3	9	6	G+1	
	Weighbridge				0.4	20	10	0.6	0.3	9	3	3	15	9	G+3	
	Parking Silo				0.2	80	60	4.0	3.0	9	3	3	12	9	G+5	
	Bus Parks/Stage				1.6	30	20	0.9	0.6	9	3	3	12	6	G+3	
	Boda-Boda sheds				0.045	60	50	1.2	1.0	4.5	1.2	3	12	3	G+1	
	BRT Stations				1.6	30	20	0.9	0.6	9	3	3	15	6	G+3	
	Parking lot for bicycles				0.045	60	50	1.2	1.0	4.5	1.2	3	12	3	G+1	
TRANSPORTATION (7)	Railway Station				1.6	30	20	0.9	0.6	9	3	3	15	6	G+3	
	Parking Yard for trucks				1.2	30	20	0.9	0.6	9	3	3	15	6	G+2	
	Airstrip				8.0	15	10	0.45	0.30	9	6	6	18	12	G+2	
AGRICULTURAL (9)	Large Scale All coffee farms; tea farms; avocado farms; range lands;	JJA9 ₁ JJA9 ₂ JJA9 ₃	Murera/Oakland Farms Kiaora Farm along Juja-Gatundu Road Juja Farm Zuri Springs	Permitted: All agricultural uses; farm houses; storage for produce; animal pens; forestry; urban agriculture; housing for workers; low density residential developments; water pans, dams	0.2	50	40	2.25	1.8	6	3	3	15	9	G+2	Farm houses & housing for workers allowed at max 5% of land size Value addition e.g. agro-processing industries permitted Controlled transition to low density residential development with commensurate public utilities evenly distributed
	Small Scale All land within the sub-county that can support horticulture & early maturing crops e.g. maize, beans grown at peasant scale		Within Juja.	Conditional: Public facilities; shopping zones;	0.045	50	40	2.25	1.8	3	1.2	3	9	3	G+2	This applies mostly to urban agriculture for horticulture
MIXED USE (COMMERCIAL CUM RESIDENTIAL-BCR) (10)		JJA10 ₁	Juja CBD, Gachororo	Highrise apartments; studios; bedsitters; Hostels; event gardens; Parks; residential hotels; commercial; offices; public facilities	0.1 ≥	65	60	9.7	9.0	6	2.4	1.2	12	6	G+14	This is the core CBD and emerging urban cores of Juja Municipality. Such areas are still much rural in character and form. The emerging secondary towns don't have well developed commercial centres. a) Provide for alternative green energy use e.g. solar, wind power b) Shall provide for water harvesting/roof tanks/underground collection c) Provide for recycling of wastewater through adoption of new technology d) Shall consider urban design considerations: orientation towards maximum solar capture, lighting and ventilation; consider direction of wind; movement of wildlife/protection of rare ecosystem/protection of heritage sites (sacred trees, structures) e) Shall ensure adoption of locally available & environment friendly construction materials f) Permitted land uses shall be guided by standards of the principle land use ie roads, size of land , compatibility etc
				Conditional: Light & medium industry; colleges; churches; schools; cottage industry	0.08≥0.1	65	60	6.5	6.0	6	2.4	1.2	12	6	G+10	
				Prohibited: Heavy industry	0.06≥0.08	65	60	5.2	4.8	6	2.4	1.2	12	6	G+8	
					0.045≥0.06	65	60	4.5	4.2	6	2.4	1.2	9	3	G+7	
		JJA10 ₂	Spur Mall & Kimbo Area		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA10 ₃	Ali Juja		0.045≥	65	60	5.2	2.4	3	2.4	1.2	9	3	G+4	
		JJA10 ₄	Mugutha		0.045≥	65	60	5.2	2.4	3	2.4	1.2	9	3	G+4	
		JJA10 ₅	Witeithie		0.045≥	65	60	5.2	4.2	3	2.4	1.2	9	3	G+7	
		JJA10 ₆ JJA10 ₁₁	Athi Premier Bag & Cordage		0.045≥	65	60	5.2	2.4	3	2.4	1.2	9	3	G+4	

Legend: GC =, Ground Coverage; PR = Plot Ratio; S = Sewered area, U = Unsewered area

Source: Directorate of Physical Planning, County Government of Kiambu, 2020.

General standards for comprehensive developments

All development proposals on land size 8 Ha (20 acres and above) that shall at a minimum constitute at least 2 principal land uses shall be considered as comprehensive developments. The respective applications shall be required to indicate permitted use, densities, access roads, plot coverage, plot ratio and building heights, and shall also include 3D models. Each comprehensive development shall indicate and provide detailed standards and guidelines to be considered by the county for advice/approval. Land allocation shall consider compatibility of adjoining land uses and conform with long-term plan proposal for the area (existing plans and policies)

All comprehensive development proposals shall surrender adequate land for public purpose/utilities to the relevant authority. Land Uses and sizes to be surrendered for public use in a comprehensive development shall be as per the planning standards set out in the ISUDP and shall be based on expected population and distances of access to these facilities. A current & comprehensive needs assessment report shall be required for all comprehensive development proposals. Surrendered land shall be forwarded to the relevant authority for development.

Minimum land requirements for the principal land uses shall be dependent on the general Vision of the ISUDP which is Educational/Residential:

NB: Review/amendment of comprehensive developments shall not be done before the expiry of 3 years.

Other general considerations for comprehensive developments

- a. Shall provide for use/application of green energy (at least 30% of total energy needs)
- b. Shall provide 10% of the area for forestry/tree planting
- c. Shall provide for solid waste disposal mechanism (transfer station(s))
- d. for residential units on less than 0.1ha each, the proposal shall provide a common onsite liquid waste treatment plant/centralised wastewater management system
- e. Shall provide for recycle of grey water
- f. Shall provide for water harvesting/roof tanks/underground collection
- g. Civil works (electricity, roads, wastewater, water, communication lines) shall be completed to county standards before development
- h. Shall take into account urban design considerations: orientation towards maximum solar capture, lighting and ventilation; consider direction of wind; movement of wildlife/protection of rare ecosystem/protection of heritage sites (sacred trees, structures)
- i. Shall ensure adoption of locally available & environment friendly construction materials
- j. Shall provide for Non-Motorized Transport (NMT) facilities: provision of friendly pedestrian walkways, cycling lanes, footbridges, zebra crossings, pick and drop points, etc

ZONING FOR MEDIUM DENSITY PROPOSALS ON LAND SIZES 0.045-2HA

No.	Zone Subdivision level (Ha)	Allowable density (Ha)	Minimum land size (Ha)	Special conditions
1	0.045	0.0225	1	Considerations for comprehensive developments within high density zones
2	0.1	0.045	1.5	Considerations for comprehensive developments within medium density zones
3	0.2	0.1	2	Considerations for comprehensive developments within agricultural zones and surrounding medium density areas around agricultural zones

RESIDENTIAL APARTMENTS IN COMPREHENSIVE DEVELOPMENTS

- Minimum land that allow for comprehensive development (apartments) shall be 1.2ha (3 acres)
- Shall have minimum allowable ground coverage of 50% & Plot Ratio of 10 (ground+7 floors)
- Parking requirements shall be as provided in the respective ISUDP
- Shall provide recreational/children play area (or floor area for play area),
- Shall provide for pre-primary facilities, laundry area, corner shop/minimart, mechanical sewer space, alternative water source, among others as guided in the proposal

14.2 Detailed Action plans

The Plan has identified three action areas due to their influence within Juja Sub-County. This action areas require special attention spurring the growth of Juja as vibrant knowledge and commercial hub within the region. The action areas include revitalisation of Juja CBD, rehabilitation of Ndarugo quarrying sites, and creation of a green zone at Juja-Farm area.

14.2.1 ACTION AREA 1: REVITALISATION JUJA CBD

Juja Town is located approximately 25 km from the Nairobi Central Business District, 20 km from Kiambu town and 18 km from Thika town. It is also located about 3 km from Ruiru town, a growing commercial and residential town within Kiambu County.

Juja developed as a small town which served the sisal farming in the larger Juja Farm area and the processing of the sisal products into cordage and gunny bags in the East Africa bag and cordage industry. After the decline of sisal farming and the collapse of the gunny bag factory, two other activities started gaining prominence. First was the quarrying of stones along Ndarugo River, and second, was the advent of JKUAT in 1981 which was the focal driver of Juja CBD's development. To date, JKUAT has a ripple effect and

continues to be the prime driver of Juja CBD's economy and beyond. Juja Town continues to expand given its strategic location in terms of connectivity as the mid-town between Ruiru and Thika town and turn off into the Gatundu hinterland to the west and Juja Farm to the east.

14.2.1.1 Current Urban Extent

The construction of Thika Superhighway saw the split of Juja Town into two areas of urbanisation, namely, Juja main core and Muchatha urban core. Each of these urban cores is noted to span about 200 m. The highway has also led to uncontrolled corridor development spanning from Ndarugo River to Kenyatta Road junction. It is, therefore, necessary to bring out planning interventions that will guide the future growth of the CBD.

14.2.1.2 Role of JKUAT

As mentioned earlier, the population demography and character of the town has mainly been influenced by the presence of JKUAT. Majority of Juja's population is comprised of young people who are mostly students. It was noted that individuals (mostly former students) preferred residing within Juja due to the low cost of living within the area.

Aside from dictating the demography of the area, JKUAT was also noted to influence the general character of the town. The presence of the university has seen the development of a number of unplanned residential buildings which mainly targets university students for accommodation. Other challenge emerged which include conflicts between the university and the plot owners such as one relating to the JKUAT thoroughfare.

14.2.1.3 Challenges within the CBD

- Juja lacks a distinct delineation of its CBD;
- Conflicts between the university and residents living along the former's main access from the Thika Superhighway;
- Poor vehicular connectivity of the CBD;
- Traffic congestion and poor traffic flow (one way) at the overpass which spills over to the CBD's core;
- Conflict of JKUAT's dedicated thoroughfare with access to adjoining properties;
- Poor physical state of roads and stormwater drainage channels;
- Acute vehicular and pedestrian conflicts;
- Challenge in mass transit management (dangerous matatu stops and boda boda); and
- Inadequate parking spaces within the CBD.

Goal:

- To create a sustainable, economically vibrant, and modern knowledge town that is well-planned and has integrated urban spaces, transportation systems and reliable physical and social infrastructure.

- To realise this goal, the following objective needs to be achieved:

Objectives:

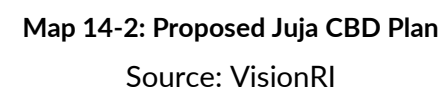
- To delineate the extent of the CBD to contain unplanned urban sprawl;
- To have efficient and modern urban spaces as well as a reliable transportation system that integrates all and modern public amenities and services to meet the needs of the people;
- To provide adequate social service infrastructure that is accessible, well-equipped and in good condition;
- To be an academic-focused CBD that will attract even foreign scholars and investors; and
- To have a proper waste management system that ensures proper waste disposal.

Interventions 1: CBD Delineation

The CBD has been delineated as shown below so as to encompass areas of intense economic activities. The delineated has been done using various structuring elements which include JKUAT To the north JKUAT, Premier Bag and Cordage to the east, and Thiririka river and Kalimoni Senior School to the south.

The CBD's Zoning plan was developed in consideration of the future prospective land demand and in accordance with the role that JKUAT plays as an educational hub and economic driver of Juja Sub-County. The need for student housing and walkable and compact neighbourhoods also augments the zoning model adopted. The CBD comprises of approximately 902 ha of land and includes commercial developments comprising Juja Urban Core, Muchatha Urban Core and Juja City Mall.

Juja Urban Core is envisioned to include a pedestrian bazaar in the western precinct with pedestrianised, vibrant streets and retail spaces. Muchatha Urban Core is envisioned to prioritise office spaces with requisite on-street parking spaces provided. In addition, a secondary commercial node is proposed at the south-western edge of the CBD to provide auxiliary services to the residents of Juja Town. The direction of expansion is structured along Thika Superhighway due to emerging development trends and suitability of the land as depicted in Map 14-2. Growth of the CBD towards the west is limited due to the presence of Thiririka River.



Interventions 2: Traffic management plan

- i. **Inclusive Streets:** Inclusive streets or complete streets is an urban design concept that integrates various means of transport within a typical street. This concept seeks to create an inclusive environment for all users of the street. The choice of the various aspects to be included within the street is determined by:
- Street size;
 - Street users; and
 - Location of the street.

The two streets noted to be most suitable to integrate this inclusive street concept are the ones that run parallel to JKUAT. This plan also proposes the improvements of JKUAT thoroughfare as shown below in Figure 14-2.



Figure 14-2: Juja access thoroughfare

Source: VisionRI

- ii. **Road Designs:** Given that the population of Juja mainly comprises of a young population largely made up of students most of whom depend on public means of transport, walking or cycling, it is necessary to design streets that are able to cater for each of these users.

Creating a street that integrates and prioritises public and private means of transport, cycling and walking not only helps decongest a typical street but also creates a safe environment for its users by slowing down traffic speeds from the core of the street, outwards towards the built space/environment. Below are cross-sections of different road reserves (9m, 12m, 15m and 60m) that should be implemented within the planning area.

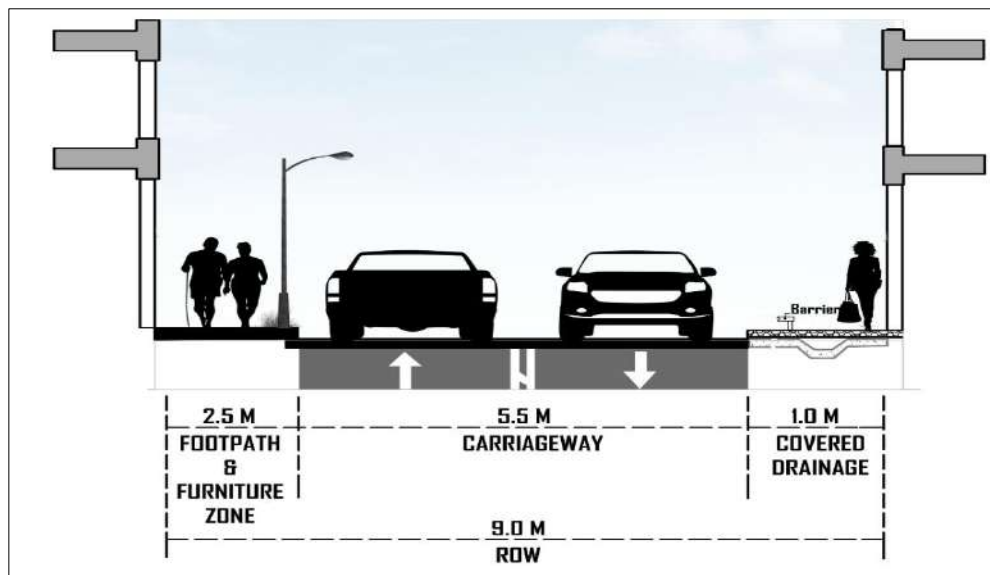


Figure 14-3: Road cross-section for 9m road reserve

Source: VisionRI

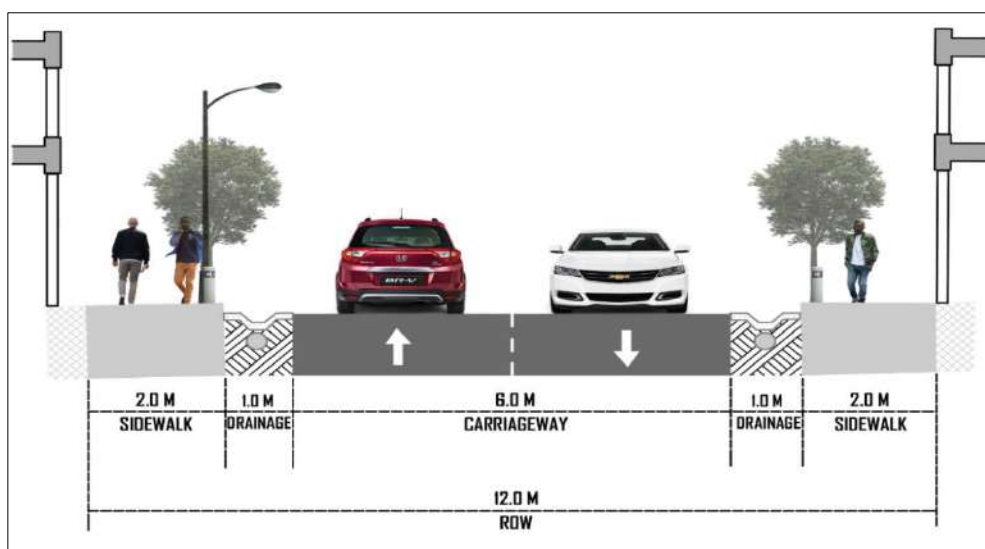


Figure 14-4: Road cross-section for 12m road reserves

Source: VisionRI

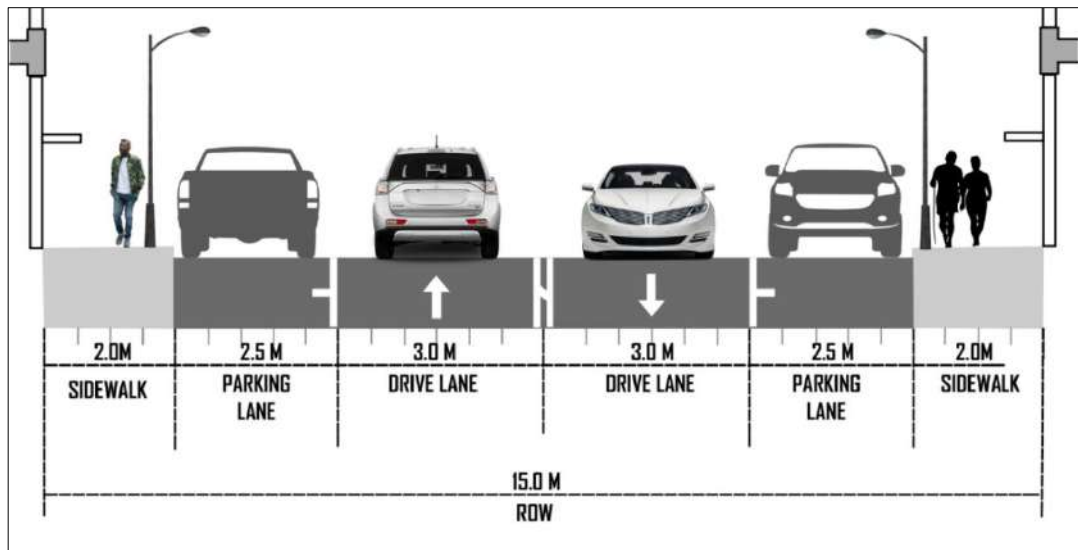


Figure 14-5: Road cross-section for 15m road reserves

Source: VisionRI

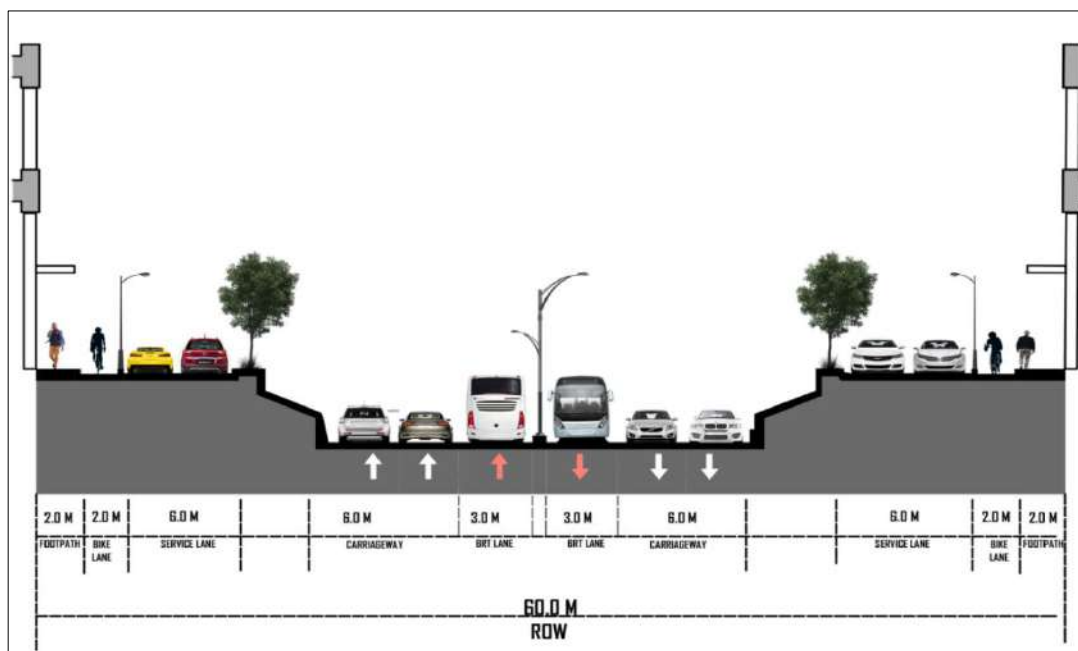


Figure 14-6: Road cross-section for 60m road reserves

Source: VisionRI

These streets should be designed to incorporate safe spaces for walking and cycling through a shared space where pedestrians mix with slow-speed vehicle movement.

A vegetation or utility lane can be incorporated to serve as a buffer between the cyclist lane and carriageway, and the other shared function of the street. This lane may also be used to enhance street

façade through the planting of streets or providing street furniture such as bins and lighting utilities where necessary.

Given the main users of the area being students, a BRT lane from Thika Superhighway should be extended into the CBD and incorporated into these 2 streets. This will help ease both human and vehicular traffic as well as serve as a cheaper means of transport for the students.

iii. **Intervention 3: Urban Core-Juja**

Urban design interventions that safeguard pedestrian safety as well as enhance pedestrian traffic flow are necessary within Juja urban core in regard to parking policy and regulations.

Parking Facilities: Juja urban core is characterised by streets/roads that are narrow in width. It was noted that streets within Juja do not follow definite parking policies, with most regulations being determined by motorists, depending on building frontage design. Below is an image showing the current state of parking facilities within the CBD.



Figure 14-7: Juja CBD current parking state

Source: VisionRI

With the above situation in mind, it is necessary to design streets within this urban core that can accommodate all the functions of a street.

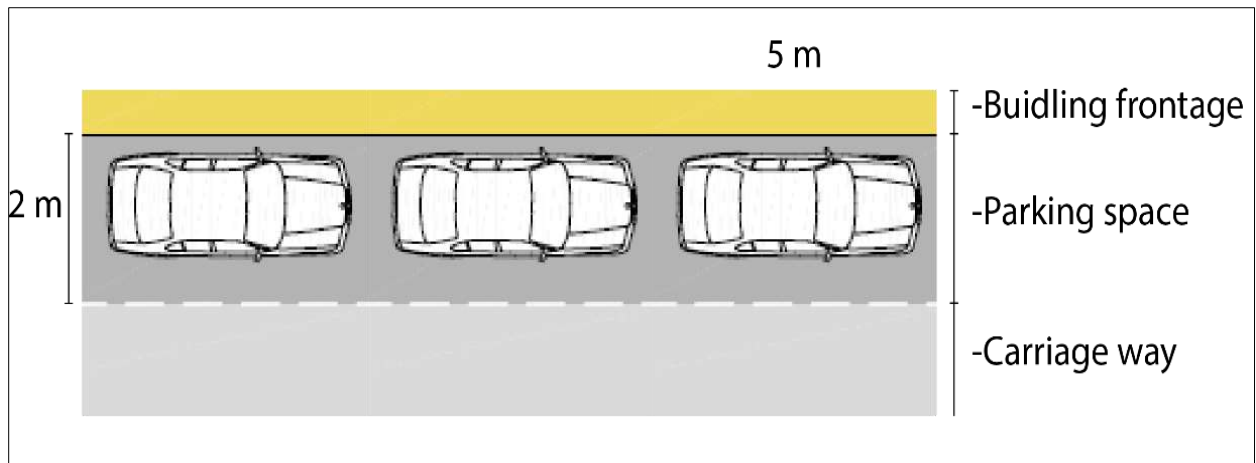


Figure 14-8: Aerial Road Profile

Source: VisionRI

Parallel parking methods should be adopted within the town centre. This is because it not only saves on-road space but are also much safer for motorists when exiting the parking area of a busy street. These parking spaces should be allocated a width of 2.5 metres and an average length of 5 metres within urban roads. This not only provides proper clearance for the vehicle on either end but ensures that any vehicle width can fit sufficiently within this allocated space.

Parallel parking areas within Juja town could also be integrated with holding facilities for two-wheeled motorised or non-motorised means of transport (bicycles).

The presence of such parking facilities will not only reduce street clutter caused by motorcycles and bicycles but also be able to provide safe parking areas for them. This can also catalyse the use of alternative means of transport within the CBD as opposed to motorised transportation.

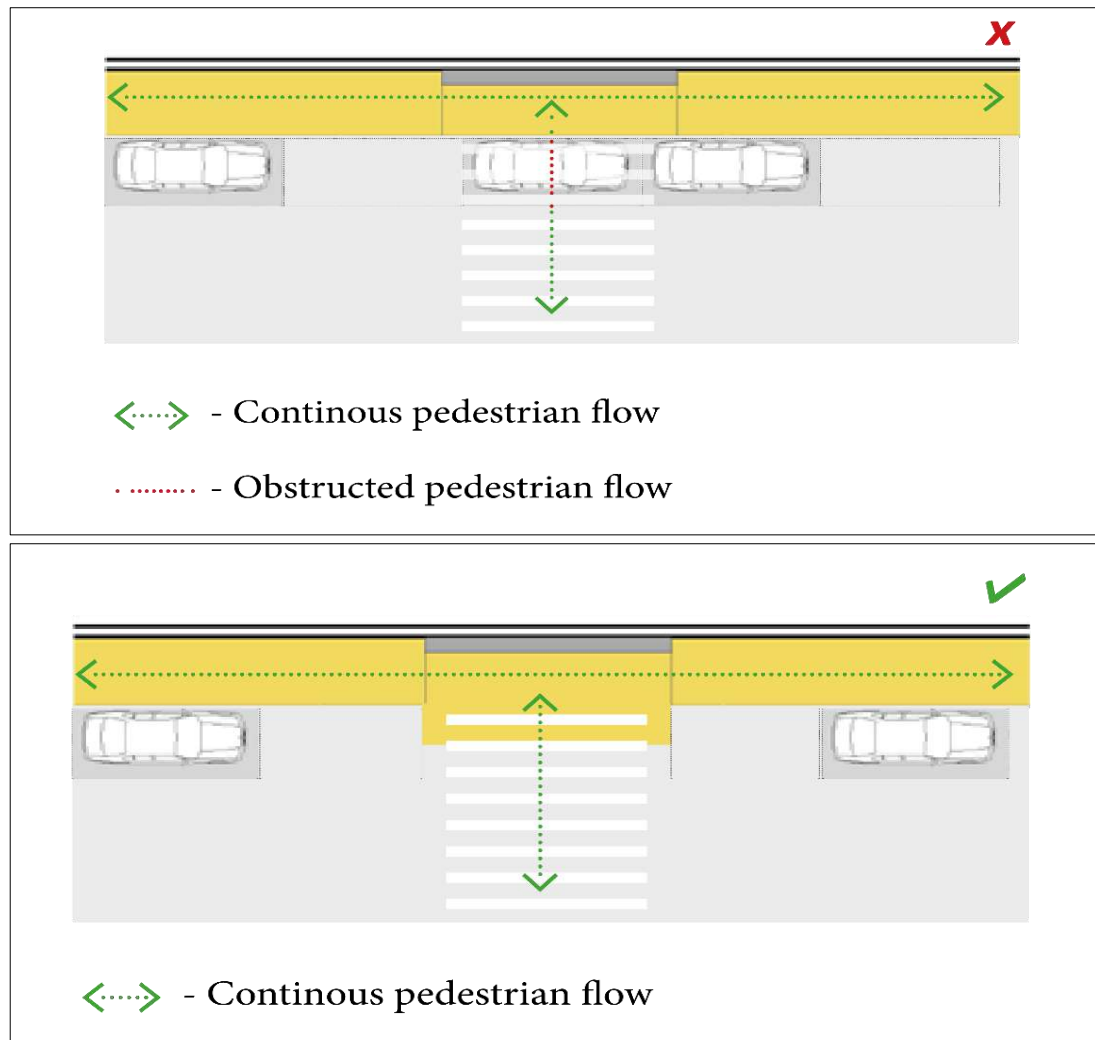


Figure 14-9: Pedestrian Flow Profile

Source: VisionRI 2020

Parking spaces within Juja CBD should not be placed at road intersections, pedestrian crossings or between building blocks as indicated in the figure above. This obstructs the pedestrian flow and may cause pedestrian-related accidents.

Rather, parking spaces should be designed in a manner that is convenient for motorised users of an area, as well as maximise pedestrian safety within the street. Parking spaces should be regulated so as to not extend onto sidewalks as well as not serve an obstruction to any pedestrian infrastructure put in place e.g., pedestrian crossings.

iv. **Intervention 4: Residential Areas**

Juja area has over the years grown into a dormitory town due to a large number of residential houses in the area. This dominance of residential housing units within the area has been brought about by the presence of JKUAT and close proximity Nairobi city and Thika town.

As mentioned above streets within Juja are characterised by small road widths. This extends up to residential areas such as Gachororo and Muchatha. It is necessary to come up with urban design interventions that are able to build the character of each of these residential areas. A summary of the transport challenges faced in residential areas are as follows:

- Lack of basic streets infrastructure (lighting and road tarmac);
- Encroachment of the informal economy onto the street; and
- Lack of proper stormwater drainage.

Streets within these residential areas lack basic street infrastructures such as tarmac or street lighting. Lack of these basic infrastructures tends to create an unsafe environment for street users - motorists and pedestrians alike.

Encroachment onto the street by vendors tends to reduce the useable carriageway. This encroachment is noted to force pedestrians onto the main carriageway and thus may lead to pedestrian-related accidents. Also, reduction in street carriageway due to encroachment may make it difficult to access certain areas in case of an emergency such as fires.

The lack of proper stormwater drainage not only interferes with an area's aesthetics but may also pose as a health risk to its users.



Figure 14-10: Street within the residential areas

Source: VisionRI

Some of the urban design interventions that are proposed within residential streets include:

- Installation of stormwater drainage channels underneath footpaths;
- Clearing of encroachments;
- Proper lighting and utility installation along the streets; and
 - Proper tarmacking of roads within the planning area.



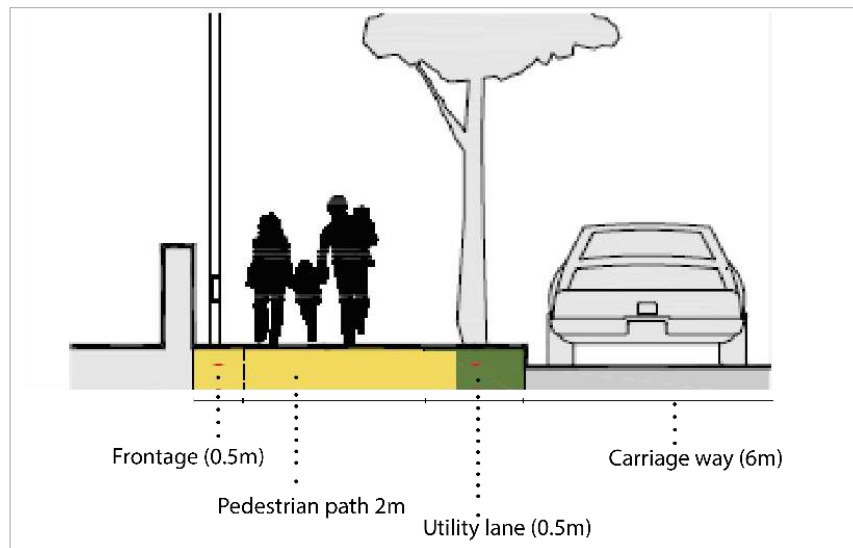
Figure 14-11: Rehabilitated Street within the residential area

Source: VisionRI

As shown in the image above, informal structures may be cleared to create more space for utility and vegetation provision. This will create a proper infrastructure to facilitate/encourage pedestrianisation.

Streets within the CBD should be designed to efficiently serve and function in line with the residential needs of the area. Given that the area is densely developed, street space should be greatly enhanced to ensure maximum mobility in case of emergencies such as fires.

To ensure the sustainability of the area, well-defined streets with the relevant infrastructure should be put in place. Carriageways should be at least 6 m wide with footpaths measuring 2 m and utility and building frontages measuring 0.5 m each.



v. Intervention 5: Intermodal Transport

Intermodal transport refers to the linking of two or more means of transport. This is done to minimise time spent and maximising efficiency in the movement of persons, good and services.

It was noticed that Thika Superhighway which is a major structuring element in Juja town serves as both a transport mode as well as a barrier between the existing bus station and the proposed train station located in Muchatha area.

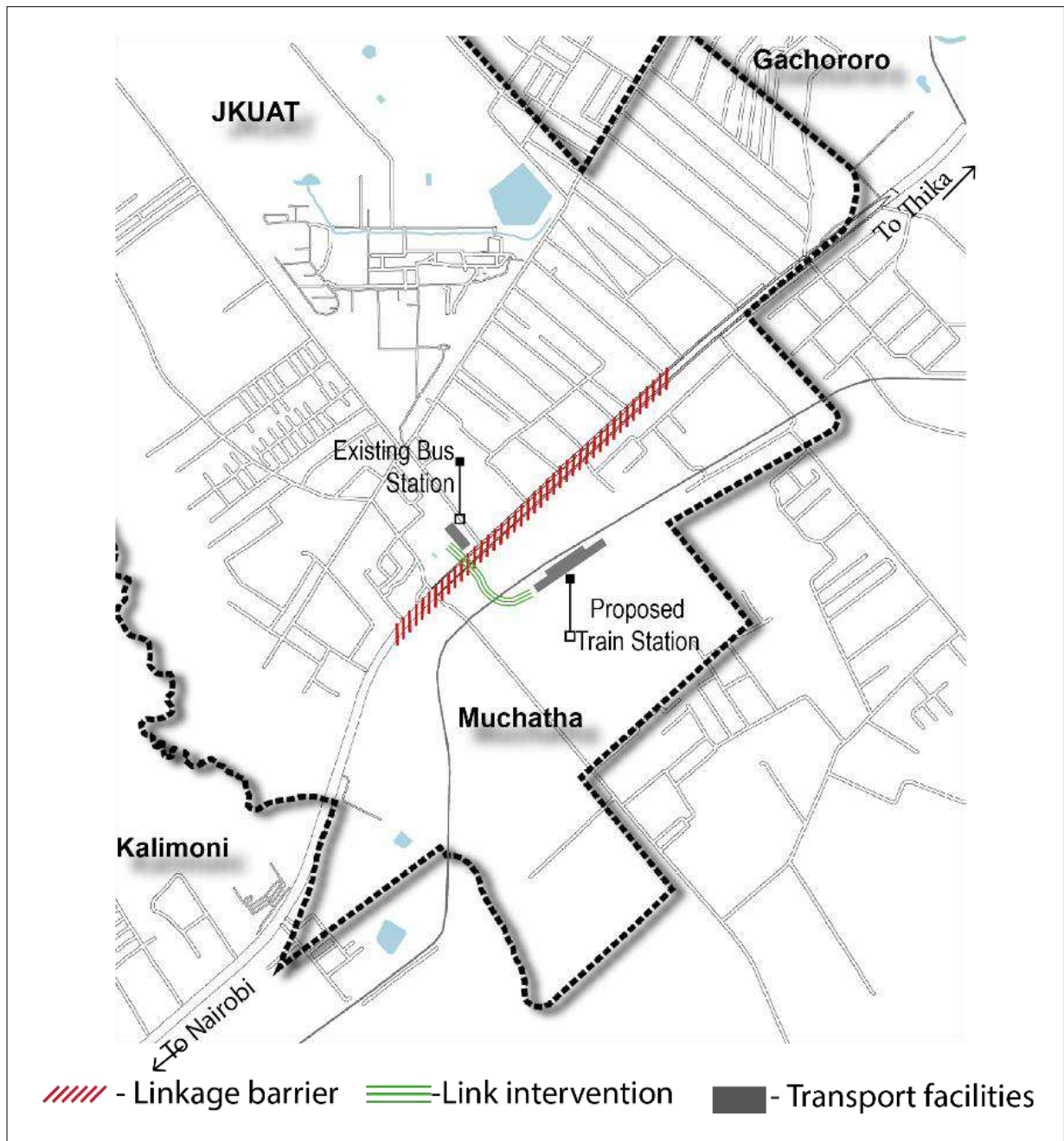


Figure 14-12: Intervention 5 - Intermodal Transport

Source: VisionRI

To counter this barrier, a vibrant integrated mobility option may be considered. This option may provide for non-disruptive flows between pedestrian, cyclists and motorists as illustrated in the Figure 14-13.

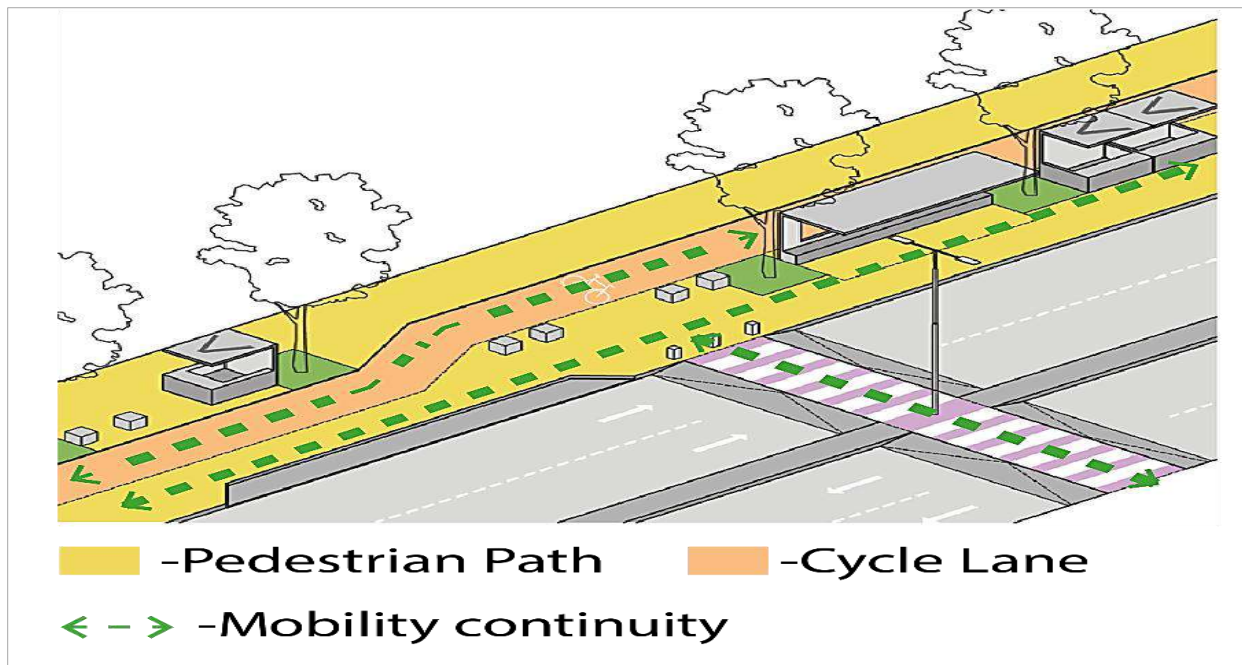


Figure 14-13: Desired pedestrian flow

Source: VisionRI

When designing for intermodal transport, intersections should also be considered as a main area of focus. Intersections refer to areas or points in which two or more transport means converge. The bulkiness of an intersection may be dependent on the use of the road, or the area in which the intersections are located.

Intersections within Juja area are mainly noted to focus on vehicular modes of transport. They are also not designed to properly cater for the safety of all users of the specific means of transport.



Figure 14-14: Shared vehicular and pedestrian overpass within Juja town

Source: Field Survey 2020

Intersection within Juja town should have proper pedestrian markings and demarcation. These clear demarcations are able to greatly enhance motorist and pedestrian safety between various forms of transport.

Pedestrian and cycle paths should also not be obstructed and the radius of curbs within residential areas should also not exceed 4 m. This small radius between two roads especially within the residential area is able to serve as a traffic calming mechanism which is able to slow down motorist speeds.

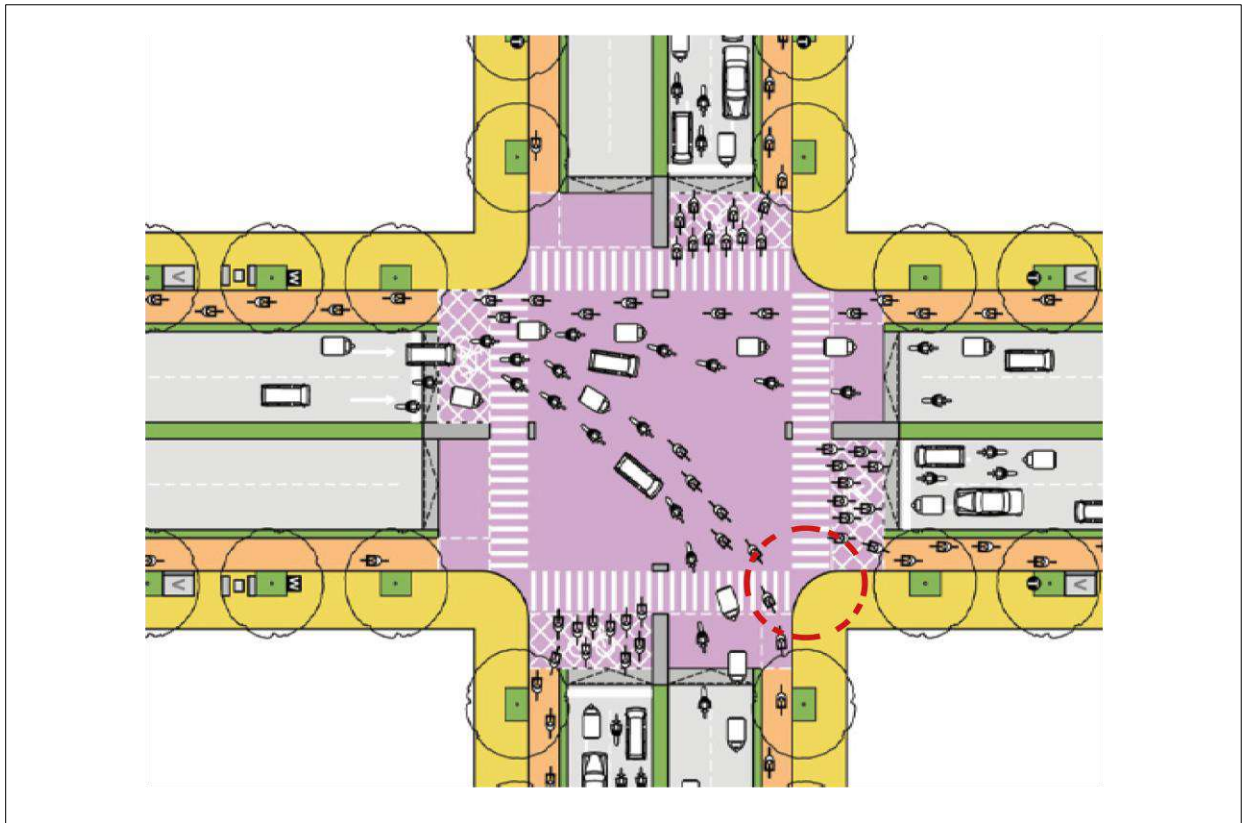


Figure 14-15: Suitable intersection design

Source: VisionRI 2020

14.2.2 ACTION AREA 2: NDARUGO QUARRYING SITE ACTION AREA

There are seven rivers passing through the Sub-County namely, Thirika River, Ndarugo River, Theta River, Mugutha River, Komu River, Karukuta River and Athi River. Riverfront development can be planned at appropriate locations on all the rivers. A broad plan will be prepared for Ndarugo River, which will act as the guideline to develop other riverfronts. The site has been selected considering its strategic location and adjacent land uses, which can be transformed into recreation parks.

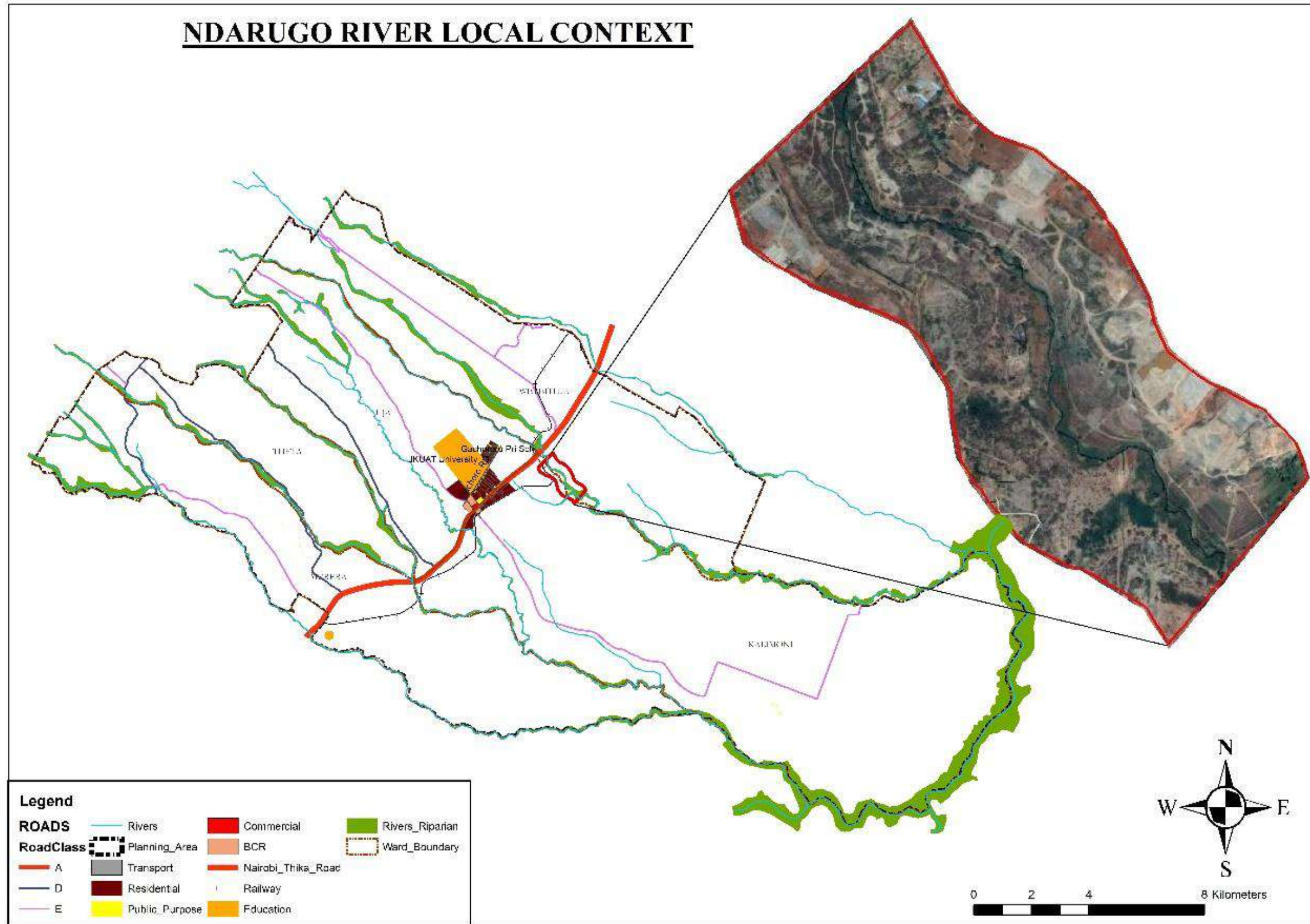
Ndarugo's riverfront is currently used for agriculture. The river is not currently used as a place of recreational activities.

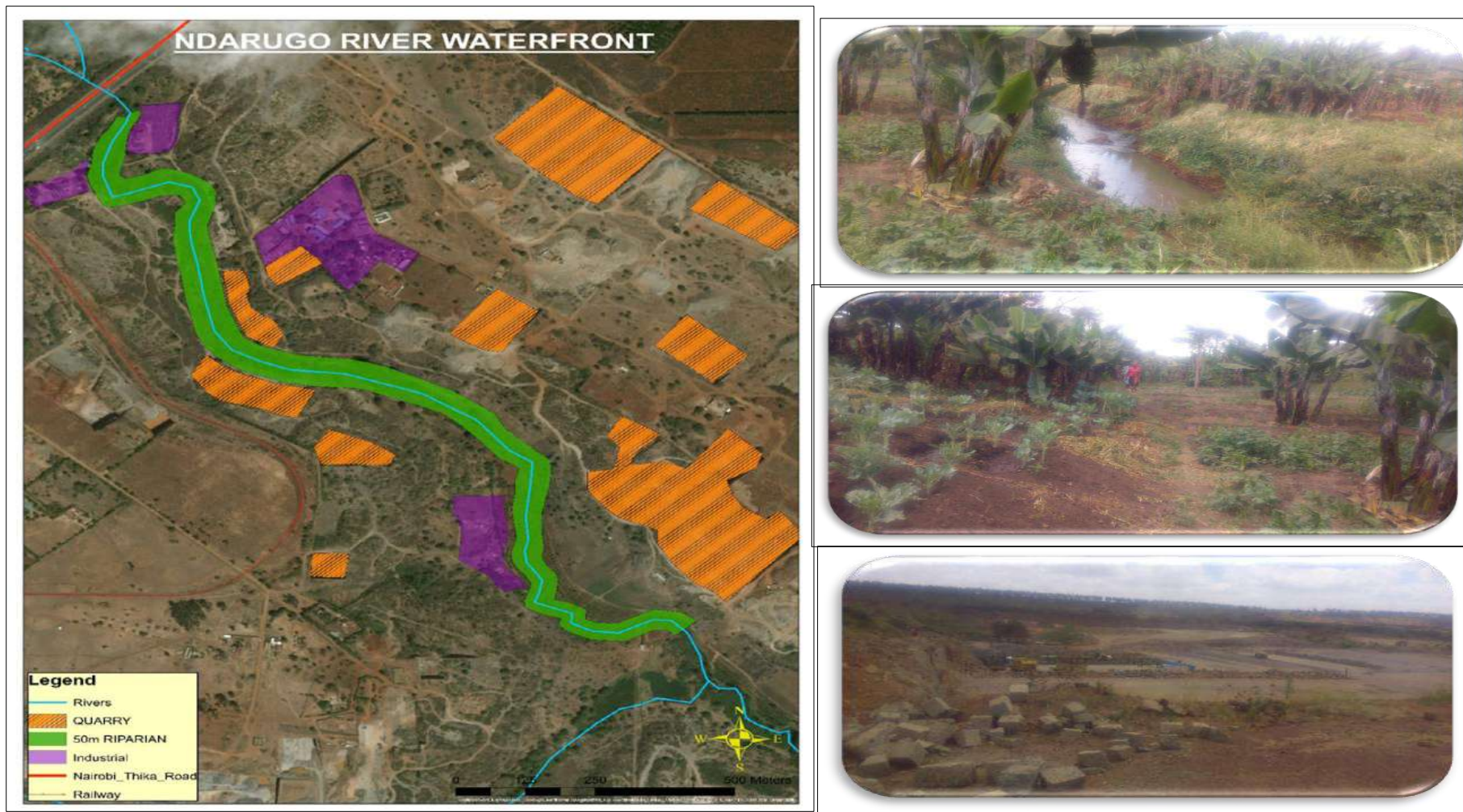
Objectives of riverfront development:

- To provide a link of the river with the town's life;
- To develop areas along the river for recreational activities; and
- To construct a dam on the river to create an artificial lake for water sport activities.

Proposed strategies:

- Green corridor along the river integrated with paved spaces for general movement;
- Green open spaces along the river for picnics activities; and
- Sports activities along the river.





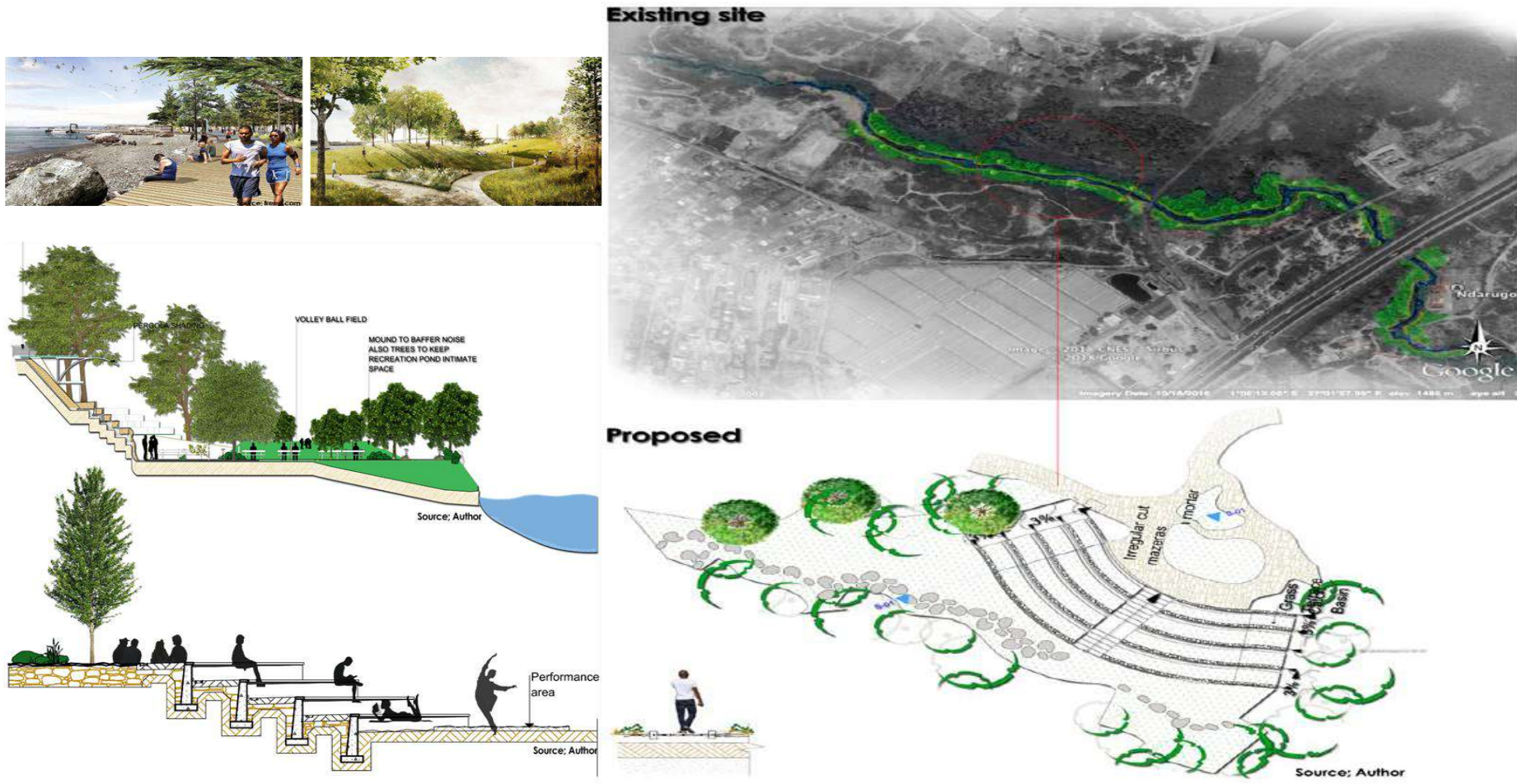


Figure 14-17: Proposed Ndarugo River Waterfront Development design

Source: VisionRI 2020



Figure 14-18: Rehabilitation into recreation spaces 1

Source: VisionRI 2020



Nature and hiking trails should be the focus for the open quarries since there is ample room on the floor and rims of these quarries. Installation of guardrails and fences should be done to reduce the chances of accident occurrence. Kids and family recreational parks should also be constructed next to the quarries on the less steep land to complement the nature and hiking trails.

Water from nearby rivers such as Ndarugo



Rainwater and groundwater that fill abandoned quarries can be used for swimming, boating and rafting thus converting the quarries into recreational parks. Wildlife parks are also appropriate



Figure 14-19: Rehabilitation into recreation spaces 2

Source: VisionRI 2020

14.2.3 ACTION AREA 3: JUJA FARM GREEN ZONE ACTION AREA

Historically, the Juja Farm area has been oriented toward agricultural production due to its rich soils and adjoining Athi River. The decline in sisal production and the subdivision that have been taking place provide the perfect opportunity for providing for the food requirements of the growing urban population.

Challenges:

There is potential in the rich soils and abundance of the Athi River waters that continues to diminish for lack of planning guidance. The greatest challenge has been the subdivision from the original large tracts of sisal plantations into smaller plots of land that are not agriculturally viable. This has serious repercussions in the availability of food. If these spatial challenges are addressed, clear interventions are necessary to promote diversified agricultural production and agro-based industries.

Urban poverty tends to be fuelled by people migrating towards the cities in an attempt to escape the deprivations associated with rural livelihoods. Partly due to the rural decline, the world is urbanising at a fast pace and it will not be long before a greater part of developing country populations is living in large cities. Therefore, urban food security and its related problems should also be placed high on the agenda in the years to come.

Jacques Diouf, FAO Director-General [FAO: The State of Food Insecurity 2006]

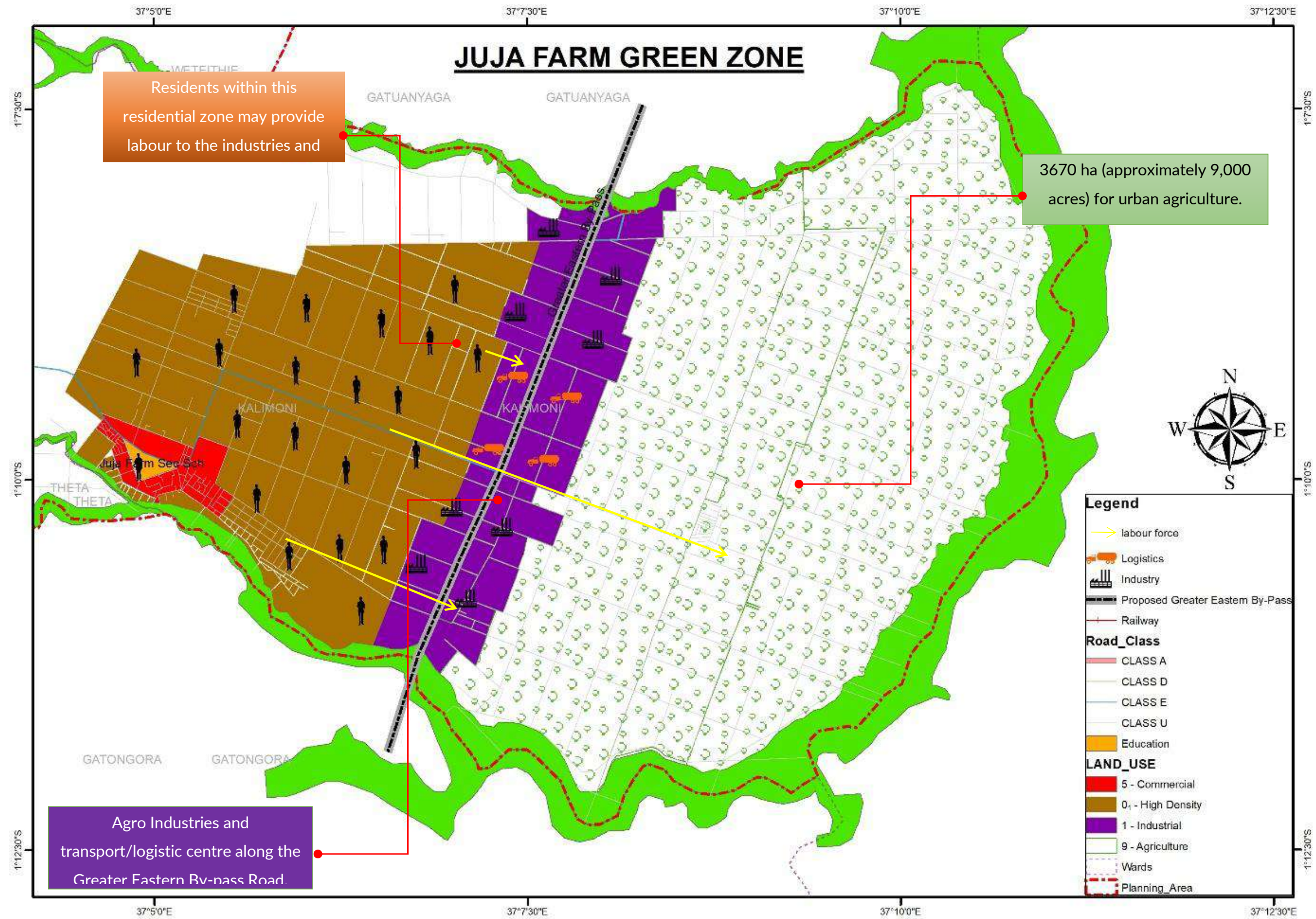
Goal:

- To support and strengthen the presence of farms for the production of fruits and vegetables for the local and regional market;
- Encourage investment in the food chain and job creation opportunities; and
- Raise awareness of the general public, develop food chain programmes, and train the community to engage in innovative agricultural production

Objectives:

- To increase food production in Juja Sub-County;
- To control the conversion of land from agricultural to residential; and
- To create employment in the agricultural sector.

Map 14.4 shows an illustration of how the above interventions may be actualised in the action area.



Map 14-4: Juja Farm Green Zone Action Area

Source: VisionRI

Proposed Interventions

To achieve the above objectives, some intervention needs to put in place. This will help ensure that the project is sustainable and also economically viable.

- I. Sensitise and train the community on the potential benefits of farming viz a viz residential development.
- II. A detailed transportation master plan for the industrial corridor shall be prepared to guide the development of agro-industrial activities.
- III. Promote high-value horticulture crops farming and agro-based industries to supply food for urban consumption.
- IV. Establish agribusiness services to provide farming infrastructures to promote the marketing of farm produce.
- V. Provide technical and financial assistance to potential innovators and small-scale farmers.
- VI. Promote farmers cooperatives groups for procurement of farm equipment and farming inputs.
- VII. Explore alternative strategies to boost agricultural production in line with market demands.
- VIII. Support the processing and packaging of agricultural produce.
- IX. Promote transport and logistics interventions that will make marketing efficient.

The chart below highlights some of the priorities and indicators of the proposed interventions in the action area which may make this proposal viable and sustainable.

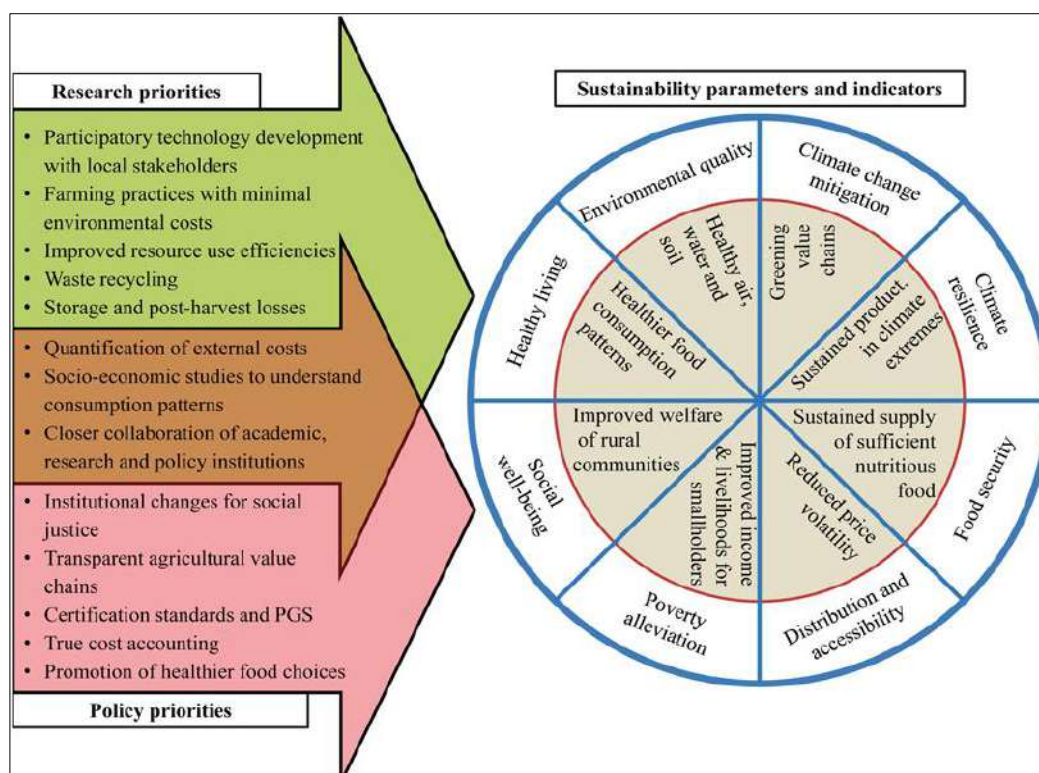


Figure 14-20: Priorities areas and indicators

Source: Frontiers in Environmental Science. Front. Environ. Sci., 02 February 2016 <https://doi.org/10.3389/fenvs.2016.00005>

15 SECTORAL STRATEGIES AND MEASURES

15.1 Sectoral measures and strategies

15.1.1 RESIDENTIAL DEVELOPMENT STRATEGY

The Sub-County generally has good housing units as most people occupy their own houses. There are also upcoming residential developments due to the presence of the Thika Superhighway. Despite that, the housing situation in the area lacks basic essential infrastructures such as water, sewerage systems, and adequate solid waste management system, amongst others.

Goal:

- To ensure access to safe and affordable housing with essentials basic infrastructures in Juja Sub-County.

Objectives:

- To provide direct or indirect financial assistance to own a house;
- To provide places for elderly households and permanently disabled people;
- To minimise the displacement of people during the implementation of the Plan's policies and projects;
- To provide decent housing for all with essential services;
- To promote incremental upgrading of the informal settlement; and
- To formalise all informal settlements by providing security of tenure.

Strategies:

- The County Government may adopt a densification principle within urban areas by increasing plot ratios where applicable;
- Promoting public-private partnership in housing provision through joint ventures agreements;
- Reducing the timelines for housing plan approvals;
- Upgrading the existing physical infrastructure;
- Providing basic infrastructure in areas where growth is expected;
- Promoting County social housing projects; and
- Provision of open spaces and modern markets within settlements.

15.1.2 TRANSPORT STRATEGIES

Goals:

- To ensure sustainable integration of all transportation modes within the Sub-County.

Objectives:

- To ensure ease of movement hence reduced travel time;
- To decongest the roads especially within Juja CBD;
- To revive the old railway line traversing Juja CBD for mass transit;
- To promote an efficient public transport system for the Sub-County; and
- To promote active transport.

Strategies:

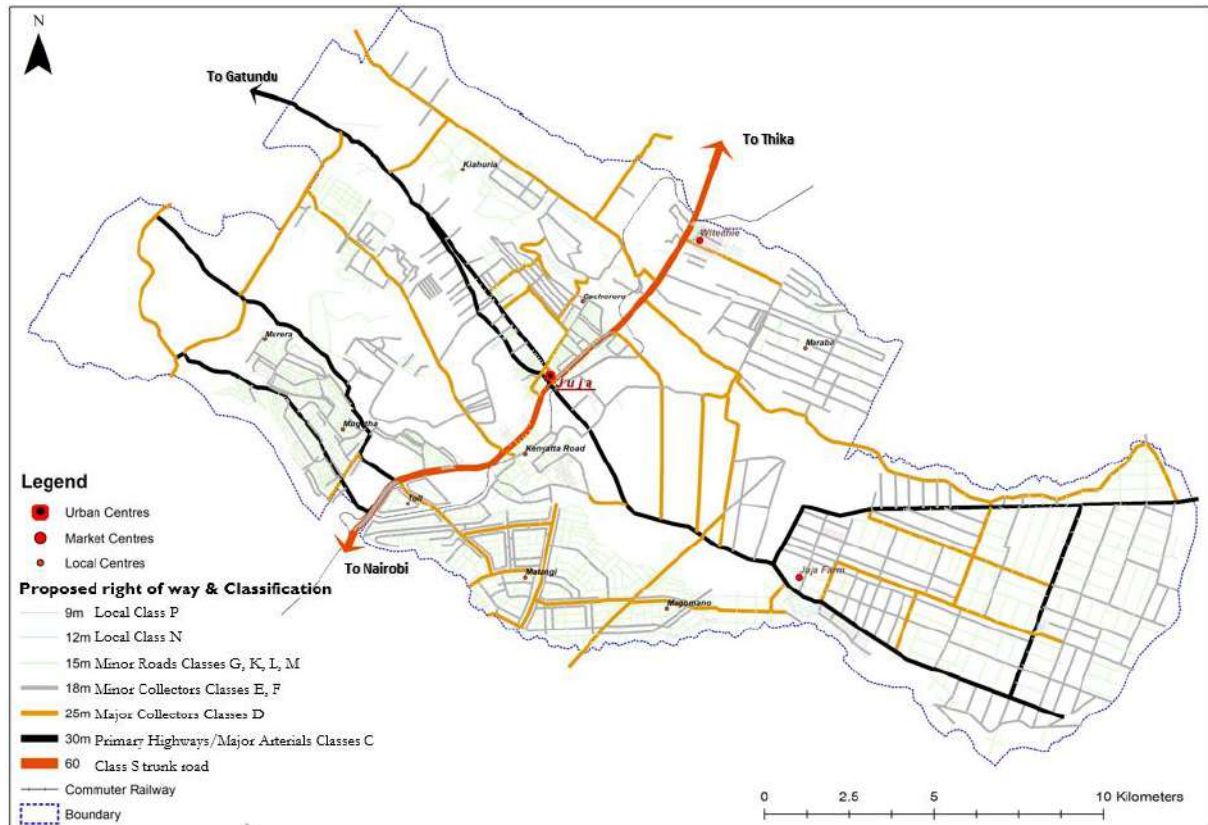
- Provide transit-oriented development centred on important transit hubs like bus terminals and railway stations by creating compact, walkable, pedestrian-oriented, and mixed-use communities;
- Increase the productivity and efficiency of existing transportation facilities through transportation system management practices;
- Promote and increase access to multimodal transportation modes within the planning area such as active transport (by providing dedicated walking and bike lanes), and mass transit;
- Establish road reserves complete with NMT, pedestrian pathways and appropriate stormwater drains;
- Establish transit stations like Traffic and Transit Management Centres (TTMC) along with parking facilities for private vehicles for park-and-ride along the bus routes, and concentrate housing near these stations to maximise accessibility, convenience, and employment opportunities;
- Provide boda-boda sheds at strategic locations within the nodes/centres;
- Revive commuter rail transport and modernise the station at Juja into a transit interchange;
- Establish dedicated bus routes;
- Prevent encroachment on road reserves through regular inventory surveys, beaconing, engineering and enforcement;
- Reduce conflict points through design strategies such as channelised intersections, roundabouts, signalised intersections, grade separation and protected lanes;
- All season maintenance of roads;
- Improve signage on all roads;
- Provide wayfinding information at convenient points in the urban areas;
- Promote sustainable land uses along transport corridors;
- Discourage direct access of plots onto main arterial, sub-arterial and collector roads;
- Develop a comprehensive transportation mobility plan for the entire Sub-County;
- Open missing link roads especially in Juja Farm;
- Enforce traffic management guidelines by retraining road users and enforcing traffic laws and regulations;
- Construct parking bays and spaces for both on- and off-street parking;
- Establish nine metres as the minimum road width by reclaiming encroached roads and negotiating setbacks;
- Enforce development control guidelines on all roads to reduce encroachment and to ensure that subdivisions provide adequate road reserves, permitting nothing below 9 m;

- Upgrade roads to bitumen and gravel standards and prioritise those that lead to important facilities e.g. hospitals, fire stations, industries, and education as well as into residential areas for purposes of emergencies;
- Upgrade and maintain feeder roads; and
- Install streetlights along key Sub-County roads and in all urban centres.

Functional Classification of Roads

Functional classification groups roads according to the character of the service they are intended to provide. Higher function highways place more emphasis on mobility for through traffic, and lower function highways and roads place more emphasis on land access. Roads may be functionally classified into five groups:

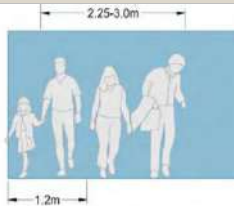
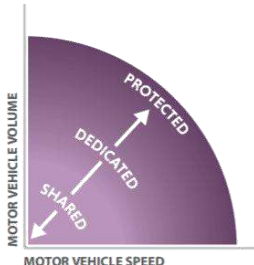
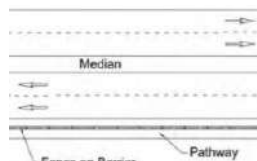
- International trunk roads (A & S); typically, highways and expressways.
- National trunk roads (B); Secondary Highways.
- Primary Highways (C); Arterials. Class H urban.
- Major Roads (typically arterials but may include). Class D, J-urban; principal bus routes
- Minor Roads (typically collectors but may include some arterials) Classes E, F, G, K, L, M.
- Special Purpose Roads.
- Local Roads (typically Access roads for residential areas/farmland) Class N, and P.

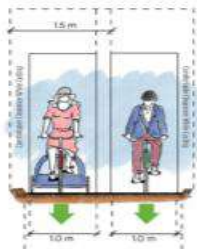
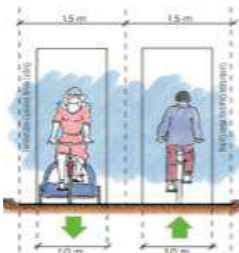


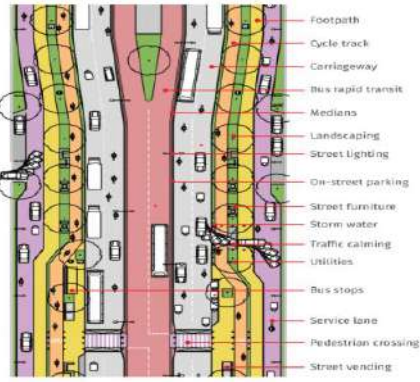
Map 15-1: Proposed right of way & classification
Source: VisionRI

Table 15-1: Transport Implementation Guidelines: Designing safe and accessible roads for everyone

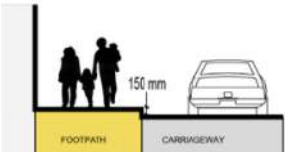
Parameter	Primary/Highway/ Arterial Roads (Classes A, S, B, C)	Major/Secondary/Collector Roads (Classes C, D, E, J)	Tertiary/Minor Roads Classes E, F, G, K, L, M)	Local/Access Roads (Class N, and P)
Design Speed	60-110 kph	60-80 kph	≤ 50 kph	<30 kph
Width of Traffic Lane	3.75 m	3.5 m	3.25 m	3 m
Shoulder Width	2.5 m -3 m	1.5 m-2.5 m	1 m	0.5 m
Width of Parking Lane	none	2.5 m	2.5 m	-
Streetlight requirements and spacing	Based on the applicable road/street Luminaires and spacing guidelines.			
Road Gradient	Minimum slope: 0.5% to facilitate drainage; Maximum slope: 10% for long stretches and 15% for stretches not exceeding 100 meters; and Cross slopes: 1 in 100 for paved roads and 1 in 50 for unpaved roads.			
Visibility at Junctions: Splay Angle and distance	30 degrees; >5m Truncation standards to be observed.	30 degrees; >4m Truncation standards to be observed.	45 degrees; >3m Truncation standards to be observed.	45 degrees: >2m Truncation standards to be observed.
Traffic Calming Strategies	Where applicable with consultations: Speed humps/bumps; table-top crossings, raised crosswalks; median islands and bulb-outs/curb extensions, traffic circles, speed limits (designated areas e.g.: community areas, school zones, certain public facilities).			
Pedestrian walkways Sidewalk placement and crossings	Off-street pathway or enhanced separated sidewalk; overpass crossings.	Separated sidewalk or enhanced separated sidewalk; table-top crossings, raised crosswalks.	Separated or non-separated sidewalk: table-top crossings, raised crosswalks.	Shared space; marked crossings.
Pedestrian walkways widths (Area of high pedestrian activity >2.4m)	1.8 m	2.4 m	>2.1 m	1.8 m
Maximum Longitudinal Grade	Preferably less <5.0% else, > 5.0% to 8.3% landings should be provided with every 9.0 meters, > 8.3% alternative accommodations recommended (railings, rest areas, adding switchbacks, accessible ramps, circulating shuttle, ladder sidewalks, stairways, escalators, etc.			
Pedestrian walkways Surface Materials	Asphalt (long stretch, rural areas, and parks); brick (high pedestrian volumes; brick may not be a comfortable surface for people using mobility devices); decorative paving materials (cobblestone, unit pavers, exposed aggregates, exposed glass)			

Parameter	Primary/Highway/ Arterial Roads (Classes A, S, B, C)	Major/Secondary/Collector Roads (Classes C, D, E, J)	Tertiary/Minor Roads Classes E, F, G, K, L, M)	Local/Access Roads (Class N, and P)
 Walking Side By Side	decorative paving materials may be used to enhance the visual aesthetic; permeable pavement (permeable pavement can include permeable concrete or porous unit pavers). The pavement should be raised 150mm from the road. Note: The Sub-County shall formulate a strategic approach to managing footpath obstructions; i.e., by hawking activities, parking, advertising, improperly placed street furniture, dumping and surface degradation. Crossings: ensure clearly marked crossing and placement of curb ramps.			
	0.9 m is the absolute minimum required for streetlights and utility poles, street trees 1.2 m minimum, roads with transit stops require the desired width of 3.0 m for passenger landing pads, benches, and bus shelters.		Basic (0.6 m to 2.0 m) Enhanced (3.0 m to 5.0 m)	
	Road Hardware: road lighting, traffic signals, pedestrian and cycling push buttons, traffic signage, utilities, fire hydrants, parking metres, and/or bollards, fences, or other barriers. Pedestrian Amenity: coloured and/or textured surface materials, benches, tables, and chairs, other seating amenities, waste receptacles, mailboxes and newspaper corrals, drinking fountains, bicycle parking, transit stops and shelters, wayfinding signage, public art (sculptures, murals, fountains, clocks, and other decorative features), road banners, flags, and other graphics, and public washrooms/restrooms.			
	- Protected bicycle lanes; and - Bicycle pathways/ highways. 	- Protected bicycle lanes; - Painted and buffered bicycle lanes; and - Advisory bicycle lanes.	- Protected bicycle lanes; - Painted and buffered bicycle lanes; - Advisory bicycle lanes; - Bicycle accessible shoulders; and - Shared street.	- Bicycle accessible shoulders; and - Shared street.

Parameter	Primary/Highway/ Arterial Roads (Classes A, S, B, C)	Major/Secondary/Collector Roads (Classes C, D, E, J)	Tertiary/Minor Roads Classes E, F, G, K, L, M)	Local/Access Roads (Class N, and P)
Dedicated cycling lane width	2.5m Uni-directional 3m Bi-directional Multi-use pathway (cyclist and pedestrians= 3 to 4m)			
				
Bicycle and Pedestrian Accessible Shoulders for rural areas	2.0 m- 3.0 m	2.0 m - 3.0 m	1.5 m - 2.0 m	1.5 m - 2.0 m
Bicycle and Pedestrian Accessible Shoulders for Urban areas	-	-	1.5 - 1.8 m	1.5 - 1.8 m
Cycling lane desired paving material	The preferred material for a bicycle pathway is asphalt; may add oxides to differentiate with traffic lanes. Rough surfaces are uncomfortable, smooth surfaces are comfortable.			
Cycle parking racks	Offer short- and long-term bicycle parking areas/racks in urban areas; shopping centres, malls, markets, and other public spaces and facilities which must be convenient, accessible, safe/secure, functional, and supportive.			
				
Drainage	Drainage and maintenance should be considered upfront in the design process to ensure that issues can be avoided. The gradient should not be less than 0.5%. This is to facilitate drainage in flat terrains.			
Lighting	Roads and ways should be well lit at night especially at crossings, urban centres, institutions, bridges, major conflict spots, alleys, tunnels and underpasses, and intersections.			
Signage and Wayfinding	A seamless, predictable, consistent, and easy-to-understand system of wayfinding, signage, and trip planning tools for vehicles, walking and cycling is important as well as to consider that many residents and visitors may not be familiar with certain locations. This should include but not limited to centres, local neighbourhoods, major attractions, local destinations, road names, traffic signs, information booths, fingerposts, monoliths, etc.			
Other Guidelines				

Parameter	Primary/Highway/ Arterial Roads (Classes A, S, B, C)	Major/Secondary/Collector Roads (Classes C, D, E, J)	Tertiary/Minor Roads Classes E, F, G, K, L, M)	Local/Access Roads (Class N, and P)
Other Road Systems	Cul de Sacs: When a cul-de-sac is used in residential development it should be provided with a curved turning circle of sufficient width to facilitate easy access and the turning of not only cars but trucks and other heavy vehicles. The recommended minimum radius is 12 m. The cul de sac should serve no more than 20 dwelling units and a maximum length of 120 m.			
Parking Management Strategy	Parking standards; (See building code), parking restrictions, parking Pricing and parking supply and demand position.			
Building Setbacks from Roads	See development control guidelines; ensure a building-street relationship through urban design.			
Corridor Development	Strip development, or development that contributes to the growth of a linear of plots, must not be permitted to the front on or directly connect to a highway or major arterials; road classes (A, S, B and C). An exception may be considered on a highway route if development adjacent to the route has already occurred to the extent that this policy document can no longer be fully applied.			
Public Mass Transport	Public transport should be guided with the following principles: Stronger integration of transportation and land use, Integrating fares and service, reliable, frequent service, Protection from mixed traffic, safe, comfortable stations with passenger information and development of an Intelligent Transportation System for the Sub-County. Bus routes will be located not more than 1km from an urban area and 2.5 km from a rural area. In establishing bus schedules, the objective is to arrange for buses to arrive at known intervals, but they need to be consistent and regular.			
Efficiency of public transport routes	 • Dedicated busways and priority; improves efficiency; • Bus stops will be permanent whenever practical, allowing the public to become familiar with stop locations: - Consider all modes; walking, cycling, trams, LRT, BRT, MRT; - Coordinate station access design with land development; - Address existing and future needs; - Integrate community design into station development; - Consider station access in route alignments; and - Universal design and universal access. • Roads must be at least 18 m wide; • Provide a location for a change of bus direction with no backing; - Have adequate shoulders to allow the bus to pull off the roadway; and - Be kept clear of any obstructions that would prevent safe movement of buses.			

Parameter	Primary/Highway/ Arterial Roads (Classes A, S, B, C)	Major/Secondary/Collector Roads (Classes C, D, E, J)	Tertiary/Minor Roads Classes E, F, G, K, L, M)	Local/Access Roads (Class N, and P)
Travel Demand Strategy	Increasing public transport modal shares, additional demand management interventions need to be implemented, i.e.: Congestion Pricing - mobility management strategy to reduce traffic congestion. Restricted parking supply or imposing restriction of vehicles.			
Pollution reduction and mitigation	Improving transport options (walking, cycling, ridesharing, public transit, carsharing, etc.), more fuel-efficient vehicles tend to reduce energy consumption, pollution emissions and fuel cost; and			

Parameter	Primary/Highway/ Arterial Roads (Classes A, S, B, C)	Major/Secondary/Collector Roads (Classes C, D, E, J)	Tertiary/Minor Roads Classes E, F, G, K, L, M)	Local/Access Roads (Class N, and P)
	Streets to be lined with trees to enhance sequestration of pollutants.			
Pedestrian facilities, people walking and using mobility devices  	General Design Guidance: Preferred 2 m-3 m; Physical separation from other road users; Firm, smooth, and even surfaces; The Pedestrian through Zone should be straight and unobstructed; Enough pedestrian crossing opportunities; Short distances between destinations; Continuous and direct routes between destinations that reflect pedestrian desire lines; Buildings that are oriented towards the road, creating an engaging environment; Diverse land uses that create a varied and interesting walking experience; Wayfinding that makes it easy to navigate between destinations; Street trees and other vegetation; Weather protection elements to provide refuge from the rain; Adequate lighting for safety, security, and visibility; Enough benches and rest areas; Pedestrian amenities including landscaping, water fountains, washrooms, garbage and recycling receptacles, public art, and street furniture; and Well-maintained pedestrian facilities in all seasons.			

Parameter	Primary/Highway/ Arterial Roads (Classes A, S, B, C)	Major/Secondary/Collector Roads (Classes C, D, E, J)	Tertiary/Minor Roads Classes E, F, G, K, L, M)	Local/Access Roads (Class N, and P)
Maintenance	Follows the road classification guidelines and related legislations; and Maintenance of private driveway access within the public right-of-way shall be the responsibility of the property owner and well as adjoining drainage improvements.			
Providing Loading and unloading zones	Loading zones shall be provided within the urban centres on main streets and back streets; and Loading bays along roads may be provided in rural areas.			

Source: VisionRI

Recommendations:

- i. **Provide non-motorised transport:** Enhance and expand active transportation, aided mobility, walking, and cycling.

Based on both the current and projected modal split, the majority of the Sub-County's residents will be walking. There is thus a need to make walking and cycling safe and attractive for all users including the elderly, children, and persons with disabilities. NMT provides basic mobility, affordable transport, access to public transport, as well as health and recreation benefits.

In order to achieve a walkable urban area in Juja, complete street designs need to be articulated. Complete street designs ensure that all streets have dedicated spaces for NMT modes, designated cycle parking facilities, traffic calming with at-grade crossing facilities for pedestrians, well maintained NMT facilities with smooth surface conditions and with ramps at grade changes to enhance universal accessibility, provision of shade, street furniture and landscaping to enhance attractiveness and comfort of pedestrians and cyclists. A facility may also be provided by creating space for street vendors so that they may not lose their lively hood. All intersection needs to provide at grade pedestrian crossings to enhance the comfort and convenience of pedestrians especially the elderly and children. Where space allows, street furniture such as benches, trees, flowers/landscaping should be provided. The County Government needs to put strict measures to ensure that parking and street vending are prohibited in pedestrian facilities.

- ii. **Public transport:** Build a comprehensive rapid transit/bus network.

Public transport in Juja has to be improved in order to meet the needs of current commuters as well as their projected growth. Juja Town has no designated bus park or terminal, therefore, this needs to be established in order to accommodate the rising volume of buses. This can be developed close to the railway station. In other urban centres within the Sub-County, land needs to be acquired or set aside for the construction of terminal facilities to reduce the current nuisance of operating along road shoulders and other undesignated areas. Some of the key facilities that need to be incorporated in the new terminals include toilets including those for persons with disabilities and baby changing stations, ample passenger sitting area with shelter, luggage storage facilities, and customer information on the route and fare. Bus stops or lay-bays must have shelters and constructed at appropriate intervals and on need basis.

- iii. **Boda Boda:** Boda bodas play a key role for last-mile connectivity especially in areas where public transport is not readily available. The following are ways in which the boda boda sector will need to be improved in Juja:

- It shall be a mandatory requirement for all boda boda operators to join a registered SACCO for easier regulation;
- The Sub-County administration should provide dedicated stands/stops for the operators;
- Mandate all boda boda operators to take advantage of new technologies such as Safe Boda and Uber boda boda to avoid overcrowding in urban areas; and
- Boda boda operators should have regular training on safety and business development.

iv. Parking management: Effective parking management is an essential tool to facilitate the efficient use of road space and to ensure the mobility of public transport, pedestrians, and cyclists. In addition, appropriate parking fees can act as a lever to manage the use of personal motor vehicles and ensure that personal motor vehicle users compensate the city for the use of valuable land on which they park their vehicles. The Sub-County administration needs to define both on-street and off-street parking areas in order to prevent encroachment of parking into other areas including footpaths.

For a parking system to succeed, users need clarity on where they can and cannot park. This requires the physical definition of spaces for parking, protection of pedestrian spaces from encroachment through physical barriers such as bollards, signages and strict enforcement. Secondly, customer information is key to ensuring successful parking management. On-street parking charges should vary by location, with higher fees levied in areas with high demand. This results in a high turnover of parking slots as it discourages motorists from unnecessary long parking. At locations where there is the demand for long term parking, the Sub-County can identify land for off-street parking with parking charges on a weekly or monthly basis. Higher parking fees encourage people to use sustainable modes of transports including walking, cycling and public transport. Finally, enforcement is key in ensuring that parking rules and regulation are maintained, and offenders are penalised.

15.1.3 NATURAL RESOURCES AND ENVIRONMENTAL CONSERVATION STRATEGY

The Kenya Constitution 2010 provides for the right to a clean and healthy environment for all under Article 42. It is the aim of the Plan to actualise this goal by conserving and maintaining environmentally sensitive areas within Juja Sub-County for the present and future generations. These areas include rivers, dams and quarrying sites. The Sub-County has a number of quarries within Ndarugo where building stones, ballast and murram are obtained for construction activities. The quarries have far-reaching environmental implications if they are not well managed.

Goal:

- To ensure optimal utilisation of natural resources and conservation of the environment.

Objectives:

- To utilise available natural resources such as quarry sites;
- To reclaim unused quarry sites;
- To create public awareness on the conservation of the environment;
- To conserve environmentally sensitive areas; and
- To promote recreational sites along the major rivers.

Strategies:

- Map riparian reserves to avoid encroachment;
- Preserve and maintain the rivers, natural streams and drainage ways within the developed areas by designating them as part of the open space system;
- Encourage public-private partnership in the planning and management of natural resources;
- Incorporate best management practices to prevent pollution of rivers and streams;
- Establish a comprehensive monitoring regime of rivers and wetlands and include findings in the County's state of environmental reports; and
- Map all quarry sites and deposits in the Sub-County.

An action plan of the rehabilitation of the quarries along a section of Ndarugo River has been prepared (See action area 2- section 14.2.2 above).

15.1.4 PHYSICAL INFRASTRUCTURE

Physical infrastructure plays a major role in the development of any area. The physical infrastructure in the Sub-County includes water sources, energy, drainage systems, power line, and ICT facilities.

Goal:

Easy access for safe, affordable and reliable physical infrastructure utilities.

Objectives:

- To develop, rehabilitate and redevelop the infrastructure network;
- To provide adequate infrastructure along the transportation corridors; and
- To link the high-potential economic areas of the Sub-County.

Water and sanitation

Projections of water demand over the plan period are based on analysis of the current consumption patterns in the planning area, as well as the projected changes in demographic patterns. For design purposes and according to the Water Design Manual for Water Supply in Kenya (2005), domestic water demand is

estimated at 250, 150, 75, and 30 litres per capita per day (l/c/d) for high, medium, low cost, and peri-urban settlements. However, WHO (1978) recommends a global rate of 65l/c/day for planning purposes.

Based on the projections of the 2009 population census for the planning area, a projection for water demand to the year 2030 is made as illustrated in the table below. According to the Ministry of Water and Irrigation (MWI) design manual guidelines, an average figure of 100 l/c/day may be used to derive global water demand for the planning area.

According to WRA, the water supply deficit in the Sub-County based on its 2009 population is 4240 m³ per day given that the current supply is 10,980m³ per day, yet the water demand is 15520m³ per day as indicated in the table below.

Table 15-2: Projected Water demand within the Sub-County

Year	Population	High	Middle	Low	Other uses	Water demand	Current water supply	Deficit
2009	118,793	250	150	75				
		5%	25%	70%	25%			
		1485	4454	6,237	3044	15,220	10,980	4,240
2028	412,465	5156	15467	21,654	10,569	52,846	10,980	41,866
2030	478,130	5977	17930	25,102	12,252	61,260	10,980	50,280

Sources: WRA Water Demand Guidelines

The projected water demand for the Sub-County will not be met if the current level of water production is maintained. The current water production capacity is 10,980 m³ per day. There is a need to expand the existing water supply coverage and explore other means to meet the demand such as drilling boreholes and employing water harvesting techniques.

According to the Water Design Manual for Water Supply in Kenya (2005) published by the MWI, approximately 70-80% water demand is translated into wastewater hence appropriate channels should be put in place to convey wastewater into the existing wastewater treatment plants. The Sub-County is not well covered by a sewer trunk system. The area around Witeithie is covered with the ongoing construction of sewer trunk in Kiambu County but the connection has had not yet be made.

Strategies:

- Improving and upgrading the existing water reticulation systems;
- Public awareness and sensitisation on water recycling and water storage techniques;
- Regular maintenance of water infrastructure to reduce un-accounted water;
- Encouraging private investment in the water sector; and
- Explore increasing water availability by drilling more boreholes, earth water dams, and rainwater harvesting in the Sub-County.

15.1.5 SOCIAL INFRASTRUCTURE

Social infrastructure facilities play a major role in making a place safe and liveable. The facilities enhance unity, instils a sense of care, and encourages high morals, visionary and competitiveness. They act as the platform for socialisation, sharing of information and innovation. The County Government has the mandate to ensure that these facilities are provided for the resident by allocating land for their development. Social infrastructure facilities range from educational facilities, health facilities, recreational facilities, fire stations, libraries, parks community centres and security. The Sub-County lacks adequate social infrastructure facilities, which the ISUDP plan to address.

Goal:

- To have adequate, accessible and affordable social infrastructure facilities which are well equipped for the wellbeing of the people.

Objectives:

- To repair, maintain and upgrade existing social infrastructure facilities;
- To equip schools and hospitals with necessary requirements e.g. furniture, staffing amongst others;
- To allocate and secure land for social infrastructure facilities; and
- To involve the community in the provision of social infrastructure facilities.

Strategies:

- Upgrade by densification and maintenance of the existing social infrastructure facilities;
- Apply development control mechanism on large parcels of land that are capable of accommodation large surrenders and reservation such as primary school, secondary schools and hospitals
- Promote private-public partnership in the provision of social infrastructure facilities such as health facilities, education facilities etc.;
- Ensure inclusivity for the user;
- Compulsory acquisition of land for social infrastructure facilities;
- Equip the facilities with qualified staff;
- Encourage public participation in the maintenance and management of the social infrastructure facilities; and
- Map all the social infrastructure facilities to establish the areas which are not well-covered.

15.1.6 EDUCATION FACILITIES

Education is one of the key drivers of country economic development. It also plays a significant role in eradicating poverty, improving health care, enhancing human resource skills, etc.

Demand Gap Assessment

The Sub-County currently has a deficit of 33 primary schools and 21 secondary schools. Considering that the population will be 478,130 by the end of the planning period, the demand for primary schools will be 119 while that for secondary schools will be 62. The Sub-County has no special school and relies on the neighbouring Sub-County.

Table 15-3: Demand and deficit for education facilities

Type of Institutions	Existing Institutions	Additional Required Institutions			
	2019	2023	2025	2030	
	300,948	451,156	600,221	1,183,119	
Pre-schools	20 [-33]	54 [74]	29 [103]	34 [119]	
Primary Schools	33 [-20]	54 [74]	29 [103]	34 [119]	
Secondary Schools	5 [-22]	31 [37]	15 [52]	18 [62]	

Source: VisionRI

Land Requirements

Existing planning standards recommend 0.15-0.25 ha of land for a kindergarten and pre-school. The standards also prescribe 3.25 ha and 4.5 ha as the required size of land for primary and secondary schools, respectively. The table below presents the projected land required to accommodate the additional educational institutions during the plan period, 2020-2030.

Table 15-4: Land requirement for education facility

Years	Primary schools	Secondary schools
	3.25 (ha)	4.5 (ha)
2019	87.8	130.5
2023	84.9	99
2030	159.1	135
Total area required	331.8	364.5

Note: Primary schools include ECDs

Source: VisionRI

Other planning options should be considered due to the lack of adequate public land to accommodate this future needs as per the requirement of the Physical Planning Handbook. The Plan proposes the following strategies:

- Enforcement for the surrender of land for public facilities such as schools when private developers are subdividing/converting large scale parcels of land into smaller portions;
- Upgrading existing facilities and increasing the number of streams to accommodate more students;
- Construction of high-rise education blocks to minimise space requirements; and
- Creating an enabling environment to attract private investment in the education sector by establishing more schools. Currently, the private sector has provided 66 primary schools compared to 33 which are public.

15.1.7 HEALTH SECTOR

The quality of the population greatly determined the overall productivity of an economy. This quality depends on the availability of health facilities and services plus accessibility to the same. Provision of health facilities therefore will be a prerequisite to the development of Juja Sub-County. Health facilities should be strategically located with easy access by both ambulance and on foot.

The minimum land requirements for health facilities as proposed by the Physical Planning Handbook is as follows:

- National referral hospital – 20 hectares;
- Provincial hospital – 8 hectares;
- District hospital – 8 hectares;
- Sub-district hospital – 4 hectares;
- Health centre – 3 hectares;
- Sub-health centre – 2 hectares;
- Nursing Homes – 0.4 hectares; and
- Veterinary clinic – 0.1 hectares.

Health services within Juja Sub-County are provided by the County Government of Kiambu and private sector. There are five dispensaries and three health centres within Juja Sub-County. The Sub-County lacks a Level 4 hospital with inpatient facilities.

15.1.7.1 *Proposals for Healthcare*

Planning standards prescribe one health centre and one sub-hospital for every 30,000 and 100,000 population, respectively. The projected requirement for health facilities within the Juja Sub-County is presented below.

Table 15-5: Demand for Health Facilities

Type of Institutions	Existing Institutions	Required Institutions		
	2019	2023	2025	2030
	300,948	451,156	600,221	1,183,119

Sub-County Hospital	0 (-3)	3 (1)	4 (-2)	6 (-5)
Health Centres	3 (-7)	10 [-5]	15 [-5]	20 [-19]

Source: VisionRI

Land Requirements

The Physical Planning Handbook's standards indicate that 4 Ha is required for a Sub-County hospital and 3 ha for a health centre, respectively. The projected additional health facilities will require approximately 106 ha. However, this may not be feasible given the current constraints on land availability other options need to explore such as construction storey building. To improve access to health service, the Plan proposes the following:

- Provide for village health workers to create more awareness on the preventive measure;
- Upgrade existing facilities;
- Construct multi-storeyed buildings to reduce pressure on demand for land; and
- Encourage private and faith-based organisations to bridge the gap by offering quality services.

15.1.8 OTHER SOCIAL FACILITIES

Juja Sub-County lacks the following social infrastructures which the Plan has taken into consideration:

- Recreational facilities;
- Fire stations;
- Libraries;
- Public parks; and
- Community centres.

The innovative way of providing these facilities include:

- Utilise existing facilities like schools, public administration and County office ground to provide libraries;
- Provide public land in farms undergoing subdivision/change of user; and
- Partner with private, neighbourhood's associations, and faith-based organisations.

15.1.9 PROMOTING STRATEGIES OF LOCAL ECONOMY

Juja Sub-County is one of the fastest-growing Sub-Counties in Kiambu. According to the SPC for NMR, the Sub-County has been designated as a service town. The Sub-County has a good transportation network which is ideal for promoting economic growth. The main economic activities within the Sub-County include service businesses such as formal and informal commercial activities which include, amongst others: (i) wholesale, retail, open-air markets, financial institutions, jua kali activities, hawkers, etc.; (ii) education as seen in the presence of private institutions; (iii) hospitality industry; (iv) a vibrant transport sector; and (v)

construction industry. The analysis of the economic activities in the Sub-County has led to the identification of its economic potential which, in turn, informed the proposed strategies below.

Goal:

- To provide a conducive business environment for a vibrant economy based on innovation, technological upgrading and diversification.

Objectives:

- To provide a sustainable economy through innovation and technological advancement;
- To utilise the strategic location to attract more investors;
- To enhance connectivity to ease movement of people and goods;
- To promote employment growth through competent human capital; and
- To ensure the optimal utilisation of economic resources.

Strategies:

- Providing suitable spaces for hawkers and jua kali sectors;
- Promoting agro-based industries for value addition of agricultural produce;
- Providing basic infrastructure facilities to open up the area and attract investment;
- Promoting urban agriculture through training in Juja Farm and parts of Koma area;
- The County Government should ease the lengthy bureaucracy when starting businesses to attract investment; and
- Prompting policies and strategies concept which increased access to financial services.

15.1.10 AGRICULTURE STRATEGIES

With the increased rate of land sub-division in the planning area to uneconomical agricultural size and high rate of land conversion from agricultural land to residential, the Plan advocates for the protection and conservation of the large parcels mainly on the upper side of the Sub-County.

The Plan has also proposed a section in Juja Farm area along Athi River to be left for agricultural activities which will mainly focus on urban agriculture and horticulture. How this proposal will be operational has been brought out in the Chapter 14 section 14.2.3 on the Juja Farm Green Zone Action Area (see Action Area 3 above).

Goal:

To make Juja a self-sufficient Sub-County with the modernised agricultural practice that will supplement the food value chain within and outside it.

Objectives:

- To increase food production;

- To control the conversion of land from agricultural to residential; and
- To create employment in the agricultural sector.

Strategies:

- Promoting and supporting urban agriculture which is technologically-driven;
- Scrutinising any development application for conversion of land from agricultural to residential;
- Offering training and incentives to small scale farmers within the Sub-County through the County's Department of Agriculture, Livestock and Irrigation;
- Support large scale farming by offering conducive market channels both locally and internationally for produce like coffee and tea; and
- Promote agro-based industries within designated agricultural zones

15.1.11 REVENUE ENHANCEMENT AND FINANCE MANAGEMENT

Currently, Juja Sub-County generates its revenue from different sectors as indicated below. In financial year (FY) 2016/2017, the Sub-County generated a total of Kshs. 170,107,880 while the FY 2017/2018 generated a total of 93,309,761. It is worth noting that the revenue decreased rapidly in the FY 2017/2018 due to the reduction of fees and charges within the County. The County has put measures to rectify the situation and this FY 2018/2019, the revenue is expected to increase to Kshs. 210,933,769.

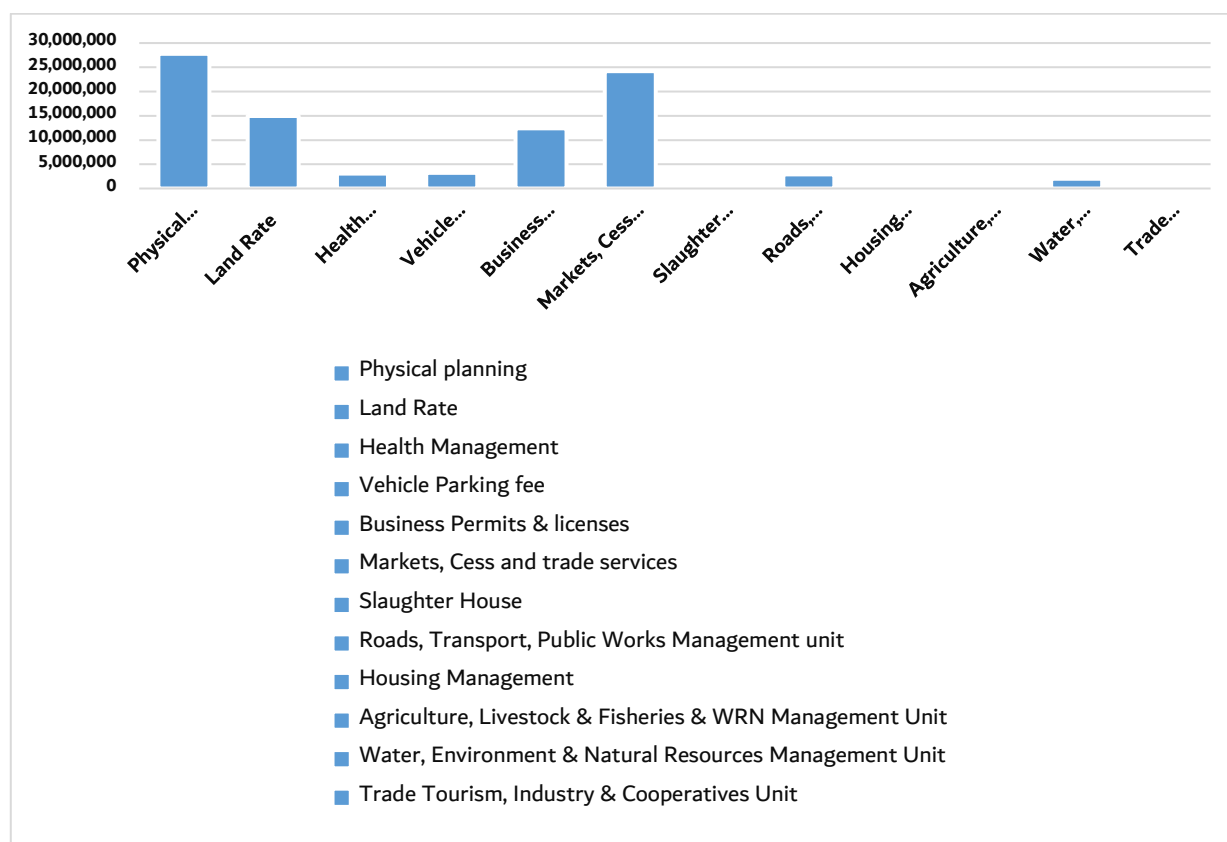


Figure 15-1: Juja Sub-County Revenue Sources FY 2017/2018

Source: Author (2018) Adopted from Proposed Kiambu Municipality Kenya Urban Support Programme (KUSP)

Table 15-6: Generated Sub-County revenue for FY 2016/2017, FY 2017/2018 and projected FY 2018/2019

	FY 2016/2017	FY 2017/2018	2018/2019
Management Unit Description	Amount	Amount	Estimates
Physical Planning Management Unit	41,446,753	27,777,638	51,393,973
Business Permit Management Unit	17,809,548	11,423,376	22,083,839
Cess Management Unit	52,455,100	23,398,750	65,044,324
Health Services Management Unit	3,577,719	3,078,800	4,436,371
Housing Management Unit	21,840.00	14,610	27,082
Land Rates Management Unit	21,126,105	14,957,071	26,196,370
Market Management Unit	3,044,244	802,444	3,774,863
Others	3,270,860	2,205,600	4,055,866
Roads Transport Public Works Management Unit	2,273,950	2,911,600	2,819,698
Slaughterhouse Management Unit	660,171	370,020	818,612
Trade Tourism Industry & Cooperatives Unit	149,958	136,422	185,948
Vehicle Parking Management Unit	6,111,480	3,231,230	7,578,235
Water Environment & Natural Resources Mgt. Unit	3,517,152	2,015,200	4,361,268
Liquor Licenses Management Unit	14,643,000	987,000	18,157,320
Total (Kshs)	170,107,880	93,309,761	210,933,769
Source: Author (2018) Adopted from Proposed Kiambu Municipality Kenya Urban Support Programme (KUSP)			

A study carried out by Taxation Services Limited⁸ identified various challenges of Kiambu County in terms of revenue collection and came up with various proposals through which the County can remedy this and enhance revenue collection. The proposals are summarised below:

- i. **Automation:** This means making it possible for the public to honour their financial obligations to the County via electronic means and online platforms. Examples include mobile applications, web-based applications and Unstructured Supplementary Service Data (USSD⁹).

Currently, Kiambu County has rolled out USSD code *419# for parking, quarrying, markets, livestock and CESS. The County has also made it possible to pay for building development application through the bank or their respective agents.

The Physical Planning Department has also embraced automation through the introduction of electronic development application through Kiambu-E DAM. This has resulted in an increase in the number of development application done within the County.

However, there is a need to expand this to other departments, for example, health. This will increase efficiency and minimise losses.

- ii. **Incentives:** Incentives are measures that governments can undertake to encourage members of the public to do in order to stimulate greater output. One area that Kiambu County has not fully exploited is the payment of land and property rates. The County can offer incentives to the public to encourage them to comply. Some of the incentives the County can effect include:

- Introduce waivers on penalties imposed on land rate defaulters to encourage them to pay up; and
- Offer discounts to those who comply before a specified period.

- iii. **Enforcement:** The County can enhance revenue collection by ensuring compliance. According to Kiambu County Budget Review and Outlook Paper, 2018 lack of compliance in building plan approval and land rate payments was identified as a major reason for underperformance in revenue generation. To remedy this, the County can do the following.

- Conducting regular and random checks;
- Impose penalties on defaulters; and
- Increase the human and capital capacity for enforcement; and

⁸ PKF Taxation Services Limited (June 2015) Expanding Counties' Tax base and sources of Revenue

⁹ USSD is a real time mobile phone communication protocol that makes it possible for users to communicate with the mobile network computer/server.

- The County can also outsource to the private sector to undertake the enforcement.
- iv. **Create Awareness to the public:** A good number of the members of the public are not properly sensitised on matters of revenue within the County. Some are not aware of their financial obligations to the County. There is a need to create awareness on the need to honour their financial obligations regularly and in time. Some of the ways the County can achieve this is by:
- The County should come up with an electronic system e.g. SMS to notify people on impending charges;
 - It should also advertise on media, public forums and churches on the existing revenue streams and financial obligations; and
 - Holding regular public forums/barazas to notify people of their fiscal obligations.
- v. **Better fiscal management:** This calls for prudent measures to manage the funds that have been collected. These measures can be rolled out at the point of collection, accounting, auditing and allocation to various expenditures. Some of these measures include:
- Analyse budgets and expenditure to check on affordability;
 - Ensure value for money for goods and services rendered;
 - Monitor spending habits by only spending allocated funds for intended and priority purposes;
 - Ensuring transparency and tight spending controls;
 - Avoiding unnecessary wastage on expenditure;
 - Regular and consistent auditing of financial records;
 - Reduce handling of money by officers by encouraging online payment; and
 - Encourage compliance by those living or working in the counties to fulfil their financial obligations regularly and in time.
- vi. **Introduction of development levy:** These are fees, which can be imposed on those intending to put up developments. The charges may vary depending on the size, location and type of development. The funds collected can then be channelled to servicing upcoming developments and upgrading of the existing physical infrastructure including roads, sewer trunks, drainage channels and extension of water services.
- vii. **Other sources:** Other sources include introducing charges on use of public cemeteries, county parks, and tourist sites. The funds collected can then be channelled to maintaining these facilities.

The Kenya Constitution 2010 and Public Finance and Management Act empowers the County Governments to use other measures to supplement the national allocation and their sources of revenue to fund devolved functions. The County can borrow money under the authorisation of the National Treasury and approval by

the County Assembly. The County can also enter into a joint agreement with other counties or state corporations to enhance its financial capacity.

The following financial and revenue-generating strategies are proposed:

Resource Mobilisation Strategy:

Under this strategy, the Plan proposes the following approaches:

- i. **Public-Private Partnerships (PPP):** These are joint ventures between Government agencies and private sectors which come together to offer services while at the same time-share the risk involved. In Kenya, PPPs are governed by the Public-Private Partnership Act of 2013 and Public Procurement and Disposal Regulations of 2009. The following types of PPPs can be applied:
 - **Management Contracts:** This is a form of partnership in which the public authority enters into an agreement with private companies to provide management services in return for a fee. In this arrangement, the County will retain the ownership and control of the assets. The County Government of Kiambu can engage in management contracts to outsource private companies and investors in the following areas: billing and collection of parking fees, land rates, recreational use fees, public toilets, and garbage collection, amongst others. The joint venture will result in efficiency in services provided and an increase in revenue generated.
 - **Leasing:** This is a form of arrangement in which the County leases its assets to a private investor for an agreed rental sum for a specified timeline. According to the World Bank, leasing is also a form of agreement in which the private sector is given the mandate to operate and maintain the utility plant. According to Kiambu County Affordable Housing Project 2018, the County Government of Kiambu recently advertised for leasing partnership with private investors to provide for affordable housing in Thika, Kiambu, Ruiru, Kikuyu and Limuru. The County Government will provide land and facilities for approval processes while the private investors will provide the following professional services: engineering, design and construction. Other areas that the County can explore leasing include stadia, schools, health facilities and leasing machinery for road maintenance, amongst others.
 - **Concessions:** This is a joint partnership venture between a public entity and the private sector. In this case, the County leases its assets to private investors at a fee and shares the profit and the risks involved. The concession period should not exceed 30 years. The private investors are mandated to maintain and enhance the asset. This model of partnership is ideal for the County considering the rapid urbanisation being experienced. This has resulted in an influx in major real estate developments such as Tatu City, Tilisi,

Migaa, upcoming Northlands city, amongst others. The developers are required to surrender at least 10% of the total land for public amenities such as health facilities, schools, power substation, fire station, etc. The County can enter into a concession with the private sector where it is not in a position to provide these facilities.

- **Build-Own-Operate Transfer (BOOT):** This is a type of partnership where the private investors invest, build, operate, own and later transfer the property back to the County Government. This type of partnership mostly involves capital intensive infrastructural development. The private investors operate the infrastructure until it recovers its fees. Under this arrangement, the County can explore this form of partnership in the provision of major infrastructural development such as sewer trunks in the rapidly urbanising areas and exploring solar and wind energy generation plants.
- **Build-Own-Operate (BOO):** This is a form of a public-private partnership model where the private sector invests, builds and permanently owns an asset on public land under contractual terms that secure public interest under County supervision. The County Government can encourage this mode of investment through financial incentives such as tax exemption. At the local level, the County Government can use this model by promoting the provision of recreational facilities in a residential neighbourhood, fire station and kindergartens, amongst others. At a higher level, the County can employ the model to promote foreign direct investment in areas such as industrial development.

For an efficient public-private partnership, the following need to be taken into consideration:

- Undertake thorough screening of suitable projects to be considered for PPP arrangement by assessing value for money and risks involved.
 - Outlining project milestones, responsibilities of actors involved, quality indicators and economic rebalancing methods.
 - Well-structured legal framework and institutional guidelines to ensure transparency and fairness.
 - Public participation/awareness: This will bring about political goodwill, transparency and ownership of the project, which will in the long run build trust.
- ii. **Partnership with Development Agencies:** Development Partners refer to international development organisations that partner with the National and County Government to aid in the development in various sectors such as water, energy, health, agriculture and food security, and physical infrastructure.

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

The development partners can fund the County Government through the following channels:

- **Grants/Donations:** These refer to financial aid given to County Governments that do not require to be repaid. The grants are mostly need-based. According to the Public Finance Management Act of 2012, the County can enter into an agreement with third parties or any entity and obtain grants. The agreement must be approved by the County Executive Member for Finance. The WB has collaborated with the Government of Kenya through the Kenya Devolution Support Programme to give grants to County Governments to improve their human resource and performance, civil education, public participation, and development plans, amongst others. The County has managed to develop municipalities under the support of WB through KUSP. Under this arrangement, the County will get approximately Kshs 1.6 billion per year for the next five years to support the provision of infrastructure facilities and services in the six municipalities. Kiambu County can also partner with Kenya Informal Settlement Improvement Programme (KISP) to upgrade the existing informal settlement in Kiambu. The KISP projects are funded by the Swedish International Development Cooperation Agency (SIDA).
- **Loans/Borrowing:** The County Government can borrow/loan money for development purposes from development partners. The County is supposed to get approval for borrowing from the County Assembly and also from the Cabinet Secretary of Finance under section 50 of the Public Management and Finance Act. A good example is where the WB through the Ministry of Transport, Infrastructure, Public Works, and Housing and Urban Development has loaned counties within the NMR to prepare Integrated Strategic Urban Development Plans.
- **State Corporation:** State Corporations are non-profit organisations established by an Act of Parliament. The National Government controls the majority of shares in state corporation/parastatals. The County Governments can engage or enter into an agreement with State Corporations for finances and management services. For example, the County Government of Kiambu has engaged the Kenya Revenue Authority to assist in revenue collection such as property taxes and single business permits.
- **Joint agreements:** The Kenya Constitution 2010 under Article 189 (2) provides for cooperation between the National and County Government. It also provides for cooperation between different counties in endeavours to meet their obligated mandate.

The County can exploit this opportunity to enter into an agreement with neighbouring counties within the NMR to provide services, which cut across counties such as public transport.

- **Corporations and Companies:** After the devolved form of governance come into effect, all local bodies within previous local authorities were transferred to the management of county governments. The County Government can establish its own specialised corporations, which can then generate revenue by offering services and can get funding from external sources. For instance, the formation of Kiambu County Water and Sewerage Company.

The above approaches need to exploited revenue generation and resources mobilisation to support the implementation of this Plan.

16 INTEGRATION OF STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT

The preparation of this ISUDP was done together with the Strategic Environmental and Social Assessment (SESA). The purpose of SESA is to integrate environmental and social considerations into policies, plans, and programmes. It involves an evaluation of the environmental and social consequences of a proposed policy, plan or programme initiative in order to ensure that they are fully included and appropriately addressed at the earliest appropriate stage of decision making in line with economic and social considerations. Section 57A of Environment Management and Coordination Act (EMCA) (amendments) 2015, all policies, plans, and programmes for implementation shall subject to Strategic Environmental Assessment.

In this light, this ISUDP has included a SESA assessment on the potential impacts from the strategies, formulated alternatives, and develop mitigation strategies. SESA is complemented by an Environmental and Social Management Framework (ESMF), which establishes the principles, guidelines, and procedures for reducing, mitigating, and/or offsetting potential adverse environmental and social impacts, enhancing positive impacts and opportunities, and otherwise guiding potential investments towards compliance with relevant safeguards.

The SESA shall integrate social and environmental considerations into planning, leading to more sustainability of the expected outcomes of this Plan. The table below summarises the key social and environmental impacts on various projects identified in the Plan.

Table 16-1: Summary of impacts, mitigation measures and interventions

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Interventions
1.	Impacts on air quality (emissions expected at construction sites)	Industrial activities, chemicals, quarrying, improper waste management and automobiles, heavy equipment and vehicles from construction sites, and construction activities.	- SESA has indicated that the Environmental and Social Management Plan) ESMP has provided adequate mitigation measures; and - The ISUDP should ensure maintenance and enhancement of green zones to sequester carbon from emissions. Furthermore, the ISUDP can develop an air quality policy that binds developments within all planning areas (such as the industrial sector) to control pollution and adhere to air quality regulations.	- Continuous monitoring has been identified in the ISUDP implementation plan; and - Preparation of Environmental and Social Impact Assessment (ESIA) to be carried out on specific projects.
2.	Noise and Vibrations Impact on activity sites	Excavators, mixers, and delivery trucks.	- Land-use planning should encourage the location of noisier activities (such as industrial and commercial uses) near main roads or peripheral areas, and the residential, recreational, educational uses inwards in the more serene areas; - Establishment of buffer zones between different land uses will attenuate noise, further reducing the potential impacts; and. - Adherence to noise ordinances such as the Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009 and employment of noise attenuation mechanisms for point sources will mitigate the impact.	- The Plan recommends the integration of Environmental Impact Assessment to be part of plan approval change of use approval to ensure compliance; and - There is a need for the County to do continuous monitoring to ensure compliance.
3.	Impact on energy resources	The proposed development and project activities will result in higher demand for energy resources both during the execution of the planned developments and operation phases.	Institute energy conservation measures in proposed developments while at the same time taking advantage of the renewable energy opportunities that the site and proposed developments provide, including solar energy, green buildings, etc.	- County to promote green and renewable energy; - Building plans to be approved subject to compliance to provision for solar energy; and - Promote green building technologies and designs.

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Interventions
4.	Impact on soils and geology	- Activities such as landscaping, excavation, quarrying, and carting away soil may lead to soil degradation from compaction and soil sealing leading to increased surface runoff and soil erosion; and - Spillage of materials (such as oils, fuel, grease, paints, solvents, curing compounds, adhesives, acids, soil stabilizers and binders, etc.) may also lead to soil contamination while the importation of soil in landscaping and fill activities may lead to the introduction of invasive species/ noxious weeds and pathogens such as bacteria, fungi and nematodes.	It is considered that these impacts can be mitigated and should be adequately addressed in ESMPs developed. Impact on soils and geology is expected to be moderate. This is because the planners have taken adequate measures to ensure re-vegetation and management of stormwater in all cleared sites, landscaped areas and farmlands.	- Compel miners and landscapers to ensure revegetation to reduce soil erosion - The Plan has identified steep slopes as fragile areas and unsuitable for development activities. Care should also be taken in mining in such areas; and - Mining companies to submit compliance certificates to the County
5.	Impact on water resources	- The development is likely to lead to increased demand on water resources; and - Generation and disposal of wastewater/effluent from the proposed developments have the potential to cause ground/surface water pollution and health hazards to human and aquatic life.	- Include measures to ensure adequate water supplies for the envisioned developments by the proposed ISUDPs need to be established in the project/site-specific ESMPs to ensure the conservation of water resources; and - Management of construction wastewater, spill control mechanisms, and treatment of effluent will be required to ensure the protection of water resources.	These proposals have been integrated into the water resource and supply strategies.
6	Solid Waste Generation	All proposed developments and land uses will generate a substantial amount of solid and liquid waste. During development phase materials (soil, rocks, vegetation) packaging materials (e.g., paper, polythene, plastic and metallic packaging), reject materials (including damaged bricks, concrete and mortar, plastics),	Adequate waste management measures are required since dumping/careless disposal both on-site and off-site may cause environmental pollution, interfere with aesthetics and lead to the creation of breeding grounds for vermin	Solid waste management strategies have been incorporated into the plan

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Interventions
		wastewater, used oil among others will be generated.		
7.	Impacts on flora	• An upsurge in catchment degradation through the clearing of vegetation may lead to loss of economically significant flora and degradation of environmentally important areas; • Habitat alteration may include fragmentation of forested and other wildlife habitat through bush clearing, disruption of watercourses, the establishment of non-native invasive plant species, creation of barriers to wildlife movement and visual and auditory disturbance due to the presence of machinery, construction workers, associated equipment and development operations; and • Environmental degradation on change of land use from agricultural land to a built environment was identified as a concern by the stakeholders.	• Some of the key management strategies include carrying out landscaping of different zones and maintaining the proposed green spaces as per the Plan; and • The Plan should also ensure the protection of the riparian environment and establishment of a riparian reserve management plan. Based on the precautionary measures to be put in place, this impact is expected to be moderate.	• This has been identified as a challenge in the situational analysis and provided for in the strategies.
8.	Impacts on Fauna	• There would be visual and auditory disturbance due to the presence of machinery, construction workers, and associated equipment. There is also likely loss and fragmentation of wildlife habitats. Some of the natural forests which act as habitat for wildlife are likely to be cleared to pave way for the proposed development. This will result in habitat loss and fragmentation. Changes that may alter the existing	• A wildlife management plan can be developed in collaboration with the Kenya Wildlife Service (KWS) to determine the carrying capacity of the conservation area, translocations and/or introduction of any new wildlife species. Since the ISUDP has recommended preservation of areas ecosystems, this impact will be moderate.	• Collaboration between the County Government, KWS, and KFS in management of areas with flora and fauna.

No	Impacts	Sources of Impact	Suggested Mitigation Measures in the SESA	Interventions
		natural conditions are known to impact negatively on wildlife.		
9.	Impacts on the socio-economic environment	Weak inclusion of hawkers and small-scale business operators in the local economy.	Social inclusion in business planning by including hawkers and other small-scale business operators to cushion them from the uncompetitive business environment.	The ISUDP has identified the need to engage with the business operators to increase their participation in the local economic activities.

Source: Kiambu SESA Report 2020

PART IV:

IMPLEMENTATION, MONITORING, EVALUATION AND REPORTING

17 PLAN IMPLEMENTATION AND CAPITAL INVESTMENT

17.1 Overview

The new planning approach under devolution provides counties with broad statutory mandates running through both plan-making and implementation by establishing structures and networks that influence strategies and investment. This chapter addresses the need for the concerned authorities with functions in the County to ensure conformity to this Plan by joining-up across all sectors and provide opportunities for promoting or improving the economic, social and environmental well-being of the County. Overall, spatial planning, under the county governance institutional context, is a tool for coordinating spatial equity and integrating balanced redistribution of resources through explicit and agreed policy framework.

17.2 Institutional and Coordination Framework for Plan Implementation

17.2.1 ROLE OF THE COUNTY PLANNING UNIT (CPU)

At the core of demonstrating key dimensions of planning processes in the County is the County Planning Unit (CPU) provided under clause 105 of the County Governments Act. The CPU has the strategic role and duty of integrating and coordination all County sectors and provides a degree of certainty and consistency across the entire planning and implementation cycles. From the guidelines provided by the National Land Commission, the establishments of the CPU rely on the key County sectors' (departments) knowledge and skills that consider all likely significant social factors, the effects on the environment, and economic performance. The head of the CPU is the County Director of Physical/Land Use Planning. The idea is that all sectoral strategies would operate within a spatial framework, and in turn, this would reflect the socio-economic analysis across the entire County.

Crucial to the CPU, the test of the soundness of county plans and the success of their implementation should be done through a prioritisation process by comparing possible alternatives, based on effective joint working strategic priorities. Figure 17-1 provides a detailed understanding and translation of the role of the CPU from institutional and governance structures and their power relations.

In broad terms, the 10-year county spatial plans tend to deal with some key aspects of substance and processes such as the perceived role of planners and the interpretation of spatiality and methods of engagement and spatial organising principles. For modes of implementation, the 10-year county sectoral plans provide a clear understanding of programmes and specific projects and their budgetary implications. This provides a basis of implementation concepts by factoring the future and the treatment of performance time. As recommended under the implementation framework below, Result Based Management (RBM) should be the prerequisite to hone the professional capacity under the institutional and capacity building programme.

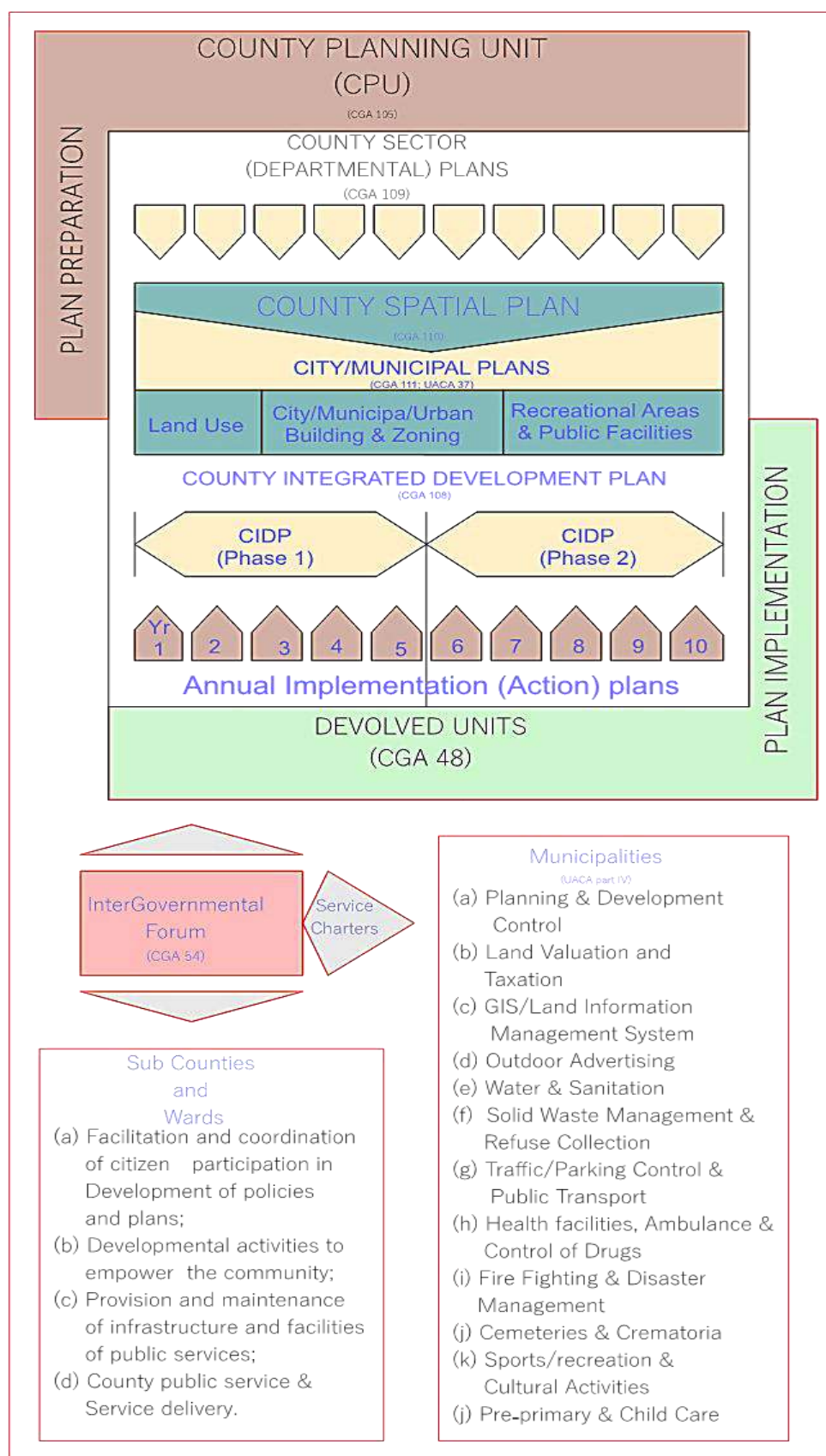


Figure 17-1: County Planning Unit (CPU)

Source: VisionRI

17.2.2 PLAN IMPLEMENTATION AT THE DECENTRALISED UNITS

The objectives of devolution essentially outline the sovereign reasons for transfer authority for decision-making, finance, and management to quasi-autonomous units. Part VI of the County Governments Act classifies the units as urban areas (city or municipality), sub-county, wards and villages.

Both the executive and legislative arms of the County Government have complementary roles in executing the recommendations of the County Plans. Figure 16-3 provides a snapshot of the two main decentralised units with the greatest burden of the identified programmes and projects and the delivery of defined services. If these two units are well managed, the two others (wards and village units) can easily be handled.

It is important to mention at this stage that some functions handled by the National Government must translate into the county planning and implementation framework through the County Inter-Governmental Forum (County Government Act section 54) chaired by the County Governor. As the head of the County Government, the Governor occupies the pivotal role of executive authority through the County Executive Committee and as the symbol of political sovereignty in the County Assembly for the execution of county functions and oversight, respectively. Both arms of the government must operate within established processes and deploy the tools of performance appraisal.

Much as the plan recommendations must meet the objectively assessed needs, the implementation mechanisms should be sufficiently flexible to adapt to rapid change without adverse impacts.

17.2.3 CAPACITY BUILDING FRAMEWORK

From the planning responsibilities stated in the County Governments Act 105(1) to the designated implementing planning authority 105(2), the CPU should set into motion the translation of the ‘abstract concepts’ to ‘real development’ through an implementation plan with clear outcomes, provisions for monitoring and evaluation and clear reporting mechanisms. Figure 16-5 illustrates the core pillar and three branches that make up this fundamental plan implementation framework:

- i. The core pillar is the internal governance mechanism through capacity building that ensures better inter-and intra-sector engagement so that public, private and third sector service providers can work together for optimum solutions.
- ii. Premised to the core pillar are three branches defining the aligned programmes that address the different needs of different people and places informed by the plan.
- iii. Each branch has specific projects and services that ensure public investment is made at the relevant places and services where most needed.

For the framework to be effective, it will require the structuring under the Result Based Management guidelines, recruiting, training and retaining professionals in all technical and managerial skills capable of setting up and running ICT systems, including a land information management system, exercise a clear chain of command and reporting methods and active stakeholder engagement, partnerships and feedback.

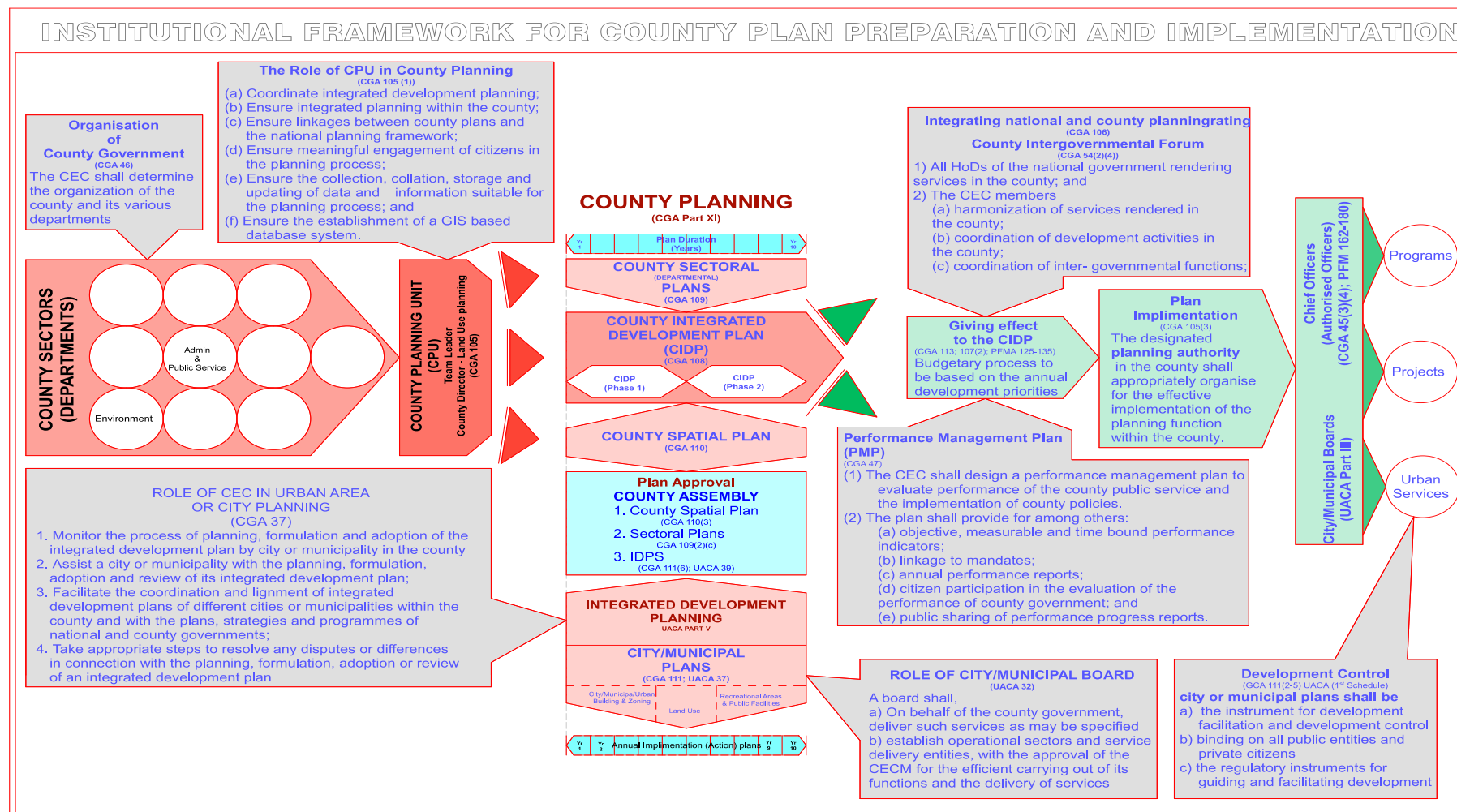


Figure 17-2: Framework for Plan Preparation and Implementation

Source: VisionRI

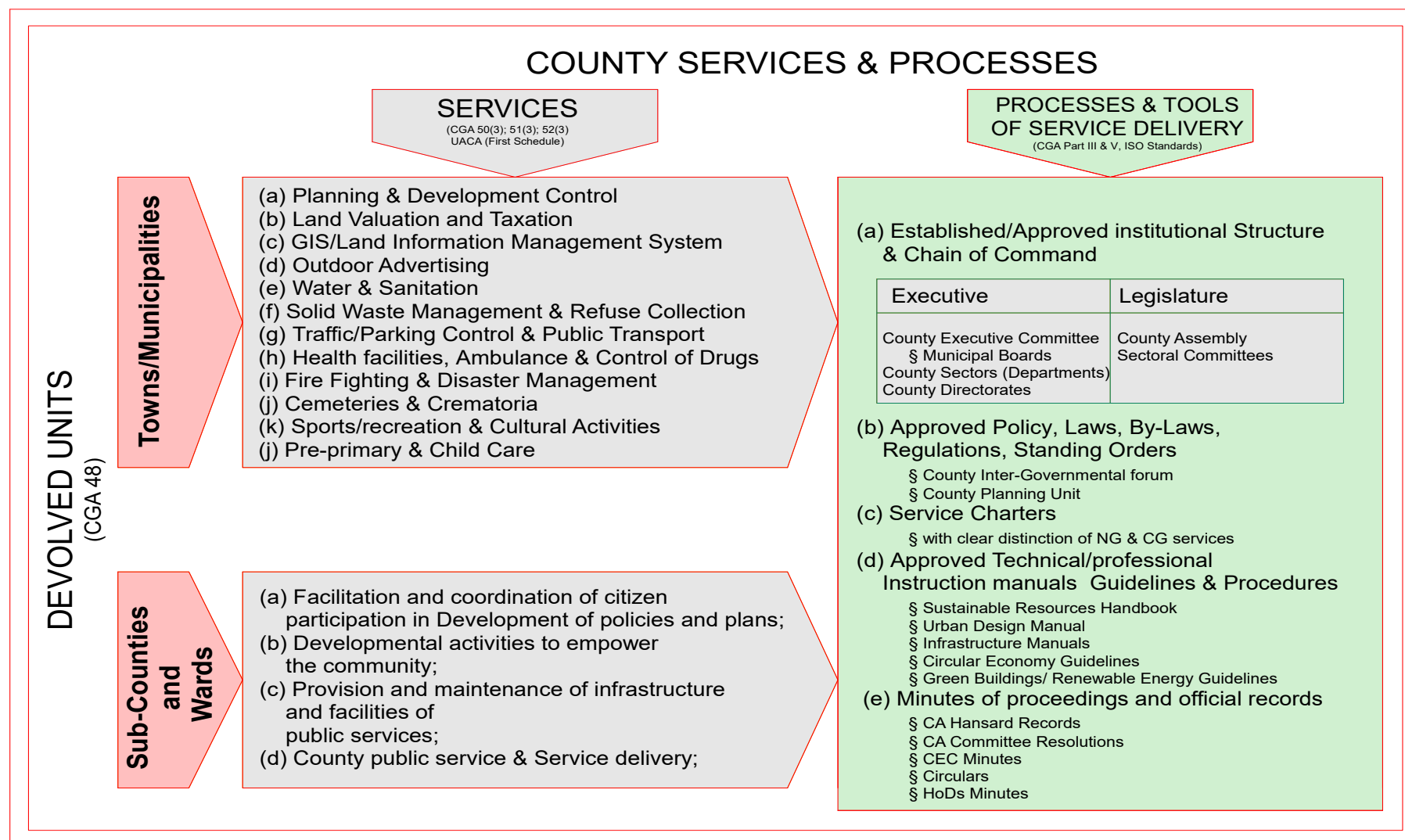


Figure 17-3: County Services & Processes

Source: VisionRI

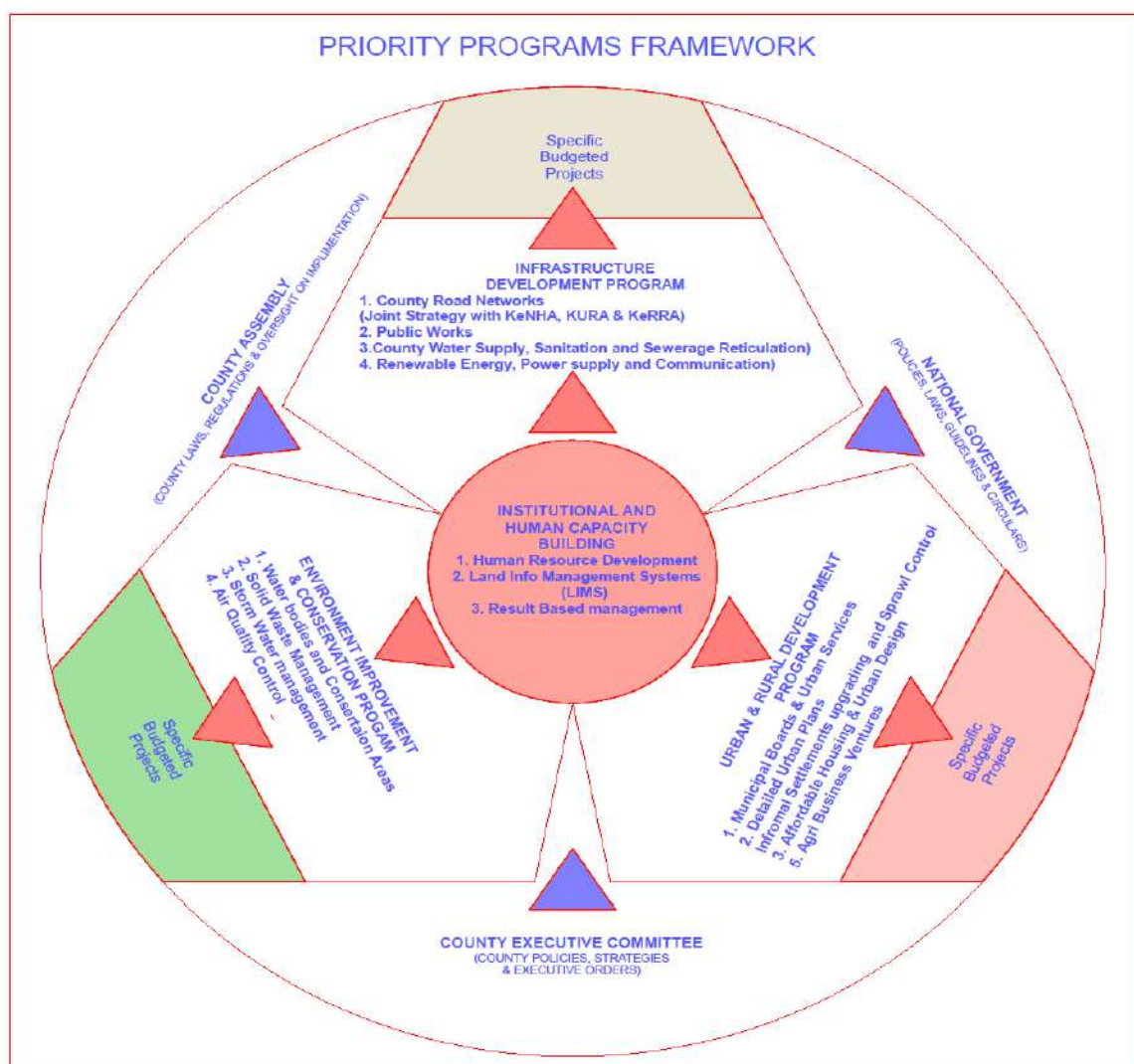


Figure 17-4: Capacity Building Framework

Source: VisionRI 2020

17.3 Human Resource Framework

This will require structuring under the Result Based Management guidelines, recruiting, training and retaining professionals in all technical and managerial skills capable of setting up and running ICT systems, including a land information management system, exercise a clear chain of command and reporting methods and active stakeholder engagement, partnerships and feedback.

The County from the Joint Capacity Assessment and Rationalisation Report of 2015 came up with a human resource framework for both arms of the County, i.e., the Legislative and Executive. The Executive which comprises of ten ministers who are in charge of various county departments. The organogram above shows the proposed organisational structure both at the macrostructure and the departmental structure.

The Report also proposed the optimal staffing level which will ensure that no department is understaffed. The table below outlines the staffing proposed for the Department of Planning in the table below. The department should, however, work closely with other departments such as the environment department

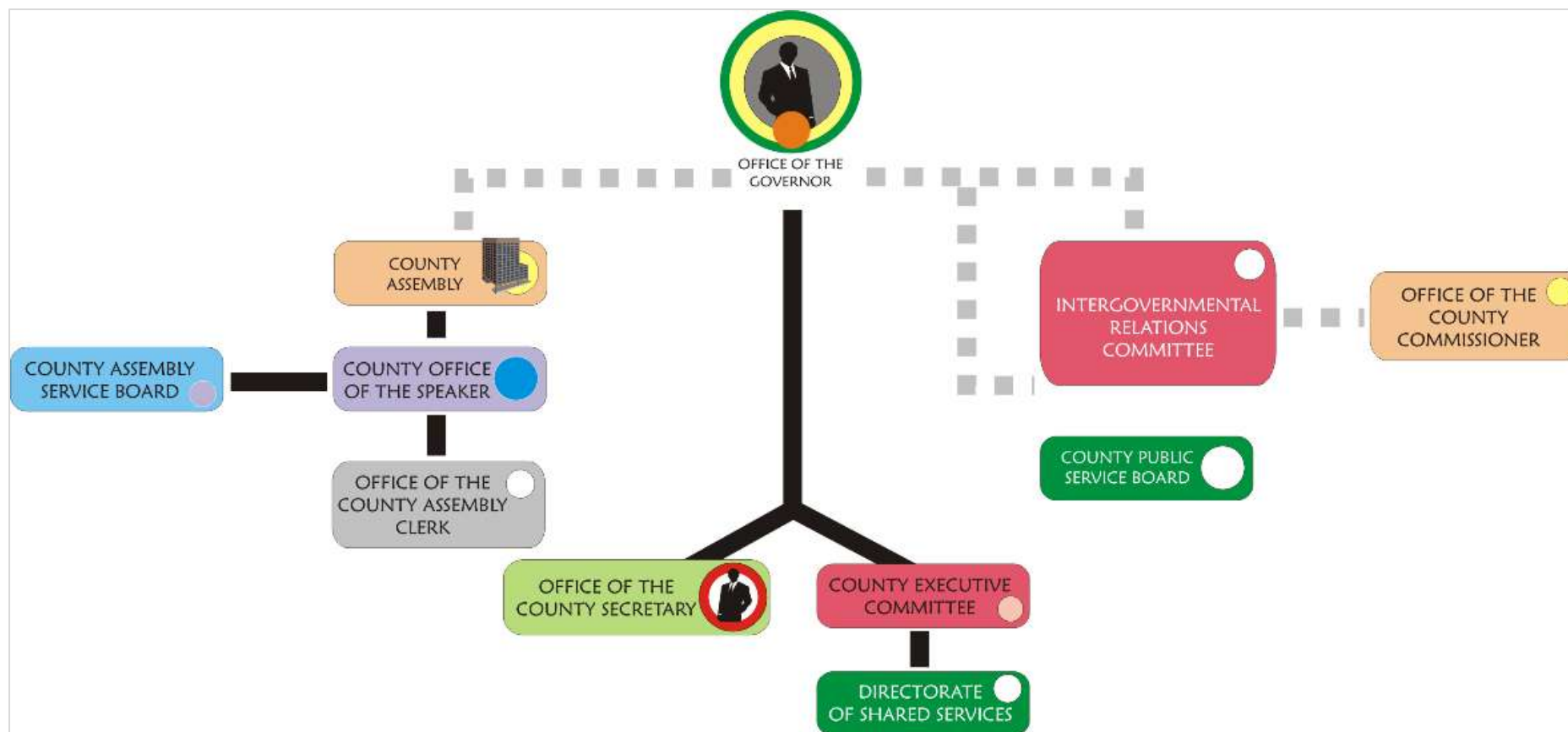


Figure 17-5: Human Resource Framework

Source: Kiambu County Joint Capacity Assessment and Rationalisation Report of 2015

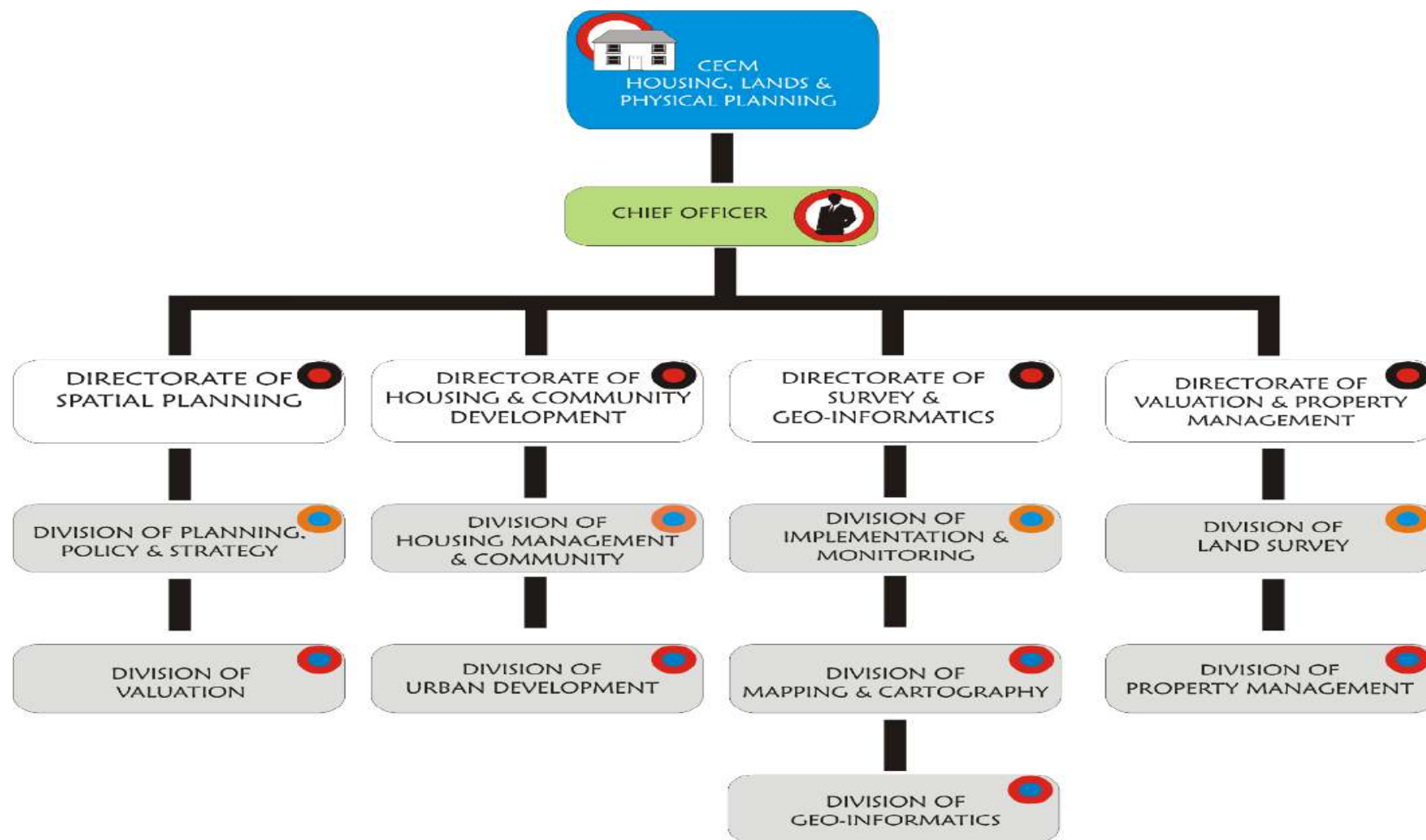


Figure 17-6: Human Resource Framework for Kiambu County's Housing Lands and Physical Planning Ministry

Source: Kiambu County Joint Capacity Assessment and Rationalisation Report of 2015

However, it should be noted that Juja is one of the urban sub-counties where the rate of urbanisation is high. The ISUDP, therefore, proposes that the Sub-County be allocated three physical planners with two assistants for each. This will help in the management of development application and also enforcement.

Table 17-1: Proposed Optimal Staffing Level

Resource Categories	Result of the FTE Analysis	Country proposed an optimal staffing level
Country Executive Committee Member	0	0
Physical Planning		
Chief Officer	0.6	1
Director	2.5	3
Planners	18.6	19
Development Control Office	4.7	5
Enforcement Officer	12.3	12
Secretary	14	14
Driver	14	14
Support Staffs	30	30
Planning Clerks	24	24
Accountant	3	3
Procurement Officer	3	3
Stores Personnel	3	3
Sub-Total	129.7	130

Source: Kiambu County Joint Capacity Assessment and Rationalisation Report of 2015

17.4 Capital Investment: Programmes and Projects Matrix

For ease of implementation, the final out outputs of the Plan for specific projects are identified accordingly to the thematic and sectorial areas. It is expected that this will enable integration during planning and execution. The Plan has identified two levels of project implementation.

Level 1 - Quick Win Projects: This includes projects that the County can implement immediately after the approval of this plan. These projects are mainly in the identified action area which area Juja CBD, Ndarugo Quarries and Juja Farm Zone.

Table 17-2: Quick Win/High Impact Projects

Areas	Proposed Project	Estimated Budget (KShs.)	Implementing Agencies
	Construction of a modern market.	50M	County Government of Kiambu.
Juja CBD	Construction of an integrated commuter station.	500M	County Government of Kiambu.
	Construction of a direct access road (overpass) from the integrated terminus to JKUAT and CBD.		KRC KeNHA
	Construction of a loop from Centurion Hotel through Gachororo to CBD.	300M	KURA NAMATA
	Construction of a link road linking Juja South Road to Gatundu-Juja road (Juja farm road) to Kalimoni side around the former Cordage industrial area.		NLC
	Widening and upgrading of roads within the CBD and with the provision of NMT.	50M	County Government of Kiambu KURA
	Improvement of JKUAT access thoroughfare.	20M	JKUAT County Government of Kiambu.
	Provision of waste bins around the CBD and Gachororo.	1.5M	County Government of Kiambu.
	Proper lighting and utility installation along the streets.	10M	Kenya Power and Lighting Company (KPLC).
	Installation of stormwater drainage channels underneath footpaths.	10M	KeRRA County Government of Kiambu.
	Construction of public toilets.	5M	County Government of Kiambu.
Ndarugo	Green corridor along the river integrated with paved spaces for general movement.	10M	County Government of Kiambu.
	Green open spaces along the river for picnics activities.	5M	County Government of Kiambu.
	Sports activities along the river.	-	Private investors.
Juja Farm Green Zone	Feasibility study and detailed planning for the agricultural and agro-industrial park.	20M	County Government Development Partners
	Carry out research on high-value horticulture crops farming and agro-based industries.	10M	

Source: VisionRI

Level 2- Sectorial Projects:

Key

Time Frame	County Government Departments	National Govt. and Agencies	Score	Locality
1-2 yrs. Short term (ST)	- Public Service & Admin; - Roads, Public Works & Infrastructure; - Health Services; - Education, Vocational Training & ICT; - Youth, Sports & Culture;	- KIWASCO; - Kenya Power; - KeRRA; - KeNHA; - KURA;	(Score) 1 Actor; - Actors; - Actors; - Actors; and - Actors.	WARDS
3-5 yrs. Medium-term (MT)	- Agriculture, Livestock & Fisheries; - Trade, Tourism, Industry, Cooperatives; - Land, Housing, Physical Planning & Urban Development;	- ERC; - WRA; - NEMA; - NLC;		
6-10 yrs. Long term (LT)	- Health Services; - Finance & Economic planning; and - Environment, Water & Sanitation.	- KEMSA; - KRC; - NACADA; - National Government; and - Development partners.		

Table 17-3: Detailed Projects Implementation Matrix

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
Water supply	Extending piped water coverage to the unserved area such as; Matangini; Komo; Tora; Nyacaba Hakairu and Jacaranda.	ST	Water, Environment, Energy and Natural Resources	WRA NEMA	Juja ward; Murera ward; Witeithie ward	800 M
	Juja farm distribution system - Phased construction of distribution network in Juja rural areas of DN 160 mm-63 mm for 100 km.				Kalimoni Ward	100 M
	Jacaranda –Juja water project. Construction of DN350mm HDPE transmission pipeline from Jacaranda to Juja Gachororo of 35 km Construction of masonry storage tank in Juja capacity 300CM.				Juja Ward	200 M
	Construction of water pants at Nyacaba area and Kalimoni areas.				Nyacaba and Kariaini area	
	Carry out a safety audit of existing dams and water reservoirs such as dam in Murera; Theta areas and Kariaini.				All Wards	
	Review existing water company policy in line with pro-poor strategies, i.e., affordability					
	Construction of dam at Theta; Juja Farm, etc.					
	Adopt modern technology to support in monitoring unaccounted water due to illegal connection, spillage and vandalism.	MT	Water, Environment, Energy and Natural Resources	KIWASCO Development Partners	All Wards	

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
Sanitation and wastewater	Extending and improve the current sewer trunk to cover an unserved area such as Juja Farm; Mirimaini; Witeithie; Kenyatta Road.	ST	Water, Environment, Energy and Natural Resources	WRA NEMA Private Sector	Juja Farm; Mirimaini; Witeithie; Kenyatta Road	150 M
	Promote affordable and sustainable sanitation technologies at both household and commercial areas e.g., bio-digesters, etc.					
	Enforcing mandatory connections to main sewer trunk systems for high rise development.					
	Construction of wastewater treatment plant at Juja Farm.	MT	Water, Environment, Energy and Natural Resources	KIWASCO Development Partners	Entire Sub-County	500 M
Solid Waste Management	Establish waste incinerators for hazardous waste e.g., medical and other biochemicals.	ST	Water, Environment, Energy and Natural Resources Health Services	NEMA	Juja, Kimbo, Kenyatta Road, Juja Farm and Witeithie	1.5 B
	Increase the waste collection services to cover the entire Sub-County.					
	Provide waste transfer stations at all urban centres.					
	Setting up waste receptacles and waste bins in all urban centres such as Juja, Kimbo, and Witeithie, etc.					
	Enhancing PPPs in the waste collection through licensing and training small waste enterprises in the Sub-County.					
	Creating public awareness of the importance of waste separation and 3Rs					

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
	through regular solid waste clinics seminars.					
Energy	Promotion the use and adoption of clean energy sources for cooking and lighting such as solar.	ST	Roads, Public Works & Infrastructure Land, Housing, Physical Planning & Urban Development	EPRC NEMA Kenya Power	Juja Town; Witeithie; Juja Farm	150 M
	Creating awareness of electricity connection through the last mile connectivity by organising public forums.					
	Development Control guidelines to ensure enforcement of ERC energy policy and Act on renewable energy.	ST MT			Entire Sub-County	
ICT Infrastructure	Connect all TVET Institutions to ICT infrastructure to promote innovations.	ST	Youth Affairs, Sports, ICT & Communication	Land, Housing, Physical Planning & Urban Development Roads, Public Works & Infrastructure Development Partners	All wards	400 M
	Connect all Government facilities with ICT infrastructure to enhance service delivery and efficiency.	ST				
	Expand internet coverage and access using fibre optic lines across the Sub-County.	MT				
Roads and Transport	Development of a transportation master plan for the entire Sub-County.	MT	Land, Housing, Physical Planning & Urban Development Roads, Public Works & Infrastructure	KeRRA KeNHA KURA Police NLC	Murera ward and Kalimoni ward	200 M
	Construction of identified missing links in the road sector such as Juja Farm and Matangini Road, Juja and Thika via Witeithie.					30 M

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
	Reclaiming encroached road reserves and provide walkways; stormwater drainage.	ST			Entire Sub-County	1 M
	Enforcement of traffic management guidelines through retrain road users and enforce set traffic laws and regulations.	MT		KeRRA KURA Police	Entire Sub-County	1 M
	Construction of a bus terminus for public service vehicle in Juja Town.	ST			Juja town	100 M
	Integrating BRT along Thika Superhighway.	ST			Juja, Witeithie, Kimbo	30 M
	Enforcement of development control (Physical Planning) guidelines on all roads to reduce encroachment and to ensure subdivisions are providing adequate road reserves. Permit nothing below 9 m.	MT			Entire Sub-County	1 M
	Upgrade and renovating Juja Farm road, Juja-Gatundu road, Ndarugo-Tora road; Gachororo road and old Juja road.	LT		KeRRA KeNHA KURA NLC	Juja ward; Kalimoni ward; Witeithie ward;	20 M
	Upgrading and maintenance of feeder roads such as Gatongoro access road; Gacege Gakoe road; Matangi-Kimbo road; Ebenezer-Matangi road.	ST	Roads, Public Works & Infrastructure County Gov. of Kiambu	KeRRA Kenya Power KURA	Ndarugo ward Theta ward Murera Ward	20 M
	Installation of streetlights and floodlights mast in key Sub-County roads and market centres.	MT			Kibii, Murem, Riverside, Highpoint; Avenue 1&2, Orion	100 M

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
	Upgrading all feeder's road in Juja CBD to bitumen standards.	ST		KURA	Juja town	15 M
	Revive commuter rail transport and modernise the station at Juja town.	MT		KRC	Juja town	50 M
Stormwater drainage	Repairing and maintain the existing drainage channels within urban areas and areas which are flood prone.	ST	Roads, Public Works & Infrastructure	County Government of Kiambu KURA	All wards	100 M
	Designing and covering all the drainage systems along the major roads.					100 M
Education	Construction of special schools within the Sub-County.	MT	Education, Vocational Training & ICT	National Government Development Partners	Juja town	300 M
	Construction and enhance the performance of ECDEs, Primary, Secondary and Tertiary Institutions.	MT			In all Wards	
	Construct and equip a national status technical and vocational institute at Juja Farm and Witeithie (TVETS).	ST			Juja; Witeithie; Juja farm	
Housing	Preparation of County housing policy to guide the provision of affordable housing in the Sub-County.	ST	Land, Housing, Physical Planning & Urban Development	Roads, Public Works & Infrastructure UN-Habitat Development partners		200 M
	Develop a social housing masterplan and strategy for the Sub-County.	ST				100 M
	Rezoning urban areas to promote densification of residential developments (high rise development) and lowering the approval period in urban areas such; Juja; Witeithie; Kimbo; Toll.	MT				

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
	Servicing the undeveloped land to promote investment by the private sector such as Juja Farm.	MT			Juja; Witeithie; Kimbo; Toll;14	50 M
	Adoption of appropriate and affordable building technologies.	MT				150 M
	Review the housing approval process in terms of time and cost.	ST			Gachororo; Dekonia	100 M
	Extension of essential services to informal settlement areas such as sewer trunk systems and water reticulation.	MT				
Health Services	Construction of a Level 4 hospital in Juja ward.	MT	Health Services	KEMSA	Serving the entire Sub-County	100 M
	Equipping and staffing Gachororo health dispensary and Kalimoni health centre.	ST				
	Construction of health centre at Murera; Juja farm and Nyacaba area.	MT			Murera; Juja farm; Nyacaba	
	Introduction of mobile clinics in all sub-location with village health officer.	LT		KEMSA	All Wards	
	Construction of modern rehabilitation centre for drug addicts at Juja.	MT		NACADA	Juja Town	
Cemeteries	Identify land and set aside for cemeteries, and where necessary acquire land in Juja Farm.	ST	Land, Housing, Physical Planning & Urban Development	Health Services KEMSA	At least one in the Sub-County	50 M
	Establishment of the crematorium at Mugutha.	MT	Land, Housing, Physical Planning & Urban Development	Health Services NEMA	Mugutha	
	Construction of sports and recreational park in Juja Ward and Juja Farm.	ST	Youth, Sports & Culture	Development Partners	Juja ward; Kalimoni ward	50 M

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
Social amenities and facilities	Construction of a cultural centre and modern social halls.	LT	Youth, Sports & Culture	Development Partners	Mugutha; Witeithie; Juja Farm; Juja; Theta	10 M
	Construction of the Sub-County library, Amphitheatre and an ICT resource centre.	LT	Education, Vocational Training & ICT	Youth, Sports & Culture Development Partners	Juja and Kalimoni ward	5 M
	Construction of Cultural Museum and historical monument within Ndarugo area.	LT	Youth, Sports & Culture	Education, Vocational Training & ICT Development Partners	Ndarugo area Kalimoni	10 M
Abattoirs	Construction of pig abattoir.	MT	Agriculture, Livestock & Fisheries	Trade, Tourism, Industry, Cooperatives Development Partners	Serving the entire Sub-County	5 M
Tourism and Hospitality industry	Promote and support events grounds.	ST	Trade, Tourism, Industry, Cooperatives	Youth, Sports & Culture Development Partners	Serving the entire Sub-County	50 M
	Hotels, guest houses and homestays.	LT	Trade, Tourism, Industry, Cooperatives	-	Serving the entire Sub-County	50 M
	Conference facilities.	LT	Trade, Tourism, Industry, Cooperatives	-	Serving the entire Sub-County	100 M
Promote trade, commerce	Construction of modern market at Juja town, Witeithie, Mirimaini and Juja farm.	ST	Trade, Tourism, Industry, Cooperatives	Agriculture, Livestock & Fisheries	Juja town; Witeithie; Mirimaini and Juja farm	100 M

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
and cottage industries	Construct Curios/handicraft.	ST	Trade, Tourism, Industry, Cooperatives	Agriculture, Livestock & Fisheries	Juja town, Witeithie; Mirimaini and Kimbo area	10 M
	Construct Jua-kali sheds.	ST	Trade, Tourism, Industry, Cooperatives	Youth, Sports & Culture	Juja town	10 M
	Development of agri-business cooperative societies in all wards.	ST	Trade, Tourism, Industry, Cooperatives	Agriculture, Livestock & Fisheries	All Wards	1 M
	Promoting urban agriculture; greenhouses technology and irrigation.	ST	Agriculture, Livestock & Fisheries	Development partners	At Juja Farm and parts of Ndarugo area and Kiaora area	10 M
Urban Services	Preparing detailed local urban plans and urban limits delineation.	ST	Land, Housing, Physical Planning & Urban Development	Private Consultants	Juja Town; Witeithie; Juja Farm; Kimbo; Kenyatta Road; Hakairu	1.2 B
	Informal settlements upgrading through planning, surveying and titling and provision of basic infrastructure.	ST	Land, Housing, Physical Planning & Urban Development	Development partners	Gachororo Dekonia	
	Data capture for Land Information Management System (land administration, valuation and development control).	ST	Land, Housing, Physical Planning & Urban Development	Development partners	Sub-County	
	Strengthen Municipal Board structures as defined in UACA.	ST				
	Institutionalise urban services in Juja Sub-County as defined in the UACA Schedule 1.	ST	Land, Housing, Physical Planning & Urban Development	Public Service & Admin	Sub-County	

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
	Data capture for Land Valuation and Taxation.	ST	Land, Housing, Physical Planning & Urban Development	Public Service & Admin	Sub-County	
	Equipping development control and enforcement section in each ward.	ST	Land, Housing, Physical Planning & Urban Development	Public Service & Admin	Sub-County	
	Capacity enhancement through staffing, skills training and performance management.	ST	Public Service & Admin	National Government Land, Housing, Physical Planning & Urban Development Development partners	Sub-County	
Urban Public Spaces and recreational grounds	Improvements of public parks, streetscape, outdoor furniture, monuments & heritage sites.	MT	Environment, Water & Sanitation	Corporate entities	Sub-County	10 M
Regulation of Outdoor adverts and trade promotional activities	Develop a comprehensive policy on outdoor advertisements and signage.	ST	Land, Housing, Physical Planning & Urban Development		Sub-County	1 M
Street Naming and Address Systems	Develop guidelines on street naming and identify zones for street address systems in partnerships with the neighbourhood associations, etc.	MT	Public Service & Admin Land, Housing, Physical Planning & Urban Development	Development partners	Sub-County	1 M

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
			Roads, Public Works & Infrastructure			
Natural Resources	Mapping and surveying the riparian reserves along the following rivers; Theta River, Ndarugo River, Thiririka River, Mugutha River and Athi River.	ST	Environment, Water & Sanitation	Development partners NEMA	Sub-County	500 M
	Enforcing the riparian wayleaves as per the guidelines during the development application stage by hiring more enforcement officers.	ST	Environment, Water & Sanitation	NEMA KFS	Sub-County	
	Formation of Environmental Conservation Forums at wards level to create awareness on the need to protect rivers.	MT	Environment, Water & Sanitation	Development partners	Sub-County	
	Planting of trees along the riverbanks to reduce soil erosion.	MT	Environment, Water & Sanitation Land, Housing, Physical Planning & Urban Development	Development partners	Sub-County	
	Rehabilitating the unused quarry site as recreational parks, animal orphanage, urban agriculture, housing, etc.	MT	Environment, Water & Sanitation	NEMA	At Juja ward; Ndarugo	
	Preparing an inventory of Quarry Management System with spatial data for all the quarry sites and owners in the Sub-County.	ST	Environment, Water & Sanitation	WRA NEMA National Government Development partners	Sub-County	

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
	Develop a policy on sustainable extraction of natural resources e.g., building materials, etc.	MT	Public Service & Admin Land, Housing, Physical Planning & Urban Development Finance & Economic planning Environment, Water & Sanitation	NEMA Development partners	Sub-County	
Disaster Risk Reduction	Carry out a safety audit of all buildings and issue a compliance certificate.	ST	Public Service & Admin	0	Sub-County	10 M
	Periodic inspection of public, institutions and industrial facilities for fire and occupational safety.	ST	Public Service & Admin Trade, Tourism, Industry, Cooperatives Land, Housing, Physical Planning & Urban Development	WRA NEMA National Government	Sub-County	10 M
			Environment, Water & Sanitation			
	Rehabilitation of firefighting equipment (fire engines, hydrants, etc.).	ST	Roads, Public Works & Infrastructure	National Government Development partners	Sub-County	2 M
	Routine inspection of dams.	ST	Roads, Public Works & Infrastructure	National Government	Sub-County	1 M
			Environment, Water & Sanitation	Development partners		
Noise, water and air Pollution	Noise pollution control in construction sites, public places and residential neighbourhoods.	ST	Public Service & Admin Environment, Water & Sanitation	NEMA Development partners	Sub-County	10 M

Programmes	Project	Timeframe	Driving Department	Other Implementing actors	Benefiting Ward/Towns/Market	Estimated Cost (Kshs.)
	Water quality monitoring.	ST	Environment, Water & Sanitation	Water & Sanitation Utility Company WRA NEMA Development partners	Sub-County	
	Air quality monitoring in public places (transport termini, industries, etc.).	ST	Environment, Water & Sanitation	WRA NEMA Development partners	Sub-County	

Source: VisionRI 2020

17.5 Proposed Capital Investment Financing

The proposed projects will be financed using the following approaches:

- Preparation of detailed sector plans for each programme and project and secure budgetary allocation through the CIDP process;
- Financing by the national government and agencies in major infrastructure such as roads, energy, water supply and sanitation;
- Factor specific projects within the bilateral funding programmes such as Kenya Urban Support Programme (KUSP), Kenya Informal Settlement Improvement Programme (KISIP) and NaMSIP; and
- Direct private sector investment and partnership with the county in housing, education, industrial, health, etc.

18 MONITORING, EVALUATION AND REPORTING

18.1 Procedure for Monitoring

The purpose of monitoring and evaluation is to assess the effectiveness of the implementation of the plan. A fully functional M&E system is important for the implementation and review of the plan to ensure it delivers the intended results.

It verifies whether the activities of each county's priority project or programme are happening according to planning timelines and targets presented in the (CIDP; and whether resources are being used in a correct and efficient manner.

On the matters of physical and land use planning, the CoK (2010) requires the Department of Physical Planning and the National Land Commission (NLC) to work in concert on matters of physical and land use planning. The National Spatial Plan has spelt out the need to develop performance indicators to facilitate the monitoring of the plan.¹⁰

NLC has developed the Urban Land Use Planning Monitoring and Oversight Guidelines to “provide a lawful basis for engagement between the County Governments as planning authorities responsible for preparing, approving, implementing and reviewing Urban Land Use Plans and the National Land Commission as a monitoring and oversight agency over land-use planning”.¹¹

The guidelines provide for:

- Systematic, purposeful and regular checking of the plans;
- Documenting and providing feedback on land use planning activities undertaken by planning authorities;
- Ensure the quality of the planning outputs and outcomes;
- Adherence to the Constitution, relevant policies, legislation, planning standards and guidelines;
- Take remedial actions to mitigate inappropriate practices;
- Hold the planning authorities accountable for their actions so as to enhance performance; and
- Guide and systematise the practise of preparing, implementing and reviewing Urban Land Use Plans in the country.

¹⁰ Government of Kenya, 2016:254

¹¹ Republic of Kenya (2016), Urban Land Use Planning: Monitoring and Oversight Guidelines - National Land Commission

18.2 Monitoring Unit

The role of M&E will be anchored within the County Planning Unit whose core mandate, as stipulated in Clause 105 of the County Governments Act, is to integrate and coordinate all the County sectors in planning and implementation of the various plans.

It verifies whether the activities of each county's priority project or programme are happening according to planning timelines and targets presented in the County Integrated Development Plan (CIDP); and whether resources are being used in a correct and efficient manner.

The County Director of Physical/Land Use Planning who is a member of the CPU will ensure that the ideals of this ISUDP are integrated across entire County planning process to reflect the spatial, social, and economic development programmes and projects in the County.

An effective M&E requires an inter-agency/departmental coordination to ensure inclusiveness which reflects the multi-sectoral framework of the plan. This means that all the departments and agencies need to be engaged.

18.3 Planning Indicators of Progress

The table below shows the planning indicators of the Plan's progress.

Table 18-1: Physical Planning Indicators

Physical planning indicators	Means of verification
Targets indicators	
Legal and policy compliance	• Compliance with ISUDP and Urban Dev. Sector with Vision 2030; • Compliance with Urban Agenda and National Spatial Plan; • Compliance with relevant legislation; • Compliance with relevant policies; • Compliance with the NLC guidelines; and • Compliance with other national agenda.
Physical Planning process	• % of entities using the ISUDP; • % of applications in compliance with the plan; • % of Sub-County's defined as problem areas; • No. of reviews of the ISUDP; • No. of projects/initiatives completed per year; • % of functional planning committees in accordance with the Act; and • Integration with other plans.
Institutional framework	• Effectiveness of Municipal Boards in plan implementation; • Effectiveness of the relationship between the Municipal Board and County; and • Functionality of the Physical Planning Liaison Committee. • Technical staff capacity of the Sub-County/Municipality; • Technical equipment capacity at the Sub-County/Municipality; and • No. of committees constituted as per the legal requirements.

Community participation	• Level of resident consultation on physical and land use planning issues; • No. of neighbourhood associations engaged in planning issues; • No. of planning clinics on awareness held per year; • Responses on public notices on plans and planning intention adverts; and • % of participation in planning forums.
Monitoring and evaluation	• Number of Departments/Units reporting well functional M&E; • No. of annual physical planning needs assessments carried out; • No. of staff trained and applying M&E tools; and • Availability of M&E tools.
Resource Mobilisation	• Number of partners/agencies supporting ISUDP; implementation; and • Revenue generated by physical planning activities.

Source VisionRI 2020

The implementation of programmes and projects shall be monitored and reviewed annually. This shall be done through annual accomplishment reports to be submitted by concerned County Government Departments to the CPU. The list of programmes and projects shall be updated annually and amended along with the full review of the ISUDP.

18.4 Financial Monitoring

CoK 2010 requires all county governments to plan and budget for the delivery of goods and services under their mandate. The constitution requires counties to prepare the following plans to guide expenditure and investment programmes within their areas. These include:

- County Integrated Development Plan (CIDP);
- County Sectoral Plans;
- County Performance Management Plans;
- County Spatial Plan; and
- Cities and urban area plans.

Annual budgets are based on the approved plans by the respective county assemblies. Related guidelines are mainly directed to the monitoring and implementation of programmes and projects outline the CIDP, Constituency Development Fund (CDF) and other devolved funds as well as priority government and private sector priority investment programmes being undertaken within the county.

The M&E system in the Urban Land Use Planning recognizes the present veracities which include:

- Lack of an effective M&E system – currently, the system is mainly used on how funds are used and not in programme/project planning;
- M&E activities at County level are limited due to lack of capacity and backstopping role from NLC, National Physical Planning Department;
- Lack of clear indicators and tools to guide tracking of changes at all levels;

- Most sectoral (infrastructure, social and economic) plans are not synchronised with the physical development plans;
- Most of the planning activities are on development control with little emphasis on plan preparation and reviews, leading to development happening in unplanned areas;
- Low appreciation of physical and land use planning by policymakers; and
- Inadequate resources availed for land use planning at the county level.

An effective physical and land use planning M&E system should be domiciled within:

- National policies such as Vision 2030, National Land Use Policy, Urban Policy, Housing policy etc.;
- County planning and development framework as provided in the County Government Act, 2012, UACA, Physical Planning and Land Use Act 2019 etc.;
- Public participation with an emphasis on grassroots aspirations; and
- Effective partnerships to ensure inclusivity, resource mobilisation and timely delivery of programmes and projects.

CONCLUSIONS

Juja Sub-County is one of the most rapidly urbanising sub-counties within Kiambu County. Its strategic location within the NMR means that it accrues the benefits of an enhanced socio-economic development with the implementation of the plan. It is, therefore, prudent to consider the following areas:

- There is a need to have cohesive coordination between the County Spatial Plan, CIDP and other plans and initiatives across the NMR. This will improve matching similar development models along and across inter-county boundaries and regions;
- Implementation of this Plan's vision should be done within the National, NMR and Kiambu County planning frameworks;
- Improvement of infrastructure including roads, water and sanitation, sewerage expansion, energy supply, solid waste management, and ICT to support the envisaged development programmes in the Sub-County;
- There is a need to review the future of the agriculture sector in the Sub-County with a view to protect productive lands against the pressure of urban sprawl, especially the land adjacent to the water bodies;
- Development of comprehensive and integrated transport system including BRT and commuter rail transport master plan that integrates urban, peri-urban and rural roads across the Sub-County and incorporates and traffic management systems;
- Develop capacity development (human and technical) of CPU and implementing agencies/entities at all levels on urban planning development and management to ensure effective implementation of this Plan;

- Awareness creation through identification and utilisation of effective communication systems and modes on the importance of land use planning and management at all levels;
- Integrating intra and inter-region learning to help in scaling best practice across the Sub-County through effective monitoring and evaluation;
- Strengthening of the implementing institutions at both the County and Sub-County levels. This will streamline the operations and symbiosis of all strategies and deliverables within the Plan's timeframe;
- Strengthen County Planning Units – evidentially this unit is moribund and would need to be rejuvenated and given the necessary merit and structure to ease their delivery, especially on matters related to land administration and management;
- Continuous monitoring and evaluation of interventions – in relation to identifying and strengthening the working of each intervention process and system. An unremitting M&E framework provides a consistent forecast of failure and emerging opportunities; and
- Revenue enhancement through different sources – beyond County allocations from the national government, mooted strategic partnerships and ensuring delivery of each agreement will see the Sub-County improve its planning delivery within the proposed timeframe.

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ANNEXURE 1: STAKEHOLDERS PARTICIPATION

ANNEXURE 1.1: STAKEHOLDERS PROFILING

Categories of stakeholders	Participants
National Government Ministry of Land, Housing and Urban Development	• Directorate of Urban and Metropolitan Development; • Sarah Gichanga - NAMSIP; and • Barbara Bikala - NAMSIP.
Sub-County Officials	• James Maina - CEC Lands, Housing Physical Planning; • Mary Kamau - CEC Roads, Transport & Public Works; • Anthony Wahome; • Dr Joseph Kengethe - CEC Education, culture & social Services; • Dr Isabel Waiyaki - CEC Trade; • John Karonji - Chief Officer; and • David Kuria - CEC Water. Sub-County Officials • Joyce Kanyari; • John Kimani; • Willy Gitiba; • Charity Kaara; • Peter M. Karis; • Julius Mwaura Wambui; • Dorcas Njenga; • Catherine Irungu; • Lucy Kiio; • Anne Wanjiku; • Samwel Kariuki; • Charles Mwangi; • Pauline Njeri; • Geoffrey Mburu • Felistas Wamaitha; • Alice Muchiri; • Beatrice Wandai; • Isabel Waiyaki; • David Kuria; and • Alice Wangui Kamau.
Government Agencies/Parastatals	• KeNHA; • KURA; • KeRRA; and • KFS- Simon Guchu.

ANNEXURE 1.2: PARTICIPANTS IN THE STAKEHOLDER'S FORUMS

Designation	Participant
Juja Sub-County Administrator	Juja Sub-County Administrator.
AREA MPs	- Francis Ndichu - Juja CDF; and - John Muiruri - Juja CDF.
Members of County Assembly M.C.A Juja Ward M.C.A Witeithie Ward	- Hon. Kaleshi; - Macharia Taki; - Zena Cheruiyot - MCA Secretary; - Jane Nyawaira - MCA Representative; - Ericah Wanjohi - MCA Representatives; - Michael Njenga - Theta M.C.A Representatives; and - Naomi Watiri - Secretary.
Educational Institution	- William Ombogi - JKUAT; - Esther Gichuru - Principal Gachororo Secondary; and - Evelyn Wanjohi - Gachororo primary.
Business community	- Jackson Mutuma - Kenya Association of Manufacturer; - Julius Githinji; - Gladys Ndege; - Anthony Kiragu; - George Marugu - Juja Market Chairman; - Jecinta Gitahi - Juja Market Secretary; - Alex Okech- Wholesale Transporters; - Timothy Ouko - Wholesale transporters; - Fredrick Wambua - Wholesale transporters; and - Stephen Mwangi - Co-operatives.
Public Health and Environment	- Agnes Muthanje - Public health; - Freshia Waithaka - Public health; - Rodah Chesang - Health services; - Paul G. Ndun'gu - Health services; and - James Nderitu - Community Health Worker.
Utility services Providers	Evans Kimari - Water Officer.
Neighbourhood/Residents	- Moses Mwangi - Resident leader; - Serah K. - Resident leader; - Gachora Waweru - Resident RODI; and - Duncan Mwangi - Juja south estate.
Informal Businesses Associations	- Stephen Mshero - Jua kali; - Jane Wairimu - Jua kali; - Mwangi Kamau - KCMSEA (jua kali); and - Joseph Kamau - KCMSEA (jua kali).
Non-Governmental Organisations	James K. - NGO representative Kiambu.
Transport Sector Associations	- George a. Njoroge - NMT Kimbo; - John Muniu - Wikika Sacco; - Anthony Njenga Mwangi - Chania SACCO; and - Laban Mahasi - Boda-boda.
Religious Institutions	Apostle Paul Ngun'gu - Juja pastor fellowship;

	• Pastor Ben Ouma - Juja pastor fellowship; • Rev. Julius Murage - Kenyatta road pastors forum; • Rev. Paul Kagiri - Secretary, JPF; • Pastor Jane Gichoki - Secretary Juja Pastors; • Jenifer Mureithi - JO Fellowship; and • Jackson Muiru - Gospel church.
Community-Based Organisations	• Paul Karitu - Witeithie CBO; • John Mwangi Maina - Witeithie CBO; • Jane Njeri - Witeithie CBO; • Suzan N. Karanja - Witeithie CBO; • Dorothy Muthoni - Wofada C.B.O; • Samwel Karanja - Umoja wa Witeithie; • Onesmus Ngigi - Murera SHG; • Gladys Gitungo - CHUS; • Regina Nyaruiro - CHUS; • Patricia Njoroge - CHUS; • Agnes Mukina - CHUS; • Julie Muhia - CHUS; and • Grace Gichia - CHUS.
Farmers	• John Kang'ara - Smart-Econ Farm Ltd.; • Margaret Njeri Muiruri - Smart-Econ Farm Ltd.; • George Bush - Smart-Econ Farm Ltd.; • Anthony Wainaina - Smart-Econ Farm Ltd.; • Peris Muthoni - Smart-Econ Farm Ltd.; • George Kiige - Smart-Econ Farm Ltd.; • James Kung'u - Smart-Econ Farm Ltd.; • Peter Gathogo; and • John Macharia.
Persons with disabilities	• Daniel Njoroge - Kalimoni (physically challenged); • Jane Gathoni Muhoro - Kalimoni (physically challenged); • Joseph Kuria - Kiaura disability; • Lucy Kabiru - Kiaura disability; • Stephen Mwaniki - P.W.D representative; and • Maureen Nyanjugu - Witeithie cerebral palsy.
Women	• Joyce Mwangi - Trusted Ladies W.G; • Nancy Macharia - Trusted Ladies W.G; • Phyllis Ngan'ga - Theta Chairlady; • Esther Wanjiku - Theta hand cheer up; • Pauline Mwihaki Ngigi - Theta hand cheer up; • Rose Wahu Nderitu - Juja women group; • Esther Waithera - Gikundi; and • Naomi Mwea - Gikundi.

ANNEXURE 2: SWOT ANALYSIS

ANNEXURE 2.1: SWOT OUTPUTS OF NATURAL RESOURCES AND ENVIRONMENT GRP

Strengths	Weaknesses	Opportunities	Threats
Good climatic conditions	Poor solid & liquid waste disposal.	Rainwater harvesting.	Environmental pollution.
Favourable soils condition for farming	Unrehabilitated quarries.	Due to the high-water table, there is an opportunity for underground water.	Proposed residential development will lead to the clearing of land.
Availability of local building materials	Pollution. Mainly in rivers.	Aquafarming from dumped quarries.	High water table.
Coordination of county government and private garbage collectors	High rates of deforestation.	Recycling of waste materials.	Diseases caused by poor waste management.
Availability of natural resources such as rivers, construction materials, etc	Lack of proper enforcement of the law.	Harnessing green energy.	Dumped quarries.
Good terrain			

ANNEXURE 2.2: SWOT OUTPUTS OF LOCAL ECONOMY

Strengths	Weaknesses	Opportunities	Threats
Availability of existing industries that create employment	Lack of cooperative societies.	Ready markets for goods and services.	Inflation and increased fuel cost causing an increase in the price of the products.
Availability of market centres	Land grabbing of some designated markets.	There is an existing railway which if revived can boost the economy of the area.	Land degradation due to quarrying.
Availability training and extension services	Lack of security lights leading to businesses closing early.	Plenty of milk in the area hence a milk processing plant should be proposed in Juja.	Change of use from agriculture to residential affecting the agricultural activities.
Favourable climate and fertile land for agriculture	Encroachment on the roads by traders.	Real estate business doing well e.g Juja farm.	Transition from one regime to another affecting the local economy.
Malls coming up in this Sub-County	Policy gaps in the economy sector.	Huge tracks of land for agriculture & horticulture.	High cost of living.
Quarrying is a major activity in this area (Ndarugo)	Lack of proper zoning for various economic activities.	Accessibility to the financial services provider.	
High population creating a good market			

ANNEXURE 2.3: SWOT OUTPUTS OF LAND USE AND URBAN DESIGN GROUP

Strengths	Weaknesses	Opportunities	Threats
Large parcels of land	Lack of ownership documents for land.	Vast undeveloped land.	Un-proportioned development growth as opposed to infrastructural growth.
Availability of land	Land fragmentation.	Opportunities for vertical housing in urban centres.	Urban Sprawl and uncontrolled development.
High connectivity index	Subdivision of very small plots.		Uncontrolled subdivision of land into small residential plots.
Proximity to Nairobi, Thika and Kiambu	Incompatible land uses.		

ANNEXURE 2.4: SWOT OUTPUTS OF SOCIAL INFRASTRUCTURE GROUP

Strengths	Weaknesses	Opportunities	Threats
Adequate distribution of social facilities	Poor accessibility to hospitals and schools.	Government support for social facilities education, hospitals and health centre.	High levels of unemployment.
Social & cultural interaction	Understaffing of medical personnel.	Proximity to schools and hospitals.	Poor road conditions accessing the facilities.
Vibrant community	Lack of open spaces, stadiums and public recreation centres.	Availability of land and private developers.	Increased demand for health & education facilities thus pressure on available facilities.
Availability of competent human resource	Grabbing of public land.	Income generation to the County Government.	Inadequate funding to develop the facilities.

ANNEXURE 2.5: SWOT OUTPUTS OF TRANSPORT GROUP

Strengths	Weaknesses	Opportunities	Threats
The presence of Thika-Superhighway which has spurred both physical and economic development	• Failure to provide NMT facilities. • Inadequate provision of Boda-Boda sheds.	Plans to improve commuter rail system within NMR.	Impunity in public service transport.

Presence of railway line in the Sub-County	• Underutilisation of the railway line. • Poor provision of the well-articulated drainage system.	Investment Prospects in real. estate and industrial sectors.	Increase accidents due to speeding.
Easy access to Nairobi	• Lack of adequate pedestrians crossing areas/footbridges along the highway. • Lack of provision of Bus terminus in Juja.	Employment opportunities in various sectors.	Lack of efficient public transport.
Availability of multiple modes of transport such as Public service vehicle, Boda-Boda, motorcycle & NMT	• Encroachment to the road reserve. • Existence of narrow roads in the area such as Witeithie, Gachororo. • Poor road conditions.	Reduced travel time.	Traffic congestion.

ANNEXURE 2.6: SWOT OUTPUTS OF PHYSICAL INFRASTRUCTURE GROUP

Strengths	Weaknesses	Opportunities	Threats
Existing trunk sewer line in some parts of Juja	Lack of efficient solid waste management system.	Investment on fibre optic cables by Safaricom.	High cost in accessing electricity and sewer line services.
Presence of private solid waste collectors	Vandalism of streetlights.	Donor funding on water and sewerage infrastructure.	Population increase that will lead to pressure on the existing physical infrastructure.
• Well electricity connection to the national grid • Good mobile network coverage for communication	Poor drainage channels.	Availability of renewable source of energy.	Disease outbreaks due to unplanned solid waste management.
Availability of piped water	High cost in accessing and connecting to internet and optic cables.	Solid waste disposal site at Kagoki in Thika.	Vandalism of public amenities.

ANNEXURE 2.7: SWOT OUTPUTS OF GOVERNANCE GROUP

Strengths	Weaknesses	Opportunities	Threats
Public participation through stakeholders Planning Workshops	High rate of corruptions and mismanagement of government resources by senior government officials.	Election period is normally held after 5 years.	Lack of political goodwill in some planning matters.
Democracy practised during elections	Conflict and duplication of power amongst government officials.	Awareness camping of quality leaders.	Inadequate funding to facilitate governance.
Devolved governance system	• Delayed service delivery. • High level of bureaucracy.	Kenya Constitution of 2010 which highlights the qualification of leaders.	Ineffective communication strategies to the public.
Community policing	Elected members not easily accessible.	Availability of legal and institutional framework for governance.	

Appendices 1.1: Notice of Intention to Plan

DAILY NATION
Wednesday October 28, 2015

ACTED VACANCY ANNOUNCEMENTS

ACTED Kenya is looking for experienced self-driven and self-motivated professionals to fill the following roles:

1. HEAD OF OFFICE - EAST AFRICA AND HUMANITARIAN UNIT

Under the authority of the Country Director, this role will include:

- Lead the development and implementation of project and management.
- Manage the development and implementation of project and management.
- Lead or co-lead the Country Director's office in the region, working with appropriate and relevant external and internal resources.
- Provide information to other internal stakeholders through the internal and the regional office.

2. PROJECT DEVELOPMENT AND External Relations and Project Strategy

- Develop and deliver a comprehensive and coherent funding strategy for the region.
- Act as a point of contact for all donor communication, including the preparation and writing of donor proposals in the field.

3. External Communication

- Develop and deliver a comprehensive and coherent funding strategy for the region.
- Act as a point of contact for all donor communication, including the preparation and writing of donor proposals in the field.

4. Project Development

- Lead or co-lead the Country Director's office in the region, working with appropriate and relevant external and internal resources.
- Provide information to other internal stakeholders through the internal and the regional office.

5. Project Development

- Lead or co-lead the Country Director's office in the region, working with appropriate and relevant external and internal resources.
- Provide information to other internal stakeholders through the internal and the regional office.

Kenya Power

CLARIFICATION AND EXTENSION OF TENDER CLOSING DATE

Kenya Power wishes to inform firms participating in the tender below, that clarification and extension of the tender closing date has been deemed necessary, calling for addendum 1 to the tender.

TENDER NO.	DESCRIPTION OF GOODS	PREVIOUS CLOSING DATE	NEW CLOSING DATE
KPL/04A-2/PT/15/CT/75-16	Supply, installation and Commissioning of 220/48 VDC Battery Systems	29.10.2015	05.11.2015 at 10.30 AM

Tender Security should therefore be valid from the new closing date shown above.

Addendum 1 detailing the requirements of the above tender may be obtained from Kenya Power's E-Procurement Portal accessible on Kenya Power's website (www.kpcc.co.ke) from Wednesday 28th October, 2015.

Prospective bidders should register for E-Procurement to enable them access the Kenya Power portal under "New Supplier Registration" found under the Tenders Tab.

All other terms and conditions of the tender remain the same.

**GENERAL MANAGER
SUPPLY CHAIN**

www.kpcc.co.ke

GIMCO LIMITED

Real Estate & Managing agents
Land Development Consultants

PROPERTY FOR SALE - BY WAY OF BID-

Under the instructions from our principals, the following property situated in Nairobi is on sale by way of Bid by the Agent Stated above:

L. R. NO. 7533/2 NAIROBI, UNIT 5, BEING PART OF THE DEVELOPMENT "THE PARK OFF TREE LANE" IN THE KAREN AREA OF NAIROBI

A prime residential property sitting on approximately 0.76 acres comprising of a six bedroomed executive mansion with staff quarters in a gated community within the prestigious development, "The Park off Tree Lane" in the leafy Karen suburb.

Bid packs are available from the above listed agent in both soft or hard copies at a non-refundable fee of KShs. 2,000 payable in Banker's Cheque.

The pack shall contain a description of the property, legal documentation and format of bidding.

The bids must be addressed to:
GIMCO LIMITED
GIMCO CENTRE,
67 KIAMBERE ROAD, UPPER HILL
NAIROBI

The deadline for the receipt of bids shall be at 11.00 Hrs on 12/11/2015.

The vendor does not warrant any particulars and reserves the right to accept or reject any bid and shall not be called upon to assign any reason thereof.

Viewing is strictly by appointment through the offices of the agent.

REPUBLIC OF KENYA

MINISTRY OF LAND, HOUSING AND URBAN DEVELOPMENT
DIRECTORATE OF URBAN AND METROPOLITAN DEVELOPMENT
PROJECT NAME: NAIROBI METROPOLITAN SERVICES IMPROVEMENT PROGRAMME (NAMSIP)
CREDIT NO. IDA 51028-KE

PUBLIC NOTICE

KIAMBURU COUNTY GOVERNMENT

Commencement of preparation of Integrated Strategic Urban Development Plans for Kiambu, Uthmaniyah, Kariakara, and Ngara.

Contract No. MOLA/UD/DOH/NE/NA/SP/17A-12/2013-2014

Pursuant to articles 4, 10 (2), 66, 67, 184, 185 and the first and fourth schedules of the Constitution of Kenya, 2010, the National Land Commission Act, County Government Act, Urban Areas and Cities Act, Physical Planning Regulations Act and other enabling legislations.

Notice is hereby given that the Kiambu County Government has commenced the preparation of Integrated Strategic Urban Development Plans (ISUDP) for the 10 wards in 3 clusters (Kiambu, Uthmaniyah, Kariakara, and Ngara).

The ISUDP planning areas shall comprise the existing boundaries of the townships and municipalities in addition to the extent of urbanising areas while the planning area for the transport corridor shall be a kilometer on either side of the transport corridor.

The purpose of the ISUDP is to provide a framework for detailed development policies and proposals for towns, indicate action areas for immediate development or redevelopment and provide a coordinated basis upon which various implementing agencies can develop their individual programs for work for which they have executive responsibility. For example housing, transportation, water supply, electricity supply, sewerage development among others. The plan preparation project is expected to be completed in April, 2016.

It is a constitutional and statutory requirement that stakeholders and members of the general public participate in the plan preparation process. Any person or institution that wishes to participate in or has comments on the planning process, can reach or may forward any such comments to the County Director of Physical Planning at the address below.

**COUNTY SECRETARY
KIAMBURU COUNTY GOVERNMENT**
P.O. Box 3344 - 00090 KIAMBURU
Tel: +254 47 5882188
Mobile: +254 788 385 288

REPUBLIC OF KENYA

MINISTRY OF LAND, HOUSING AND URBAN DEVELOPMENT
DIRECTORATE OF URBAN AND METROPOLITAN DEVELOPMENT
PROJECT NAME: NAIROBI METROPOLITAN SERVICES IMPROVEMENT PROGRAMME (NAMSIP)
CREDIT NO. IDA 51028-KE

PUBLIC NOTICE

MACHAKOS COUNTY GOVERNMENT

Commencement of preparation of Integrated Strategic Urban Development Plans for Machakos, Uthmaniyah, Kariakara, and Ngara.

Contract No. MOLA/UD/DOH/NE/NA/SP/17A-12/2013-2014

Pursuant to articles 4, 10 (2), 66, 67, 184, 185 and the first and fourth schedules of the Constitution of Kenya, 2010, the National Land Commission Act, County Government Act, Urban Areas and Cities Act, Physical Planning Regulations Act and other enabling legislations.

Notice is hereby given that the Machakos County Government has commenced the preparation of Integrated Strategic Urban Development Plans (ISUDP) for the 10 wards in 3 clusters (Machakos, Uthmaniyah, Kariakara, and Ngara).

The ISUDP planning areas shall comprise the existing boundaries of the townships and municipalities in addition to the extent of urbanising areas while the planning area for the transport corridor shall be a kilometer on either side of the transport corridor.

The purpose of the ISUDP is to provide a framework for detailed development policies and proposals for towns, indicate action areas for immediate development or redevelopment and provide a coordinated basis upon which various implementing agencies can develop their individual programs for work for which they have executive responsibility. For example housing, transportation, water supply, electricity supply, sewerage development among others. The plan preparation project is expected to be completed in April, 2016.

It is a constitutional and statutory requirement that stakeholders and members of the general public participate in the plan preparation process. Any person or institution that wishes to participate in or has comments on the planning process, can reach or may forward any such comments to the County Director of Physical Planning at the address below.

**COUNTY SECRETARY
MACHAKOS COUNTY GOVERNMENT**
P.O. Box 341 - 80110 MACHAKOS

REPUBLIC OF KENYA

MINISTRY OF LAND, HOUSING AND URBAN DEVELOPMENT
DIRECTORATE OF URBAN AND METROPOLITAN DEVELOPMENT
PROJECT NAME: NAIROBI METROPOLITAN SERVICES IMPROVEMENT PROGRAMME (NAMSIP)
CREDIT NO. IDA 51028-KE

NOTICE OF INTENTION TO PLAN

MURANG'A COUNTY GOVERNMENT

Commencement of preparation of Integrated Strategic Urban Development Plans for Murang'a, Uthmaniyah, Kariakara, and Ngara.

Contract No. MOLA/UD/DOH/NE/NA/SP/17A-12/2013-2014

Pursuant to articles 4, 10 (2), 66, 67, 184, 185 and the first and fourth schedules of the Constitution of Kenya, 2010, the National Land Commission Act, County Government Act, Urban Areas and Cities Act, Physical Planning Regulations Act and other enabling legislations.

Notice is hereby given that the Murang'a County Government has commenced the preparation of Integrated Strategic Urban Development Plans (ISUDP) for the 10 wards in 3 clusters (Murang'a, Uthmaniyah, Kariakara, and Ngara).

The ISUDP planning areas shall comprise the existing boundaries of the townships and municipalities in addition to the extent of urbanising areas while the planning area for the transport corridor shall be a kilometer on either side of the transport corridor.

The purpose of the ISUDP is to provide a framework for detailed development policies and proposals for towns, indicate action areas for immediate development or redevelopment and provide a coordinated basis upon which various implementing agencies can develop their individual programs for work for which they have executive responsibility. For example housing, transportation, water supply, electricity supply, sewerage development among others. The plan preparation project is expected to be completed in April, 2016.

It is a constitutional and statutory requirement that stakeholders and members of the general public participate in the plan preparation process. Any person or institution that wishes to participate in or has comments on the planning process, can reach or may forward any such comments to the County Director of Physical Planning at the address below.

**COUNTY SECRETARY
MURANG'A COUNTY GOVERNMENT**
P.O. Box 11 - 10000 MURANG'A
Telephone: 060-3300171
Email: info@murangakc.go.ke

KIGUMU BENDERA HIGH SCHOOL

INVITATION TO TENDER - YEAR 2016

Tenders are invited for the supply and delivery of the following items as at 1st January, 2016 to 31st December, 2016:

- K.B.H.5010016: Lab equipment & chemicals
- K.B.H.5010016: Staff & students uniforms
- K.B.H.5010016: Games equipment & uniforms
- K.B.H.5010016: Stationery
- K.B.H.5010016: Supply of cartridges and toners
- K.B.H.5010016: Textiles & bedding
- K.B.H.5010016: Pharmaceuticals
- K.B.H.5010016: Baking flour and ingredients
- K.B.H.5010016: Fresh milk
- K.B.H.5010016: Fresh fruits
- K.B.H.5010016: Fresh vegetables, manioc, etc
- K.B.H.5010016: Petroleum (oil)
- K.B.H.5010016: Cabbages & tomatoes
- K.B.H.5010016: Dry food & cereals (maize and beans)
- K.B.H.5010016: Manufactured food (sugar, salt, fat, tea leaves)
- K.B.H.5010016: Insurance (comprehensive cover for school vehicles)
- K.B.H.5010016: Insurance cover (students, staff and school property)
- K.B.H.5010016: Electrical appliances
- K.B.H.5010016: Detergents & disinfectants
- K.B.H.5010016: Maize flour
- K.B.H.5010016: Exercise books
- K.B.H.5010016: Supply of fire fighting equipment & servicing
- K.B.H.5010016: Supply of fire rescue bucket body
- K.B.H.5010016: Provision of security services

A complete set of tender documents may be obtained from the Accounts Office from Monday to Friday during working hours upon payment of a non-refundable fee of KSh. 1,000 per item code.

Quotations should include cost of delivery and V.A.T.

Completed forms in plain sealed envelopes marked "Tender No. _____" should reach the undersigned on or before 18th November, 2015 at 9.00 a.m. Tenders will be opened the same day in the school library. Interested tenders or their representatives are welcome to attend.

The school reserves the right to accept or reject any tender either in whole or in part and it is not bound to give reason for the same.

Chairman - Procurement Committee, Kigumu Bendera High School,
P.O. Box 86-10000, KIGUMU

REPUBLIC OF KENYA

MINISTRY OF LAND, HOUSING AND URBAN DEVELOPMENT
DIRECTORATE OF URBAN AND METROPOLITAN DEVELOPMENT
PROJECT NAME: NAIROBI METROPOLITAN SERVICES IMPROVEMENT PROGRAMME (NAMSIP)
CREDIT NO. IDA 51028-KE

PUBLIC NOTICE

KIAMBURU COUNTY GOVERNMENT

Commencement of preparation of Integrated Strategic Urban Development Plans for Kiambu, Uthmaniyah, Kariakara, and Ngara.

Contract No. MOLA/UD/DOH/NE/NA/SP/17A-12/2013-2014

Pursuant to articles 4, 10 (2), 66, 67, 184, 185 and the first and fourth schedules of the Constitution of Kenya, 2010, the National Land Commission Act, County Government Act, Urban Areas and Cities Act, Physical Planning Regulations Act and other enabling legislations.

Notice is hereby given that the Kiambu County Government has commenced the preparation of Integrated Strategic Urban Development Plans (ISUDP) for the 10 wards in 3 clusters (Kiambu, Uthmaniyah, Kariakara, and Ngara).

The ISUDP planning areas shall comprise the existing boundaries of the townships and municipalities in addition to the extent of urbanising areas while the planning area for the transport corridor shall be a kilometer on either side of the transport corridor.

The purpose of the ISUDP is to provide a framework for detailed development policies and proposals for towns, indicate action areas for immediate development or redevelopment and provide a coordinated basis upon which various implementing agencies can develop their individual programs for work for which they have executive responsibility. For example housing, transportation, water supply, electricity supply, sewerage development among others. The plan preparation project is expected to be completed in April, 2016.

It is a constitutional and statutory requirement that stakeholders and members of the general public participate in the plan preparation process. Any person or institution that wishes to participate in or has comments on the planning process, can reach or may forward any such comments to the County Director of Physical Planning at the address below.

**COUNTY SECRETARY
KIAMBURU COUNTY GOVERNMENT**
P.O. Box 3344 - 00090 KIAMBURU
Tel: +254 47 5882188
Mobile: +254 788 385 288

REPUBLIC OF KENYA

MINISTRY OF LAND, HOUSING AND URBAN DEVELOPMENT
DIRECTORATE OF URBAN AND METROPOLITAN DEVELOPMENT
PROJECT NAME: NAIROBI METROPOLITAN SERVICES IMPROVEMENT PROGRAMME (NAMSIP)
CREDIT NO. IDA 51028-KE

PUBLIC NOTICE

KAJIADO COUNTY GOVERNMENT

Commencement of preparation of Integrated Strategic Urban Development Plans for Kajado, Uthmaniyah, Kariakara, and Ngara.

Contract No. MOLA/UD/DOH/NE/NA/SP/17A-12/2013-2014

Pursuant to articles 4, 10 (2), 66, 67, 184, 185 and the first and fourth schedules of the Constitution of Kenya, 2010, the National Land Commission Act, County Government Act, Urban Areas and Cities Act, Physical Planning Regulations Act and other enabling legislations.

Notice is hereby given that the Kajado County Government has commenced the preparation of Integrated Strategic Urban Development Plans (ISUDP) for the 10 wards in 3 clusters (Kajado, Uthmaniyah, Kariakara, and Ngara).

The ISUDP planning areas shall comprise the existing boundaries of the townships and municipalities in addition to the extent of urbanising areas while the planning area for the transport corridor shall be a kilometer on either side of the transport corridor.

The purpose of the ISUDP is to provide a framework for detailed development policies and proposals for towns, indicate action areas for immediate development or redevelopment and provide a coordinated basis upon which various implementing agencies can develop their individual programs for work for which they have executive responsibility. For example housing, transportation, water supply, electricity supply, sewerage development among others. The plan preparation project is expected to be completed in April, 2016.

It is a constitutional and statutory requirement that stakeholders and members of the general public participate in the plan preparation process. Any person or institution that wishes to participate in or has comments on the planning process, can reach or may forward any such comments to the County Director of Physical Planning at the address below.

**COUNTY SECRETARY
KAJADO COUNTY GOVERNMENT**
P.O. Box 11 - 01188 KAJADO

Appendices 1.2: Notice of Completion



REPUBLIC OF KENYA
State Department for Housing and
Urban Development



COUNTY GOVERNMENT
OF KIAMBU

PHYSICAL AND LAND USE PLANNING ACT, 2019

NOTICE OF COMPLETION OF DEVELOPMENT PLANS

Names of Developments Plans:-

1. Juja Integrated Strategic Urban Development Plan, JJ/ISUDP/457/2020/01
2. Ruiru Integrated Strategic Urban Development Plan No. RRU/ISUDP/53/2020/01
3. Kikuyu Integrated Strategic Urban Development Plan No. KKY/ISUDP/43/2020/01
4. Limuru Integrated Strategic Urban Development Plan No. LMR/ISUDP/94/2020/01
5. Kiambaa Integrated Strategic Urban Development Plan No. KBA/ISUDP/605/2020/01
6. Nairobi-Thika Transport corridor Integrated Strategic Urban Development Plan No. NTTC/ISUDP/022/2020/01.

NOTICE is hereby given that preparation of the above Development Plans was completed on **11th September, 2020.**

The Development Plans relate to the Plans situated in Kiambu County.

Copies of the plans as prepared have been deposited for public inspection at the office of **Kiambu County Director of Physical Planning**, located in Red Nova Building, Kiambu Town, and respective Sub county Physical Planning offices of **Juja, Ruiru, Kikuyu, Limuru and Kiambaa Sub-Counties.**

The copies so deposited are available for inspection free of charge by all persons interested at the above-mentioned address between the hours of 0800hrs and 1700hrs.

Any interested person(s) who wishes to make any representation in connection with or objection to the above Development Plans may send such representations in writing to be received by the Kiambu County Director of Physical Planning, P. O. Box 340-00900 Kiambu not later than 14 days from the date of this Notice and any such representation or objection shall state the grounds on which it is made.

Dated the **11th day of September, 2020.**

MUGO KIMANI
County Executive Committee Member
Land, Housing, Physical Planning, Municipal Administration and Urban Development
KIAMBU COUNTY

Appendix 1.3: Gazette Notice

3664

THE KENYA GAZETTE

18th September, 2020

NOTICE is given that the preparation of the above Development Plan was on 20th August, 2020 completed.

The Development Plan relates to the land situated in parts of Nairobi City, Machakos and Makueni Counties.

Copies of the Development Plan as prepared have been deposited for public inspection at the offices of Nairobi Metropolitan Service at KICC, 24th floor, Machakos County Government at the Lands and Physical Planning Offices, Machakos Town, opposite County Commissioner's office and Director of Physical Planning, Makueni County, Wote.

The copies so deposited are available for inspection free of charge at the offices of Nairobi Metropolitan Service at KICC, 24th floor, Machakos County Government at the Lands and Physical Planning Offices, Machakos Town, opposite County Commissioner's office and Director of Physical Planning, Makueni County, Wote, between the hours of 0800 to 1700 Monday to Friday.

Any interested person(s) who wishes to make any representation in connection with or objection to the above Development Plan may send such representations or objections in writing to be received by the following offices not later than fourteen (14) days from the date of this Notice and any such representations or objections shall state the ground on which it is made:

Secretary, Lands and Physical Planning,
Nairobi Metropolitan Service,
P.O. Box 40530-00100,
Nairobi.

Director of Physical Planning,
Machakos County Government,
P.O. Box 1996-90100,
Machakos.

Director of Physical Planning,
Makueni County Government,
P.O. Box 78-90300,
Wote.

AUGUSTINE K. MASINDE,
MR/1324611 National Director of Physical Planning.

GAZETTE NOTICE No. 7095

THE PHYSICAL AND LAND USE PLANNING ACT

(No. 13 of 2019)

COMPLETION OF DEVELOPMENT PLANS

PDP No. JJ/ISUDP/457/2020/01 – Juja Integrated Strategic Urban Development Plan.

PDP No. RRU/ISUDP/53/2020/01 – Ruiru Integrated Strategic Urban Development.

PDP No. KKY/ISUDP/43/2020/01 – Kikuyu Integrated Strategic Urban Development.

PDP No. LMR/ISUDP/94/2020/01 – Limuru Integrated Strategic Urban Development.

PDP No. KBA/ISUDP/605/2020/01 – Kiambaa Integrated Strategic Urban Development.

PDP No. NTT/ISUDP/022/2020/01 – Nairobi-Thika Transport Corridor Integrated Strategic Urban Development.

NOTICE is given that preparation of the above Development Plans was on 11th September, 2020 completed.

The Development Plans relate to the Plans situated in Kiambu County.

Copies of the plans as prepared have been deposited for public inspection at the office of Kiambu County Director of Physical Planning, Red Nova Building, Kiambu Town, and respective Sub-county Physical Planning offices, Juja, Ruiru, Kikuyu, Limuru and Kiambaa Sub-Counties.

The copies so deposited are available for inspection free of charge by all persons interested at the above mentioned address between the hours of 0800 and 1700.

Any interested person(s) who wishes to make any representation in connection with or objection to the above Development Plans may send such representations in writing to be received by the Kiambu County Director of Physical Planning, P.O. Box 340-00900 Kiambu not later than 14 days from the date of this Notice and any such representation or objection shall state the grounds on which it is made.

Dated the 11th September, 2020.

MUGO KIMANI,
CECM,
Land, Housing, Physical Planning, Municipal Administration
and Urban Development, Kiambu County.
MR/1324611

GAZETTE NOTICE No. 7096

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

(No. 8 of 1999)

THE NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED REHABILITATION OF THIKA-NANYUKI METRE GAUGE RAILWAY (MGR) AND FOR THE CONSTRUCTION OF NEW CHAKA STATION FOR KENYA RAILWAYS CORPORATION FROM THIKA TO NANYUKI THROUGH KIAMBU, MURANG'A, KIRINYAGA, NYERI, LAIKIPIA COUNTIES

INVITATION OF PUBLIC COMMENTS

PURSUANT to regulation 21 of the Environmental Management and Co-ordination (Impact Assessment and Audit) Regulations, 2003, the National Environment Management Authority (NEMA) has received an Environmental Impact Assessment Study Report for the above proposed project.

The proponent, Kenya Railways Corporation, is proposing rehabilitate the 178Km long Thika Nanyuki Metre Gauge Railway (MGR) and for the Construction of New Chaka Station for Kenya Railways Corporation traversing through Kiambu, Murang'a, Kirinyaga, Nyeri and Laikipia Counties.

The following are the anticipated impacts and proposed mitigation measures:

Impact	Proposed Mitigation Measures
Solid waste generation	- Special attention should be given to minimizing and reducing the quantities of waste produced during all the sites preparation and rehabilitation. - Materials to be reused or recycled where possible. - Wastes generated during the renovation and construction phase will be disposed of as stipulated in the EMCA(Waste Management) Regulations 2006. - Conduct training for waste management, such as waste disposal and segregation practices. - Comply with Waste Management Regulations, 2006.
Asbestos Roof Removal	- Dispose all Asbestos Containing Materials according to WBG/IFC EHS Guidelines NEMA Guidelines/ requirements. - Use recommended PPE. - Conduct Risk Assessment before removal of ACMS. - Notify the authority by filling in the notification form.