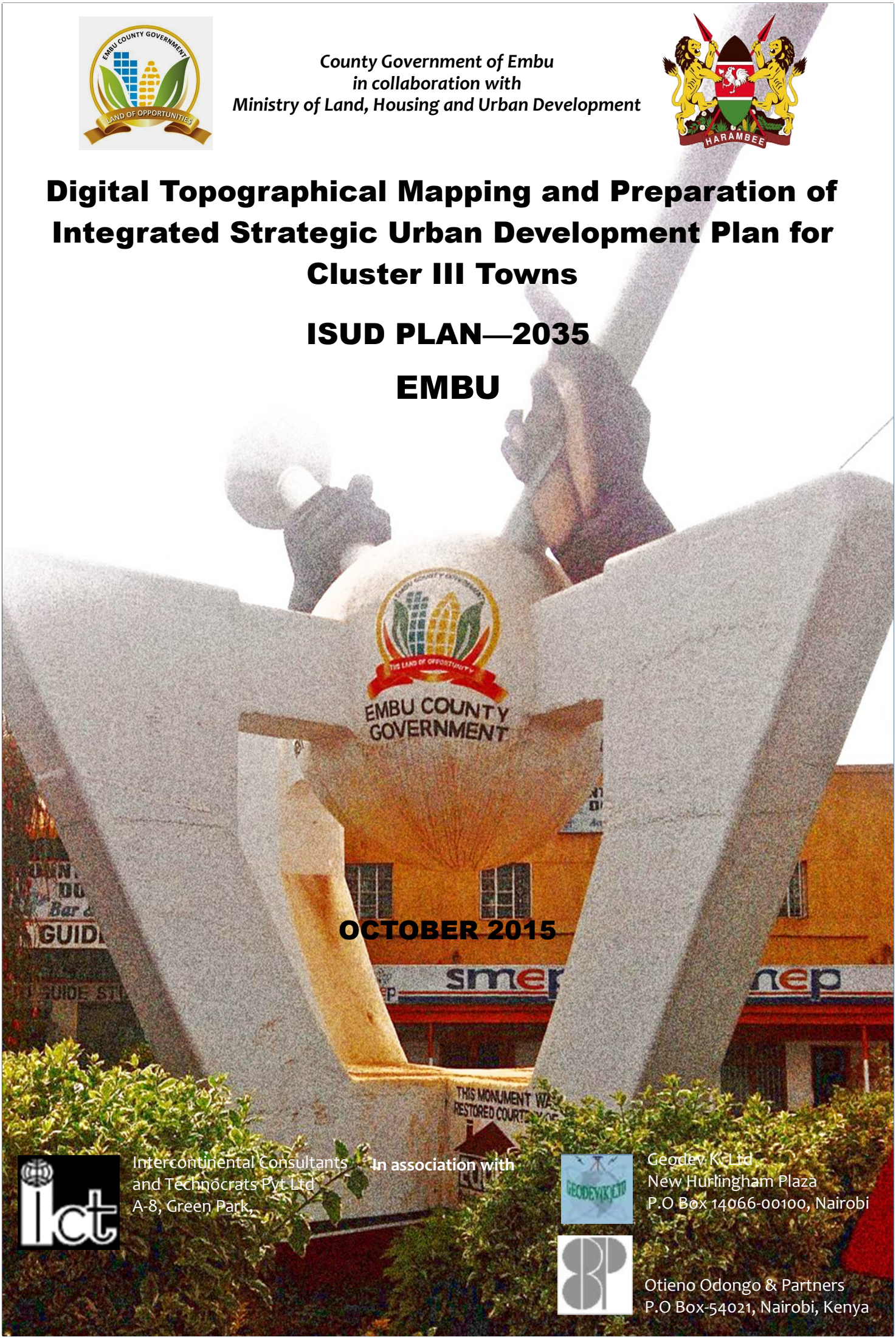
County Government of Embu
in collaboration with
Ministry of Land, Housing and Urban Development

Digital Topographical Mapping and Preparation of Integrated Strategic Urban Development Plan for Cluster III Towns

ISUD PLAN—2035

EMBU



OCTOBER 2015

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FOREWORD

It is a privilege for me to introduce this plan to the people and town of Embu. The recent past has seen a deterioration in the quality of our urban areas due to uncontrolled development and increasing congestion. This Integrated Strategic Urban 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 Embu a more attractive and efficient city.

Urban spatial development plans are not new in Kenya. However, this one is different. It has now become clear that the pace of urbanisation is such that any attempt to plan far ahead is bound to be overtaken by events. For this reason the traditional "Master Plan" which had a life of twenty or more years was unable to respond to economic and social changes. The new thinking, which this plan reflects, is that planning should rather be strategic – identifying major strategic targets, while giving the opportunity to change tactics and details every five years. Such a strategic plan is more flexible and allows closer collaboration between the professional planners and the communities they serve. It also allows the plan to respond to the rapid changes in technology which are affecting our society so deeply.

One of the features of this project is that the consultants were required to undertake aerial photography from which they could prepare a digital topographical base map. In addition they have prepared a cadastral map. These two are extremely valuable resources which have value far beyond the confines of spatial planning. They will assist in mapping and managing utilities such as water and electricity and in integrating the planning and taxation functions of the city. They may also be a resource that can be sold to private sector companies such as cell-phone operators.

Another feature of this work which distinguishes it from previous planning contracts is that it incorporates Capital Investment Plans. These are based on realistic estimates and prioritised according to the expressed needs of our citizens. In this way the plan provides a practical and realistic road map for the development of our much-loved town and implementation of the most important first steps in making Embu the destination of first choice within the region.

I commend this work to all citizens of Embu and thank everyone who was involved in its preparation.

H.E. Hon. Martin N. Wambora
The Governor,
Embu County.

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A.I.P.C.A	*:*	*African Independent Pentecostal Church of Africa*
ACK	*:*	*Anglican Church of Kenya*
ASK	*:*	*Agriculture Society of Kenya*
ATM	*:*	*Automated teller machine*
CBD	*:*	*Commercial Business District*
CBOs	*:*	*Community Based Organizations*
CDF	*:*	*Constituency Development Fund*
CEC	*:*	*County Executive Committee*
CIP	*:*	*Capital Investment Plan*
CO	*:*	*Chief Officer*
DMP	*:*	*Disaster Management Plan*
DPR	*:*	*Detailed project report*

DTM	:	*Digital Terrain Model*
ECDMC	:	*Embu County Disaster Management Committee*
EIA	:	*Environmental Impact Assessment*
EMCA	:	*Environmental Management and Co-ordination Act*
ESM F	:	*Environment and Social Management Framework*
EWASCO	:	*Embu Water Supply and Sewer Company*
GDP	:	*Gross Domestic Product*
GHG	:	*greenhouse gas*
GIS	:	*Geographical Information System*
GOK	:	*Government of Kenya*
H.E.	:	*His Excellency*
Ha	:	*Hectare*
HHs	:	*Households*
ICT	:	*Information Communication Technology*
IDA	:	*International Development Association*
IEC	:	*Information, education and communication*
ISUD	:	*Integrated Strategic Urban Development*
ISUDP	:	*Integrated Strategic Urban Development Plan*
KARI	:	*Kenya Agricultural Research Institute*
KCB	:	*Kenya Commercial Bank*
kg	:	*Kilogram*
KISIP	:	*Kenya Informal Settlements Improvement Program*
Km	:	*Kilometre*
km^2	:	*Square Kilometre*
KMP	:	*Kenya Municipal Programme*
Ksh	:	*Kenyan Shilling*
LAIFOMS	:	*Local Authority Integrated Financial Operational and Management System*
LAPSET	:	*Lamu Port-Southern Sudan-Ethiopia Transport*
LATF	:	*Local Authority Transfer Fund*
LFPR	:	*Labour Force Participation Rate*
LPDPs	:	*Local Physical Development Plans*
m	:	*Meter*
m3	:	*Cubic meter*
MC	:	*Master of Ceremonies*
MCAs	:	*Members of County Assembly*
MEC	:	*Member of Executive Committee*
MGDs	:	*Millennium Development Goals*
Mt.	:	*Mount*
NEMA	:	*National Environment Management Authority*
NGOs)	:	*Non-Governmental Organizations*
NMT	:	*Non-Motorised Traffic*
No.	:	*Number*
NO2	:	*Nitrogen Dioxide*
NORC	:	*National Opinion Research Center*
P.C.E.A	:	*Presbyterian Church of East Africa*
PC	:	*Provincial Commissioner*

PM	:	*particulate matter*
PPP	:	*Public Private Partnership*
RMLF	:	*Road Maintenance Levy Fund*
ROW	:	*Right of Way*
SACCO	:	*Savings and Credit Cooperative Organization*
SBP	:	*Single Business Permit*
SEA	:	*Strategic Environmental Assessment*
SIDA	:	*Swedish International development Agency*
STP	:	*Sewer Treatment Plant*
SWM	:	*Solid Waste Management*
SWOT	:	*Strengths Weaknesses Opportunities and Threats*
TB	:	*Tuberculosis*
TDA	:	*Town Development Agency*
UM	:	*Upper Midland*
US$	:	*United State Dollar*
USD	:	*United State Dollar*
V/C	:	*Volume Count*
VIP	:	*Ventilated Improved Pit*
WC	:	*Water Closet*
WRMA	:	*Water Resources Management Act*

1 Introduction

1.1 Background

This project *Digital Topographical Mapping and the Preparation of Integrated Strategic Urban Development Plans for Cluster III Towns* is a part of the Kenya Municipal Programme (KMP). The KMP aims[1] to strengthen local governance and improve urban service delivery in selected urban municipalities by reforming frameworks for urban governance, municipal restructuring, strengthening planning, finances and capacity, and investing in infrastructure and service delivery improvements in these local authorities. The programme aims to create a broader national framework for municipal reforms and investments – a framework that is flexible and sustainable, and can reach all local authorities over the medium- to long-term.

The KMP has the following four components:

1. Institutional restructuring and empowering local governments;

2. Participatory strategic planning for urban development;

3. Investment in infrastructure and service delivery; and

4. Programme management, monitoring and evaluation.

The current project is a part of Component 2 'Participatory Strategic Planning for Urban Development' of the Kenya Municipal Programme (KMP).

Although there are other factors involved, urbanisation is a key indicator of the degree of development. It is directly linked with the economic development because urban settlements are centres for secondary and tertiary economic activities and these activities are high return activities. Developed countries are highly urbanized, as shown in the table below, demonstrating that urbanization is a positive force in development.

It is interesting to note that the level of urbanization and gross national per capita income of Kenya is much less than the world average and substantially less than the average of Sub-Saharan Africa.

Table 1.1: Percentage of urbanised population by region and per capita income in selected countries

Name of Country	2008 % of population	2012 % of population	Gross National Income per capita 2012 (US$)
Afghanistan	23	24	688
Germany	74	74	42,598
Ghana	50	53	1,646
India	30	32	1,503
Indonesia	48	51	3,551
Ethiopia	16	17	467
Kenya[2]	**23**	24	933
Tanzania	25	27	609
Uganda	14	16	551
Sub-Saharan Africa	-		1624
United Kingdom	79	80	37,840
United States of America	82	83	38,649
World	-	53	**9,527**

[1] http://www.worldbank.org/en/news/loans-credits/2010/05/04/kenya-municipal-project-support-first-phases-municipal-program

[2] The Kenya National Bureau of Statistics, 2009, states the share of urban population to total population is 32.3% (2009), which is higher than the World Bank estimates

Name of Country	2008 % of population	2012 % of population	Gross National Income per capita 2012 (US$)
Latin America and Caribbean	-	79	8,275
Middle East and North Africa	-	60	3,453
South Asia	-	31	1,334
Euro area	-	76	38,742

Source: http://wdi.worldbank.org/table/3.12# and http://data.worldbank.org/indicator/NY.GDP.PCAP.CD

The above table indicates that Kenya is relatively low in the urbanization scale. Per capita income is correlated with the level of urbanisation which is an important component of economic development. Per capita income increases with the increase in level of urbanisation because the type of economic activities (manufacturing, trade, services, etc.) in urban areas are more productive than the type of economic activities in rural areas (agriculture, forestry, fishing, etc.). Apart from a low level of urbanization, urban settlements in Kenya face many problems such as:

- Very low planning capacities terms of staff, technology, equipment and space
- Unplanned growth of urban settlements,
- Urban sprawl and unsustainable urban growth,
- Inadequate provision of infrastructure and services, like roads, water supply, sanitation, electricity, recreational facilities, parking facilities, housing, etc.
- Illegal sub-divisions
- Growth of informal markets
- High rate of unemployment
- Inadequate co-ordination among various agencies working in the urban settlements,
- Lack of integrated development.
- Inadequate capacity of urban authorities to deal with the fast urban expansion
- Lack of employment opportunities
- Mushrooming of informal settlements
- Crime and social distress

To address the abovementioned problems and issues, there is an urgent need to integrate physical, economic, social, cultural, and environmental as well as institutional aspects and tap the inherent potential of towns. The integrated strategic urban development plan will be required to attract investments for enhanced revenue collection, growth and development.

To resolve the abovementioned issues and prepare an Integrated Strategic Urban Development Plan (ISUDPs) for Cluster III Town: Machakos, Embu and Thika, the Government of Kenya has received a credit from the International Development Association (IDA) for the implementation of the Kenya Municipal Programme (KMP).

Implementation of the contract for Digital Topographical Mapping and the Preparation of Integrated Strategic Urban Development Plans for Cluster III Towns is intended to help achieve the Kenya's Vision 2030. The Kenya 2030 Vision for housing and urbanization is "an adequately and decently-housed nation in a sustainable environment, which will be attained by preparing and implementing strategic development and investment plans in major urban areas, implementing a decentralization policy, and strengthening local level planning and development departments in local administrations among other initiatives[3]".

For the Digital Topographical Mapping and the Preparation of Integrated Strategic Urban Development Plans for Cluster III Towns of Machakos, Embu and Thika, the Ministry of Land, Housing and Urban Development, Government of Kenya, appointed Intercontinental Consultants and Technocrats Pvt. Ltd, New Delhi, India in association with Otieno Odongo and Partners (OOP), Kenya and GEODEV (K) Ltd, Kenya.

[3] Project Appraisal Document, World Bank, http://documents.worldbank.org/curated/en/2010/04/12085837/kenya-municipal-program-project.

1.2 Purpose of the ISUDP

The purpose of the integrated strategic urban development plan is to:

- **Define a vision for future growth and development of the areas over the next 10 to 20 years**. Overall vision based on ground realities and ethos of the town is to be prepared for midterm (10 year) and long term (20 year).
- **Provide an overall integrated physical framework for urban growth of the three towns.** After digital topographic mapping of the planning areas of three towns and detailed analysis of existing situation, an overall integrated physical framework is to be prepared to fulfil the current and future requirements.
- **Provide a basis for co-ordinated programming of projects and budget, thereby serving as a downstream management tool.** A realistic implementation plan is also to be prepared for all identified projects along with a capital investment plan.

1.3 Appreciation of ISUDP's Objectives

The main objectives of the assignment are:

- To produce accurate up-to-date digital topographic maps
- To prepare digital cadastral layers in the same system as the digital topo maps.
- To conduct participatory planning exercises in the municipality to identify citizens' priorities.
- To prepare medium and long term plans to guide urban development, including action area plans, subject plans, advisory or zoning plans and regulations and other reference materials.
- To prepare strategic structure plans, showing current and proposed land use and infrastructure
- To prepare an Integrated Strategic Urban Development (ISUD) Plan.
- To prepare a Capital Investment Plan (CIP).
- To provide hands-on training to key staff of the planning department on plan preparation and implementation.
- To prepare a monitoring and evaluation strategy to assist the planning department to review and update the plan in line with the ever-changing trends of the city.

1.4 Scope of Work

The scope of work includes Digital Topographical Mapping and the Preparation of Integrated Strategic Urban Development Plans Embu Towns, namely Machakos, Thika and Embu, covering a total area of 739.259 km^2. This report concerns only Embu.

The Embu Planning Area, as agreed with Embu County is 102.28 km^2.

The main scope of work of the consultancy is:

- Digital Topographical Mapping[4]
    - Preparation of an up-to-date accurate digital topographical map
    - Placing of acceptable permanent (monumented) and accurate ground control
    - Ground control survey data
    - Digitization of all cadastral maps of all registered parcels
    - Digital Terrain Model (DTM)
    - A situational analysis of the current socio-economic, physical, environmental and cultural characteristics of the city
- ISUDP
    - Formulation of a City Vision
    - Structure plan with detailed land use and zoning regulations
    - Strategic Sector Plans:
        - Transportation Plan
        - Environmental Management Plan
        - Disaster Management Plan
        - Cultural Heritage Conservation Plan

[4] *Digital Topographical Mapping includes collection of relevant data through survey and as well as mapping*

- Development of planning policies and zoning regulations
- Capital Investment Plan
- Training

It may be noted that though components of Digital Topographic Mapping and ISUDP are mentioned separately these two components are not isolated from each other and are integrated in terms of the analysis and outputs.

1.5 Duration of the work

Under the TOR an implementation period of twelve months was allowed. However, due to delays in approval of the Planning Boundary the implementation period has been increased to fifteen months.

1.6 Commencement of the study and team mobilization

The consultant's team was mobilized within 15 days after the contract was signed. The team members were mobilized for the tasks of Inception Report as per the staffing schedule given in the proposal. The Project start-up process commenced with the arrival of the team on site. The project team met the client (Ministry of Land, Housing and Urban Development) first in order to obtain overall guidance. The tentative plan for Inception Report including field visits, list of stakeholders initial stakeholder consultations, initial data collection, etc. was discussed in detail and the plan prepared by the consultant was modified based on the client's feedback. After the first meeting at Ministry level, the project team met the coordinators of Embu town and started the project with a field reconnaissance. A Notice of Intension of Plan was published on Newspaper on 30th July 2014, to inform the general public (see Annexure 1).

1.7 Completion of Project:

The project was completed on 6th October 2015 in a final workshop for handing over the project document by Consultants to the County Government.

1.8 Project output and deliverables

The list of project outputs and deliverables is given in Table 1.2

Table 1.2: Project Output and Deliverables

S. No.	**Deliverable**
1	Inception Report
2	Launch Workshop and Situational Analysis Reports
3	Preliminary Maps including the following: • Aerial photography that is geo-referenced and rectified, in both hard and soft copy. • Ground control points, approved by Director of Surveys. • Cadastral layer of the registered land parcels. • An inventory of all physical and social infrastructure
4	Preliminary Map Validation Workshop Report
5	Interim Report with Final maps and thematic studies
6	Draft ISUD proposal including: • Structure plan • Action area plans • Planning policies and regulations • Vision workshop report
7	Validation Workshop Report for the ISUD Proposals
8	Draft Capital Investment Plan
9	Coloured (hard copies and digital) for the final ISUD
10	Workshop report for final ISUD Plans and Capital Investment Plan
11	Final ISUD Plan and Capital Investment Plan Report
12	Official launch of approved ISUD plan and Capital Investment Plan

1.9 Stakeholders Consultations:

1.9.1 Introduction

The new constitution provides rights for citizens regarding participation in public affairs, and duties on behalf of Counties and urban governments to share information and seek the views of citizens.

Section 87 of the County Government Act states:

> **Principles of citizen participation in counties**
> Citizen participation in county governments shall be based upon the following principles—
> (b) 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;
> (f) promotion of public-private partnerships, such as joint committees, technical teams, and citizen commissions, to encourage direct dialogue and concerted action on sustainable development.

In the context of physical planning, stakeholders' participation through face-to-face meetings, discussion and focus groups provides planners with insights and information regarding community needs, and promotes public understanding of the project. Consultation during the project preparation stage as an integral part of the social assessment process not only minimizes the risks and unwanted propaganda against the project but also removes the gap between the community and the project formulators, which helps in the timely completion of the project and makes the project people-friendly. The main purpose of the stakeholder consultation process is to build consensus among key stakeholders.

The main purpose of stakeholder consultation is to build consensus among key stakeholders. The stakeholders are involved through meetings and interviews to gauge the situation in terms of urban infrastructure, services, overall management etc. The key stakeholders of the town were identified as hereunder:

- **Primary stakeholders**, beneficiaries of a development intervention or those directly affected (positively or negatively) by it. They include resource persons, community leaders, resident associations, squatters and residents of informal settlements, religious leaders, traders' organizations, transporters, etc. in the project/programme area.
- **Secondary stakeholders**, those who influence a development intervention or are indirectly affected by it. They include project staff, implementing agencies, local governments, civil society organizations, private sector firms, and other development agencies.

1.9.2 Identification of Stakeholders

The following broad categories have been identified for stakeholder consultations:

- Elected Representatives
- Government Officials
- Religious organizations (Christian, Muslim, others)
- Community Based Organizations (CBOs)
- Non-Governmental Organizations (NGOs)
- Chamber of Commerce and Industries
- Citizen for (all working in different wards and or city level)
- Citizen fora/ association of Informal areas/ urban poor/ slums (if there is no citizen forum/ association existing in the informal areas then find out the representatives/ local leaders/ eminent citizen vocal about the interest of people of informal areas)
- Activists (working in the fields of human rights, livelihood, etc.)
- Eminent citizens
- Youth associations
- Women's associations
- Matatu associations
- Tuk Tuk associations
- Bikers' association (who provides public transport)
- Taxi associations

- Residents associations
- Security agencies – the police, community policing associations
- Others

The identified stakeholders were consulted in the form of focussed group discussion as well individual interviews. The outcomes of these consultations were presented in the Situational Analysis Report and the Interim Report. A complete check list of identified stakeholders was prepared for general consultation and for the purpose of workshops to be organised during the project duration is given in the Annexure 2.

1.9.3 Stakeholder consultation

The consultations included focus group discussions with selected stakeholders, one to one discussions and workshops. In most cases the discussions took a form of debate and later exchanges of views. The participants shared their ideas and concerns, and often proposed solutions. The problems and recommendations generated by these consultations have been utilised for finalising the proposals of ISUDP.

1.9.4 Workshops

Four workshops were held

1. Launch workshop – 4 August 2014
    1. This gave the participants an opportunity to understand the objective of the ISUDP and the process that would be followed. It also gave them an opportunity to meet the consultants and for the stakeholders to express their aspirations
2. Situational Analysis and Visioning workshop – 24 November 2014
   This allowed the consultants the opportunity to present their analysis of the existing situation and for the participants to add to or correct this analysis. Participants were able to work in small groups, each of which concentrated on a specific sector, in making recommendations regarding future planning. A vision of town was also formulated during the workshop.

3. Draft ISUDP – 8 June 2015
   This allowed the consultants to present their plans and for the stakeholders to make comments and suggest changes to the proposals. Participants were able to vote regarding what they considered to be the top five most important issues to be addressed at the implementation stage.

4. Final workshop – 6 October 2015
   This was an opportunity for the consultants to present the final plan and for H E the Governor to publicly express the adoption of the plan.

   The brief proceedings of all the workshops are presented in Annexure 3, Annexure 4, Annexure 5 and Annexure 6.

Stakeholder consultations

Meeting with H.E. the Governor of Embu County

Meeting with Chairman, Jua Kali Association

Meeting with Hon. Dy. Speaker, Embu County Assembly

A workshop in progress

Interaction with Kenya Power Officials

Site visit with CCPPO

Embu Markets Association

Group discussion during workshop

Chief Officer; Land, Water, Environment and Water Resources

CEC Member for Trade Investment and Industrialization

Chief Officer; Land, Water, Environment & Water Resources

Deputy Country Director of Environment

Monthly Meetings: Apart from the workshops and other consultations, a Technical Committee comprising the KMP Team from the Directorate of Urban Development, Ministry of Land, Housing, Urban Development; County Officials and Consultants' Team, was formed under the Chairmanship of the Chief Officer; Land, Planning and Development. The monthly meetings to date have been held on the dates below:

- 16 July 2014
- 13th August 2014
- 10th September 2014
- 12th November 2014
- 14th January 2015
- 19th February 2015
- 12th march 2015
- 26th August 2015 (Steering Committee, Chaired by H.E. the Governor of Embu)
- 15th September 2015

1.10 Methodology

Figure 1.1 shows the key tasks to be undertaken according to the requirements of the Terms of Reference. Moreover it details the inter relationships between each task since some tasks start simultaneously. For better understanding of the methodology[5] it has been divided into 3 phases, 6 stages and 33 activities. The core tasks of phase I are the assessment of the status quo of the town, including basic topographical as well as land use mapping. Core activities under phase II are the formulation of the vision, developing alternative planning concepts, and preparing structure and action

[5] As per the Minutes of the Meeting dated 16th April 2013, the consultant has made changes in the methodology.

area plans along with proposed land use mapping. Phase III activities include the preparation of a capital investment plan and zoning and development control regulations. Participatory plan preparation is an integral part of the whole process. The detailed methodology was described in the Inception Report but a brief methodology is presented below.

Phase I

Stage 1: Familiarization and Launch Workshop

- Mobilization and Start-up Meetings
- Identification of Stakeholders and Stakeholders Consultation
- Initial Reconnaissance
- Collection of Aerial Photographs and Other Maps
- Inception Report Submission
- Launch Workshop
- Launch Workshop and Situation Analysis Reports

Stage 2: Preparation of Existing Land Use Map and Assessment of Existing Situation

- Digital topographical mapping, cadastral map and land use map preparation
- Submission of preliminary maps
- Preliminary map validation workshop and report
- Data Collection
    - Primary survey and stakeholders consultations
        - Aerial Photography - establishing ground control points etc
        - Cadastral maps
        - Land use survey
        - Socio-economic surveys
        - Traffic and transportation survey
        - Community/stakeholder consultations
    - Secondary data collection and review
        - Maps: Land Records, Topographic Sheets and Other Maps
        - Socio-Economic Data: Demography, Economy,
        - Housing
        - Infrastructure: Physical and Social Infrastructure
        - Land Use
        - Urban Planning and Legal Framework/Urban Governance
        - Municipal Finance
        - Transportation
        - Environment
        - Disaster Management Plan

Stage 3: Assessment of Existing Status

- Sectoral Analysis
- Norms and Standards
- Identification of Gaps
- SWOT Assessment
- Interim Report, Final Maps and Thematic Studies

Phase II

Stage 4: Formulation of Vision

- Visioning Workshop
- Population Projections

Stage 5: Preparation of Draft Integrated Strategic Urban Development Plan

- Alternative Planning Concepts
- Hierarchy of Planning Units
- Action Area Plans
- Formulation of Proposed Structure Plan and Development Control Regulations
- Draft ISUD Plan Proposal Report
- Validation workshop for the ISUD Plan Proposals and Report

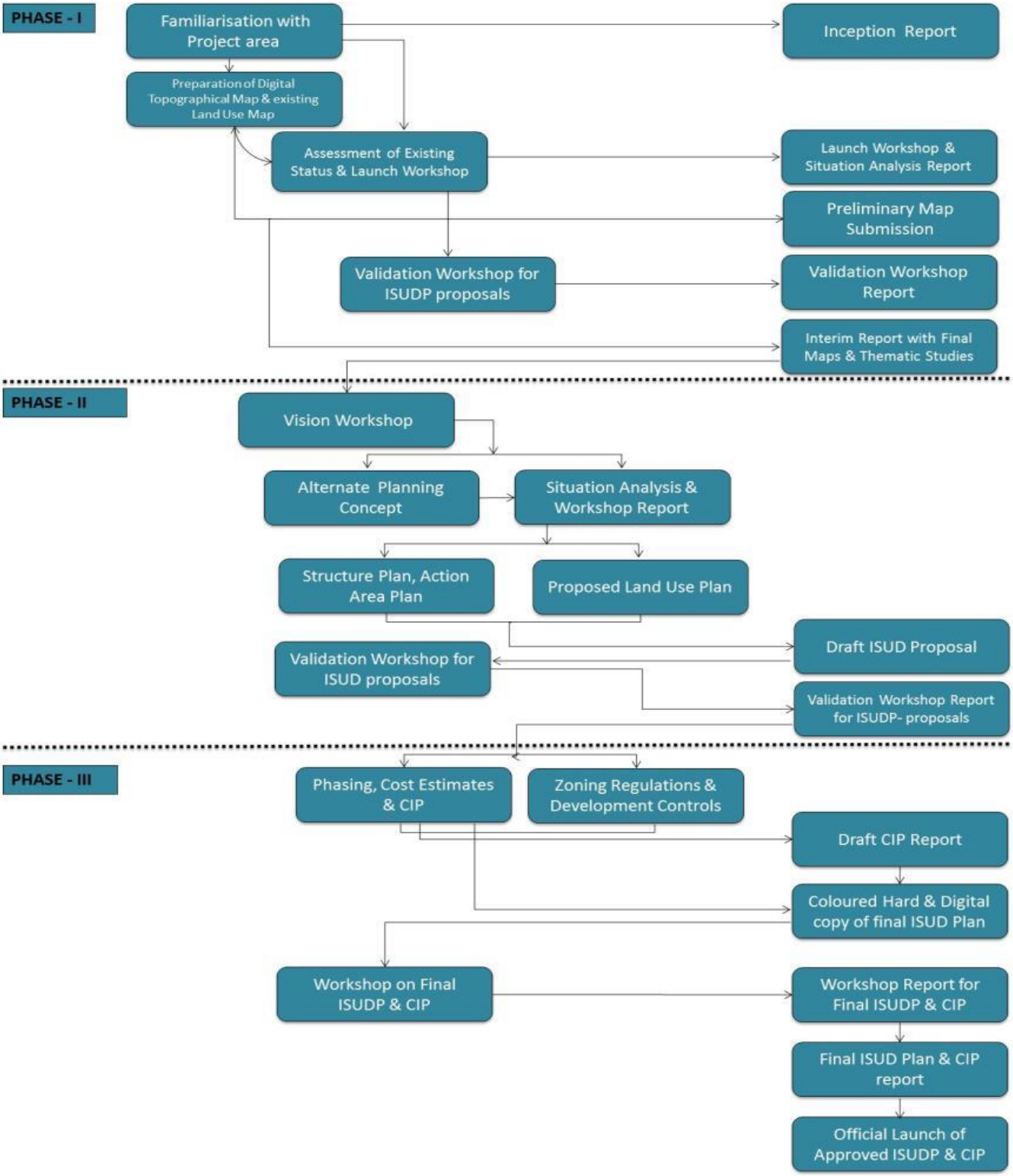
Phase III

Stage 6: Costing, Phasing and Capital Investment Plan

- Phasing and Cost Estimates
- City Investment Plan
- Institutional Arrangements, Co-ordination and Framework
- Monitoring and Evaluation
- Draft Capital Investment Plan Report
- Coloured (hard and digital copies) for the final ISUD Plan
- Workshop for final ISUD Plans and Capital Investment Plan and Report
- Final ISUD Plan and Capital Investment Plan Report
- Official launch of approved ISUD plan and Capital Investment Plan

The process is shown graphically in the Figure 1.1.

Figure 1.1: Preparation of Digital Topographical Mapping and Integrated Strategic Urban Development Plans for cluster III Town: Embu



1.11 Report Structure

The structure of this report is as follows:

1. Introduction
2. Town profile and projection
3. Development Context
    a. Vision
    b. Planning concept
    c. Spatial development models
    d. Proposed Development Concept
    e. Illustration of Concept
4. Gaps in existing provision and future demand
    a. Water
    b. Sewerage
    c. Traffic and transportation
    d. Stormwater drainage
    e. Fire safety
    f. Solid waste
    g. Electricity and street lighting
    h. Education
    i. Health
    j. Social and economic facilities
    k. Housing
5. Structure Plan
    a. Existing land use
    b. Land use norms
    c. Planning principles
    d. Spatial development strategy
    e. Population density
    f. Future expansion of Embu Planning Boundary
    g. Population growth scenarios
    h. Development options
    i. Land Use Plan
6. Strategic Sector Development Plan
    a. Commerce and industry
    b. Physical infrastructure
    c. Roads and transport
    d. Environment
    e. Disaster management
    f. Tourism and heritage
    g. Institutional set-up
    h. Financial management
7. Action area plans
8. Development Control and Zoning Regulations
    a. Development control
    b. Zoning
9. Implementation
    a. Implementation plan
    b. County economy
    c. The urban dividend
    d. Public private partnerships
    e. Planning under the new constitution

2 Town profile and projections

This chapter presents town profile, population projection and land requirement projections of Embu town.

2.1 Town profile

The town profile is presented in terms of history and administration, regional context, local context, demography and economic status.

2.1.1 History and Administrative divisions

History

Embu is the capital and largest town of Embu County which is located within the former Eastern Province of Kenya. The County was formed on 4 March 2013 under the new Kenya Constitution.
The Embu are a Bantu people speaking the Embu language as a mother tongue. To the south of Embu are to be found their cousins, the Mbeere people. In essence Embu county encompasses the ethnic Kiembu dialect, from whom the Embu county's name derives, and the Kimbere dialect spoken by their Mbeere conterparts who inhabit the lower reaches of the county. Historically, both were just referred to as the Embu people. To the east, Embu's neighbours are the closely related Kikuyu in Kirinyaga, Nyeri, Kiambu, Muranga and Nyandarua counties. The Meru people border the Embu to the East (http://en.wikipedia.org/wiki/Embu_people).

The Aembu believed that their god, 'Ngai', lived on the top of Mount Kenya. Prayers and sacrifices were traditionally made to this god. However, today, the majority of Embu and Mbeere people are Christians.

Christianity was introduced to Embu around the same time the British jurisdiction was established in 1906. In 1912, the Church Missionary Society (Anglican Church) built the first church at Kigari in Embu County. This mission served the entire Embu and Mbeere. Later, missions were opened in Karungu in Embu, and Kiritiri and Kanyuambora in Mbeere.

In 1922, the White Fathers, as they were then called, set up the first Catholic mission in Ngoire near Makengi in Embu. They later opened missions in Kyeni, Kevote in Embu and Siakago in Mbeere. Since then, both the Anglican and Catholic Churches have dominated in Embu and Mbeere. Similarly, other Christian denominations were set up hence various Christian churches have a presence in Embu County.

The headquarters of the Roman Catholic Diocese of Embu is the cathedral of St. Peter and Paul Cathedral at Karurina. It is the largest church in the County and has a unique African-inspired design in that its rooftop is modeled on the shape of the peaks of Mt. Kenya. The Anglican Diocese of Embu has its headquarters at St. Paul's Cathedral in Embu town. Furthermore, another Anglican cathedral is based at Siakago which is the headquarters of Mbeere diocese.

The Presbyterian Church of East Africa (P.C.E.A) has its main place of worship at Blue Valley area of Embu town. Other mainstream churches such as the Salvation Army and African Independent Pentecostal Church of Africa (A.I.P.C.A) also have their headquarters in Embu town. There are also numerous evangelical churches such as Winners Chapel, Deliverance Church, Pentecostal Church, Full Gospel church and many others.

There are relatively few Muslims, and they reside mainly in the major towns of the County, however their population is growing steadily. In Embu the main mosque is the Jamia Mosque located close to the Municipal Stadium, while others are in Majengo, Dallas and Majimbo estates. There are also mosques at the Prison and within the Administration Police base. Outside Embu town, there are mosques at Siakago, Kiambere and Runyenjes towns.

Historically Embu was a major trading centre in Eastern Kenya. For a long time, it was the main economic centre for the Embu and Mbeere communities, as well as other communities from central Kenya. It was founded in 1906 when a British Government Agent set up a colonial military camp. It assumed more functions when it became an administrative centre. The old town lies between two rivers, Rupingazi to the west, and Kapingazi River to the east.

In 1925 Embu town was made the seat of the African Native Council for Embu District. Administrative offices were constructed and educational institutions like Kangaru School was established. Embu District by then comprised the present Embu, Mbeere, Kirinyaga and Chuka divisions of the town; the Asian community started the commercial area.

Other notable developments during this period were the administrative police lines, Embu hospital, mainstream churches (Roman Catholic, and Anglican churches) and some residential areas like the Government quarters. The A.P. lines were later moved to the current site and the old one was annexed to the Embu General Hospital.

The period between 1940 and 1963 saw the development of Embu town as the District Headquarters. In 1940, Embu, as the District headquarters became one of the military recruiting centres for World War II. Matakari residential area was established as an "Emergency village" after the declaration of state of Emergency in 1952. This area was outside the old urban boundary of Embu town. It was also during this period when Kirinyaga district was annexed from Embu with headquarters at Kerugoya and Chukka division became part of Meru District. In 1971, Embu became a Municipality and the boundary was extended from 3Km^2 to 24Km^2. The municipal boundary was extended again in 1991 to cover an area of 80 sq. km.

The 1980s saw Embu growing more into an administrative centre than a commercial centre with the transfer to Embu of the Provincial Police Headquarters from Isiolo, Provincial General Hospital from Machakos and the Provincial Works Headquarters from Nyeri.

Mbeere District was carved out of the former Embu district in the 1990s. Siakago, which was founded in 1906 by the British settlers for administrative purposes and as an agricultural market town, and is about 25 km east of Embu, was made its headquarters.

Administration
Embu County has four constituencies namely Mbeere South Constituency, Mbeere North Constituency, Runyenjes Constituency and Manyatta Constituency. These constituencies or sub-counties are further divided into Electoral Wards. There are total 20 electoral wards in Embu County as given below (http://embu.go.ke):

Constituency	No of Wards
Manyatta	6
Runyejes	6
Mbeere North	3
Mbeere South	5
Total	**20**

Source: http://embu.go.ke

The Embu town is located within the Manyatta Constituency.

2.1.2 Embu in regional context

Embu town is located within the Embu County, which is located within the former Eastern Province of Kenya. The County was formed on 4 March 2013 as one of the 47 Counties established under the First Schedule of the Constitution of Kenya 2010 (http://embucounty1.net/#sthash.PyArybKF.dpuf). The Figure 2.1 shows the location of Embu County in Kenya.

The Location of Embu town within Embu County is shown in Figure 2.2. Embu town is located approximately 130 kilometres northeast of Nairobi towards Mount Kenya on the West side of the County (refer 2.2). It is 120km from Meru and 25km from Siakago town. It is served by two major roads: the B6 Nairobi-Embu-Meru road, and the B7 Embu-Siakago-Garissa road. Located on the south eastern a slope of Mount Kenya, Embu has an elevation of 1,350 metres (4,429ft) located 0°32′S, and 37°37′E.

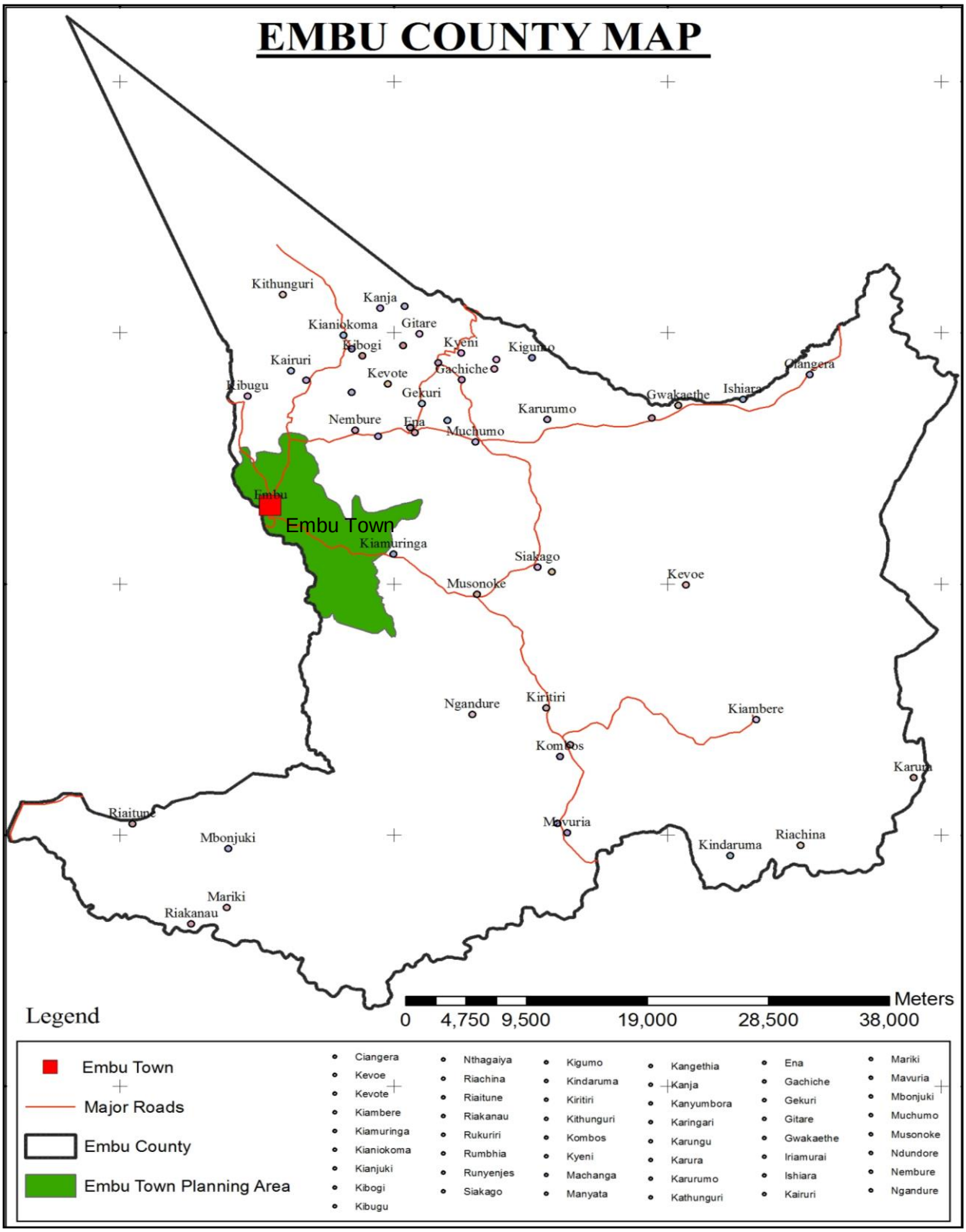
Road transport is the main mode of transport in Embu town which is well linked to the international, national, regional and local transportation system. There is a small (1km long) airstrip at Kagonga, which is 7.1km southeast of the heart of the town. The facility is currently under rehabilitation and

upgrading. There is no railway connection. Both private and public means of transport are used in the town with public means taking the biggest share.

Embu earlier served as the provincial headquarters of the Eastern Province. Embu County is divided into sub-counties which are headed by a sub-county administrator, appointed by a County Public Service Board. Under the former Constitution of Kenya, the provinces of Kenya were subdivided into a number of districts. In line with restructuring the national administration to fit with the devolved government system brought in by the 2010 Constitution the 8 provinces and their administrators and districts were replaced by County Commissioners at the county level, while former districts existing as of 2013 were reorganised as Sub-Counties, and had Deputy Commissioners appointed over them (http://en.wikipedia.org/wiki/Sub-Counties_of_Kenya).

Figure 2.1: Location Embu County in Kenya

Figure 2.2: Location of Embu Town within Embu County



The county is also divided into constituencies (which are almost similar of sub-counties). There are total four constituencies within the Embu County viz. Manyatta, Runyenjes, Mbeere North, and Mbeere South. The Embu town is in Manyatta constituency as shown in Figure 2.3. The Embu Town is located on the South-West of Manyatta constituency.

Figure 2.3: Location of Town and Constituencies

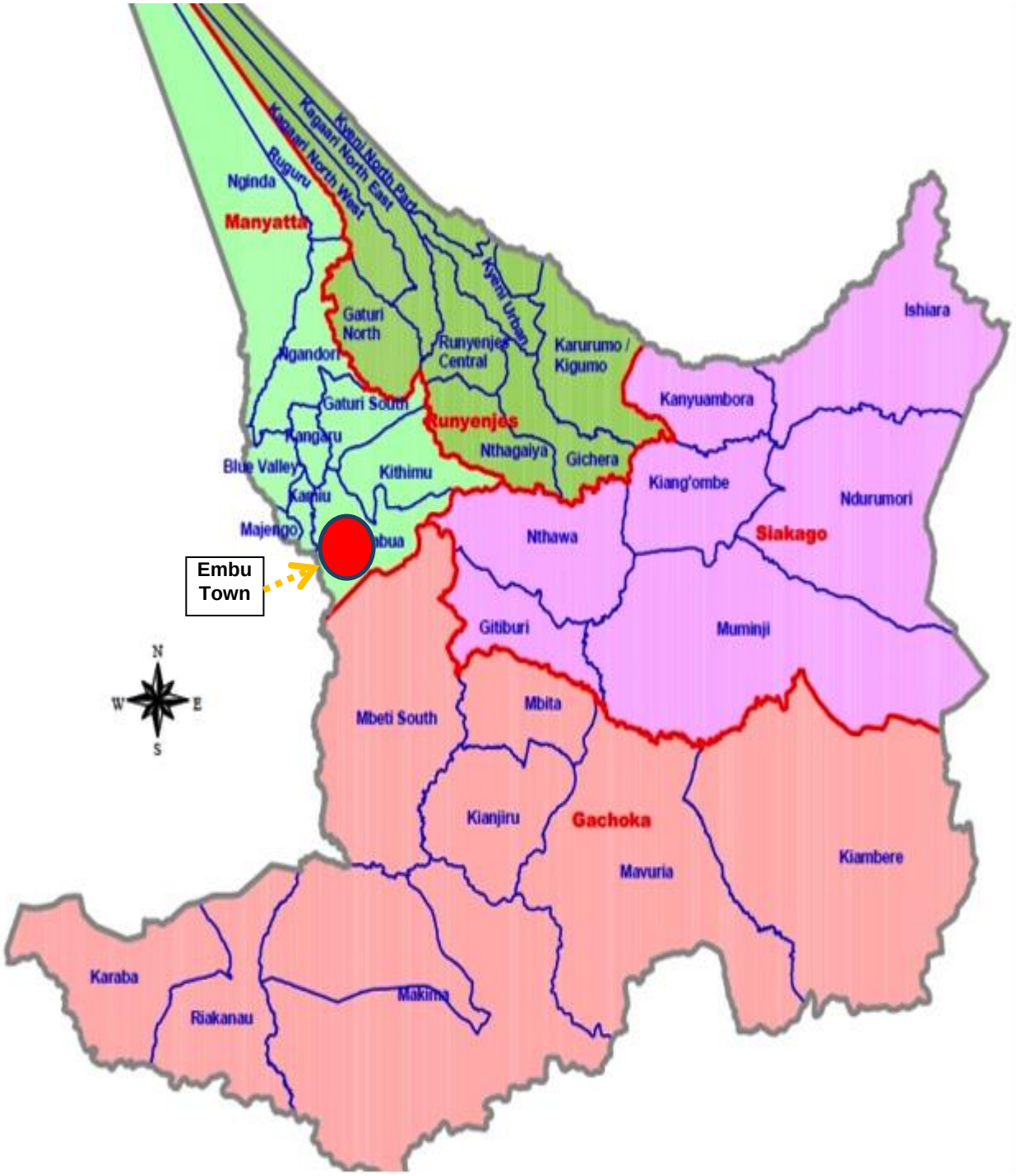
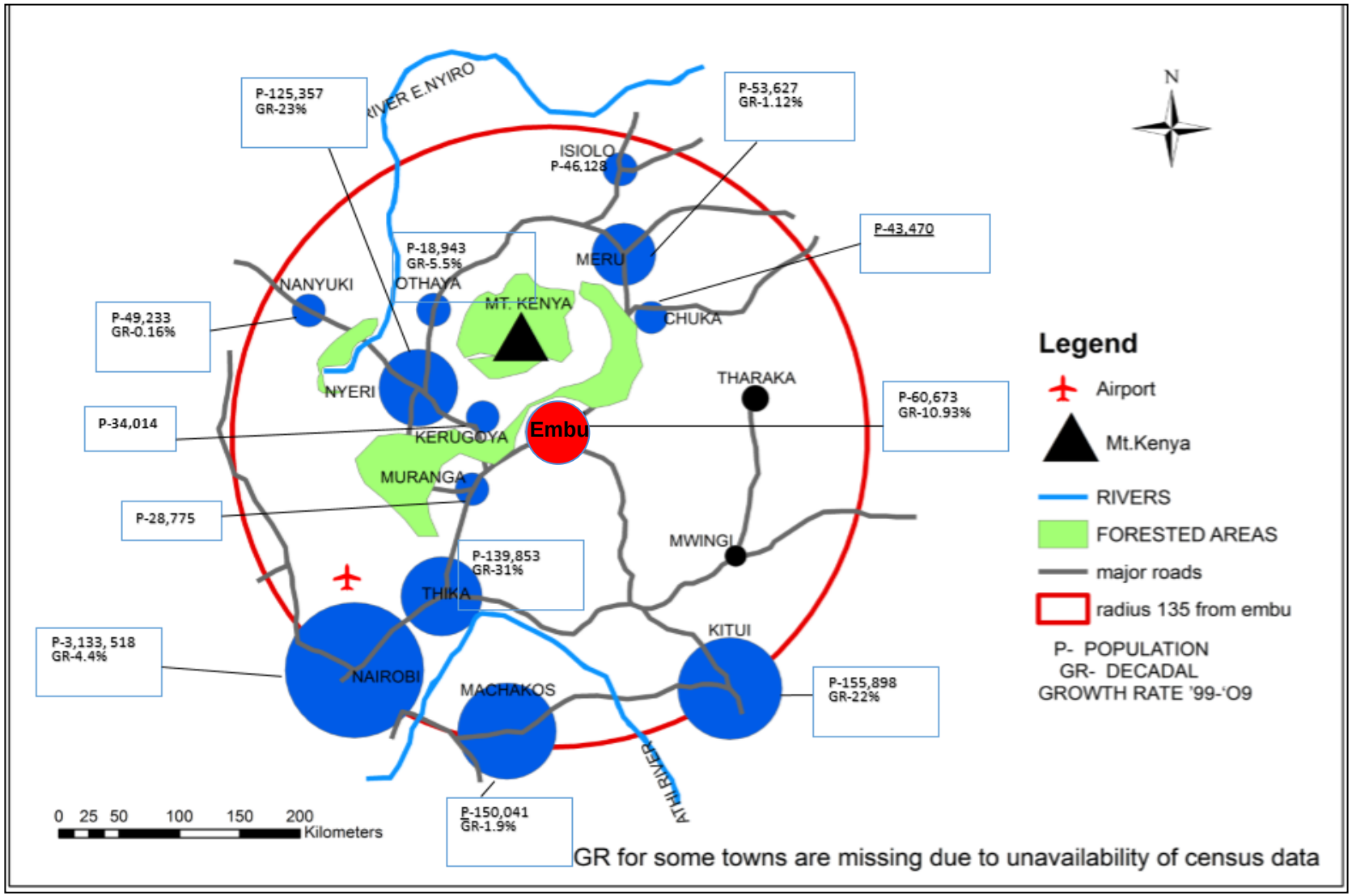


Figure 2.4 shows the relative location of Embu town within a radius of 135 km. Embu town is strategically located in Mt. Kenya region and is one of the major regional centres.

Figure 2.4: Regional Setting of Embu Town



2.1.3 Demography

At this stage demography has been analyzed in terms of population growth, sex ratio, household size and population density, as explained below.

2.1.3.1 Population Growth

As shown in Table 2.1, the population of Embu town grew from 3,928 in year 1969 to 60,673 in year 2009. The growth rate of town has not been consistent. It grew at a very high growth rate of 30.7% (more than the average urban population growth and average population growth of Kenya) during the decade of 1969 to 1979 while for the period 1999-2009 it was 1.6% (much less than the average Kenya urban population growth rate and Kenya total population growth rate). The main reason for the declining growth rate could be economic migration to other urban centres such as Thika and Nairobi. Another reason as stated by stakeholders during the field visit could be that in the recent past some people have moved from Embu Town to Murinduko (2 km away from Embu Town) mainly because of cheaper land availability. The population of Murinduko was 3,161 in the year 1999.

Table 2.1: Population Growth of Town and Kenya

Year	Embu Town		Kenya			
Year	Total Population	Annual Growth Rate (%)	Total Urban Population	Annual Growth Rate (%)	Total Population	Annual Growth Rate (%)
1962	-	-	670,950	-	8,636,300	-
1969	3,928	-	1,078,908	8.7	10,942,705	3.82
1979	15,986	30.7	2,315,696	11.5	15,327,061	4.01
1989	26,525	6.6	4,264,873	8.4	21,448,774	3.99
1999	52,446	9.8	6,156,979	4.4	28,686,607	3.37
2009	60,673	1.6	9,151,992	4.9	38,610,097	3.46

Source: Kenya National Bureau of Statistics

The population of Embu County is 516,212 (2009) and the Embu town has around 12% of the county population.

The area and population of Embu town given in above table are of former Embu Municipality. For the current project the previous municipal boundary, modified by the County Government, has been adopted. The total area within the Embu Planning boundary is 102.28km^2 and the population is 66,805 (2009) and 82120 (2015) as shown in Table 2.2.

Table 2.2: **Population of Embu Planning Area**

Sub-Locations	Total population (2009)	Total population (2015)	Area (square km)
Kangaru	10220	12563	10.53
Nthambo	4290	5273	8.59
Njukiri	4615	5673	5.87
Kamiu	15020	18463	5.79
Itabua	8228	10114	38.93
Dallas/stadium	18767	23069	5.02
Kiamuringa	4973	6113	17.67
Gachoka	642	789	8.99

Sub-Locations	Total population (2009)	Total population (2015)	Area (square km)
Gachuriri	50	61	0.88
Embu Town	66,805	82120	102.28

Source: Kenya National Bureau of Statistics, 2009 and Consultants' Projection

The sub-locations Gachoka and Gachuriri are not fully part of the planning area as most of their area is outside the planning boundary. Only 15% and 1.3% of total area of Gachoka and Gachuriri sub-locations respectively fall within the planning boundary of Embu Town. Therefore the populations of these sub-locations, as indicated in the above Table 2.2, are not the total population but it has been estimated proportionate to the area falling within the planning boundary.

2.1.4 Economy of town

The economic base of a town affects its prosperity and is critical to ascertain the overall sustainable development of town. This section focuses on major the economic activities and occupational pattern of the town.

The economic profile has been assessed in terms of GDP status at national level, GDP growth rate of east Africa region, Labour Force Participation Rate, Employed Population and types of economic activities.

The plan will take note of the economic goals of Kenya Vision 2030. The Vision 2030 is anchored on three key pillars: economic, social and political governance. The **economic pillar** aims to achieve an average economic growth rate of 10 per cent per annum and sustaining the same till 2030 in order to generate more resources to meet the Millennium Development Goals and vision goals.

Economic Pillar: Moving the Economy up the Value Chain
After a comprehensive analysis of Kenya's global competitiveness, six key sectors were identified to deliver the 10 per cent economic growth rate per annum envisaged under the economic pillar: tourism; agriculture; manufacturing; wholesale and retail trade; business process outsourcing (BPO); and financial services.

The key aspects of the economic profile are explained in the subsequent sections:

2.1.4.1 Employed Population

As per Central Bureau of Statistics employed persons were persons who reported to have worked and those holding jobs but absent from their jobs (on leave or sick) during the 7 days preceding the census night. The economically active or the labour workforce consists of the employed and unemployed.

Table 2.3: Percentage of Employed Population to the Total Labour Force Population (Population aged-15-64), 1999

Country/ Province/ District	Total			Rural			Urban		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
Kenya	89.9	91.6	88.1	92.1	93.4	90.9	82.3	86.3	76.3
Eastern Province	91.7	93.4	90.0	92.0	93.7	90.5	86.9	90.0	83.3
Embu District	94.3	95.6	93.0	95.1	96.2	94.0	89.0	91.9	85.8

Source: Kenya National Bureau of Statistics

As shown in Table 2.3, the percentage of employed population to the total labour force in 1999 was 89.9%; 91.7% and 94.3% in Kenya, Eastern Province and Embu District respectively. The data indicate the high rate of employment. The rate of employment is higher in rural areas compare to urban areas. It may be noted that in absence of data availability for the county and town, the district level and province level data have been analysed.

2.1.4.2 Per Capita Income

Kenya's per capita income increased from USD 771 in the year 2009 to USD 994 in the year 2013. As shown in Table 2.4, Kenya has a higher per capita income than other East African countries.

Table 2.4: Per Capita Income (USD**)**

Year	2009	2010	2011	2012	2013
Kenya	**771**	**793**	**816**	**933**	**994**
Burundi	195	220	247	251	267
Ethiopia	375	337	351	467	498
Rwanda	495	519	575	623	633
Tanzania	504	525	530	609	695
Uganda	451	472	441	551	572

http://data.worldbank.org/indicator/NY.GDP.PCAP.CD

2.1.4.3 Poverty Level

Kenya's poverty line- In 2005, the cost of basic food and non-food needs per month for one adult was established at Ksh 1,562 for rural areas and Ksh 2,913 for urban areas. Throughout this report, the poverty rate or headcount refers to people living in households with per adult equivalent expenditures below these amounts. Adjusting for increases in prices since 2005 using the Consumer Price Index (CPI), the approximate value of the rural poverty line in 2012 was Ksh 2,900 per month for rural areas and Ksh 5,400 per month for urban areas (World Bank).

Kenya's poverty lines expressed in 2005 international dollars – the unit of measure used by the global 1.25 "dollar per day" measure of poverty—was approximately 1.57 dollars per day per person for rural areas, and 2.9 dollars per day per person for urban areas. Expressed in Kenyan shillings, the 1.25 poverty line in 2005 was approximately Ksh 1,246 per day. Using this benchmark, Kenya's 1.25 dollar a day poverty rate in 2005 was 43.3 percent overall (World Bank).

With strong economic growth, a peaceful political transition, a new constitution and a rapidly growing and educated labor force, Kenya has growing potential to tackle poverty. In 2005, close to 17 million Kenyans (**47 percent of the population**) were estimated to be living in poverty. As there has not been another nationally representative household budget survey since 2005 that enables poverty measurement (http://www.worldbank.org/content/dam/Worldbank/document/Africa/Kenya/kenya-economic-update-june-2013.pdf)

The district level poverty data has been used as an indicator of conditions prevailing in the locality. The Table 2.5 indicates representative districts of high, medium and low poverty rates. The highest poverty rate is in Turkana District (94.3%) and lowest rate is in Kajiado District (11.60%). In comparison of poverty range across districts in Kenya, the Embu district has a moderate poverty rate of 36.6%.

Table 2.5: Poverty status of Representative District

District Name	Poverty Rate (2005-06)	Number of Poor (2005-06)
Turkana	94.30%	481442
Marsabit	91.70%	118786
Mandera	87.80%	225812
Machakos	59.60%	660220

District Name	Poverty Rate (2005-06)	Number of Poor (2005-06)
Kuria	58.90%	102846
Mt. Elgon	58.70%	126907
Embu	**36.60%**	**118012**
Thika	36.10%	194391
Meru Central	23.30%	127383
Nairobi	22.00%	632373
Kiambu	21.80%	202833
Kajiado	11.60%	46578
Kenya	**47%**	**17 million**

Source: https://www.opendata.go.ke/browse

The poverty level data for Embu town captured by Kenya State of the Cities Baseline Survey shows that about half (49%) of all households have monthly expenditures below the poverty line (which is determined by the household composition). This proportion is considerably lower when the head of household works either in a "skilled" profession (35%, vs. 54% un-skilled occupation if household head). Likewise, it is significantly lower when the household owns a water connection to when it does not. An interesting fact about poverty is that a large proportion of households that reported ownership of their structure, land, or both was poor (63%), a considerably higher rate than that calculated upon all households.

2.1.4.4 Industries

As per the Draft Embu Local Physical Development Plan, the industrial activities within the planning area are agro-based. These are mainly coffee factories and the Macadamia Nuts Processing Factory. However low coffee prices caused a decline in coffee production and consequently some coffee factories have closed or lie idle staffed with only maintenance workers. Most coffee farms have been put under maize and beans. Other agricultural related industries are bakeries and home based fruit processing activities. The Embu Co-operative Union constructed a macadamia processing factory at Kamiu, which is currently in operation.

Key industries

1. ASPEN - manufactures Yoghurt and REAL milk.
2. Several Honey Processing plants
3. Spice making
4. Water purification and packaging

Other industrial activities include carpentry, tailoring, general fitting, metal fabrication, motor vehicle repair and the leather works. It may be noted here that all the information about industry has been taken from the Draft Embu Local Physical Development Plan and will be verified at later stage to know the updated status. The informal industrial activities (Jua Kali) are functioning under the Embu Jua Kali Association. There are around 49 Jua Kali industries namely carpentry and joinery (N-27), mechanics (N-15), welding (N-3), tailoring (2), cushion maker (1) and a tin and blacksmith (N-1).

There are many informal markets especially along road reserves – an effect of the Kenyan Kandogo economy emanating from low and unreliable incomes of majority of residents.

A modern office block with shops in the CBD

2.1.4.5 Commercial Activities

The main economic activities in this category include wholesale, retail trade, restaurant, hotels and sale of farm produce. Employment in these commercial activities has been increasing over the years. This attributed to the fact that Embu is a commercial, service and distribution centre. The town has a number of informal commercial

activities such as hawking of cheap, light commodities, sale of second hand clothes, food and vegetable kiosks on the street and in residential areas. The informal commercial activities provide earning to those who are not in formal employment. The CBD currently has a total of 3074 business establishments (see Table 2.6).

Table 2.6: Type and Number of Businesses in the Central Business District in Embu Town

Sl. No.	Type	Numbers
1	Large Traders	368
2	Medium Traders	886
3	Small Traders	1588
4	Others	232
Total		3074

Source: Draft Embu Local Physical Development Plan, 2005

2.1.4.6 Agriculture

Embu town is situated in a rich agricultural hinterland with most of activities within the town related directly or indirectly to the agriculture sector. Agriculture activities are mainly carried out in Githimu (787ha) and Kirigi (545.4ha) sub locations. Main crops of the area are beans, maize, coffee and horticulture crops (Draft Embu Local Physical Development Plan).

Kenya's economy is heavily dependent on agriculture, which contributes to rural employment, food production, foreign exchange earnings and rural incomes. The agricultural sector directly accounts for about 26 per cent of Kenya's Gross Domestic Product (GDP) and 27 per cent indirectly through linkages with manufacturing, distribution and other service related sectors. The sector accounts for 65 per cent of Kenya's total exports, 18 per cent and 60 per cent of the formal and total employment, respectively. The agriculture sector has been a key driver of economic growth in Kenya for the last four decades and is the main source of livelihood for almost 80 per cent of Kenya's population living in rural areas. The key policy goals of the sector are in line with Kenya Vision 2030, and are guided by the Agriculture Sector Development Strategy (Government of Kenya, 2003) framework, which emanated from a revision of the Strategy for Revitalizing Agriculture (Government of Kenya, 2003). Overall, the sector is critical in realizing the various targets that are set out in the Millennium Development Goals (MDGs), especially that of reducing hunger and poverty.

(http://www.kippra.org/downloads/Kenya%20Economic%20Report%202013.pdf)

The agricultural potential in the county varies from low potential areas in some parts of Mbeere to high potential areas in the Embu high lands. Key agricultural activities are characterized by mixed farming. The main cash crops grown are coffee, tea, macadamia and cotton. The main food crops include maize, beans, Irish potatoes, sweet potatoes, cassava, green grams, cowpeas, sorghum and millet. Vegetable production is practiced mainly in the small holder irrigation schemes but also under rain fed conditions. Livestock production which includes dairy and beef cattle, poultry and shoats is also a major agricultural activity in the county. Horticulture is a major enterprise in the region producing vegetables, fruits, nuts and floriculture for both local and export markets. The production statistics of major food crops, industrial crops and horticulture crops are given in the tables below.

Table 2.7: Major Subsistence Food Crops Production Statistics of Embu County

Food Crop	Area (Ha) 2011/12	Production (Tons) 2011/12 in '000'	Value (Ksh) 2011/12 in '000'	Area (Ha) 2012/13	Production (Tons) 2012/13 in '000'	Value (Ksh) 2012/13 in '000'
Maize	28,310	25,228	756840	30,920	33,393	1,001,799
Sorghum	1423	1285.5	51420	1,535	1,381	27,620
Pearl millet	1,230	1014	35499	1,295	1,058	35,622
Beans	20,190	14542	872520	22,105	15,473	928,380

Food Crop	Area (Ha) 2011/12	Production (Tons) 2011/12 in '000'	Value (Ksh) 2011/12 in '000'	Area (Ha) 2012/13	Production (Tons) 2012/13 in '000'	Value (Ksh) 2012/13 in '000'
Cow peas	2,590	1399	69950	2,620	1,572	34,320
Green grams	860	464	32480	875	473	37,840
Sweet potatoes	540	800	28,000	620	870	30,450
Cassava	960	1,428	34,618	1,225	1,776	42,624
Irish potatoes	2560	5114	102,280	2,565	5,294	104,310
Total	71,740	51,274.5	1,983,607	63,760	61,290	2,242,965

Source: Embu County Profile, Ministry of Agriculture, 2013

Table 2.8: Major Cash Crop Production (excluding horticultural): Embu County

Crop	Area (Ha)	Production (Tons)	Value (Ksh)	Area (Ha)	Production (Tons)	Value (Ksh000)
	2011/12	2011/12	2011/12	Current 2012/13	Current 2012/13	Current 2012/13
Cotton	840	668.5	23397.5	720	576	20,160
Coffee	1,720	16772	1,090,180	1,723	16,804	1,260,094
Tea	3,820	30,573	1,681,515	3,825	33,630	1,849,650
Macadamia	721	2311	2,332,000	726	2660	1,446,501
Total	7101	50324.5	5127092.5	6994	53670	4,576,405

Source: Embu County Profile, Ministry of Agriculture, 2013

Table 2.9: Major Horticultural Crops: Embu County

Horticultural Crop	Area (Ha) 2011/12	Production (Tons) 2011/12	Value(Ksh) in 000 2011/12	Area (Ha) 2012/13	Production (Tons) 2012/13	Value (Ksh) in ,000 2012/13
Grafted mango	3,120	24,396	14,637	3,144	32,535	85,692
Local mangoes	116	1,624	4,220	116	1,615	4,106
Bananas	4,198	13,210	954	4379	11,294	833
Passion fruits	110	1,307	9,751	121	2,247.5	7,585
Avocadoes	372	3130	38.55	421	7,463	59.29
Kales	150	665.2	15.64	514	1,787	31.68
Tomatoes	1681.5	1534	51.455	2236	3974	100.84
Carrots	91	125	1.87	192	147.7	2.54
Butternuts	89.5	211.5	2.78	118	423	5.72
Watermelons	126	1522	13.175	163.5	1972	37.088
Irish Potatoes	498	4625	69.375	571	5139	73.25
Total	10,552	52,349.7	29,754.845	11,975.5	68,597.2	98,526.408

Source: Embu County Profile, Ministry of Agriculture, 2013

Agriculture area within Embu Town Planning Area: According to our calculations about 63% of the total planning area in under agriculture activities. There is no detailed information about the cropping pattern within the planning area as data are only available at the County level. But from field observations and stakeholder consultations, the consultants have identified the main crops within the planning area as maize, beans, pearl millet, coffee, tea, potatoes, avocados, macadamia nuts, mangoes, bananas, watermelons, etc. Considering the cropping pattern within the planning boundary and with Embu County there is a lot of potential for developing Embu town as an agro-processing hub for the county and region.

2.1.4.7 Tourism

Tourism is travel for recreational, leisure, or business purposes. The World Tourism Organization defines tourists as people "travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes". Tourism plays a major role in economy of any town by attracting people from outside. Tourism helps the local economy by creating better infrastructure and jobs.

Embu is not renowned as a tourist destination, but due to its proximity to Mount Kenya it attracts a small number of tourists.

2.1.4.8 Informal Sector

The general view of the informal sector is that it comprises activities primarily of petty traders involved in such activities as selling of second-hand clothes, shoe shining, food selling and repair and construction; operating mainly from the streets of the main urban centres. It can also be described as any unregulated activity generating income and profits, though on a small scale, typically using simple skills. Such activities include vegetable selling, street vendors, masonry, carpentry, etc.

In Kenya, the informal sector is referred to as jua kali, which literally means fierce sun in Swahili. The name stems from the fact that the workers in the informal sector work have the hot sun beating on their heads and backs, while working on metal, wood or selling wares on the streets. The work involved is usually done under harsh conditions unsuitable for labour.

The Kenyan informal sector usually operates on small-scale, locally and at a subsistence level. They have fewer employees (especially home-based enterprises), they operate for a shorter period, and have poor access to water and electricity and few sell outside the establishments where the entrepreneurs live. Kenya's informal sector is large and dynamic. (http://www.nayd.org/PDF/The%20informal%20sector%20in%20Kenya.pdf)

The informal sector in the form of petty trading and casual labor is typically the outcome of unemployed and under-employed people who do not have wherewithal to start any business in an organized way. However, it is also a means for skilled tradesmen to enter the market for making and mending goods, typically metalwork, carpentry and joinery and tailoring. In Embu town the following activities constitute the informal sector activities:

- Selling fruits and vegetables in vegetable markets and along roads
- Food items
- Selling clothes and shoes (new and second hand)
- Kiosks selling various items along roads
- Water kiosks
- Retailers or hawkers of cereals, home suppliers, fuels and other goods.
- Small scale manufacturing, production, construction and repair of goods

The Kenyan labour market is characterized by a large share of informal sector employment, which partly explains the low levels of income per capita and productivity. The informal sector is generally characterized by low productivity, vulnerability of employment, and low incomes (Kenya Economic Report 2013, Kenya Institute of Public Policy Research and Analysis)

Specifically, only about 19 per cent of all employment is formal, while the share of informal economy jobs has steadily increased from 70 per cent in 2000 to 83 per cent in 2012. The declining capacity of the formal sector to create employment is evidenced by the fact that out of the 445,900 new jobs created in 2009, 88 per cent were in the informal economy. This trend presents a challenge on the appropriate mix of informal versus formal employment.

The Jua Kali Association in Embu


Jua Kali workshops

The Jua Kali Association is quite active in the town. It occupies two sites: one around the Kenya Power Corporation Offices (1 acre) and another one near the sewage pond, occupying 5 acres. The Jua Kali artisans deal in a wide range of goods which they sell within and without the boundaries of the town and county. According to the Chairman of the Jua Kali Association, they are one of the key contributors to the economic development of Embu town. They have over 800 registered members, working in the sectors as shown in the Table 2.10 below.

Table 2.10: Number of Jua Kali Units in Town

Sl. No.	Sub-sector	Approximate number
1	Mechanics	400
2	Wood work	100
3	Agro food processing	90
4	Chemical works	80
5	Building	70
6	Blacksmiths	60
Total		800

Source: Embu Jua Kali Association

On average about 2 persons are employed per unit to which may be added an equal number of seasonal and casual labourers. There are therefore approximately 1600 artisans employed directly on a permanent basis and around 1000 unskilled labourers employed seasonally. According to the Chairman there is a huge potential for Jua Kali to contribute to the overall economic development of town and this can easily be achieved by proper training, financial assistance and marketing.

2.1.4.9 Issues/ Observations:

- The employment rate is very high in urban areas in Embu District (94.3% of the total economically active labour force)
- The CBD of Embu is a commercial centre for the people of the town and surrounding hinterland
- The other commercial areas of town (Sub-CBDs) are not organised properly in the town
- The town works mainly as an administrative, commercial, education and health centre to the local people and people from surrounding hinterland
- Most of the old industries are closed down
- The town can be the industrial centre for agro-processing industries because there is a huge potential to exploit the agricultural resources of the region like coffee and other horticulture crops
- Embu is located in a fertile area and can consider strengthening its role as an agricultural marketing and support centre.
- Tourism is not a major contributor to the economy, but Embu might be able to use its role as a knowledge centre to attract conference and similar trade
- In jua kali areas, most of the basic amenities like toilets, drinking water facility, storm water drainage, street lights, roads, etc. are inadequate. Some of the area allocated to Jua Kali has been grabbed near sewage pond site. There is no proper platform to get better training for the artisans and there is no platform for marketing of jua kali products

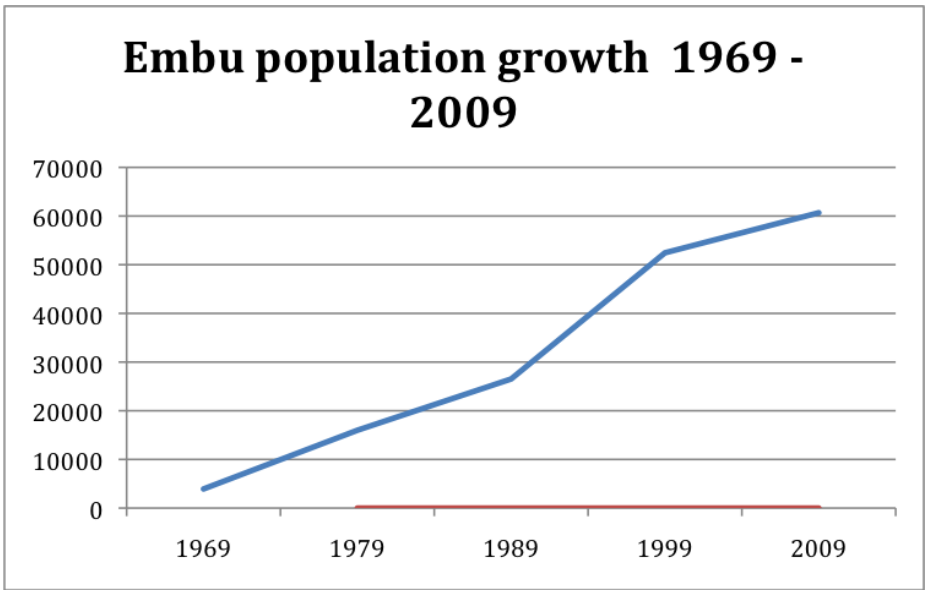
2.2 Population projection

2.2.1 Historic growth rates

Embu has grown dramatically in the period since Independence. From a small market and administrative centre it has grown into a sizeable town, with all the problems that rapidly growing urban areas face – traffic congestion, informal settlements and overloaded services. Indeed, for it to grow from what was, in a sense, little more than a large village of 3,928 people in 1969 to its 2009 population of 60,673 (more than 15 times) in a period of 40 years is truly remarkable. It demonstrates the importance of the town within the region.

The graph below illustrates this growth.

Figure 2.5: Embu population growth 1969 - 2009



Source: Kenya Bureau of Statistics, Census data

It will be noted that growth slowed down in the period 1999 – 2009 to a rate of 1.47% a year. This is less than the population growth rate of Kenya as a whole, which was 3.0%. This means that a percentage of the population were leaving Embu during that period. This may be ascribed, in part, to the changing economy under which Kenya reduced tariffs and protectionism. Coffee prices slumped and many small local industries, both in Embu and elsewhere, closed their doors.

2.3 Interpreting the data

Census data only gives a true picture of the rate of change if it refers to exactly the same area in each census year. There is another way of presenting data – that is the rate of growth of the *urban area*. If this approach is taken the total count will refer to a larger area in each successive census as the town expands. This is the approach that the Kenya National Bureau of Statistics takes. So while it gives a good assessment of the size of the urban population, it will, to some extent, overstate the rate of growth due to the existence of peri-urban settlements that were not classified “urban” in the previous data analysis.

2.4 Projections

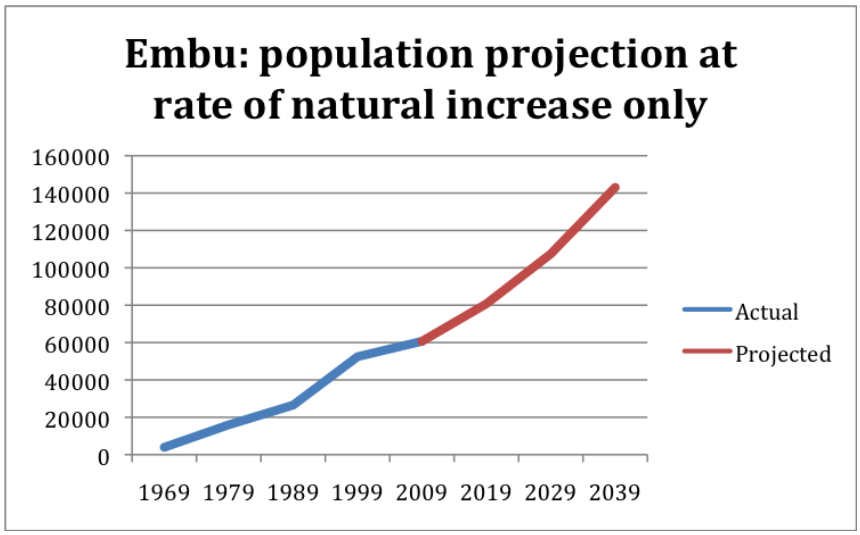
Population projections can never the exact. They can be based on the rate of growth of the previous intercensal period, on the assumption that economic and social factors remains constant, or they can be increased or decreased based on an analysis of current conditions.

There are many factors to be considered, of which the following are the most important:

2.4.1 Natural Increase

Kenya has a very high rate of natural increase. In the period 1999 – 2009 it was 3.00%, but is currently estimated to be slightly lower at about 2.9%[1]. If this rate continues, and there is no loss of population due to migration, the population in Embu will have increased in the 30 year period from 60,673 in 2009 to 143,029, 2.3 times its present size.

Figure 2.6: Population projection, Embu: Natural Increase only

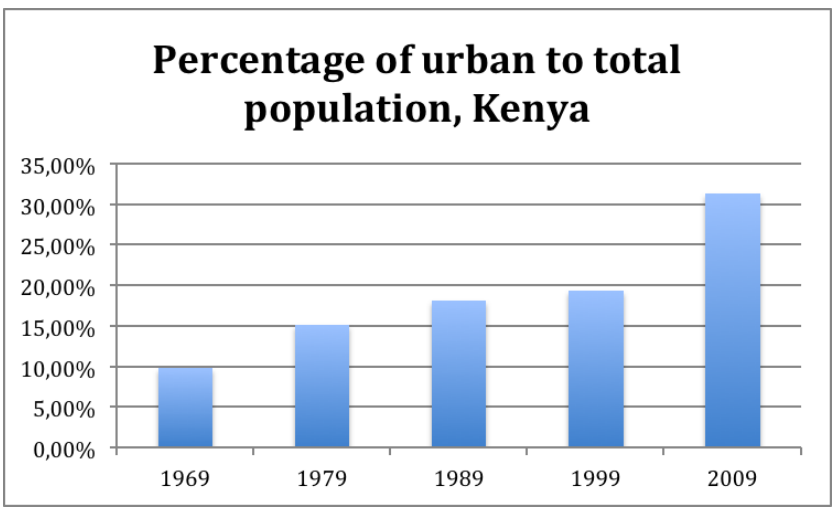


2.4.2 Urban growth in Kenya

Another important factor to consider is the growth of urban areas. As noted above, urbanisation is a global phenomenon. The inherent advantage of urban areas over rural areas in terms of economic efficiency allow urban areas to be more prosperous and to absorb an increasing workforce. History has shown that it cannot be stopped.

Kenya is no exception to this rule. The percentage of urban to total population has been growing consistently.

Figure 2.7: Percentage of urban to total population, Kenya

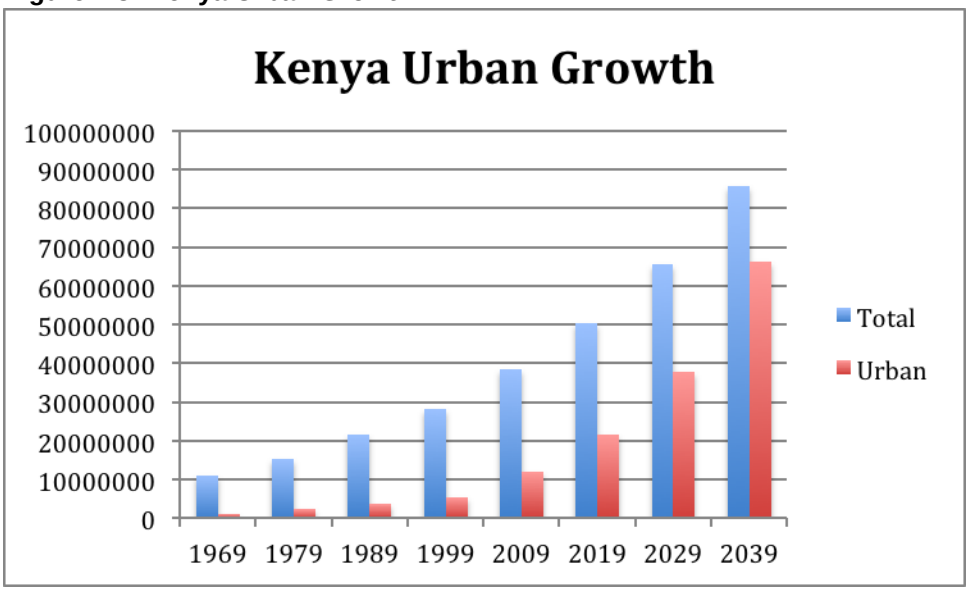


Source: Kenya Population Situation Analysis: Government of Kenya, 2013

[1] Kenya Population Situation Analysis: Government of Kenya, 2013, p303

The growth rate of the urban population between the 1999 and 2009 censuses was 8.3%. At this rate the population would be 100% urbanised by the end of 2031 – clearly an impossible situation. A more likely scenario is that the rate of growth would decline somewhat, to say 6% in the next ten years (2009 – 2019), 4% the following ten years (2019 – 2029) and 3.5% in the subsequent ten years (2029 – 2039). Under this scenario the rural population will decline to about 20% of the total within 30 years a situation more consistent with economies that have experienced similar rates of urban growth. The chart below illustrates this projection.

Figure 2.8: Kenya Urban Growth



Source: Kenya Population Situation Analysis: Government of Kenya, 2013

2.4.3 Economic trends

Will Embu thrive in the future or will it decline? There can be no certain answers. What is not in doubt is that population growth is a product of economic growth, so we must make an assessment of the factors that will influence economic growth.

The pull of the centre

Nairobi, as the primate city will, if international trends are a guide, continue to grow and absorb an increasing share of urban growth. The second tier cities are more vulnerable to local conditions which include the availability and cost of land, the quality of the infrastructure and good transport connections. There is also a degree of competition between towns of similar size, so the degree to which a town scores higher in the above points compared to other comparable ones will affect its rate of growth.

The table below lists the population of the urban centres[2] correlated with their distance from Nairobi. Those at the top of the list, Kiambu, Ruiru, Limuru and Thika are so close to Nairobi that they are part of the greater Nairobi conurbation. They have all shared in Nairobi's rapid growth, and are expected to do so.

Table 2.11: Population and distance from Nairobi of urban centres

Location	Population 2009 (previous municipalities)	Distance from Nairobi (Km)
Nairobi	3 375 000	0
Kiambu	88 869	18
Ruiru	238 858	26
Limuru	104 282	37

[2] Kenya Population Situation Analysis: Government of Kenya, 2013, Table 11.4, p196

Location	Population 2009 (previous municipalities)	Distance from Nairobi (Km)
Thika	139 853	45
Machakos	150 041	62
Naivasha	181 966	91
Kerugoya	34 014	118
Embu	60 673	125
Nakuru	307 990	159
Kitui	155 966	160
Chuka	43 470	164
Nyahururu	51 434	185
Nyeri	125 357	190
Nanyuki	49 233	190
Runyenjes	61 604	191
Meru	53 627	220
Bomet	110 963	228

Embu falls into the second tier – close enough to Nairobi to be within an easy day trip, but outside its direct economic sphere. Naivasha falls into a separate category, both because it is a tourist destination and because of its strong horticultural industry. In a sense Embu is therefore in competition with Nakuru, Nyahururu and Nyeri. What does Embu have, or potentially have, that they do not?

1. Excellent road connections with Nairobi
2. Potential for increased tourist traffic by strengthening its links it to Mount Kenya and improving accommodation.
3. Selling it as a high altitude training centre.
4. Its role as a higher education centre, particularly in terms of the development of the Embu campus of Nairobi University
5. Potential for agricultural processing industries.

It is unlikely that Embu will see the growth of any industries except those related directly to agriculture, as they are most likely to locate themselves near the major market – Nairobi.

These factors would suggest that there is a likelihood of moderate growth.

Infrastructure availability and cost

Embu has no serious problem with water and electricity supply and cost. There are serious concerns, however, about solid waste collection and treatment, and the lack of sewers. However, these deficiencies are shared by most towns in Kenya, so are not likely to influence the rate of urban growth.

Land – price and availability

Currently there is little land available in the town, and much land is difficult to develop due to the hilly topography. Looking to the future in which the town expands to the flatter land to the East, there is a potential to develop plentiful land at lower cost.

Availability and price are closely connected. One of the objectives of the ISUDP will be to make serviced land available for development in the quantities required. This can be an important factor in attracting certain types of development, and although Embu cannot expect to attract any major industry there are many small service and warehousing firms that might be attracted to the town.

2.4.4 Summary

The potential for Embu to expand exists. Its favourable location relative to Nairobi and Mount Kenya suggest that it is likely to grow faster than in the recent past. The improved road from

Nairobi, the development of the Nairobi University Campus and the tourist potential which has hardly been touched as yet are all factors which suggest a growth rate higher than the slow rate of the recent past.

We would therefore suggest three annual growth scenarios for the 30 year period 2009 - 2039.

- The lowest would be for Embu to grow at the rate of natural increase (about 2.9%) thereby growing at 1.43% faster than it did in the period 1999 to 2009.
- The conservative estimate would be for it to grow slightly faster than the rate of natural increase – say 3.5%, declining to 3.0% after ten years.
- The high projection would be for it to grow at 4%, declining to 3.5% after ten years.

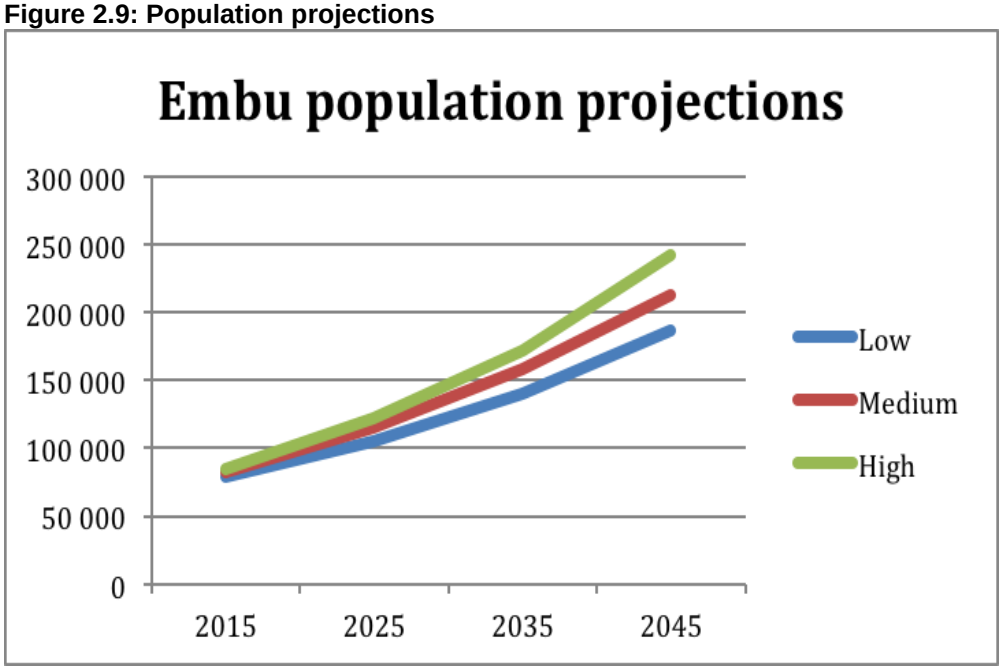
These projections are shown in the table and graph below.

Table 2.12: Population Projections

Projection	2015	Intercensal Growth rate	2025	Intercensal Growth rate	2035	Intercensal Growth rate	2045
Low	79 305	2,90%	105 549	2,90%	140 478	2,90%	186 966
Medium	82 120	3,50%	115 279	3,00%	157 956	3,00%	212 280
High	84 530	4,00%	121 558	3,50%	171 470	3,50%	241 875

Taken in conjunction with the rate of urban growth as a whole in mid-sized towns, it is considered that the medium projection is the most likely figure. This has been used in estimates regarding land use and demand for physical and social infrastructure.

Figure 2.9: Population projections



2.5 Land use projections

2.5.1 Planning for growth

Population growth is not directly related to growth in demand for land. There are several factors in land demand, of which the most important are:

- How much land within the existing built-up area is unused?
- Will densities increase or reduce in future?
- Are any corrections required to the existing land use pattern which will affect land requirements?

One of the failures of past planning has been not to expand urban boundaries in advance of population growth. This has resulted in unplanned and haphazard growth outside the boundaries which not only presents difficulties in subsequent servicing, but also prevent orderly planning of the urban area. It is therefore important to expand boundaries in advance of projected urban growth and thereby enable provision for essential infrastructure in an orderly fashion.

Although the ISUDP Terms of Reference require planning for a 10 – 20 year period, it is nevertheless of great value to look further into the future and thereby protect essential communications routes. A 30 year time horizon has therefore been taken for these projections.

2.5.2 Existing land use

Measurements from aerial survey provide the following data concerning land use within Embu town. It shows a built up area of 2,528 Ha (25.28 square kilometres) This shows that within the planning area of 102.28 square kilometres there is considerable land available for development which is currently mainly in agricultural use.

Table 2.13: Existing Land Use

Land Use	Area (Ha)
Residential	1,658
Commercial	52
Educational	144
Industrial	19
Public Purpose	92
Public Utility	31
Transport	515
Recreational	17
Built-up area (including public open space)	2,528

2.5.3 Are there any changes in land-use patterns which will affect densities?

There are factors which will reduce densities once an ISUDP is in place.

- There is almost no public open space within the existing built-up area.
- There are some areas which are not served by proper roads.

Bringing the town up to standard in this respect will have the effect of reducing densities. In making projections about land use, it is probably wiser to use current densities are the basis for land use projections.

2.5.4 Density projections

Within the built-up area of 2,528 Ha there is a considerable amount of under-used and low density development. As the economy strengthens, land values will increase, and land-owners will have the incentive to redevelop (or sell to someone else who will redevelop) their land. The example below shows a typical example of densification in Nairobi from two adjacent parcels of land. The land owners on the left have chosen to retain their existing large gardens: those on the right sold out to developers, who have made the maximum use of the land.

Densification in progress – adjacent areas in Nairobi

Thus, there is likely to be densification within the near future as low density areas in areas relatively close to the town centre are redeveloped. However, this will not take place unless and until the area is sewered, and it is not likely that densification will be as rapid or to the degree that it has taken place in Nairobi.

Planning for the future: the uncertainties regarding densities

Elsewhere in this report there is an analysis of land requirements in terms of **planned land uses.** The plan proposes development at densities that much higher than those prevailing today.

However, we must recognise that it will take time for the habit of historically low densities to be replaced by better planned, higher density development. The plan will prescribe the space standards (and therefore the densities) to be used for all land uses, but in practice, the time taken between infrastructure being laid down, plans prepared, projects being conceived, planning consent being given, and completion and occupation, can be anything from three to seven years.

International experience has shown that this lag results in overall densities falling far below the ultimate target levels. Thus while an area may be planned to have densities of 40 dwellings per hectare, only half of these might be occupied in the early years. This has resulted in the phenomenon of declining densities in rapidly developing cities in the third world, as documented in the *Planet of Cities*[3]*.*

Land requirements for the next 30 years

One of the classic faults of urban planning has been to fail to recognise the rate of urban growth, and attempting to constrain growth within a tight urban boundary. This results in overcrowding, and very high land prices which effectively exclude the poor. As a result informal settlements spring up on the urban fringe. To avoid this, urban boundaries should be set for expected growth over the next 25 – 30 years, thus allowing room for development. In so doing, to be on the safe side, and based on the massive research discussed in the *Planet of Cities,* it is wise to use existing densities in projections of gross land use. This will show whether there is sufficient room within the current planning boundary for urban expansion.

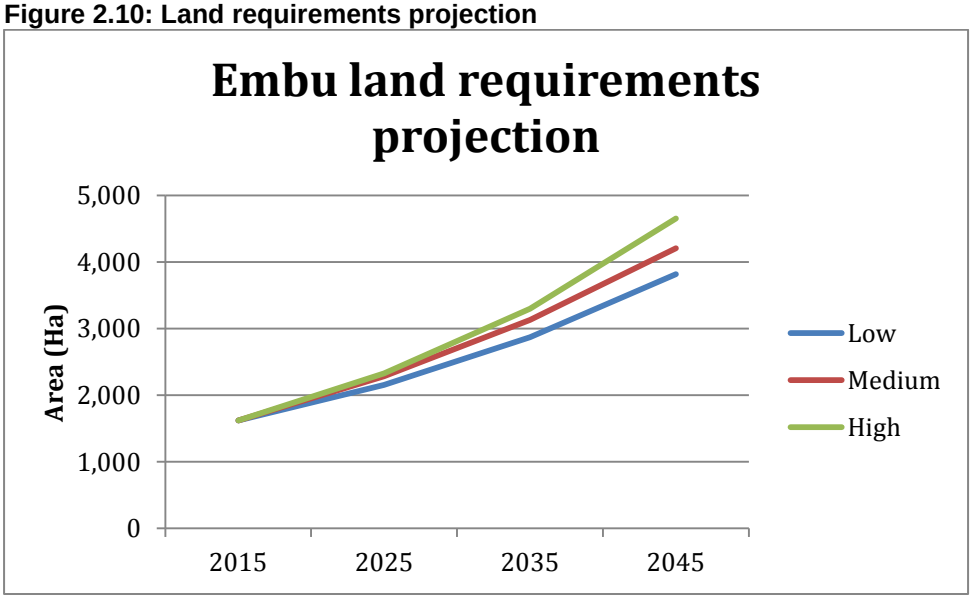
The table and chart below show projected land demands, using the same density as that prevailing today (32 persons per hectare).

[3] Shlomo Angel: *Planet of Cities*, Lincoln Land Institute, Cambridge Massachusetts, 2012

Table 2.14: Projected land requirements (Ha)

Year	2015	2025	2035	2045	Planning area	Difference 2045
Low	1 620	2 156	2 870	3 819	10228	6 409
Medium	1 620	2 285	3 131	4 208	10228	6 020
High	1 620	2 330	3 302	4 658	10228	5 570

Figure 2.10: Land requirements projection



The projections show that the planning boundary is sufficient to cope with the land use demands up to the year 2045, with 55,70 square kilometres to spare for the high population growth projections, and more for the others. For the low population growth projection, only just over one third of the land (37%) will be used.

Under the planned scenario the land requirement will be different as indicated in table below, which indicates the land requirement for the projected population of Embu Town Planning area based on the planned density of 47 persons/Ha.

Table 2.15: Projected land requirements (Ha) based on population density of 47 person/Ha

Year	2015	2035	2045	Planning area	Difference 2045
Low	2,528	2,989	3,978	10,228	6,250
Medium	2,528	3,361	4,517	10,228	5,711
High	2,528	3,648	5,146	10,228	5,082

The projections under planned scenario show that the planning boundary is sufficient to cope with the land use demands up to the year 2045, with 4,517 Ha to spare for the medium population growth projections, and more for the others.

3 Development concept

3.1 Introduction

This chapter deals with the planning development concept, town vision, goals and planning strategies for all development sectors.

3.2 Vision

Embu is the capital and largest town of Embu County. Embu town is located approximately 130 kilometres northeast of Nairobi towards Mount Kenya on the West side of the County. A stakeholder workshop was organized on 24th November 2014 for formulation of the vision for Embu town. The key stakeholders invited for the visioning workshop included Members of County Assembly (MCAs); County Officials; members of organisations representing Commerce and Industry, Religions, Matatus, Bodabodas, Hawkers, Jua Kali, informal settlements, Police, Development Practitioners, Opinion Leaders, Farmers, Cultural Groups, Education, other community based organisations and civil society organisations, etc. Around 170 participants attended the workshop and expressed their view about the town vision. The consultants have compiled all the vision statements stated by various participants during the group discussion and also considered the various critical issues and challenges of the town; and formulated the following city vision for Embu for year 2035:

""Embu will be the educational and commercial hub of the Mount Kenya region along with focus on agro-based industrial development, that provide adequate and affordable infrastructure and services to its citizens; a secure, well planned, well governed, clean and green town that is environmentally and economically sustainable; a town with all resources to be competitive at national and international level"

The detailed proceedings of the visioning workshop including attendance sheet, copy of presentation, copy of invitation letter, list of stakeholders, etc. was prepared and submitted in a report in December 2014 and brief proceedings of workshop are given in Annexure 4.

3.3 Planning concept

The development planning concept of the planning area has been developed out of an in depth understanding of the existing situation, regional settings, development constraint and potential, environmental sensitivity, digital elevation model, direction of growth, spatial development models, planning hierarchies, development scenario, etc., which are explained below:

3.3.1 Understanding of the regional setting

Embu town is located approximately 130 kilometres northeast of Nairobi towards Mount Kenya on the West side of the County (refer Figure 3.1). It is 120km from Meru and 25km from Siakago town (Refer Figure 3.1). It is served by two major roads: the B6 Nairobi-Embu-Meru road, and the B7 Embu-Siakago-Garissa road.

The town is well connected with national urban centres and regional urban centres. As shown in Figure 3.2, Embu is also very close (around 14km) the proposed LAPSET corridor from Nairobi to Isiolo, which will also work as positive factor for future development of town.

In the future the level of urbanisation will increase with fast pace as also has been indicated in the Kenya Vision 2030, which states that by 2030 the proportion of the Kenyan population living in urban areas is estimated to reach 60 per cent.

Embu town is an important urban centre within the Mount Kenya Region and has potential to become national urban centre also.

Figure 3.1: Regional Setting of Embu Town (within 135km Radius)

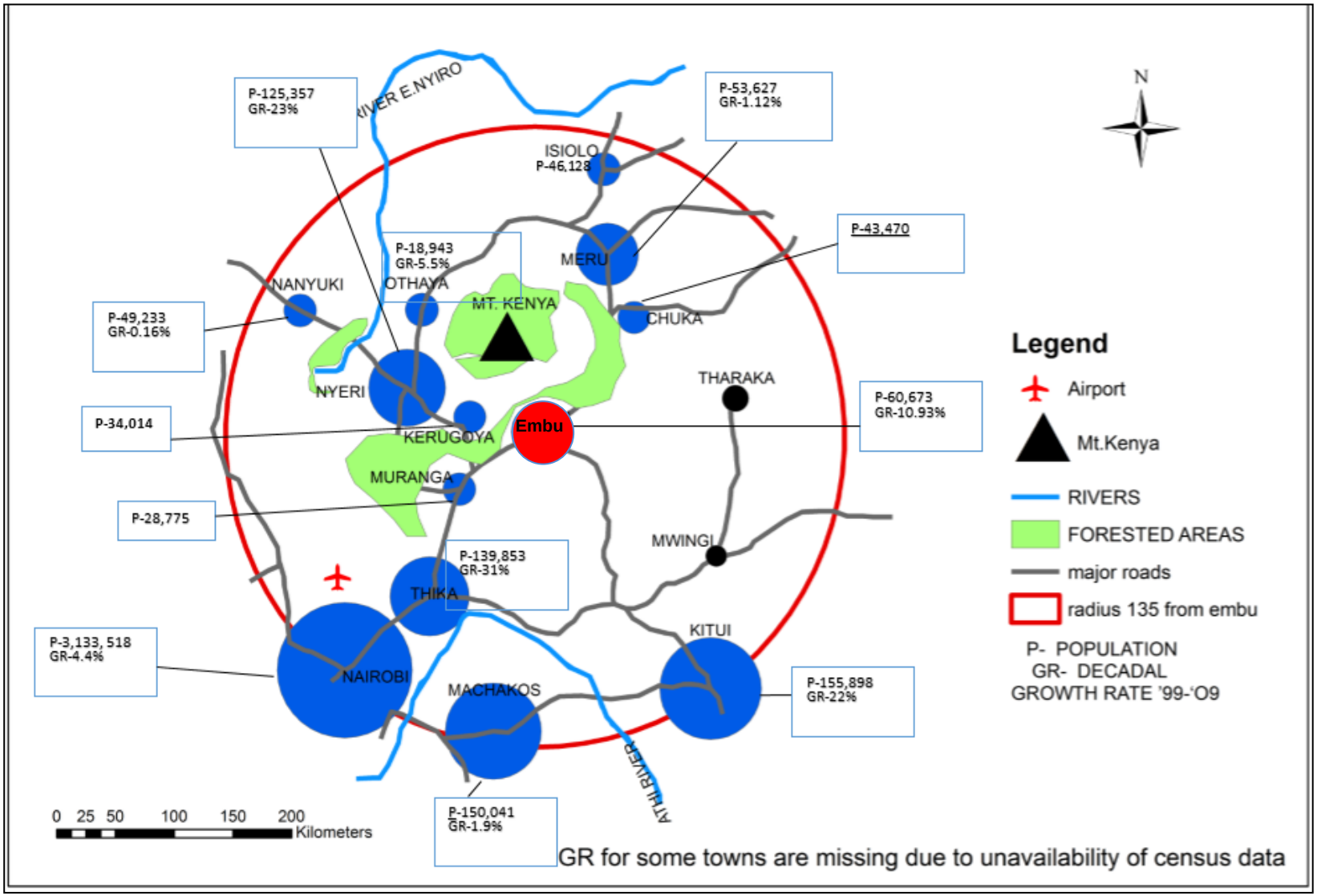
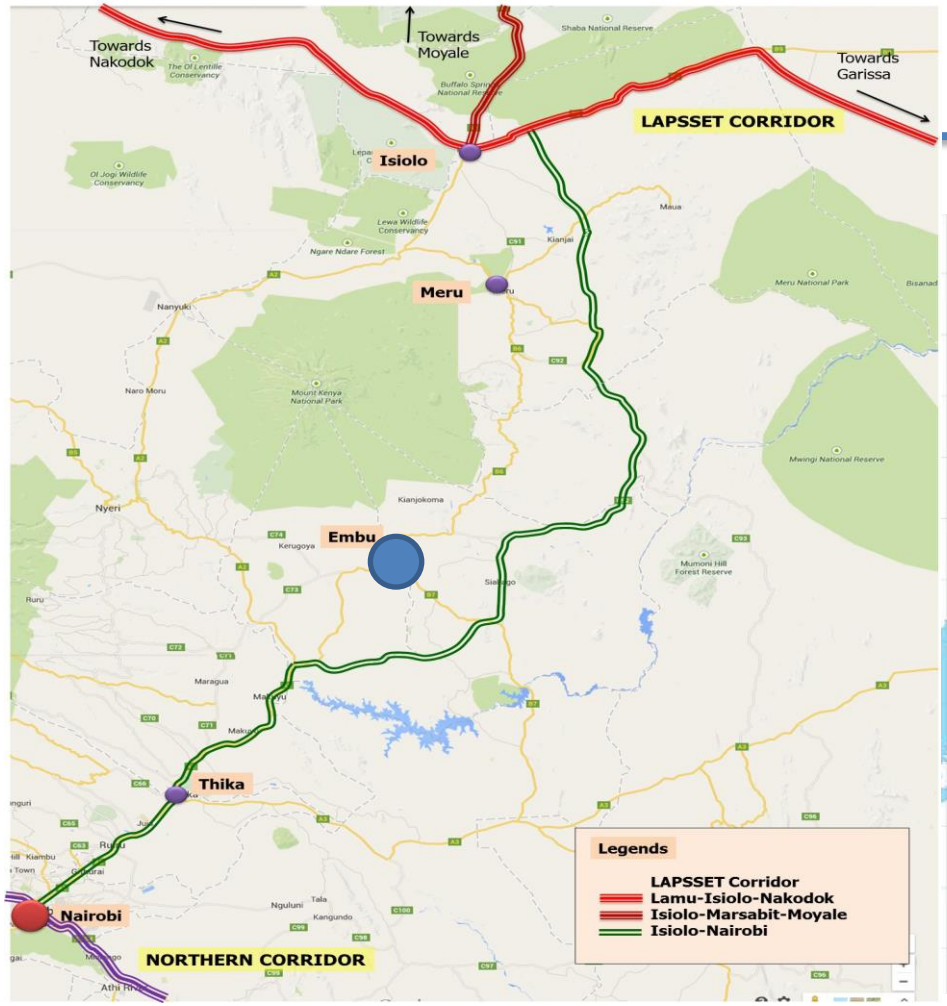
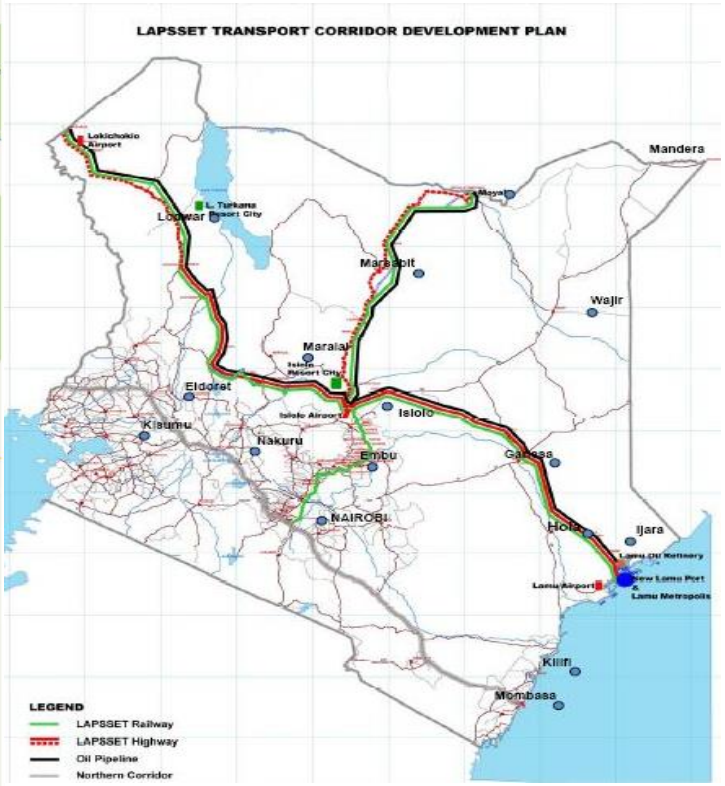


Figure 3.2: Regional Linkages of Embu Town



Regional Road/ Rail Network



3.3.2 Development potential and constraints

The road connectivity in terms of the B6 Nairobi-Embu-Meru road, and the B7 Embu-Siakago-Garissa road and the relatively flat topography in the southern part of the town planning area, are positive factors for future development of the town, while its three rivers and some hilly areas (northern part) present challenges for development. Considering the potentials and constrains, the future growth of Embu town will be towards the southern side where relatively flat land is available.

Potentials

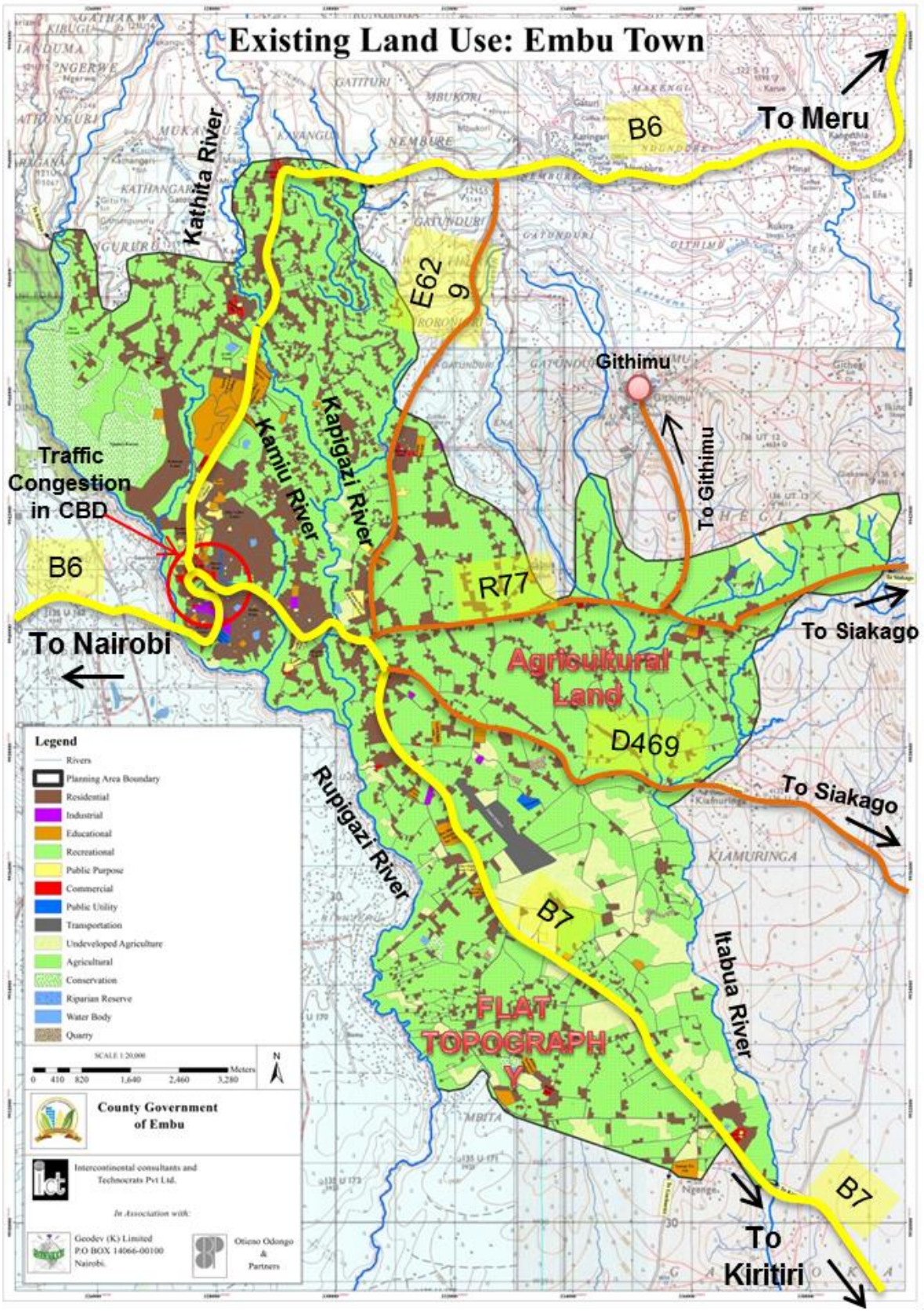
- Better road connectivity
- Flat land available in south-east of planning area
- Good climate
- Rich agricultural hinterland can provide raw material for agro-processing industries

Constraints:

- Natural streams
- Traffic congestion in the CBD area
- Lack of bypass roads
- Lack of industries
- Hilly terrain in some parts of planning area
- Inadequate infrastructure

Figure 3.3 presents the potentials and constraints for development of Embu town.

Figure 3.3: Development Potential and Constraints



3.3.3 Environmentally sensitive areas and land suitability

A detailed analysis of land suitability has been undertaken with the objective of conserving the natural environment within the planning boundary.

Embu is located on the eastern side of Mt Kenya, within close proximity of the mountain. The influence of the tectonic land formation is evident in the deep valleys running from Mt Kenya towards the lowland on the eastern section.

There are many natural streams passing through the planning area of Embu town, as shown in Figure 3.4. Adequate riparian reserves have been put on both sides of all the rivers and no development is planned in the riparian reserves.

The northern side of the planning area, which is also moderately populated, has very steep terrain ranging between 5^0-10^0 (mostly) and 10^0-15^0 occurring in in isolated areas, which are also dotted by very steep terrain with slopes of between 15^0-20^0 (Figure 3.5). This area is prone to soil erosion with the likelihood of increase as storm water increases with and increase in paved surfaces. Storm water management will require careful consideration: without good management there is the potential to trigger mass movement or undermine building foundations.

The gentle slope gradient of 5-10 is widespread along the river valleys, and provided that there are adequate precautionary measures such as storm water management, riparian area conservation and protection, these areas can be developed. Incidents of water system pollution by solid waste are high in these steeply sloping areas.

The degree of slope has been used to identify land suitable for development. Three types of areas have been identified in terms of land suitability i.e land suitable for development without any intervention, land suitable for development with intervention and land not suitable for development. The land with a slope of up to 5^0 is considered suitable for development. Land coming within the range of 5.1^0 to 10^0 slope is developable, provided that measures are taken to avoid soil erosion. Areas steeper than 10^0 are considered not suitable for development. The slope analysis (Figure 3.5) suggests that southern and eastern sides of the planning area are more suitable for future development.

Figure 3.4: Riparian reserve and slope

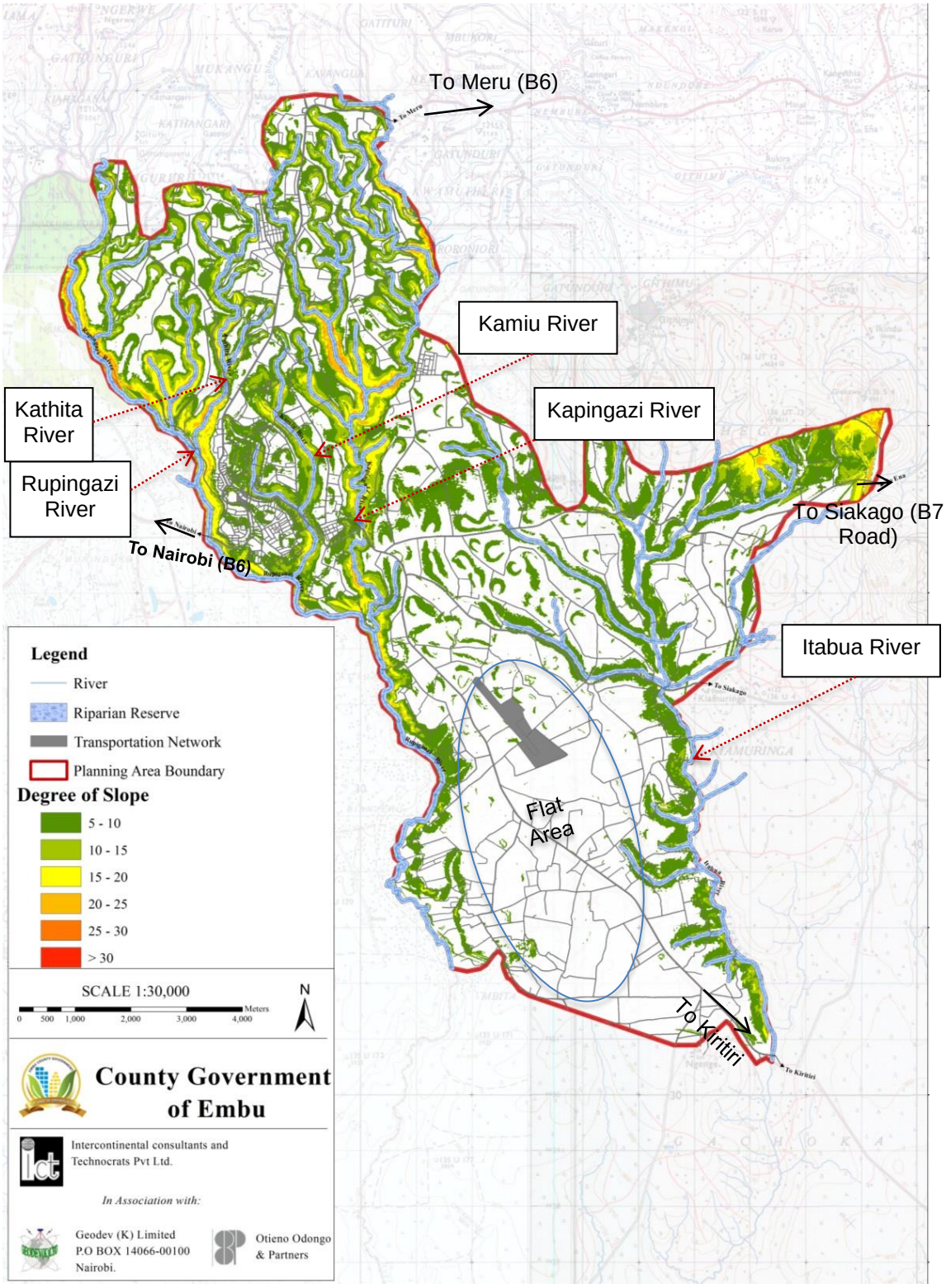
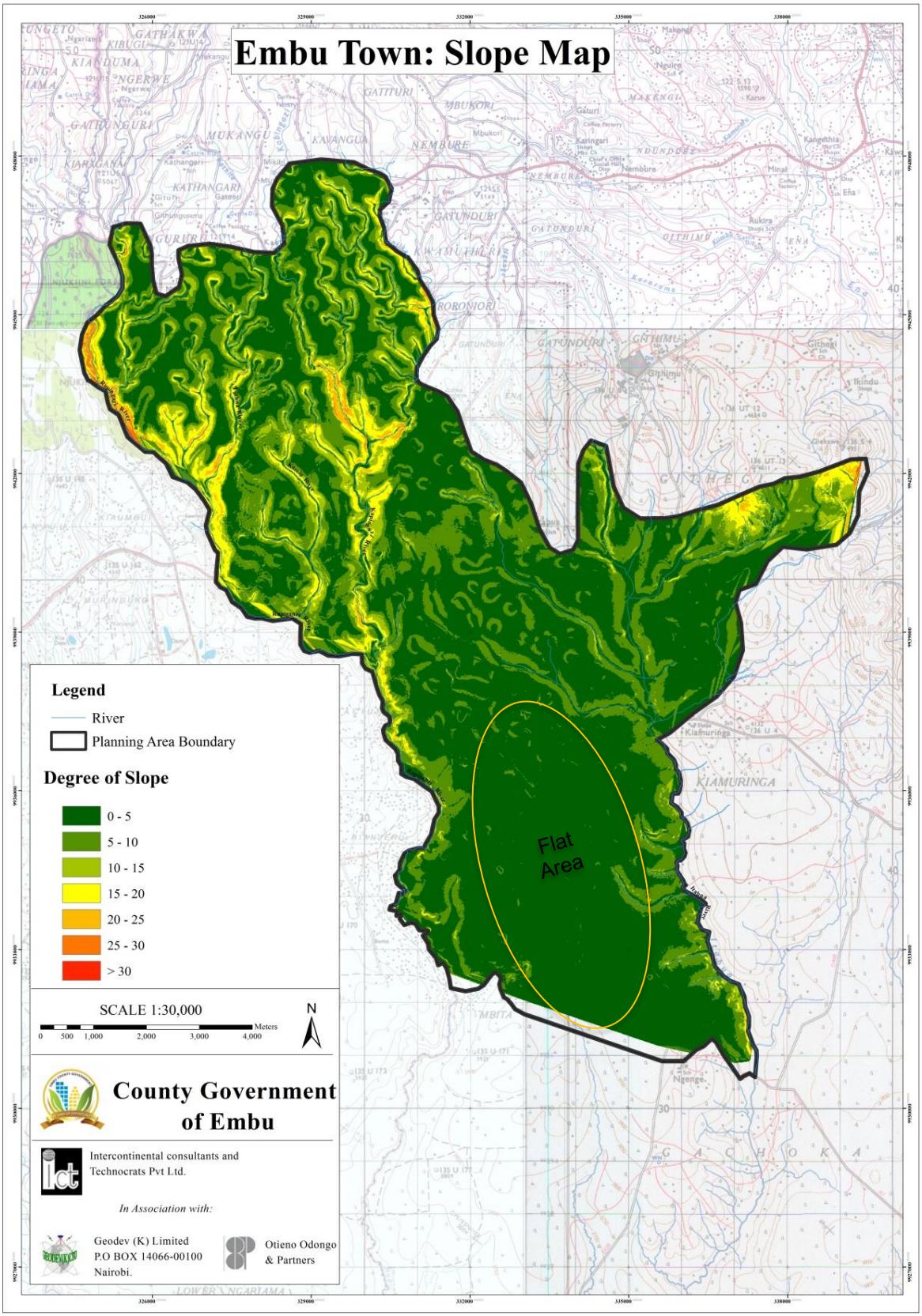


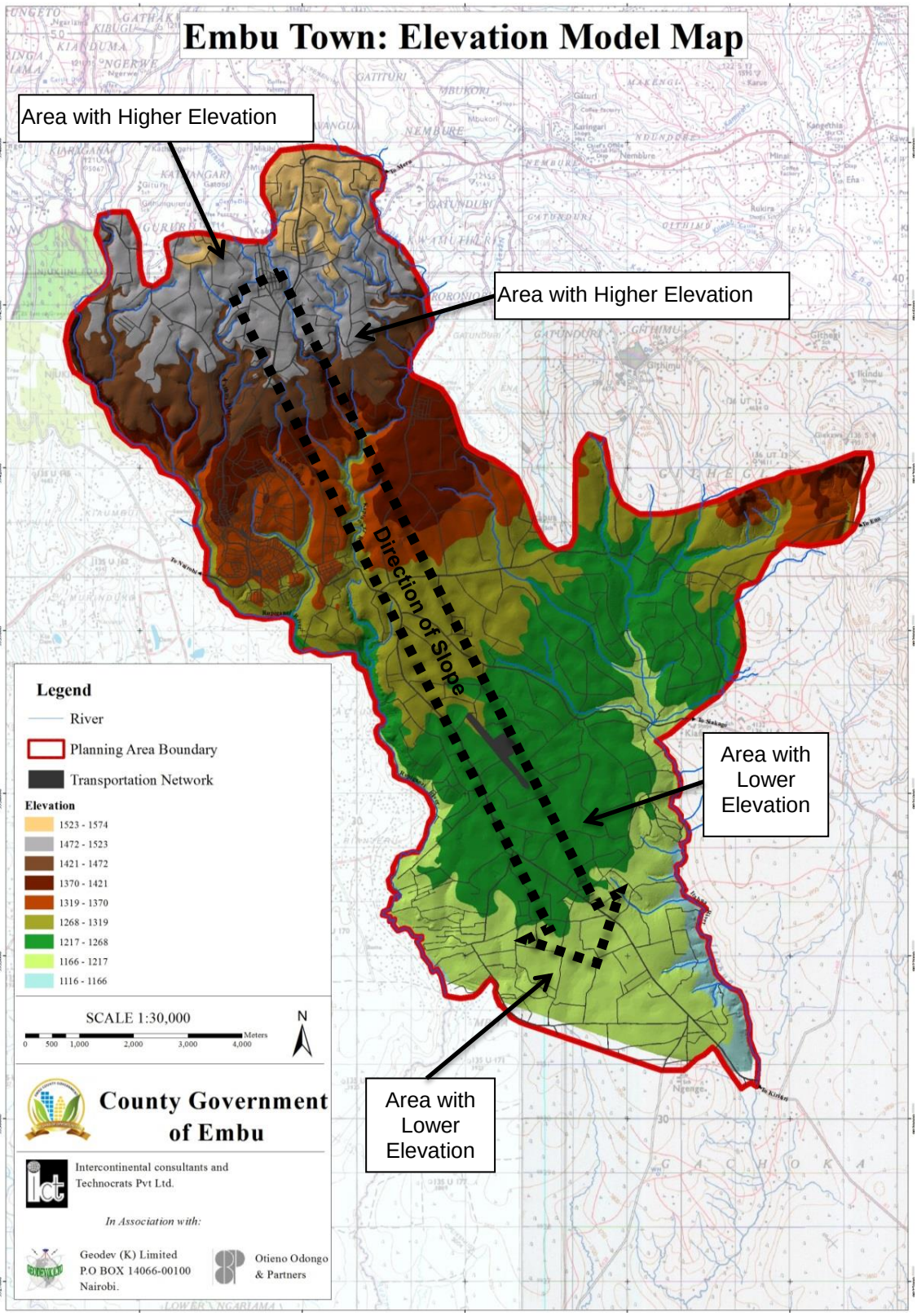
Figure 3.5: Environmental sensitivity and land suitability map



3.3.4 Elevation analysis

A digital elevation model of the town planning area is shown in Figure 3.6 below. The analysis indicates that the northern area, near Njukiri and Muthunduri, has the highest elevation and southern side (the area towards Gachoka) has the lowest elevation. The direction of slope is from the north-west to the south-east.

Figure 3.6: Digital Elevation Model



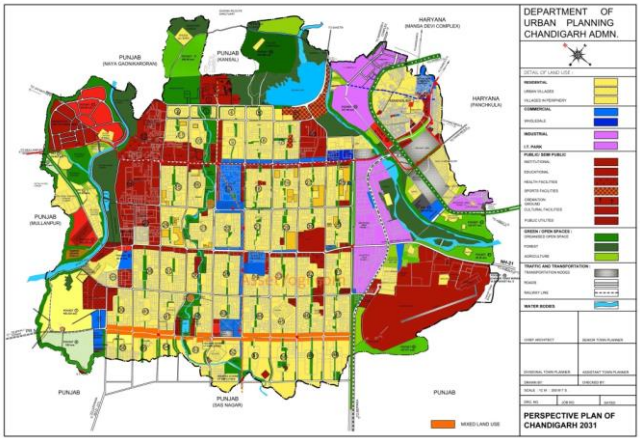
3.4 Spatial development models

Various spatial development models have been analysed to understand the possibility of type of development within Embu planning area. These spatial development models are briefly explained below:

3.4.1 The Grid Model

The grid plan, grid street plan or gridiron plan is a type of city plan in which streets run at right angles to each other, forming a grid, as illustrated in the example of Chandigarh in India. Basic characteristics of the grid model are as below:

- All roads run parallel to each other
- Can work only in flat land
- Disregards environmentally sensitive areas
- Suitable only for new plans on flat land



City of Chandigarh, India

3.4.2 Radial Development Model

This model presents a structure of a city that facilitates radiating roads from the focal point (CBD). This is an ideal urban development model that facilitates development all around the town with easy access to infrastructure facilities. The example of Moscow in Russia illustrates the concept. Basic characteristics of the radial model are as below:

- Radiating roads from a focal point
- Easy access for infrastructure
- Integrated but concentrates traffic on a single focal point
- Possible on relatively flat land
- Better connected between different land uses

Moscow Radial Road Network

3.4.3 Linear/Ribbon Model

Ribbon development is based on developing along the communications routes radiating from a human settlement. This model is applicable where land for development is only available along the major infrastructure corridors. This example is of Quebec in Canada. Basic characteristics of the linear model are as below

Basic Characteristics

- Development along major road corridor in linear form
- Easy to develop infrastructure along main corridors
- Traffic congestion on main transport corridors
- Suitable for relatively flat land

3.4.4 Applicability of various Development Models

As far as applicability of any spatial development model is concerned, none of the above mentioned models can be applied completely in Embu town. The various factors affecting the development of topography, patterns of existing development and cost implications suggest a mixed model approach. Therefore, some proposed development can represent some components of all development models

3.5 Included in the plan

3.5.1 Integration of all development models

As mentioned above the included development is based on all the spatial development models like grid model, linear model, and radial model. Some basic components of all the models have been followed in the included development of Embu.

3.5.2 Hierarchy of planning units

The plan is based on the decentralized planning hierarchies like sectors, clusters, neighbourhood and estate.

3.5.3 Seamless transportation

The plan also present the seamless transportation system through integration of road network, bypass routes, linking with rail network, provision of transportation facilities, etc.

3.5.4 Proving adequate basic infrastructure

The plan is based on provision of all basic infrastructure facilities at different level. These facilities are provided in a equidistant manner considering the availability of existing facilities.

3.5.5 Decentralised commercial areas

The plan provide decentralized commercial activities within the planning area. The decentralized commercial activities are included in terms of sub-CBDs, commercial nodes and informal markets.

3.5.6 New Industrial area

The plan also includes new industrial area to provide a base for Industrial town in future for economic development.

3.5.7 Environmental conservation (hills, rivers)

The plan proposes to conserve all the rivers and hills within the planning area. The efforts have been made to develop rivers as recreational centre so that these rivers can become part of city life.

3.5.8 Providing new high density residential areas and re-densification of existing areas

Current population density is very low and therefore plan proposes re-densification of existing developed areas. All new development areas include high density areas.

3.5.9 Improvement of informal areas

Although all the informal areas within the planning area are taken care by KISIP project but still the plan provide strategies for improvement of informal areas

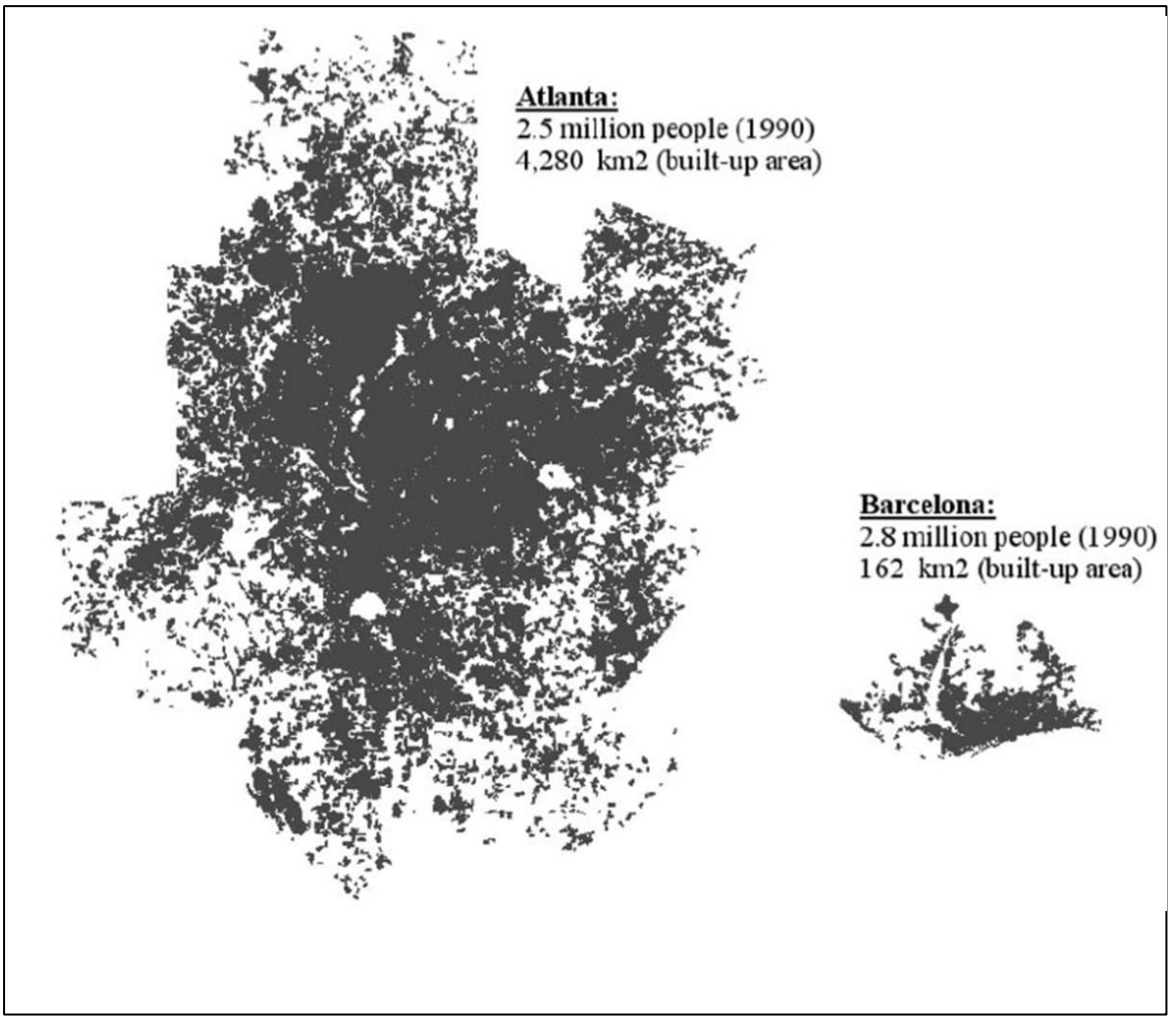
3.5.10 Stakeholder consultations

The plan has been prepared in continuous consultation with various stakeholders throughout the project duration. The consultations were done through FGDs, Individual discussions and workshops.

3.6 Illustration of Concepts

The following pages illustrate some concepts that should be incorporated into detailed planning[1].

3.6.1 Densification



Source: Bertaud, Alain: The spatial organization of cities: Deliberate outcome or unforeseen consequence?m May 2004

Rationale

High densities reduce the cost of infrastructure, facilitate the operation of a viable public transport system, and reduce the environmental impact of urbanisation. They are therefore, in principle, highly desirable.

Implementation

Densities in the smaller towns of Kenya are typically quite low. The symptoms of this low density are poor quality roads, a lack of sewerage, and an inefficient public transport system.

[1] *Note:* this work owes much to three sources
Alexander, C; Ishikawa, S; Siverstein,M; Jacobson, M; Fiksdahl-King, I; Angel, S: A Patter Language, Oxford University Press, Oxford, 1977.
Angel, S: Planet of Cities, Lincoln Land Institute, Cambridge, Massachusetts, 2012
UN Habitat: Urban Planning for City Leaders, UN Habitat, Nairobi, 2013

However, low densities are typically associated with low land values: as land prices increase, so too does the pressure to increase densities.

This point is well illustrated by the photo below of part of Embu: it can be seen that not only are densities very low, sole of the defined properties have no dwelling on them.

Embu: an example of the very low densities in part of the town

Densification in progress – adjacent areas in Nairobi

This is manifested in the densification of previously low density suburbs, as well as increasing development of four/five storey apartment blocks for middle and lower middle income groups. This trend should be enabled in zoning and development control regulations so as to make the most efficient use of existing and proposed infrastructure

In lower income areas, the phenomenon will manifest itself in very high density single storey housing, as evident in most on Nairobi's lower income areas. This is well illustrated in the photo below which shows how both formal and informal housing has filled all the land available.

Dandora, Nairobi: High densities from single storey housing

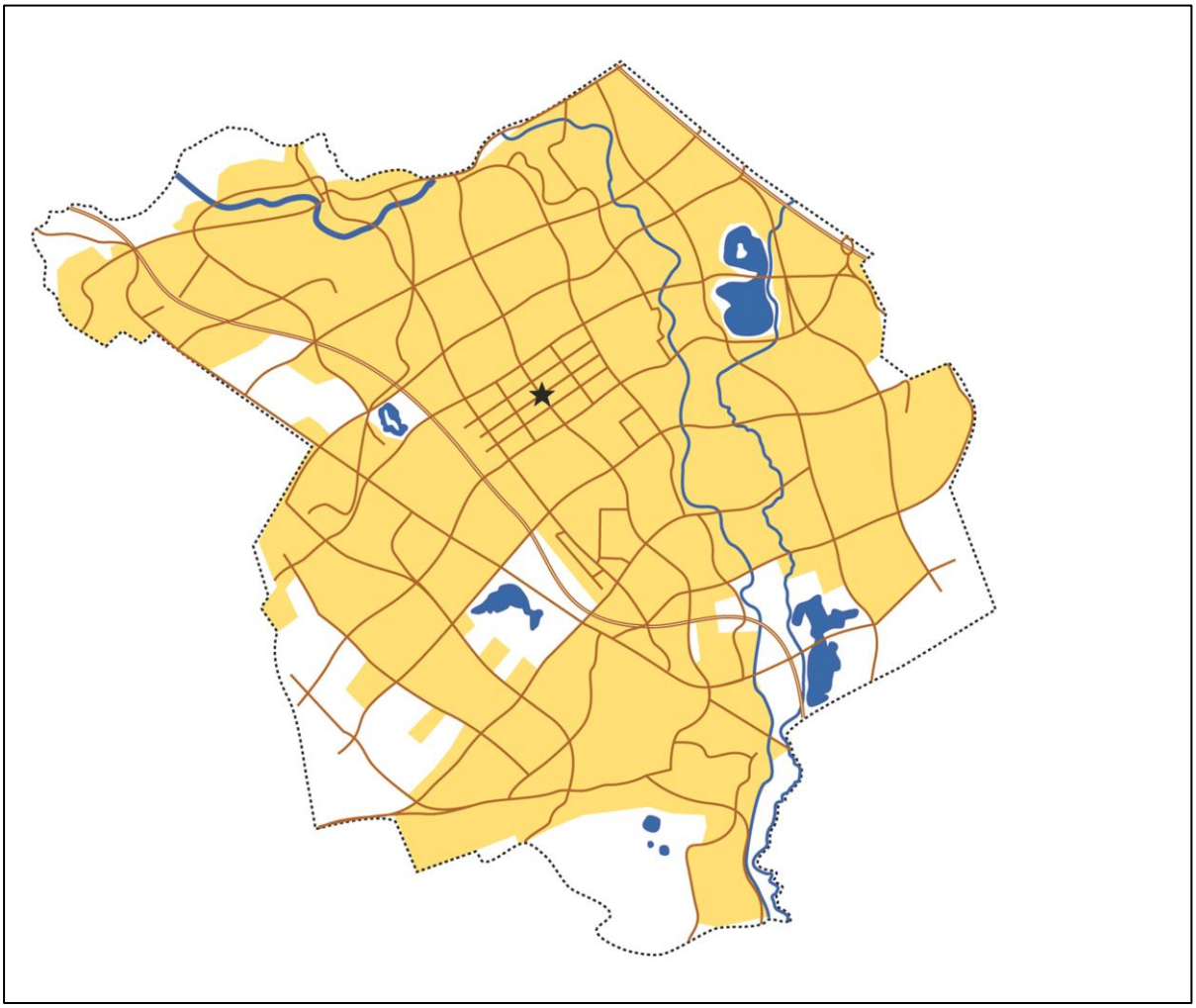
One of the phenomena regarding development is that even though densities may ultimately be high, ***during the development phase***, the average density will suffer a time lag. From the moment when land is made available for development until the time when it is fully developed will take between ten and fifteen years. International experience has shown that this lag results in overall densities falling far below the ultimate target levels. Thus while an area may be planned to have densities of 40 dwellings per hectare, only half of these might be occupied in the early years. This has resulted in the phenomenon of declining densities in rapidly developing cities in the third world, as documented in the *Planet of Cities*[2].

Typical 4/5 storey development along the Thika Highway, Nairobi, with many plots not yet developed

The above photo illustrates this point clearly. Although the land along the Thika Highway to the North East of Nairobi is highly desirable, and has seen an unprecedented rate of development, it takes time for all the land to be developed.

[2] Shlomo Angel: *Planet of Cities*, Lincoln Land Institute, Cambridge Massachusetts, 2012

3.1.1 Arterial Roads



The arterial road grid for Milton Keynes New Town in the UK

Rationale

The most important tool in planning for orderly urban expansion is to lay out the arterial grid for the coming 20 – 30 years in advance.

A well designed arterial grid facilitates a convenient and cost-effective public transport system.

Implementation

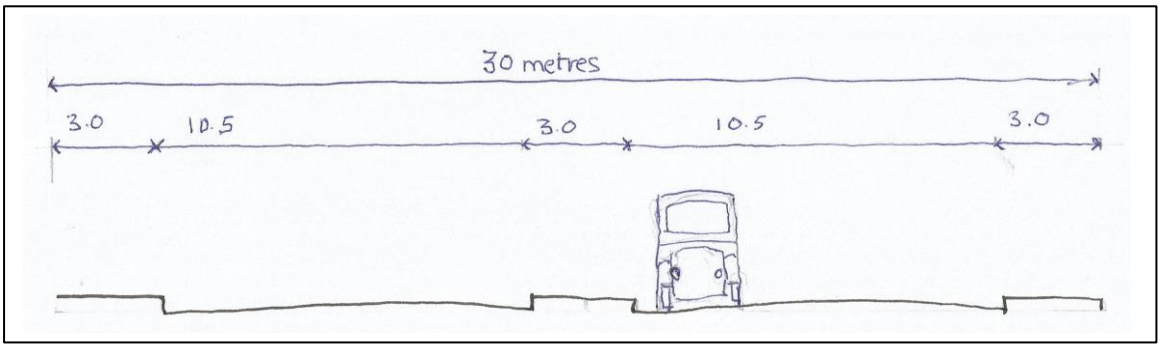
Protecting the route
To protect the plan from encroachment the land for the arterial roads should be acquired within the first five years of the plan period. Construction of the roads themselves can then be phased according to the speed of land development.

Spacing
Since the public transport system will be operating on the arterial grid the roads should be between 1km and 1.5km apart so that public transport routes are within easy walking distance.

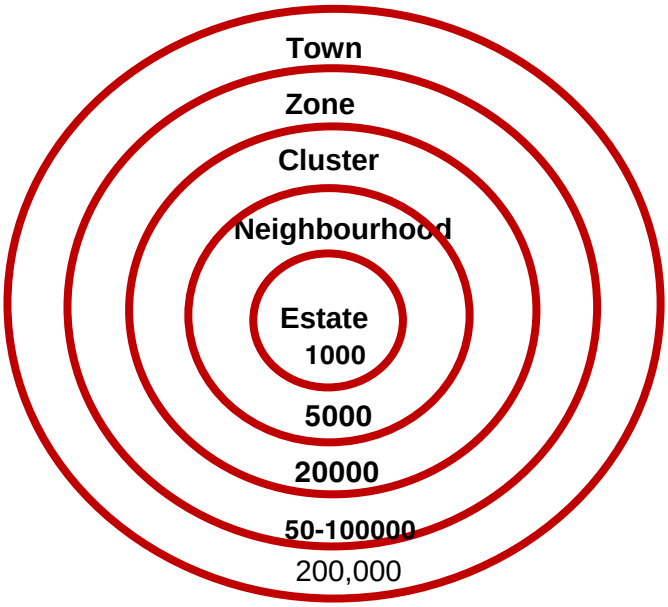
Design
The grid should respect the topography – for example where possible following the contours, avoid areas of environmental sensitivity and features of natural beauty.

The profile should allow for broad footpaths, two lanes for normal vehicular traffic and one lane each way for a dedicated bus/matatu lane, which might be converted into a bus rapid transit lane at a future date.

The profile will therefore be as shown in the drawing below.



3.6.2 Planning hierarchy/Decentralized planning



A planned town, for its convenience, should have a hierarchical cellular structure with its nucleus to contain essential facilities and services at different levels. The town should be planned based on a hierarchical system of planning units with provision of dispersed services and facilities based on the hierarchy of planning entities, in order to improve the quality of life of present and future residents of the town. A system of planning units has, therefore been suggested for this purpose.

Rationale

Urban areas consist of a network of opportunities. It is the proximity of workplace, residence and social facilities, combined with easy access, that distinguishes towns from rural areas. This proximity generates economic growth. But while the network is crucial, other factors come into play. People like their neighbourhood to have a character of its own with which they

may identify. This is the essence of the concept of breaking the town into small component parts.

Implementation

There is a natural hierarchy in urban planning related to the number of persons required to support each type of facility – be it commercial or social.

Planning should therefore capitalise on this hierarchy to combine individuality at the local level with connectivity with the town as a whole.

There are two hierarchies of spatial planning units, as per Physical Planning Handbook viz. Estate and Neighbourhood. The characteristics of these planning units are given below:

Level 1: the Estate
An estate is a spatial planning unit, which is adequately provided for in terms of basic community facilities and has an identity. The service centre which forms the focal point of the estate satisfies the minimum walking distance from the perimeter. The population of an estate should be able to support the services within the physical entity. The Physical Planning Handbook suggest 100 household for estate, which comes around 400 persons but the Consultants suggest 1000 population (250HHs) for an estate.

It has all of the following characteristics:

- Common housing design
- Common services
- Common entry and exit
- Uniformity in plot size and design
- Well-defined development period.
- Population around 1000

Level 2: the Neighbourhood
This can be defined as a comprehensive planning unit with some of the following characteristics:

- Socio-economic identity
- Common facilities such as schools, recreational, shopping centres, etc.
- An almost self-contained unit
- It may include several estates
- Population is 5000

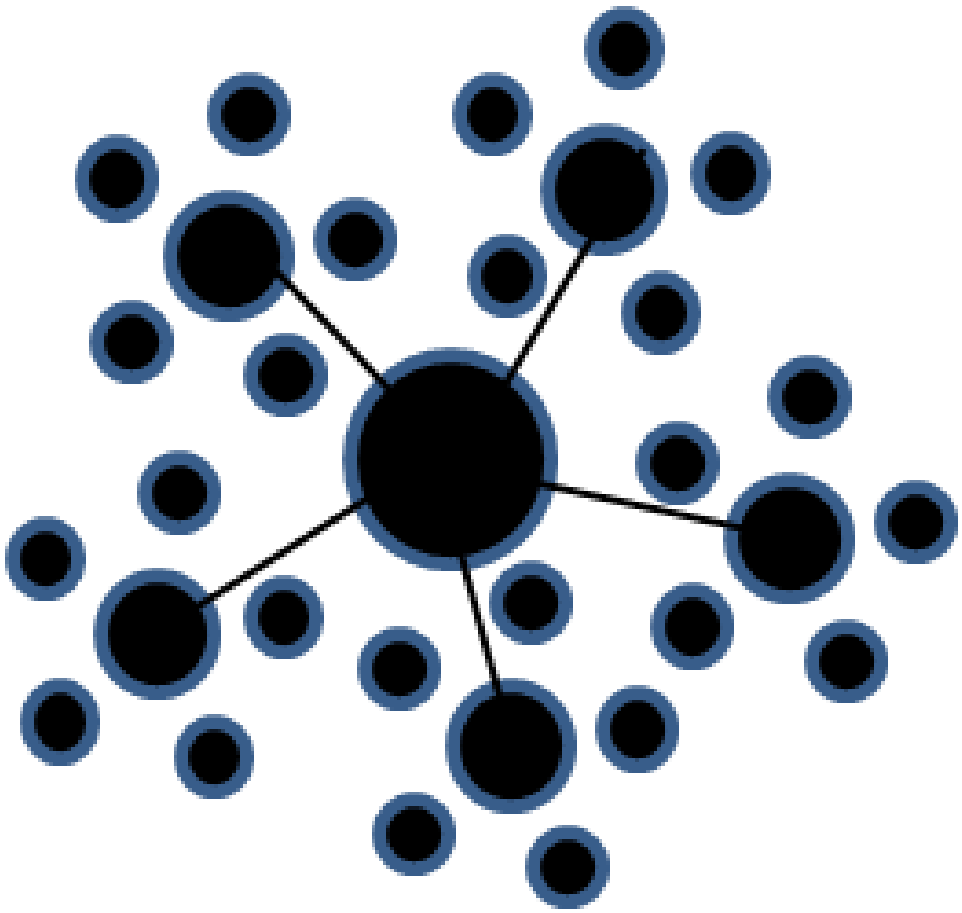
It may be noted that beyond the neighbourhood, there are no planning units given in the Physical Planning Handbook but to cover mid-level and higher level, the consultants suggest the following additional planning units:

Amenities/Infrastructure services	**No of Units**
• Neighbourhood park	1
• Kindergarten	1
• Bakery	1
• Dispensary/ Small Clinic with Chemist Shop	1
• Nursery school	1
• Primary school	1
• Police post	1

Level 3: the Cluster

The cluster consists of four neighbourhoods – 20,000 people – and is sufficient to support a range of middle order facilities as follows.

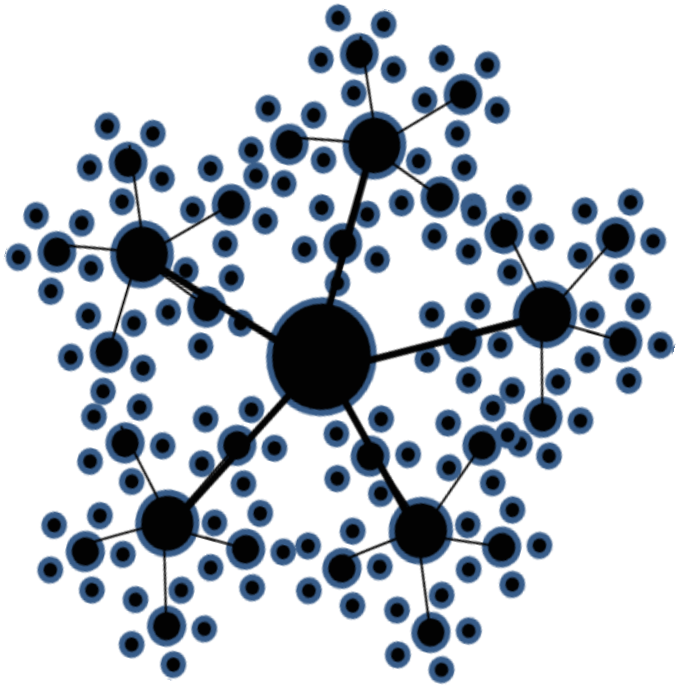
- Secondary school 2
- Post office 1
- Cluster park 1
- Cluster playground 1
- Informal market 1
- Police Station 1
- Integrated Cluster Centre
    - Local shopping centre 1
    - Service market 1
    - Community hall 1
    - Basic Health Sub Centre/ Nursing Home (Level 2) 1
    - Veterinary Clinic 1
    - Taxi stand 1
    - Matatu station 1
    - Car repair centre 1
    - Solid waste collection and segregation centre 1
    - Underground water tank with booster station or OHT 1



Level 4: the Sector 50,000 – 100,000 persons

The sector consists of 5 clusters, making a total population of about 50,000. This is sufficient to support a secondary school, a level 3 hospital, a police station, a community centre, and a park with football pitches and other recreational space. It is sufficiently large to justify tertiary education institutions such as a polytechnic or teacher training college. There can also be homes for those with special needs such as orphans and the elderly. It will offer the following facilities:

- Community/cultural centre (library/ resource centre, social hall, VCT centre, public telephone, amphitheatre/ cultural dance centre) 1
- College 1
- Special school for specially challenged 2
- Youth polytechnic 2
- Sector hospital/level 3/ Sub-District Hospital 1
- Main receiving electric sub-station 1
- Main distribution electric sub-station 1
- Sector park 1
- Sector playground 1
- Stadium 1
- Night shelter 2
- Management training/teachers Training institute 2
- Old age home 2
- Rehabilitation centre 2
- Working men's/women's hostel 2
- Orphanage/children centre/destitute home 2
- Sectoral commercial centre/ Sub-CBD/ Intermediate centre 1
- Slaughterhouse 1
- Bus station and terminal 1
- Matatu station 2
- Fire sub-station 2

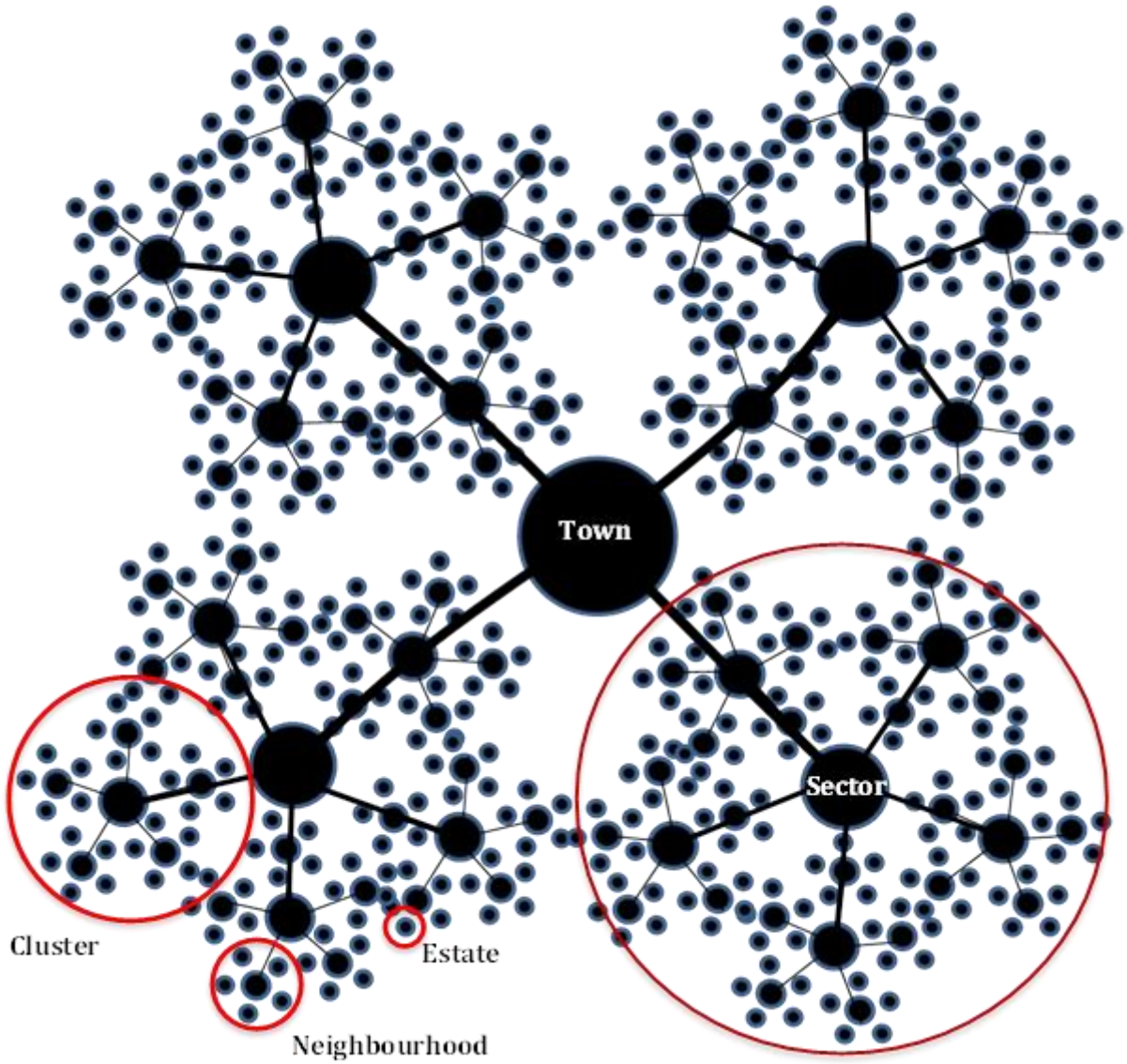


Level 5: the Town

Town Level: The town will include about four sectors, making a total population of about 157,956. This is sufficient to support a level 5 hospital, police headquarters, a university, an amusement park, an equipped sports centre etc. Its shops will attract trade from both within the town and the region. It will therefore have major bus and lorry parks. Various town level facilities are presented below:

- Town Level integrated cultural centre (library/ resource centre, social hall/ town hall/ amphitheatre/ cultural dance centre) 1
- University campus 3
- Medical college cum hospital 1
- Town hospital/ Level 5 hospital 1
- Communicable disease hospital 1
- Veterinary hospital 1
- Engineering college 3
- Research institute 1
- County level police headquarters 1
- Prison 1
- Mega bus terminal 2
- Mega truck terminal 2
- Warehouse 2
- Integrated office complex 1
- Integrated Sport Centre 1
- Town park 1
- Zoo 1
- Amusement park 1
- CBD 1

The planning hierarchies explained here present a framework within which allocation of land uses may be undertaken. The land use plan which is the subject of this report translates these recommendations into practice, modified to respond to realities on the ground. However, by their nature the diagrams above can only depict conceptual provision of facilities. The detailed planning of individual facilities and demarcation of planning hierarchies below sector level like cluster, neighbourhood and estate will be done as per detailed plan/ PDPs to be prepared at the implementation stage.


Town
Sector
Cluster
Estate
Neighbourhood

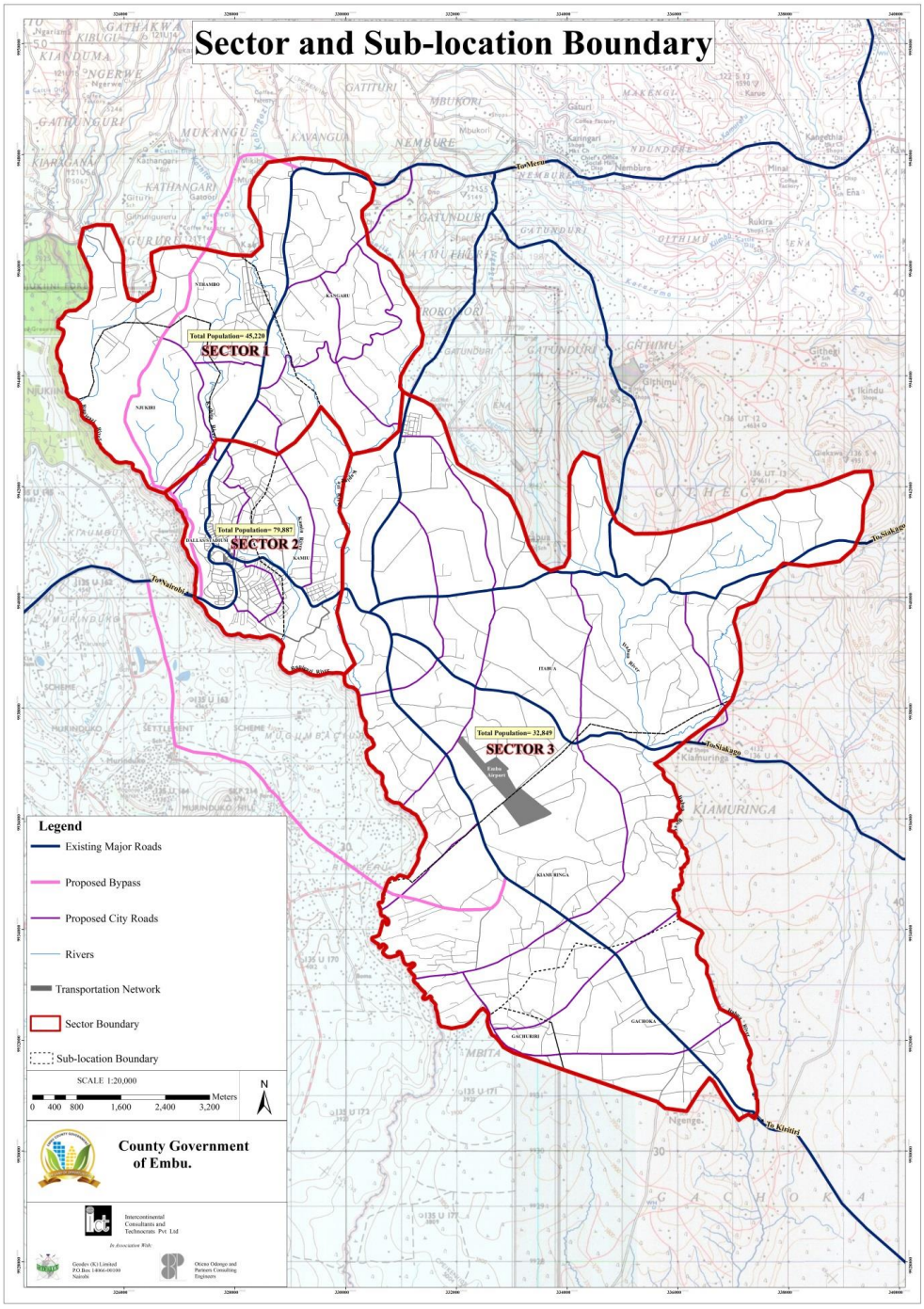
3.1.2 Division of town into sectors

The town is divided into 4 Planning Sectors as shown in Figure 3.7. The population of these sectors is presented below:

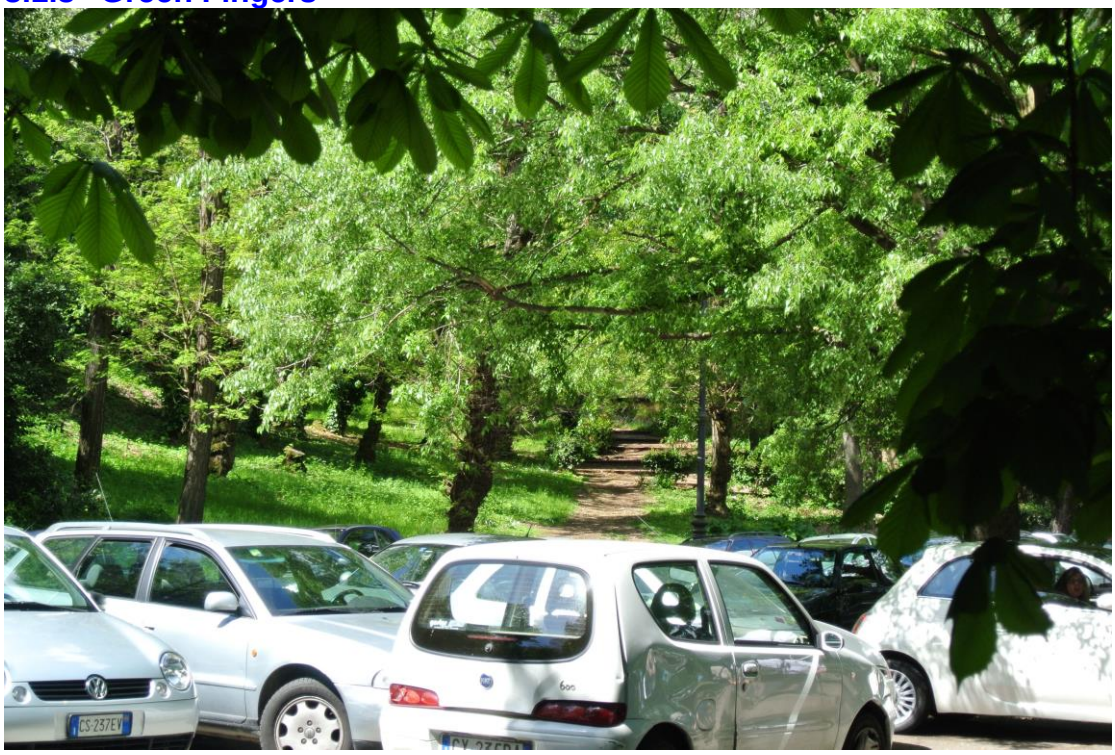
- Sector 1 (mostly Kangaru, Nthambo and Njukiri sub-locations): 45,220 persons
- Sector 2 (mostly Kamiu and Dallas sub-locations): 79,887 persons
- Sector 3 (Itabua, Kiamuringa, Gachoka and Gachuriri Sub-locations): 32,849 persons

It may be noted here that demarcation of all planning hierarchies below sector level namely the Clusters, Neighbourhoods and Estates is a part of detail planning (which should be done at the detailed planning level exercise). The allocations of facilities are suggested in accordance with the population norms considering the geographical spread of existing and planned development.

Figure 3.7: Planning Sectors (sub-town level planning divisions)



3.1.3 Green Fingers

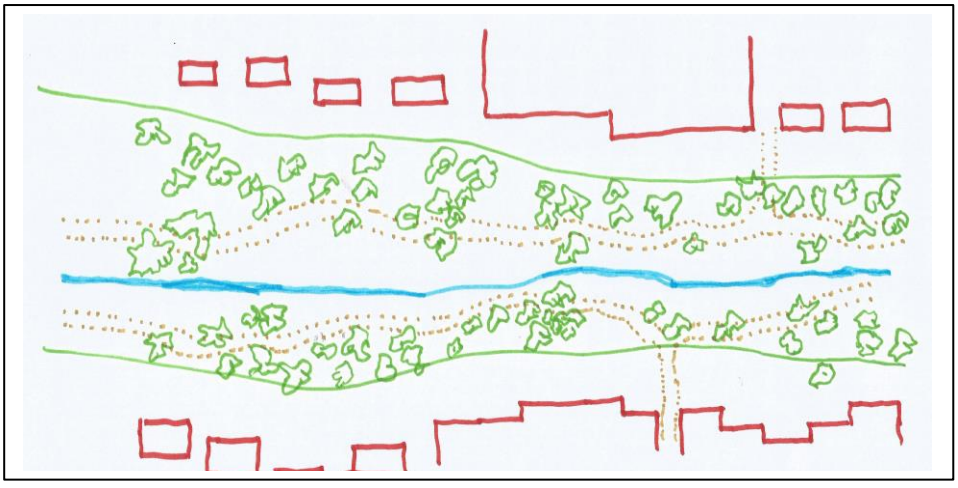


Rationale

As towns grow and densities increase green space becomes increasingly important. It is therefore necessary to protect areas of natural beauty and environmental sensitivity as an essential part of the planning process. Within the context of Kenya's towns green areas are often related to streams and rivers. These should be incorporated in the plans as areas for rest and recreation and where appropriate urban agriculture.

Implementation

Rivers and stream often run through the urban areas. Other areas are not developed due to poor soils, a liability to flood, or other reasons. By linking these areas with residential and commercial development they can be incorporated as space for recreation and development. By keeping them relatively narrow it will be possible to ensure that they are an integral part of the urban landscape.



Links with: Urban agriculture

3.1.4 Pedestrian friendly: wide pavements

Rationale

Wide, well surfaced, footpaths can transform the experience of walking from a struggle to a pleasure. Moreover, in commercial areas they facilitate the development of ancillary uses such as cafes and kiosks.

Implementation

The contrast between the experience of being in a town with wide footpaths with that of a cramped narrow one is striking. Not only is commerce easier, but the environment is more pleasant. There is no rule of thumb about the right width for a footpath, but history has shown that the majority of footpaths in Kenya's towns are much too narrow. This results in pushing and shoving, difficulties for people carrying loads, and so on.

Wide pavements allow trees to be planted along the road, thus providing shade for pedestrians. They also present opportunities for small businesses, such as kiosks, open-air restaurants and cafes.

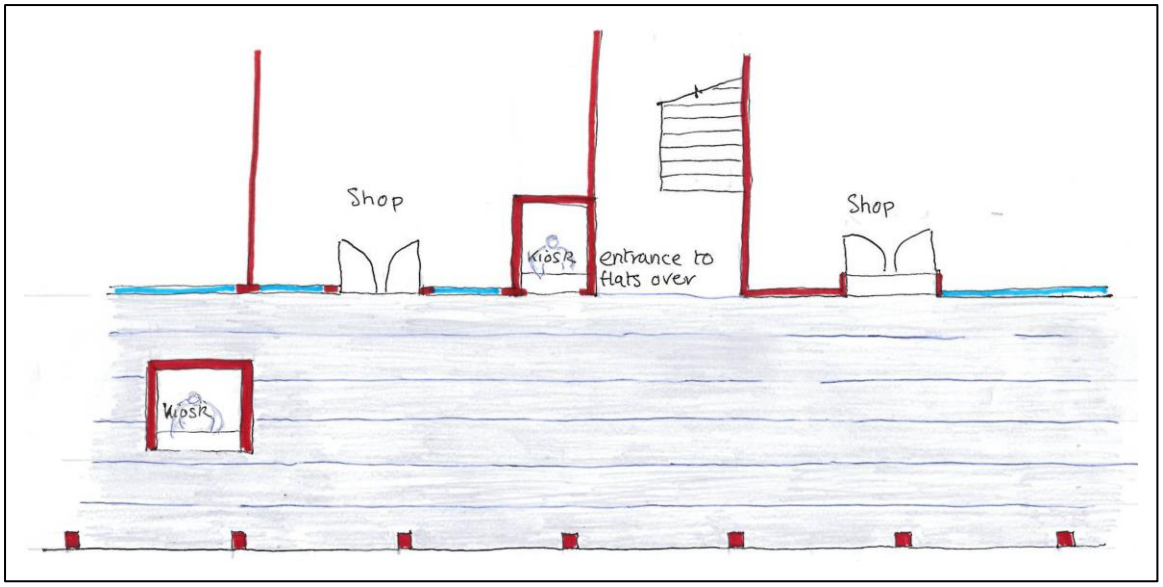
3.1.5 Pedestrian friendly: arcades

Rationale

Shelter from the run and rain are both welcome throughout much of the year in Kenya. Shops should be required to provide canopies in front of the entrances. This has the dual advantage of protecting their windows from hot sun and making shopping less stressful for their customers. Combined with broad pavements these contribute to an environment that attracts customers.

Implementation

Commercial premises should be required to provide a canopy or other cover over part of the pavement – normally at least three metres. The upper floors can be built over the columns of the canopy, thus not foregoing land space. This recommendation should be combined with the wide pavements where appropriate.



Links with: Mixed use

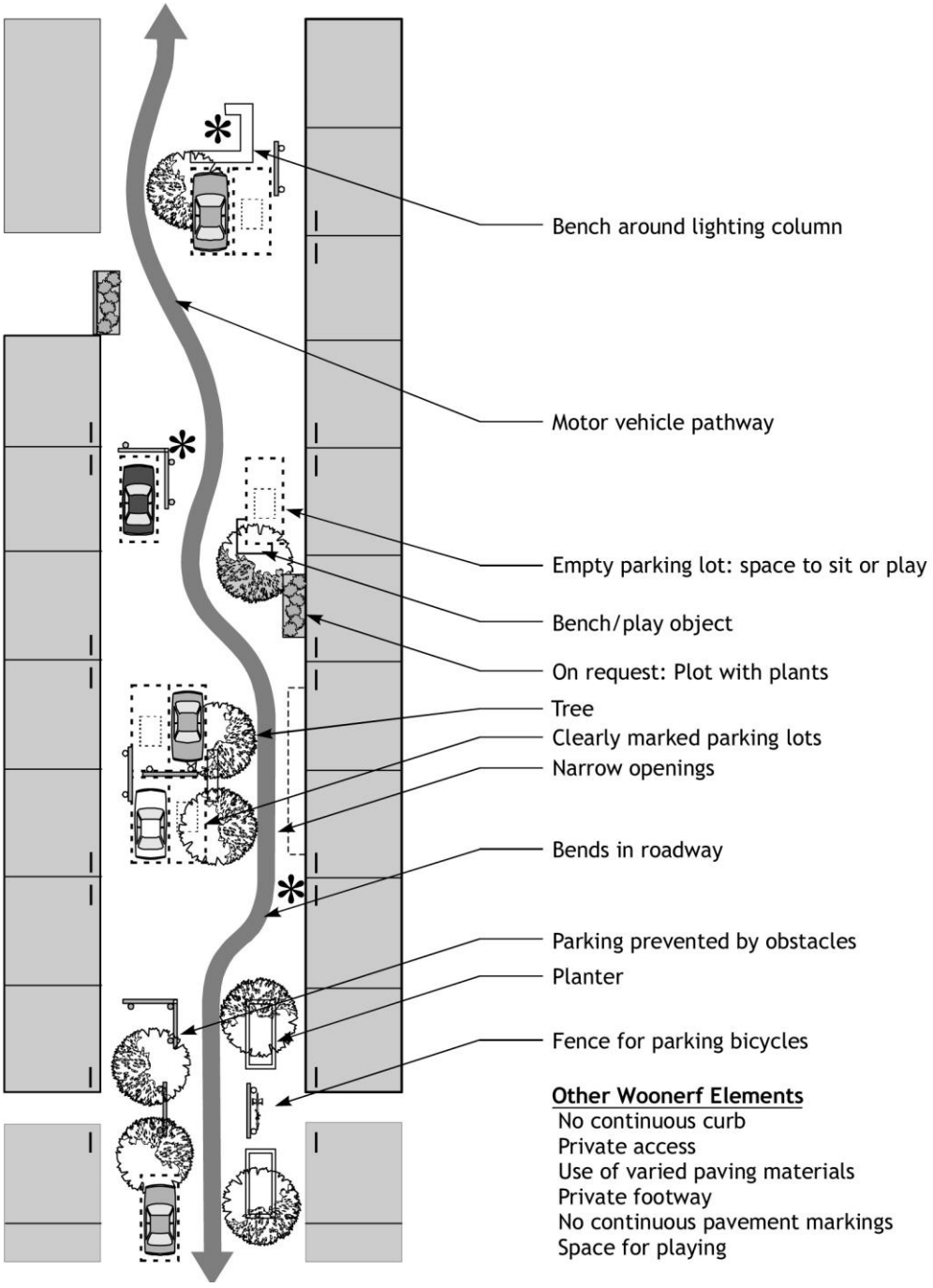
3.1.6 Pedestrian friendly: narrow roads

Rationale

Wide roads are a threat to pedestrians and are extremely divisive. Although the arterial roads will have to be wide to accommodate public transport, other roads in commercial areas should be relatively narrow. This creates a form of traffic calming and allows pedestrians to cross in relative safety.

Implementation

Roads, which have small sharp curves and similar obstacles reduce vehicle speed and place pedestrians and vehicles on a more even footing. The principle of *traffic calming* can be applied to commercial and residential streets. The Netherlands has pioneered the concept (known as Woonerf – residential place) in residential areas whereby cars are allowed, but the presence of street furniture and other obstacles means that they have to drive very slowly. The principle of the woonerf is illustrated in the diagram below.



Source: US Department of Transportation, Federal Highway Administration: University Course on Bicycle and Pedestrian Transportation, Lesson 20: Traffic Calming, Washington DC July 2006

Links with: Topographical responses**,** Curved Streets

3.1.7 Mixed Use

Amalfi, Italy

Edinburgh, Scotland

Rationale

Planning legislation was introduced when industries were noxious and noisy**,** and there was a demand for the quietness and simplicity of rural life – as represented in the Garden City movement. An unintended consequence of this was the loss of interaction between different uses and the inconvenience and sterility of single-use zones. The powerful advocacy of Jane Jacobs in her book *The Life and death of Great American Cities* reminded the planning world that the richness of mixed uses brings life and convenience to urban areas. Planning legislation, however, has tended to be stuck in the "single use" mode of land-use planning, even though, in practice, mixed uses are inevitable.

Implementation

Zoning regulations need to specify that mixed uses are acceptable. An example is mixed residential and commercial, where the ground floor accommodation is typically commercial and the upper floors are residential. This drastically reduces travel time and expense for many people. Similarly commercial uses should be permitted in dwellings, either as small shops opening onto the street or as offices. "Light Industrial" uses should be permitted in residential plots, for example non-noisy activities such as tailoring and carpentry. Such measures

stimulate the economy by reducing the barriers to entry for small entrepreneurs, and reduce the current tendency to flout regulations.

Flouting the rules: a kiosk in an upper income area of Nairobi

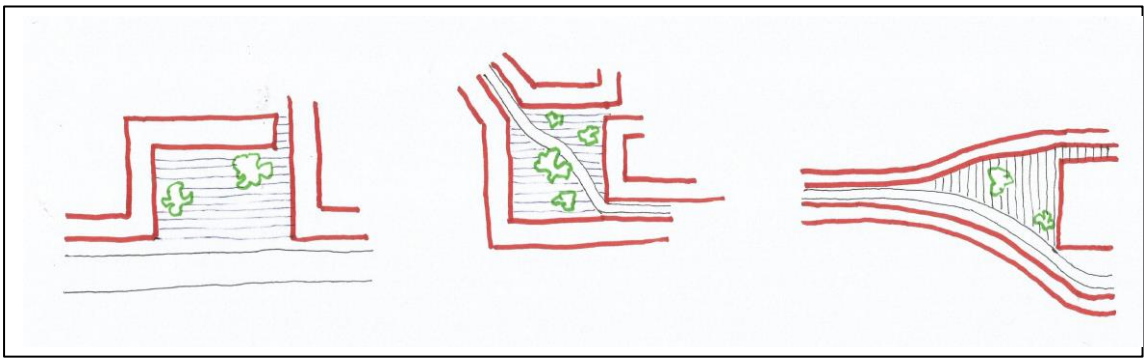
3.1.8 Small squares

Rationale

Irregular road alignment allows the creation of small squares. Unlike the grand squares which are typical of city centres in Europe, these are human in scale and provide places of shade, where people can sit and rest and children can play.

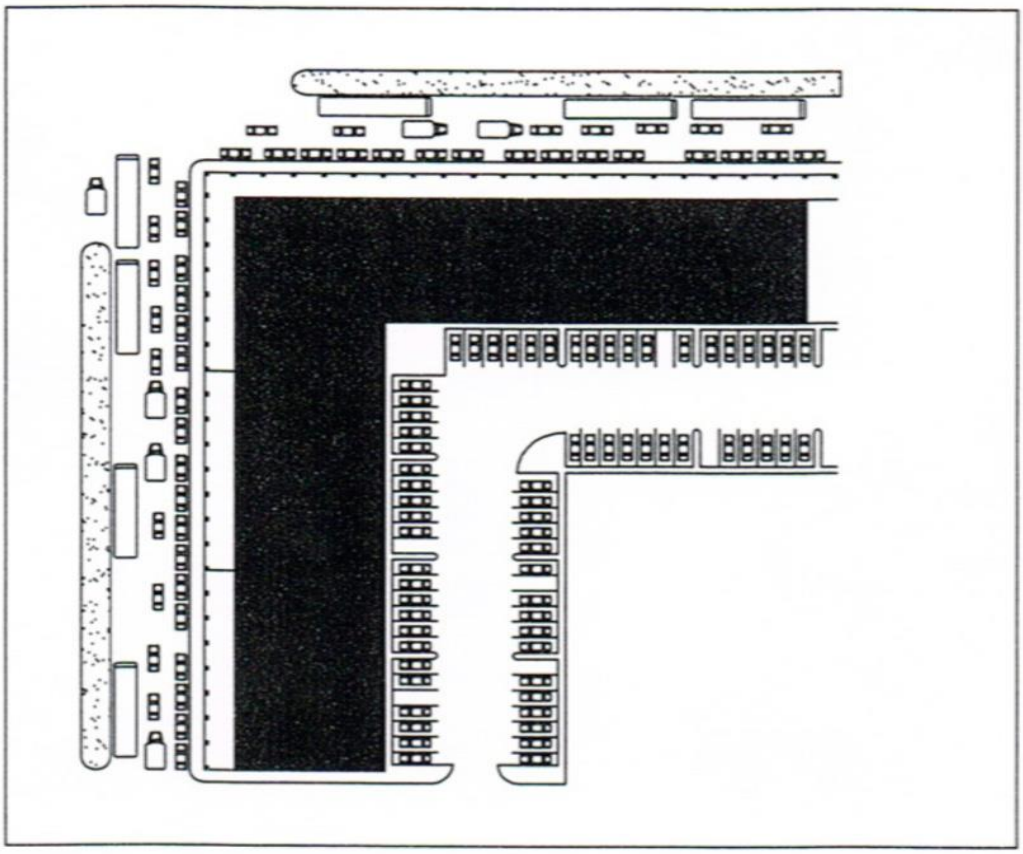
Implementation

The drawings below illustrate typical conditions for the creation of small squares, such as that above.



Links with: Large blocks, Mixed use

3.1.9 Parking



Rationale

Parking provides one of the main revenues. But not only are parking spaces hard to find – resulting in fuel and time being waste searching for a place – but also parked cars clutter the street. The time has come for parking to be planned for.

Implementation

Parking can no longer be left to chance: if the CBDs are to survive, it will be essential for proactive steps be taken to identify viable parking space. In existing towns, this might require construction of multi-storey car parks. There is little doubt that these can be self-financing. In newly developed areas, car parking should be designed so that car parks do not act as a barrier around the facilities it serves. The typical edge-of-town shopping mall, with its hectares of parking space illustrates the impact of this lack of proactive planning.

Westbrook Mall, Conneticut, USA

3.1.10 Water

Amalfi, Italy

Rationale

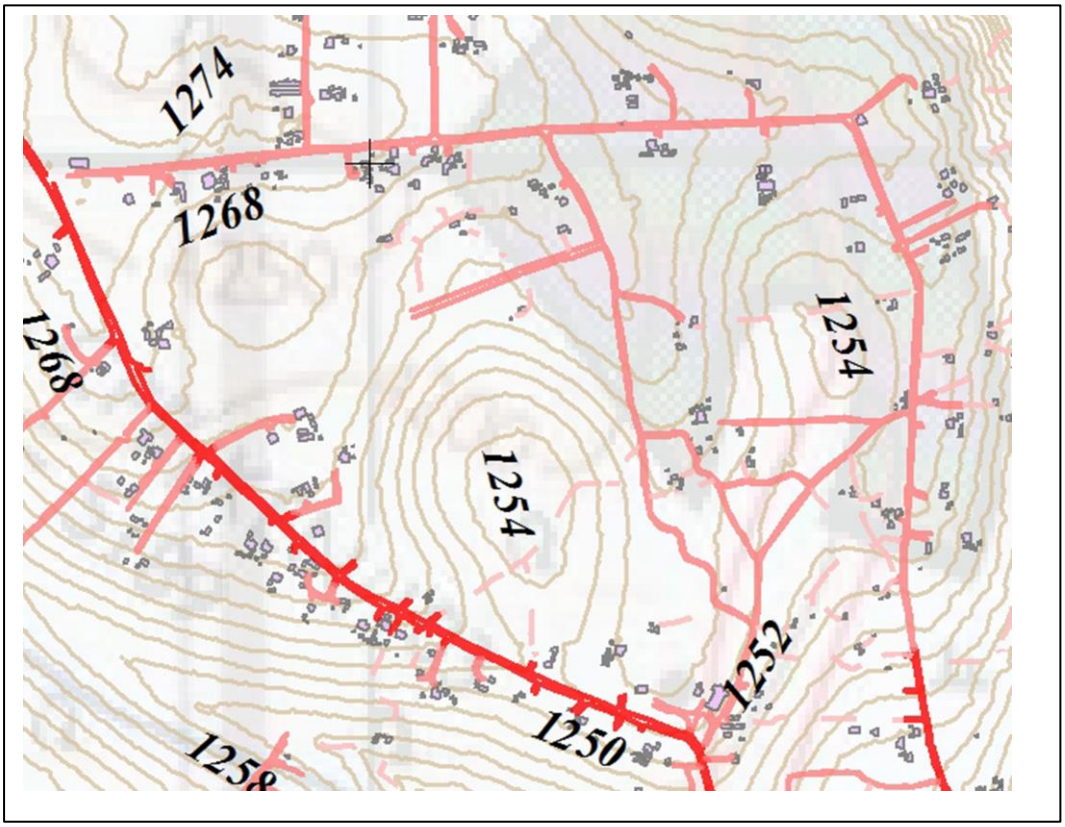
The presence of water in an urban setting is calming and refreshing, and rivers can be harnessed as attractive features in the urban landscape.

Implementation

Whether by accident or design rivers in Kenyan towns tend to be at the back of development – hidden from public view. As a result they are often treated as public drains. They can be made features on the urban landscape: canalised, as in the above photo, dammed, to create lakes, or made the centre point of parks and gardens. The rule about not developing closer than 30 metres of the river banks needs to be reviewed when development is designed with a full understanding of the environmental situation.

Links with: Topographical responses, Mixed use, Green fingers

3.1.11 Topographical responses

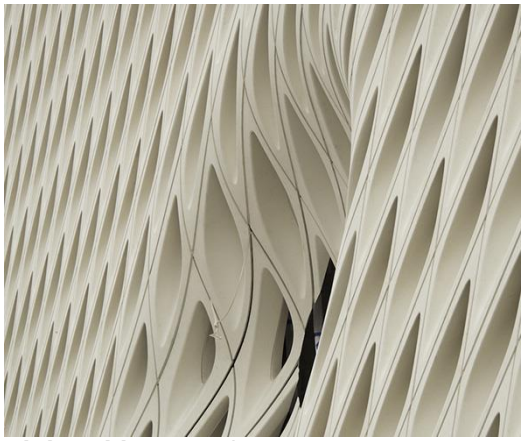


Rationale

Following the contours saves cut and fill – a major cost in road construction. But there is another consequence: since all topography is unique, the places made by following this logic are also unique. The example above demonstrates the subtle curves in the roads as the result of respecting the topography which have spontaneously emerged in a semi-rural setting.

Implementation

The tyranny of the set square which made curves and different angles complex for the traditional draftsman is no more. Even though planning needs to take place within the confines of an arterial grid, it does not need to be confined to the rigid geometry of the recent past. Computer aided design is liberating planners, just as it has in respect of architecture.



Facade of Broad – a museum in Los Angeles: Architects Diller Scofidio + Renfro, 2015

Links with: Curved streets

3.1.12 Curved streets

San Migeul de Allende, Mexico

Rationale

One of the symptoms of modern planning is the uniformity of the layouts. Using the logic of the straight line and the rectangle, planning tends to eliminate a sense of place. The mass housing projects of the second half of the twentieth century effectively standardised solutions, both in Europe and Africa – see below.

Housing in Lusaka, Zambia

Implementation

Using the guidance of topography, and responding to physical landmarks can enliven the design of towns. Even the smallest bend in a road can transform it from a standard solution to a local solution.

Links with: Topographical responses

3.1.13 Small business and jua kali

Rationale

Typically there is a prohibition against informal sector traders in the official CBDs and other commercial areas of the town. This means that such traders have two choices – either to pay the high rents for formal shopping space, or trade illegally. There is a need for a halfway house: small premises that are not expensive to rent, located in formal commercial areas. This is not different in principle from the “cart traders” that are an increasing feature of shopping malls – carts of no more than two or three square metres located within the circulation space.

Implementation

The official acceptance of jua kali enterprises distinguishes Kenya from many other countries in Africa. However, the tendency to centralise jua kali industries denies them an opportunity for more exposure to their markets. There is a need to take the concept one stage further by permitting budding small businesses a place in the formal city.

Jua Kali can mean noise and mess, but it does not have to do so. By providing space where such small businesses can graduate into the formal economy we can help them to grow. Wide pavements facilitate this, but they need to be supplemented by official support for kiosks and provision of very modest trading spaces.

Small business support centres can provide an attractive setting for sales as well as an environment in which the entrepreneurs can receive support and training.

Links with: Large blocks, Wide pavements, Mixed use

3.1.14 Urban agriculture

Rationale

Within the relatively low densities of secondary towns in Kenya, urban agriculture presents major opportunities in terms of food security and income generation.

Implementation

It is not necessary to have a large plot of land to grow sufficient vegetables for a family, but the value of urban agriculture is a strong argument in favour of providing the majority of dwellings with their own land on which to grow food. Where high land values make this impractical space should be found in the green fingers that may not be built on due to soil conditions, or for environmental reasons, for such activities.

Urban agriculture does not have to be hidden – it can be an integral part of the public open space shared by residents.

Links with Large blocks, Mixed use, Green fingers

4 Gaps in existing provision and future demand

4.1 Introduction

In principle gap analysis can only be undertaken in respect of recognised benchmarks, because without them there is nothing against which to measure existing provision. This chapter is concerned with the provision of the traditional infrastructure services as well as social facilities.

There are, in fact, three measures against which to measure performance.

- The first is spatial: what parts of the planning area are served by the service concerned?
- The second is the theoretical: to what extent does the service fall short of the norms and standards prescribed?
- The third is economic: to what extent is there an effective demand for a service?

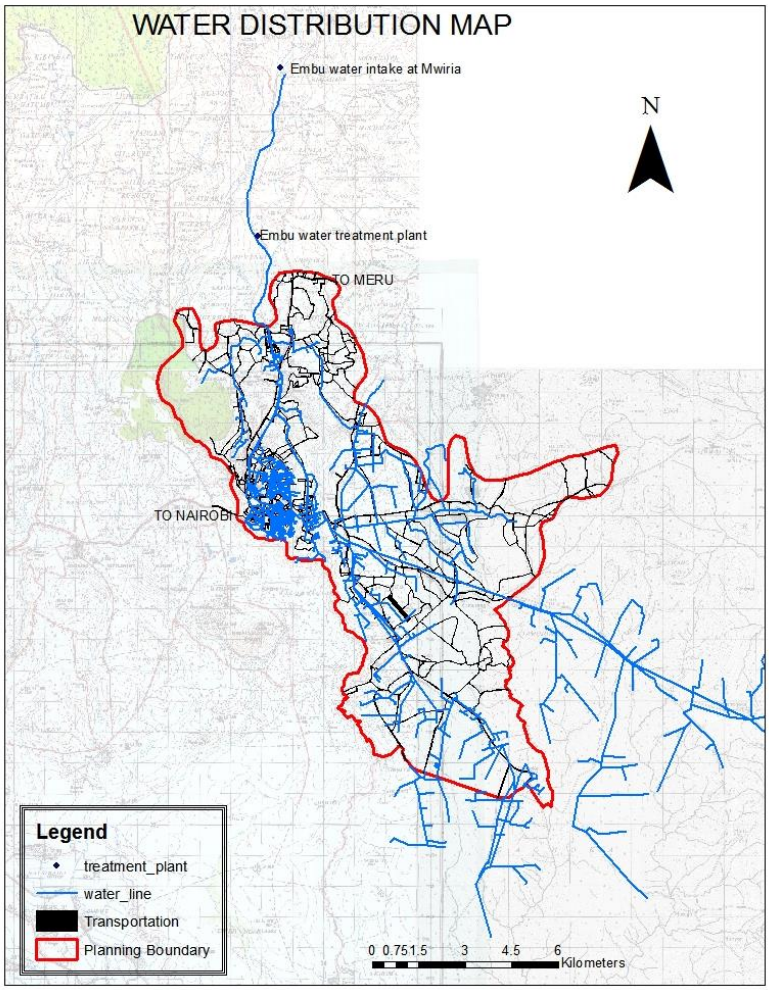
4.2 Water

4.2.1 Spatial gaps

The map below shows the water reticulation within the town.

The water supply network is available in most of the built-up areas of town except some peripheral areas as shown in figure below.

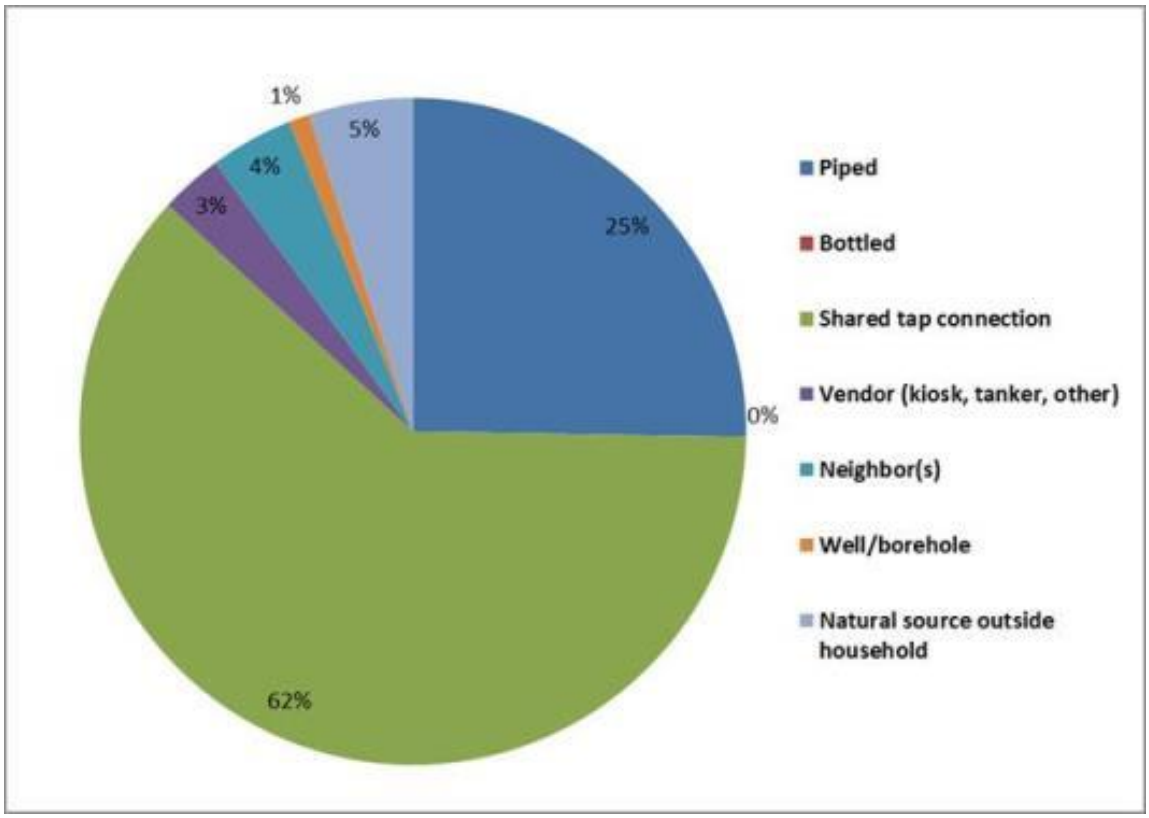
Figure 4.1: Existing Water Reticulation



4.2.2 Theoretical Demand

The current situation in Embu is as shown in the pie chart below. Although there is a water supply network in most of the built-up areas of the town but still 5%, 3% and 1% of households are dependent upon natural sources, vendor and wells respectively.

Figure 4.2: Existing household water supplies



Source: Kenya State of the Cities Baseline Survey, NORC

This shows that the majority of households do not have their own tap, and some obtain water from wells or other unsafe sources. On the assumption that all households should have their own water supply, the theoretical demand for 2015 and for each ten year phase of urban growth is shown below.

Table 4.1: Theoretical Water Demand (m^3)

	Population	Demand per housing type			Other	Unaccounted for	Existing Supply	Gap
		High	Medium	Low	% of residen-tial			
Proportion		5%	25%	70%	25%	25%		
Litres/p/day		250	150	75				
Year								
2015	84 530	1 057	3 170	4 438	2 166	13 538	17 955	4 417
2025	115 279	1 441	4 323	6 052	2 954	18 463	17 955	-508
2035	157 956	1 974	5 923	8 293	4 048	25 298	17 955	-7 343

Source: Water Design Manual for Water Supply Services in Kenya (October 2005) and consultant's estimates.

4.2.3 Effective demand

Water supply is a commercial service, and the level of consumption varies with different income groups. The Water Design Manual for Water Supply Services in Kenya (October 2005) recognises this fact by recommending different consumption levels for each income group, as show in the above tables.

However, the ability of consumers to pay for a better service is limited. In addition, EWASCO has limited funds with which to invest in sewers and water reticulation. Indeed, with the cost-in-use of a sewered WC/bathroom being at least three times that of a VIP many low income families cannot afford it.[1]

It is therefore more realistic to project a solution in which individual water connections and sewers are phased in over time, as shown in the table below. This shows that the total water demand will be15,828 cubic metres in 2025, rising to 22,891 in 2035.

Table 4.2: Effective daily future water demand (m^3)

		Demand per housing type				Other users	Total cubic metres/day	Existing Supply	Gap
	Population	High	Medium	Low	Shared	Non residential	Including unaccounted for at		
Proportion		5%	25%	70%		25%	25%		
Litres/pp/day		250	150	75	20				
Year					60%				
2015	84 530	1 057	3 170	1 775	1 014	1 754	10 962	17 955	6 993
2025	115 279	1 441	4 323	3 329	1 038	2 533	15 828	17 955	2 127
2035	157 956	1 974	5 923	5 805	948	3 663	22 891	17 955	-4 936

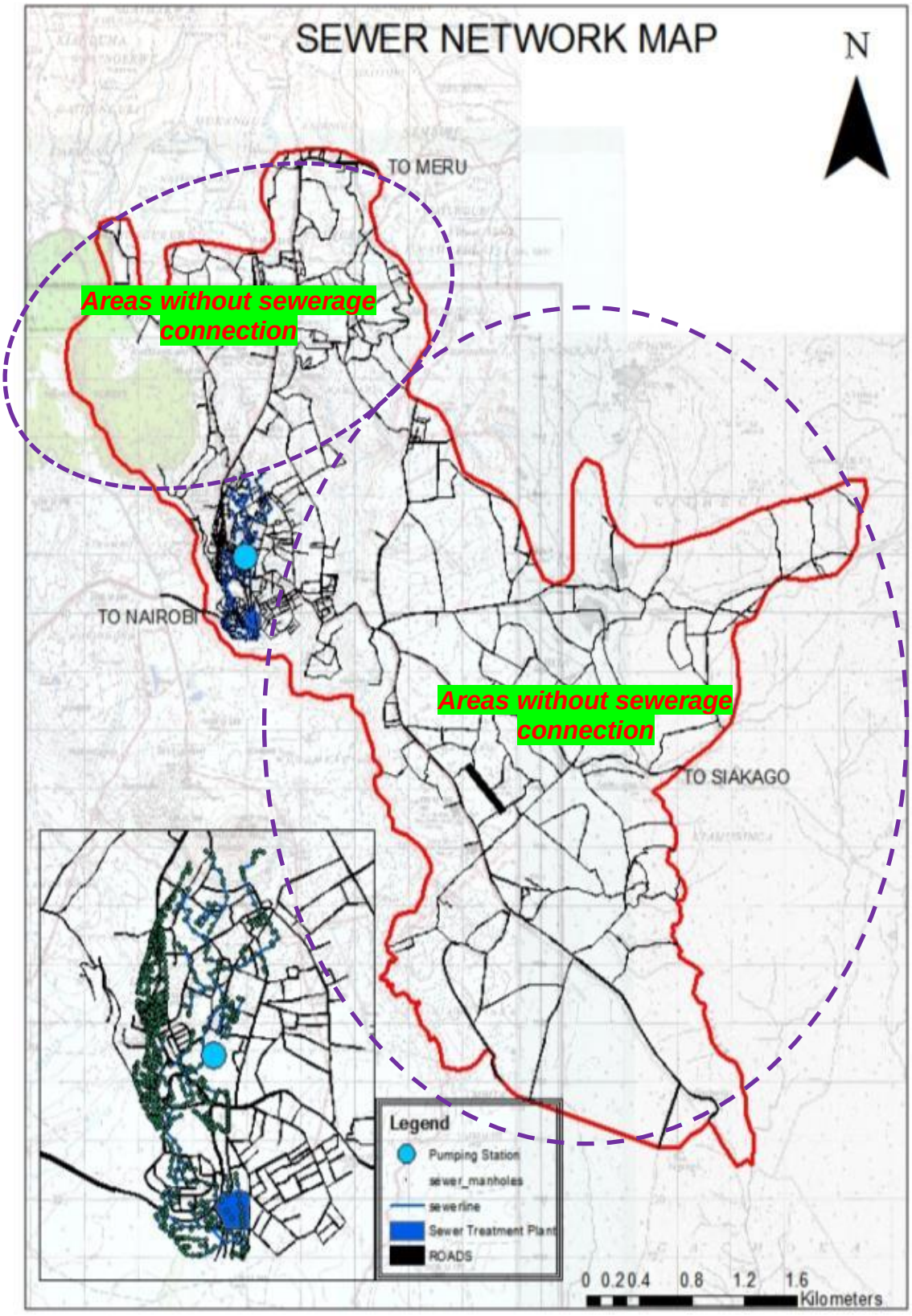
[1] Martin, R, and Pansegrouw, P: Development of a model for determining affordable and sustainable sanitation demand in dense settlements of South Africa, Water Research Commission, Pretoria, 2009.

4.3 Sewerage

4.3.1 Spatial gap

The existing coverage of sewers is as shown in the map below.

Figure 4.3: Existing sewerage system



The fact that such a small part of the urban area is sewered is not unusual. This derives mainly from the low densities. Properties in these areas are typically have their own septic tanks. The second reason is that some low income areas and informal settlements are served by pit latrines.

4.3.2 Demand

Theoretical demand

If all households were to be served by sewers, the sewage treatment demand would be as shown in the table below.

Table 4.3: Sewerage: theoretical demand

Year	Population	Water consumption	Sewerage flow	Capacity of existing	Gap
			80%		
2015	84,530	13 538	10 830	5 932	-4 898
2025	115,279	18 463	14 770	5 932	-8 838
2035	157,956	25 298	20 238	5 932	-14 306

This table illustrates the scale of the challenge rather than a realistic target. As stated above, there are economic constraints which limit the effective demand for sewerage.

Effective demand

If we make the assumption that EWASCO has the capacity to expand the sewerage system to meet the effective demand, which we put at 70% of all households by 2035, then the effluent quantity will be as shown in the table below.

Table 4.4: Sewerage flow: effective demand

Year	Population	Water consumption	Sewerage flow	Capacity of existing	Gap
			80%		
2015	84 530	10 962	8 770	5 932	-2 838
2025	115 279	15 828	12 663	5 932	-6 731
2035	157 956	22 891	18 313	5 932	-12 381

4.3.3 Planned development

There are two major types of development planned by EWASCO: increasing the coverage of sewers, and moving the existing sewage treatment works to a new location. The two maps overleaf illustrate these concepts.

Figure 4.4: EWASCO existing and proposed sewerage network (option 1)

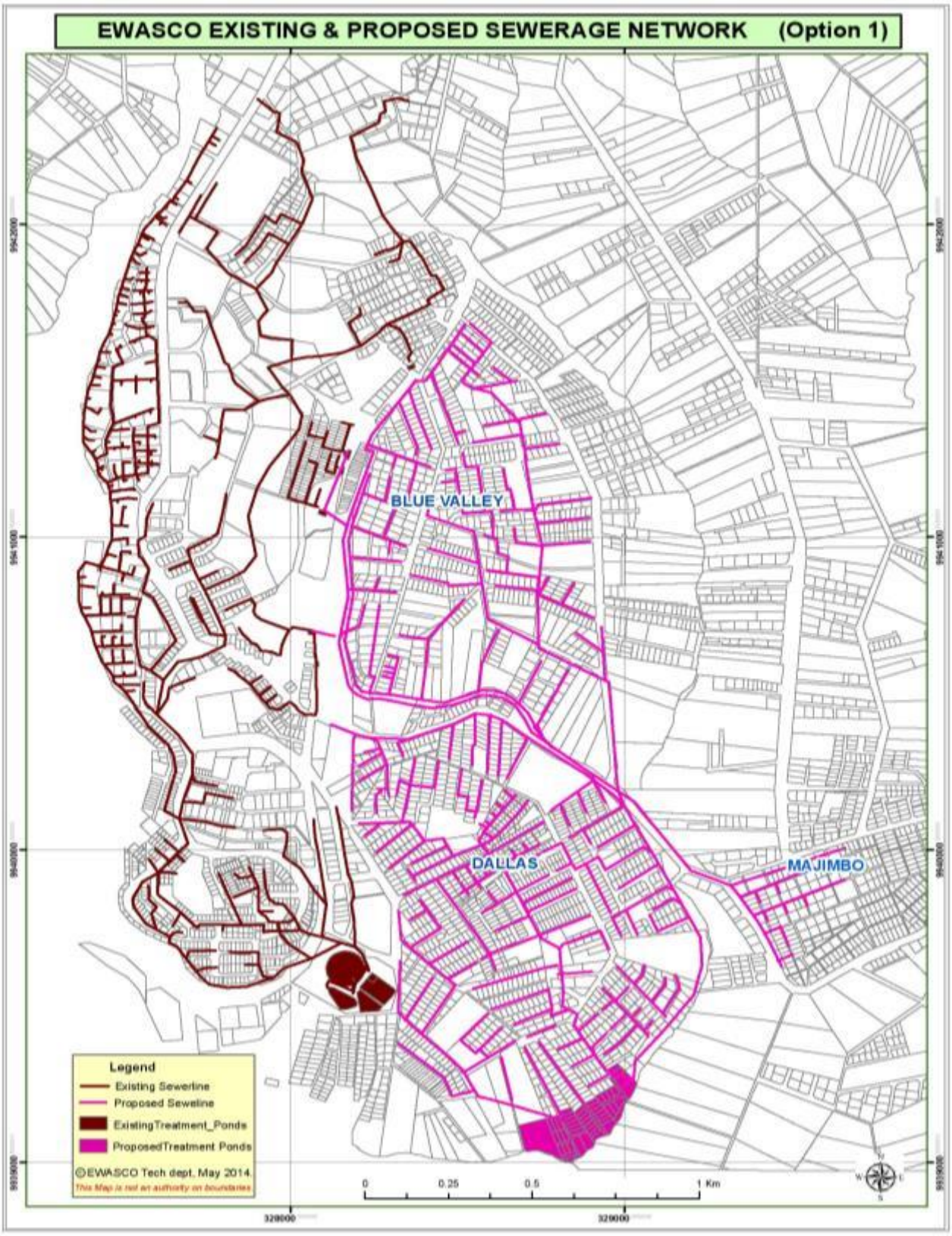
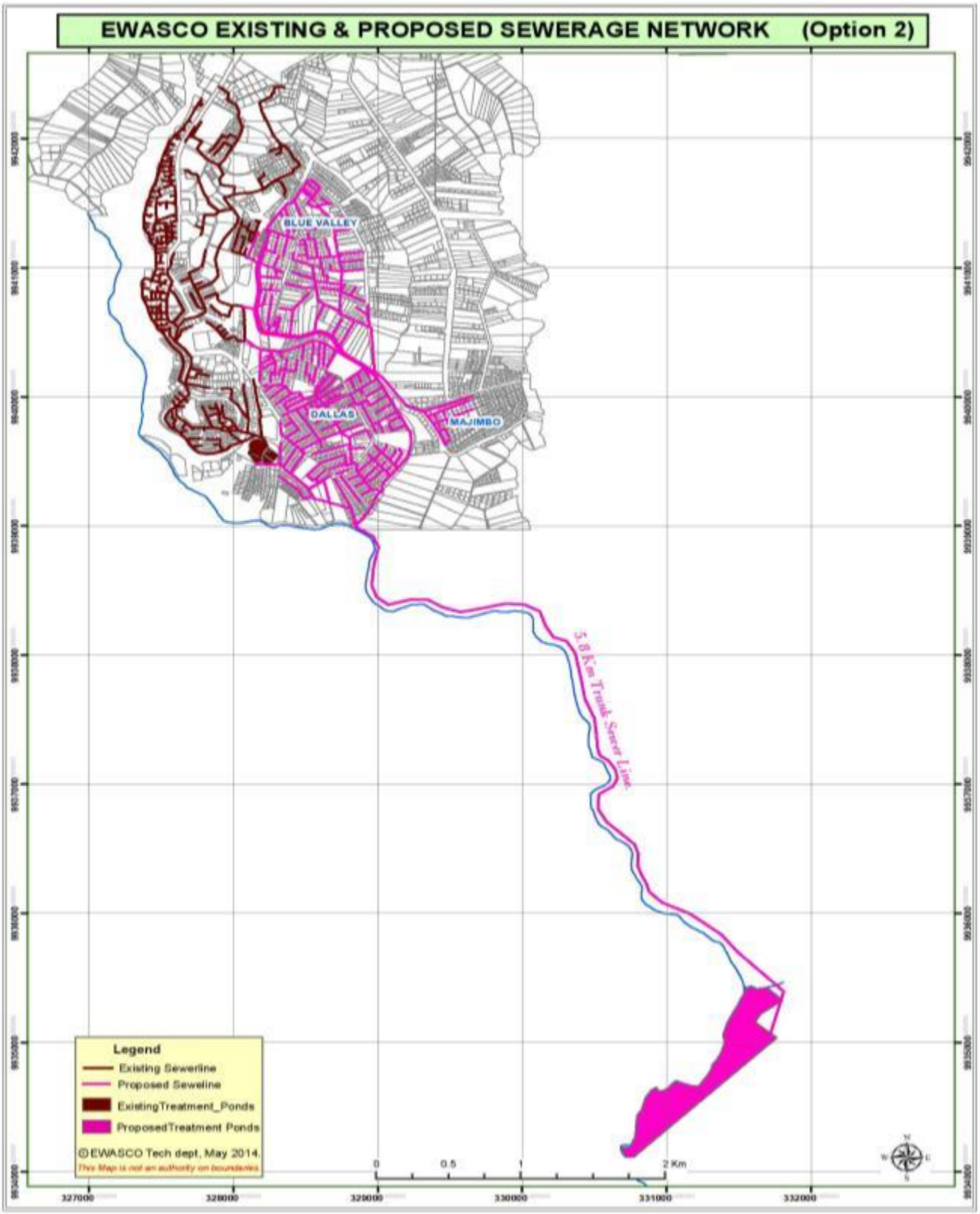


Figure 4.5: EWASCO existing and proposed sewerage network (option 2)



4.4 Roads and traffic

4.4.1 Road Capacity

The Nairobi-Embu-Meru Highway (B-6) and the Embu-Kiritiri Road (B-7) are two major inter-city corridors passing through Embu town. Embu-Saikago Road (D-469) joins Embu to Saikago town and E-629 is another important road in Embu and connects Embu-Kiritiri Road (B-7) at south with Embu-Meru Highway (B-6) at Karingari located north of Embu.

The existing traffic volume on major roads and their capacities has been analysed to assess the existing road space demand. Traffic figures on these roads are projected for horizon years and future demand are also analysed. Road capacity standards are obtained from "Road Design Guidelines for Urban Roads, 2001 – Ministry of Local Government, Government of Kenya". Table 4.5 shows the peak hour traffic on major roads in Embu.

Table 4.5: Existing Traffic and Capacity of Major Roads in Embu

Road Section	From	To	Lanes	Capa-city	Peak Hour Traffic	Volume/ Capacity (V/C)
Nairobi-Meru Highway	Embu Town Boundary	Bamburi Cement Outlet	2-Lane undivided	1,500	922	0.61
Nairobi-Meru Highway	Bamburi Cement Outlet	KCB ATM	2-Lane undivided	1,500	1,118	0.75
Nairobi-Meru Highway	KCB ATM	Barclays Bank	2-Lane undivided	1,500	1,202	0.80
Nairobi-Meru Highway	Barclays Bank	B-6 & B-7 intersection	2-Lane undivided	1,500	1,222	0.81
Nairobi-Meru Highway	B-6 & B-7 intersection	Embu Post Office	2-Lane undivided	1,500	1,267	0.84
Nairobi-Meru Highway	Embu Post Office	ACK Faith House	2-Lane undivided	1,500	818	0.55
Nairobi-Meru Highway	ACK Faith House	Embu Provincial Hospital	2-Lane undivided	1,500	947	0.63
Nairobi-Meru Highway	Embu Provincial Hospital	Embu University College	2-Lane undivided	1,500	1,050	0.70
Embu-Kiritiri Road	B-6 & B-7 intersection	Embu-Kiritiri Bus Stage	2-Lane undivided	1,500	1,379	0.92
Embu-Kiritiri Road	Embu-Kiritiri Bus Stage	KCB Kenya Ltd	2-Lane undivided	1,500	994	0.66
Embu-Kiritiri Road	KCB Kenya Ltd	Majimbo Shopping Centre	2-Lane undivided	1,500	860	0.57
Embu-Kiritiri Road	Majimbo Shopping Centre	Embu Airport	2-Lane undivided	1,500	790	0.53

*Road Design Guidelines for Urban Roads, 2001 - Ministry of Local Government, Government of Kenya

Existing peak hour traffic on Nairobi-Meru Highway (B-6) between Bamburi Cement and Embu Post Office is observed to be more than 70% of its capacity, which is a more than acceptable threshold for an urban road. Peak hour traffic on Nairobi-Meru Highway (B-6) from Embu Post office to Embu University College is within its acceptable limit.

Peak hour traffic volume on Embu-Kiritiri Road (B-7) from B-6 & B-7 intersection up to Embu-Kiritiri bus stage is above the acceptable limit utilizing 90% of the road capacity. Traffic in Embu-Kiritiri Road (B-7) from Embu-Kiritiri bus stage up to Embu Airport is observed to be within threshold limit utilizing less than 70% of its capacity.

Capacity analyses of these with projected traffic at peak hours are presented in Table 4.6.

Table 4.6: Projected traffic and road capacity

Road Section	From	To	Capacity	2020	2025	2030	2035
Nairobi-Meru Highway	Embu Town Boundary	Bamburi Cement Outlet	1,500	1,111	1,258	1,412	1,578
Nairobi-Meru Highway	Bamburi Cement Outlet	KCB ATM	1,500	1,347	1,525	1,711	1,912
Nairobi-Meru Highway	KCB ATM	Barclays Bank	1,500	1,448	1,640	1,840	2,057
Nairobi-Meru Highway	Barclays Bank	B-6 & B-7 intersection	1,500	1,473	1,668	1,872	2,092
Nairobi-Meru Highway	B-6 & B-7 intersection	Embu Post Office	1,500	1,527	1,729	1,940	2,168
Nairobi-Meru Highway	Embu Post Office	ACK Faith House	1,500	986	1,117	1,253	1,400
Nairobi-Meru Highway	ACK Faith House	Embu Provincial Hospital	1,500	1,141	1,292	1,450	1,621
Nairobi-Meru Highway	Embu Provincial Hospital	Embu University College	1,500	1,265	1,433	1,608	1,797
Embu-Kiritiri Road	B-6 & B-7 intersection	Embu-Kiritiri Bus Stage	1,500	1,662	1,882	2,112	2,361
Embu-Kiritiri Road	Embu-Kiritiri Bus Stage	KCB Kenya Ltd	1,500	1,198	1,357	1,523	1,702
Embu-Kiritiri Road	KCB Kenya Ltd	Majimbo Shopping Centre	1,500	1,036	1,173	1,316	1,471
Embu-Kiritiri Road	Majimbo Shopping Centre	Embu Airport	1,500	952	1,078	1,210	1,352

*Road Design Guidelines for Urban Roads, 2001 - Ministry of Local Government, Government of Kenya

Projected peak hour traffic on Nairobi-Meru Road (B-6) exceeds its capacity from Embu town boundary to Embu University College. Traffic on Embu-Kiritiri Road (B-7) from B-6 & B-7 intersection up to Majimbo Shopping Centre exceeds its capacity during projected peak hour traffic conditions at 2035.

4.4.2 Road Connectivity

Nairobi-Meru Highway (B-6) is the main road in Embu: it connects the CBD and Majengo area in the south with Embu University, Kangaru, Kathuri, Kiangima and Mutunduri in the north. The other major road in Embu is the Embu-Kiritiri Road (B-7. It connects the CBD and Dallas area with Majimbo, Gatondo, Don Bosco and Ngenge area located east of Embu. Mama Ngina Street in the CBD acts as a loop road parallel to the Nairobi-Meru Highway (B-6) and provides access to the buildings in the CBD.

However, roads in other parts of the city towards east side of the CBD, the Blue Valley Estate, Gatondo and Itabua area are narrow, unpaved roads in a bad condition or insufficient in number to form a network. Travel time and travel distance for residents to access the nearest road is more than the threshold standard. A road network analysis of the existing road system that a reclassification is required for Embu.

The primary distributor or arterial roads form the primary road network of an urban area. Primary distributor roads for Embu are identified and right of way requirement for these roads have been analysed based on existing and future development and traffic demand.

The Right of Way (ROW) requirements for the primary distributor roads in Embu are presented in Table 4.7.

Table 4.7: Primary distributor roads right of way requirements

Road Category	Road Segment	Existing ROW	Required ROW
Existing Primary Distributor Roads	Nairobi-Meru Highway (B-6)	Less than 20m	30m
	Embu-Kiritiri Road (B-7)	Less than 20m	30m
	Muthatara-Karurina-Gatundury Road (E-629)	Less than 20m	30m
	Majimbo-Embu University Road	Less than 20m	25m
	Uchumi-Level-5 Hospital Road	Less than 20m	25m
	Dallas Ring Road	Less than 20m	25m

4.4.3 Junction Capacity

The capacity of an intersection depends on the volume of turning traffic passing through it during peak hours and the delays caused at the intersection. Intersection delays of right-turning traffic depend on the gap to cross the through traffic in opposite direction. Level of service analysis for major intersections in Embu have been carried out and listed in Table 4.8

Table 4.8 Intersection Capacity Analysis

Intersections	Description	Intersection delay during peak hours	Level of service* during peak hour traffic 2015
Nairobi-Meru Highway (B-6) & Bamburi Cement Road	At-grade T-junction	15-25 seconds	C
Nairobi-Meru Highway (B-6) & Panesic Hotel Road	At-grade staggered junction	> 50 seconds	F
Nairobi-Meru Highway (B-6) & Embu-Kiritiri Road (B-7)	At-grade T-junction	> 50 seconds	F
Nairobi-Meru Highway (B-6) & ACK Faith House Road	At-grade T-junction	10-15 seconds	B
Junction on Embu-Kiritiri Road (B-7)/Kubukubu Road near Uchumi	At-grade 4-legged junction	> 50 seconds	F
Embu-Kiritiri Road (B-7) and Majimbo Shopping Centre Road	At-grade T-junction	15-25 seconds	C

*Level of Service LOS F = beyond acceptable limit

The analysis shows that turning traffic at the intersections of the Nairobi-Meru Highway (B-6) and the Embu-Kiritiri Road (B-7), the Nairobi-Meru Highway (B-6) and the Panesic Hotel Road and the junction on Embu-Kiritiri Road (B-7)/Kubukubu Road near Uchumi during peak hour exceeds intersection capacity under existing traffic conditions. Capacity analysis for these intersections for projected traffic also shows an unacceptable level of service. These intersections need improvements in terms of additional through lanes and turning lanes etc. Other intersections operate at acceptable level of service under existing and projected traffic conditions.

4.4.4 Bus/matatu terminal and capacity

Two matatu terminals are located on the Embu-Kiritiri Road (B-7)/Kubukubu Road west of Uchumi within CBD area of Embu, providing services for Embu-Kiritiri, Embu-Meru routes. A larger matatu/bus terminal is located on the Nairobi-Meru Highway (B-6) at the southeast corner of the stadium, serving the Embu-Nairobi and Embu-Nyeri buses and matatus. A total of 400 matatus are presently plying in Embu.

The existing matatu and bus terminal area in CBD is 1.51 hectares, which includes circulation area of the terminals. Access roads are congested during peak hours, due to the practice of stopping matatus

in the middle of road for boarding of passengers. Waiting areas for the passengers are absent and they stand on raised paved area and also on abutting roads. Bus/matatu terminals require larger spaces with waiting facilities, small commercial establishments, toilet facilities and ticket counters etc. In order to provide basic bus terminal facilities at least 3.0 hectares is required to meet the existing demand.

Based on the population distribution and new planned area within Embu, demand for public transport is expected to grow. Basic facilities of boarding/alighting bays, passenger waiting area, ticket counters and toilets will require about 5.0 hectares to satisfy future demand. The bus/matatu terminal will be located near to intercity highways for easy accessibility. Shaded boarding and alighting facilities and sufficient bus bays are to be provided within CBD.

4.4.5 Parking

The CBD consists of offices and commercial establishments which cater for the needs of the whole town and the Sub County. The net built-up area, including all floors of existing office and commercial uses in the CBD, is 187,125 m^2. 750 parking spaces are presently available in the CBD, though the theoretical demand is for 2,368 spaces (at the norm of one parking space per 60 m^2 of office and commercial space). With the growth of business in CBD and redevelopment possibilities, demand in the CBD will increase in coming years, although under the plan there will be a measure of decentralisation of commercial centre and industrial uses. Considering these factors the future demand is calculated to be 3,000 spaces. Table 4.9 presents existing and future parking demand for the CBD.

Table 4.9 Parking demand in the CBD

Area	Area in Ha	Number of Parking Space
Total Area of CBD	28.79	
Stadium Area	3.84	
Net CBD Area	24.95	
Total Covered Area	18.71	
Total Parking Demand		3,118
Existing Open Parking		750
Net Parking Demand		2,368
Parking Demand at 2035		3,000

4.4.6 Parking for heavy vehicles

Embu is located on the intercity corridors of Nairobi-Meru Highway (B-6) and Embu-Kiritiri Road (B-7) and heavy vehicles pass through Embu to reach their destination. Many of these stop and park for refuelling, small repairs and to rest at night. Roadside shoulders are used by these heavy vehicles for their parking and small repairs. Small temporary shops and hotels have also sprung up which provide food and lodging facilities to the long distance drivers. However, all these facilities create congestion on the roads that are insufficient for the existing demand. A facility to provide parking spaces for 40 heavy vehicles is required to meet the existing demand.

The volume of heavy vehicles on the Nairobi-Meru Highway (B-6) and the Embu-Kiritiri Road (B-7) is expected to grow as is the demand for heavy vehicle parking. In order to accommodate future demand, an integrated heavy vehicle parking facility of 10ha is required. This will include 70 parking spaces along with small repair shops, food kiosks and lodging facilities.

4.4.7 Public Transport

Matatus, minibuses, tuk tuks and boda bodas are the prevailing modes of public transport in Embu. Matatus carry 14 passengers and minibuses carry 25 to 29 passengers. Both follow certain approved routes. Tuk tuks and boda bodas do not follow any route and they operate on as as-required basis. The matatu and minibus fleets are owned and operated by SACCOs. Matatu drivers and helpers are hired by the SACCO. There are no specific bus/matatu stops and they cause traffic congestion by stopping in the middle of roads for boarding/alighting passengers.

Matatus provide the most popular mode of carrying passengers in Embu. Public transport carries 65% of all passengers, and 30% are carried by private cars; however, 60% of the traffic is private cars and 30% is public transport. An improvement in the public transport system is essential for Embu to meet the future travel demands of the city. A public transport share of 75% can be achieved through improvement of the existing system and introduction of new public transport systems.

4.5 Stormwater drainage

4.5.1 Summary of the current stormwater drainage

- Stormwater drainage is inadequate
- The main storm water drains are about 5km in length and found in the following areas and road sections:
    - From slightly above the general hospital down to the stadium along Kenyatta highway about 2km
    - From Highway Court to Uchumi supermarket along Kubukubu road about 500m
    - Along Mama Ngina street about 500m
    - Majengo area about 1km
    - Blue valley area about 1km
- There are about 5km of roads with lined drains, and, out of the total length of 430km about 70km of roads have earth drains. This is about 16% of the total road length.
- Storm water drains are mainly found in the CBD along the main avenues/classified roads and consist of lined open drains.
- The roads in a few residential areas have drains including Majengo, Blue Valley and Kaunda estates.
- There are no drain wayleaves in slum areas. The worst affected are Grogon and Shauri Moyo because of their hilly terrain which puts the residents at risk of structural collapse and loss of life
- The town lacks a comprehensive study and design for storm water drainage
- The existing outfalls require lining
- Areas that require immediate interventions include Miraa road behind Naivas Supermarket and Kubukubu road from Highway court to Uchumi to Supermarket

Water-logged areas of town: There are a few water-logged areas in the lower parts of the town where minor flooding occurs, including areas around the stadium. Due to the hilly terrain there has not been any major flooding. The household survey data in the table below shows that around 8% households each reported to have flooding and mudslides in their areas. More people in informal areas reported to have flooding and mudslides than the formal areas.

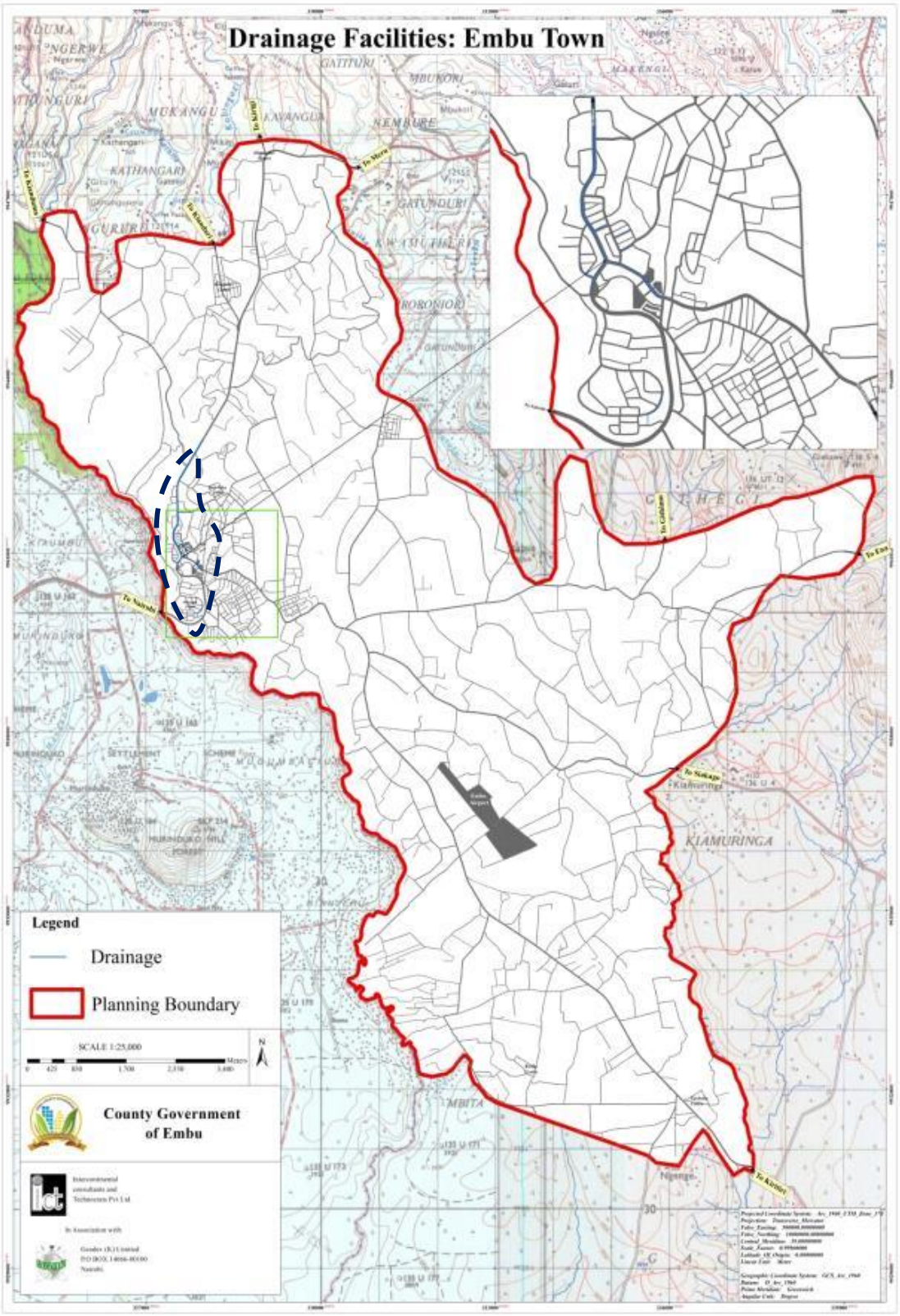
Table 4.10: Flood risk: Percentage of households subject to risk stated

		Location		***HH poverty***		***Gender (Informal)***	
Characteristic	**All**	**Informal areas**	**Formal areas**	**Poor**	**Non-poor**	**Male-headed**	**Female-headed**
Flooding[(b)]	8	**28**	**4**	8	7	31	24
Mudslides[(c)]	8	**16**	**6**	7	7	20	12
N	1,014	137	877	470	537	88	43

(a) Households reported that the area floods during heavy rains.
(b) Households reported that they are located on a hillside that is subject to mudslides.

Source: Kenya State of the Cities Baseline Survey, NORC

Figure 4.6: Existing storm water drainage



4.5.2 Demand supply gap

The majority of roads (62.5% of the total length) lack proper drainage. Provision of drainage facilities in residential areas is very poor with only a few areas covered.

The demand supply gap of planning area for stormwater drains is given in table below:

Table 4.11: Stormwater drainage demand and gap assessment (length of drains in km)

Type	Norms	Current situation	Demand		Gap	
			2015*	2035**	2015	2035
Primary drains (2 to 5 m^3)	As per natural drainage and slope	10	43	50	33	40
Secondary drains (1 m^3)	Along both sides of major roads (around 25% of tertiary drain length)	10	215	250	205	240
Tertiary drains (1 to 5 cubic feet)	Both sides of all other roads	0	860	1,000	860	1,000

*Current road length 430km ** Future road length 500km/ Source: Consultants' Estimation

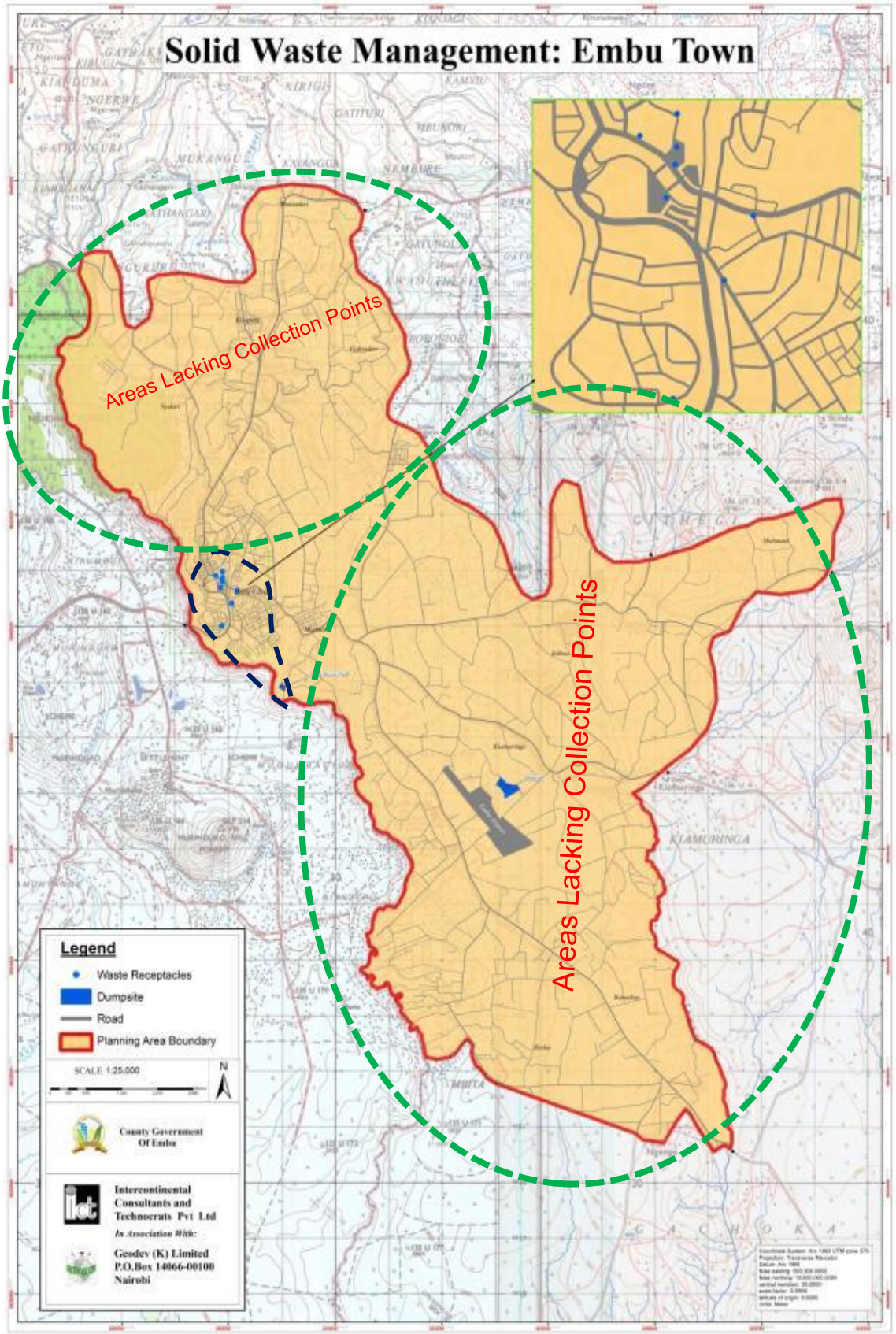
4.6 Solid waste

As shown in the table on the next page, there are many gaps in terms of collection and disposal of solid waste.

Table 4.12: Summary of existing solid waste removal and treatment system

Main areas covered with solid waste collection	CBD and residential areas within town	About 25% of Embu town planning area, see map on next page
Waste generated	Approximately 155 tons per day	Waste mainly includes: vegetable and food remains from domestic and market places, paper, plastic, cans, bottles, fruit and wood
Waste collected	84 tons per day which is about 54% of waste generated. Around 60 percent of waste generated in slums/informal settlements is collected daily	Inadequate collection and transportation facilities
House-to-House Collection	A private group called Solid Waste Management that collects waste in Blue Valley at a fee of Ksh150/month. CBO called Unity for Development in Dallas at a cost of Ksh150/month per plot (charged on the plot owner) and Ksh 20 per bag per household	
Waste receptacles/ skips	There are six skips in Embu town located in Blue Valley (1), Dallas (1), and four in CBD	Only Dallas and Blue Valley where waste is collected and deposited in specific designated locations (skips). Vandalism of waste collection facilities
Transportation	About 68% of the total waste is collected and transported to the dumping site. There is one tractor and three Isuzu trucks for solid waste collection which are not adequate	Inadequate collection and transportation facilities
Transfer Stations and Dumpsite	The town has two transfer stations located in Majimbo and Koimugo areas. There is no landfill but a dumpsite at Kagonga area measuring 15 acres approximately 7km from the heart of the town	The current unfenced dumping site is not suitable as it is near the airstrip. There is no recording of the quantity of waste deposited there. Presence of a number of scavengers. Lacks a protection belt as specified in the Physical Planning Handbook, 2008 (100m belt)

Figure 4.7: Existing solid waste collection



4.6.1 Solid waste demand/supply gap

The generation of solid waste is higher than the capacity to remove it and many areas are left with waste uncollected either completely or on time. With urban expansion and population increase, the available vehicles won't be able to handle transportation adequately. More staff and vehicles are required to match the collection and disposal requirements/standards. Mechanisms for waste treatment also need to be put in place.

Issue identification

Based on data analysis and stakeholder consultation, the following issues have been identified:

- The current dumping site is not suitable as it is near the airstrip. It is currently not fenced.
- There are no management practices at the dumpsite currently.
- The town lacks mechanisms for formal separation, recycling and treatment of the waste collected
- Inadequate collection and transportation facilities
- Vandalism of waste collection facilities
- Lack of modern technology to treat waste in the town and probably produce energy from the waste

Waste production projections

Table 4.13: Projected solid waste production
(Based on current rates of production)

Year	Population	Quantity per head/day (kg)	Total/day (kg)	Total/day (tonnes)
2015	84,530	1.80	152 154	152
2025	115,279	1.80	207 502	208
2035	157,956	1.80	284 321	284

Note: Average waste production per person per day is expected to increase with time due to an anticipated increased income levels and lifestyle changes. The above figures may therefore be exceeded in practice

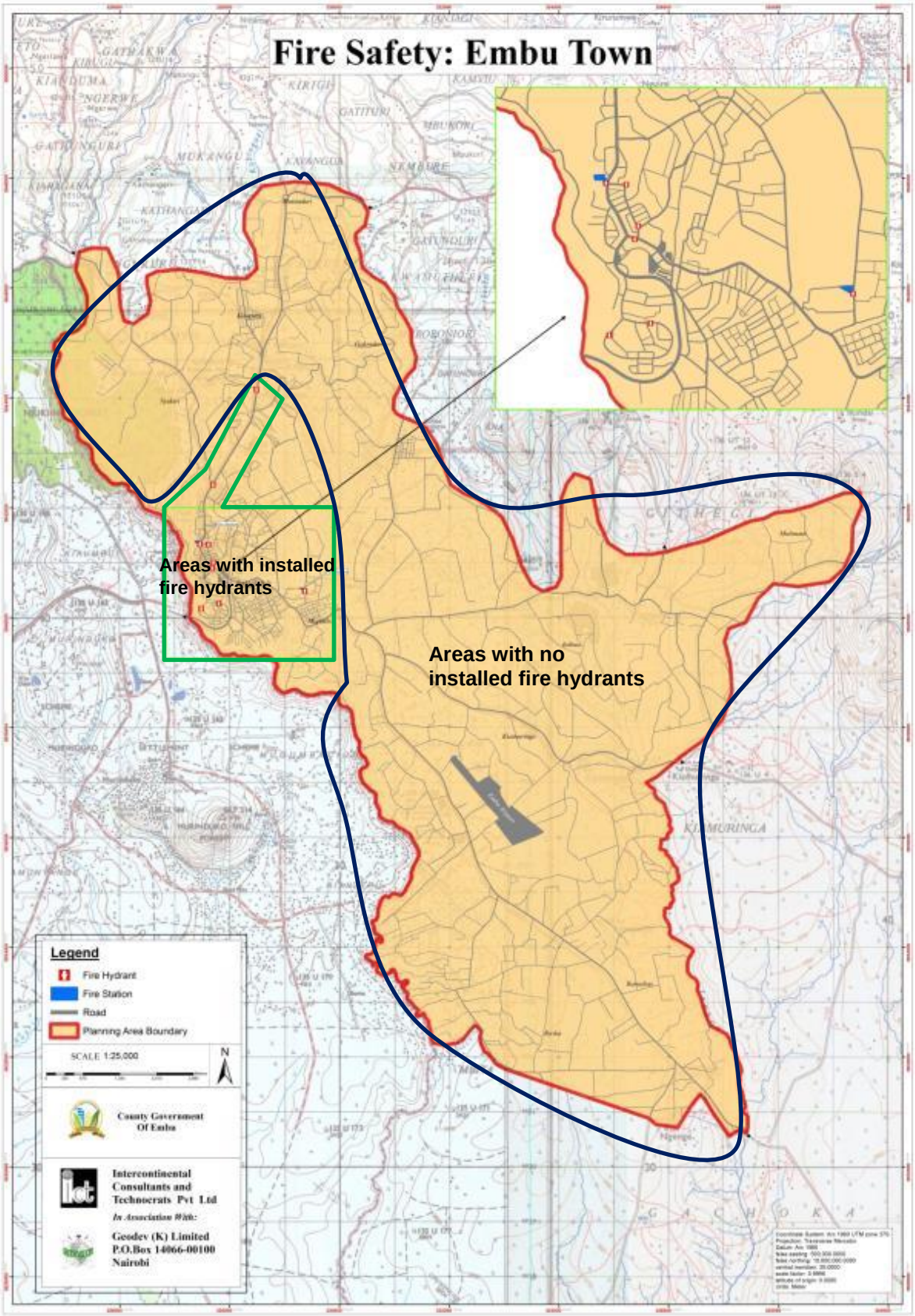
4.7 Fire safety

The agency involved in fire safety in Embu town is the County Government of Embu under the Ministry of Transport, Infrastructure and Housing. There are two fire stations:

- One fire fighting facility that operates from the county offices (as shown in Figure 4.8)
- One in Majimbo area proposed for rehabilitation and completion

There two fire tenders and one Land Rover.

Figure 4.8: **Location of fire station and fire hydrants**



4.7.1 Demand and supply for fire services

Table 4.14: Fire safety demand gap assessment

Facilities	Norms (1 per catchment population)	Current provision	2015 (Population: 82,120)	2035 (Population : 157,956)	Gap 2015	Gap 2035
Fire Sub-Station	50,000		2	3	2	3
Fire Station	100,000	1	1	2	0	1

Source: Adopted from the Physical Planning Handbook, 2008

4.8 Electricity and street lighting

4.8.1 Electricity

Kenya Power and Lighting supplies electricity to Embu town from the national electricity grid. The town is adequately supplied with electricity. The CBD is well served compared to the other parts of the planning area. This can be attributed to the economic demand of the town centre as compared to the other areas as well as its primacy as the county headquarters

A total of 85 percent of the households in core Embu town are connected with electricity as told by electricity officials. From the Kenya Population and Housing Census 2009, 48% of the urban households (11,386) were connected to electricity in Embu District (Urban). Households not connected to the national power grid are mostly found in the rural areas and low income areas. Some residents reported to the study team that they have not been connected to electricity due to prohibitive electricity tariffs.

Electricity is available within the built-up area, including the informal settlements, except Majimbo, Grogon, and Shauri Yako.

4.8.2 Street lighting

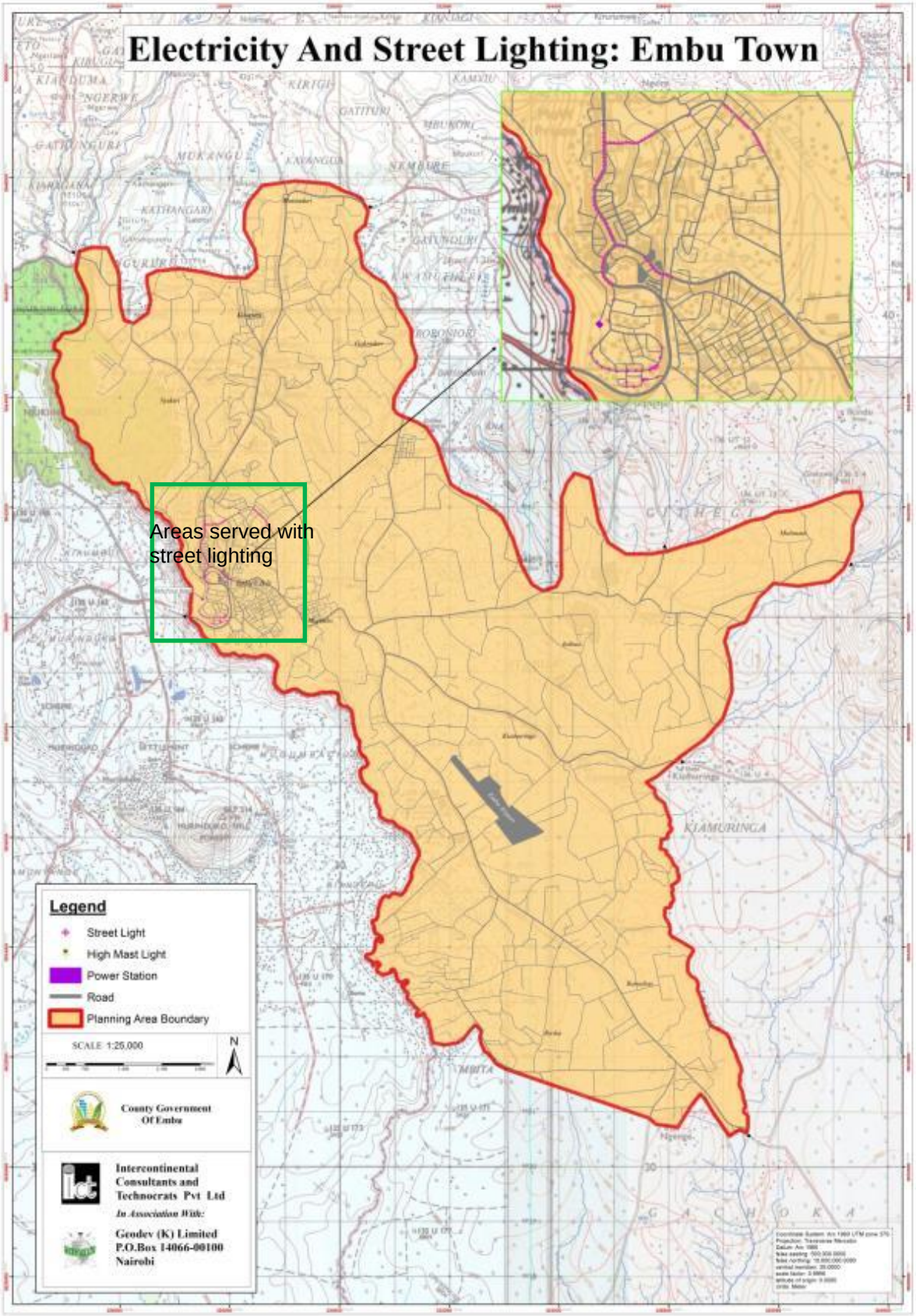
The core town area has street lighting, but it is either inadequate or not available in the peripheral areas of the town. High pressure sodium lights are the predominant type. Streets covered with sodium lights are:

- Kubukubu road from Shell petrol station (round about) to Uchumi supermarket:14 street lights
- Blue Valley road from County Assembly to Sunrise: 50 street lights
- Kenyatta highway up to ACK Church: 46 street lights
- Majimbo road from Cereals Board to Tenri: physical counting not done

The number and location of high mast lights is as follows:

- 20m high (located in Shauri Yako, Majimbo and Dallas)
- 15m high (located in Meru stage)
- 10m high (there are 2 in Majengo, 2 in Dallas and 3 in blue valley)

Figure 4.9: **Electricity and street lighting coverage**



The demand and gap assessment of street lighting is presented in the table below:

Table 4.15: Street lighting: demand and gap assessment

Facility	Norms	Total Road length	Current availability in town	2015 (Road Length-430km)	2035 (Road Length-500km)	Gap 2015	Gap 2035
Normal street lights	One per 30 metres	430 km	110	14,333	16,667	14,223	16,557
High mast	At major junctions and markets	-	11	20	44	9	33

Source: Consultants' Estimation

4.9 Education

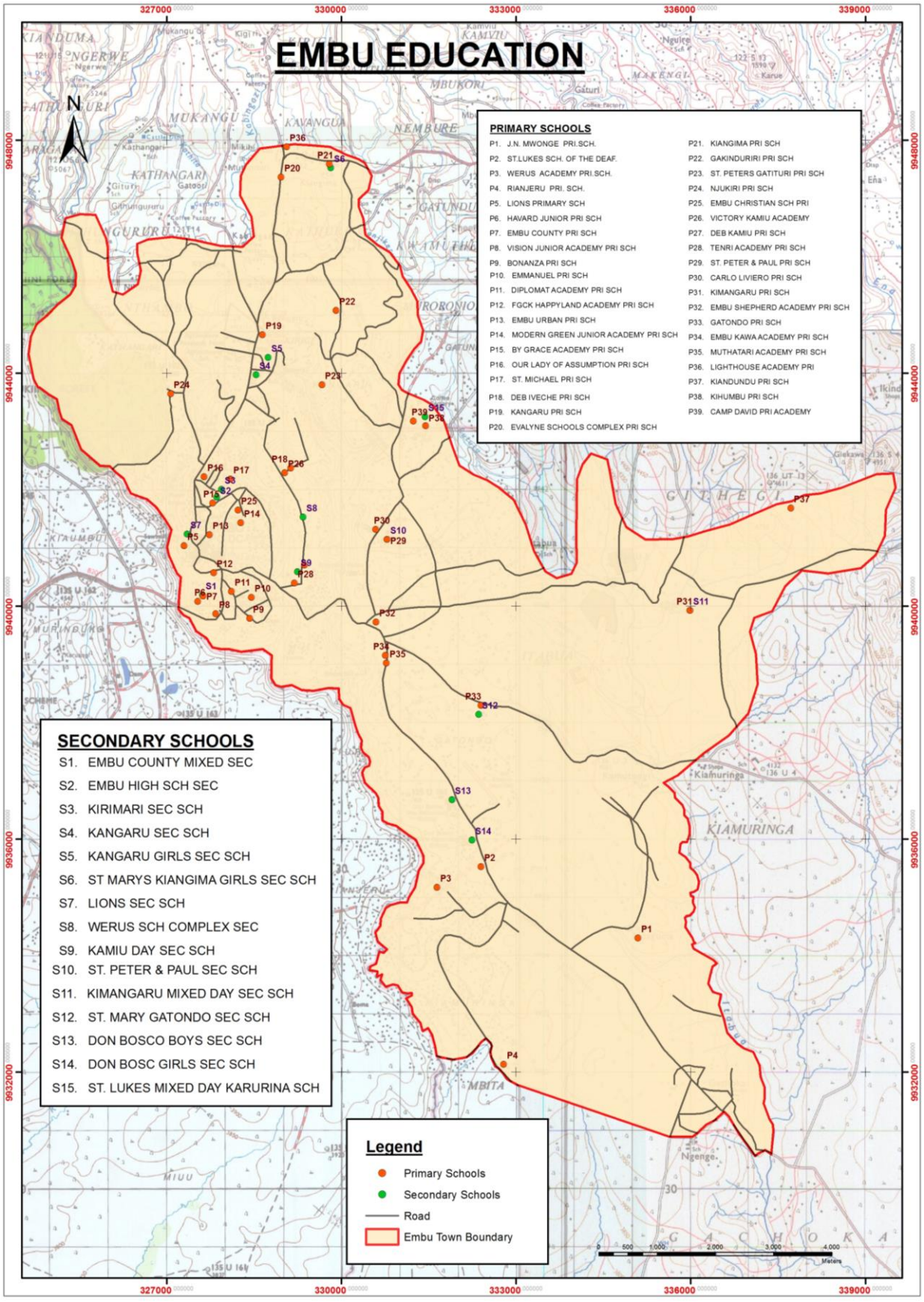
The gaps in existing and future supply, relative to the standards stated in the Planning Handbook, are shown in the table below.

Table 4.16: Analysis of present and future gap in education facilities

	Catchment population/unit	Land required (ha)	Current supply	Demand		Gap	
				2015	2035	2015	2035
Population				82 120	157 956		
Primary school (Class I - VIII)	3 500	3.25	39	23	45	-16	6
Senior Secondary (Class IX - XII)	8 000	3.40	15	10	20	-5	5
Special Schools	50 000	3.00	2	2	3	0	1
Youth Polytechnic	50 000	4.50	1	2	3	1	2
College	100 000	10.20	1	1	2	0	1
University	100 000	50.00	3	1	2	-2	-1
Management/Teacher Training Institute	100 000	5.00	1	1	2	0	1
Medical training College	100 000	5.00	1	1	2	0	1
Education township	Town level	200	-	-	-	1	1

The number and location of existing education facilities are shown in the Figure 4.10 overleaf.

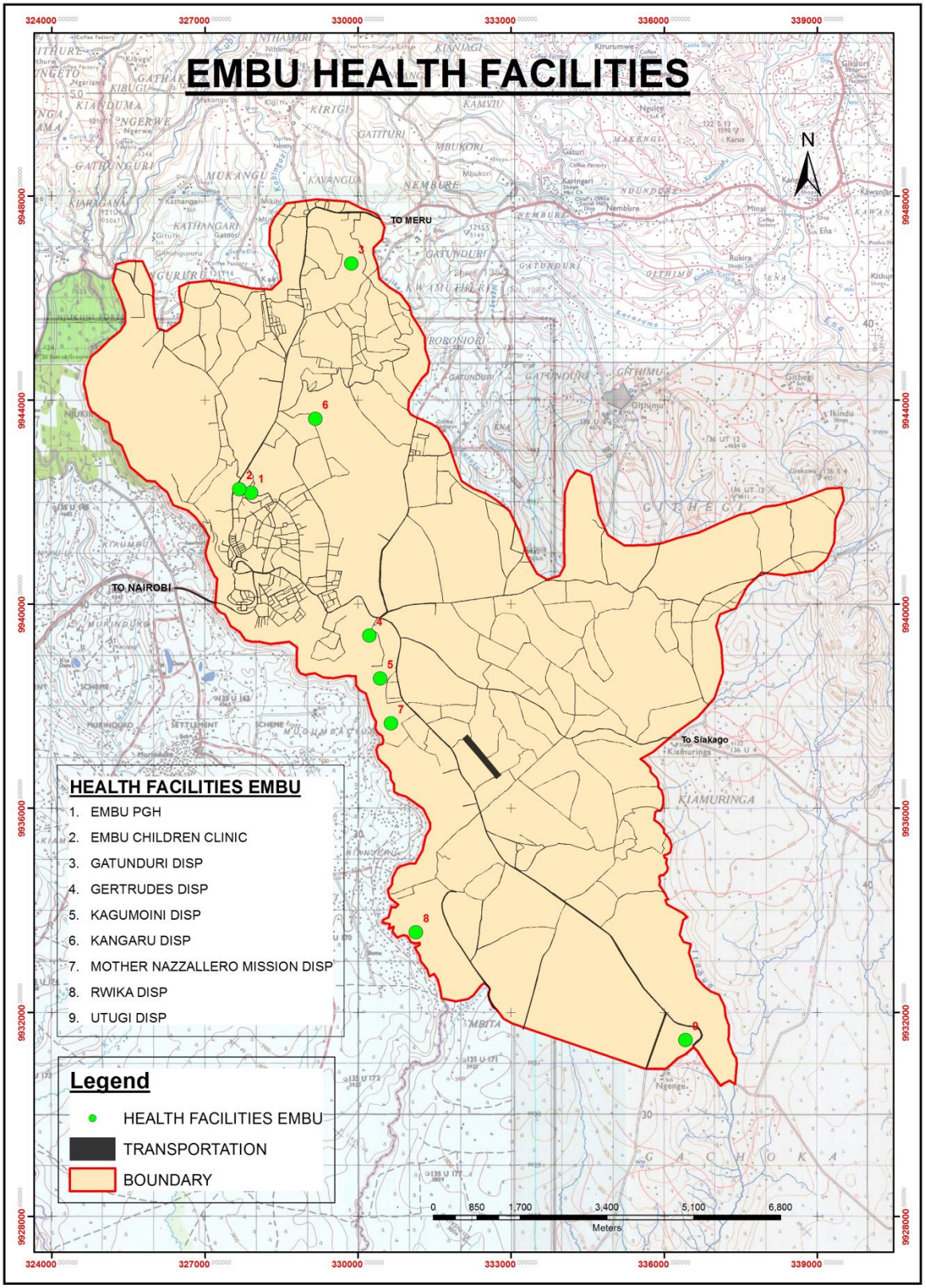
Figure 4.10: Existing education facilities



4.10 Health

The number and location of existing health facilities are shown in the Figure below.

Figure 4.11: Existing health facilities



Relative to the standards stated in the Planning Handbook, today's gap, and that at the end of the planning period, are shown in the table below.

Table 4.17: Demand and supply for health facilities

	Catchment population/ unit	Land required (ha)	Current supply	Demand		Gap	
				2015	2035	2015	2035
Population				82 120	157 956		
Town Hospital/Level 5 Hospital	Town level	8.00	1	1	1	0	0
Level 4/Sub District Hosp	100 000	4.00	0	1	2	1	2
Health Centre (Level 3)	30 000	2.00	0	3	4	3	4
Basic Health Sub-Centre (Level 2)	10 000	0.10	1	8	15	7	15
Dispensary/Small Clinic with Chemist Shop	5 000		7	16	32	9	25
Veterinary Hospital	25 000	5.00	1	3	6	2	5
Veterinary Clinic	150 000	0.10	0	0	1	0	1
Medical College-cum-Hospital	150 000	15.00	0	0	1	0	1
Communicable Disease Hospital	150 000	4.00	0	0	1	0	1

4.10.1 Social Facilities

The table below summarises the situation relative to the standards stated in the Planning Handbook, and indicate the gap in provision, if any, at present and at the end of the planning period.

Table 4.18: Analysis of present and future gap in social facilities

	Catchment population/unit	Land required (ha)	Current supply	Demand		Gap	
				2015	2035	2015	2035
Population				82 120	157 956		
Police Post	5 000	0.20	1	16	32	27	31
Police Station	25 000	2.00	2	3	6	3	4
Police headquarters	Town level	10.00	1	0	1	0	0
Prison	Town level	16.00	1	0	1	0	0
Juvenile home	Town level	2.00	0	0	1	0	1
Post office	25 000	0.12	1	3	6	2	5
Cemetery with crematorium	50 000	5.00	3	1	3	-2	0
Town Level Integrated Cultural Centre	Town level	10.00	0	0	1	0	1
Sub-town level cultural centre	80 000	5.00	1	1	1	0	1
Community/Cultural Centre	20 000	0.30	1	4	7	3	7
Night Shelter	50 000	0.50	0	1	3	1	3
Old Age Home	50 000	0.50	0	1	3	1	3
Rehabilitation Centre	50 000	0.50	0	1	3	1	3
Working Men's/Women's Hostel	50 000	1.00	0	1	3	1	3
Orphanage/Children Centre	50 000	1.00	0	1	3	1	3
Convention centre	Town level	10.00	0	0	1	0	1

4.10.2 Economic facilities

The table below summarises the situation relative to the standards stated in the Planning Handbook, and indicate the gap in provision, if any, at present and at the end of the planning period.

Table 4.19: Analysis of present and future gap in economic facilities

	Catchment population/unit	Land required (ha)	Current supply	Demand		Gap	
				2015	2035	2015	2035
Population				82 120	157 956		
Informal Market	20 000	3.00	3	4	8	1	5
Cluster commercial centre	20 000	5.00	0	4	8	4	8
Sub-sector Commercial Centre (Sub-CBD)	100 000	10.00	0	1	2	1	2
CBD	Town level		1	1	1	0	0
Slaughterhouse	50 000	2.00	1	2	3	1	2
Warehouse	Town level	10.00	0	1	1	1	1
Matatu Station	40 000	0.50	2	2	4	0	2
Bus Station and Terminal	Town level	5.00	1	1	2	0	1
Mega Truck Terminal	Town level	10.00	0	1	1	1	1

4.10.3 Recreational facilities

The table below summarises the situation relative to the standards stated in the Planning Handbook, and indicate the gap in provision, if any, at present and at the end of the planning period.

Table 4.20: Analysis of present and future gap in recreational facilities

	Catchment population/unit	Land required (ha)	Current supply	Demand		Gap	
				2015	2035	2015	2035
Population				82 120	157 956		
Totlot (small park)[2]	1000	0.1	0	143	317	143	317
Neighbourhood Parks	5000	0.5	0	29	63	29	63
Neighbourhood Playground[3]	5000	0.5	0	29	63	29	63
Cluster Park	20 000	1.00	0	4	7	4	8
Cluster Playground	20 000	1.00	0	4	7	4	8
Sector Park	100 000	2.00	0	1	2	1	2
Sector Playground	100 000	2.00	0	1	2	1	2
Stadium	100 000	5.00	1	1	2	0	1
Integrated Sport Centre	Town level	10.00	0	1	1	1	1
Town Park	Town level	10.00	0	1	1	1	1
Zoo	Town level	10.00	0	1	1	1	1
Amusement Park	Town level	10.00	0	1	1	1	1
Golf course	Town level	25.00	0	1	1	1	1

[2] Totlot not demarcated on map and land will be allocated for the same at the time of detail planning

[3] Neighbourhood park and playground have not been demarcated on the land use map and land will be allocated for the same at the time of detail planning

It should be noted that these standards were prepared some time ago, and certain functions have changed. For example, postal services have declined in importance due to the power of mobile phone technology, on the one hand, and the competition from courier services. In other cases policies may have changed: for example the use of police posts.

However, in general the recommendations are valid and will be adhered to in the land use planning.

4.11 Housing and associated infrastructure demand

4.11.1 Introduction

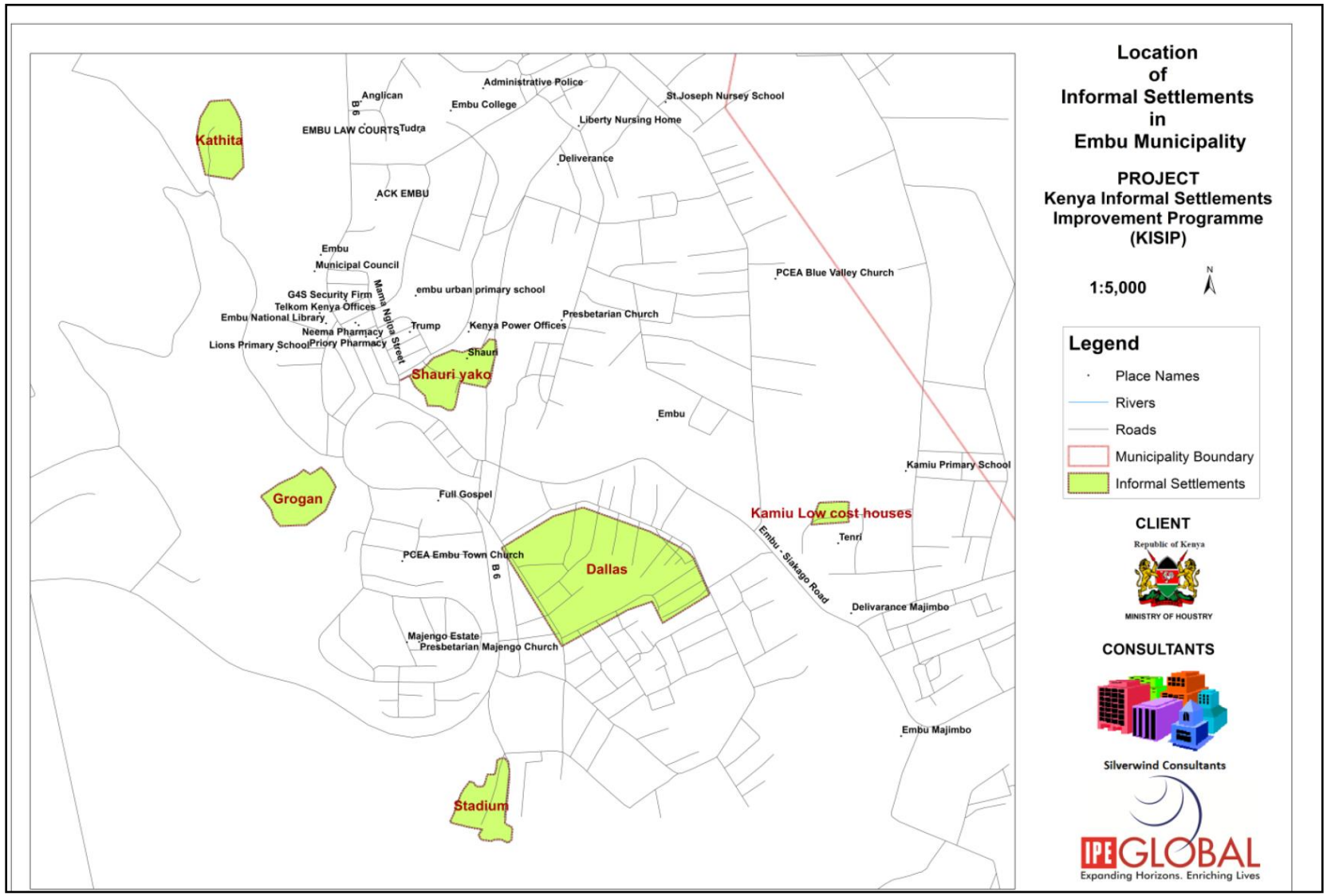
Housing is the largest single land use and requires substantial infrastructural investment in terms of roads, water reticulation and sewerage.

It is not easy to identify a gap in housing provision. There is no evidence of overcrowding in Embu: this therefore cannot be an indicator of housing need. There are, however, areas of informal and decayed housing, as shown in the map below.

It was decided at an early stage that, in order to avoid duplication, the strategy for dealing with informal and substandard settlements should be left to KISIP – the parallel project with this responsibility.

The map overleaf shows the location of informal settlements or slums in Embu (Dallas is a formal settlement but has been classified as a slum for the purposes of the KISIP programme).

Figure 4.12: Location of informal settlements



4.11.2 Housing demand and land use

A successful housing policy provides solutions for all sections of society at prices that they can afford. Kenya lacks the funds to provide subsidised housing for the poor, but this should not prevent public authorities from addressing their needs.

The policy development thus follows a three stage process:

- Analyse incomes
- Match incomes to housing solutions
- Allocate responsibilities for each actor in the process

What follows is a very preliminary such analysis, of which the main objective is to determining the future requirements in terms of land and infrastructure, It does not purpose to be a prescriptive housing policy as such.

Incomes and affordability

The only source for household incomes is the household survey which provides expenditure data. Expenditure data are considered a very good proxy for incomes especially in the lower income groups.

The last household survey for which urban expenditure is available was in 2005-6. To update this to 2014 figures the annual inflation rates have been used. The resulting data are as shown in the Table below.

Table 4.21: Urban Incomes

Midpoint urban income deciles*	2005	2014	2014
	US $	US$	Kshs
1	1,110	2,271	204,376
2	1,888	3,862	347,623
3	2,404	4,918	442,630
4	2,955	6,045	544,081
5	3,578	7,320	658,789
6	4,288	8,772	789,516
7	5,009	10,247	922,268
8	6,058	12,393	1,115,412
9	8,202	16,780	1,510,170
10	22,823	46,691	4,202,219

**A decile is derived by ranking the population in terms of income, and dividing the population by ten. Each group is thus classified as a single decile.*

Source: HH data: Gakuru, Rhoda and Mathenge, Naomi: Poverty Growth and Income Distribution in Kenya: Agrodep Working Paper, 0001, June 2012, Table 2.
Inflation data: Kenya National Bureau of Statistics, Consumer Price Indices

Given these incomes, how much can each income group afford? General practice has the upper limit at 40% of income[4], but as incomes decline the available disposable income declines with it. Therefore a sliding scale of affordability is the most realistic, ranging from 15% of income for the very poor to 40% for the higher income groups.

Following common practice, it is easiest to use monthly rather than annual figures for both incomes and expenditure. Using the assumptions above, the affordability table is as follows:

[4] Walley, Simon: Developing Kenya's Mortgage Market, World Bank report 63391-KE, Washington DC, 2011

Table 4.22: Housing affordability by income group

Decile	Monthly income 2014	Estimated affordability	Monthly payment
	Kshs		Kshs
1	17,031	15.00%	2,555
2	28,969	15.00%	4,345
3	36,886	20.00%	7,377
4	45,340	20.00%	9,068
5	54,899	25.00%	13,725
6	65,793	25.00%	16,448
7	76,856	30.00%	23,057
8	92,951	30.00%	27,885
9	125,847	40,00%	50,339
10	350,185	49,00%	171,591

The next stage is to calculate what such a monthly payment will buy. Using an interest rate of 12%, a repayment period of 15 years the affordable amounts are as shown in the following table[5]. The "Total" column on the right assumes that a 10% deposit is paid for deciles 3-10.

Table 4.23: Affordable loans by income group

Decile	Monthly payment	Affordable Loan	Total
	Kshs	Kshs	Kshs
1	2,555	212,861	212,861
2	4,345	362,056	362,056
3	7,377	614,677	682,975
4	9,068	755,562	839,513
5	13,725	1,143,571	1,270,634
6	16,448	1,370,495	1,522,772
7	23,057	1,921,122	2,134,580
8	27,885	2,323,449	2,581,610
9	50,339	4,194,328	4,660,365
10	171,591	14,297,216	15,885,795

4.11.3 Possible housing solutions

Finally, we must construct development scenarios which correspond to the costs in the above table. The below is an example of such a scenario.

[5] These calculations are not based on the assumption that all income groups will be able to borrow from a bank. They are rather used as a tool to indicate the potential in terms of a sustainable housing finance system. In the case of income deciles above 2, it is assumed that a deposit of 10% will be pai

Table 4.24: Cost of different solutions (Kshs)

Plot area (m^2)	96	120	140	240	240	500	Multi-storey
Land	71,181	88,977	103,806	177,954	177,954	370,737	46,342
Basic services	108,282	125,216					
Full services			220,570	359,232	359,232	545,933	68,242
Unit size (m^2)		25	35	50	70	100	100
Construction		450,000	1,260,000	1,800,000	3,150,000	6,300,000	7,875,000
Total	179,463	664,193	1,584,376	2,337,186	3,687,186	7,216,669	7,989,684
Monthly repayments							
Kshs	2,154	7,971	19,015	28,050	44,252	86,612	95,890
Affordable for Groups	1,2	3	4,5,6	7,8	9	10/2	10/2

The bottom line of the table shows which groups can afford the proposed solution. Thus, if there is a requirement for dwelling units, the distribution of solutions would be as follows:

Table 4.25: Space requirements per 1000 dwellings

Net Plot area (m^2)	96	120	140	240	240	500	Multi-storey
Gross area (m^2)	163	204	238	408	408	850	
Number	200	100	300	200	100	50	50
Total area (m^2)	32,640	20,400	71,400	81,600	40,800	42,500	2,000
					Grand total (m^2)		291,340

This data allows for strategic planning to be undertaken in terms of overall land use.

Clearly, an important question is to what extent densities will increase. The table makes assumptions, but these may be adjusted in light of experience. As in all matters of strategic planning the challenge is to plan for appropriate development, while being flexible enough to respond to market pressures.

Number of units

Based on the projected population growth and a household size of the urban average of 4.1 persons per household, the following is the projected demand for each five year period in the next twenty years.

Table 4.26: Housing demand by income group

Number of units	2015-2025	2025-2035	Total (no.)
Low cost	5,661	7,286	12,948
Medium cost	2,022	2,602	4,624
High cost	404	520	925
Total	8,088	10,409	18,496

Source: Generated by Consultants

Table 4.27: Land required for housing by income group

Land required (Ha)	2016-2025	2026-2035	Total (no.)
Low cost	125	161	286
Medium cost	91	118	209
High cost	34	43	77
Total	250	322	572

4.11.4 Road, water and sewerage demand to service housing

It is possible to make an approximate calculation of the length of road, water pipes and sewers that would be required to service the above housing. The lengths are approximately the same, though topography can make a substantial difference in the case of sewers.

Table 4.28: Infrastructure Requirements per ten year period (in Km)

Infrastructure required (Km)	2016-2025	2026-2035	Total (no.)
Low cost	36,459	46,924	83,382
Medium cost	20,927	26,933	47,860
High cost	8,526	10,973	19,498
Total	65,911	84,829	150,740

5 Structure Plan

5.1 Introduction

The Integrated Strategic Urban Development Plan (ISUDP) deals with existing and proposed land use, population density, etc within the agreed planning area. It has been prepared after analysing the existing situation of land use, environmental sensitivity, regional setting, linkages, provision of services, etc. The development concept for the plan is explained in Chapter 3.

5.2 Existing land use within the planning area

5.2.1 Town Level Existing Land Use

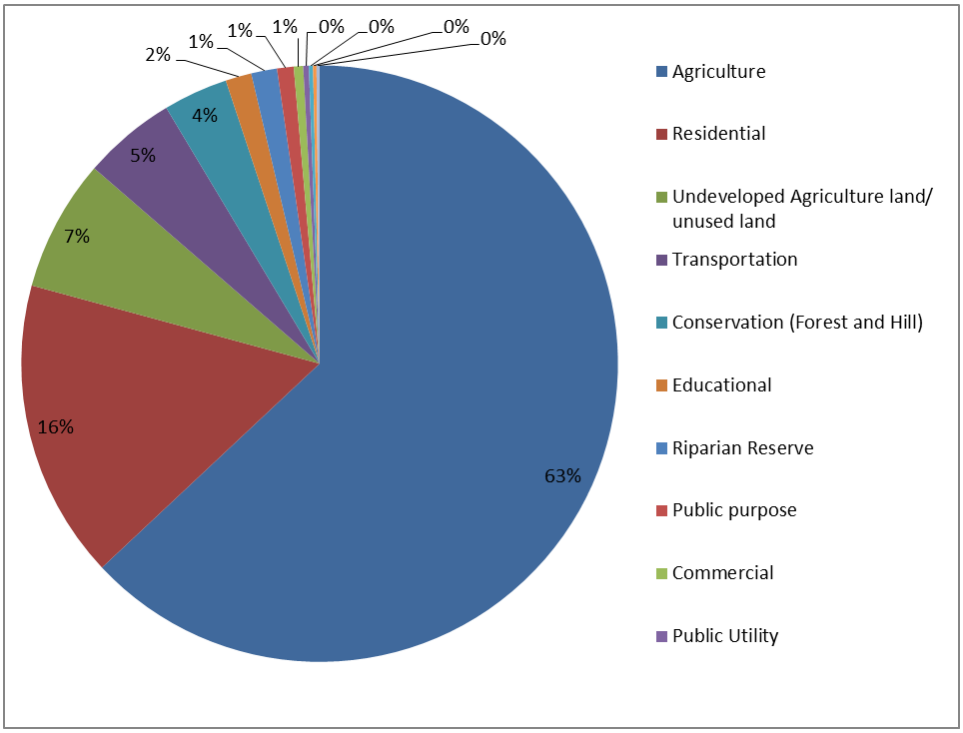
The planning area of the town is 102.28 km^2. Out of this total area, the largest use is agriculture (63.01%), followed by residential (16.21%), undeveloped agriculture land/ unused land (7.15%), transportation (5.04%), conservation (3.50%), educational (1.41%), riparian reserve (1.40%), public purpose (0.90%), public utility (0.30%), water body (0.22%), industrial (0.19%) and recreational (0.17%). It may be noted that majority of the area within planning area is under undeveloped use like agriculture, conservation and riparian reserve. The gross population density of town planning area is 8.3 persons/ha. The details of town level land use are given in the Table 5.1, and Figures 5.1 and 5.2.

Table 5.1: Existing land use of planning area of Embu Town

Sl. No.	Land use	Area (ha)	Percentage Area
1	Residential	1,658	16.21
2	Industrial	19	0.19
3	Educational	144	1.41
4	Recreational	17	0.17
5	Public purpose	92	0.9
6	Commercial	52	0.51
7	Public utility	31	0.3
8	Transportation	515	5.04
9	Undeveloped agricultural land/ unused land	731	7.15
10	Agriculture	6,445	63.01
11	Conservation (forest and hill)	358	3.5
12	Riparian reserve	143	1.4
13	Water body (pond/lake/dam)	23	0.22
Total		**10,228**	**100**
Total population (2015)		**84530**	
Gross population density (person/ha)		8.3	

Source: Land Use Survey

Figure 5.1: Existing land use of planning area of Embu Town



5.2.2 Existing land use of developed and undeveloped area

The town level share of different land uses does not give a true picture of the distribution of developed land uses and population density because the majority of land is undeveloped. As shown in Table 5.2, out of the total developed area, the highest share is residential (65.59%) followed by transportation (20.37%), educational (5.70%), public purpose (3.64%), commercial (2.06%), public utilities (1.23%), industrial (0.75%) and recreational (0.67%). The share of land use of developed area is not matching with the average of 10 towns of Kenya and area under all the uses is much less than the average of the ten towns except for residential and transportation. The area under transportation is high due to the Airstrip. The areas under recreational and industrial use, which are critical for healthy life and robust economy respectively, is much less. Figure 5.2 shows the existing land use of Embu town planning area.

The population density of the developed area is 32 persons/ha. For the purpose of comparison with average of Kenyan towns, population density also has been calculated: it is 41 persons/ha (excluding the transportation land uses). This is much lower than the average density of 10 towns (63.5 persons/ha).

The detailed comparison of land uses and population density with all 10 towns is presented in Table 5.3.

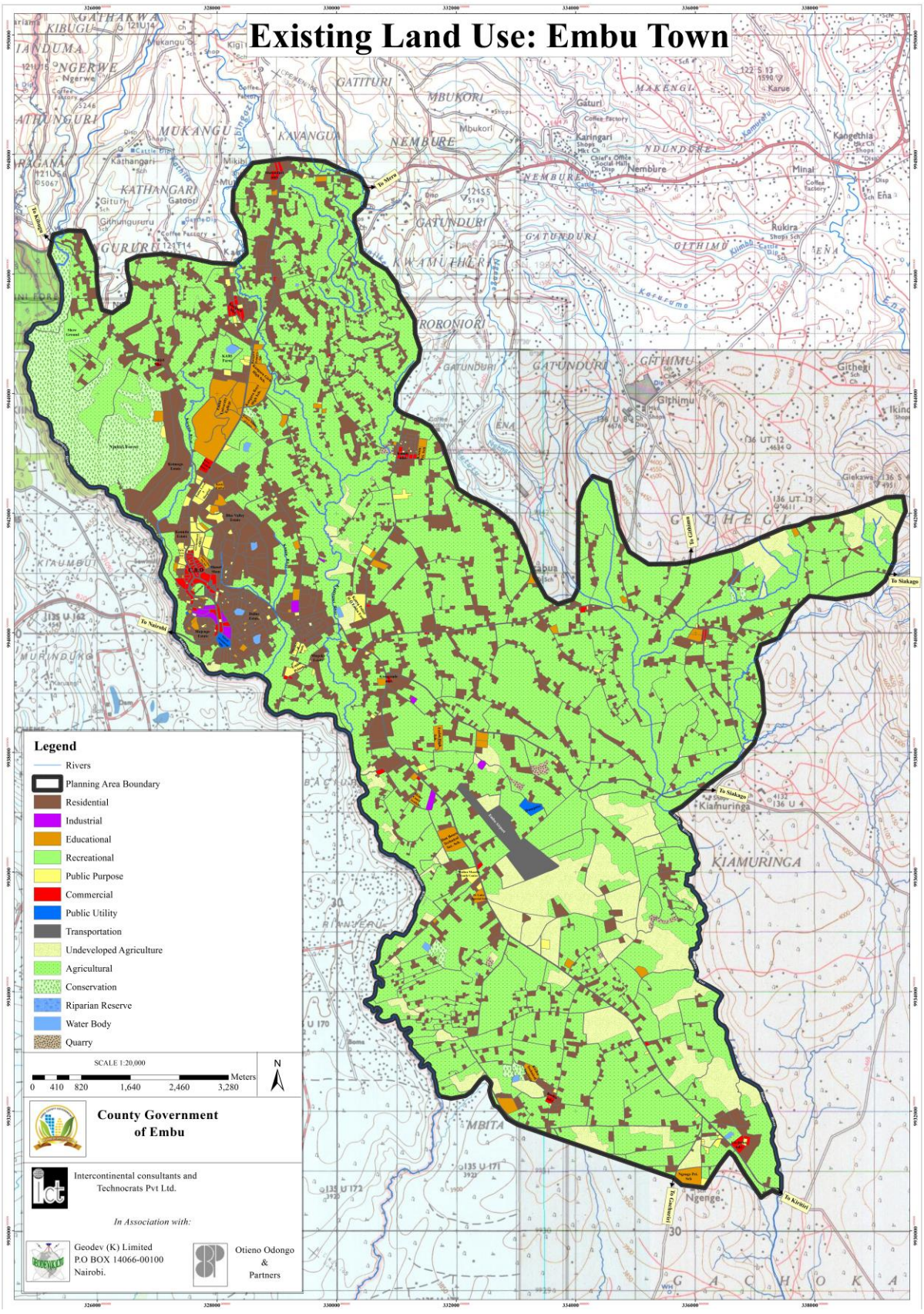
Table 5.2: Land use of developed and undeveloped area of Embu Town Planning Area and comparison with ten towns' average land use

Sl. No.	Embu			Ten Towns' Average[1] (%)
	Land use	**Area (km^2)**	**% Area**	
Developed Area				
1	Residential	1658	65.59	57.64
2	Industrial	19	0.75	8.7
3	Educational	144	5.70	9.4
4	Recreational	17	0.67	5.1
5	Public Purpose	92	3.64	12.2
6	Commercial	52	2.06	6.8
7	Public Utility	31	1.23	-
8	Transportation	515	20.37	-
Sub Total of Developed Area		**2528**	100	
Undeveloped Area				
1	Undeveloped Agriculture Land/ Unused Land	731	9.49	-
2	Agriculture	6445	83.70	-
3	Conservation (Forest and Hill)	358	4.65	-
4	Riparian Reserve	143	1.86	-
5	Water Body (Pond/ Lake/ Dam)	23	0.30	
Sub Total of Undeveloped Area		**7700**	**100**	**-**
Total		**10228**	**100**	**-**
Total Population (2015 projected)		82,120		
Gross Population Density (person/ha)		8		
Net Population Density on Developed Area (person/ha)		32		
Net Population Density on Developed Area, excluding Transportation Use (person/ha)		41		
Net Population Density of 10 Towns' Average, excluding transportation use (person/ha)		63.5		

Source: Field Surveys

[1] Figure taken from Physical Planning Handbook 2008

Figure 5.2: Existing land use



5.2.3 Issues/ Observations

- The majority of land is under agriculture use
- Haphazard and unplanned growth of the town
- There is a lack of hierarchy of commercial spaces. Most of the commercial activities including wholesale and retail are concentrated in the CBD area. Beyond the CBD, commercial activities appear to have developed without any planning
- In the peripheral areas dominated by agricultural uses, there seems to be a lack of development control
- The infrastructure services and amenities have not been provided in a planned manner and the spatial distribution of these facilities does not meet the current needs.
- There is a lack of information on land and no land database for public land
- High cost of land in urban area
- Financial institutions do not give loans for housing of land without title deeds
- Squatters in government land should be given title deeds
- Prevalence of grabbing of public land and public land that has been grabbed has not been reclaimed
- Lack of development control and zoning regulations
- No policy on land use for any public land
- Most of land not in good use like KARI land
- Allocation of trust land is misused as few get the land
- Committee officials in case of community land hold title for other members and do not give land to members
- No time frame for approval of building plans and other applications
- Long procedure in approving building plans
- Excess subdivision of land to uneconomical portions
- Cost of land and construction materials is very high
- Lack of designs and guidance in town for housing construction
- High rise settlements to be promoted in informal areas
- County government to come up with a land use master plan to capture the needs of informal settlements

5.3 Land use norms

For comparative purposes it is useful to refer to the norms for land use given in the Physical Planning Handbook, 2008. Table 5.3 below shows the percentage share of each land use in 10 different towns in Kenya along with the average of all towns. The data for Embu town planning area are included for comparison.

Embu's distribution of existing land uses (2014) is very different from the average of all 10 towns. The share of different land uses of Embu neither matches the average nor any individual towns.

Table 5.3: Comparison of land use within Embu Town Planning Area (figures in %) with other towns

Type of Land use	Nakuru	Kisumu	Eldoret	Thika	Nanyuki	Nyeri	Kitale	Isiolo	Nyahururu	Naivasha	Average	Embu
Residential **0**	53.3	60.2	78.8	87.8	54.1	35.4	7.5	47.2	58.7	63.4	57.64	65.59
Industrial **1**	5.4	28.1	6.2	5	13	7.2	9.4	3.1	9.2	3.4	8.7	0.75
Education **2**	9.9	3.2	5.4	2	6.7	12.2	20.3	13.4	13.2	7.9	9.4	5.70
Recreation **3**	9.2	3.8	1.1	0.7	1.2	18.8	5	2.2	2	8.3	5.1	0.24
Public purpose **4**	14.3	1.6	5.4	2.5	14.1	14.6	13.1	34.9	10.7	10.7	12.2	4.07
Commercial **5**	4.9	2	2.7	1.3	5.9	11.7	3	27.9	4.9	3.6	6.8	2.06
Public Utilities **6**	3.1	1.4	0.5	0.6	5.1	0.2	11.5	11.8	1.3	2.7	3.8	1.23
Total Area Zones 0-6 (ha)	7,506	2,490	5,458	6,065	1,081	608	1,378	485	1,217	3,276		2,013
Population 1999	231,262	322,734	197,449	106,707	49,330	101,238	86,282	32,684	37,412	158,678		82,120 (2015)
Town Density Population/area	30.8	129.6	36.2	17.6	45.6	166.5	62.6	67.4	30.7	48.4	63.5	41
Growth Rate Per Annum (%)	3.1	5.1	5.5	4.3	5	0.8	4.3	5.4	7.7	12.1		1.6
Population Increase 1999 – 2004	38722	29915	33034	2824	9660	2679	16602	5626	7326	26569		32080 (1999 to 2015)
Growth 1999-2004 (%)	16.7	9.3	16.7	2.6	19.6	2.6	19.2	17.2	19.6	16.7		4

Source: Physical Planning Handbook 2008

5.4 Planning principles

The ISUDP is based on the following planning principles:

- *Mixed Use Development* − A mix of functions and housing types creates a more efficient and lively environment with a variety of activities and people. However, incompatible uses must be confined to specific locations with specific regulations.
- *Inclusiveness* − The process of plan-making is most likely to succeed if it involves the real target population and development actors, especially the urban poor, who are usually left out of such activities.
- *Progressive and incremental development* − considering the limited resources available, urban plans should be based on a step-by-step approach through which the basic minimum is met first. This incremental approach is the most cost effective method of land development and provision of infrastructure. Rights of way or wayleaves for all infrastructure components must be established for the horizon year but the actual implementation of investment in infrastructure should be in accordance with the requirements of different phases.
- *Phasing* – Extension areas should be divided into blocks to be developed according to development phases. This is to maximize efficiency and provide infrastructure and services at the same time.
- *Integrated planning* − the best use of the limited resources should be considered. There should be a special focus on closely related activities carried out by line Ministries and other agencies as appropriate in the provision of utilities (roads, water, and electricity). Such initiatives need to be planned and implemented in a coordinated manner.

5.5 Spatial development strategy

The goal of spatial development is to promote and provide for sustainable development to enable Embu town to accommodate the needs of existing and future residents and also facilitate its functionality as a regional development centre.

The strategic aim of spatial development is as follows:

- To protect the sensitive areas and enhance the natural environment while providing high quality accessible recreational areas.
- To conserve the urban heritage and maintain an ecological balance especially with reference to rivers and other water bodies
- To develop a functional balance between residential areas, community facilities and employment centres.
- To develop an integrated transport strategy linked to the land use, which facilitates access to better public transport and safer and environmentally friendly travel choices.
- To facilitate access to the physical and social infrastructure and community facilities for the citizens including access to housing across a cross section of society.

The objective of the ISUDP is to promote and provide for sustainable development of the town enabling it to accommodate the needs of existing and future residents, and also to facilitate its function as a regional urban centre. The following development strategies have been adopted in preparing the plan:

5.5.1 Low and high rise development with overall medium density

The plan is based upon low and high rise development with medium and high density character by year 2035 with harmonious and coherent interrelationships between various uses and activities. The average density recommended in total developable area is 55 persons/ hectare. The proposed population density is stated as medium density at town level. The existing developed area is proposed to be less dense than the newly development areas.

5.5.2 New planned development in urban extension areas

If new development takes place in accordance with the proposed population densities, the current planning boundary is sufficient to accommodate the projected population for the year 2035. But considering the strong possible impact of the three main radiating roads from Embu to Nairobi, Meru and Siakago towards west (Murindiko-Jukini in Kirinyaga County), north and south-east direction of town respectively; the natural growth trend will be towards north, west and south-east of Embu town

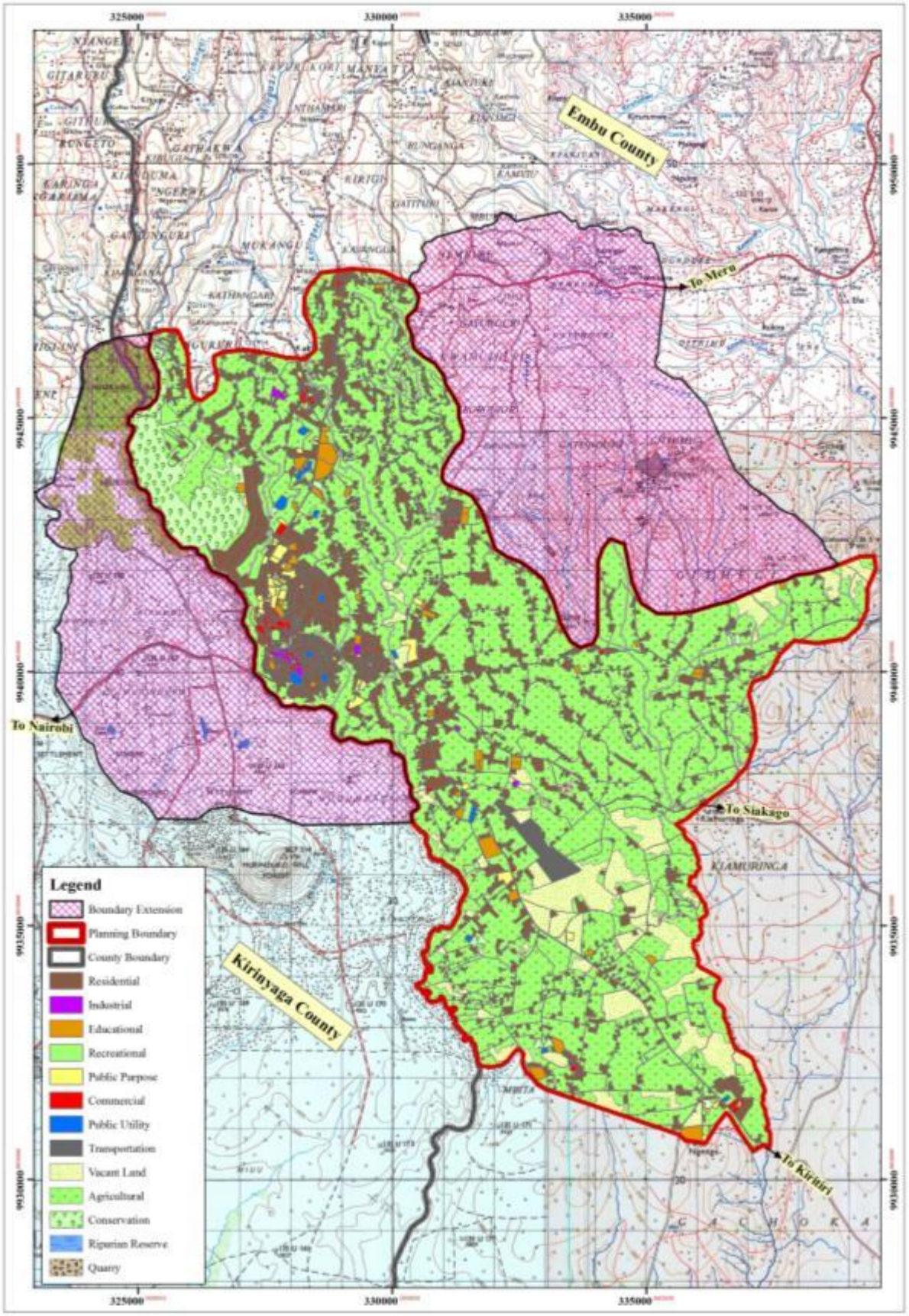
beyond the proposed planning area. Therefore it is suggested that the boundary of Embu should be expanded within the area of Kirinyaga County (west) and within the area of Embu County towards north, east and south-west towards Githimu.

Currently also due to natural growth of Embu town, much of the area has already been developed west of the Embu town planning boundary along Nairobi road, which is coming under the administrative jurisdiction of Kirinyaga County (Murindiko-Jukini). This development is naturally part of Embu town but out of town's jurisdiction. To do a justice with the outgrowth of Embu town towards Kirinyaga County and in Embu County (on north-east of town), the consultants suggest the following:

- Include the outgrowth of Murindiko-Jukini within the Embu Town Planning Area by transferring the land to Embu county
- If inclusion of outgrowth area is not possible due to any reason, create an independent **Town Planning Authority** with jurisdiction over areas of both counties. In this way the goal of integrated and comprehensive physical planning can be achieved without changing the administrative jurisdiction. The town planning authority will ensure an integrated development by sharing the resources and infrastructure.
- Increase the future planning towards north-east beyond the current planning area within Embu County

Although the boundary extension exercise should be done with the help of land surveyors and by considering natural slopes, contiguity, environmental aspects and in consultation with the political leadership of both counties a draft proposed boundary is presented in the Figure 5.3.

Figure 5.3: Proposed Town Extension Boundary



5.5.3 Renewal of the old town area

The entire inner area of Embu Town including the CBD is highly congested due to inefficient use of the available space and lack of other planned commercial centres, and requires urban renewal. Therefore, a renewal area should be identified and prioritized for implementation. In order to reduce the gap between planning proposals and the existing situation on ground the urban renewal programme has to be carried out and realistically programmed for implementation in phased manner.

The following areas of the existing town need urgent attention for renewal:

- The CBD
- The informal settlements

5.5.4 Control of fringe development

Embu town is witnessing development along Meri Road, Kiritiri Road and Nairobi Road (Kirinyaga County). Future uncontrolled development immediately outside the ISUDP area can ruin the ambience of the town. In order to curb such development, it is suggested that a regional development plan is prepared separately covering the areas of Embu County and Kirinyaga County targeting the urban expansion of Embu town.

5.6 Population density

The population density is defined here as the number of persons per hectare, obtained by dividing the population in a given area by the size of area, expressed in persons per hectare. The population density over the total area including developed (residential, commercial, industrial, roads, etc.) as well undeveloped (agriculture, undeveloped agriculture land/ unused land, forests, river, etc.) is termed as grossed population density; and the population density over the developed area is termed as net population density.

5.6.1 Density matters for sustainability

The compact development rather than dispersed development pattern is more cost efficient: it is easier to administer for the local authorities, and it is better organized and more effective use of the facilities that provide services. **The World Bank Report on "Enhanced Spatial Planning as a precondition for Sustainable Urban Development", *December 26th, 2013,*** the promotion of dense development patterns can help cities become more sustainable. Dense cities require less investment in public services, infrastructure development and maintenance (roads, water networks, sewer lines, street lighting, solid waste management, public transport, etc.); they allow higher profitability for public transport operators (since every transit stop serves on average more people than in less dense cities); they enable walking and biking as means of commuting; they discourage car use and transport-related pollution; they can help lower greenhouse gas (GHG) emissions; they require less energy expenditure for the delivery of key public services (e.g., pump costs for water, fuel costs for garbage collection); and, most importantly, they can usually offer a better quality of life for people to the extent that diseconomies of scale and agglomeration are properly controlled. To take one of the above-listed examples, it is estimated that the energy consumed for transport needs in a city with a density of less than 25 people per hectare may reach an annual average of 55,000 mega joules per person. By comparison, in an urban area with a density of 100 people per hectare, this figure is about three times lower (*World Bank*). It can be concluded that population density of about 100 persons/hectare is ideal to maximise the investment on infrastructure. Beyond that investment in infrastructure will not be cost-effective.

5.6.2 Existing population density

As shown in Table 5.4, the gross population density of Embu Town Planning area is 8 persons/ hectare. Based on the current land use analysis, the total developed area in town is 2,528ha. The density of the built-up area, based on the projected 2015 population, is 32 persons/hectare.

Table 5.4: Sub-location population density

Sub-Locations	Total Population (2015 Projected)	Area (ha)	Population Density (Persons/ha)
Kangaru	12,564	1,053	11.9
Nthambo	5,272	859	6.1
Njukiri	5,674	587	9.7
Kamiu	18,460	579	31.9
Itabua	10,117	3,893	2.6
Dallas/stadium	23,067	502	46.0
Kiamuringa	6,109	1,767	3.5
Gachoka	791	899	0.9
Gachuriri	66	88	0.8
Embu Town	**82,120**	**10,228**	8.0
Gross Population Density based on 2015 Population: **8 persons/ha**			
Total Current Developed Area: 2528ha			
Current Net Population Density: 32 Persons/ha			

Source: *Kenya National Bureau of Statistics and Projection by Consultants*

5.6.3 Proposed population density and land requirements

A study of ten towns given in the Physical Planning Handbook indicates an average net population density of 63.5 persons/hectare, ranging from as low as 17.6 persons/hectare in Thika and as high as 166.5 persons/ hectare in Nyeri.

Although, as suggested above, the optimum population density is about 100 persons/hectare this is a target which cannot be achieved in the short term. Considering the current low population density, availability of land for future development within planning area, and environmental concerns, the consultants have proposed a net population density of 45 persons/hectare for Embu town as presented in Table 5.5.

As shown in Table 5.5, the population density for the currently developed area has been proposed as 40 persons/ hectare and for new developed it is proposed as 69 persons/ hectare. To achieve the desired population density of 47 persons/ hectare within the built-up area, a two way approach has been adopted i.e. re-densification of existing developed area and assigning higher population density for new development.

5.6.3.1 Land requirements

As presented in Table 5.5, considering the proposed net population density of 40 persons/ha for existing developed area of 2,528ha, around 101,120 persons will be accommodated within the existing developed area. To accommodate the remaining of the total projected population of 157,956 persons, with a proposed population density of 58 persons/ha, around 982 ha of additional land will be required. Therefore, to accommodate the projected population of Embu town, a total of around 3,510ha land will be required and currently undeveloped land (undeveloped agriculture land-731ha and agriculture land-6445ha), which can be developed, available within the planning area is 7199ha. Therefore, whole projected population can be accommodated within the planning boundary of Embu and there is no need for extension of current planning boundary up to the planning period of year 2035.

Table 5.5: **Proposed population density and land requirements**

Existing Pop	82120
Total Current Developed Area (Hectare)	2528
Current Net Population Density (Persons/ha)	32
Current Undeveloped land available within the planning area, Excluding Environmentally Sensitive Areas (undeveloped agriculture land/ unused land -3606ha and Agriculture-2716ha), which can be made available for development	7,199
Projected Population for 2035	157956
Proposed Gross Population Density (Persons/ha, on total planning area)	15
Proposed Net Population Density (Persons/ha on existing and proposed built-up area)	45
Total developable land requirement for all uses based on Net Population Density (in hectare)	3,510
The proposed net population density of existing developed area (through re-densification, on total built-up area)	40
Estimated Population to be covered by the existing developed area	101,120
Remaining Population to be accommodated additional to the existing developed area	56,836
The proposed population density of new developed area (on total built-up area)	58
Average net residential density (on existing residential area)	50
Average net residential density (on proposed residential area)	239
Additional Land Requirement for population to be accommodated outside the existing developed area (ha)	982

Source: Consultants' Estimates

5.7 Population Growth Scenarios

5.7.1 High Growth Rate

Under the high growth scenario the following factors have been considered:

- Good quality infrastructure will attract more people
- Good road connectivity with Nairobi
- Adequate land available for future development
- Rich horticultural land surrounding the town provides raw material for fruit agro-based industries
- Development of adequate infrastructure facilities through the implementation of ISUDP

Considering the above factors, it is expected that Embu will develop with a high growth rate. As shown in Table 5.6 (taken from Chapter 2 for convenience), under a high growth scenario, growth rates of 5% and 4% have been proposed for the periods 2015-2025 and 2025-2035 respectively. Considering the current growth rate of 5.15%, and the creation of adequate infrastructure and services under the ISUDP, a growth rate of 5% is used for the first ten years. During the period between 2025 and 2035, the population growth, in line with a decline in the rate of growth of the urban population of Kenya, a rate of 4% has been used. Under this scenario the population of Embu town planning area would be 171,470 persons in the horizon year of 2035.

Table 5.6: Alternative population projections

Projection	2015	Intercensal Growth rate	2025	Intercensal Growth rate	2035	Intercensal Growth rate	2045
Low	79 305	2,90%	105 549	2,90%	140 478	2,90%	186 966
Medium	82 120	3,50%	115 279	3,00%	157 956	3,00%	212 280
High	84 530	4,00%	121 558	3,50%	171 470	3,50%	241 875

5.7.2 Medium Growth Rate

Under the medium growth scenario the following factors have been considered:

- Currently inadequate infrastructure services will discourage people
- Good road connectivity with Nairobi
- Adequate land available for future development with intermittent hilly/ undulating areas
- Rich horticultural land surrounding the town provides raw material for fruit agro-based industries
- Development of adequate infrastructure facilities through the implementation of ISUDP

Under the above scenario, Embu would develop at a growth rate of 4% and 3.5% for the 2015-2025 and 2025-2035 periods respectively.

Under this scenario the population of Embu town planning area would be 157,956 persons in the horizon year of 2035.

5.7.3 Low Growth Rate

Under the low growth scenario the following factors have been considered:

- Low industrial growth as considering the currently insignificant industrial base
- The growing economy of other towns like Nairobi and Thika will continue to attract more and people
- Currently inadequate infrastructure services will discourage people
- Lack of financial resources and implementation capacity of the county government to implement ISUDP and provide adequate infrastructure for future development
- Outmigration due to inadequate infrastructure and better employment opportunities in Nairobi

Considering the above factors, under this scenario Embu would develop at an annual rate of 3%. Under the low growth scenario the population of Embu town planning area would be 140,478 persons in the horizon year of 2035.

5.7.4 Selection of Growth Scenario

Considering all factors and recent development trends in the town, it is considered that Embu town will develop at the medium growth rate and projected population of town will 157,956 by year 2035.

5.8 Development options

Three development options have been considered for the future development pattern of the town. These options will help in deciding the future development pattern which will become the base for all planning proposals. The applicability of each option is described below:

5.8.1 Option 1: Linear/ ribbon development

The current development pattern of Embu town is in somewhat linear form to some extent along Meru road. The proposal for future linear development depends upon the associated opportunities and issues. On the one hand linear development makes infrastructure development easy, and reduces transportation costs. On the other it puts extra pressure on transport and other infrastructure networks, and it is difficult to avoid land use incompatibility/ conflicts in a linear development model.

5.8.2 Option 2: Compact radial development

The town has grown in an elongated shape over a period of time. The three radiating main roads are the axes of the growth pattern of Embu town. The undulating terrain has been an obstacle to radial

growth. There has been little development to the west of the B6 road due to the barrier formed by the river Rupingazi, while the town has grown to south due to the relatively plain land surface and lack of major streams. Recently the town has also grown in the north direction along B6 road. The rich agriculture and dense vegetation surrounding the town has also been not conducive to urban development. Although the current development pattern is in an elongated shape, there are some signs of compact radial structure especially around the CBD area. The radial development pattern is best possible with flat land with development of infrastructure. The suitability of compact radial development depends upon associated opportunities and issues. Compact radial development allows the best utilisation of land along with easy accessibility to infrastructure and services.

5.8.3 Option 3: Polynuclear/decentralised development

Although Embu's current development pattern is quite elongated with some compact development in the CBD, there are some signs of decentralised development, for example in the small commercial developments along Meru road at Mutunduri. The suitability of polynuclear forms of development for future proposals depends upon associated opportunities and issues. The most important advantage of polynuclear development is that the whole area of the town may be served with adequate services and it is not necessary for everyone to go to the CBD to obtain services. However this model needs more land and infrastructure is likely to be more costly.

5.8.4 Selection of the development option

None of the above mentioned development models can be applied directly to the development of Embu town. The consultants suggest a combination of approaches which incorporates components of the linear, radial and polynuclear models.

5.9 Land Use Plan

The Physical Planning Handbook provides guidelines for determining the allocation of land for various uses. The one main reference has been taken from the average land uses of ten towns. Conditions in Embu differ from the averages of ten towns due to the following reasons:

- Currently inadequate land is available for recreational activities
- The current residential area is mostly spread horizontally with low densities, and can be re-densified
- Lack of functional land for industrial uses
- Increasing the share of educational and public purposes will help to create more educational and public facilities in the town
- Existing undeveloped land can be used for future development
- Preserving the agricultural land (which is used for cash crops/high yield crops) as much as practically possible will continue the income flow to the town and provide raw material for industries. It will also bring environmental benefits.
- Considering the above, a land use plan has been prepared for Embu Town Planning Area and presented in Table 5.7 and Figure 5.4.

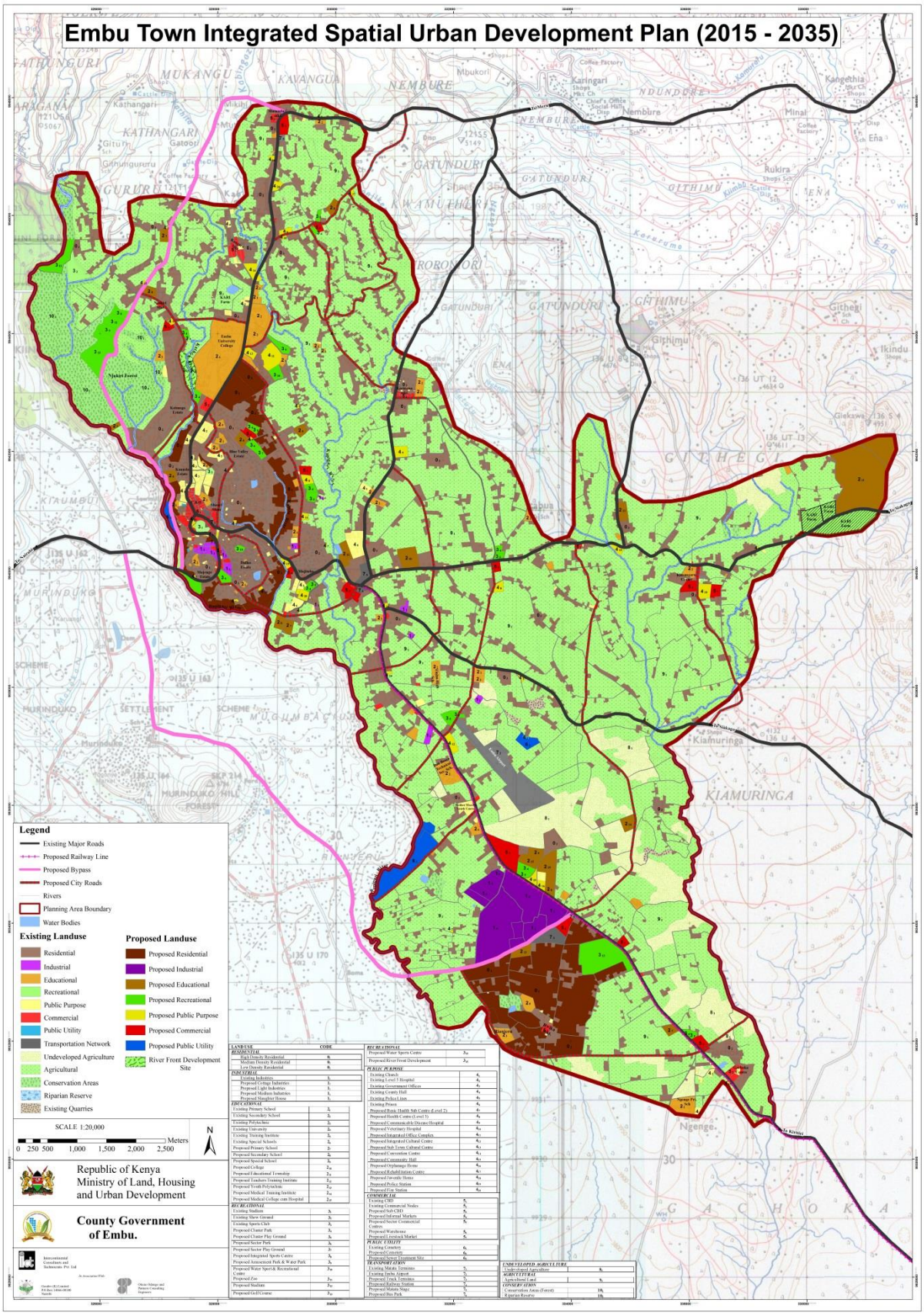
Table 5.7 Existing and proposed land use of Embu Planning Area

Sl. No.	Embu			Ten Towns' Average[2] (%)	Proposed Land Use	
	Land use	**Area (km^2)**	**% Area**		Area	%
Developed Area						
1	Residential	1658	65.59	57.64	1895	54
2	Industrial	19	0.75	8.7	140	4
3	Educational	144	5.70	9.4	316	9
4	Recreational	17	0.67	5.1	176	5
5	Public purpose	92	3.64	12.2	140	4
6	Commercial	52	2.06	6.8	140	4
7	Public utility	31	1.23	3.8	70	2
8	Transportation	515	20.37	-	632	18
Sub-total of developed area		**2,528**	100.00		3510	100
Undeveloped area						
1	Undeveloped / unused/ vacant land	731	-	-	0	-
3	Agriculture	6,445	-	-	6194	-
4	Conservation (Forest and Hills)	358	-	-	358	-
4	Riparian Reserve	143	-	-	143	-
	Water Body	23	-		23	-
Sub Total of Undeveloped Area		**7,700**	-	**-**	6,876	-
Total		**10,228**	**-**	**-**	10,228	-

Source: Field Surveys

[2] Source-Physical Planning Handbook, 2008

Figure 5.4: Planned Land Use (2035)



The Land Use Plan as presented in Table 5.7 and Figure 5.4 is explained below:

5.9.1 Residential land use

The current residential area is 65.59% of the total developed area and for the planning period the 54% area has been proposed for residential use. Currently the residential areas are spread horizontally and occupying lot of land with a low population density of 32 persons/ha. With a suitable policy and convenient procedures, the existing residential areas have considerable scope for re-densification including the sparsely located government residential quarters. The existing developed area has been proposed at 40 persons/ha and new development has been proposed at 58 persons/ha (on total built-up area) but the net residential density (high density, medium density and low density) is different from the net population density, which is mentioned in the respective section below. There are four types of residential area:

- High density residential areas
- Medium density residential areas
- Low density residential areas
- Mixed use (residential-cum-commercial)

High density residential

The high density residential areas include any existing developed areas as well as new residential areas. The following areas, as shown in Figure 5.5, are planned as high density residential areas:

- **Existing developed area:** Some of the high density areas within the existing developed area: Blue Valley estate, Majengo Estate, Dallas Estate, etc. The population density of existing residential areas under high density is proposed to be 200 persons per hectare.
- **New areas:** Some of the high density areas within the residential areas are Dallas, KARI Land Estate, in front of Embu University, New Residential Area at Gachoka near proposed industrial area, etc. The population density of new high density residential areas is to be 280p/ha (70 dwellings/ha).

The total area allocated for high density residential neighbourhoods is around 750 ha (existing and planned).

Medium density residential

The medium density residential area includes the existing developed area as well as new residential areas. The following areas, as demarcated on the Figure 5.5, are medium density residential areas:

- **Existing developed area:** Some of the medium density areas within the existing developed residential areas are Koimogo Estate, Residential areas near Itabua Police line, Majimbo estate, etc. The population density of existing medium density residential areas is128p/ha (32 dwellings/ha)
- **New areas:** The medium density areas within the new residential areas is planned in New Residential Area at Gachoka near proposed industrial area. The population density of new residential areas under medium density is proposed to be 128p/ha (32 dwellings/ha).

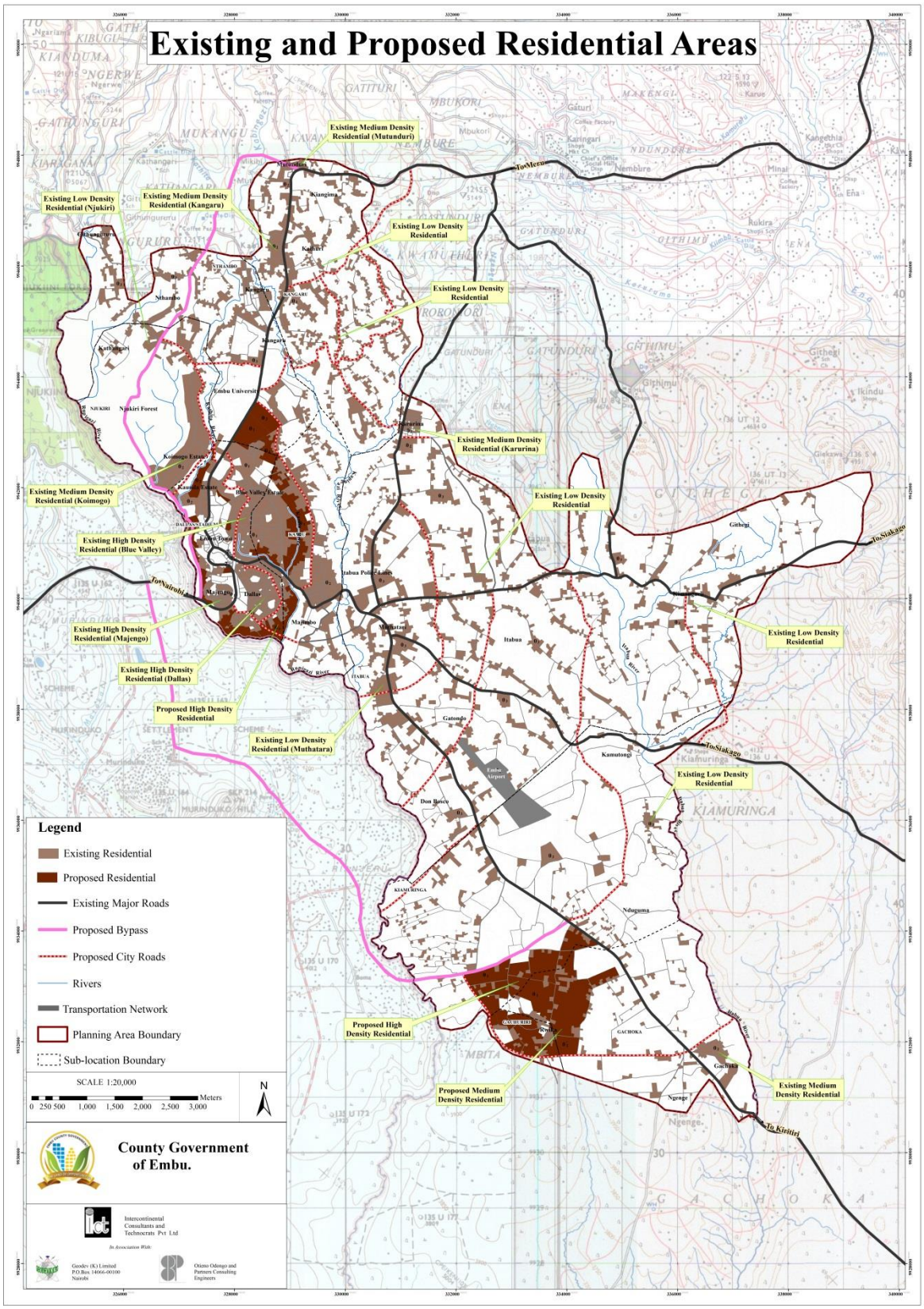
The total area allocated for medium density residential neighbourhoods is around 500 Ha (existing and planned).

Low density residential

The low density residential area includes some of the existing developed area. The following, as demarcated in the Figure 5.5, are low density residential areas:

- **Existing developed area:** Some of the low density areas within the existing developed residential areas are Muthatara, Njukiri, Kangaru and other residential areas into the agricultural land. The population density of existing residential areas under low density is set at 40p/ha (10 dwellings/ha)
- **New areas:** No additional areas are planned for low density housing.

Figure 5.5: Existing and planned residential areas



5.9.2 Industrial land use

The current industrial area in Embu town is 0.75% of the total developed area and for the planning period the 4% area has been proposed. Some industrial units of small and medium sizes are already established (but some are non-functional) in the town but there is potential of developing more industries thereby creating economies of scale. The good horticulture base of macadamia, coffee, tea, mangos, bananas, etc. will be helpful in developing the new industries and strengthening existing industries.

The Economic Survey 2015 shows that the share of manufacturing to the total economy was 10% with 12% employment in 2014 at national level. The working population (15-64 age) of the Embu District-Urban was 68% in 2009 and is expected to be 67% in the year 2035 for Embu Town Planning area. Out of the total working population in Embu District-Urban in 1999, 89% were employed (*Kenya Central Bureau of Statistics).* For the year 2035 an employment level of 90% is assumed. Thus out of the 105,830 persons of working age 95,247 will be in employment.

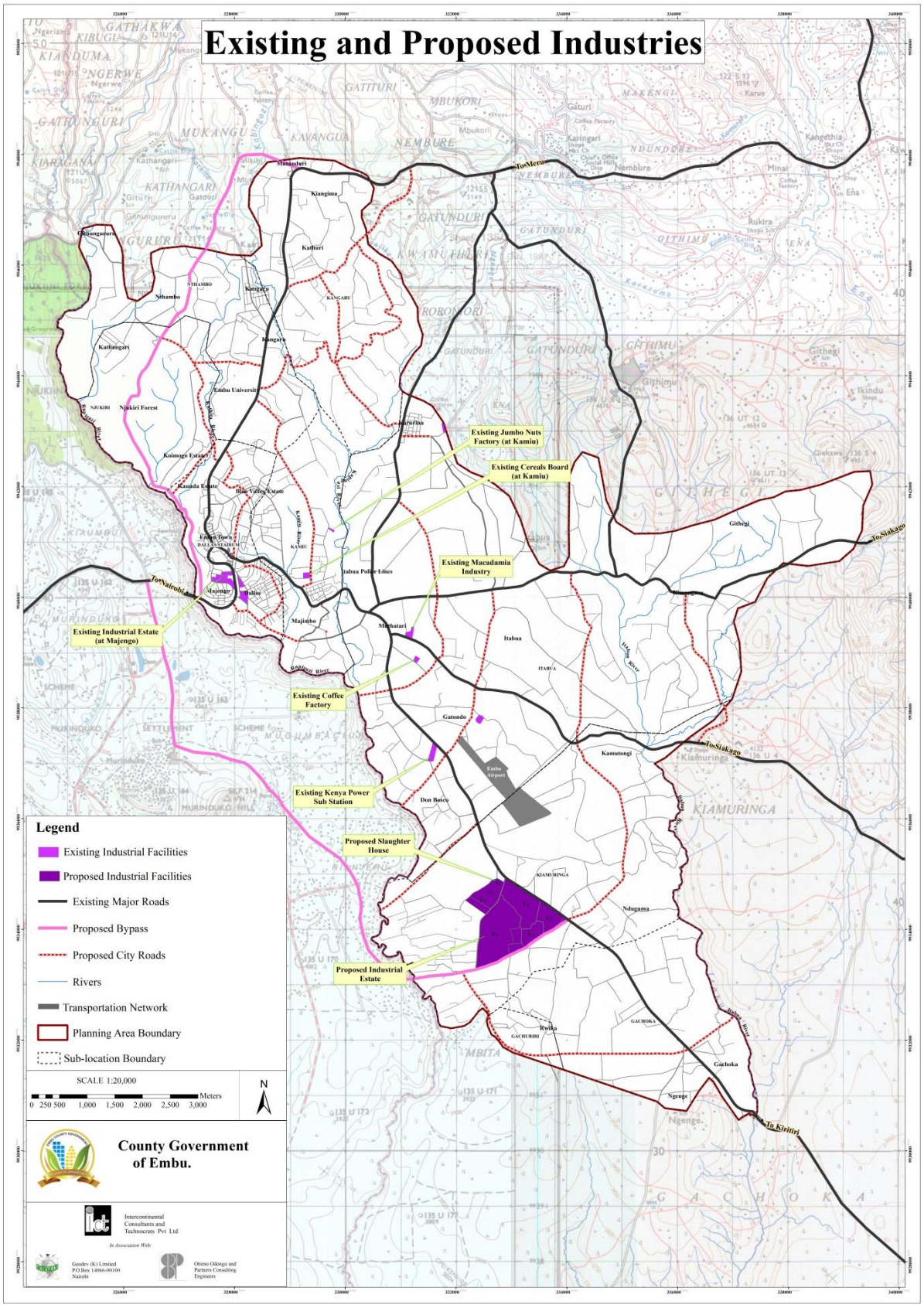
Three types of industrial areas are planned. (For details refer Figure 5.6).

1. Services and Light Industry: A total of around 16 Ha has been planned under services and light industries such as manufacture of clothes, shoes, furniture, consumer electronics, home appliances, food processing (like ugali flour) and jua kali etc. Light industries have been planned near Majengo Estate and new Industrial area near Gachoka. Some also have been proposed within or nearby the residential areas. The light industries permitted within or near residential areas include workshops, large laundries, dry cleaners, printing, furniture, etc. The minimum plot size for light industry is 0.05 Ha

2. **Medium Industry**: A total of around 53 Ha has been planned under medium industries. One medium industry is already functional along Siakago road (coffee factory). New medium industries are planned at new Industrial area near Gachoka. Medium industries proposed include tanneries, skin and hides processing, animal feed production, milk processing and cooling plant, etc. The minimum plot size for medium industry is proposed to be 2 ha.

3. Extensive and Heavy Industry: A total of 78 Ha has been planned for heavy industries like automotive, steel making, industrial machinery, large food processing, cement manufacturing industry, plastic industries, chemical, etc. There are large size industrial units proposed in new Industrial area near Gachoka. The minimum plot size for large industry is proposed to be 10 ha.

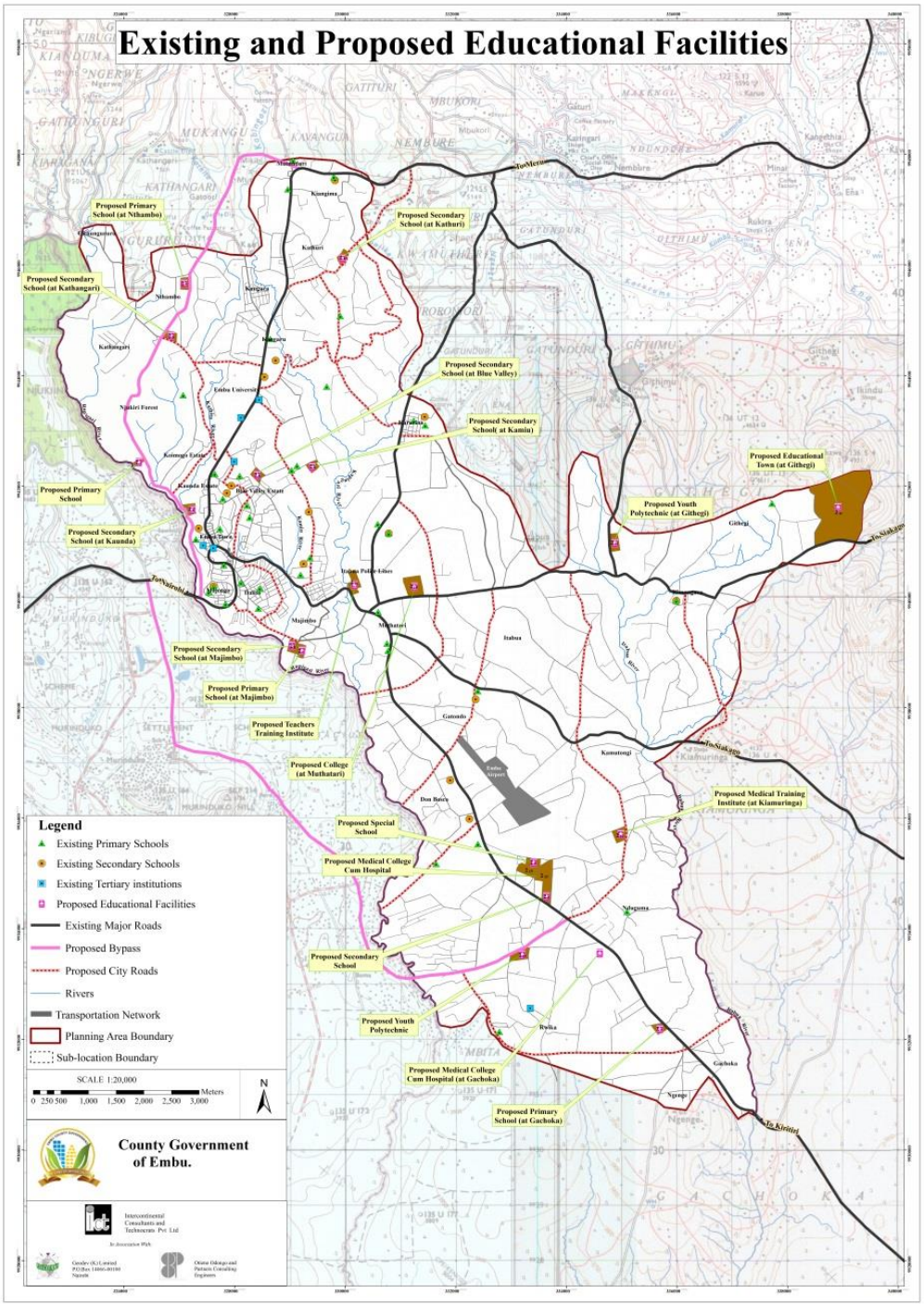
Figure 5.6: Existing and planned industrial areas



5.9.3 Educational land use

The current area under educational facilities in Embu town is 5.70% of the total developed area and for the planning period an area of 9% has been proposed. The share under educational facilities has been increased to make Embu as educational hub of Mount Kenya region. For the projected population of 157,956 many new educational facilities are required, which include primary schools (6), secondary schools (5), special schools (1), youth polytechnics (2), an education town ship (102Ha), a management training/teachers training institutes, a medical training colleges and a medical college-cum-hospital. All the educational facilities are planned on private land, which will require compulsory land acquisition. The location of existing and planned educational facilities is presented in Figure 5.7.

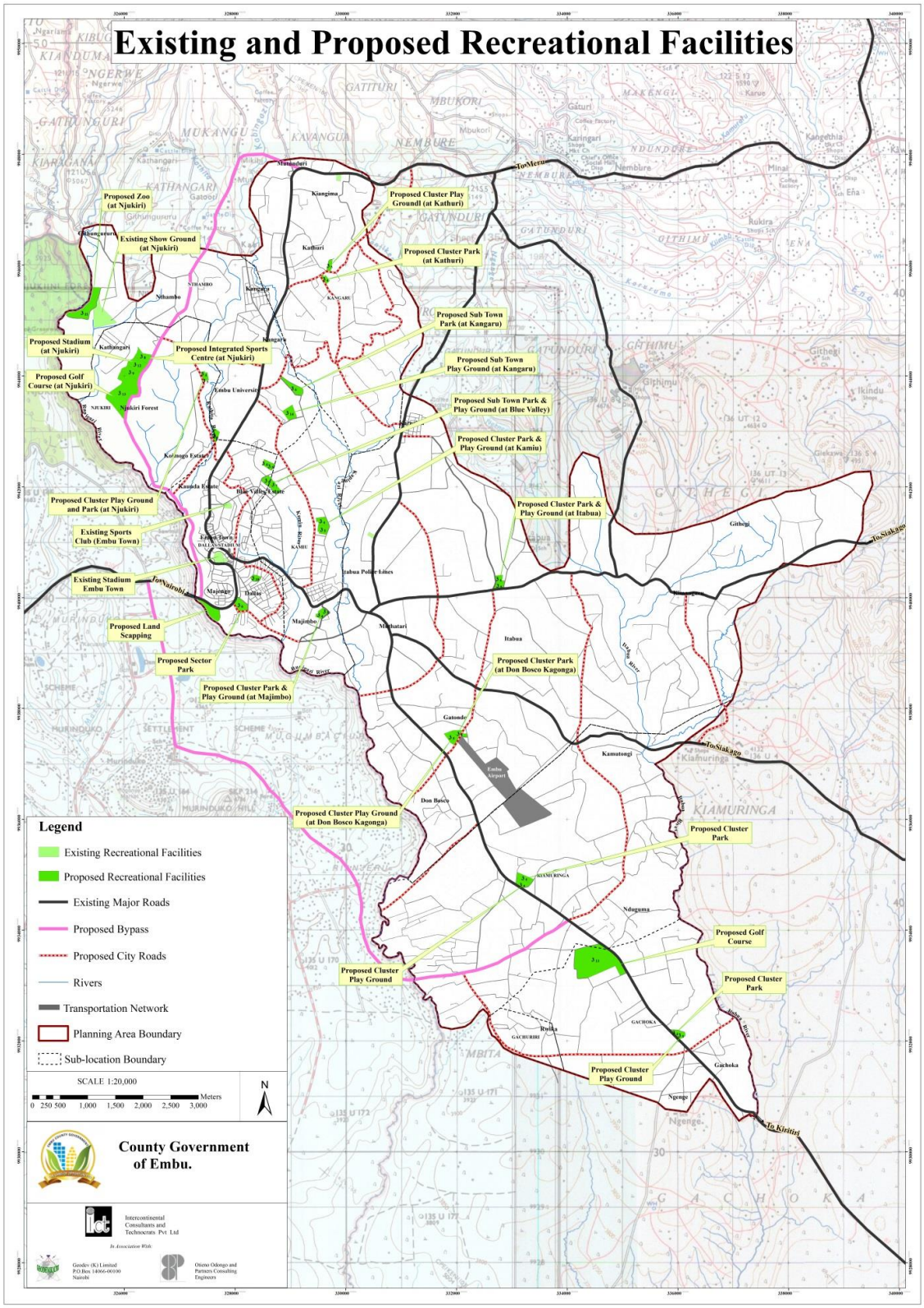
Figure 5.7: Existing and proposed educational areas



5.9.4 Recreational land use

The existing area under recreational facilities is 0.67% of the developed area, which is very low. Considering the need to have adequate space for recreational activities like parks, playground and open spaces, 5% area has been planned for the year 2035. Figure 5.8 shows the location of recreational facilities in Embu town planning area.

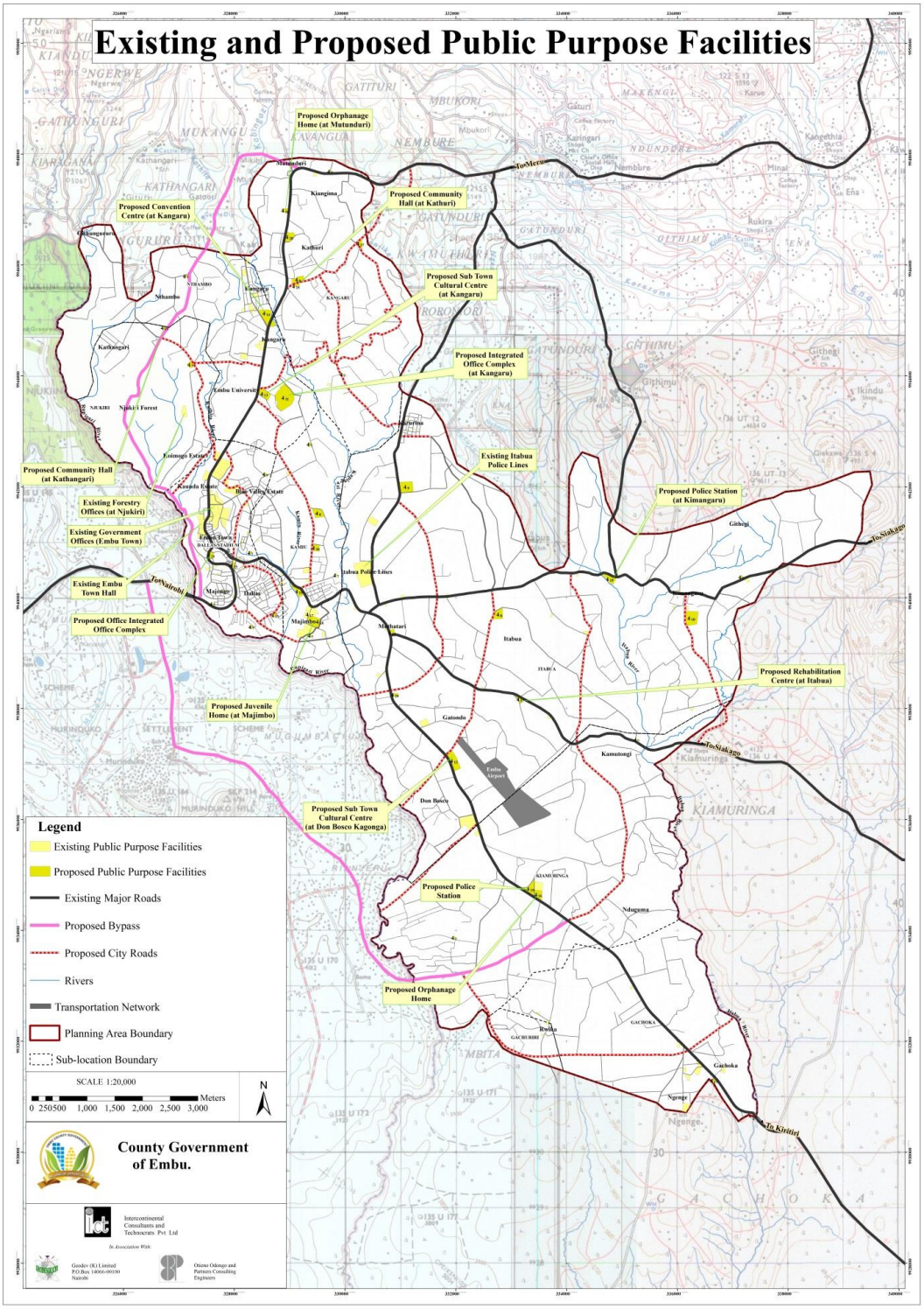
Figure 5.8: Existing and proposed recreational areas



5.9.5 Public purpose land use

Public purpose includes community facilities like hospitals, community halls, libraries, post offices, security, religious facilities, banks, government offices, etc. The current area under public purpose is 3.64% of the total developed area and for the planning period 4% area has been proposed. The share of area under public purpose facilities has been increased for future considering the town as county headquarters and a regional centre. Figure 5.9 shows the proposed location of uses under public purposes.

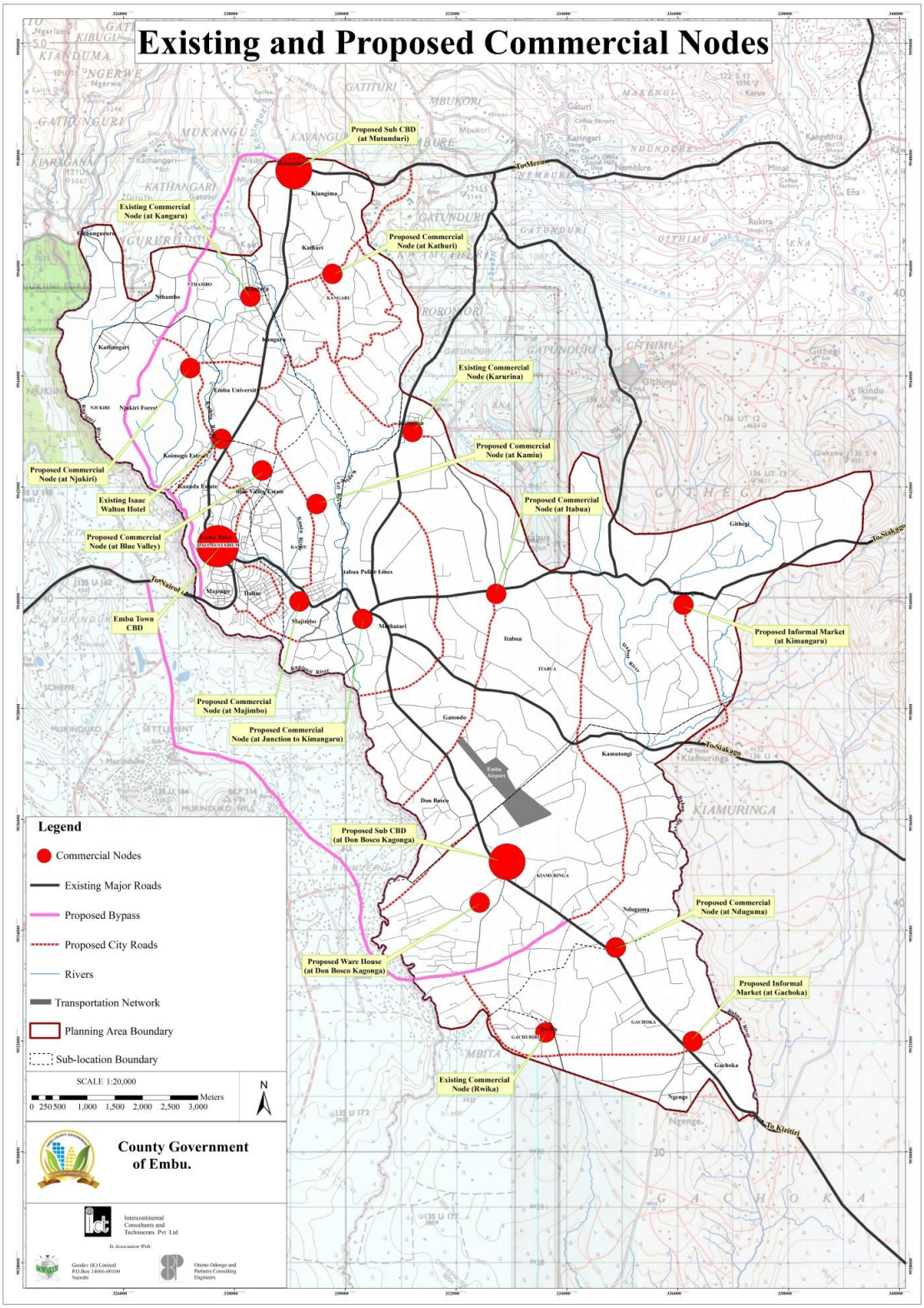
Figure 5.9: Existing and Proposed Public Purposes Areas



5.9.6 Commercial land use

Currently 2.06% of the total developed area is used for commercial activities. For the planning period this has been increased to 4%. The types of commercial activities planned for different levels of commercial centre are fully described in the 'Planning Hierarchies/ Decentralized Planning in Planning Units' section of Chapter 3. Figure 5.10 shows the proposed location of commercial areas in the planning area.

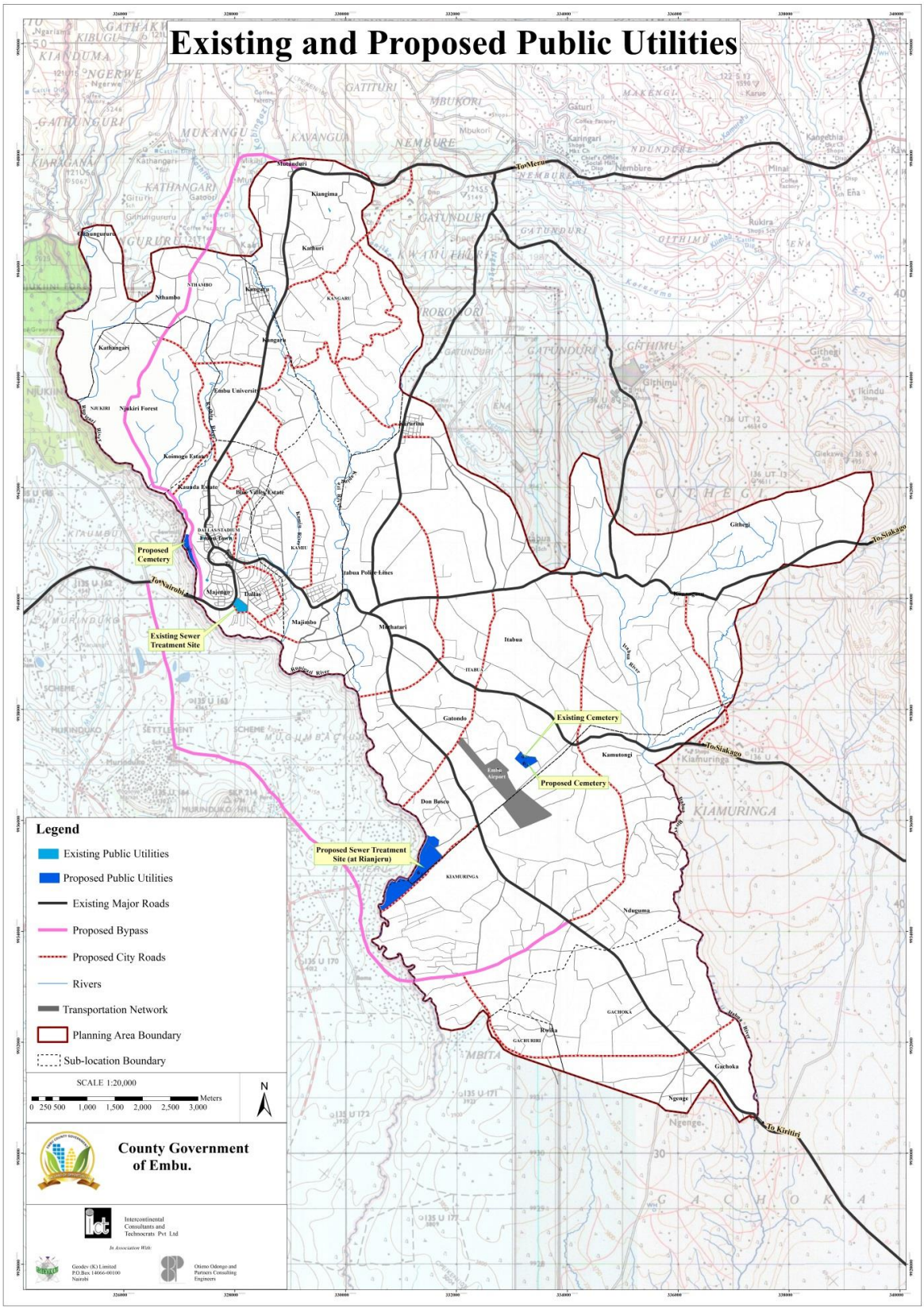
Figure 5.10: Existing and planned commercial areas



5.9.7 Public utilities land use

With 1.23% of the total area there is currently adequate land for public utilities in the town. However, the proportion has been increased slightly (2%) so that adequate land can be provided to serve the town with infrastructure and services in future. Figure 5.11 indicates the location of public utilities.

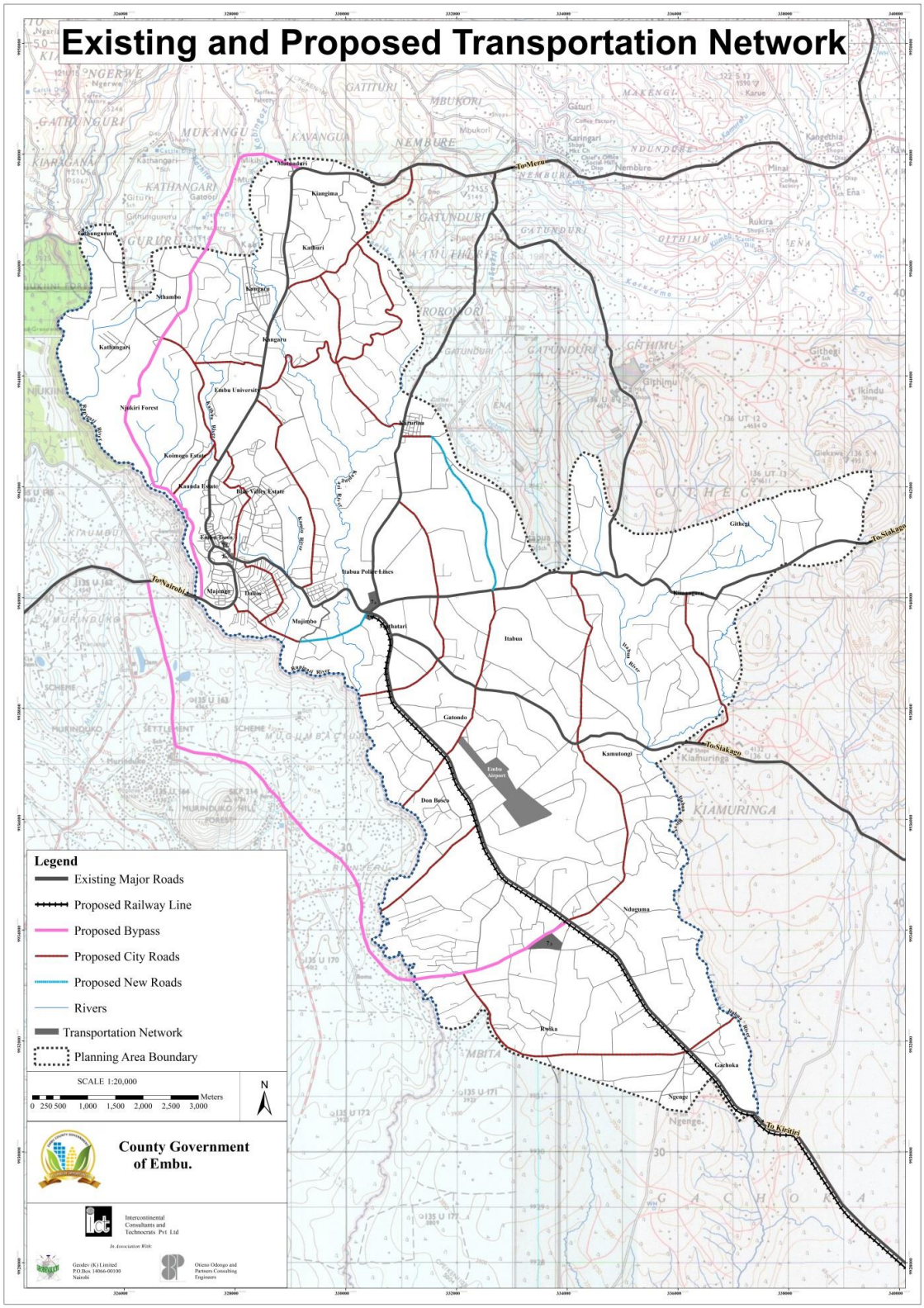
Figure 5.11: Existing and planned public utilities



5.9.8 Roads and transport land use

Already there is an adequate area in use in the town for roads and transport, with 20.37% of the total developed area, of which a proportion is for the airport. The share of transportation has been kept almost same (18%) which is assumed to be sufficient for a town such as Embu. The broad transportation proposals for parking, transport terminal, bus/matatu station, truck terminal, roads, etc. are shown in Figure 5.12.

Figure 5.12: Existing and proposed transportation areas



5.9.9 Other land uses

Unused Land: Currently undeveloped agriculture land/ unused land represents 9.49% (731ha) of the total undeveloped area. Most of the undeveloped agriculture land/ unused land area has been planned to be consumed for various other uses (refer Figure 5.4).

Agriculture Land: Currently the area under agriculture is 6445 ha (where agriculture is practiced currently). This will be reduced slightly to accommodate the planned development. Theoretically, most of the new development can be accommodated within the existing undeveloped agriculture land/ unused land with some 251ha agriculture land but considering the direction of growth, contiguity of development and other planning needs, the consultants had to take some extra agriculture land also although an efforts were made preserve the same (refer Figure 5.4).

Environmentally sensitive areas: To preserve the environment, areas under forest, riparian reserve and water bodies (dams) are to be retained as they are. The detailed analyses of environmental aspects are explained separately in this report (refer Figure 5.4).

6 Strategic sector plans

6.1 Commerce and industry

The economic base of a town affects its prosperity and is critical to ascertain the overall sustainable development of town.

6.1.1 Industry

The industrial activities within the planning area are agro-based: mainly coffee factories and a macadamia nuts processing factory (operated by the Embu Co-operative Union at Kamiu). However low coffee prices have caused a decline in coffee production and consequently some coffee factories have closed or lie idle staffed with only maintenance workers. Most coffee farms have been put under maize and beans. Other agricultural related industries are bakeries and home based fruit processing activities.

Key industries

1. ASPEN - manufactures yoghurt.
2. Several honey processing plants
3. Spice making
4. Water purification and packaging

Other industrial activities include carpentry, tailoring, general fitting, metal fabrication, motor vehicle repair and the leather works.

6.1.2 Commerce

The main economic activities in this category include wholesale, retail, restaurant, hotels and sale of farm produce. Employment in these activities has been increasing over the years. This is attributed to the fact that Embu is a commercial, service and distribution centre. The town has a number of informal commercial activities such as hawking of cheap, light commodities, sale of second hand clothes, food and vegetable kiosks on the street and in residential areas.

As shown in the table below, in 2014 there were 7,987 registered businesses within the Manyatta Constituency (town level data is not available and Embu town is located within Manyatta Constituency). The biggest category of registered business in terms of numbers is shops (N-4,207) followed by professional firms (N-1034); hotels, lodges, guest houses, restaurants, bars (N-883); and informal traders (N-684).In terms of potential revenue generation the biggest category of registered business is workshops (Ksh 35,036,000) followed by shops (Ksh 29,145,400); hotels, lodges, guest houses, restaurants, bars (Ksh 6,222,000) and professional firms (Ksh 6,215,500). The data indicate that most of the economic activities in the Manyatta Constituency are related to trading and servicing, and manufacturing activities are almost negligible.

Table 6.1: Single Business Permit: Collection Performance County Government of Manyatta Sub-County); Year: 2014 (Amount in Kshs. Million)

Business Activity	No. of Registered Businesses	Revenue Potential (Ksh)	Permits Paid (Ksh)	Penalties Paid (Ksh)	Total Paid (Ksh)	% Compliance
Shops	4,207	29,145,400	4,860,600	33,593	4,894,193	16.7
Professional Firms	1,034	6,215,500	1,202,200	7,857	1,210,057	19.3
Hotel, Lodge, Guest House, Restaurant, Bar	883	6,222,000	1,488,000	10,250	1,498,250	23.9
Informal Traders	684	2,217,500	68,000	0	68,000	3.1
Workshop	425	35,036,000	313,000	4,710	317,710	0.9
Agriculture Dealer	153	1,152,000	319,000	1,970	320,970	27.7
Education	119	2,098,000	306,000	0	306,000	14.6
Others	104	1,063,800	406,600	1,265	407,865	38.2
Storage	103	1,299,000	339,800	450	340,250	26.2
Health	92	1,095,000	300,000	1,170	301,170	27.4
Banking and Financial	60	2,470,000	990,000	3,000	993,000	40.1
Transport	41	574,000	43,000	1,920	44,920	7.5

Business Activity	No. of Registered Businesses	Revenue Potential (Ksh)	Permits Paid (Ksh)	Penalties Paid (Ksh)	Total Paid (Ksh)	% Compliance
Entertainment	29	230,000	75,000	0	75,000	32.6
Filling Station	27	410,000	146,500	0	146,500	35.7
Super Markets	10	450,000	90,000	0	90,000	20.0
Wholesale	10	42,000	7,200	0	7,200	17.1
Industry	3	72,000	24,000	0	24,000	33.3
Mining	3	57,000	0	0	0	0.0
Total	7,987	89,849,200	10,978,900	66,185	11,045,085	**11.9**

6.1.3 Agriculture

Embu town is situated in a rich agricultural hinterland with most of activities within the town related directly or indirectly to the agriculture sector. Agriculture activities are mainly carried out in Githimu (787ha) and Kirigi (545.4ha) sub locations. Main crops of the area are beans, maize, coffee and horticulture crops (Draft Embu Local Physical Development Plan).

Kenya's economy is heavily dependent on agriculture, which contributes to rural employment, food production, foreign exchange earnings and rural incomes. The agricultural sector directly accounts for about 26 per cent of Kenya's Gross Domestic Product (GDP) and 27 per cent indirectly through linkages with manufacturing, distribution and other service related sectors. The sector accounts for 65 per cent of Kenya's total exports, 18 per cent and 60 per cent of the formal and total employment, respectively. The agriculture sector has been a key driver of economic growth in Kenya for the last four decades and is the main source of livelihood for almost 80 per cent of Kenya's population living in rural areas. The key policy goals of the sector are in line with Kenya Vision 2030, and are guided by the Agriculture Sector Development Strategy (Government of Kenya, 2003) framework, which emanated from a revision of the Strategy for Revitalizing Agriculture (Government of Kenya, 2003). Overall, the sector is critical in realizing the various targets that are set out in the Millennium Development Goals (MDGs), especially that of reducing hunger and poverty.

(http://www.kippra.org/downloads/Kenya%20Economic%20Report%202013.pdf)

The agricultural potential in the county varies from low potential areas in some parts of Mbeere to high potential areas in the Embu high lands. Key agricultural activities are characterized by mixed farming. The main cash crops grown are coffee, tea, macadamia and cotton. The main food crops include maize, beans, Irish potatoes, sweet potatoes, cassava, green grams, cowpeas, sorghum and millet. Vegetable production is practiced mainly in the small holder irrigation schemes but also under rain fed conditions. Livestock production which includes dairy and beef cattle, poultry and shoats is also a major agricultural activity in the county. Horticulture is a major enterprise in the region producing vegetables, fruits, nuts and floriculture for both local and export markets.

Agriculture area within Embu Town Planning Area: According to our calculations about 63% of the total planning area in under agriculture activities. There is no detailed information about the cropping pattern within the planning area as data are only available at the County level. But from field observations and stakeholder consultations, the consultants have identified the main crops within the planning area as maize, beans, pearl millet, coffee, tea, potatoes, avocados, macadamia nuts, mangoes, bananas, watermelons, etc. Considering the cropping pattern within the planning boundary and with Embu County there is a lot of potential for developing Embu town as an agro-processing hub for the county and region.

6.1.4 Labour Force Participation Rate (LFPR) and employed population:

The Labour Force Participation Rate (LFPR) is the percentage of people of working age (15 – 64) who are employed or looking for employment. The unemployment rate is the percentage of people within the labour force who are not employed.

The Kenya Central Bureau of Statistics 2009 records the LFPR in the Embu District as 65.19%, and an unemployment rate of 11% (Year 1999). Assuming, therefore, that the LFPR will be at 65% and unemployment at 8% the estimated labour force in 2035 as shown in the table below.

Table 6.2: Labour Force Participation Rate (LFPR) and Employed Population

	2009 (Embu District Urban)		Estimated for Embu Town Planning area(2015)[1]		Estimated for Embu Town Planning area 2035	
	%	No.	%	No.	%	No.
LFPR (%)	65.19	52,286	65.19	53,534	65	102,671
Unemployment rate (%)	11[2]	5,751	11	5,889	8	8,214

Kenya Central Bureau of Statistics and Consultants' Estimates

Based on the land allocated for various activities (see Chapter 5 Structure Plan for land allocation for various uses) in the plan, the estimated wage employment is given in the table below:

Table 6.3: Estimated wage employment

Industry and Sector	**Wage Employment**			
	Kenya (2014)[3]		**Embu Town Planning Area estimate (2035)**	
	No. (000s)	**%**	**No.**	**%**
Primary Sector				
Agriculture, forestry and fishing	350.7	14.2	6,500	5
Mining and quarrying	13.5	0.5	7,500	1
Secondary Sector				
Manufacturing	303.1	12.3	71,560	18
Tertiary Sector				
Wholesale and retail trade; repair of motor vehicles and motorcycles	233.3	9.4	49,350	30
Construction	151.2	6.1	12,400	6
Education	460	18.6	9,000	19
Transportation and storage	83.4	3.4	7,600	4
Others	875	35.4	25,000	17
Total	**2470.2**	**100**	**188,910**	**100**

The following issues/ observations emerged out from the analysis of the economy of the town:

- The employment rate is very high in urban areas in Embu District (94.3% of the total economically active labour force)
- The CBD of Embu is a commercial centre for the people of the town and surrounding hinterland
- The other commercial areas of town (Sub-CBDs) are not organised properly in the town
- The town works mainly as an administrative, commercial, education and health centre to the local people and people from surrounding hinterland
- Most of the old industries are closed down
- The town can be the industrial centre for agro-processing industries because there is a huge potential to exploit the agricultural resources of the region like coffee and other horticulture crops
- Embu is located in a fertile area and can consider strengthening its role as an agricultural marketing and support centre.
- Tourism is not a major contributor to the economy, but Embu might be able to use its role as a knowledge centre to attract conference and similar trade

[1] The figures for Embu District Urban are assumed to be valid for the Town Planning Area
[2] Embu District Urban 1999.
[3] Source: Kenya Economic Survey 2015

- In jua kali areas, most of the basic amenities like toilets, drinking water facility, storm water drainage, street lights, roads, etc. are inadequate. Some of the area allocated to Jua Kali has been grabbed near sewage pond site. There is no proper platform to get better training for the artisans and there is no platform for marketing of jua kali products
- Agriculture related issues:
    - High production cost
    - Inadequate training of farmers for innovative farming techniques and for high yielding crops
    - Inadequate Financing specially for small farmers
    - Low agricultural productivity compare to the production cost

6.1.5 Project identification for economic development

Economic development includes development of industries and trade and commerce. Currently Embu town is an administrative town and commercial centre. Agro-based resources are available in the town for industrial development. Although the town has been proposed as an education centre the development of industries and commerce is also needed to make the town economically sustainable. Considering the potential of horticulture (coffee, macadamia nuts, etc) and agriculture, small and medium scale agro-processing industries have potential. The goals, strategies and projects that have been identified for overall economic development are presented in table below.

Table 6.4: Economic development: goals, strategies and projects

Goals	Strategies	Projects	Quant-ity	Unit	Remarks
To provide a favourable business environ-ment and employ-ment opportun-ities	Provide new industrial and commercial areas	Allocate land for new industrial areas	134	ha	New industrial area has been planned. A detailed plan of industrial area to be prepared, linked with industrial promotion policy
		Allocate land for new commercial areas	134	ha	The plan includes 2 Sub-CBDs, 5 informal markets, 8 commercial nodes, etc. .
		Notification of the land demarcated for commercial and industrial development	1	No.	Land to be acquired by Government.
		Preparation of detailed project report for industrial and commercial areas for development	1	No.	
		Allocation of industrial land for development	1	No.	
	Integrate and improve Jua kali industries	Improvement of basic infrastructure and services (e.g. roads, drainage, water supply and electricity) in jua kali areas	-	-	Improvement of infrastructure in the planning area that also includes jua kali areas
		Annual training for skill upgrading of jua kali artisans	1	No.	Train artisans in different groups to be organised once a year
		Marketing of jua kali products through a co-operative society	-	-	Jua kali association to be helped with marketing skills by government or other NGOs working in the field of marketing
		Organising annual fair to showcase the jua kali products at county and national level	-	-	Rewards for best product in each categories of jua kali products will be announced to motivate the artisans
	Improve existing informal markets	Improvement of existing Informal areas	-	-	Infrastructure in existing informal markets needs to be improved.
	Simplify business approval process	Single window approval system	1	No.	Streamline single business permit process
	Infrastructure for industrial development	Construct roads, drainage, trunk water supply system, trunk sewer line, electricity supply, etc within proposed Industrial area	-	-	Infrastructure development will attract investor for industrial development
		Construction of proposed truck terminal (1) and warehouse (1)	2	No.	
	Government promotion	Tax holidays for small and big industries	1	No.	Five year tax holidays for all new industries in Planning area including existing jua kali

Goals	Strategies	Projects	Quant -ity	Unit	Remarks
					units
	Promotion of Training for farmers	Establish farmers training centres for farming techniques, high yielding variety seeds, fertilisers & pesticides, farm equipments, cost effective irrigation and financial help	1	No	The training centres will help farmers for opting for new farming technique, new crops or high yielding seed, required fertilizer and pesticides; and cost effective irrigation; and guidance for how to approach banks for loan
	Promotion of value addition of farm produce	Promote value addition in agriculture by helping farmer in establishing household industries of farm produce	-	-	Farmer can start household level processing or manufacturing of their farm produce to earn more income
	Promotion of marketing facilities for agricultural products	Establish a marketing centre for linking farmers to market	No	1	Marketing centre will help farmers by informing them about market rates and direct link with market

6.2 Physical infrastructure

Based on the status assessments and SWOT analysis, together with the views expressed by the stakeholders during consultations including workshops, development strategies and projects have been developed to achieve the sectoral goals and town's vision. The development strategies and projects have been identified considering the existing gap and projected demand. The sectoral goals, development strategies and project of various components of physical infrastructure are presented in tables below:

Table 6.5: Goals, strategies and projects for water supply

Goals	Strategies	Projects	Quantity	Unit	Remarks
Safe Drinking Water for all	New treatment plant	Expand the current water treatment plant to meet requirements of 2035	5000	m^3	To cover the uncovered area and also plan for new planned development as per structure plan
		Rehabilitate the old pipe line in Kangaru, Majengo and town	40	km	Old and damaged pipelines need to be rehabilitated
		Laying new pipelines	14	km	Around 25km of new main trunk pipe line to serve the new developments and existing uncovered areas
	Improve the Distribution system	Installation of community water points in informal areas and public places	32	No.	Around 23% of informal residents (around 321 structures) are not getting piped water supply. One community water point is proposed for every 10 structures
	Water Manage-ment Plans	Construction of 10 rain water harvesting structures on natural streams to recharge the ground water	10	No.	On Rupingazi, Kapingazi, Kamiu and Itabua Rivers. Detailed analysis is needed
		Mandatory provision of water harvesting building design	-	-	The government needs to prepare templates for different housing designs relating to water harvesting
		Recycling of waste water	1	No.	Recycled waste water from STP can be utilised for agricultural and gardening purposes
	Public awareness and asset manage-ment plan	Awareness programme among the people on safe water use	1	No.	An awareness campaign is required regarding the importance of safe drinking water
		Asset management system (GIS Mapping of water supply network)	1	No	Mapping of water supply network within the existing and proposed developed area of 33.52km2

Water supply rehabilitation areas are shown in Figure 6.1 overleaf.

Figure 6.1: Water pipeline rehabilitation area: Embu Town

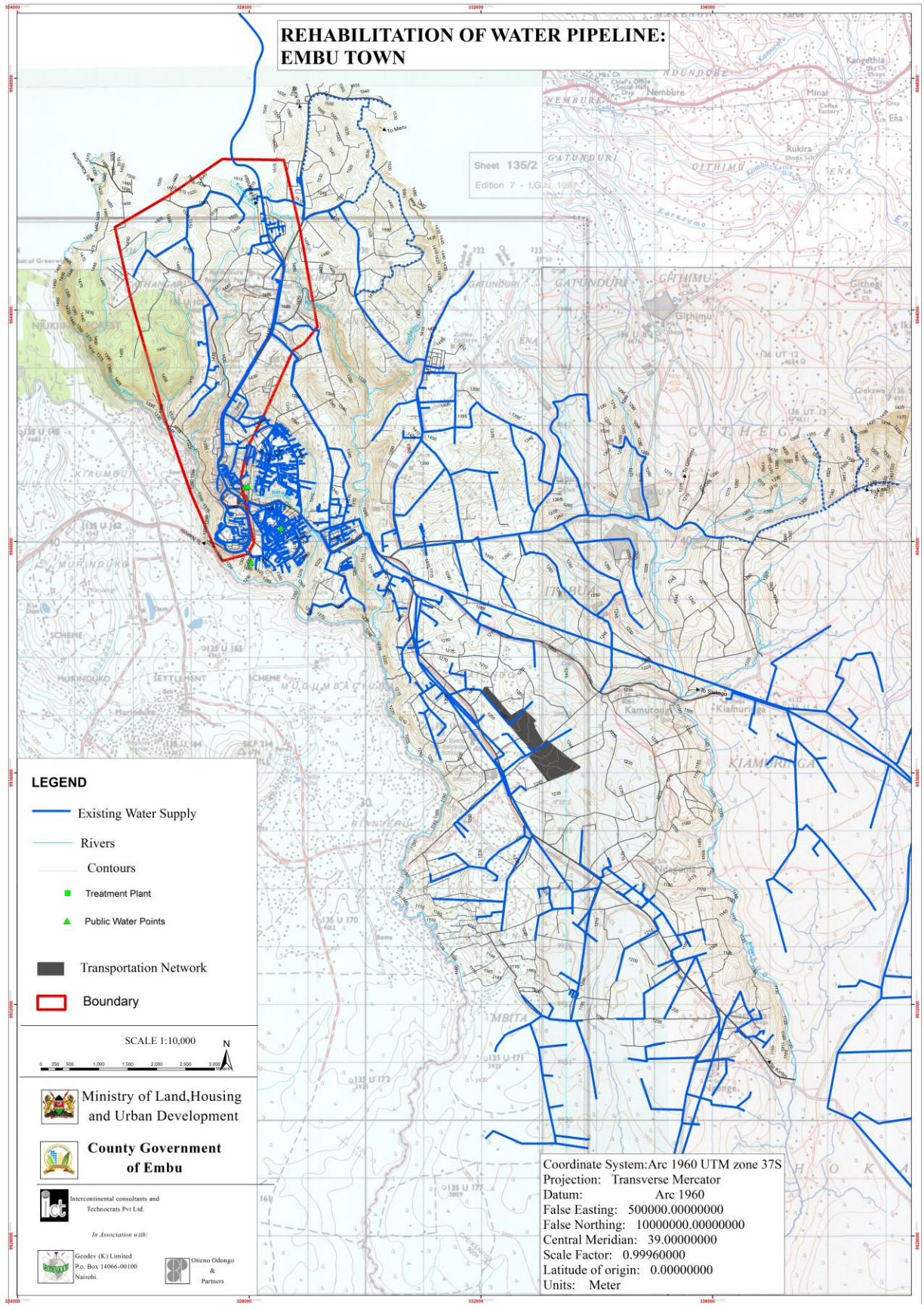


Table 6.6: Goals, strategies and projects for sewerage and sanitation

Strategies	Projects	Quantity	Unit	Remarks
Toilets facilities in every house	Linking of functional toilet design with building approval system	1	No.	Administrative decision
	IEC measures for safe sanitation practice	1	No.	An awareness campaign is needed to emphasize the benefits of safe sanitation practices
Providing sewer system in whole town area	Construction of a new sewerage treatment plant (near Don Bosco/Rianjeru-36Ha)	1	No.	Considering the slope towards south-east of planning area, the location is suitable
	Preparation of feasibility study and comprehensive design for sewer network	1	No.	A detailed study to provide exact requirement for laying down various infrastructure for sewerage system
	Construction of new sewerage network in uncovered areas	52	Km	Subject to demand, an estimated 45 Km of trunk sewer line could be required
Providing community and public toilets	Construction of community toilets in informal areas (1/10 families)	20	No.	Around 12% of informal residents (around 206 houses) do not have household toilets. One community toilet is proposed for every 10 households
	Public Toilets in market areas and public buildings (total 20)	20	No.	Public toilets are proposed in all the existing and proposed market areas

Rehabilitation and extension of sewer line areas are shown in Figure 6.2 overleaf.

Figure 6.2: Rehabilitation and extension of sewer line: Embu Town

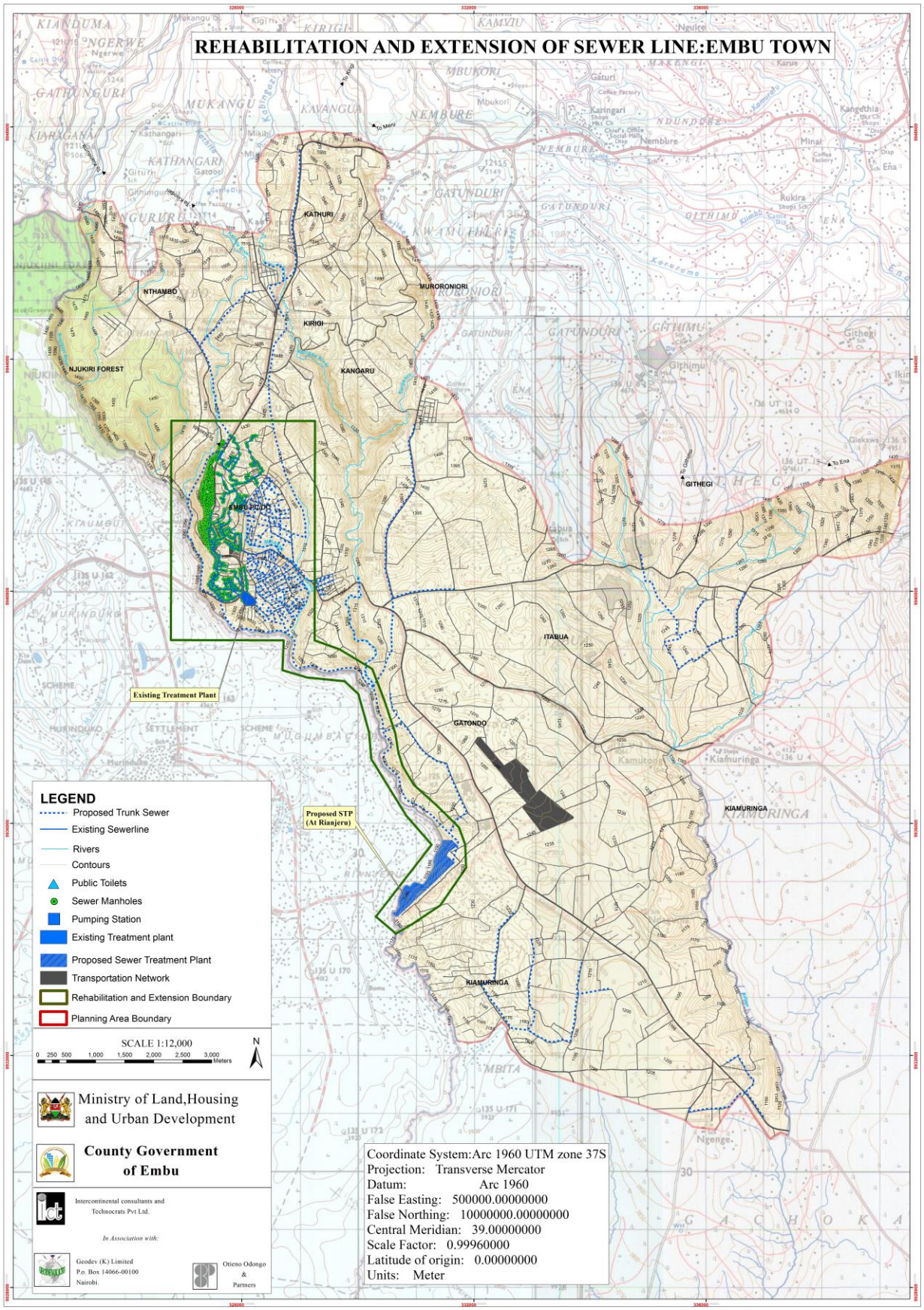


Table 6.7: **Goals, strategies and projects for storm water drainage**

Goals	Strategies	Projects	Quantity	Unit	Remarks
Draining of entire storm water from town	Drains based on level of slope	Implementation of the on-going feasibility study and comprehensive master plan for the stormwater	1	No.	The project is on-going
	Constructing new drains and missing links; align, develop and maintain existing drains	Construction of primary drains	48	km	Estimated length
		Construction of secondary drains	240	km	Estimated length
		Improvement/repair of existing primary and secondary drains	1,000		Estimated length
		Construct small water harvesting structures on all natural rivers	10	No.	Same item also given under supply section.
		Covered drain in market areas to be used as footpath	10	Km	Estimated length
	Remove encroachment	Removing the encroachments of drains	-	-	County needs to act firmly on this
		Notification of natural drainage area for non-construction activities	-	-	A gazette notification to be issued to ban all construction activities on natural drainage systems

Table 6.8: Goals, strategies and projects for solid waste management

Goals	Strategies	Projects	Qua-ntity	Unit	Remarks
Treatment of solid waste at landfill site with proper collection and segregat-ion at source	Improvement of waste collection system	Distribution of community dustbins/ skips (20x20m)	226	No.	One skip per 700 persons
		Litter bins (small size)	150		Only at market places and public buildings
		Recruitment of more staff for waste collection	20	No.	-
	Improvement of waste transportation system	Purchase of Compactor (covered)	2	No.	-
		Purchase of cess pool emptier (covered)	2	No.	-
		Purchase of covered truck	2	No.	-
	Improvement of waste disposal system	Acquisition and development of a new landfill site	13	Ha	Acquisition for new landfill site in under process near Mecca on Kiritiri Road (20km from town)
		Composting of biodegradable waste	1	No.	All biodegradable waste will be converted into fertiliser
		Recycling of waste	1	No.	All non-biodegradable waste will be recycled
		Explore the possibility of PPP in SWM	1	No.	PPP can be explored in waste collection
	Public awareness	Awareness programme for	1	No.	People need to be made aware of benefit of

Goals	Strategies	Projects	Qua-ntity	Unit	Remarks
	campaign	segregation of waste at source and for solid waste management system in general			segregating waste at source

Table 6.9: Goals, strategies and projects for fire fighting

Goals	Strategies	Projects	Quantity	Unit	Remarks
Minimum loss of property and life due to fire	Provide adequate fire stations and associated logistics	Completion of the fire station at Majimbo	1	No.	-
		Development of 4 new fire sub-stations	3	No.	-
		Development of 1 new fire stations	1	No.	-
		Repair all the non-functional fire hydrants (17) and install new as per planned expansion	50	No.	All newly developed areas need to be provided with fire hydrants
		Purchase of new fire tender/vehicles	4	No.	Purchasing of small fire tender/vehicles to serve the congested areas
		Purchasing of small fire tender/vehicles to serve the congested areas	2	No.	-
		Recruit new staff for fire fighting department	-	-	Administrative decision
		Create a separate fire fighting unit for Embu town	-	-	Administrative decision
	Provide adequate fire fighting capacity within other areas of county	Increase personnel and appliances in other fire stations to reduce overreliance on the Embu town fire station	-	-	Administrative decision to reduce the burden on Embu Fire Stations
		Regular checking of fire fighting installations within built-up areas	-	-	Administrative decision

Table 6.10: **Goals, strategies and projects for street lighting**

Goals	Strategies	Projects	Quantity	Unit	Remarks
Cover whole area with street lighting to make the city safe and promote alternative sources of energy	Separate poles for street lights	Repair all the faulty street lights along the major and in the core areas.	50	No.	-
		Install street light poles 30m apart	16,557	No.	-
	Erect high mast lights in high density areas and at all the major road junctions	Erect new high mast lights at CBD, Sub-CBDs, informal markets, jua kali areas and main junctions	71	No.	At Main Junction: 44, at 8 integrated commercial centres-16, at 8 informal marketa-16 and at 2 sub-CBDs-6 (in addition to 11 existing high mast lights)

6.3 Roads and Transport

6.3.1 Road Improvements

Peak hour traffic volume in some of the major roads in Embu exceeds their capacity under existing traffic conditions. Based on this traffic volume and projected traffic analysis, the following roads need capacity augmentation.

- Nairobi-Meru Highway (B-6)
- Embu-Kiritiri Road (B-7)
- Muthatara-Karurina-Gatundury Road (E-629)
- Majimbo-Kiambo-Riandu (R-77)
- Embu-Saikago Road (D-469)
- Majimbo-Embu University Road
- Uchumi-Level-5 Hospital Road
- Dallas Ring Road

Table 6.11 presents the existing and proposed lane configurations of the identified roads.

Table 6.11: Existing and proposed road improvements

Road Name	Road Segment		Existing Lanes/Road Type	Proposed Lanes/Road Type
	From	To		
Nairobi-Meru Highway (B-6)	East of Rupingazi River bridge near Embu boundary	Embu University College	2 Lane undivided	4 Lane Divided
Embu-Kiritiri Road (B-7)	Nairobi-Meru highway (B-6) & Embu-Kiritiri Road (B-7) intersection	Majimbo Shopping Centre	2 Lane undivided	4 Lane Divided
Muthatara-Karurina-Gatundury Road (E-629)	Muthatara	Gatundury	2 Lane earthen	2 lane paved
Majimbo-Kiambo-Riandu (R-77)	Muthatara/Majimbo	Riandu	2 Lane earthen	2 lane paved
Embu-Saikago Road (D-469)	East of Muthatara	Saikago	2 Lane earthen	2 lane paved
Majimbo-Embu University Road	Majimbo	Embu University College	2 Lane earthen	2 lane paved
Uchumi-Level-5 Hospital Road	Kubukubu Road Uchumi	Level-5 Hospital	2 Lane earthen	2 lane paved
Dallas Ring Road	Sewage Treatment Plant on B-6	East of Uchumi on B-7	2 Lane earthen	2 lane paved

The existing rights of way of Nairobi-Meru Highway (B-6) and Embu-Kiritiri Road (B-7) are less than 20 metres. A 30 metre right of way is required for each of these two roads, in order to accommodate four lane carriageways, pedestrian paths on both sides, cycle tracks on both sides and landscaping.

The Muthatara-Karurina-Gatundury Road (E-629), Majimbo-Kiambo-Riandu (R-77) and Embu-Saikago Roads (D-469) are presently earthen roads with rights of way of less than 20 metres. These three roads will be paved with two to four lane carriageways and a 30 metre right of way.

The Majimbo-Embu University Road, Uchumi-Level-5 Hospital Road and Dallas Ring Road have rights of way of less than 20 metres. These roads will be upgraded from earthen to paved two lane roads with a 25m right of way to accommodate a 2-lane undivided carriageway.

Figure 6.3 shows typical cross section of a 30 metre wide four lane road and Figure 6.4 presents a typical cross section of a 25 metre wide two-lane road.

Figure 6.3: Typical Cross Section of a 30m Wide Road

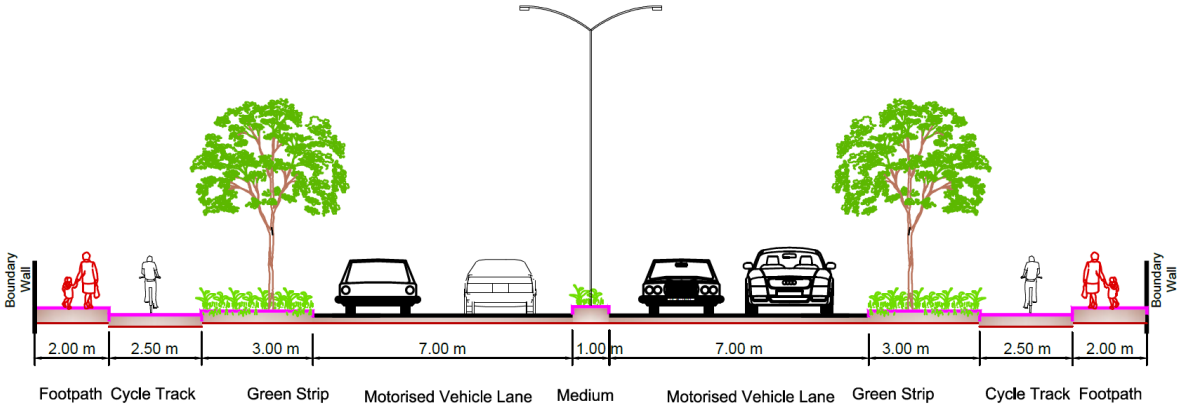
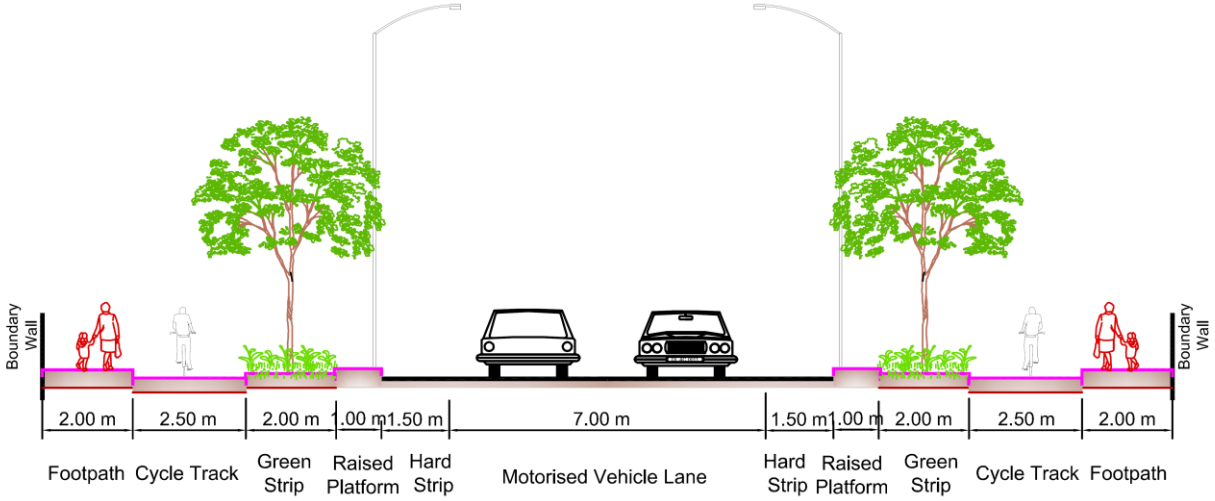


Figure 6.4: Typical Road Cross Section of a 25m Wide Road



Road Classification System

Other than the major roads in Embu, which are paved, majority of the roads are earthen roads. As per the road classification system in Kenya, Class A, B, C, D, E, F and G falls under rural road category and Class H,J, K, L, M, N and P are urban roads categories. Earthen roads and gravel roads in Embu county are proposed to be classified as urban and rural roads as per the road classification system in Kenya. Following table shows rural and urban road classifications in Kenya.

Road Type	Road Class	Description
RURAL ROADS CLASSIFICATIONS		
Arterial or Trunk Roads	Class S, A and B	Superhighways (S roads) are fully access controlled motorways or toll roads, International Trunk Roads (A roads), National Trunk Roads (B roads)
Collector Roads	Class C and D	Primary Inter-district Roads (C roads), Secondary Intra-district Roads (D roads)
Local Roads	Class E, F and G	Local Minor Roads (E,F and G roads)
URBAN ROADS CLASSIFICATIONS		
Arterial Roads	Class H and J	Provides highest Level of Service at the greatest speed for the longest uninterrupted distance within a Municipality with access control
Collector Roads	Class K and L	Provides less highly developed Level of Service at the lower speed for shorter distances by collecting traffic from local roads and connecting them with arterial roads
Local Roads	Class M, N and P	Consists of all roads not defined as arterials or collectors; primarily provides access to residential, commercial and industrial areas with little or no through movement

Minimum Road widths of existing earthen roads are proposed to be kept as 9 metre for a two way vehicular road. This minimum width is required for carriageway and pedestrian pathways both sides of the road.

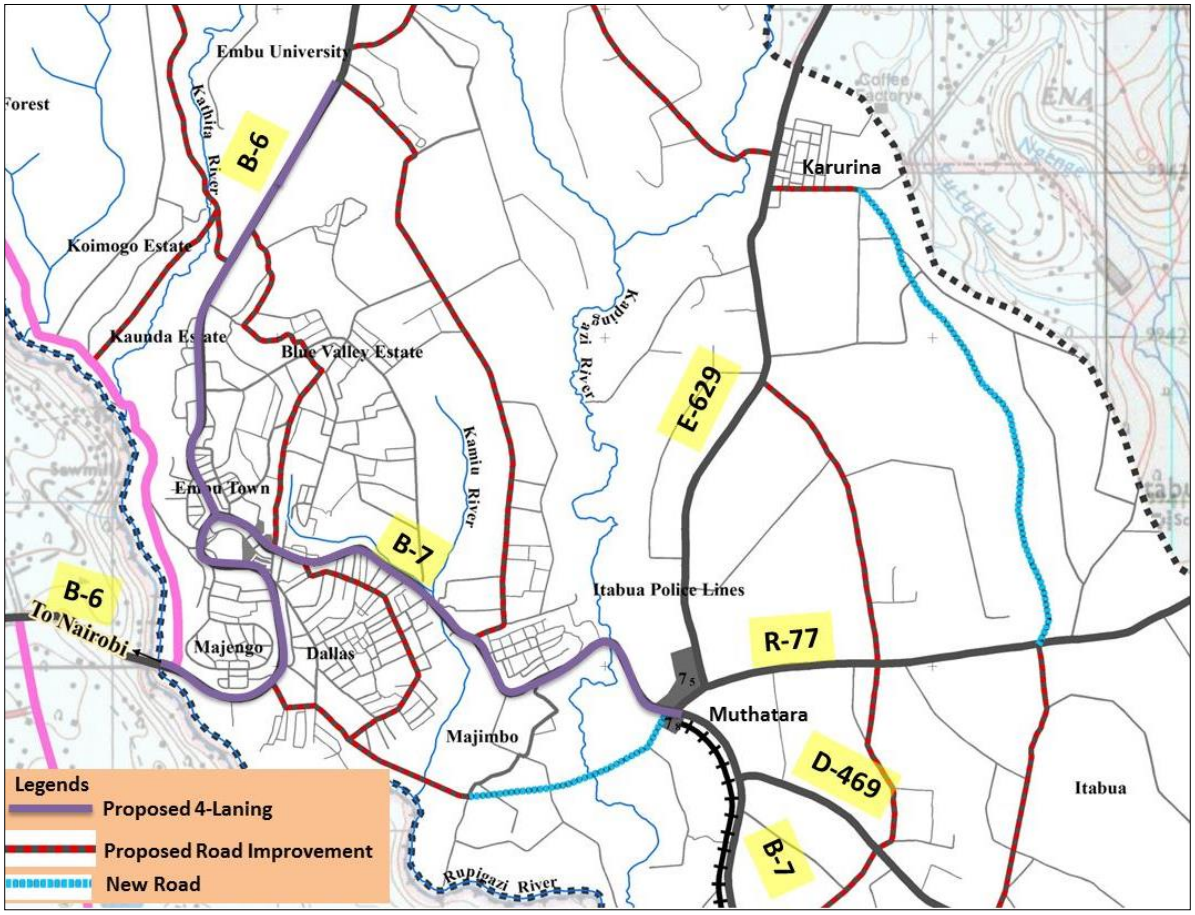
6.3.2 New Roads

An existing road starts near the sewage treatment plant on the Nairobi-Meru Highway (B-6) and going via Dalla turns north and joins Embu-Kiritiri Road (B-7) east of Uchumi near the CBD. This road is to be extended from Dallas and Majimbo up to the Embu-Kiritiri Road (B-7) at Muthatara and finally will join an improved Muthatara-Karurina-Gatundury Road (E-629). This new road will provide a direct connectiion for the Meru-bound traffic from south of Dallas up to Karingari on the Nairobi-Meru Highway (B-6) located outside the Embu boundary.

In order to develop a road network of radial and circumferential ring roads, another new road link is required from west of Kambo on the R-77 up to Karurina and finally joining the Muthatara-Karurina-Gatundury Road (E-629).

Figure 6.5 presents the road widening, improvements and new road proposals near the CBD.

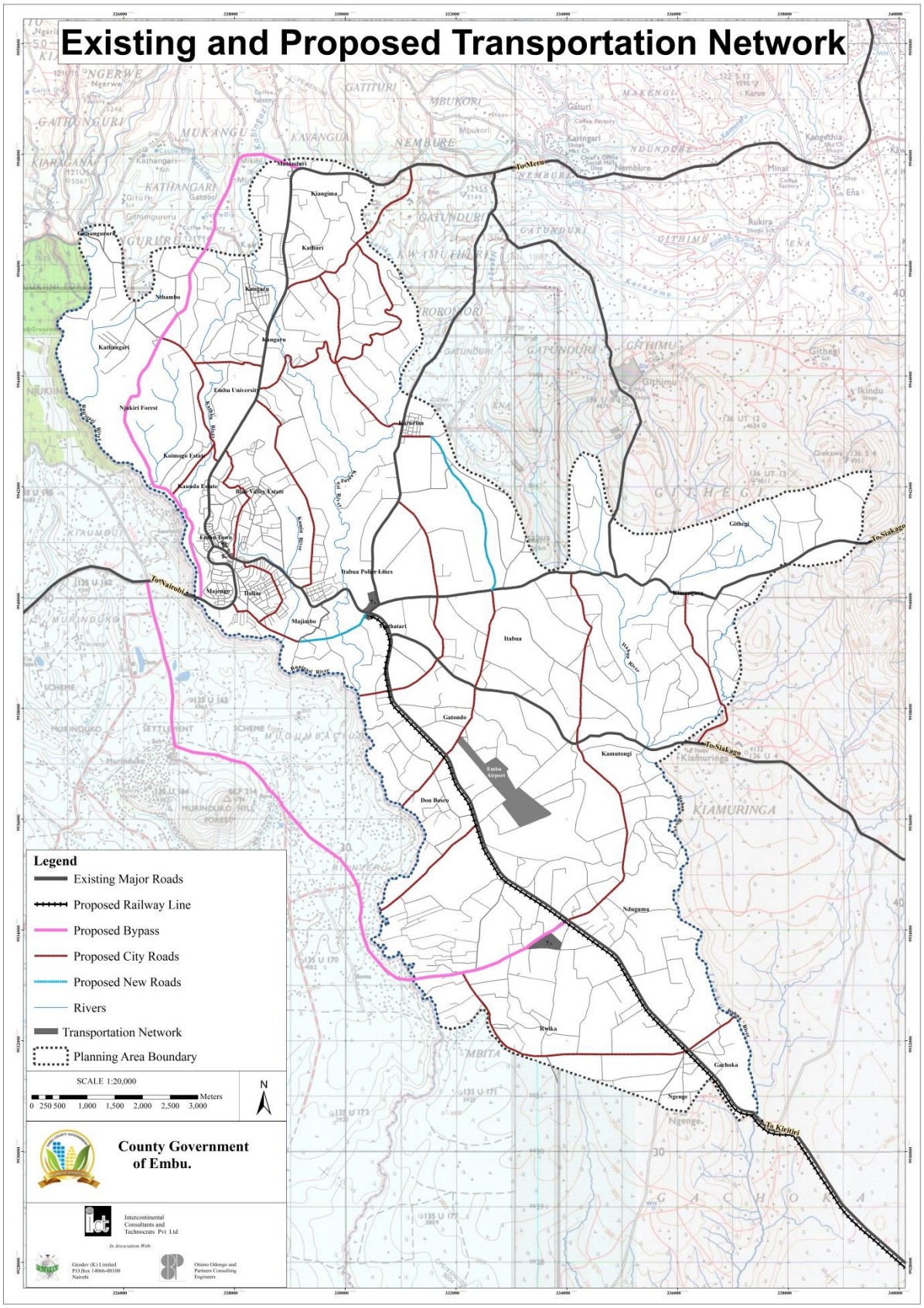
Figure 6.5: Road widening, improvements and new road proposals around the CBD



The Embu-Kiritiri Road (B-7), Muthatara-Karurina-Gatundury Road (E-629), Majimbo-Kiambo-Riandu (R-77) intersect at Muthatara junction. The Embu-Saikago Road (D-469) originates from Embu-Kiritiri Road (B-7) immediately southeast of the Muthatara junction. All these roads will be developed as radial roads and will act as primary distributors in the east and southern parts of Embu. Various circumferential or semi-ring roads will also be developed as paved two-lane carriageway, which will connect B-7, D-469, R-77 and E-629 from south to east. A combination of radial and circumferential roads will form road network and road hierarchy in Embu.

Figure 6.6 presents various planned road improvements and new roads in Embu town.

Figure 6.6: Planned road Improvements and new roads



6.3.3 Bypasses

In order to segregate through traffic from Embu bound traffic, two bypasses will be developed. The Northern Bypass and Southern Bypass will also provide easy access to the existing and future industrial areas of Embu.

The Northern Bypass will start from the Nairobi-Meru Highway (B-6) immediately east of the Rupingazi River Bridge. It will pass through Njukiri forest and Nthambo area and join the Nairobi-Meru Highway (B-6) at Mutunduri located north of Embu. The Northern Bypass will provide easy passage for the long distance Meru-bound heavy vehicles and will facilitate segregation of city and long distance traffic. The bypass will be developed on the existing road tracks and will have a right of way 40 metres.

The Southern Bypass will start from Murinduko area on the Nairobi-Meru Highway (B-6) and it will run southward through Murinduko Hill forest and Rianjeru area and finally join the Embu-Kiritiri Road (B-7) near Don Bosco Kagonga. The Southern Bypass will provide direct access to the B-7 for Kiritiri bound traffic and facilitate travel time saving. It will be developed on existing roadway tracks. A 40 metre right of way will be reserved to develop carriageways, pedestrian and NMT facilities. The Southern Bypass will provide accessibility to the proposed industrial area near Don Bosco Kagonga.

Figure 6.7 shows the cross-section of the bypasses (with a 40m right of way) and Figure 6.8 presents the alignments of the Northern and Southern Bypasses.

Figure 6.7: Typical cross section of 40 metre wide bypass roads

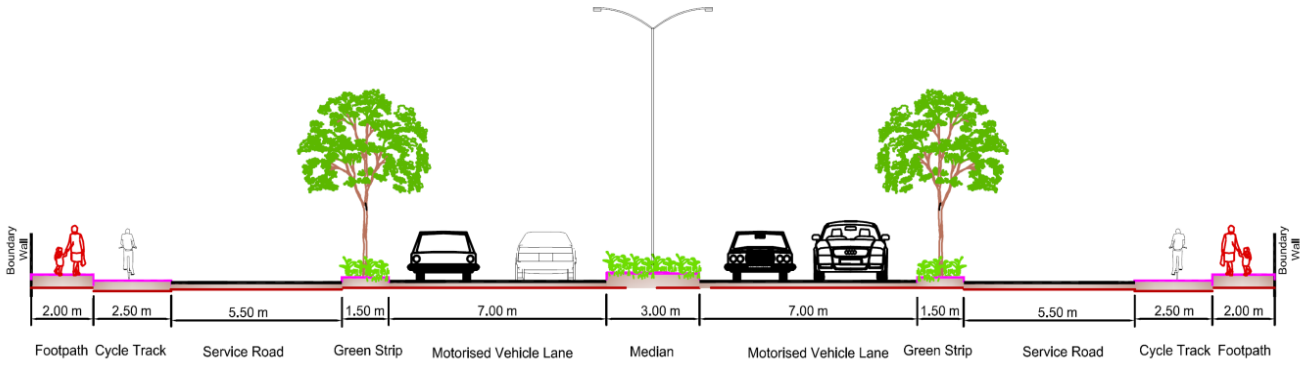
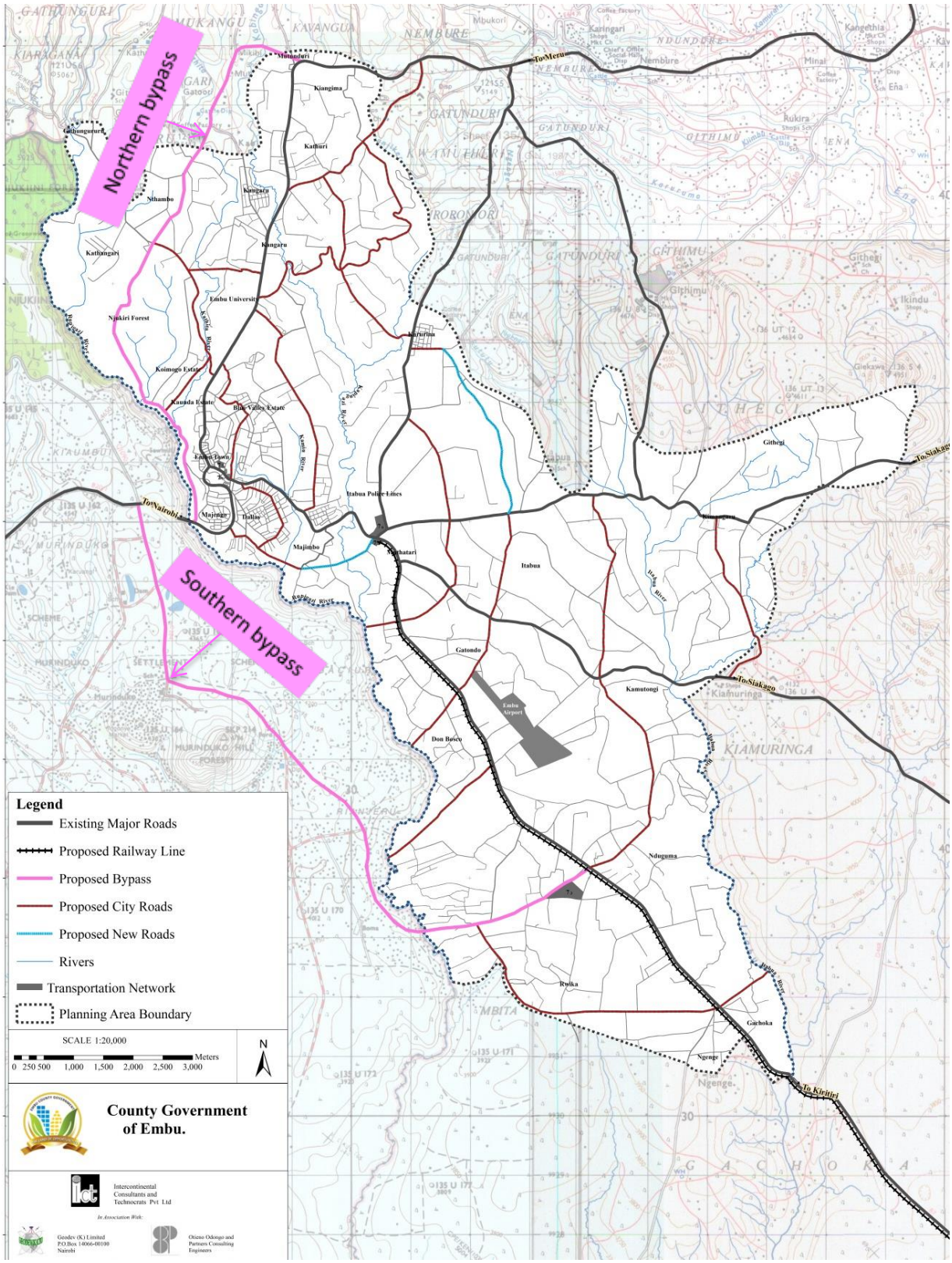


Figure 6.8: Proposed bypasses



Service roads will also be developed along both sides of the Northern and Southern Bypass Roads to provide accessibility of the properties and facilitate NMT and pedestrian movements.

6.3.4 Intersection Improvements

Intersection operation analysis results show major intersections in Embu are required to be improved under existing and projected turning traffic conditions. Following intersections are identified to be improved.

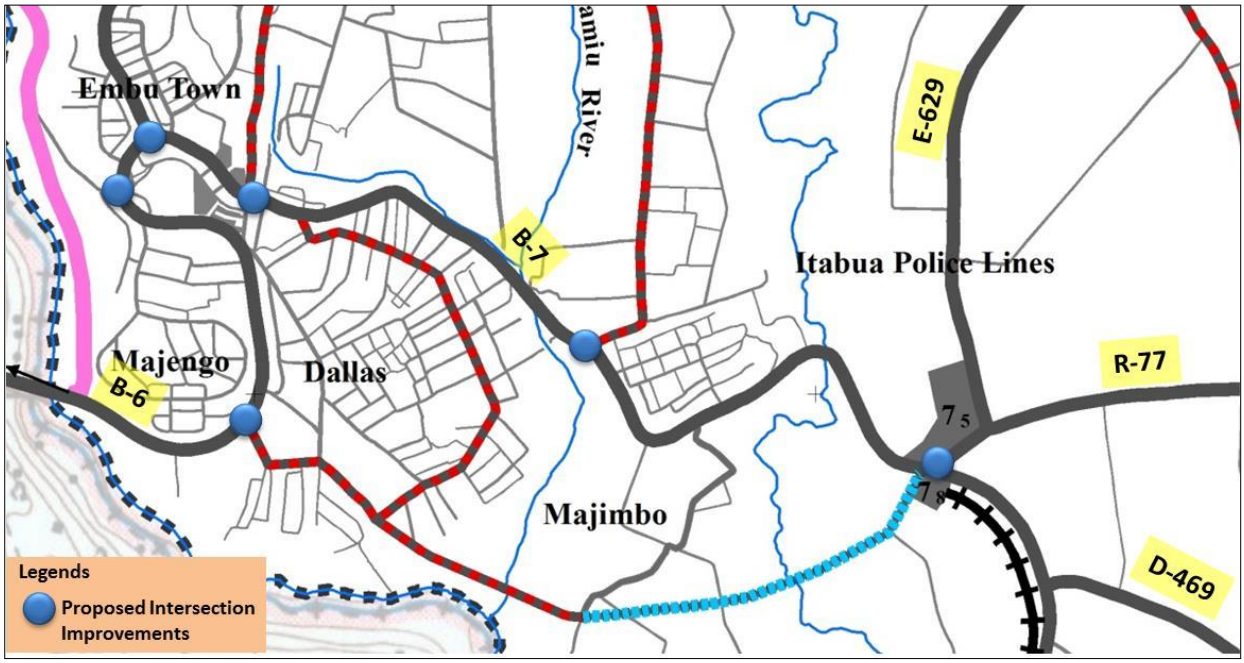
- Nairobi-Meru Highway (B-6) & Panesic Hotel Road
- Nairobi-Meru Highway (B-6) & Embu-Kiritiri Road (B-7)
- Junction on Embu-Kiritiri Road (B-7)/Kubukubu Road near Uchumi
- Nairobi-Meru Highway (B-6) & Dallas Ring Road near sewage treatment plant
- Embu-Kiritiri Road (B-7) & Majimbo-Embu University Road
- Muthatara Junction on Embu-Kiritiri Road (B-7)

Table 6.12 presents proposed intersection improvements necessary to accommodate projected turning traffic during the horizon year 2035. They are also shown on the map in Figure 6.9.

Table 6.12: Major intersection improvements

Intersections/Junctions	Existing Condition	Proposed Improvements
Nairobi-Meru Highway (B-6) and Panesic Hotel Road	Un-signalized T-Junction, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) to be 4 lanes, exclusive left turn lanes at B-6 and Panesic Hotel Road
Nairobi-Meru Highway (B-6) and Embu-Kiritiri Road (B-7)	Un-signalized T-Junction, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) to be 4 lanes, Embu-Kiritiri Road (B-7) to be 4 lanes, exclusive left turn lanes on both roads
Junction on Embu-Kiritiri Road (B-7)/Kubukubu Road near Uchumi	Un-signalized Intersection, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) 4 lanes x 2 lanes, exclusive left turn lanes
Nairobi-Meru Highway (B-6) & Dallas Ring Road near sewage treatment plant	Un-signalized Intersection, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) 4 lanes x 2 lanes, exclusive left turn lanes
Embu-Kiritiri Road (B-7) & Majimbo-Embu University Road	Un-signalized Intersection, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) 4 lanes x 2 lanes, exclusive left turn lanes
Muthatara Junction on Embu-Kiritiri Road (B-7)	Un-signalized Intersection, 2 lanes X 2 lanes	Embu-Kiritiri Road (B-7) to be 4 lanes, to be 4 lanes, Majimbo-Kiambo-Riandu Road (R-77) to be 4 lanes and to have grade separared flyover, exclusive left turn lanes at all directions

Figure 6.9: Proposed Intersection Improvements

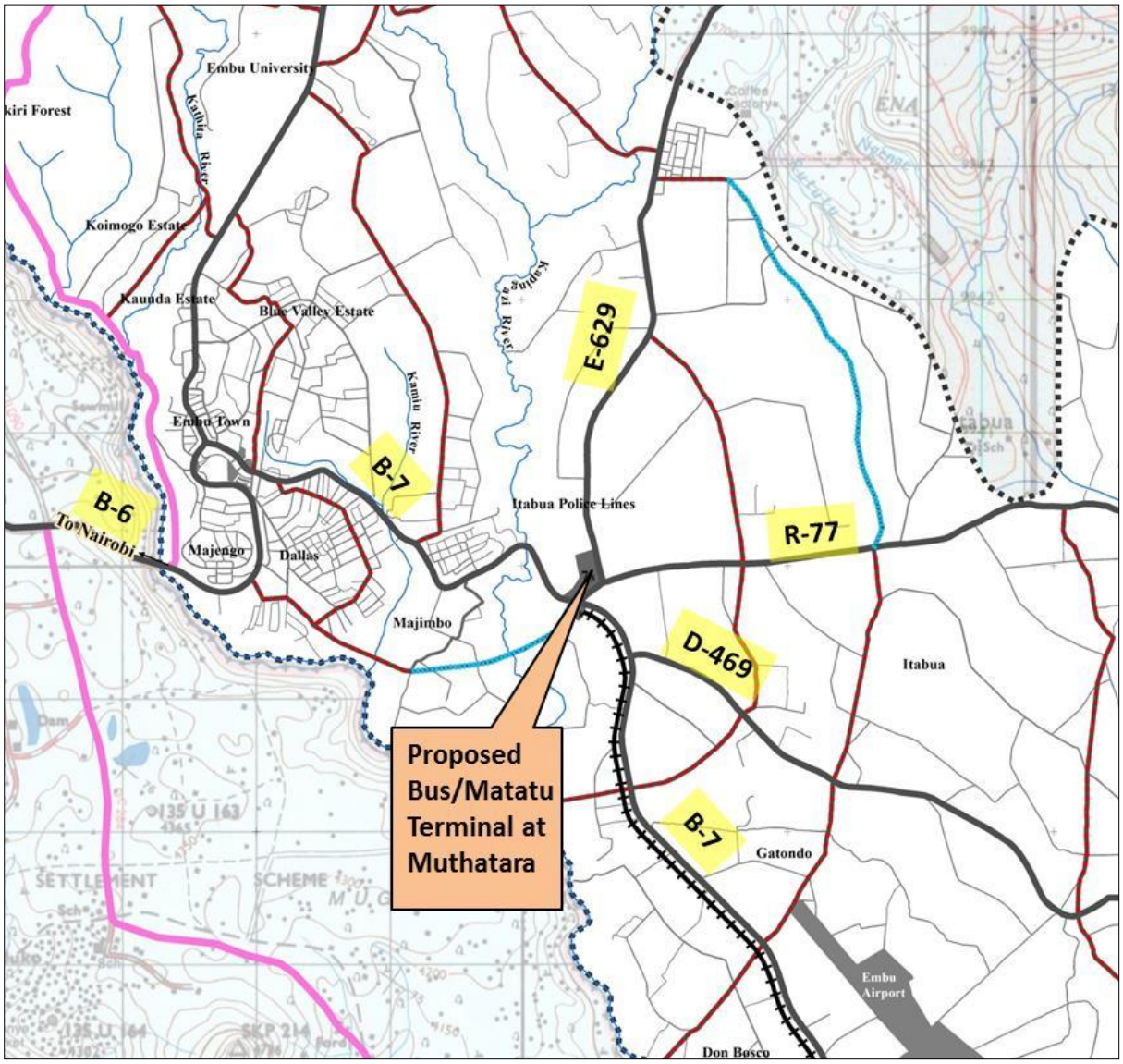


In order to improve traffic flow on Nairobi-Meru Highway (B-6) and Embu-Kiritiri Road (B-7), all minor intersections on these two roads will be restricted to left-in and left-out intersection with closed median at the major roads.

6.3.5 Bus/matatu terminal and shelters

Minibuses and matatus share the same terminal in Embu which is insufficient and not equipped with basic facilities. Bus terminals and bus depots will be developed in strategic locations in Embu. Bus terminals require larger spaces for parking of buses and matatus and provision of basic facilities. As shown in Figure 6.10, a bus and matatu terminal will be developed at Muthatara junction near Embu-Kiritiri Road (B-7) and Majimbo-Kiambo-Riandu Road (R-77) intersection. This will also include a depot facility and will be accommodated within 5.25 hectares.

Figure 6.10: Proposed bus/matatu terminal and depot location



The bus/matatu terminal will include a waiting area for the passengers and small corner shops and small refreshment shops, sufficient toilet facilities and accessible ticket counters. Sufficient lighting will be provided in the bus terminals during evening hours. A police post will be included in the terminal area to provide security to the passengers. Bus routes, schedules and bus bay numbers will be displayed on digital boards. The terminal will also have public address system for announcements. This terminal will also include a bus/matatu depot which will include repair shops, fuelling and maintenance facilities and also serve as parking spaces for vehicles not in use. The terminal and depot is proposed to be located at Muthatara area in Embu. Figure 6.11 illustrates a typical bus terminal, matatu terminal and a bus depot.

Figure 6.11: View of typical bus terminal, matatu terminal and bus depot

Bus/matatu shelters will be developed at 500m intervals along both sides of the routes. They can be accommodated within the right of way of a road. It is recommended that they are lit at night for security reasons. Figure 6.12 illustrates a typical bus shelter.

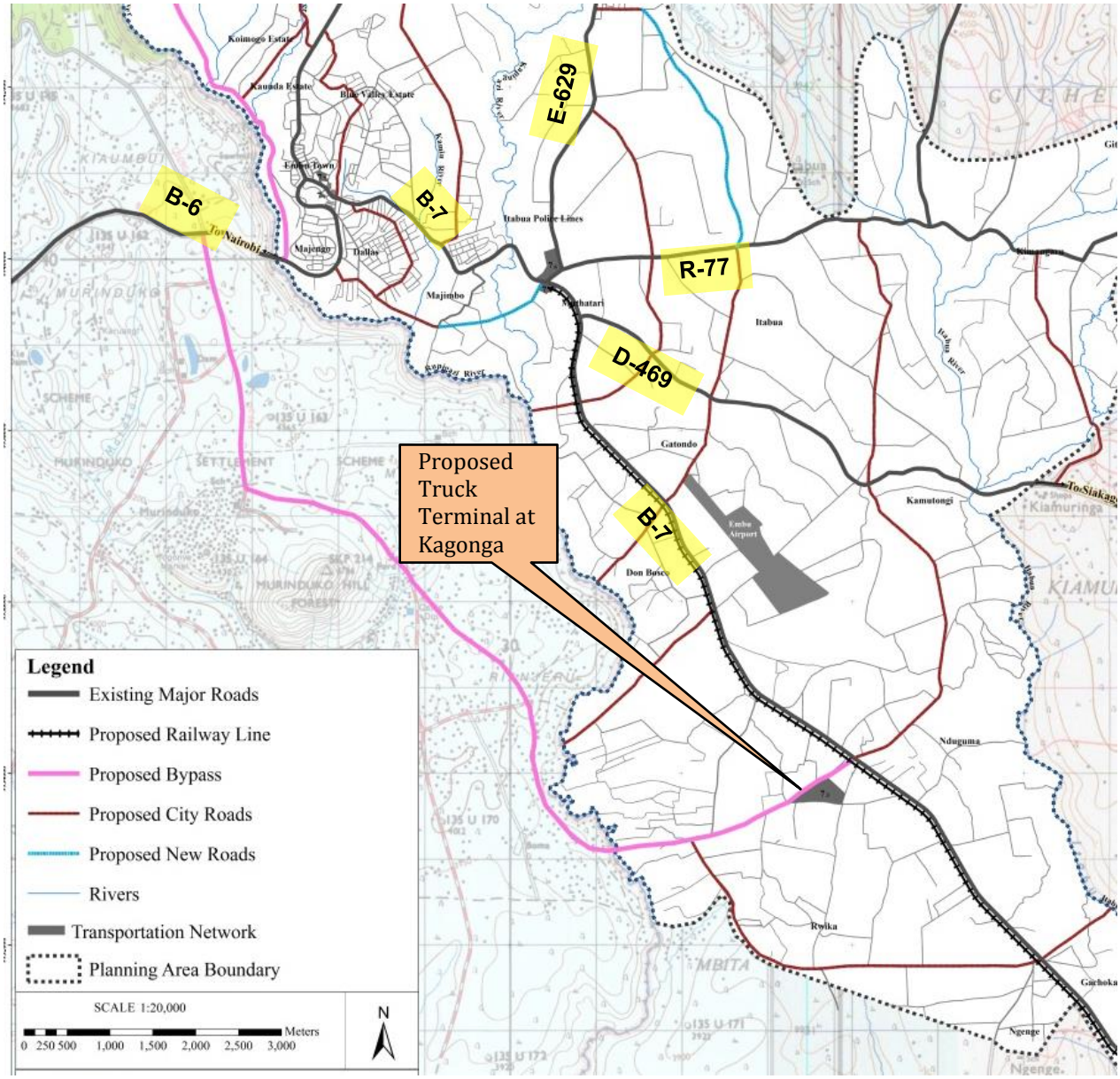
Figure 6.12: View of Typical Bus Shelter

6.3.6 Truck terminal

Goods vehicles carry heavy loads and travel long distances to reach final destinations. Two major trunk road corridors pass through Embu: the Nairobi-Meru Highway (B-6) and the Embu-Kiritiri Road (B-7). These long distance trucks stop to refuel, to make minor repairs and for the drivers to rest. A truck terminal to meet these needs is proposed in Embu.

The site for this truck terminal is near Don Bosco Kagonga is shown in Figure 6.13. It is well connected to the Embu-Kiritiri Road (B-7) and the Southern Bypass. It will facilitate movement of raw materials and delivery of finished products from the Don Bosco Kagonga industrial area, and will ensure that trucks do not interfere with local traffic.

Figure 6.13: Location of the Truck Terminal



The truck terminal will include a fuelling station, repair area, waiting area, toilets, accommodation for the drivers, refreshment shops. Office space, warehousing and truck parking facilities will be developed as an adjacent logistic centre of the type illustrated in Figure 6.14.

Figure 6.14: View of typical logistic centre

6.3.7 Public Transport System

Matatus and mini buses currently meet the demand for public transport in Embu. However, matatu and mini buses are operated by SACCOs. Government control and performance benchmarks for the bus/matatu operation is absent in the present scenario and as a result facilities provided by matatus are below standard and unsafe for passengers. Exhaust emissions by matatus cause health hazards due to air pollution.

A city bus system can be introduced as a new public transport system in Embu. City bus system will be designed in a way to provide a high quality, reliable, comfortable, accessible and affordable public transport system in Embu. A city bus service system will include following components,

- City bus terminals and depots
- City bus operating company – can be a joint venture among public and private sector
- City bus fleet – with medium buses with approved international standards
- City bus shelters – with digital display of bus schedules
- Automatic ticket collection system
- Distance based fixed fare system
- Integrated with traffic control system of the city

Based on the future demand at the major road corridors in Embu, a city bus service system can introduced when deemed feasible. Figure 6.15 presents view of such a city bus system in Indore city, India.

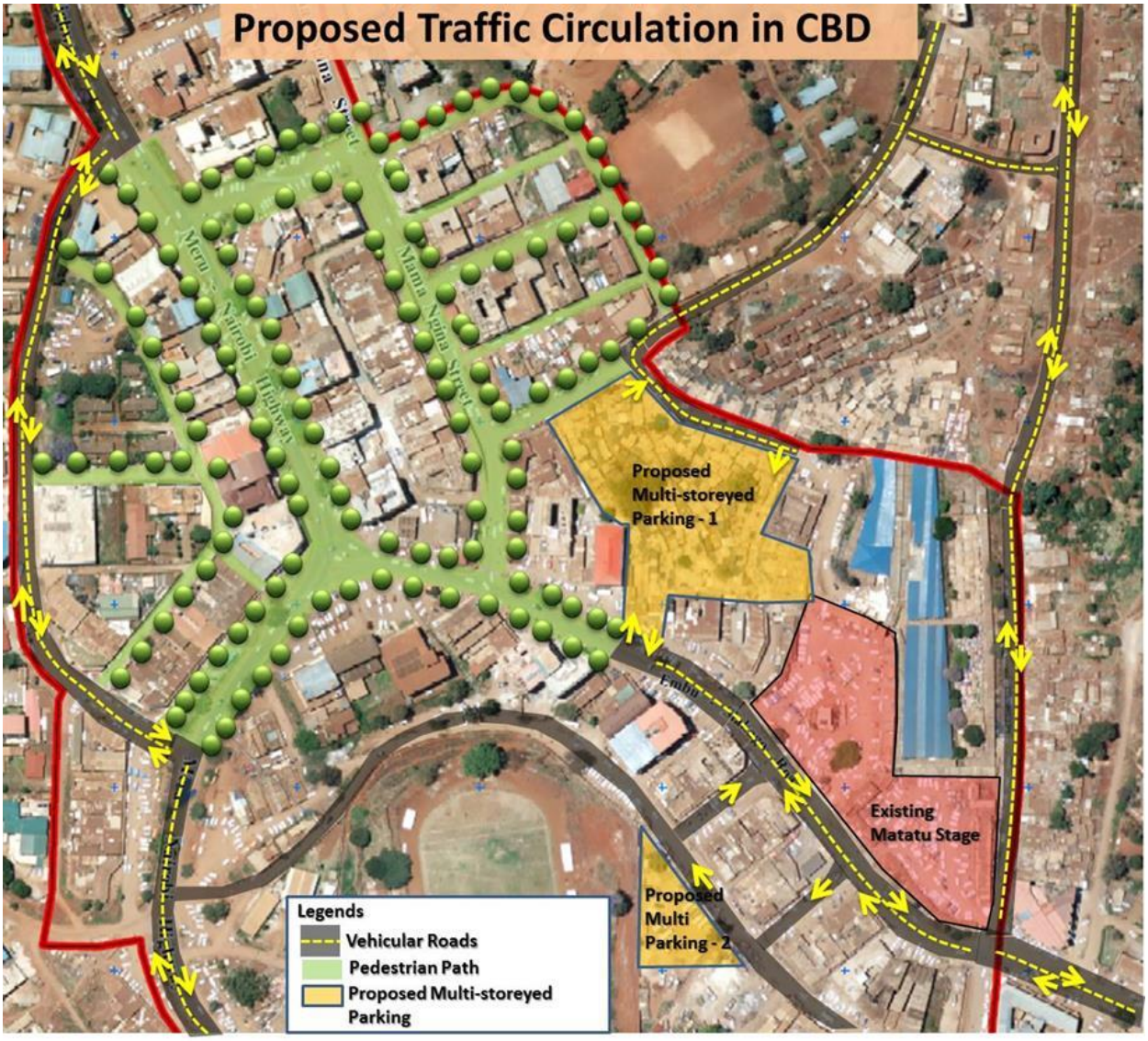
Figure 6.15: View of a city bus system in Indore, India

6.3.8 Traffic Management

Peak hour traffic volumes on Nairobi-Meru Highway (B-6) and Embu-Kiritiri Road (B-7)/Kubukubu Road around the existing CBD area are reaching their full capacity. In order to maintain a smooth traffic flow, a traffic management scheme is necessary in the CBD.

In order to pedestrianize Embu CBD area, vehicular access through Nairobi-Meru Highway (B-6) to CBD will be diverted before B-6 & B-7 intersection through a parallel road located west of the CBD. This parallel road will join Nairobi-Meru Road (B-6) north of Emco House. Vehicular access will be allowed on Embu-Kiritiri Road (B-7) up to immediate west of existing Matatu terminal. The proposed multi-storeyed car parking will be located west of Matatu terminal on Embu-Kiritiri Road (B-7) and accesses will be provided from B-7 and from north. The intersection on Embu-Kiritiri Road (B-7)/Kubukubu Road near Uchumi is proposed to be developed as signalized intersection. Northbound traffic on Embu-Kiritiri Road (B-7) will use the improved road located west side of existing Uchumi Supermarket. By this arrangement the Embu CBD will be developed as traffic free zone during working hours. However, traffic movement inside CBD will be allowed before 7:00 AM and after 9:00PM. Traffic flow is expected to be improved around the CBD through this traffic management scheme presented in **Figure 6.16**.

Figure 6.16: Traffic Management Schemes for Roads in CBD Area



Existing matatu terminals have their entry and exit points on Kubukubu Road. All the existing entry and exit points of matatu terminals are proposed to be converted to Left-in entry and Left-out exit. In order to implement left-in and left-out movement at entry/exit point, raised medians are proposed to be introduced on the Nairobi-Meru Highway (B-6) and the Embu-Kiritiri Road (B-7) to reduce conflicting traffic flow. Traffic congestion near matatu terminals are expected to get reduced through left-in and left-out entry and exit points.

Traffic management scheme during graduation day in Embu University and special event in Stadium are proposed in the Figure 6.17 and Figure 6.18 respectively.

Figure 6.17: Traffic Management Schemes for Embu University

Embu University is located on Nairobi-Meru Road (B-6) north of CBD area. Large volumes of private vehicles enter and exit the university gate during graduation day. In order to channelize the traffic one-directional traffic flow is proposed for Embu University. During graduation day entrance will be allowed from Nairobi-Meru Road (B-6) and the exit is proposed to be redirected towards the showground road located west side of the university, which forms a loop and joins B-6 near Level 5 Hospital.

Figure 6.18: Traffic Management Schemes for Stadium

Large number of spectators and vehicular traffic is expected on a special event day to enter and exit from the stadium. Entrance to the stadium is proposed to be allowed through east side road which is connected to Kubukubu Road and Nairobi-Meru Road (B-6). Traffic will be allowed to take a Left-out turn at the exit on Nairobi-Meru Road (B-6) located west side of the stadium. The road connecting Nairobi-Meru Road (B-6) and Kubukubu Road will be made one-way during end of an event for the northbound traffic.

6.3.9 Parking

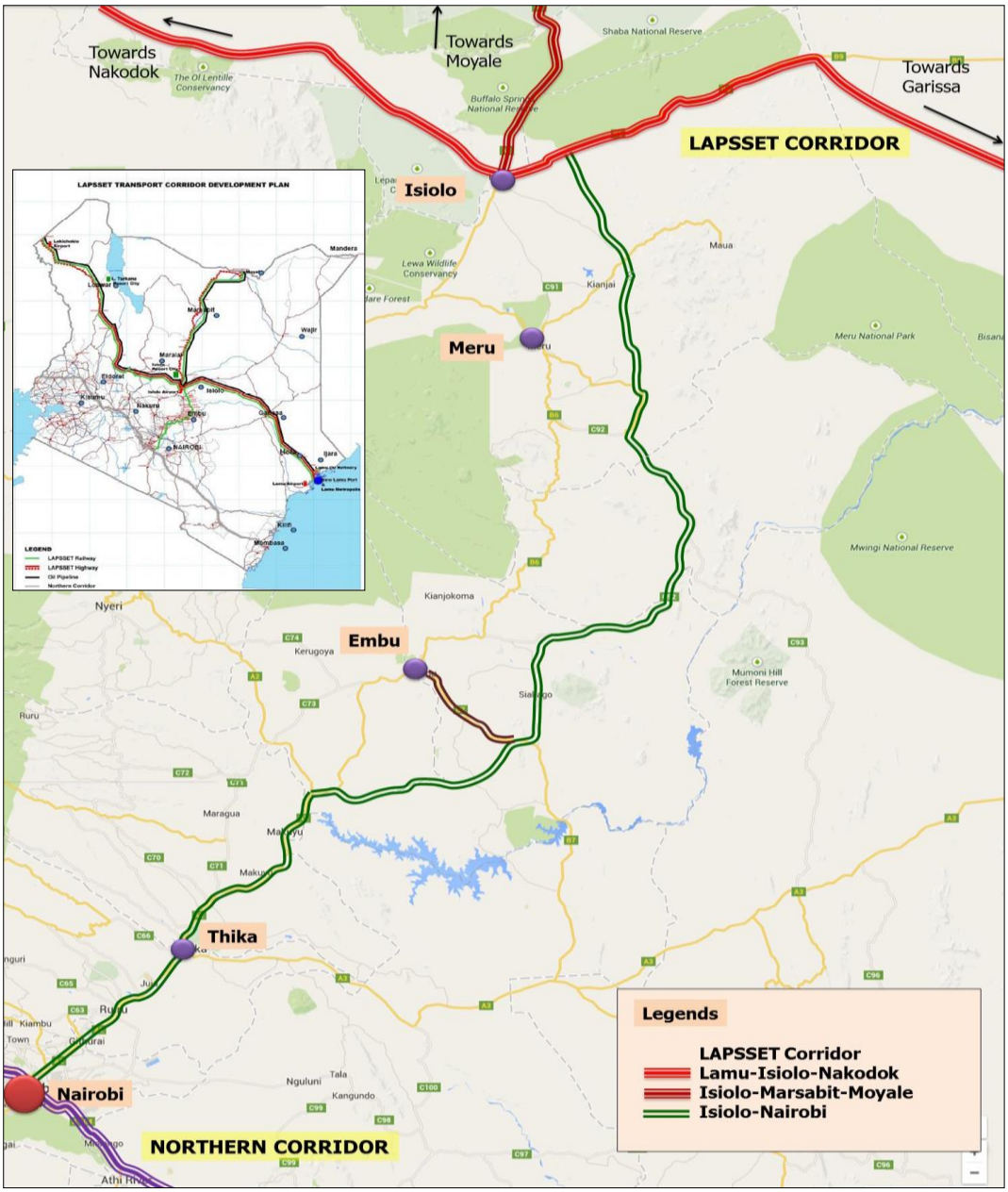
Based on projected parking demand, two multi-storey car parks will be developed, one at west of existing matatu terminal located on Embu-Kiritiri Road (B-7) and the other one will be located northeast of the existing stadium. Locations of the multi-storeyed parking building are shown in Figure 6.16. These multi-storeyed parking buildings can accommodate commercial establishments and two wheeler/boda boda parking at ground floor level. Entry and exit to the Multistoreyed Car Parking Building-1 will be directly from Kubukubu Road and the access to the Multistoreyed Car Parking Building-2 at northeast of the stadium will be through one-way loop road from Kubukubu Road. These two multi-storey car parks will accommodate 3,000 car parking spaces.

Car parking for the future development of sub CBD areas in Embu will comply with the approved parking guidelines and standards.

6.3.10 Railway Link

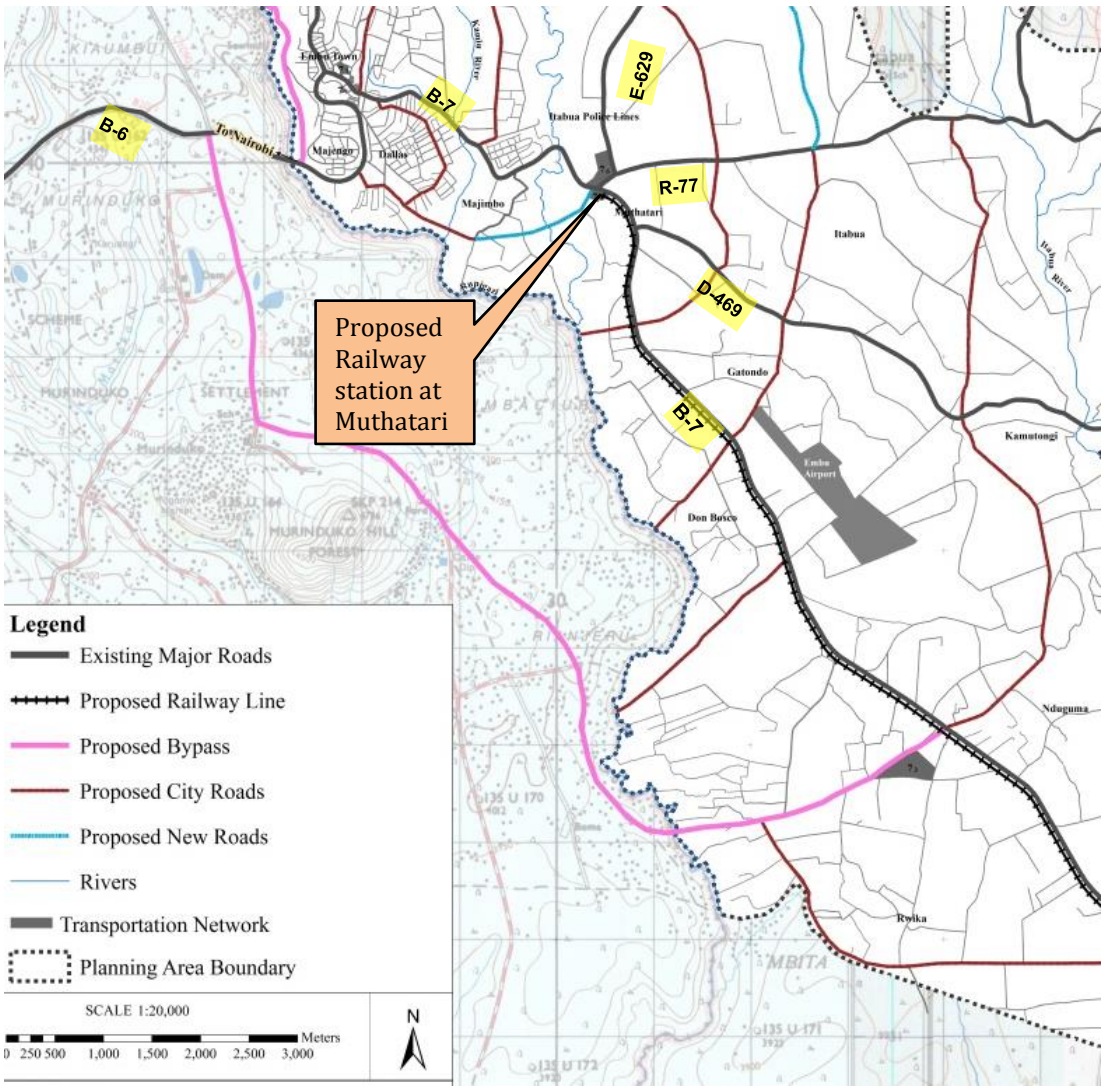
Embu is located near to the midpoint of the Isiolo-Nairobi railway section of LAPSSET corridor as shown in Figure 6.19.

Figure 6.19: Isiolo-Nairobi LAPSSET corridor in relation to Embu



In order to integrate with the future rail connectivity with Nairobi, Meru and Isiolo, a right of way reserve for a railway line along Embu-Kiritiri Road (B-7) and land for a railway station area at Muthatari can be planned and allocated for future development. It can be developed as a combination of freight and commuter system to facilitate both transport of goods and passenger movement to and from Embu. Figure 6.20 shows the proposed alignment of the railway line and proposed location for Embu railway station.

Figure 6.20: Location of Embu railway station and proposed railway line



A railway passenger demand and freight demand assessment study should be conducted by the concerned authority. Embu railway station can be developed at Muthatari area with modern facilities when deemed necessary.

6.4 Environment Management Plan

Environmental information is critical as inputs into the planning process in order to strive towards a sustainable city. The environment of the city can essentially be seen in terms of two components of urban management- the environment per se or the habitat, and services management. The former pertains to the natural features and resources including the elements of air and noise, water (water bodies i.e. rivers, drains and ponds and ground water) and land with reference to open spaces, green areas and other surface and sub-surface conditions. The latter is related to the built environment and includes the environmental infrastructure, i.e. water supply, sewerage, solid waste disposal, and transportation network. This section outlines proposals and also makes an assessment of changes that may occur during the implementation of the ISUD Plan and to devise ways of avoiding or mitigating such impacts at the planning and implementing stage.

6.4.1 Major Environmental Issues

The major environmental issues in Embu town include the following:

- Green Spaces: There is lack of adequate green spaces such as parks and playgrounds, which area required considering the current and projected population of town.
- Wetlands: Upper Dallas Dam is a privately owned land and therefore for it to be conserved it must be compensated for. The wetland poses a health threat to the communities due to diseases like Malaria and potential drowning as it is unfenced.
- Riverine areas: Protection of rivers was one of the major concerns because of pollution of the rivers in built up areas and farming areas, septic tanks waste is discharged in the rivers and also some people dump their solid wastes in the rivers.
- Soil Erosion: Soil erosion occurs on steep and hilly terrain due to uncontrolled settlements and also due lack of sufficient vegetation cover on some of the steep terrains like in Karue Hills where there is scanty vegetation.
- Solid Waste: There is no effective solid waste disposal system. The current waste dumpsite which is less than 1km from the airstrip has been condemned by NEMA and airport authority, since it should be at least 13km away. A new site along Kiritiri road, which is around 20km from town has been acquired for solid waste management. Inadequate provision of medical incinerators.
- Drainage: Poor drainage has resulted to infrastructure and property destruction for example in Grogon and Shauri Yoko and some other areas, storm water swept through peoples' property and structure or even cause loss of lives. Uncollected solid waste chocks the drainage resulting to flooding. There is a lot of waterlogging around the stadium. During flooding the rivers are polluted with the waste water.
- Sewerage System: The current sewer treatment plant in town at the entrance of the town from Nairobi, have frequent blockage with raw sewer draining into river Rupingazi. There is need to consider a sewer system since currently very few areas (covering Blue Valley, Kui Mugo, Police, Dallus, and Majengo) are connected to sewers with the majority of the people using soak pits which drains into the streams/rivers systems.
- General: No water monitoring mechanism to control pollution, there has been piecemeal planning mainly through change of user in the urban area which needs to be streamlined by respecting designated urban zones. One of the big challenges to environment management and regulation is the fact that, physical planning approval takes place before NEMA approval meaning that environmental issues are not considered before physical planning approval. While NEMA and physical planning have locally agreed to allow NEMA assessment prior to approval but this process needs to be streamlined through legislation at either national government level of country level. The former is preferred since ecosystem processes do not respect political boundaries. This would allow promotion of sustainable development, improved environmental management and promote habitable living environment. There is encroachment on rivers and springs in areas like Ngorogoni, Shauri springs behind Uchumi being encroached.

The components of built environment like solid waste management, sanitation, water supply, storm water drainage, etc. have been planned adequately for the current and projected population. These proposals are given this chapter under physical infrastructure sections.

6.4.2 GOAL

To protect, conserve, manage and regulate the environment and natural resources for socio-economic development.

6.4.3 PROPOSED ENVIRONMENT MANAGEMENT STRATEGY

ISUDP proposes issue specific strategy to help alleviate the current environmental challenges while at the same time mitigating potential impacts in the future. A three fold approach is proposed to be adopted:

1. Management of natural resources and the related environment infrastructure and services in a manner that would lead to optimisation of use of natural resources, and reduction/abatement of pollution.
2. Conservation and development of the natural features with a view to enhancing their environmental value.
3. Development and preservation of open spaces, greens and landscape/ recreational areas.

The following are some of the major strategies and projects that may be undertaken as a priority in Embu town:

6.4.4 Protect Environmentally Sensitive Areas

The northern part of the Embu planning area is covered by forest, Njukiri forest, which serves as water catchment and sinks for carbon generated from the town among other greenhouse gasses. There are several wetland ecosystems, most of which have been converted into farming area but have potential for flooding and should be conserved as water ways. On the Eastern part of the planning area the area of characterized by deep valleys, with high soil erosion potential and like mass movement due to steep valleys thus landscape management becomes important.

On the south eastern side, mining is common on steep areas, where soils are also loose and easily erodible. This mining also take place close to the river contributing to high sedimentation. While the south western side area is characterized by farming along steep slopes with cultivation extending right to the banks of Rupingazi River. A detailed analysis of environment of Embu Town in terms of climatic condition, geology, soils, eco-system and biodiversity, air pollution, water resources, sanitation, etc. was included in the Interim Report. Therefore here only mapping of the environmentally sensitive areas is presented along with proposals. This section covers mapping of environmentally sensitive areas, a land suitability analysis, green areas, riparian reserves and mapping of all possible land use conflicts and matters relating to heritage conservation.

Rivers and Wetlands: There are three rivers i.e. Rupingazi River, Kapinganzi River, Kathita River, Kamiu River and Itabua River, passing through the town planning area. Apart from these rivers, there are also several dams within the planning area (Figure 6.21 and Figure 6.22).

Land Suitability Analysis

The ISUDP has considered the degree of slope for identification of land suitable for development. Three types of areas have been identified in terms of land suitability, namely land suitable for development without any intervention, land suitable for development with intervention (adequate precaution measures mentioned in foregoing paragraph) and land not suitable for development. Land considered suitable for development has a slope of less than10 degrees. The land coming under the slope of 10.1^0 to 15^0 has been considered as steep slope area and development is also proposed on this slope with extra measures to manage the slope to avoid any soil erosion and concerns about safety. All the areas beyond the slope of 15^0 are considered as highly steep slope and not suitable for any kind of development. The slope analysis suggests that northern and north-western sides of the planning area are having relatively steep slope and area in the south along Kiritiri road have relatively flat topography. Therefore, southern side planning area is more suitable for future development. (Figure 6.22).

Figure 6.21: Environmentally Sensitive Areas of Embu Town Planning Area

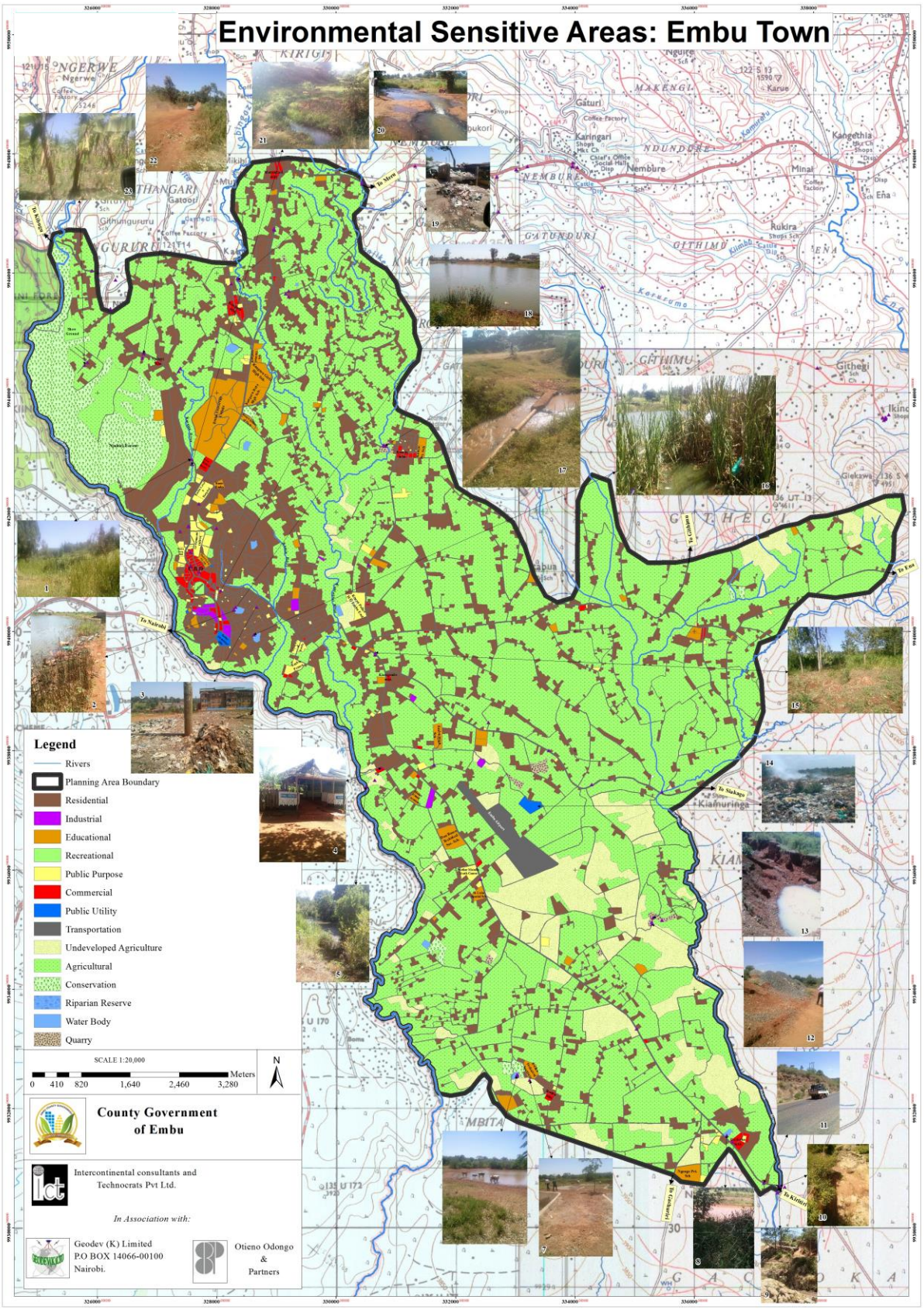
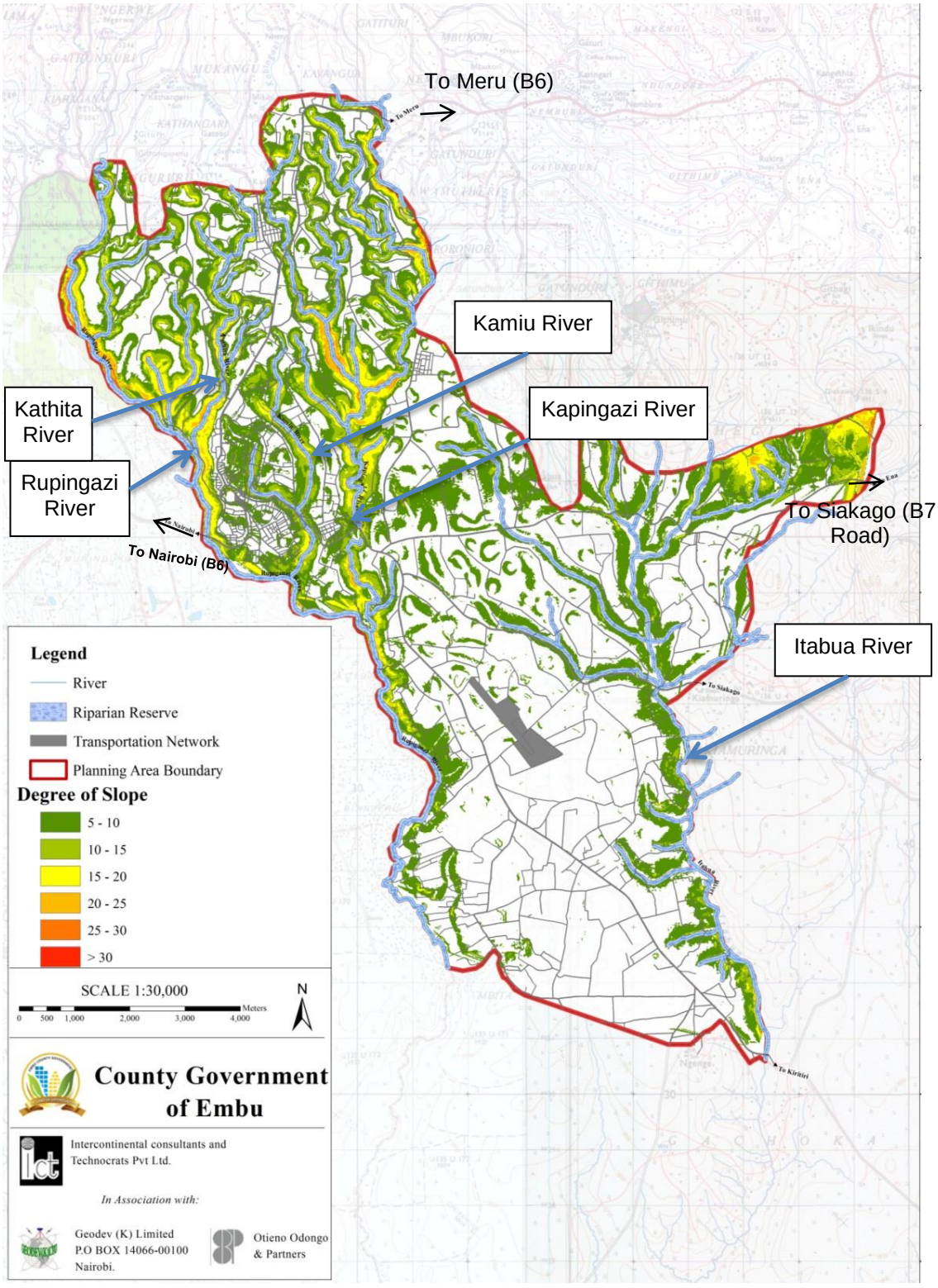


Figure 6.22: Land Suitability Analysis of Embu Town Planning Area



6.4.5 Maintain Forest and develop green zone

There is Njukiri forest area within the planning area and this forest area has been planned to be reserved as such with provision of some recreational activities. Apart from the Njukiri forest, tree plantation is also proposed along both sides of all the rives within a riparian reserves.

Apart from the conservation of existing forest area and plantations, other green/ recreational areas are included in the plan, namely a town level park, water park, amusement park, sub-town level parks, cluster level park, etc. Around 5% of the total developed area is planned for recreational activities (Figure 6.23)

6.4.6 Protection of the water catchment area and riparian reserves

The area under water bodies including riparian reserve is 1.4% (143Ha) of the total planning area. As Embu town sits across several water bodies, including Rupingazi and Kapingazi rivers. Wetlands are also found with the town, for example the Dallas wetland, which has been degraded. In spite of the need for the wetland to be conserved, many individuals have been issued with official documents permitting them to settle on the land. Another encroached riparian area is the slum called Ngrogoni. Shauri springs behind Uchumi supermarket is also being encroached.

The mapped rivers and other water bodies/ wetlands (Dams) are all protected under the plan. The riparian areas of the rivers are faced with two major threats to some extent, one is pollution caused by poor waste disposal, including the liquid waste, since the town lacks a waste management system, and the other is encroachment by buildings.

Riparian management is one of major concerns in the planning area. The size of the area to be conserved (as riparian reserve) has been calculated based on the width of the river, which also involves water reservoirs protection as well. Around 30m on both sides from banks of all the rivers has been demarcated as riparian reserves. Planting of bamboo along the riverine area will help stabilize soils, restore nature and provide livelihood sources. Consideration should also be given to using the riparian reserves for public green space, including nature trails. All the rivers have been provided with adequate riparian reserve on both sides of the rivers as shown in Figure 6.22 above.

6.4.7 Protection of Ground Water Resources

Rain water harvesting through rain water harvesting structures on natural steams as well as on buildings will help in ground water recharging. Recycling of waste water will also help the sustainable usage of water resources as it can be used in agriculture and gardening.

6.4.8 Maintain Air Quality

Action to manage and improve air quality is largely driven by NEMA regulations. There are legally binding limits set for concentrations in outdoor air of major air pollutants that impact public health such as particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2).

It is important that the potential impact of new development on air quality is taken into account. Odour and dust can also be a planning concern, for example, because of the effect on local amenity. Therefore, the town planning may need to consider the potential cumulative impact of a number of smaller developments (roads, housing, etc.) on air quality as well as the effect of more substantial developments. Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise, if the development is likely to generate air quality impact in an area where air quality is known to be poor. Air quality monitoring devices have been proposed to be procured to check the quality of air regularly. Based on the report on air quality corrective measures can be taken by the county government.

6.4.9 Maintain Noise Level

Noise needs to be considered in two ways (i) when new developments may create additional noise and (ii) when new developments would be sensitive to the prevailing acoustic environment. Kenyan noise regulations appreciate factors affecting noise level that include: the source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night. Noise quality monitoring devices have been proposed to be procured to check the level of noise regularly. Based on the report on noise level corrective measures can be taken by the county government.

6.4.10 Develop Sustainable Built Environment

The ISUDP presents an opportunity to improve the development of built environment within the urban setting that are sustainable and respond to new environmental challenges such as climate change. This means that building design and construction should have a minimum standard that aim to create buildings that use less energy, little water, produce minimal waste in operation or construction, and are made of materials that are largely derived from sustainable sources.

6.4.11 Mitigation of land use conflicts

As such there is no land use conflict within the town planning area but within the built up area, the availability of community facilities and recreational facilities is inadequate and rivers and wetland are not conserved as for example residential buildings are constructed on Dallas Dam and Shauri springs.

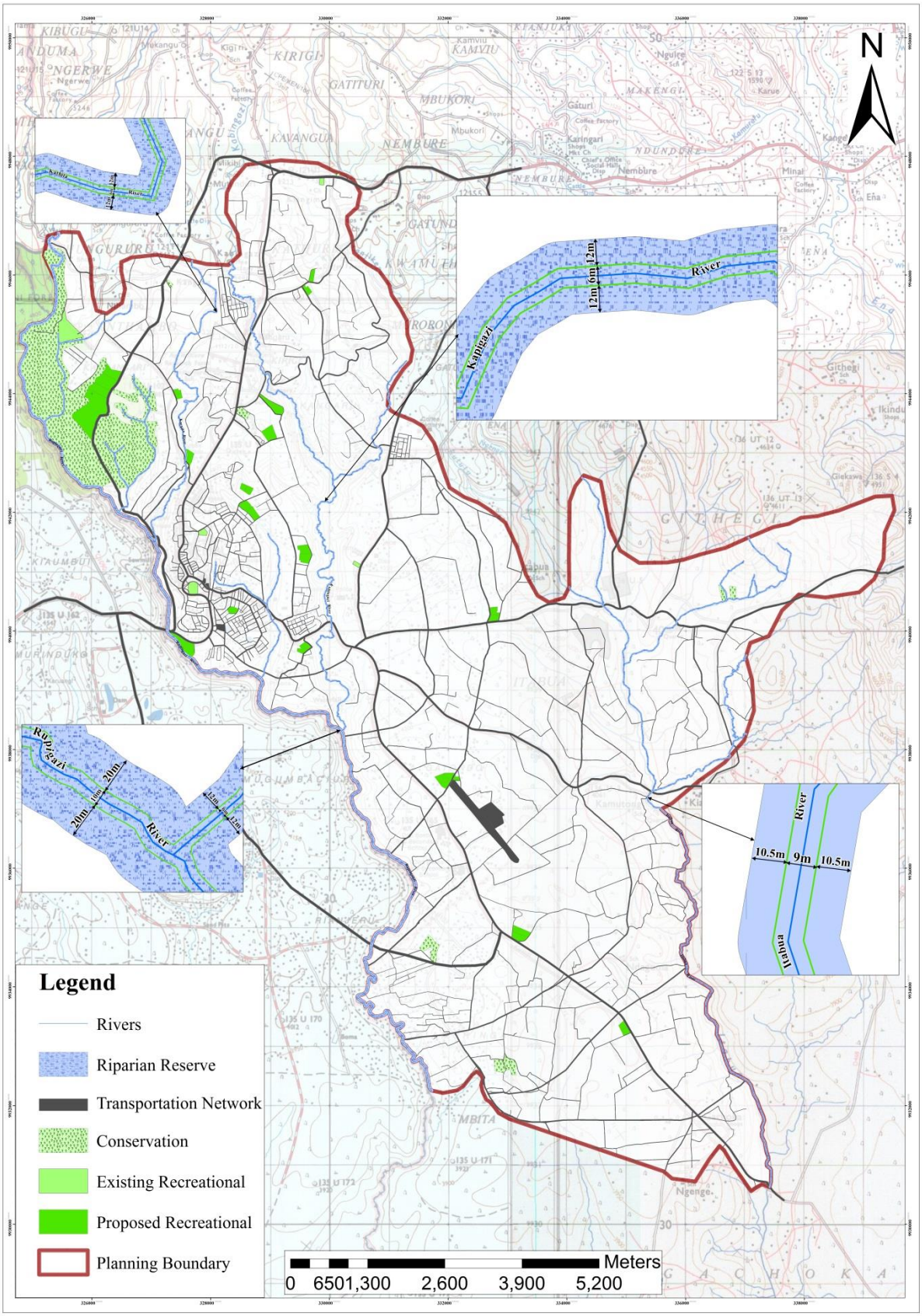
The main land use conflict within the existing developed area is related to the location of residential and water bodies. There are no buffers separating the built-up areas from water bodied like in case of Dallas Dam and Shauri springs. Additionally, the availability of community facilities and recreational facilities is inadequate within the residential areas. Considering the abovementioned issues, the plan provide adequate measures to minimise the land use conflicts.

Heritage conservation: Heritage conservation is presented along with tourism development below.

6.4.12 Environmental Conservation and Management

Built-environment: The components of built environment like solid waste management, sanitation, water supply, storm water drainage, etc. have been planned adequately for the current and projected population. These proposals are given this chapter under physical infrastructure section.

Figure 6.23: Planned green/ recreational areas, plantations and riparian reserves



6.4.13 Project Identification for Environment

The environment can be improved by providing all basic infrastructure and services; and by preserving and developing environmentally sensitive areas within the planning areas. These Rivers are main environmental assets along with the forest area and wetland area and there is a huge potential for development these assets for the betterment of town's environment. Projects related to improvement of urban environment and developments of river fronts have been identified to make the plan environmentally sustainable. These projects ideas were identified through consultation process with stakeholders.

The goals, strategies and projects have been identified for overall environmental development and are presented in table below:

Table 6.13: Goals, Strategies and Projects for Environment

Goals	Strategies	Projects	Quantity	Unit	Remarks
A good living enviro-nment	Riverfront development	Tree Plantation along river banks	15	Km^2	Planting along river banks within the provided riparian reserve. This can be done on all the rivers.
		Construction of small check dams to create water reservoirs for recreational purposes	10	No.	Same item also given under supply section. Presented here just to highlight the point
		Construction of public promenades on main rivers	8	Km	These can be planned on Rupingazi River, Kapingazi River, Kathita and Kamiu River. Detailed analysis is needed for actual implementation
	Providing new recreational places	Creating recreational open areas like parks, playground, etc.	5	%	Around 5% of total developed area has been provided for recreational facilities
		Development of dams/ wetlands for recreational activities (walkways, parks, tree plantation, boating, etc.)	10	No.	All the dams/ wetlands can be developed as as recreational facilities. Detailed analysis is needed for actual implementation
	Improve procedure for environmental clearance and proper implementation of guidelines	SEA for ISUDP of Embu	1	No.	After approval of the ISUDP, SEA must be undertaken before implementation of the plan
		Harmonizing the physical planning Act & EMCA (Change of User) to ensure that EIA takes place prior to approval by physical planning as part of legislation harmonization	-	-	All the relevant acts need to be amended to streamline the development process. Meanwhile, administrative steps should be taken to improve co-ordination
		Strict implementation of environmental guideline for extraction of building material in quarries	-	-	Administrative decision
		Removal of encroachment on natural drainage system	-	-	Administrative decision
	Reduce indoor	Promotion of energy saving eco-jikos	-	-	Administrative decision

Goals	Strategies	Projects	Quantity	Unit	Remarks
	pollution	Tax rebate for manufacturers and dealers of eco-jikos	-	-	Administrative decision
		Awareness campaign for eco-jiko and for neat and clean environment	-	-	Administrative decision
	Improve and air and noise quality	Purchase of Air quality meters: gases	2	No	Air quality meters will help in knowing the level of air pollution which will help to take corrective measures
		Purchase of air quality meters: particles	2	No	
		Purchase of Noise meters (2)	2	No	Noise meters will help in knowing the level of noise pollution which will help to take corrective measures
	Water Resource Management	Construction of 10 rain water harvesting structures on natural streams to recharge the ground water	10	No.	On Rupingazi, Kapingazi, Kamiu and Itabua Rivers. Detailed analysis is needed
		Mandatory provision of water harvesting building design	-	-	The government needs to prepare templates for different housing designs relating to water harvesting. The project can be started with all the public buildings and private building (on bigger plot size of 500m^2 and above)
		Recycling of waste water	1	No.	Recycled waste water from STP can be utilised for agricultural and gardening purposes

6.5 Disaster Management

The Embu County Disaster Management Committee (ECDMC) is the main body with the mandate to control, prevent and respond to events threatening the stability and sustainability of the human and natural environment in the county. It might be important to have a body that deals specifically with urban disasters due to their likely high impact on a densely settled area and associated economic issues.

Potential disasters include fire, especially in the slums. Embu is one of the towns where the fire department was noted as one of the services that required improvement under the Kenya Municipal Programme, Environment and Social Management Framework (ES M F) in 2010.

Another risk is flooding, especially in low lying areas, which are likely to flood as a result of increased discharge from paved urban areas with reduced infiltration. These areas are often occupied by low income people that have low mitigation ability against flooding. Again, with low sewerage coverage the wet season is likely to be characterized by storm water mixed with sewage with high chances of a disease outbreak. In several cases the sewer has leaked into the river with the potentially high risk of disease outbreak since most of the downstream users have no piped water.

The steep gradients in parts of Embu town, combined with low vegetation cover, mean that there is a high likelihood of landslides, especially where building foundations are weakened by poor land management such as erosion. A landscape approach is important to safeguard investments where soil erosion control, riverbank conservation, garbion erection and land cover management

approaches are integrated. This approach ensures a holistic approach so as to achieve social, economic, and environmental development, and ensure that highland areas are connected with lowlands. Soil erosion is minimised by tree planting and terrace farming in steep areas, and riverine areas are preserved. Very important is promotion of sustainable land management on the farming areas around the town boundary through practices like agro-forestry and permaculture.

Major Challenges

a) Lack of a county policy on disaster management
b) Information on disasters is not widely disseminated.
c) Under-developed systems of monitoring disaster risks.
d) Inadequate capacity in terms of facilities, equipment and human resource to deal with incidences of disaster in county
e) Insufficient funding and uncoordinated response when disaster strikes.

This ISUDP aims to establish Embu town as a sustainable disaster resilient and healthy town and has taken into account the measures for reduction of disaster impacts as an integral part of the planning process while designing of the proposed Land Use Plan 2035 of the town. This Plan also underlines the formulation of broad level strategies for disaster mitigation.

Goal: To develop effective and efficient firefighting and disaster management unit in Embu town to enhance efficient response to disasters.

Disaster Management Strategy

Disaster management in terms of response alone is not sufficient, as it yields temporary results at a very high cost; therefore, ISUDP proposes that disaster prevention, mitigation and preparedness are better than disaster response in achieving the goals and objectives of vulnerability reduction and are essential to integrated disaster management. ISUDP proposes following broad strategies to deal with disaster management:

a) To develop better coordination among institutions responding to disaster incidences
b) To create Town Disaster Management Authority
c) To identify indicators of disaster risks and disaster prone areas in town
d) To develop an early warning system including guidance on how to act upon warnings
e) To enhance capacity of human resource, equipment and infrastructure.
f) To reduce response time for any disasters within the town
g) To decentralize and equip disaster management units.
h) To integrate disaster risk reduction in building approvals and other development policies

6.5.1 Projects of disaster management

The goals, strategies and projects have been identified for disaster management and are presented in table below:

Table 6.14: Goals, Strategies and Projects for Disaster Management

Goal	Strategies	Projects	Quantity	Unit	Remarks
To develop effective and efficient disaster management	Link the building approval system with safety precautions	Mandatory provision of smoke detectors in all buildings with overall building approval system	-	-	Administrative decision
		Mandatory provision of earthquake resistance in building design	-	-	The county government needs to prepare design templates for different house sizes
		Inclusion of building standards in the byelaws to make seismically safe construction including preparation of handbooks/pamphlets/type designs for earthquake resistant construction	-	-	

Goal	Strategies	Projects	Quantity	Unit	Remarks
		Revise existing standards as per the present situation, develop new codes and documents/commentaries, and making these codes and documents available all over the county including on-line access to these codes	-	-	
	Provision of adequate fire safety mechanism	Establishment of 1 fire station and 3 fire sub-stations	-	-	Provided under Fire Fighting
		Repairing of existing fire hydrants and construction of new fire hydrants	-	-	
		Purchasing of fire tenders/vehicles	-	-	
	Provision of water and sanitation facilities and awareness generation	Awareness generation for general hygiene and health to prevent any health disaster	1	No.	Administrative Decision
		Provision of potable drinking water to all	-	-	Adequate provision given under infrastructure
		Provision of proper sanitation facilities to all	-	-	
	Disaster preparedness	Prepare Town Disaster Management Plan (Disaster Management Plan (DMP) will be prepared across the four phases – prevention, preparation, response and recovery; and to manage all disaster events)	1	No.	The DMP shall ensure sustainability of the programme, development of training modules; manuals and codes, focused attention to awareness generation campaigns; institutionalization of disaster management authority and disaster management teams, mock-drills and establishment of techno-legal regimes
		Carry out disaster mapping for the county	1	No.	It will be covered by Disaster management plan
		Establish early warning system and enhance risk assessments	-	-	Coordination with national government will be required
		Establish fully equipped disaster management cum rescue centers at sector level (sub-town level)	3	No.	Sector level units will reduce the burden of town level authourity and will be equipped to tackle lower level incidences
		Coordination mechanism among all concerned agencies for disaster management, like Health Department, Fire	1	No.	It will improve disaster management response

Goal	Strategies	Projects	Quantity	Unit	Remarks
		Department, police department, etc.			
		Develop, update regularly and widely disseminate information on disaster risks	-	-	It will make all stakeholders aware of any possible disaster event
		Develop and maintain a Hazardscape at town level to make an informed risk assessment data base	-	-	It will help in understanding and knowing the vulnerable areas
		Develop short-term and long-term strategy for flood management/erosion control	-	-	
		Record, analyze and summarize information on disaster occurrence, impact and losses	-	-	
		Effective development and maintenance of public buildings and offices	-	-	
	Improving health facilities' response	Preparation of hospital emergency preparedness plan to deal with mass casualty incidents	-	-	
		Training of hospital administration/ doctor for emergency preparedness	-	-	

6.6 Tourism and Heritage

6.6.1 Introduction

The findings in relation to tourism are that is not a major contributor to the economy, but Embu might be able to use its role as a knowledge centre to attract conferences and similar trade. Tourist sites within town and in the surrounding area of Embu County are not developed properly to attract local and international tourists. Combined with a lack of proper marketing of tourist sites in and around Embu town this indicates that there is considerable potential. The situation is further affected by the fact that there are no suitable hotels and restaurants for international tourists.

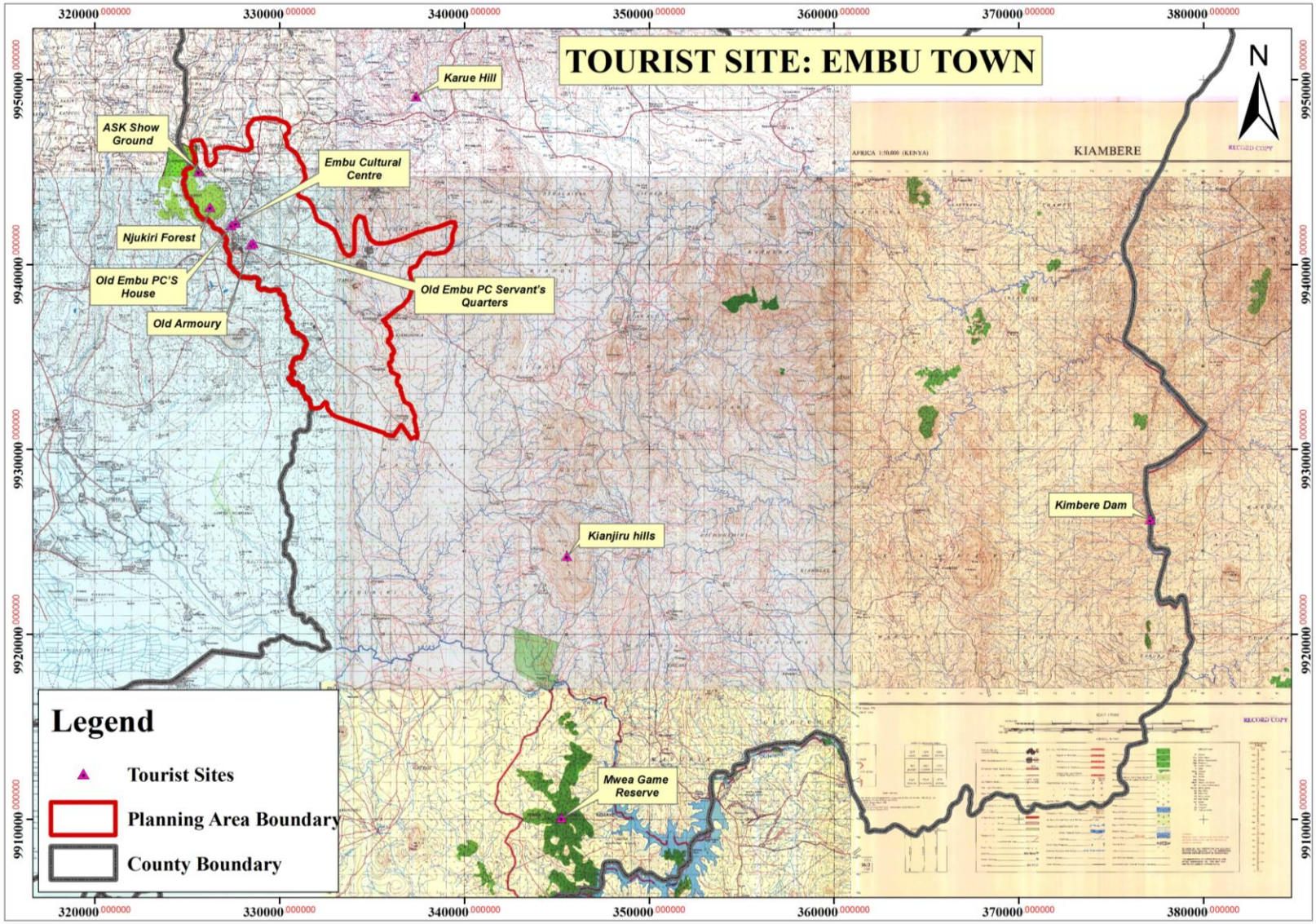
6.6.2 Tourism

The main tourist features in and around Embu town are as below:

- Karue Hill
- Jukiiri Forest
- Mwea Game Reserve
- Embu Cultural Centre & dancers
- ASK Show ground
- St. Marks Athletic Training Ground for high altitude training
- Mount Kenya viewing point in Nanyuki - Kianjiru hills

The locations of all the tourist sites within the town planning area are shown in Figure 6.24.

Figure 6.24: Location of Tourist and Heritage Site in and around Embu Town



6.6.3 Heritage

There are three heritage sites in Embu town, which are of colonial time and related to the colonial Provincial Commissioner (PC). These sites are notified as per National Museums and Heritage Act, Chapter 216 (Rev. 2009), and discussed below:

- Old Embu PC'S House
- Old Embu PC Servant's Quarters
- Old Armoury

The locations of all three heritage sites within the town planning area are shown in Figure 6.24.

6.6.4 Assessment of tourism and heritage potential

From field observations and stakeholder consultation, it was observed that the following tourist and heritage sites could be harnessed to generate revenue for the town and county:

Tourism Opportunity	Location and Observations
Njururi cultural museum	This renowned museum located near Kibugu market in Manyatta constituency. It is home to great sculptural work and rich collection of the Embu material culture. A great leaning place complete with a traditional homestead. It is located with town planning boundary
Embu Cultural Centre	This is a Government institution set up by the Ministry of Culture and National Heritage that was started in the 1990s. The centre coordinates cultural activities in the entire county. It has buildings that host meeting halls and offices. The institution is involved mostly in promotion of herbal medicine. The centre has plans to develop a botanical garden, build an amphitheatre, a herbal clinic, museum, art gallery and a curio shop. It is located within Embu town.
Embu Cultural Village	This cultural village is located at the home of Simon Njururi near Kibugu market in Embu town. It can be accessed from Kibugu-Nguviu road. Mr. Njururi is an artist, collector, sculptor and a curator and his quite passionate about his rare collection of art and cultural artifacts.
Karue Hill; a steep rocky hill with no vegetation at all	At Ena, 10km away on Embu-Meru Road
Jukiini Forest	Within Embu Town. Improved Forest/wildlife protection & management
Three quarters of the hydro-electric dams are in Mwea County i.e. Kimbere, Masinga dams	Develop tourism products based on the dams
Mwea Game Reserve	45km from Embu Town. As tourists coming from the reserve to proceed to the dams
Embu Cultural Centre & dancers	In CBD – Embu culture and dance for local and international tourists
ASK Show ground, axed from the forest, idle most of the year except June (show time)	Within the town. Develop recreation/public park(s)
St. Marks Athletic Training Ground for high altitude training	20km from Embu Town. Another tourism product to couple with others for maximum returns
Mount Kenya viewing point in Nanyuki - through construction of a new link road	50km from Embu Town. Tourists will start to use this shorter route with opening of new road link.
Unique geographical condition to establish an observatory on Kianjiru hills to boost tourism	20km from Embu Town
Waterfalls in Mboi Njeru Hills	40km from Embu Town
Potential site for hill climbing in Karue in Runyenjes	50km from Embu Town
Mau Mau Caves	60km from Embu Town. Cultural heritage.

Source: Field Survey

6.6.5 Issues/Observations

The following issues/observations emerged during the preliminary analysis of the heritage conservation of the town:

- None of the three heritage sites are open to the general public
- Lack of awareness among public about the heritage sites of Embu town
- Inadequate information availability about the heritage sites of Embu town
- Inadequate facilities for cultural events promotions

6.6.6 Projects

The goals, strategies and projects have been identified for tourism and heritage management and are presented in table below:

Table 6.15: Goals, Strategies and Projects for Tourism and Heritage

Goals	Strategies	Projects	Quantity	Unit	Remarks
Development of an Embu regional tourist hub	Development of tourist infrastructure	Construction of New Hotels and Guest Houses	-	-	New hotels can be constructed within the demarcated commercial areas in the plan
		Proper management of solid waste in town	-	-	Provision given under SWM in Chapter 4
		Development of identified tourist sites (landscaping, solid waste management, access road, etc)	1	No.	A separate project for improvement of tourist and heritage sites need to be prepared
		Construction of new road to ASK Ground (Njukiri Forest)	4	km	The paved road linking ASK Show Ground will ease the access for local people
		Opening up of three heritage sites for general public (Old Embu PC'S House, Old Embu PC Servant's Quarters & Old Armoury)	-	-	Administrative decision
	Tourist circuit development	Preparation of a regional tourist circuit map	1	No.	A tourist circuit map indicating tour itineraries to be prepared
	Promotion of cultural activities	Community hall/cluster community recreational club (with small library)	8	No.	To promote cultural activities with the town planning area, these community and cultural facilities have been proposed at town level, sub-town level and cluster level. These facilities will provide platform for cultural interaction and enhance the social cohesion with planning area
		Sub-town level community/cultural centre, library resource centre, social hall, VCT centre, public telephone, amphitheatre/ cultural dance centre)/ county social hall	2	No.	
		Town level integrated cultural centre (library/ resource centre, social hall/ town hall/ amphitheatre/ cultural dance centre	1	No.	

Goals	Strategies	Projects	Quantity	Unit	Remarks
	Publicity and marketing	Listing of tourist sites and documentation of sites with description	1	No.	The county government should prepare documentation on each tourist and heritage site with detailed descriptions mentioning the history and relevance
		Establishing a tourism information centre (for travel planning, description of sites, distances, safety issues, accommodation, etc.)	1	No.	A web linked information centre with detailed information about tourist and heritage sites

6.7 Housing and informal settlements

6.7.1 Housing

Housing is the largest single land use and requires substantial infrastructural investment in terms of roads, water reticulation and sewerage.

Issues/ observations:

- There are mushrooming housing estates without services
- Houses with an impermanent structure are mostly in the peripheral areas of the town and in informal settlements
- The supply of formal housing does not match the demand in the town
- The County should provide basic infrastructure like road and water supply, and the private sector should build houses under Public Private Partnerships.
- Government institutions are underutilizing areas of residence
- Cost of land and construction materials is very high
- Poor infrastructure to service the houses
- Lack of designs and guidance in town for housing construction
- Inadequate coverage of sewer system in the town and individual septic tanks are costly
- Inadequate houses for renting specially after the functioning of University of Nairobi Campus in town
- Long procedure in approving building plans
- In absence of title deeds, financial institutions do not give loan for housing construction

The following strategies are suggested for housing in Embu Town:

Densification: As a part of ISUDP, densification is required to make more effective use of existing infrastructure. The current net population density of town is 33 persons/hectare, which is low compared to the Physical Planning Handbook 2008 suggested population density of 50 persons/hectare. Consideration should be given to charging higher rates which will act as a disincentive to keeping land undeveloped for speculative purposes and retaining low densities in general. Furthermore policy guidelines and procedures could be developed for densification. Investigations should be undertaken into the legal powers to impose penalties for unused/vacant land. (Densification is also needed for Government Offices also as currently lot of space is occupied by these offices in low rise mostly single story buildings.)

High Rise Housing: Where possible high rise, and other forms of high density, housing should be should be encouraged.

Public Private Partnerships (PPP): PPPs can be used to increase private sector investment in housing, using development agreements requiring private sector investment in lower cost housing. .

Clarity in Planning Policy: The planning policy and land use requirements should clearly be explain with clarity thus making it easier to individual owners and private developers toward construction of new houses.

Infrastructure Provision: The County should embark on a phased urbanization programme whereby it services land with basic infrastructure (appropriate to the needs of different income groups). Annual release of such land for development will keep land relatively affordable for the poor, but can also yield good returns through sales to the private sector for middle and high cost housing.

Security of Land Tenure: Stakeholders have raised many problems concerning land tenure. The most common complaint has been the lack of individual title for buyers through land companies. The issue will need to be addressed in two ways: firstly by a communication campaign about the advantages and disadvantages of joining land companies; secondly about the process required to obtain individual title.

As noted above, occupants of informal settlements lack security of tenure: this is hopefully to be addressed under the KISIP programme.

Rental Housing: The County should examine the question of supply and demand in terms of rental housing for all income groups. The private sector, at both the corporate and individual level should be encouraged to participate in this market to the extent necessary.

Single Window Approval: Currently the approval system is very cumbersome and slow, and is one of the biggest hurdles in the development of housing in the town. All approvals such as planning, environmental and building plans should be brought under a single window approval system with a time limit so to expedite the process and reduce the corruption.

Reduce Fees/ Charges: The government fees and charges for various approvals should be made more reasonable especially for poor people living in informal settlements.

Mixed land Use: Mixed use means the provision for non-residential activity in residential premises. The policy should aim to balance the socio-economic need for such activity and the environmental impact of the said activity in residential areas. Mixed use allows access to commercial activities in the proximity of the residences and reduces the need for commuting.

Land Pooling and Land Readjustment: Such schemes could be considered as part of new acquisition procedures to be developed. This is a method in which pooling of government and private land is achieved for the purpose of planned development. Under this scheme where developed land is required for uses like parks, infrastructure or commercial use by the government agencies, land of equivalent value land is re-allocated to the land owners.

The Table 6.16 presents the goal, strategies and project for housing in Embu.

Table 6.16: Goals, Strategies and Projects for housing

Goals	Strategies	Projects	Quantity	Unit	Remarks
Providing liveable houses for all	Densification and High Rise Housing	Permission to build ground plus 2 storeys in existing plotted development	1	No	Administrative decision
	Public Private Partnership (PPP)	Site servicing of the public land and selling serviced land to private developers	1	No	All council estate which are very low density area, to be taken for PPP projects for housing
	To provide clarity in housing policy	Prepare housing policy	1	No	Administrative decision
	Infrastructure Provision	Servicing of the land for future development for housing	-	-	All new development on public or private land will proceed with the site servicing of land with basic infrastructure (water supply, drainage, road, electricity, etc) by government
	Provide Security of Land Tenure	Providing title deeds to all owners within the town	-	-	All owners of land to be provided title deeds on mission mode because not having title deed is hampering the development of housing as people can not avail loaning facilities from banks. The land titling programme should include individual owner as well as land companies.
	Promoting Rental Housing	Preparation of rental policy for county	-	-	A clear rental policy with simple and appropriate details for lease, permissible annual increase in rent, responsibilities of owner (or provision of facilities) and tenants, will help in regulating the rental market
	Single Window Approval	Developing a time bound single window approval system for housing development for land use change, design approval, possession certificate, etc. for different stages of housing development	1	No	Currently the approval system is very cumbersome and slow, and is one of the biggest hurdles in the development of housing in the town. All approvals such as planning, environmental and building plans should be brought under a single window approval system with a time limit so to expedite the process and

Goals	Strategies	Projects	Quantity	Unit	Remarks
					reduce the corruption.
	Reduce Fees/ Charges	Lower charges for housing development	1	No	Rationalisation of charges and fees considering income level will help in development of housing
	Mixed land Use	All roads with width equal or more than 15 m to be allowed for mixed use development	1	No	Allowing mixed use development along the major roads will help in keeping basic mixed character of town in new areas and existing developed areas
	Land Pooling and Land Readjustment	Preparing policies for land pooling and land readjustment for high density areas	1	No	The policy will provide guideline for making adequate provision of infrastructure in high density areas
	New housing development	Development of new houses	2426	No.	These units of houses are needed for first three year of plan implementation (2016-19)

6.7.2 Informal settlements

To improve the conditions of informal settlements in Kenya, the Kenya Informal Settlements Improvements Project (KISIP) funded by the International Development Association (IDA) is on-going in 15 towns of Kenya including Embu town. This is a comprehensive programme to deal with the problems of informal settlements and has the following four components:

a) ***Institutional development and programme management*** - assists in strengthening the capacity of the Ministry of Land, Housing and Urban Development and the participating County Governments, and also finances programme management activities (including preparation of a baseline and systems for monitoring and evaluation).
b) ***Enhancing tenure security*** – supports scale-up and process systematization of on-going efforts to regularize tenure in urban slums, and includes financing for the following types of activities: community organization and mobilization, identification and delineation of settlement boundaries, preparation of Local Physical Development Plans (LPDPs), and issuance of letters of offer/allotment to individuals/groups.
c) ***Investing in settlement restructuring and infrastructure*** – supports implementation of settlement upgrading plans developed at the community level, investment in settlement level infrastructure, and, where necessary, extension of trunk infrastructure to settlements.
d) ***Planning for growth*****:** *Supporting delivery of affordable housing and serviced land* – supports proactive planning to dampen the growth of new slums and mechanisms for delivery of land and housing that can enhance affordability for middle- and low-income households.

The implementation of all four components KISIP will certainly help in resolving the problem of informal settlement in Embu town.

From discussions with stakeholders, priorities are far as informal settlements are concerned are as follows:

- Regularization of informal settlements by providing security of tenure
- Provision of affordable infrastructure services in informal settlement areas.

- Demarcation of land for public utilities like roads as well as health, education, and commercial facilities, etc.
- Land pooling for infrastructure and services in a transparent manner. The land taken from individual occupants should be readjusted from remaining occupants.
- Relaxed building byelaws for informal settlements. Since the land is not sufficient for expansion of houses and for community facilities, the minimum requirements of byelaws should be relaxed to suit the existing realities.
- A suitable financing system should be developed for the needs of low-income households. Lots of people living in informal settlement, who are poor, are currently dependent upon the informal system of *SACCOs (Savings and Credit Cooperative Organization)*. A formal finance system considering the needs of poor people with minimum interest rates and formalities is needed to help the poor in long run. Two solutions that have worked elsewhere are Housing Cooperatives or housing associations, which receive government technical assistance and (usually) loan funds for project preparation; and government guaranteed mortgages which will encourage banks to go down-market.

The table below presents the goal, strategies and project for informal settlement of Embu.

Table 6.17: Goals, Strategies and Projects for informal settlements

Goals	Strategies	Projects	Quantity	Unit	Remarks[4]
Formalising the informal settlement with provision of infrastructure and services	Formalisation of informal settlement Areas	Notification for formalisation of all informal settlements	-	-	Policy decision. All informal settlements to be notified as formal
	To ascertain the land and people	Conduct land and household surveys	-	-	The survey will ascertain the amount of land available and numbers of people living in that area
	Conduct land sub-division and entitling	Providing title deed as per land subdivision	-	-	After keeping land for common facilities, land will be allotted to individual household
	Providing infrastructure facilities	Demarcation of land for common facilities and provision of basic infrastructure facilities s	-	-	The settlement will be provided with all basic infrastructure by linking with main town trunk infrastructure

[4] KISIP is dealing separately with informal settlements with four components viz. Institutional development and programme management, Enhancing tenure security, Investing in settlement restructuring and infrastructure and Planning for growth

6.8 Social infrastructure

6.8.1 Health Facilities

Table 6.18: Goals, Strategies and Projects for health facilities

Goals	Strategies	Projects	Quantity	Unit	Remarks
Adequately equipped existing health facilities	Provision of all basic facilities as per the requirement to make the existing health facilities fully functional	Procurement of required equipments, staff, medicine, etc.	-	-	All existing health facilities especially level 5 hospital (which is not fully functional due to some problem in getting grants) need to be fully equipped to make them functional.
		Health Centre (Level 3)	4	No.	These additional facilities need to be developed as per population norm and as per new development.
		Basic Health Sub-Centre (Level 2)	15	No.	
		Dispensary/Small Clinic with Chemist Shop	32	No.	
		Veterinary Hospital	1	No.	
		Veterinary Clinic	5	No.	
		Medical College-cum-Hospital	1	No.	
		Communicable Disease Hospital	1	No.	

Source: Generated by Consultants

6.8.2 Education facilities

Table 6.19: Goals, Strategies and Projects for education facilities

Goals	Strategies	Projects	Quantity	Unit	Remarks
Providing adequate educational facilities within the planning area	Development of new Educational facilities as per norms considering the general need, special needs and technical education	Primary school (Class I - VIII)	6	No.	Additional facilities will be developed as per population norm and as per the planned development
		Senior Secondary (Class IX - XII)	5	No.	
		Special Schools	2	No.	
		Youth Polytechnic	2	No.	
		College	1	No.	
		University	1	No.	
		Management/Teacher Training Institute	1	No.	
		Medical training College	1	No.	
		Education township	1	No.	

6.8.3 Other community facilities

Table 6.20: Goals, Strategies and Projects of other community facilities

Goals	Strategies	Projects	Quantity	Unit	Remarks
To provide safe living environment and cultural integration with adequate community facilities	**To provide adequate community facilities to promote liveability**	Police Post	31	No	All community facilities has been planned as per norm and adequate land has been allocated for these facilities
		Police Station	4	No	
		Juvenile home	1	No	
		Cemetery with crematorium	1	No	
		Town Level Integrated Cultural Centre	1	No	
		Sub-town level cultural centre	1	No	
		Community/Cultural Centre	7	No	
		Night Shelter	3	No	
		Old Age Home	3	No	
		Rehabilitation Centre	3	No	
		Working Men's/Women's Hostel	3	No	
		Orphanage/Children Centre	3	No	
		Convention centre	1	No	

6.9 Institutional set-up

Based on the status and SWOT assessments and views of the stakeholders expressed during various consultations including workshops, development strategies and projects have been developed to achieve the sectoral goals and town's vision. The development strategies and projects have been identified considering the existing gap and projected demand. The goals, development strategies and project for institutional set-up are presented in the tables below:

Table 6.21: Goals, Strategies and Projects for Institutional set-up

Goals	Strategies	Projects	Quantity	Unit	Remarks
Training of staff and Implementation of devolution	Functional Governance	Regular training of County staff in financial management	1	No.	The county staff responsible for financial management need to be trained annually in latest financial management technique like double entry accrual based accounting system
		Regular training of County staff in technical aspects	1	No.	The county staff responsible for technical aspects need to be trained annually in the latest techniques and trends
		Creating local urban body for governance of the town area	1	No.	Embu will benefit from revisions to the Urban Areas and Cities Act to reduce the size of eligible urban areas for municipal status
		Establishing environmental land courts	1	No.	Administrative decision. These courts will help in resolving land related issues
		Preparation of manual of practice for the	1	No.	The manual will help in understanding the

Goals	Strategies	Projects	Quantity	Unit	Remarks
		functions of central government and county government			jurisdiction of county government
Achieving seamless coordination among county department	Organising regular coordination meeting	Creating centralised system, to be accessible to head of departments, for auto-update of all proposed developments	1	No.	Web based linking of all the Heads of Departments will help integrate development activities. Suggestions by various departments will help in taking intervention measures to correct/ modify the approach and implementation to achieve integrated development
		Formation of a permanent steering committee of CECs headed by H.E. Governor, to have meeting monthly to oversee the development works within the urban areas (until Embu becomes a self-governing town or Municipality)	1	No.	This steering committee will further help the coordination among various department and expedite the implementation process
Providing state of the art infrastructure and equipment to county Staff	Establishing a GIS lab in Physical Planning Department	Purchasing of 3 ArcGIS 10.3 licences for Physical Planning Department	3	No.	The fully functional GIS lab within the physical planning department will be required for implementation of ISUDP proposals as it is totally based on GIS technology
		Purchasing of 3 laptop with high configuration	3	No.	
		Purchasing of 2 Plotters	2	No.	
		Training of County Staff in GIS for 3 months	1	No.	
	Recruiting New Staff	Recruitment of 2 GIS Experts	2	No.	
		Recruitment of 3 Physical Planners	3	No.	
Single window approval system	Creating online approval systems	Time bound Building Approval system with inclusion of NEMA, Surveys and other Departments (with specific time for different approvals like NEMA, Survey Department, Planning Department)	1	No.	Putting upper time limit for building approval system will help in expediting the development
Generating public awareness	To provide information to all through all accessible means of	Creating daily programmes for local TV	1	No.	There is a need to ensure an awareness of the County's initiatives for development of the town
		Creating electronic screens to display public information	1	No.	

Goals	Strategies	Projects	Quantity	Unit	Remarks
	communication	Establishment of formal local citizen forum	1	No.	The formalisation of a citizen forum will help to reduce the communication gap between Government and citizens. It will also help to smooth implementation of various developmental projects within town
		Establishment of information cell for general and legal information about various policies and acts	1	No.	Wanainchi cannot take advantage of public policy and institutions as they may not be able to understand the technical terminology of various acts and policies to take benefit cannot afford to pay lawyers to assist them.
		Creating local police helpline number	1	No.	It will improve the security situation

6.10 Financial management

Based on the status and SWOT assessments and the views of the stakeholders expressed during various consultation including workshops, development strategies and projects have been developed to achieve the sectoral goals and town's vision. The strategies and projects have been identified considering the existing gap and projected demand. The goals, development strategies and project for financial management are presented in tables below:

Table 6.22: Goals, Strategies and Projects for Financial Management

Goals	Strategies	Projects	Quantity	Unit	Remarks
Generation of own resources to sustain the city in long run with the initial help of county and central government	Improving the property tax collection system through procedures and new techniques	Creating a simple procedure for property tax assessment	1	No.	The simplified procedure will help in assessing the property tax in minimum time
		Creating property GIS system with mapping of all properties	1	No.	A project to create a Property GIS system will help the government in assessing and collecting the property rates/land rates
		Increasing the coverage of taxed properties/tax base	1	No.	All properties within the planning area need to be brought within the coverage for tax collection
		Improving collection performance	1	No.	Innovative methods like publishing of names of defaulter in newspaper or linking the collection system with electricity supply will improve the collection performance
	Improving the financial management	Creating the accrual based double entry system for income and expenditure	1	No.	Under Accrual Accounting system transaction are entered in the books of accounts, when they become due unlike Cash Accounting where transactions are recognised only when they

Goals	Strategies	Projects	Quantity	Unit	Remarks
					are actually realised. It will help the government in planning the available resources in a better way
		Regular updating of user charges for various services (considering the full recovery of related operating, maintenance and capital costs)	1	No.	Administrative decision
	Proper fund utilisation	Creating online system for funds disbursement and utilization	1	No.	The online find disbursement system will help the administration to know the actual status of implementation of various projects and corrective measure can be taken in due course
		Strengthen co-ordination between donor and Government funded projects	1	No.	
	Monetization of public land	Mapping of all public land within town	1	No.	The mapping and valuation of public land will help the government to use the available land in participation with private sector
		Valuation of public land and assess its value for sale or lease	1	No.	
		Utilising of public land for public purpose or using land as government contribution for attracting private developer for various project (PPP)	1	No.	
	Infrastructure development	Create dedicated funds for provision of infrastructure facilities	1	No.	A dedicated infrastructure fund will help to create better infrastructure within the planning area. With initial capital from the government, the fund can be utilised to create new trunk infrastructure. Developers must pay a levy towards the cost of off-site infrastructure. In time this process will provide enough funds for self-funding within the planning area. The County can acquire unused land and sell it after providing basic infrastructure as per the plan of that area
		All development charges collected to be put into dedicated infrastructure fund	1	No.	
		Seed capital provided by government initially	1	No.	

7 Action area plans

7.1 Introduction

An action area plan is an action oriented plan for a specific area within the planning boundary. The main objective is to provide details of road networks, facilities to be provided, measures to be taken for implementation, etc. Such plans provide the overall framework for the sustainable, phased and planned development of specific areas where significant regeneration or investment is needed to be planned and managed. Such plans address the specific challenges and issues of an area and specify the required land uses in particular locations and identify key strategic interventions for short and long terms. In the Embu Town Planning Area, three areas have been selected:

- Embu CBD
- Muthatari Junction
- River Front Development on Kathita River
- Redevelopment of County estates

7.2 Action area plan 1: Embu CBD

7.2.1 Existing situation

The CBD is located on the north western part of the town as shown in Figure 7.1. The total area of CBD is around 28.79 Ha. The main activities within the CBD include wholesale businesses, retail shops, restaurant, hotels, offices, matatu stages, stadium, etc. The CBD has numbers of informal commercial activities such as hawking of light commodities, sale of second hand clothes, food and vegetable kiosks, etc. The street pattern of the CBD indicates that it is a planned area.

As per Embu Municipality Local Physical Development Plan, there are around 3074 businesses functioning with the CBD area in year 2006. The types of business activities within the CBD are given in table below:

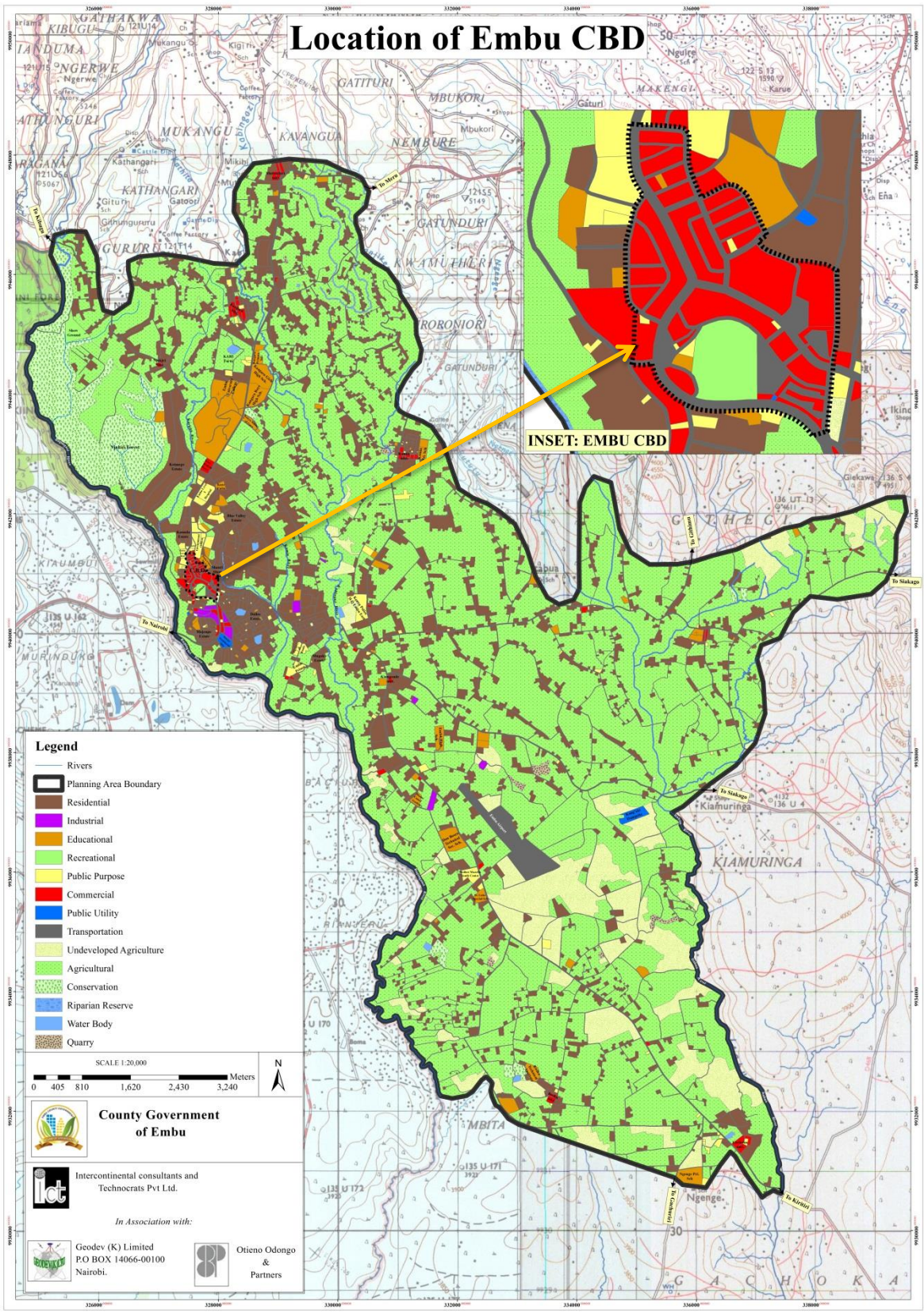
Table 7.1: Traders in the CBD

Types	Number
Large Traders	368
Medium Traders	886
Small Traders	1,588
Others	232
Total	3,074

Source: Embu Municipality Local Physical Development Plan, Draft Report 2005

The CBD is the main commercial area of the town: it serves the needs of town population as well as the population of surrounding hinterland.

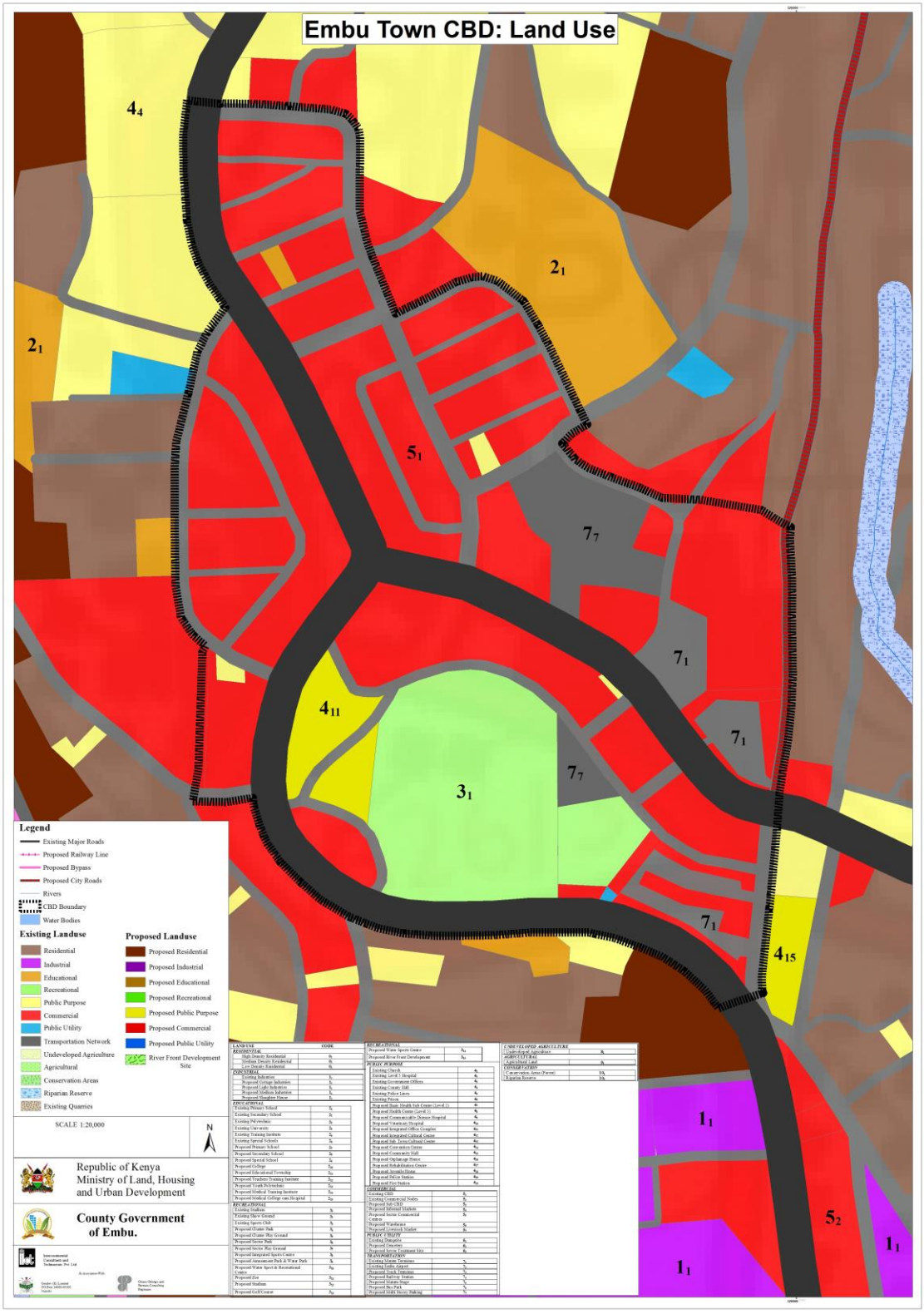
Figure 7.1: Location of the CBD within the Embu Planning Area



7.2.2 Existing land use

As shown in the Figure 7.2, most of the land is under commercial use within the CBD area. although there are other major activities namely the stadium, the bus park, two matatu stages, two schools and some office buildings.

Figure 7.2: Existing land use of Embu CBD



Issues and Challenges of CBD

- Mixed commercial activities (wholesale and retail)
- Inadequate pedestrian facilities
- Inadequate off-street parking facilities
- Inadequately managed matatu stage
- Overcrowded matatu stage
- Lack of traffic control measures
- Encroachment of road reserves
- Inadequate security for customers and business owners

Objectives of CBD Action Area Plan

- To enhance efficient transportation
- To provide more pedestrian facilities
- To provide lacking facilities within the CBD
- To improve on parking facilities
- To remove encroached road reserves
- To improve security

7.2.3 Proposed interventions

To resolve the challenges and achieve the overall objectives of the action area plan, the following interventions have been proposed within Embu CBD.

Creating a pedestrian-friendly environment

The CBD is a compact area currently marred by conflicts between traffic and pedestrians and inadequate parking arrangements. These problems will be rectified by pedestrianising the segments of Nairobi-Meru Highway (B-6) and Embu-Kiritiri Road (B-7) those passing through the CBD, as shown in Figure 7.3 below, allowing delivery trucks only in the early morning and late evening. Internal roads of the existing CBD area will be redesigned to incorporate pedestrian friendly features, which include creative paving, landscaping with shade trees and flower beds, shaded colonnades with shops and restaurants, ramps for easy access for the physically challenged. Amenities for pedestrians will be provided including ample shaded seating, drinking water fountains, tot lots for kids, street lights and poles, dust bins etc.

Traffic Circulation

Traffic inside the CBD consists mainly of three types, light goods vehicles servicing retail shops, passenger cars for work and shopping and matatus. However, because of on-street car parking and encroachment of road by hawkers, the internal roads are very congested.

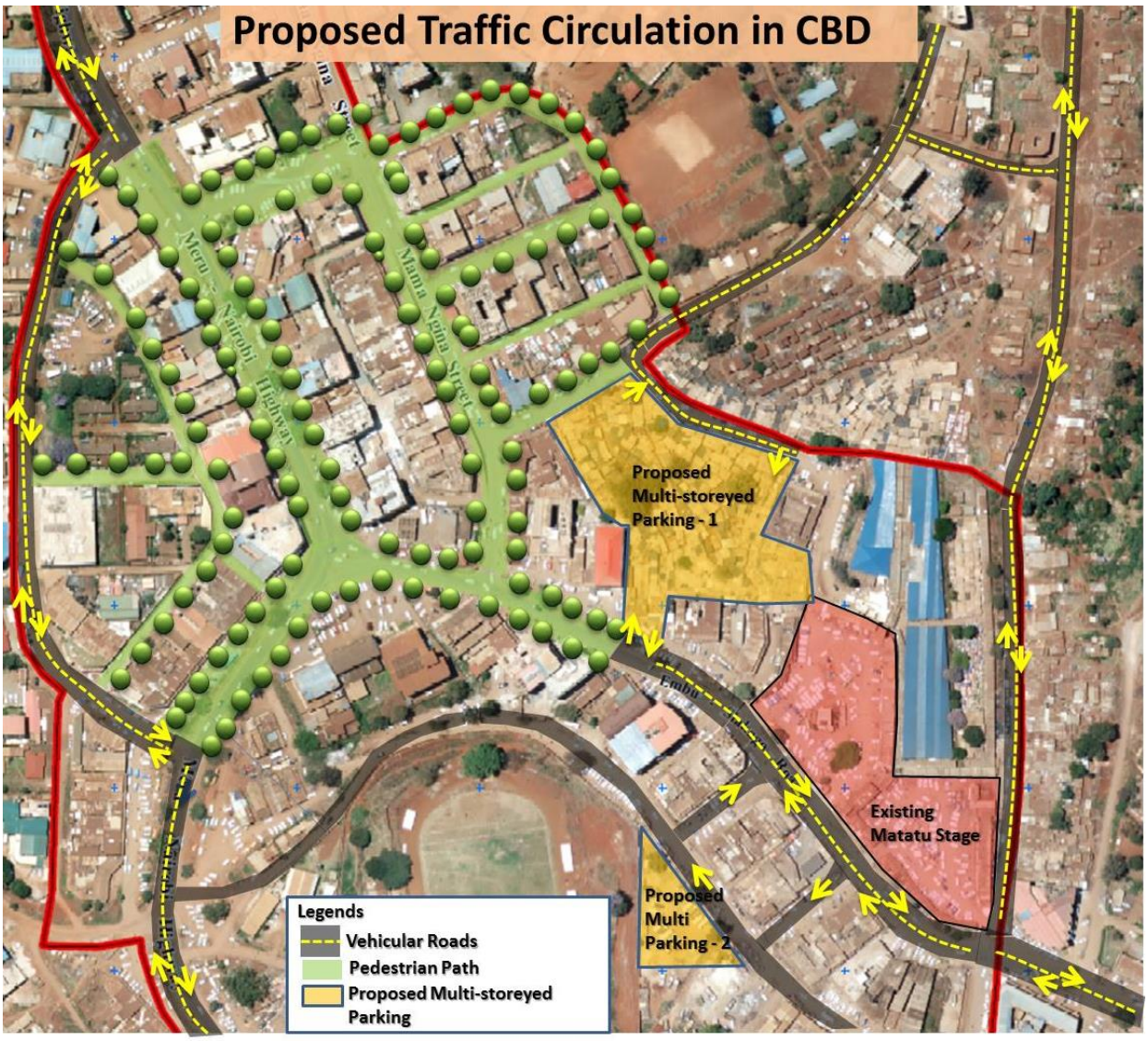
Traffic circulation can be improved by restricting goods vehicles servicing the pedestrianised area to early morning (before 8:00 am) and in the evening (after 7:00 pm). Nairobi-Meru Highway (B-6) and Embu-Kiritiri Road (B-7) are the two major roads that pass thought the CBD area. Median opening will not be permitted on Embu-Kiritiri Road (B-7) or Kubukubu Road immediate east of the intersection with B-6. On-street parking will not be allowed on Mama Ngina Street and other internal roads within CBD. Private vehicles could be parked in the multi-storeyed car park during the working hours, which will be accessible through Nairobi-Meru Highway (B-6) from north and Embu-Kiritiri Road (B-7) from south. Private cars will not be permitted within the pedestrianised area.

Providing off-street multi-storey parking

Based on the total built-up area for office and commercial uses in the CBD, there is a car parking demand of 2,368 spaces. A total future demand of 4,158 car parking spaces is projected for CBD which will be met by constructing multi-storey car park. The existing Embu-Kiritiri matatu stage located on Kubukubu Road can be developed as a multi-storey car park with the bus/matatu bays on the ground floor and commercial establishments on ground and upper floors.

The recommended development within CBD area is shown in Figure 7.4.

Figure 7.3: Planned circulation plan and parking within CBD area



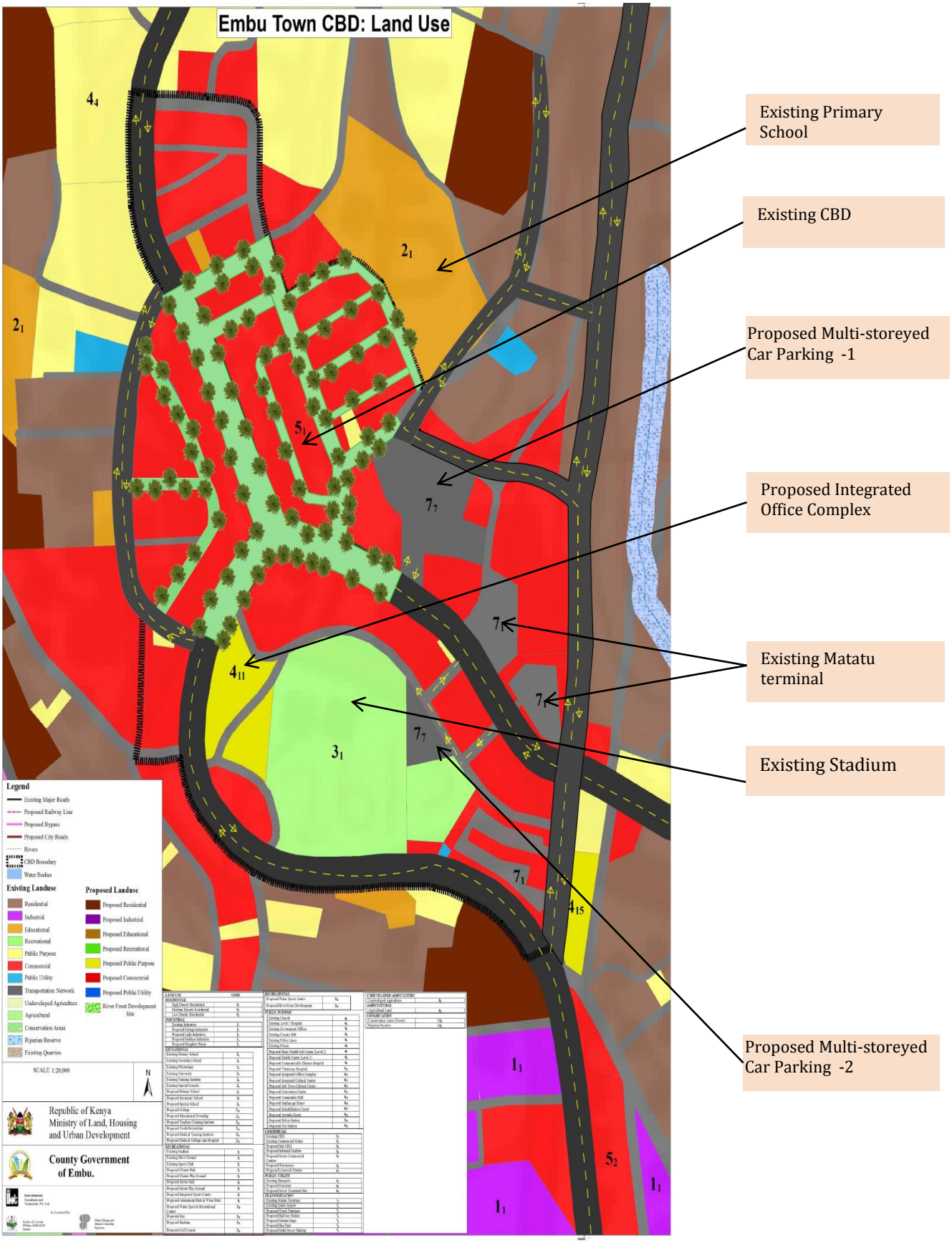
Remove encroachments on road reserves

A County government notification to remove the encroachment should be issued to free the road reserves from illegal encroachment. At the time of implementation representatives from the CBD area should be consulted and involved to make the implementation effective.

Improve Security

Considering the security of customers and business owners within the CBD area, a small police post should be opened with permanent police patrol round the clock.

Figure 7.4: Recommended development within the CBD



7.3 Action area plan 2: River front development

7.3.1 Introduction

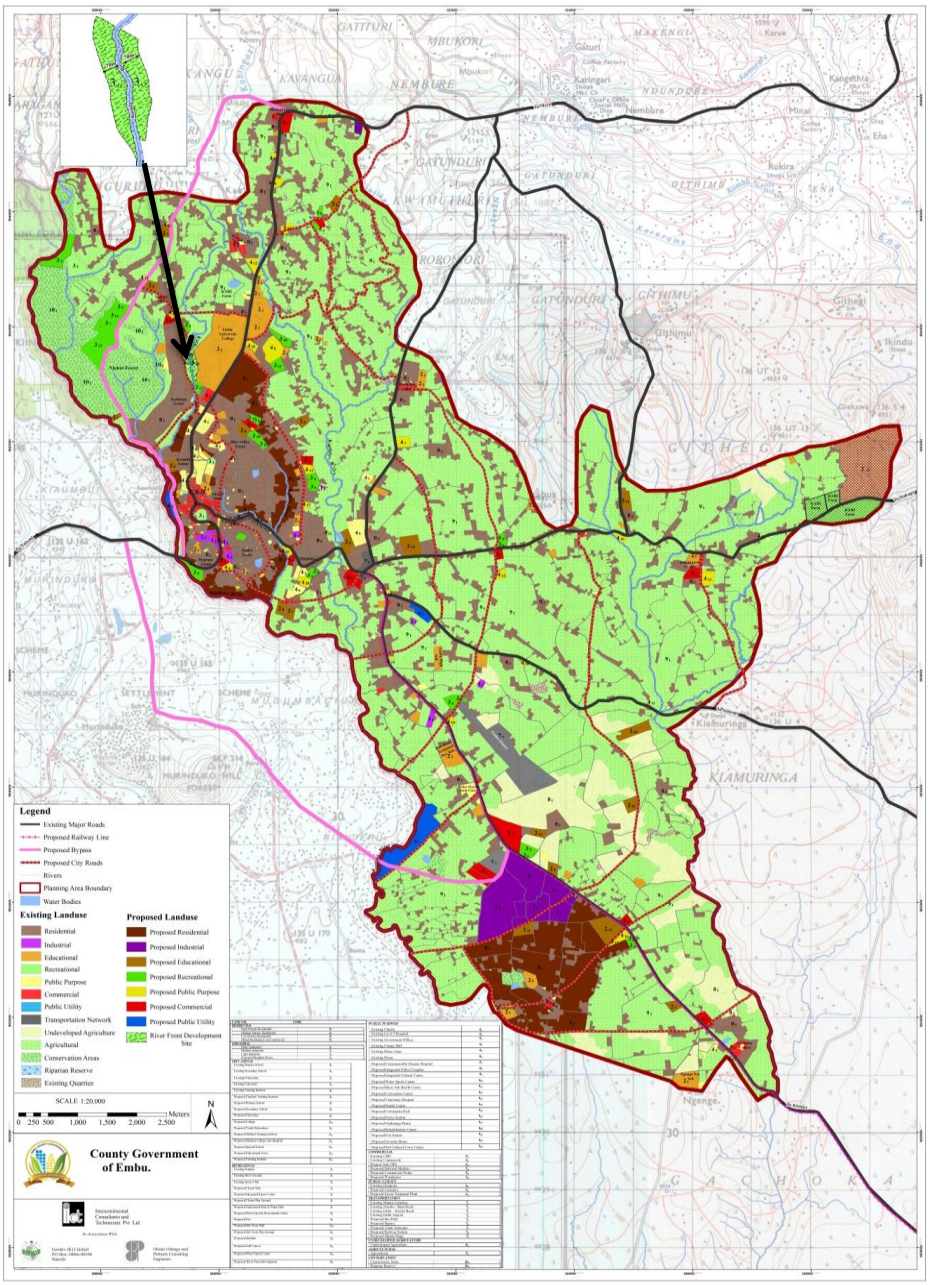
There are five rivers passing through the planning area viz. Rupingazi River, Kapingazi River, Kathita River, Kamiu River and Itabua River. All these rivers are tributaries of Rupinganzi River. One site has been selected for river front development as shown in Figure 7.5.

Such development should be planned at appropriate locations on all rivers. To provide some guidance, a broad plan has been prepared for one site on the Kathita River as presented below.

7.3.2 Near Embu University on Kathita River

The site has been selected considering the low degree of slope at that area. Kathita River is tributary of Rupingazi River and is seasonal but a small dam will help in providing water throughout the year. The area of this site is around 10 ha. This site can serve the recreational needs of people living in the north side of planning area. The location of river front development site on Kathita River is shown in the Figure 7.5.

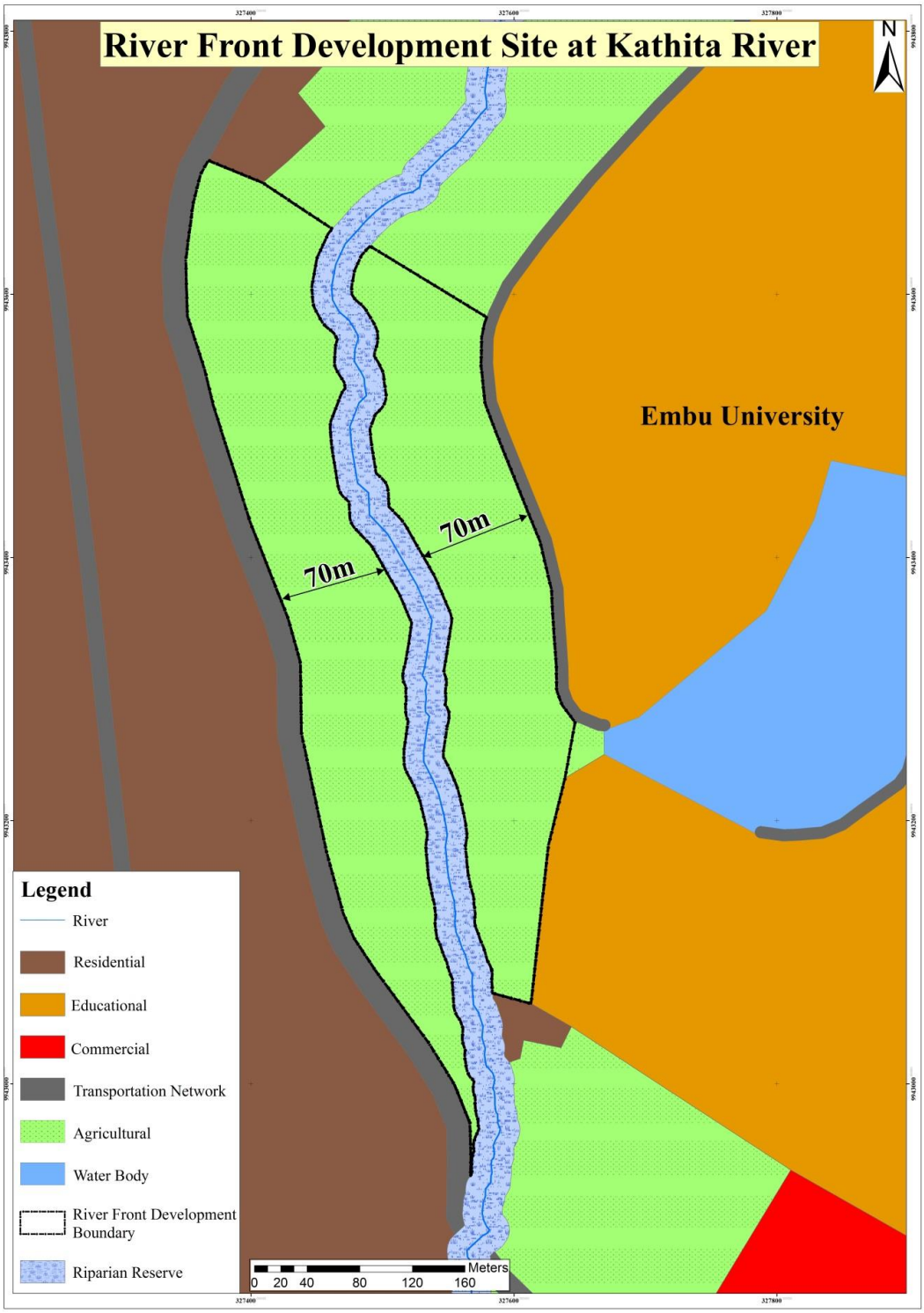
Figure 7.5: Location of two river front development sites



Existing land use of river front development sites

The current use of both sites is agriculture. The existing land use of both sites along with immediate surroundings is shown in figure below:

Figure 7.6: Existing land use of river front development site on Kathita River



Status of river front site

- Area is under agricultural use
- River is not linked with town's life
- River is not used for recreational activities

7.3.3 Objectives of river front development

- To link the river with the town
- To develop areas along river for recreational activities
- To construct a dam on the river to create an artificial lake for water sport activities

7.3.4 Proposed interventions:

To resolve the challenges and achieve the overall objectives of the action area plan, the following interventions have been proposed within the selected sites for river front development:

Construct a check dam: A check dam is planned to create an artificial lake at both planned sites for river front development. This will ensure water throughout the year, which can be used for water sport activities. A separate study will be needed for construction of the dam.

Conduct land survey: The area has to be surveyed to verify the use of the land and the ownership status.

Listing of activities to be proposed/ Land use: A suggestive list of all the activities considering the environmental sensitivity of the area is as below:

- **Public Promenades or Walkways:** The walkways can be provided along the riparian reserve on both side of the river.
- **Food Plaza:** Two food plazas on each site have been suggested to cater the demand of both sides of the rivers.
- **Picnic Spots**: Some picnic spots on each side of both rivers are planned.
- **Parking Site**: One parking site on south side of river is planned to cater the parking demand of visitors.

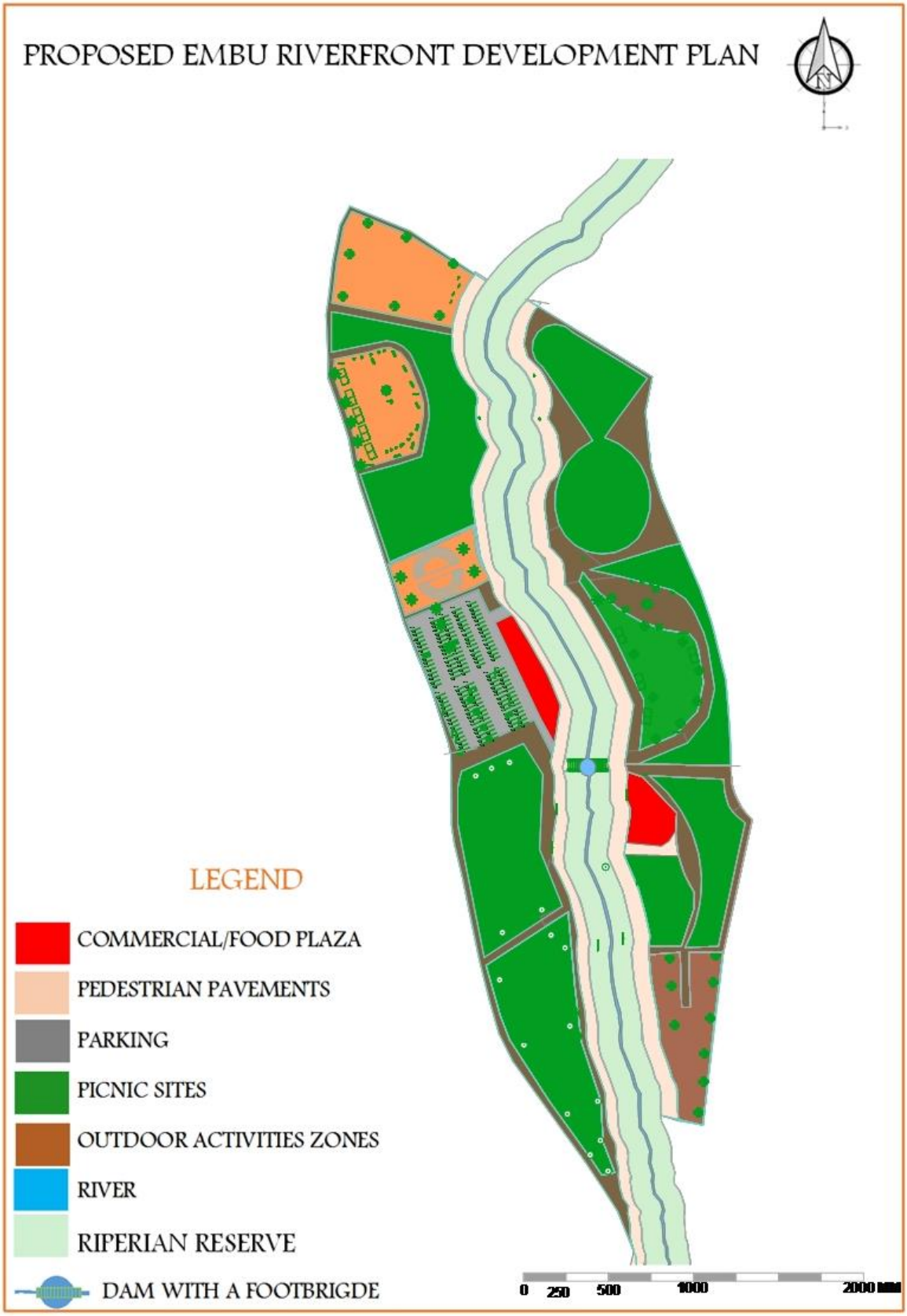
The Table below presents the zoning regulations for river front development sites.

Table 7.2: Land use zones and regulations for river front development

Type of use proposed	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio%	Maximum No. of floors allowed
River Front Development	5	10	0.2	2

The details provided here for river front development site are suggestive in nature and can be modified based on the detailed planning exercise and engineering surveys for the same. Figure 7.7 shows the location of planned activities within the river front development site.

Figure 7.7: Broad plan of Kathita site for river front development



7.4 Action area plan 3: Muthatari junction

7.4.1 Introduction

Muthatari junction is located on the Embu-Kiritiri Road (B-7) & Majimbo-Kimangaru-Riandu (R-77) intersection as shwonin the Figure below. Muthatari-Karurina-Gatunduri Road (E-629) joins R-77 within 100 metre east of the intersection. E-629 starts from Muthatari and joins Nairobi-Meru Highway (B-6) at Gatunduri located northeast of Embu.

Figure 7.8: Location of Muthatari Junction

7.4.2 Existing Conditions

Muthatara-Karurina-Gatunduri Road (E-629) is a two lane earthen road and Embu-Kiritiri Road (B-7) is a two lane paved road. Muthatari junction is a T-intersection on B-7 at present. Traffic is observed to travel through E-629 as an alternative to avoid using Nairobi-Meru Highway (B-6), due to congestion at CBD area of Embu during peak hours.

7.4.3 Issues and Challenges of Muthatari Junction

The Muthatari junction has the following main challenges:

- Unpaved Muthatara-Karurina-Gatunduri Road (E-629)
- Southside road is unpaved, staggered, narrow and not aligned with E-629
- Absence of pedestrian walkways and NMT facilities
- Inadequate street lighting

7.4.4 Objectives of Muthatari Junction Action Area Plan

- To establish road connectivity with Nairobi-Meru Highway (B-6) from south of the Muthatari junction
- To provide a bypass/alternative road of congested Nairobi-Meru Highway (B-6) through CBD during peak hour
- To develop a four lane (B-7) by two lane (R-77) intersection with through lanes and exclusive turn lanes
- To accommodate provision for signalisation
- To provide accessibility to proposed bus terminal and railway station

- To provide adequate pedestrian facilities
- To provide adequate NMT facilities
- To provide adequate street lighting arrangement

7.4.5 Proposed Interventions

To resolve the challenges and achieve the overall objectives of the action area plan, the following interventions are proposed:

Four Laning of Embu-Kiritiri Road (B-7)

Peak hour traffic on Embu-Kiritiri Road (B-7) will exceed its capacity under 2030 year projected traffic condition. In order to accommodate projected traffic, Embu-Kiritiri Road (B-7) is proposed to be widened to four lane divided carriageway from Nairobi-Meru highway (B-6) & Embu-Kiritiri Road (B-7) intersection up to Muthatara.

Paving of Majimbo-Kimangaru-Riandu Road (R-77)

Based on projected traffic and importance of connectivity between Muthatari and Kimangaru and Riandu area, R-77 road is proposed to be improved to a paved two lane carriageway facility with pedestrian path and cycle lanes.

New Alignment of Link Road from Dallas to Majimbo

The existing road track from sewage treatment plant on Nairobi-Meru Highway (B-6) connects Dallas area with B-6. A link road from south of Dallas area is proposed to be developed with a new alignment between Dallas and Muthatari area as presented in Figure 7.9.

At-Grade intersection Improvement at Muthatari Junction

Exclusive left turn lanes and receiving lanes on Embu-Kiritiri Road (B-7) and on Majimbo-Kimangaru-Riandu Road (R-77) are proposed at Muthatari junction to facilitate uninterrupted movement of left turning traffic. Following provisions for incremental improvements are to be incorporated in the intersection design,

- Provisions for signalization of Muthatari junction
- Grade separated flyover on R-77 and Link Road over Embu-Kiritiri Road (B-7)

Based on projected traffic demand due to opening of bypass route for Merubound traffic, Muthatari junction could be signalized. Further increase in traffic volume in the junction, a grade separated option could be assessed and implemented if deemed necessary. A two lane Majimbo-Kimangaru-Riandu Road (R-77) flyover crossing Embu-Kiritiri Road (B-7) could ensure a smooth traffic flow in Muthatari junction under projected traffic.

Proposed Development

A bus terminal is proposed at northwest of the Muthatari junction with an approximate area of 5.25 hectares. Land is allocated for a railway station at the southeast corner of the Muthatari junction. Figure 7.9 presents Muthatari junction with proposed developments.

Figure 7.9: Muthatari Junction and proposed developments

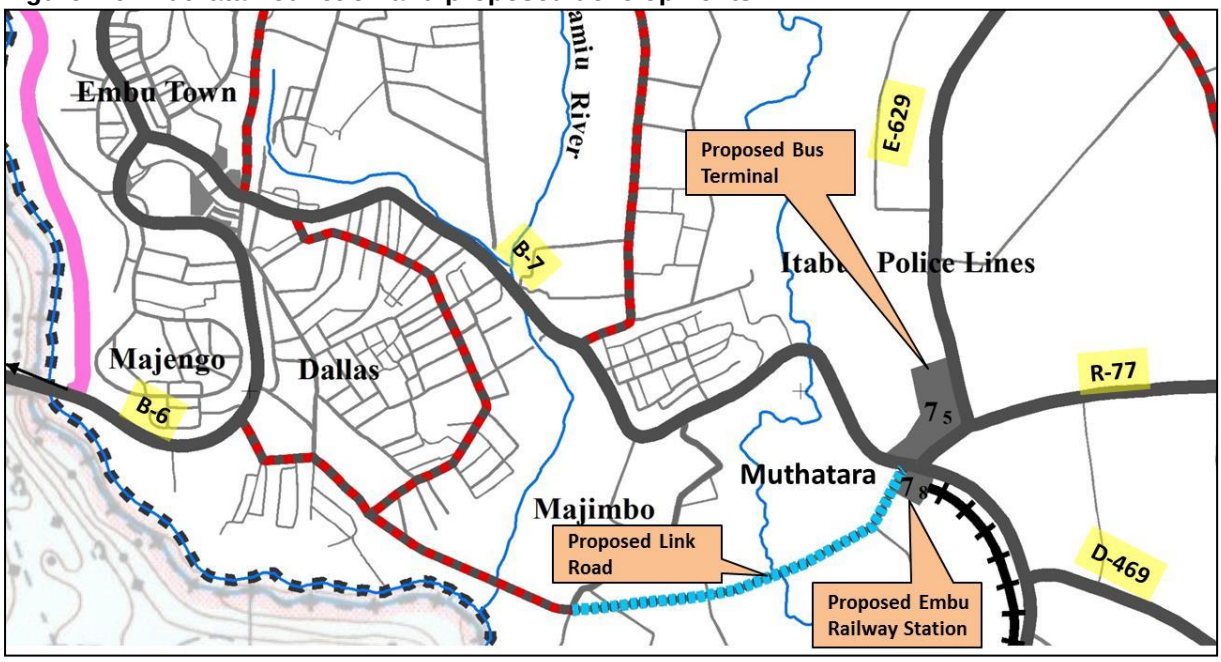


Figure 7.10 presents proposed lane configuration of Muthatari junction. It includes four lane Embu-Kiritiri Road (B-7) and two lane Majimbo-Kimangaru-Riandu Road (R-77), exclusive turn lanes at all four directions. Figure 7.11 presents proposed flyover options along Majimbo-Kimangaru-Riandu Road (R-77) over Embu-Kiritiri Road (B-7).

Figure 7.10: Proposed Muthatari Junction in Embu

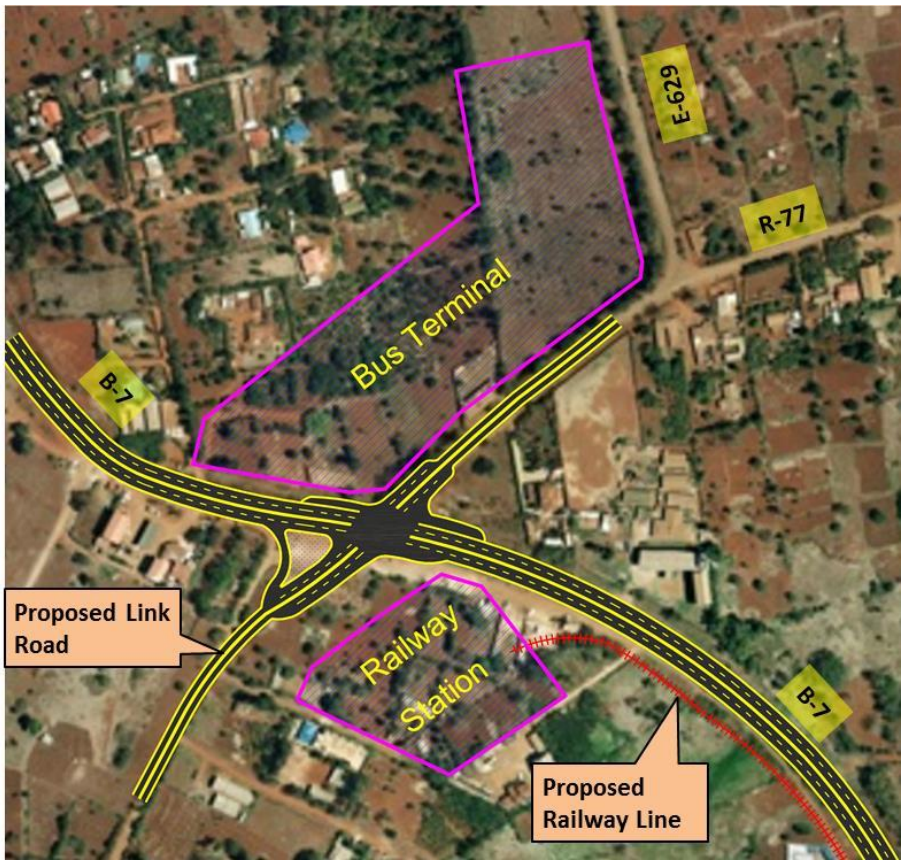


Figure 7.11: Proposed Flyover at Option at Muthatari Junction

Figure 7.12 presents views of the proposed flyover option along R-77 crossing over the Embu-Kiritiri Road (B-7).

Figure 7.12: Schematic views of flyovers for proposed Muthatari junction

The following facilities will also be provided along with junction improvements.

- Street lighting
- Pedestrian walkways on both sides of the R-77 and B-7
- Cycle tracks on both side of roads
- Ramps and railings at all entry and exit points

7.5 Action area plan 4: Redevelopment of County estates

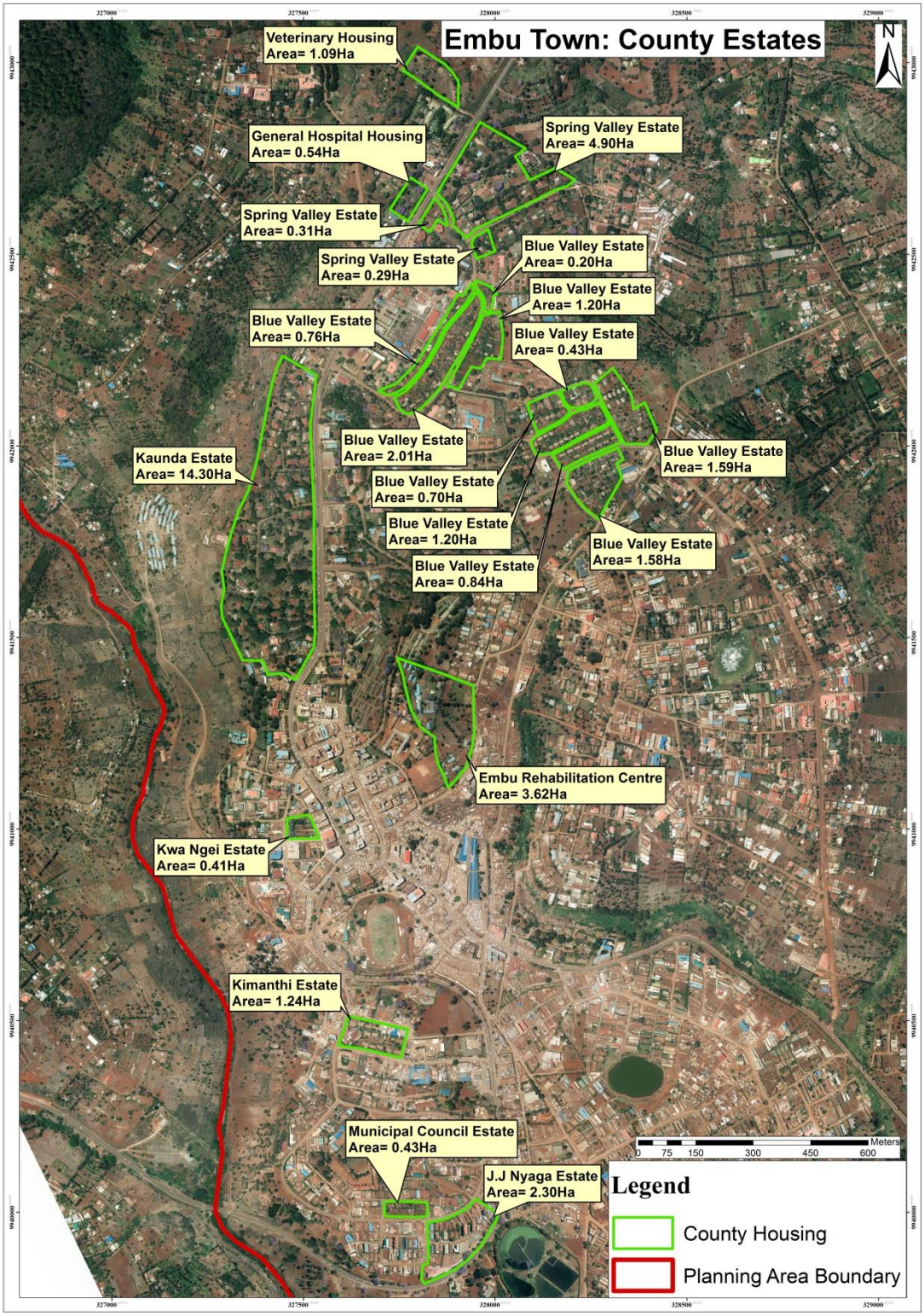
7.5.1 Existing situation

The locations of various County estates are shown in Figure 7.13. As presented below, there are total 22 government estates, which provide residential accommodation to government employees. The total area of these county estates is around 40ha. The main common attribute of these estates is that these are sporadically spread with very low population density and some of these estates are very old and in dilapidated condition.

Table 7.3: Detail of County estates

Sl. No.	Estate	Area
1	Kaunda Estate	14.30
3	J.J. Nyaga Estate	2.30
4	Municipal Council Estate	0.43
5	Kimanthi Estate	1.24
6	Kwa Ngei Estate	0.41
7	Embu rehabilitation centre estate	3.62
8	Blue valley estate	1.58
9	Blue valley estate	1.59
10	Blue valley estate	0.84
11	Blue valley estate	1.20
12	Blue valley estate	0.70
13	Blue valley estate	2.01
14	Blue valley estate	0.43
15	Blue valley estate	0.76
16	Blue valley estate	1.20
17	Blue valley estate	0.20
18	Spring valley estate	0.29
19	Spring valley estate	4.90
20	Spring valley estate	0.31
21	General hospital estate	0.54
22	Veterinary Housing estate	1.09
Total area (ha)		**39.94**

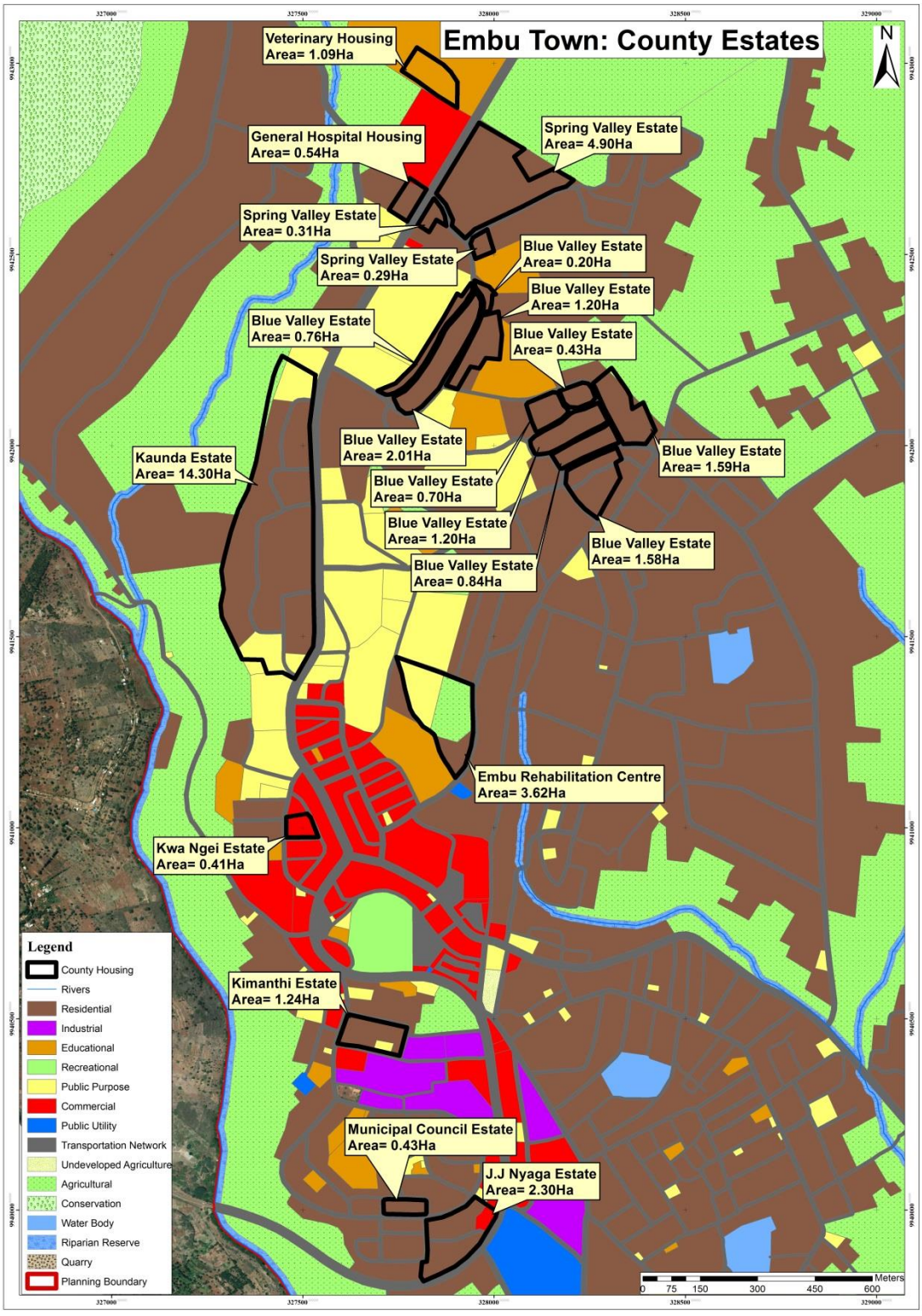
Figure 7.13: Location of the County estates within the Embu Planning Area



7.5.2 Existing land use

All the county estates are under residential use as shown in figure below.

Figure 7.14: Existing land use in county estates



Issues and challenges of the County estates:

The County estates have the following main challenges:

- Low density development
- Old dilapidated buildings
- Encroachment of undeveloped land
- Inadequate basic infrastructures

Objectives of the Action Area Plan

- To enhance the density
- To redevelop the estates
- To remove the encroachment
- To provide basic infrastructure

7.5.3 Proposed interventions

To resolve the challenges and achieve the overall objectives of the action area plan, the following interventions are planned within the County estates.

Remove encroachments on road reserves

A County notification to enforce the removal of encroachments should be issued. At the time of implementation of the County will need to involve representatives from the local citizens to make the implementation effective.

Demolish the old dilapidated estate

After removing the encroachment, the old low density houses will be demolished to create space for new development. The county may start with the oldest county estate for redevelopment.

Plan the estate for high density new development

A detailed plan of each county estate shall be prepared by the County with land allocation for different sizes of plots or multi-dwelling units/flats. The detail plan will also indicate the layout of all infrastructure aspects like water supply, drainage, road network, sewerage, street light, etc.

Service the land with basic infrastructure

As per the detailed plan of individual estates, the county shall service the land with basic infrastructure on ground.

Develop the land for high density development

After servicing the land, the County will construct the houses as per the zoning regulation of individual estates.

Option of Public Private Partnership (PPP)

The County may like to involve the private developers for the redevelopment of estates if it is not possible for county to do the same due to limitation of resources. Under the PPP option the County can engage the private developer by offering the land. Based on the type of development and quantity of various housing units, commercial area, park, etc. will be known and the County can discuss and negotiate with the private developer and based on agreement, the developer will be allowed to sell some developed units to recover the cost of all development and remaining units will be transferred to the County.

Improve Security

To enhance the security of customers and business owners within the CBD area, a small police post should be opened with a permanent police patrol round the clock.
The zoning regulations of county estate as part of residential development are given in Chapter 8.

7.5.4 Kaunda estate calculation

As an example, the basic calculation for one County estate i.e. Kaunda estate, is presented for general reference. As shown in the below table, the total area of the estate is 14.3ha and with a population density of 60 family per ha (240 person/ha), around 858dwelling units can be constructed on the land available within Kaunda estate. Currently around 95 housing units are developed in the whole area, which states that the land is highly underutilised.

Table 7.4: Basic calculation for land requirement for redevelopment of Kaunda Estate

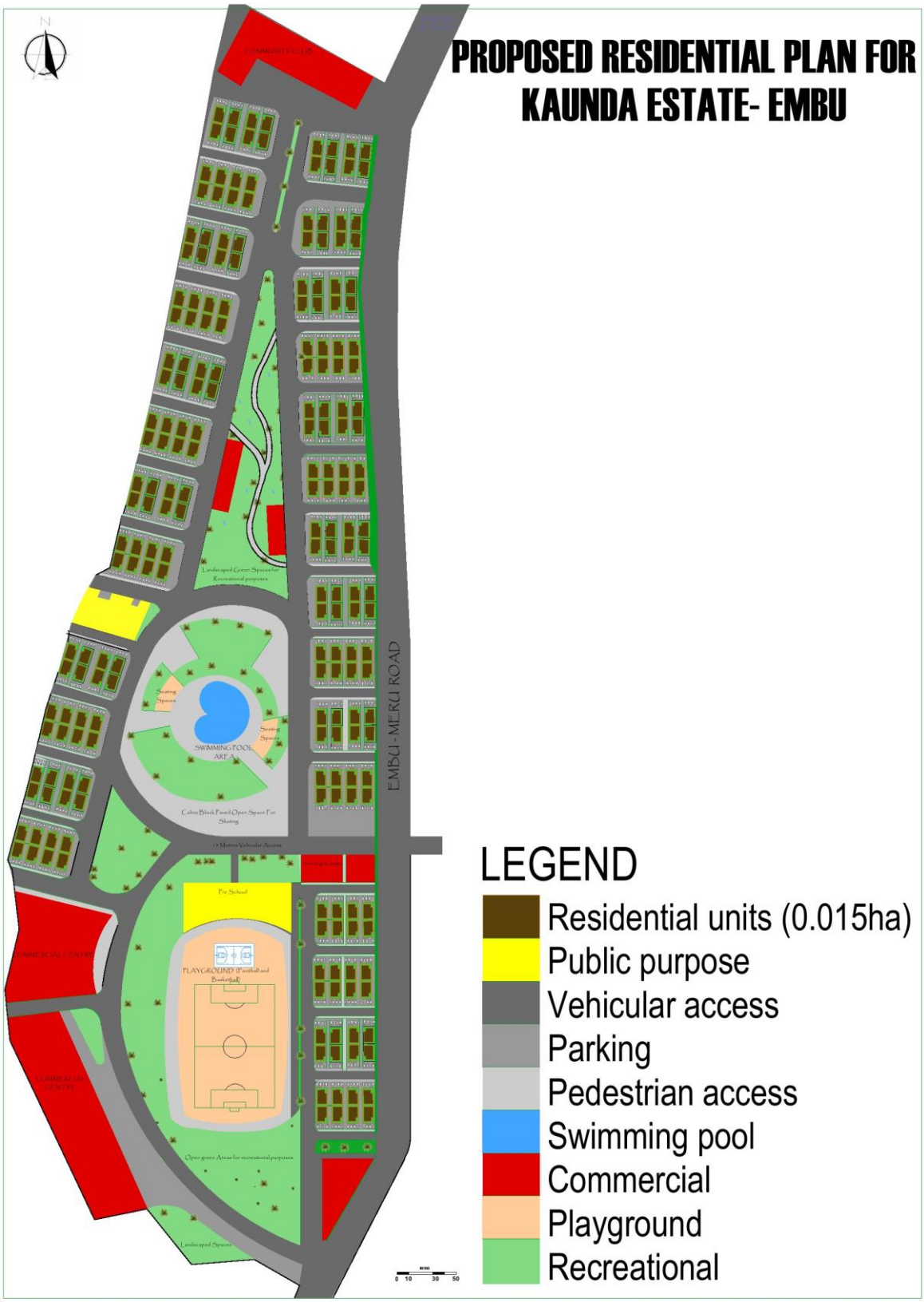
Type	Quantity
Housing units and population	
Area of estate(ha)	14.3
Population Density (dwelling units per ha)	60
Population Density person/ ha)	240
Total No of dwelling unit to be accommodate (against the existing 95 units)	858
Approximate population (4person/family) to be accommodated	3432
Parking	
Parking requirement (@one car per one unit of 2 bed room)	858
Area under parking (@38M2/car space, area in m^2) for 3 storeys	**32,604**
Other Facilities	
Estate park (area in m^2)	**1,000**
Estate park (area in m^2)	**1,000**
Estate park (area in m^2)	**1,000**
Neighbourhood park	**5,000**
Neighbourhood playground	**5,000**
2 Day care centre (area in m^2)	**2,000**
Community Club(area in m^2)	**2,000**
Swimming pool(area in m^2)	**1,000**
Commercial (area in m^2)	**3,000**
Plot size	150
Plot coverage	60
Carpet Area	90
Plot ratio	2.5
No of storeys	4
No. of house on one plot	4
No. of ground plot required	205.92
Total area under residential units (m^2)	**30,888**
Area under circulation (around 25% of total area) (m^2)	**37,180**
Area for other activities/utilities (m^2)	**21,328**
Total area under all uses(m^2)	143,000

Table 7.5: Broad land use of Kaunda estate

	Area	%
Area under Residential	30888	21.6
Parking	32604	22.8
Road	37180	26.0
Facilities	21000	14.7
Other Activities	21328	14.9
	143000	100.0

The above tables suggest that with medium population density of 60 dwelling units/ha, around 858 housing units can be developed on the land available in Kaunda estate after leaving enough land for basic infrastructure and services. The layout plan of Kaunda Estate for redevelopment is shown in Figure 7.15 overleaf.

Figure 7.15: Layout Plan of Kaunda estate



8 Development control and zoning regulations

8.1 Introduction

Effective development control is essential if planning is to achieve its objectives.

History has shown that urban planning has suffered from two main problems.

The first is the fact that statutory plans either do not exist, or are very out of date. This project, with its emphasis on **Strategic** planning is intended to recognise the problem of plans going out of date: a strategic plan goes into detail by phases, typically five years at a time, and thereby can respond to changing economic and social circumstances.

The second is that development control has been very weak. Political and economic pressures to make a special case for specific developments have been addressed by preparing Part Development Plans. These, by (essentially) planning piecemeal, make a mockery of the concept of adhering to a single urban plan.

Two things should be different with the coming into effect of this ISUDP.

- **By having a digital cadastral map of the entire urban area it will be possible to identify, with certainty, the zoning of a specific parcel of land. Furthermore planning consent can be linked to other matters affecting the land, such as access to services, Rates valuation, etc.**
- **Development can be phased in a structured way. Thus development should not be permitted on land which is not zoned for development in the current five year period. This allows servicing to keep in line with land development.**

The duty to control development lies in the Physical Planning Act, which, although it is out of date in several respects[1] provides the legislative powers necessary. Below, the powers and duties bestowed by the Act are discussed in detail.

8.2 Implementation

8.2.1 Powers and Duties under the Physical Planning Act. Cap 286 (1996)

Planning is subject to legislative control, and if there is an approved physical development plan the local authority[2] is bound to follow it. The table below examines selected provisions of the Act, as far as they affect development control.

[1] Possibly two respects: (1) Local Authorities have been replaced by Counties for the time being, though it is hoped that municipalities and cities will be established in the near future; (2) The Director of Physical Planning must initiate plans and the Minister approve them – it is not clear whether this still applies

[2] The previous designation of local authority is outdated by current legislation. No doubt this anomaly will be rectified in the forthcoming revised Physical Planning Act. In the remainder of this discussion. where not quoting from legislation, the term County will be used.

Section		Comment
Powers		
29 (a)	Each local authority "shall have the power to prohibit or control the use and development of land and buildings"	This means that **no land** can be used and **no buildings** erected unless the development is approved
29 (b)	Each local authority "shall have the power to control or prohibit the subdivision of land"	
31 (2)	(a)The applicant must surrender land for purposes of principal and secondary means of access to any subdivisions, and (b) public purposes consequent upon the proposed development	
Duties		
24, 26	Director of Physical Planning shall publish a notice in the gazette	Although the Act assumes that the initiative should be taken by the Director, the County Planning Act Section 111 gives counties the powers to prepare "city or municipal land use plans"
28	Minister shall publish approval of local physical development plan in the Gazette	See above
32 (3) (a)	The Local Authority is "**bound** by any relevant regional or local physical development plan"	The word "bound" is very important: there is no discretion in the matter
32 (3) (b)	The Local Authority shall "have regard to the health, amenities and conveniences of the community generally"	This clause is especially relevant in considering any conditions to be attached to development permission
32 (3)	"The Local Authority shall, when considering a development application . . (b) have regard to the health, amenities and conveniences of the community generally and to the proper planning and density of development"	This is an important provision, giving the County the duty to look at wider issues.
32 (4)	"If any application requires subdivision or change of user of any agricultural land, the Local Authority shall require the application to be referred to the relevant Land Control Board	
41	(3) "Where in the opinion of the Local Authority an application in respect of development, change of user or subdivision has important impact on contiguous land . . . the local authority shall . . . publish the notice of application in the Gazette. (4) If the local authority receives any objection to . . . an application . . . it shall afford the applicant an opportunity to make representations".	

8.2.2 Application of the Act

The powers to control development are based on the existence of a local physical development plan approved by the Minister. Once this step has been concluded application for development permission should follow the steps outlined below.

Subdivision

Subdivision of land covered by an approved Physical Planning Act must be in conformity with the provisions of the plan, unless the land is zoned agricultural, in which case different considerations apply (see below). Subdivision limits should be stated in connection with the zoning regulations: for example there will be a minimum size for certain land uses, such as industrial and residential. The plan may also specify maximum sizes, though this is unusual.

If a proposed subdivision conforms to the standards specified for the zone within which the land lies, then it **must** be approved as the County must rely on objective criteria in assessing an application.

If the land in question is zoned agricultural, then different considerations apply. The application must be referred to the Land Control Board, which may consent to or refuse the application. Provided that the Land Control Board approves the subdivision, the County should issue the approval in terms of the Physical Planning Act.

If the proposed subdivision "has important impact on contiguous land" then the County has the duty to give notice to the adjoining land owners so that they have an opportunity to comment on, or object to, the proposal. The County must consider any comments or objections, but it is duty bound to arrive at its own decision on the matter after taking these views into account.

Change of User

An application for change of user must be assessed in terms of the Physical Development Plan. The County is not at liberty to approve an application that is not in conformity with the Physical Development Plan, as it is "bound by" the provisions of the plan. Likewise it is not at liberty to refuse an application that conforms to the Physical Development Plan.

The provisions of the Physical Development Plan concern five attributes:

The proposed land use
This must be checked relative to the prescribed zone within which the land falls – for example residential, industrial, educational etc. Within each use class there may be certain land permissible uses which, under the zoning regulations, are permissible within that zone. The case of residential zoning is the clearest example. As shown on the box below, there are permitted uses which are not residential: if they conform to one of the other uses specified in the table consent must be given. On the other hand attention must be given to uses that are not permitted.

Permitted Uses: Residential Zones

- Residence – Bungalow, maisonette, multi-family dwelling (multi-storey flats/apartments), row housing, detached, semi-detached, residential-cum-work,
- Hostels, renting houses, old age home, community hall, police post, guest houses (not exceeding 200 m^2 in floor area),
- Day care centre and kindergartens,
- Corner shops, small shopping centres, health facilities (dispensaries, nursing home, etc.),
- Educational buildings, religious premises, library, gymnasium, park, technical training centre, exhibition and art gallery, clubs, banks/ ATM, matatus stop/boda boda stand (not exceeding 100 m^2 in floor area), post offices, hostels of non-commercial nature, etc.

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 m^2 in floor area), 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, police stations,
- Public utility buildings like electrical distribution depot, water/sewerage pumping stations, water works, fire stations, telephone exchanges/ mobile tower, matatus station/ boda boda stand (occupying a floor area not exceeding 200 m^2).

Prohibited Uses

All uses not specifically permitted as above are prohibited in residential zones including the following:

- Heavy, large and extensive industries : noxious, obnoxious and hazardous industries,
- Warehousing, storage go-downs of perishables, hazardous, inflammable goods,
- Workshops for matatus/ boda boda/buses etc.,
- Slaughterhouses, hospitals treating contagious diseases (TB)
- Wholesale market, sewage treatment plant/disposal work, water treatment plant, solid waste dumping yards, outdoor games stadium, indoor games stadium, shooting range, international conference centre, courts, sports training centre, reformatory, garrisons, etc.

Subdivision size

Under the zoning regulations there are regulations regarding subdivision size. In the table below are typical regulations regarding minimum subdivision sizes for different types of industrial development, each of which will be zoned on the plan.

Zone	Type	Min. Plot Size (Ha)	Max. Ground Coverage (%)	Plot Ratio	Maximum No. of floors	Set-Backs		
						Front	Side	Rear
1_1	Large Industry	10	75	1.5	2.00	12	9	9
1_2	Medium Industry	2	75	2.25	3.00	9	5	5
1_3	Light Industry	0.05	75	1.5	2.00	6	3	3
1_4	Slaughter House	2	75	1.5	2.00	9	5	5

Land utilization

Columns 4, 5 and 6 above (ground coverage, plot ratio, and number of floors) illustrate the land use criteria for a particular use class. The application must “show the proposed use and density”, and for this building plans are required. These must include a site plan showing the percentage of land covered and the location of the building(s) in relation to the boundaries. In addition the application must show the building design in sufficient detail to demonstrate that it conforms to the requirements of the table above.

If a proposed building does not conform to the zoning requirements, whether in terms of user or utilisation of the land relative to the appropriate specification for that use class, development permission must be refused.

Land for public purpose
The developer of the land must be willing to "surrender land for purposes of principal and secondary means of access" (s 31(2) (a)). In practice this means that land required for roads is transferred from private to public ownership, and the plans must demonstrate that sufficient provision is made for roads. The County has the duty to ensure that the road widths are sufficient for the purpose, as demonstrated by their policy on road widths for different classes of road.

It must also be willing to surrender land for "public purposes consequent upon the proposed development" (s 31(2) (b)). In determining the amount of land to be set aside the County will need to have regard to the scale of the development. The Physical Development Plan should include guidance on this matter. For example under this ISUDP for each neighbourhood of 5,000 people 3.25Ha must be provided for a Primary School.

Health, amenities and convenience of the community generally
The County, "when considering a development application" shall have regard to the health amenities and conveniences of the community generally and to the proper planning and density of development". This requires that if a development is proposed that is not linked to a water supply and sanitary sewers, and/or is remotely located so that the residents cannot enjoy the convenience of proper planning there are good grounds for refusal even though the zoning may be in conformity with the approved Plan. It should be noted, however, that refusal on grounds of this requirement must only be done if the facts are very clear. If not the decision could be attacked on grounds of irrationality.

8.2.3 Summary
If the application meets the requirements of all of the following it must be approved.

- Zoning
- Subdivision size
- Land use/plot coverage criteria
- Provision of land for public purposes
- Having regard to aspects of health and amenities

If it does not conform to any one of the above criteria is must be rejected.

8.3 Establishing a more efficient system
Stakeholder consultations revealed many complaints about the current development control system. It is recommended that the following procedures should be adopted.

1. All fees for planning applications and building permits should be ring-fenced to pay the salaries of the staff employed. This should allow a stronger team of planning staff and building inspectors.
2. All planning should be linked to a GIS data base, thus allowing consistent and fair application of the subdivision and zoning regulations.

Procedure to assess development application in terms of subdivision is presented in Figure 8.1 and Procedure to assess development application in terms of change of use is presented in Figure 8.2.

Figure 8.1: Procedure to assess development application in terms of subdivision

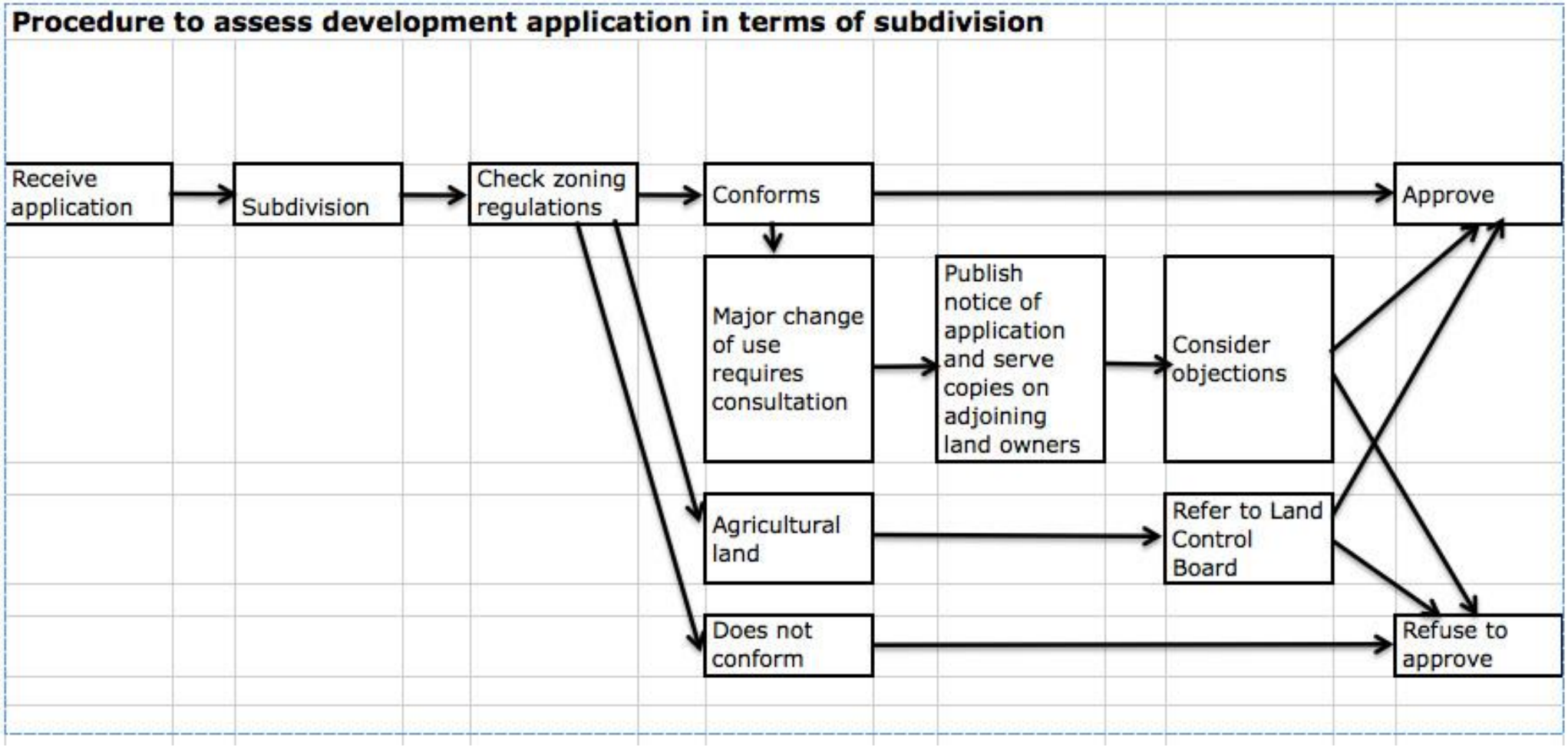
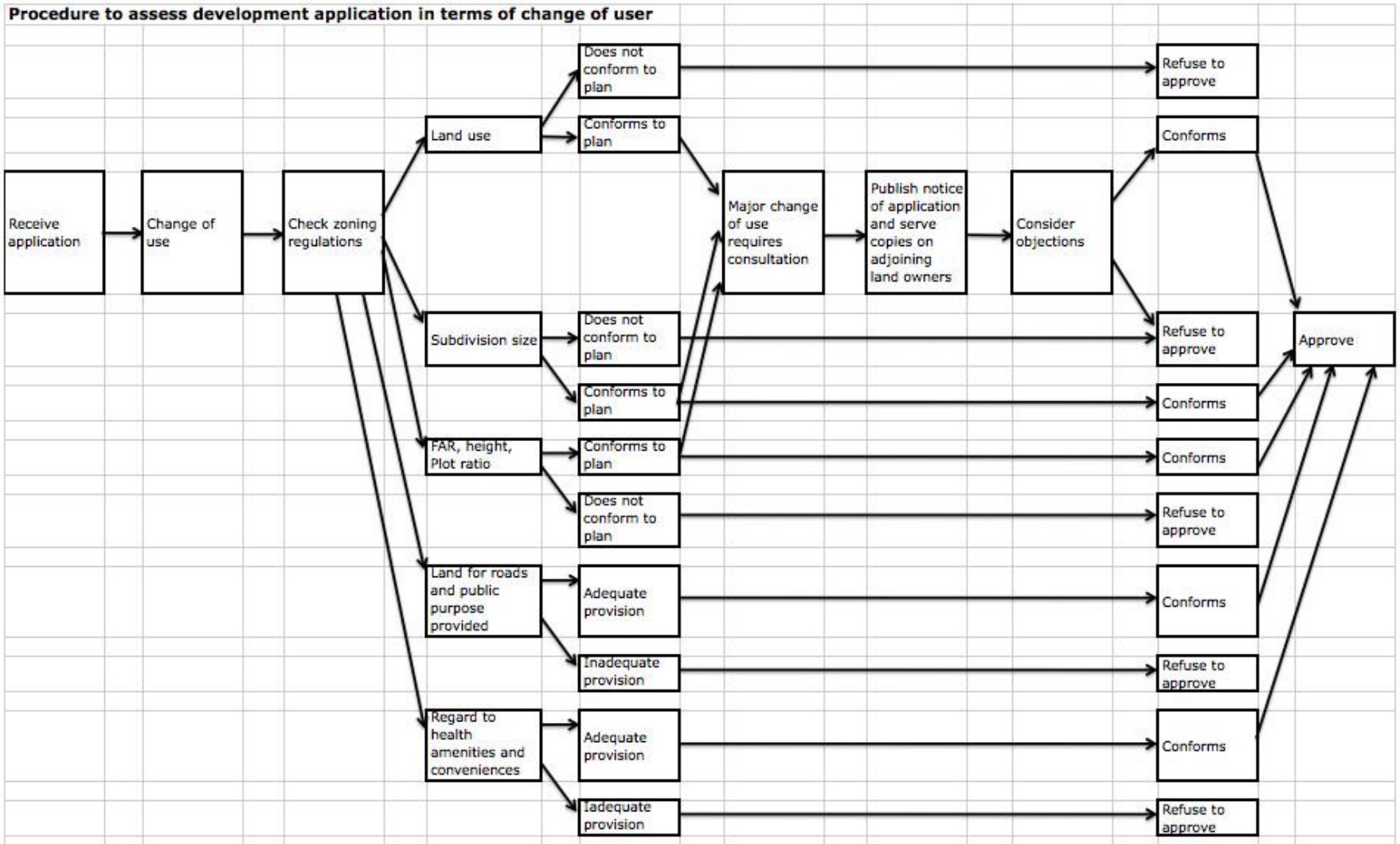


Figure 8.2: Procedure to assess development application in terms of change of use



8.4 Zoning

8.4.1 Why zone?

The demand for modern planning arose in the 19th century from the outcry caused by noxious factories locating themselves next to residential neighbourhoods, and the need to suitable access roads, water and sewerage.

A long time has passed since then, and the tools for planning have become increasingly powerful. However, the model of the "Development Plan" which was formulated in the 1940s in Britain, in part to guide the redevelopment of post-war Britain, has been found inappropriate in developing countries[3].

There are two reasons for this:

The development plan was designed for a society that was changing relatively slowly

It was designed for a period in which the major urban growth had already taken place – in the 19th Century, as a result of the industrial revolution, the construction of the railway network, and improved public health in urban areas.

Conditions in the developing world have been very different. On the one hand, urbanisation, especially in Africa, has been rapid to an unprecedented degree. On the other, systems for control, funding for infrastructure, and the poverty of many inhabitants have undermined the good intentions of planners because urbanisation has taken place too fast.

However, there is evidence that the very rapid urbanisation of the past twenty or thirty years is slowing down. Moreover increasing attention is being given to matters of good governance and community participation. These two factors might be conducive to a more orderly urbanisation. Coupled with this is an important realisation of the importance of pro-active planning: being one step ahead, so to speak, instead of one step behind.

For example much urban growth in Kenya has been highly scattered and uncoordinated, resulting in development that is impossible to service efficiently. Moreover, due to the lack of effective planning controls bad neighbour uses such a noxious or noisy industry, solid waste dumps or sewage treatment works are developed side by side with residential, educational or health facilities, for example.

In this matter zoning is therefore of crucial importance. By designating the type of development that should take place in spatial terms planners can ensure that infrastructure is provided economically and efficiently.

8.4.2 The problem of rapid change

The history of statutory development plans in Kenya, and most of Africa, is that they are overtaken by rapid urban growth. Planners watch helplessly as they find demand for development in areas outside the official planning area, or multiple demands for change of user from the public. In a word, the plan becomes outdated very quickly. Typically the plans have been prepared by consultants, and the preparation period was often two or more years. Even after preparation there was a cumbersome official approval process. The process was therefore slow and expensive, and beyond the control of the working planner.

As a result of becoming outdated, the plans became redundant, so planners were effectively forced to prepare ad hoc "Part Development Plans" which, in fact, often legitimised scattered and uncoordinated land uses. They were placed under considerable pressure from members of the public and elected representatives to approve such development in the broadly held view that land owners had a basic right to develop their land as they wished.

[3] "Local Physical Development Plan" and "Development Plan" are similarly used in Kenya's Physical Planning Act

The problem was compounded by the rapid growth of informal settlements by people who could not afford conventional housing and who chose to take the law into their own hands. In Kenya this is aided by landlords who build the maximum lettable space for the minimum cost, without meeting building or planning regulations. The problem has escalated due to the lack of affordable land or housing, so in the majority of cases the poor have had no alternatives.

8.4.3 The concept of strategic planning

Strategic planning differs from the traditional statutory development plan in one very important way: it recognises that circumstances change and that plans must also be open to change. However, this does not mean that they should not be followed, but rather that the facility to change should allow them to respond to rapidly evolving social and economic factors.

A strategic plan therefore provides guidance not for the unrealistic timeframe of 20 or 30 years, which was what the traditional development plans aimed to do, but rather the next five or so years. By being flexible in the long term it offers certainty in the short term. This is crucial in the matter of zoning.

To explain in more detail. A well-designed strategic plan provides a framework for urban development over a thirty year period. This framework will designate the location and expected degree of urban growth and will identify the routes of all major arterial roads within that area, thereby protecting their routes for development when necessary. The strategic plan will also designate the areas that are expected to be developed over the next five years. Detailed zoning will be undertaken within this short-term development area, together with infrastructure development for the land being urbanised.

At least every five years a major review of the plan should be held, but in practice the plan should be reviewed and updated *annually*. This will allow the plan to respond to changing circumstances in terms of the rate of growth or the demand for different uses. In this way, planning will always be ahead of the process, rather than struggling to keep up with it.

8.4.4 Zoning in the context of strategic planning

In workshops held in Cluster III towns stakeholders complained about zoning matters. The two most common problems were housing being built without following by-laws and people building high-rise housing in single or two storey estates. The explanation offered by offending users is typically “there was no alternative”.

Thus the aim of a strategic plan should always be to be one step ahead in terms of zoning more land for each user-type than is required for immediate future. This is crucial in terms of housing as it has the effect of reducing land prices.

8.4.5 The need for zoning also to be strategic

Mixed uses

The traditional application of zoning was for each zone to be designated for a single use, and mixed use zones were typically not provided for. However, as discussed above, urban experience throughout the world has demonstrated the value of mixed-use development.

Mixed uses have a number of valuable advantages in inner city areas. The concept allows shop-owners to live near their enterprise. It allows small business to acquire premises at relatively low cost. It reduces travelling time for users. It prevents the phenomenon of dead space at night, thereby enhancing security. Moreover it is cost and space effective.

In residential areas there are also advantages. By allowing small shops and market stalls, the operation of child care and early learning facilities, and small industrial enterprises such as tailoring which have no polluting impacts, the residents have access to increased convenience. Those who operate such facilities have the advantage of being able to work from home. Small offices, provided they do not generate any significant traffic, can also be operated from a private dwelling without any harm to neighbouring residences.

Thus zoning must be able to respond to the needs of present day society always looking to the need to protect against development which will harm the interests of the majority of residents.

Evolving zoning

A strategic plan which, as stated above, should be reviewed annually, and be part of a major five-year development cycle, must be able to respond to changes in the demand for different uses and land values.

For example, a residential area which used to be on the periphery of a city and developed as single storey houses on plots of, say, 2000 m^2 will, within twenty years be completely within the urban area. Land prices will escalate and demand for housing in that area will be massive. This will create a market for high-density town houses, or flats in multi-storey buildings. The zoning for that area should respond, at that time, to that demand by allowing such developments. Thus zoning will be able to respond to a rolling programme of action as the town expands and the nature of demand for land changes.

Zoning regulations for various uses are presented below:

8.4.6 Residential Areas

The land use regulations in terms of plot size, plot coverage, density, plot ratio and set-backs are presented in tables below:

Table 8.1: General guideline for Plot Coverage, Residential Density and Plot Ratio

Type of Dwelling		Zoning Code	Minimum Plot size (m^2)	No of Dwellings per Ha	Maximum Plot Coverage (%)[4]		Plot Ratio (%)[5]		Building line[6]
					S (Sewered)	U (Unsewered)	S	U	
Bungalow detached/ plotted development	Low density	0_3	1000	10	40	40	75	50	6
	Medium density	0_2	500	16	55	50	60	50	6
	High density	0_1	285	35	60	50	60	50	6
Semi-detached and row housing	Low density	0_3	500	20	50	40	75	50	6
	Medium density	0_2	350	32	55	45	150	80	6
	High density	0_1	250	70	60	50	150	80	6
Multi–Family dwellings	Low density	0_3	-	-	-	-	-	-	
	Medium density	0_2	220	60	55	45	250	150	6
	High density	0_1	150	70	60	50	300	200	-
	Special Density (Rental Housing)	0_1	75	70	70	55	400	200	-
	Special Density (Low Cost Housing/ Urban Poor/ Informal Area)	0_1	65	70	70	60	500	300	-
Detached house in Agriculture Zone	Low density	-	1000		-	40	-	80	9
		-	500		50			100	9

[4] *The plot coverage of unsewered areas is kept less than the sewered areas to accommodate the requirement of pit latrine (No excavation for a pit latrine shall be sited within 3m of any building or of any boundary of the site on which it is located- Kenya Building Code PP5.1) or septic tank (evapotranspirative bed or French drain be not less than 3m from any building or boundary of the site on which it is situated-Kenya Building Code-OO16.6) to complied with the Kenya Building Codes. However, unsewered areas of any residential types may be allowed full plot coverage of sewered area if the plot owner is opting for bio-digester (capacity to be verified by competent authourity) or the area is served by community toilet (in case of informal areas).*

[5] *Plot ratio of un-sewered will be less than the sewered in case of septic tank or pit latrine but the authourity may allow the plot ration of sewered area in unsewered area if the applicant is opting for bio-digester but the capacity of the bio-digester (minimum size of 1m3 is available in the market to serve 10-15 persons-http://www.kenyacastproductsltd.com/?page_id=116; http://expressdrainage.com/details.php?ser=4%20&%20maservices=52; https://energypedia.info/wiki/Plastic_Tube_Digesters_in_Kenya) has to be verified by the competent authourity.*

[6] The setback for different plot size may be decided by the competent authourity at the time of implementation with full consideration of given plot dimension and coverage. Generally the building line shall be kept minimum 6m (except in areas where the width of an existing street in front of any new building is less than 6.0m, no part of such building shall be nearer to the center line of the street than 3m or as may be decided by the competent authourity but the competent authority will be entitled to take final decision for building line considering the prevailing situation). The existing Kenya National Building Code states that the minimum building line should be 6m. However, this requirement has been omitted from the Draft Regulations of 2014

Parking norms for residential development:
The generally principle to be followed is one car parking space per 100m^2 gross built area (refer 'Table B1: 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 has 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)
- 1.5 parking Space per 1 (3-bedroom dwelling Unit)

Road Network: No new road shall be less that 9m carriage way in the new areas.

Building line: No person shall erect any building other than a boundary wall or other fence nearer to the road than such building line may be so prescribed: Provided that at the discretion of the County Physical Planning Department or competent authority such building line may vary in distance, from the road boundary throughout a road or part thereof: Such building line shall generally be in accordance with specification described below:

a) where roads range between 6m-18m in width the building line shall be 6m;
b) for any road above 18m in width the building line shall be 9m.
c) for existing road with less than 6m wide
d) Where the width of an existing street in front of any new building is less than 6.0m, no part of such building shall be nearer to the center line of the street than 3m.

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 60 m in length and shall have a turning radius of at least 15m Hammerhead.

Activities allowed in Residential Zones

Permitted Uses

- Residence – Bungalow, maisonette, multi-family dwelling (multi-storey flats/apartments), row housing, detached, semi-detached, residential-cum-work,
- Hostels, renting houses, old age home, community hall, police post, guest houses (not exceeding 200 m^2 in floor area),
- Day care centre and kindergartens,
- Corner shops, small shopping centres, health facilities (dispensaries, nursing home, etc.),
- Educational buildings, religious premises, library, gymnasium, park, technical training centre, exhibition and art gallery, clubs, banks/ ATM, matatus stop/boda boda stand (not exceeding 100 m^2 in floor area), post offices, hostels of non-commercial nature, etc.

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 m^2 in floor area), 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, police stations,
- Public utility buildings like electrical distribution depot, water/sewerage pumping stations, water works, fire stations, telephone exchanges/ mobile tower, matatus station/ boda boda stand (occupying a floor area not exceeding 200 m^2).

Prohibited Uses

All uses not specifically permitted as above are prohibited in residential zones including the following:

- Heavy, large and extensive industries : noxious, obnoxious and hazardous industries,
- Warehousing, storage go-downs of perishables, hazardous, inflammable goods,

- Workshops for matatus/ boda boda/buses etc.,
- Slaughterhouses, hospitals treating contagious diseases (TB)
- Wholesale market, sewage treatment plant/disposal work, water treatment plant, solid waste dumping yards, outdoor games stadium, indoor games stadium, shooting range, international conference centre, courts, sports training centre, reformatory, garrisons, etc.

Amendments to uses permitted: The competent authority may from time to time add to or amend the above list by considering overall land use compatibility through notification.

8.4.7 Industrial Areas

The zoning regulations for industrial areas, like minimum plot size, ground coverage, plot ratio, number of floors allowed and set-backs are presented in table below:

Table 8.2: Land use zones and regulations for industrial uses

Zone	Area/ Location	Type	Min. Plot Size (Ha)	Max. Ground Coverage (%)	Plot Ratio	Maximum No. of floors	Set-Backs		
							Front	Side	Rear
1_1	Existing Industries	-	-	-	-	-	-	-	-
1_2	The new industrial area at Kiamuringa	Cottage industries	0.02	75	1.5	2.00	6	3	3
1_3	Proposed Light Industries	Light Industry	0.05	75	1.5	2.00	6	3	3
1_4	The new industrial area at Kiamuringa	Medium Industries	2	75	2.25	3.00	9	5	5
1_5	Near prison	Slaughter House	2	75	1.5	2.00	9	5	5

Road widths and car parking in Industrial area

i. Major communication route (Highway) **40 m**
ii. Spine roads (Major roads) **25 m**
iii. Collector roads **18 m**
iv. Access streets **15 m**
v. Service lane **9 m**
vi. Parking space: one car space for every 6-10 workers

Sewerage Connection: The industrial unit has to be connected with the sewer system and if there is no sewer available in the area, then a bio-digester of adequate size has to be installed by the owner for taking approval. Industrial units of chemical nature or where chemical waste is generated in the process, an affluent treatment plant with a capacity of treating the chemicals has to be installed and in that case the chemical waste shall not be mixed with toilet waste.

Land use of industrial area: The new industrial area may be planned as per the following norms for allocation of land for various uses:

- Area under industrial unit: 50-55%
- Area under circulation (road and parking): 15-20%
- Utilities and services (water supply, drainage, sewer, electricity, etc): 20-25%
- Organised open spaces: 10-15%
- Others: 5%

Uses permitted in Industrial Zones: The following uses are normally permitted for the main purposes and accessory uses:

- All uses permissible in the Commercial Use Zone with the special sanction of the authority except residential uses.
- Residential buildings for security and other essential staff required to be maintained in the premises.

- Police posts or security company offices
- All kind 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.

Restricted uses or use permitted with special sanction of the authority: Some of the uses may be permitted with special sanction of the competent authority. These may include noxious, obnoxious and hazardous industries, storage of explosive and inflammable and dangerous materials, junkyards, electric power plants, service stations, cemeteries, business offices, bank and financial institutions, helipads, religious buildings, matatus/boda boda stands, gas installations and gas works, stone crushing, small shopping centres, etc.

Uses Prohibited: All uses not specifically permitted as mentioned above shall be prohibited.

8.4.8 Educational Areas

The land use zones and regulation for each sub-category of educational zones related to plot size, ground coverage, plot ratio and number of floors are presented in table below:

Table 8.3: Land use zones and regulations for educational uses

Zone	Type of use proposed	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. floors allowed
$2_{1\ to}\ 2_6$	All Existing	-	-	-	-
2_7	Primary Schools	3.25	20	0.4	2
2_8	Secondary Schools	3.4	30	0.6	3
2_9	Special school	3	30	0.6	3
2_{10}	College	10	40	1.2	4
2_{11}	Educational town	102	40	1.2	4
2_{12}	Teachers training institute	5	40	1.2	4
2_{13}	Youth polytechnic	4.5	30	0.6	3
2_{14}	Medical training institute	5	40	1.2	4
2_{15}	Medical College cum hospital	15	60	1.8	4

Permitted uses within educational areas: All uses related to education, training and research as mentioned above.

Restricted uses: Some of the uses may be permitted with special sanction of the competent authority, which are not proposed or mentioned here as educational facilities but related to education, training and research.

Prohibited uses: All uses not specifically permitted as mentioned above shall be prohibited.

8.4.9 Recreational areas

The land use zones and regulation for recreational zones related to plot size, ground coverage, plot ratio and number of floors are presented in table below:

Table 8.4: Land use zones and regulations for recreational uses

Zone Code	Use	Min. plot size (Ha)	Max. ground coverage %	Plot ratio	Maximum no. floors allowed
$\mathbf{3_{1\ to}\ 3_3}$	All existing	-	-	-	-
$\mathbf{3_4}$	Cluster park	1	10	0.2	2
$\mathbf{3_5}$	Cluster playground	1	15	0.2	1
$\mathbf{3_6}$	Sector park	2	10	0.2	2

Zone Code	Use	Min. plot size (Ha)	Max. ground coverage %	Plot ratio	Maximum no. floors allowed
3_7	Sector playground	2	20	0.2	1
3_8	Integrated sports centre	10	20	0.2	1
3_9	Amusement park	10	10	0.2	2
3_{10}	Water sport centre	10	20	0.2	1
3_{11}	Zoo	10	20	0.2	1
3_{12}	Stadium	5	10	0.2	2
3_{13}	Golf course	20	5	0.1	2
3_{14}	Town park	10	10	0.2	2

Permitted uses within recreational zones: parks, playgrounds, botanical/zoological gardens, clubs, stadiums (indoor and outdoor), stadiums with/ without health centre for players and staff, picnic huts, holiday resorts, shooting ranges, sports training centres, integrated sport centres, swimming pools, special recreation, library, public utilities (for recreational uses) etc.

Restricted Uses: Building and structures ancillary to use permitted in open spaces and parks such as stands for vehicles for hire, taxis, matatus, boda bodas, and passenger cars; facilities such as police posts, fire posts, and post offices; commercial uses of a temporary nature like cinema and other shows; public assembly halls; restaurants; open air cinemas; hostels for sportspersons, etc.

Prohibited Uses: Any building or structure which is not required for recreation, except for watch and ward personnel and uses not specifically permitted therein.

8.4.10 Public purpose areas

The land use zones and regulations for public purpose zones related to plot size, ground coverage, plot ratio and number of floors are presented in table below:

Table 8.5: Land use zones and regulations for public purpose facilities

Zone	Use	Min. plot size (Ha)	Max. ground coverage %	Plot Ratio	Maximum no. floors allowed
$4_{1\ to}\ 4_6$	Existing facilities	-	-	-	-
4_7	Basic health sub-centre (Level 2)	1	30	1	3
4_8	Health Centre (Level 3)	2	30	1	3
4_9	Communicable disease hospital	4	40	1.2	3
4_{10}	Veterinary hospital	5	30	1.2	4
4_{11}	Integrated office complex	20	25	1.2	5
4_{12}	Cultural centre	10	40	1.2	3
4_{13}	Sub Town Cultural Centre				
4_{14}	Convention centre	10	30	1.2	4
4_{15}	Community hall	0.3	40	1.2	3
4_{16}	Orphanage home	1	40	1.2	3
4_{17}	Rehabilitation centre	0.5	40	1.2	3
4_{18}	Juvenile home	2	40	1.2	3
4_{19}	Police station	2	40	1.2	3
4_{20}	Fire station	0.4	30	1.2	4

8.4.11 Commercial Areas

The land use zones and regulation for commercial zones related to plot size, ground coverage, plot ratio and number of floors are presented in table below:

Table 8.6: General guidelines for Land use zones and regulations for commercial areas

Zone	Use	Min. Plot Size (Ha)	Max. Ground Coverage %	Plot Ratio	Maximum no. floors allowed
$5_{1 \text{ to }} 5_2$	All existing	-	-	-	-
5_3	Sub CBD	10	30	1.2	4
5_4	Informal markets	2	40	0.75	2
5_5	Sector Commercial Centres	5	40	1	3
5_6	Warehouse	10	40	0.75	2
5_7	Livestock Market	3.5	10	0.20	2

The above table present the general guideline for development of commercial areas with the planning area but the following table presents the specific regulations for development of various commercial activities:

Table 8.7: Zoning regulation for commercial development

Zone	**Permitted user**		**Subdivision level (minimum Ha)**	**Minimum frontage road width in m**	**GC (%)**		**PR (%)**		**Special conditions**
					S	**U**	**S**	**U**	
CBD, Sub-CBD and Sector Commercial Centre	Supermarket		0.4	18	50	35	500	150	
	Retail Shop		0.045	15	80	50	500	200	
	Commercial allied uses								
	Hotels		0.2	18	50	35	500	150	Alternative mechanized disposal systems can apply on Sewer standards
	Offices/Banks/ICT		0.1	18	80	60	500	150	
	Public Facilities		0.1	15	50	35	100	100	
	Serviced Apartments/Hostels		0.045	15	50	35	300	200	Hostel-Parking to be provided for services (loading and offloading)
	Petrol Filling Stations (PFS)		0.045	18	25	25	50	50	
	Petrol Service Station (PSS)		0.2	18	25	25	50	50	
	Light industry/Showrooms		0.045	15	80	50	250	150	
	Transportation	Parking yard	0.4	18					Temporary
		Parking silo	0.2	18	80	60	500	200	
Informal Market	Retail Shop		0.010	6	90	90	90	80	To be served with community toilet. One toilet/ per 50 shops
	Vegetable kiosk		0.010	6	90	90	90	90	
	Eating place/ Restaurant		0.015	6	60	60	90	60	In case of bio-digester is full plot ration may be allowed
Mixed Commercial	All commercial activities (along road more than15m wide)		0.010	6	60	60	150	80	In case of bio-digester, full plot ration may be allowed
	All commercial activities (along road less than15m wide)		0.005	-	60	60	150	80	

Other regulations for CBD, Sub-CBDs and Sector Commercial Centre are as below:

a. Minimum plot size shall be 0.045 Ha (the plot length vs. width should not be more than 1:2)
b. Primary distributors shall be ≥ 30 metres wide
c. Local distributors shall be ≥ 15 metres wide,
   - Provide 6 metres service lane
   - Provide 6 metres lane (break) after every 60 metres distance
d. Parking requirement - 1 car park per 80 m^2 of covered area
e. Road truncation should be half the width of the adjoining road
f. Building line: 3m for plots fronting road reserve ≤ 15m; 0m for ≥ 18m
g. Access: no direct access to/ from National Road networks

Permitted uses in commercial areas: Shops, convenience/neighbourhood shopping centre, local shopping centres, cluster centre, sub-CBDs, professional offices, work places/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, 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, junk yards, railway stations, sports/stadium and public utility installation, religious buildings, hospitals and nursing homes.

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

8.4.12 Transportation areas zoning regulations

The zoning regulations for broad transportation proposals for truck terminals, bus parks and matatu stations are shown in table below:

Table 8.8: Land use zones and regulations for transportation facilities

Zone	Use	Min. plot size (Ha)	Max. ground coverage %	Plot ratio	Maximum no. floors allowed
$7_{1\ to}\ 7_2$	All existing	-	-	-	-
7_3	Truck terminus	10	30	0.6	2
7_4	Railway station	5	30	0.6	2
7_5	Matatu stage	0.5	15	0.25	2
7_6	Bus park	5	15	0.4	3

8.4.13 Agricultural Areas

No specific regulations apply to agricultural areas other than a minimum subdivision size. Two agencies are involved in this decision, as noted above in the guidance on development control.

The application must be referred to the Land Control Board, which may consent to or refuse the application. Provided that the Land Control Board approves the subdivision, the County should issue the approval in terms of the Physical Planning Act.

The land use regulations in terms of farm size, farm coverage, and permissible activities are presented in Table 8.9 below:

Table 8.9: Farm size, coverage and permissible activities

Agricultural Zone	Zone Code	Farm size required to sustain a family of 5[7]	Minimum farm size [8](Ha)	Coverage (%)	Type of activities permissible
Upper Midland Marginal Coffee Zone (UM 3)	9_1	1.03	1	100	• Plantation • Agriculture • Horticulture • Livestock rearing/ Dairy Farm • Poultry/ Piggery Farm
Upper Midland Sunflower Maize Zone (UM4)	9_1	1.11	1	100	

Guidance regarding the minimum subdivision in the Embu area is given in Annexure 7 of this report.

8.4.14 Conservation areas zoning regulations

The conservation areas are environmentally sensitive areas in the form of forested areas on hills and rivers within the planning area.

Table 8.10: Land use zones and regulations for conservation areas

Zone	Characteristic	Use	Min. plot size (Ha)	Max. ground coverage %	Plot ratio	Maximum no. of floors allowed
10_1	Hills	Forest/plantation	-	-	-	-
10_2	River	Riparian reserve	-	-	-	-

Uses permitted: Zones demarcated as a riparian reserve can have development related to river front development for recreational uses but other uses like commercial, residential, industrial, etc are prohibited unless special consent is obtained. In forests/plantation zones the competent authority may allow some uses related to tourism.

8.4.15 General Parking Norms:

Wherever norms for parking have not been specified, the following have to be followed for different types of uses:

Table 8.11: General Car Parking Norms

Car parking spaces per 100 m2 of gross built area	**Building classification** [9]
One	A1,A2,A3,A4,A5,B1.B2, B3, C1.C2,D1,D2,D3,E1, E3,F3, H3, H4
Two	E2,F1,F2,H1
Two and half	G1

Source: Table B1: Carparking in Buildings; Volume 2: Part B; Kenya Planning and Building Codes, 2009.

[7] Calculation for sustainable farm size is given in Annexure 7

[8] It may be noted that some additional income may be generated by farmers through subsistence livestock rearing to sustain the family. Therefore a minimum size of 1 ha is considered for both agricultural zones within Embu town planning area.

Also, if there is any proposal for exclusive dairy farm, poultry/ piggery farm, other horticulture farming with better yield with lesser size of farm are submitted for sub-division, the planning department shall consider and advise on minimum size of farm.

[9] *Classification of building as per the Kenya Planning and Building Codes, 2009 and detail is given in Annexure 8*

9 Implementation

9.1 Introduction

The chapter present implementation plan, additional institutional mechanism for effective plan implementation and Action needed for detail planning, monitoring and review, county economy (revenue enhancement tools), public private partenership and planning implementation under the new constitution.

9.2 Implementation Plan

The Implementation Plan for ISUDP defines how the plan will be implemented over a period of time. The plan contains individual projects and institutional responsibility to implement them. These projects include physical infrastructure (water supply, sewerage, solid waste management, storm water drainage, etc.), transport system improvement, economic development, urban environment and disaster management, tourism and heritage development, institutional development, financial management, etc. The physical implementation plan contains the time period for various activities of all the identified project for short term, medium term and long term along with list of departments responsible for implementation. Tables below present the implementation plan of various identified projects.

Table 9.1: Economic Development projects

Projects	Quantity	Unit	Years																			
			Phase I					Phase II					Phase III					Phase IV					Institutional Responsibility[1]
			2015-16 to 20120-21					2021-22 to 20125-26					2026-27 to 2030-31					2032-33 to 2035-36					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Allocation of land for new industrial areas	134	Ha																					Department of Physical Planning, Embu County
Allocation of land for new commercial areas	134	Ha																					
Notification of the land demarcated for commercial and industrial development	1	No.																					
Preparation of detailed project report for industrial and commercial areas for development	1	No.																					
Allocation of Industrial Plot for development	1	No.																					
Improvement of basic infrastructure and services (e.g. roads, drainage, water supply and electricity) in jua kali areas	-	-																					Department of Transport, Road & Public Works, Embu County EWASCO KLPC County Physical Planning Department
Annual training for skill upgrading of jua kali artisans	1	No.																					Department Industry Embu County
Marketing of jua kali products through a co-operative society	-	-																					
Organising annual fair to showcase the jua kali products at county and national level	-	-																					

[1] The Department of Finance and Economic Planning will be responsible for arranging finance for the project identified above

Projects	Quantity	Unit	Years																			
			Phase I					Phase II					Phase III					Phase IV					Institutional Responsibility[2]
			2015-16 to 20120-21					2021-22 to 20125-26					2026-27 to 2030-31					2032-33 to 2035-36					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Improvement of existing Informal markets	-	-																					Dept. of Transport, Road & Public Works, Embu County
Single window approval system	1	No.																					Dept. of Industry and Finance, Embu County
Construct roads, drainage, trunk water supply system, trunk sewer line, electricity supply, etc within proposed Industrial area	-	-																					Dept. of Transport, Road & Public Works, EWASCO KLPC County Physical Planning Dept.
Construction of proposed truck terminal (1) and warehouse (1)	2	No.																					Dept. of Transport, Road & Public Works, Embu County
Tax holidays for small and big industries	1	No.																					Dept.of Industries and Finance, Embu County
Establish farmers training centres for farming techniques, high yielding variety seeds, fertilisers & pesticides, farm equipments, cost effective irrigation and financial help	1	No																					County Agriculture department
Promote value addition in agriculture by helping farmer in establishing household industries of farm produce	-	-																					
Establish a marketing centre for linking farmers to market	No	1																					

Source: Generated by Consultants

[2] The Department of Finance and Economic Planning will be responsible for arranging finance for the project identified above

Table 9.2: Environmental and recreational projects

Projects	Quantity	Unit	Years															Institutional Responsibility[3]
			Phase I					Phase II					Phase III					
			2015-16 to 20120-21					2021-22 to 20125-26					2026-27 to 2030-31					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Tree Plantation along river banks	15	Km^2																Departments of Land, Water, Environment and Natural Resources, Embu County
Construction of small check dams to create water reservoirs for recreational purposes	10	No.																Departments of Land, Water, Environment and Infrastructure, Embu County
Construction of public promenades on main rivers	8	Km																
Creating recreational open areas like parks, playground, etc.	5	%																
Development of dams/ wetlands for recreational activities (walkways, parks, tree plantation, boating, etc.)	10	No.																
SEA for ISUDP of Embu	1	No.																NEMA and Department of Physical Planning, Embu County
Harmonizing the physical planning Act & EMCA (Change of User) to ensure that EIA takes place prior to approval by physical planning as part of legislation harmonization	1	No.																NEMA, County Government and National Government
Strict implementation of environmental guideline for extraction of building material in quarries	1	No.																NEMA and Department of Environment, Embu County
Removal of encroachment on natural drainage system	1	No.																County Administration
Promotion of energy saving eco-jikos	1	No.																Department of Environment, Embu County
Tax rebate for manufacturers and dealers of eco-jikos	1	No.																National government

[3] The Department Finance and Economic Planning will be responsible for arranging finance for the projects identified above

Projects	**Quantity**	**Unit**	Years															**Institutional Responsibility**[3]
			Phase I					Phase II					Phase III					
			2015-16 to 20120-21					2021-22 to 20125-26					2026-27 to 2030-31					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Purchase of Air quality meters: gases	2	No																
Purchase of air quality meters: particles	2	No																
Purchase of Noise meters (2)	2	No																Environment Departments, Embu County
Awareness campaign for eco-jiko and for neat and clean environment	1	No.																County Administration
Cluster park (1Ha each)	8	No.																
Cluster playground (1Ha each)	8	No.																
Sector Park (2Ha each)	3	No.																
Sector Playground (2Ha each)	3	No.																
Stadium (5Ha each)	2	No.																Departments of Land, Water, Environment and Infrastructure, Embu County
Zoo (10Ha)	1	No.																
Amusement park (10Ha)	1	No.																
Proposed Water Sport & Recreational Centre	1	No.																
Integrated Sports Centre (10Ha)	1	No.																
Town Park (10Ha)	1	No.																
Proposed Golf Course (25Ha)	1	No.																

Source: Generated by Consultants

Table 9.3: Disaster Management Projects

Projects/ Programmes	Quantity	Unit	Years																		Institutional Responsibility[4]
			Phase I					Phase II					Phase III					Phase IV				
			2015-16 to 20120-21					2021-22 to 20125-26					2026-27 to 2030-31					2032-33 to 2035-36				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Mandatory provision of smoke detectors in all buildings with overall building approval system	-	-																				Department of Physical Planning, Embu County
Mandatory provision of earthquake resistance in building design	-	-																				
Inclusion of building standards in the byelaws to make seismically safe construction	-	-																				
New fire stations, fire hydrants, fire vehicles, etc. (details given under Fire Fighting section)	1	No.																				Fire Rescue Service and Infrastructure and Land Departments, Embu County; and EWASCO
Awareness generation for general hygiene and health to prevent any health disaster	1	No.																				EWASCO
Provision of potable drinking water to all	Adequate provision given under infrastructure																					
Provision of proper sanitation facilities to all																						

[4] The Department of Finance and Economic Planning will be responsible for arranging finance for the projects identified above

Projects/ Programmes	**Quantity**	**Unit**	**Years**																			**Institutional Responsibility**[4]
			Phase I					**Phase II**					**Phase III**					**Phase IV**					
			2015-16 to 20120-21					2021-22 to 20125-26					2026-27 to 2030-31					2032-33 to 2035-36					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Prepare Town Disaster Management Plan (Disaster Management Plan (DMP) will be prepared across the four phases – prevention, preparation, response and recovery; and to manage all disaster events)	1	No.																				County Government
Carry out disaster mapping for the county	1	No.																				County Government
Establish early warning system and enhance risk assessments	-	-																				County Government
Establish fully equipped disaster management cum rescue centers at sector level (sub-town level)	3	No.																				County Government
Coordination mechanism among all concerned agencies for disaster management, like Health Department, Fire Department, police department, etc.	1	No.																				County Government
Develop, update regularly and widely disseminate information on disaster risks	-	-																				County Government
Develop and maintain a Hazardscape at town level to make an informed risk	-	-																				County Government

Projects/ Programmes	**Quantity**	**Unit**	**Years**																		**Institutional Responsibility**[4]
			Phase I					**Phase II**					**Phase III**					**Phase IV**				
			2015-16 to 20120-21					2021-22 to 20125-26					2026-27 to 2030-31					2032-33 to 2035-36				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
assessment data base																							
Develop short-term and long-term strategy for flood management/erosion control	-	-																					County Government
Record, analyze and summarize information on disaster occurrence, impact and losses																							
Effective development and maintenance of public buildings and offices																							
Preparation of hospital emergency preparedness plan to deal with mass casualty incidents																							
Training of hospital administration/ doctor for emergency preparedness																							

Source: Generated by Consultants

Table 9.4: Tourism and Heritage projects

Projects	Quantity	Unit	Years																				Institutional Responsibility[5]
			Phase I					Phase II					Phase III					Phase IV						
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					2032-33 to 2035-36						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Construction of New Hotels and Guest Houses																							Private sector
Proper management of solid waste in town	-	-																					Department of Environment, Embu County
Development of identified tourist sites (landscaping, solid waste management, access road, etc)	1	No.																					Tourism, Infrastructure and Land Departments, Embu County
Construction of new road to ASK Ground (Njukiri Forest)	4.3	km																					Infrastructure Department, Embu County
Opening up of three heritage sites for general public (Old Embu PC'S House, Old Embu PC Servant's Quarters & Old Armoury)																							Tourism Department, Embu County
Preparation of a regional tourist circuit map	1	No.																					
Community hall/cluster community recreational club (with small library)	8	No.																					Departments of Infrastructure, Housing and Land, Embu County
Sub-town level community/cultural centre, library, resource centre, social hall, VCT centre, public telephone, amphitheatre/ cultural dance centre/ county social hall	2	No.																					
Town level integrated cultural centre (library/ resource centre, social hall/ town hall/ amphitheatre/ cultural dance centre)	1	No.																					

[5] The Department of Finance and Economic Planning will be responsible for arranging finance for the projects identified above

Projects	Quantity	Unit	Years																				Institutional Responsibility[5]
			Phase I					Phase II					Phase III					Phase IV						
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					2032-33 to 2035-36						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Listing of tourist sites and documentation of sites with description	1	No.																					Tourism Department, Embu County
Establishing a tourism information centre (for travel planning, description of sites, distances, safety issues, accommodation, etc.)	1	No.																					

Source: Generated by Consultants

Table 9.5: Water Supply Projects

Projects	Quantity	Unit	Years																				Institutional Responsibility[6]
			Phase I					Phase II					Phase III					Phase IV						
			2015-16 to 20120-21					2021-22 to 20125-26					2026-27 to 2030-31					2032-33 to 2035-36						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Expand the current water treatment plant to provide the adequate capacity required by 2035	5,000	m^3																					EWASCO
Rehabilitate the pipe line in Kangaru, Majengo and town	40	km																					EWASCO
Lay new pipelines	14	km																					EWASCO
Install community water point in informal areas and public places	32	No.																					EWASCO
Construct rain water harvesting structures on natural streams within the planning area to recharge the ground water	10	No.																					Department of Water & Environment, Embu County

[6] The Department of Finance and Economic Planning will be responsible for arranging finance for the projects identified above

Projects	Quantity	Unit	Years																				Institutional Responsibility[6]
			Phase I					Phase II					Phase III					Phase IV						
			2015-16 to 20120-21					2021-22 to 20125-26					2026-27 to 2030-31					2032-33 to 2035-36						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Mandatory provision of water harvesting building design	-	-																					Department of Land (Physical Planning), Embu County
Recycling of waste water	1	No.																					EWASCO
Awareness programme regarding the use of protected and unprotected sources of water	1	No.																					EWASCO
Asset Management System (GIS Mapping of water supply network)	1	No																					EWASCO

Source: Generated by Consultants

Table 9.6: Sewerage and Sanitation projects

Projects	Quantity	Unit	Years															Institutional Responsibility[7]
			Phase I					Phase II					Phase III					
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Linking of functional toilet design with building approval system	1	No.																Department of Land (Physical Planning), Embu County
IEC measures for safe sanitation practice	1	No.																EWASCO
Construction of a new Sewerage Treatment Plant (near Don Bosco/Rianjeru-36Ha)	1	No.																EWASCO

[7] The Department of Finance and Economic Planning will be responsible for arranging finance for the projects identified above

Projects	**Quantity**	**Unit**	Years															**Institutional Responsibility**[7]
			Phase I					Phase II					Phase III					
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Preparation of Feasibility study and comprehensive design for sewer network	1	No.																EWASCO
Construction of new sewerage network in uncovered areas	52	Km																EWASCO
Construction of community toilets in informal areas (1/10 families)	20	No.																EWASCO
Public Toilets in market areas and public buildings (total 20)	20	No.																Department of Land (Physical Planning), Embu County and EWASCO

Source: Generated by Consultants

Table 9.7: Storm Water Drainage Projects

Projects	**Quantity**	**Unit**	Years															**Institutional Responsibility**[8]
			Phase I					Phase II					Phase III					
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Implementation of the ongoing feasibility study and comprehensive master plan for the storm water	1	No.																Departments of Infrastructure and Land (Physical Planning), Embu County
Construct primary drains	48	Km																
Construct secondary drains	240	Km																
Improve/repair existing primary and secondary drains	1000																	
Construct small water harvesting structures on all natural streams	10	No.																Department of Water & Environment, Embu County
Covered drain in market areas to be used as footpath	10	Km																Departments of Infrastructure and Land (Physical Planning), Embu County
Removing the encroachments on drains	-	-																
Notification of natural drainage area for non-construction activities	-	-																

Source: Generated by Consultants

[8] The Department of Finance and Economic Planning will be responsible for arranging finance for the projects identified

Table 9.8: Solid Waste Management Projects

Projects	Quantity	Unit	Years																		Institutional Responsibility[9]
			Phase I					Phase II					Phase III					Phase IV				
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					2032-33 to 2035-36				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Distribute community dustbins/ skips (20x20m)	226	No.																					Department of Environment, Embu County
Litter bins (small size)	150																						
Recruitment of more staff for waste collection	20	No.																					
Purchase of compactor	2	No.																					
Purchase of cess pool emptier (covered)	2	No.																					
Purchase of covered truck	2	No.																					
Acquisition and development of a new landfill site	13	Ha																					
Composting of biodegradable waste	1	No.																					
Recycling of waste	1	No.																					
Explore the possibility of PPP in SWM	1	No.																					
Awareness programme for segregation of waste at source and for solid waste management system in general	1	No.																					

Source: Generated by Consultants

[9] The Department of Finance and Economic Planning will be responsible for arranging finance for the projects identified above

Table 9.9: Road and Transport System Implementation Plan

Road Name	Road Segment		Existing Lanes/ Road Type	Proposed Lanes/ Road Type	Years															Institutional Responsibility [10]
					Phase I					Phase II					Phase III					
					2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					
	From	To			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Nairobi-Meru Highway (B-6)	East of Rupingazi River bridge near Embu boundary	Embu University College	2 Lane undivided	4 Lane Divided	■	■	■													Department of Transport, Roads & Public Works , Embu Government
Embu-Kiritiri Road (B-7)	Nairobi-Meru highway (B-6) & Embu-Kiritiri Road (B-7) intersection	Majimbo Shopping Centre	2 Lane undivided	4 Lane Divided		■	■	■												
Muthatari-Karurina-Gatundury Road (E-629)	Muthatari	Gatundury	2 Lane earthen	2 lane paved				■	■	■	■									
Majimbo-Kimangaru-Riandu (R-77)	Muthatari/Majimbo	Riandu	2 Lane earthen	2 lane paved					■	■	■	■								
Embu-Saikago Road (D-469)	East of Muthatari	Saikago	2 Lane earthen	2 lane paved						■	■	■	■							
Majimbo-Embu University Rd	Majimbo	Embu University College	2 Lane earthen	2 lane paved	■	■	■													
Uchumi-Level-5 Hospital Road	Kubukubu Road Uchumi	Level-5 Hospital	2 Lane earthen	2 lane paved	■	■	■													
Dallas Ring Road	Sewage Treatment Plant on B-6	East of Uchumi on B-7	2 Lane earthen	2 lane paved	■	■	■													

[10] The Department of Finance and Revenue Management, Embu Government will be responsible for arranging finance for the projects identified above

Road Name	**Road Segment**		**Existing Lanes/ Road Type**	**Proposed Lanes/ Road Type**	Years														**Institutional Responsibility** [10]
					Phase I					Phase II					Phase III				
					2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31				
	From	**To**			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Dallas-Majimbo-Muthatari Road	Majimbo	Muthatari	2 Lane earthen	2 lane paved																Department of Transport, Roads & Public Works , Embu County and National Government
Kambo-Karurina Road	Kambo on R-77	Karurina on E-629	2 Lane earthen	2 lane paved																
Northern Bypass Road	East of Rupingazi River Bridge	Mutunduri																		
Southern Bypass Road	Murinduko	Don Bosco Kagonga																		
Truck Terminal-cum-Logistic park (one)																				
Bus Terminal (One)																				
Matatus Stations (two)																				

Table 9.10: Junction Improvement Implementation Plan

Intersections/ Junctions	**Existing Condition**	**Proposed Improvements**	Years										**Institutional Responsibility**[11]
			Phase I					Phase II					
			2015-16 to 2020-21					2021-22 to 2025-26					
			1	2	3	4	5	6	7	8	9	10	
Nairobi-Meru Highway (B-6) and Panesic Hotel Road	Un-signalized T-Junction, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) to be 4 lanes, exclusive left turn lanes at B-6 and Panesic Hotel Road											Department of Transport, Roads & Public Works , Embu Government
Nairobi-Meru Highway (B-6) and Embu-Kiritiri Road (B-7)	Un-signalized T-Junction, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) to be 4 lanes, Embu-Kiritiri Road (B-7) to be 4 lanes, exclusive left turn lanes on both roads											
Junction on Embu-Kiritiri Road (B-7)/Kubukubu Road near Uchumi	Un-signalized Intersection, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) 4 lanes x 2 lanes, exclusive left turn lanes											
Nairobi-Meru Highway (B-6) and Dallas Ring Road near sewage treatment plant	Un-signalized Intersection, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) 4 lanes x 2 lanes, exclusive left turn lanes											
Embu-Kiritiri Road (B-7) and Majimbo-Embu University Road	Un-signalized Intersection, 2 lanes x 2 lanes	Signalized intersection, Nairobi-Meru Highway (B-6) 4 lanes x 2 lanes, exclusive left turn lanes											
Muthatari Junction on Embu-Kiritiri Road (B-7)	Un-signalized Intersection, 2 lanes x 2 lanes	Embu-Kiritiri Road (B-7) to be 4 lanes, to be 4 lanes, Majimbo-Kiambo-Riandu Road (R-77) to be 4 lanes and to have grade separared flyover, exclusive left turn lanes at all directions											

[11] The Department of Finance and Revenue Management, Embu Government will be responsible for arranging finance for the projects identified above

Table 9.11: Fire Fighting Projects

Projects	Quantity	Unit	Years															Institutional Responsibility[12]
			Phase I					Phase II					Phase III					
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Complete the fire station at Majimbo	1	No.																Fire Rescue Service, Infrastructure, Housing and Physical Planning Departments, Embu County; and EWASCO
Develop 4 new fire sub-stations	3	No.																
Develop 1 new fire stations	1	No.																
Repair all the non-functional fire hydrants (17) and install new as per planned expansion	50	No.																
Purchase new fire tender/vehicles	4	No.																
Purchase small fire tender/vehicles to serve the congested areas	2	No.																
Recruit new staff for fire fighting department	-	-																
Create a separate fire fighting unit for Embu town area	-	-																
Increase personnel and appliances in other fire stations in the other sub-counties in Embu County	-	-																
Regular checking of fire fighting installations within built-up areas	-	-																

Source: Generated by Consultants

[12] The Department of Finance and Economic Planning will be responsible for arranging finance for the identified projects

Table 9.12: Street Lighting and electrical supply projects

Projects	Quantity	Unit	Years														Institutional Responsibility[13]
			Phase I					Phase II					Phase III				
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Repair all faulty street lights	50	No.																Kenya Power and Lighting Company, Embu County Government
Install street light poles 30m apart	16,557	No.																
Erect new high mast lights at CBD, Sub-CBDs, informal markets, jua kali areas and main junctions	71	No.																
Convert street lights into solar street lights	-	-																
Mandatory provision of solar power within public buildings	-	-																
Encourage use of solar power by private individuals by giving government subsidies	-	-																

Source: Generated by Consultants

[13] The Department of Finance and Economic Planning will be responsible for arranging finance for the projects identified

Table 9.13: Institutional Development Projects

Projects	Quantity	Unit	Years																				Institutional Responsibility[14]
			Phase I					Phase II					Phase III					Phase IV						
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					2032-33 to 2035-36						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Regular training of County staff in financial management	1	No.																					Embu County Government and Outside Agencies
Regular training of County staff in technical aspects	1	No.																					
Creating local urban body for governance of the town area	1	No.																					National Government
Establishing environmental land courts	1	No.																					Embu County Government
Prepare practice manual on role of central government and County	1	No.																					
Create centralised system for auto-update of all proposed developments	1	No.																					
Form steering committee of CECs headed by H.E. Governor, to meet monthly to oversee development (until Embu becomes self-governing)	1	No.																					
Purchase 3 ArcGIS 10.3 licences for Physical Planning Department	1	No.																					Departments of Land (Physical Planning), Embu County
Purchase 3 laptops with high configuration	1	No.																					
Purchase 2 Plotters	1	No.																					
Train County Staff in GIS	1	No.																					
Recruit 2 GIS Experts	2	No.																					
Recruit 3 Physical Planners	3	No.																					

[14] The Department of Finance and Economic Planning will be responsible for arranging finance for the projects identified

Projects	Quantity	Unit	Years																				Institutional Responsibility[14]
			Phase I					Phase II					Phase III					Phase IV						
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					2032-33 to 2035-36						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Time bound building approval system with inclusion of NEMA, Surveys and other Departments (with specific time for different approvals like NEMA, Survey Department, Planning Department)	1	No.																					Departments of Land (Physical Planning) and Survey Department, Embu County; and NEMA
Create daily programmes for local TV	1	No.																					Embu County Government
Create electronic screens to display public information	1	No.																					
Establish formal local citizen forum	1	No.																					
Establish information cell for general and legal information about various policies and acts	1	No.																					
Create local police helpline number	1	No.																					

Source: Generated by Consultants

Table 9.14: Financial Management Projects

Projects	Quantity	Unit	Years																				Institutional Responsibility
			Phase I					Phase II					Phase III					Phase IV						
			2015-16 to 2020-21					2021-22 to 2025-26					2026-27 to 2030-31					2032-33 to 2035-36						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Create a simple procedure for property tax assessment	1	No.																					Department of Finance and Economic Planning, Embu County Government
Create property GIS system with mapping of all properties	1	No.																					
Increase the coverage of taxed properties/tax base	1	No.																					
Improve collection performance	1	No.																					
Creating an accrual based double entry system for income and expenditure	1	No.																					
Regular updating of user charges for various services (considering the full recovery of related operating, maintenance and capital costs)	1	No.																					
Create online system for funds disbursement and utilization	1	No.																					
Strengthen co-ordination between donors and Government funded projects	1	No.																					
Map of all public land within town	1	No.																					Departments of Survey and Finance and Economic Planning Embu County
Value public land and assess its value for sale or lease	1	No.																					County Land Valuer
Utilise public land to attract private developers for PPPs	1	No.																					Department of Finance and Economic Planning, Embu

Projects	**Quantity**	**Unit**	**Years**																			Institutional Responsibility
			Phase I					**Phase II**					**Phase III**					**Phase IV**					
			2015-16 to 2020-21					**2021-22 to 2025-26**					**2026-27 to 2030-31**					**2032-33 to 2035-36**					
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	
Create dedicated funds for provision of infrastructure facilities	1	No.																				County Government
All development charges collected to be put into dedicated infrastructure fund	1	No.																				
Seed capital provided by government initially	1	No.																				

Source: Generated by Consultants

9.3 Additional institutional initiatives for plan implementation:

Apart from providing the list of departments responsible for implementation of various projects, the county government needs to create additional institutional arrangement for proper implementation of the plan. Time bound and dedicated responsibilities have to be assigned to the staff responsible for implementation.

Town Development Agency (TDA): The Consultant proposes a development agency for plan implementation, which will have full authority to deal with various issues related to implementation. Dedicated staff is proposed to be provided to the TDA. The personnel from respective county departments will be employed in the TDA with specific implementation mandate in a time bound manner. The process of nominating or selection of staff for TDA can be the standard procedure adopted by the County Government. The TDA may comprise the steering committees or special task forces for various sector like land acquisition, building approval, business approval, public works, environment, water and sanitation, electricity and street light, security, PPPs, etc. The steering committees or task forces will prepare their sectoral implementation plan in detail and ensure the implementation. The TDA can be established in line of any development agencies like Johannesburg Development Agency, Delhi Development Authority and the like.

There are precedents in Kenya for establishing development authorities. Of these, a few are functioning well such as the Kenya Airports Authority and LAPSSET Corridor Development Authority (LCDA). Others such as the Lake Basin Development Authority and the Kerio Valley Development Authority, etc. are not doing so well.

The County Governments Act (No. 17 of 2012, Revised Edition) provides the power to create a development authority.

Section 6. (5) (a): Powers of county governments states:

-To ensure efficiency in the delivery of service or carrying out of a function for which the county government is responsible, the county government may—

(a) establish a company, firm or other body for the delivery of a particular service or carrying on of a particular function-

Therefore, the county government is empowered to create a development authority for Embu town. The proposed 'Embu Town Development Authority' will be empowered and mandated to do all the development work as envisaged in the Embu ISUDP. Since the cost of implementing the projects mentioned in the ISUDP is beyond the financial capacity of the Embu County considering the low resource base, low coverage, low rates, etc., a new mechanism is suggested to embark upon the process of development with multiplier effect. The steps for proposed process are as below:

Step I: Gazette notification: A gazette notification for creating the town development authority with its roles and responsibilities.

Step II: Creating initial capital: initial capital needs to be created to start the development process in the town. The development authority needs to be provided with seed capital to start the substantial activities or projects, say Khs 50 million. Considering its mandate over land development, the authority may obtain additional money by taking loans with guarantees from the county or national government, as the case may be.

Step III: Land acquisition: After getting the initial capital, the town development authority will start acquiring the potential land for development as per the ISUDP proposal. The authority can take up high priority projects that have a possibility of high return. The authority may start by developing land for residential development.

Step IV: Developing site or site servicing: the next step would be to develop the acquired land by proving basic infrastructure like roads, storm water drainage, electricity and street light, water supply lines, sewers, etc.

Step V: Auctioning of development land: Simultaneously, during the site development phase or after completion of the site servicing stage, the Town Development Authority can auction the

developed land for further development as per the planned use of that particular site. Individuals, companies, trusts, groups, etc. can be invited to buy the land for further development. The money earned through the auction of this developed land will go into the account of the Town Development Authority and not in the general account of the County.

Fund consolidation: The amount earned through selling of developed land could be around twice of the amount spent on acquisition of the undeveloped land. Around 20-40% of total cost of land acquisition may be spent for site servicing. Therefore, the profit of any project can be around 60-80%. After debt payment of the loan, around 40-60% of net profit can be expected from any project. In this way the Town Development Authority will be in a position to generate funds for its next projects.

The more detailed explanation and process of developing the basic infrastructure of town without any outside help, is explained in the same chapter under 'Urban Dividend'.

9.4 Actions needed after completion of the ISUDP

The ISUDP is a town level planning document and hence deals with all planning activities at town level. All the planning aspects in the document have been dealt in maximum detail as far as it was possible for a town level exercise and the plan provides guidance for comprehensive and planned development. The next logical planning step is to go into more detail at the sub-town level and other lower levels of planning units. Therefore for actual implementation of the plan, some actions need to be undertaken, as suggested below:

Action Points	Description	Remarks
Preparation of Strategic Environmental Assessment of the ISUDP	A strategic environment assessment of the ISUDP is the first step to be followed to ensure the environmental sustainability of the plan	• NEMA may be engaged for the same or the opportunity awarded to consultants by public tender for preparation of a SEA. • Since SEA not legally mandatory, therefore, some priority project may be started immediately after completion of ISUDP. However, for better weighted, SEA may be done, which can be completed within 3-5 months' time.
Detailed plan for residential areas	The ISUDP has zoned land for residential areas of low, medium and high density. Therefore detailed plans indicating the neighbourhood level road network, infrastructure network, recreational areas, public purposes, plot sizes, etc. have to be prepared.	• The physical planning department may prepare the detailed plan internally • It can be done -either by acquiring all the land and then developing the land with basic infrastructure and then auctioning in open market -or sub-dividing the land into various plot sizes by allocating land for basic infrastructure and public facilities. Then charging an additional amount for development from the plot owners
Detailed plan for industrial areas	The ISUDP only zones land for industrial areas for light, medium and heavy industries with respective plot sizes and zoning regulation. Therefore, detailed plans for industrial area indicating the various plot dimensions and sizes for light,	• After acquiring the land, the physical planning department may prepare the detailed plan

Action Points	Description	Remarks
	medium and heavy industries along with layout of road network, infrastructure network, open areas, public purposes, etc. have to be prepared.	
Detailed plan for commercial areas	The plan zones land for sub-CBDs, sector commercial centres, informal markets, etc. Implementation would require a detailed plan showing plot sizes for commercial activities like shopping malls, retail shops, hotels, wholesale markets, parking, etc. along with the internal road network and infrastructure network.	• After acquiring the land, the county physical planning department may prepare the detailed plan internally
Detailed plan for educational areas	The ISUDP zones land for different educational uses. A detailed layout can be prepared at the time of development for specific purposes	• Either the owner can sell the earmarked land to private parties for the defined educational use or government can acquire it for further development.
Detailed plan for recreational areas	The detailed layout of land zoned for recreational uses to be prepared by indicating sub-uses of the land for specific defined use	• The county may acquire land for development of public recreational purposes, or private landowners may develop the land or sell it to developers for development of the defined use such as an amusement park or water park.
Detailed plan for public purpose areas	Detailed layout plans of all the land zoned for public purposes have to be prepared by indicating internal layouts and infrastructure networks	• After acquiring the land the county can prepare the detailed plan or get it done by external agencies
Detailed plan for road network	The plan indicates the proposed road reserves for all major road improvements. Detailed project reports (DPRs) covering all engineering aspects have to be prepared	• The DRPs will provide the actual road alignments of all the proposed roads. The county can assign the job to external agencies
Detailed plan for truck terminal cum logistic centre	The ISUDP only provides land for truck terminal-cum-logistic centres. Detailed layout plans have to be prepared indicating the area for various uses along with infrastructure networks	• The County can acquire the land and prepare a detailed plan or can facilitate a private developer to buy land directly from owner and then develop
Detailed plan for bus terminals and matatu stages	The ISUDP zones land for bus terminals and detailed layout plans have to be prepared indicating area for various uses along with the infrastructure network. The internal traffic plan of bus and matatu	• The County has to acquire the land and the prepare a detailed plan and develop the site. The county may assign the task of the detailed layout plan to external agencies

Action Points	Description	Remarks
	operation will be part of the detailed plan.	
Detailed plan for public utilities	Detailed plans have to be prepared for the land demarcated for public utilities by indicating the land for various internal uses along with basic infrastructure network	• After acquiring the land, the county may prepare the layout plan through the respective county department.
Creating a Town Development Authority	Through a gazette notification,	• The Town Development Authority to be created with full authority for land development and collection of development fees.

9.5 Monitoring and review

9.5.1 Plan monitoring

Monitoring Unit

It is proposed to establish a monitoring and evaluation systems to assess effectiveness of implementation of ISUDP. A dedicated Monitoring Unit with modern data processing facilities should be set up which would be responsible for collection and analysis of primary and secondary data and bringing the important changes to the notice of the implementing agency comprehensively. This unit should also be in-charge of overall monitoring of implementation of the approved development plans and layout plans.

High-level Committee/Steering committee

A suitable mechanism by way of high-level committee/Steering committee under H.E. Governor is also proposed to be set up for periodic review and monitoring of the plan. To enable this, apart from targets arising from various infrastructure plans etc., other action points emerging from the proposals made in the plan for various sectors would also be listed out, to enable monitoring of timely implementation / identifying the need for any changes / corrections.

9.5.2 Plan review

Timely review of the ISUD plan shall ensure mid-term correction and modifications if needed in the plan and policies along with the implementation procedures, which will help to re-adjust the events in the plan that could not be foreseen or anticipated during the Plan Formulation. If the plan is timely monitored and appropriately reviewed, the policies can be moulded in the right direction according to the present needs of the people. As mentioned in the County Government Act, revew of plan at every five year is suggested.

9.6 County economy

9.6.1 Existing Financial Status

The county government pays for developments and services provision in Embu Town (Manyatta) sub-county with funds:

- Funds allocated by the County Government to the sub-county out of its (county's) share of national tax revenue, and,
- Funds raised by the county form the public, comprising:-

(a) Revenue arising from property taxes, fees, levies, charges and other revenue raising measures retained by the county for the purpose of defraying costs of providing services

(b) Investment income, for Embu Town this is limited to the annual lease rent for water assets to Embu Water and Sewerage Company Limited.

(c) Grants and donations from development partners including individuals, Public Benefit Organizations (NGOs), and devolved public funds such as Constituency Development Fund (CDF), Education Bursary Fund, Economic Stimulus Programme Fund

(d) Negotiate and secure loans for development or operations, this has never been applied.

(e) Engaging the private sector to finance or perform some devolved functions and services.

While the county already exploits revenue sources (a), (b) and (c) above, it is yet to put in place mechanisms to raise funds from sources (d) and (e). Table 9.15 below outlines the actual revenue yields from the sub-county's major sources of revenue (other than inter-governmental fiscal transfers) in the four year period 2010/11 to 2013/14:

Table 9.15: Embu Town Sub-County (Manyatta): Actual Revenue: 2009/10 To 2013/14

	2010/ 2011	**2011/ 2012**	**2012/ 2013**	**2013/ 2014**	**2013/ 2014**
Revenue	**Kshs. Million**	**Kshs. Million**	**Kshs. Million**	**Kshs. Million**	**% Total**
Motor Vehicle Parking Fees	24.37	25.89	29.55	25.03	38%
Market Fees	9.41	9.44	10.55	10.99	17%
Land Rates and Land Rents	14.80	8.71	9.38	6.14	9%
Single Business Permit (SBP)	15.61	16.88	18.97	5.75	8%
House, halls and assets rentals	6.90	5.91	4.39	3.76	6%
Slaughterhouse / Livestock	1.87	1.72	1.55	1.59	3%
Building Plans Approvals	1.13	0.99	2.16	0.91	1%
Enforcement Charges	0.99	2.73	2.24	0.68	1%
Other Sources	9.25	11.88	15.30	10.55	17%
Total Revenues	**84.33**	**84.15**	**94.09**	**65,40**	**100%**

Source: Embu County Government

Revenue collected in 2010/11 To 2013/14 was in accordance with the mandate of the former Municipal Council of Embu and excludes the general purpose LATF (*Local Authority Transfer Fund*) grant and the RMLF (*Road Maintenance Levy Fund*) grant from the National Government which has since been discontinued. Revenue collected In 2013/14 was in accordance with the mandate of Embu County Government but excludes collections by the County's Ministry of Health at Embu referral hospital, and revenue collected by the County's Ministry for Youth and Women Empowerment at Embu stadium, which amounts were remitted directly to the County Treasury without passing through the town sub-county finance office.

In 2013/14 the sub-county raised close to 72% of its to total revenue from parking fees (38%), single business permits (8%), market fees (17%) and property Rates (9%).

The general revenue collection trend indicates that the County Government continues to collect reducing revenue yields from where Embu Municipal Council used to collect more.

Revenue collection performance

Table 9.16 below compares the potential revenue yields of the main sources of revenue in Embu Town Sub-County to their respective actual annual yields in 2013/14:

Table 9.16: Embu Town Sub-county (Manyatta) – Revenue collection efficiency in 2013/14

	2013/2014	**2013/2014**	**2013/2014**
Revenue	**Potential Kshs. Million**	**Actual Kshs. Million**	**% actual to potential**
Inter-governmental fiscal transfers	-	-	-
Motor Vehicle Parking Fees	23.50	25.03	107%

Market Fees	12.63	10.99	87%
Land Rates And Land Rents	45.00	6.14	14%
Single Business Permit (SBP)	88.79	5.75	6%
House, halls and assets rentals	15.20	3.76	25%
Slaughterhouse / Livestock	1.63	1.59	98%
Building Plans Approvals	2.95	0.91	31%
Other Sources	18.78	11.23	60%
Total Revenues	**208.48**	**65.4**	**31%**
Note: - Land rates revenue potential based on the valuations of parcels of land listed on Embu Town 2005 Valuation Roll. SBPs revenue potential is based on the number of permits issued, and for all other sources, budget amounts are taken as the potential			

Source: Embu County Government

In 2013/14 the county collected only 14% of the expected land rates and 6% of the expected SBPs revenue. Outstanding rates revenue accounts for most of the Kshs. 262 Million debtors of Embu Town sub-County as at 30th June 2013. Collections from other sources of revenue were more or less what were budgeted for. The overall shortfall of actual collections compared to potential collections was occasioned by failure to collect rates and SBPs revenue due in the land based charges, the third most important source of revenue in the sub-county, are levied on the owners or users of land year.

Rates Revenue

Property taxes (or land rates) and land based charges, the third most important source of revenue in the sub-county, after motor vehicles parking fees and market fees (Table 9.16).

Land rates are levied on the owners or users of land situated within the town area at the rate of 3% annually on the site values of land parcels listed on Embu Town 2005 Valuation Roll whose validity was extended for a period of five years from 1st January 2012 to 31st December 2016. Table 9.17 below shows the summary of the type, number and estimated values of parcels of land listed on Embu Town 2005 Valuation Roll, and also assesses the potential rates revenue that the county may raise in a year:

Table 9.17: Embu Town 2005 Valuation Roll Summary and rates revenue potential

	Exempt Cultural Community	Private Lands	Govt. Lands	Total Rolls site Values
	Kshs. Million	Kshs. Million	Kshs. Million	Kshs. Million
Number of plots/parcels	-	-	-	-
Total site value – Kshs	166.00	1,203.33	296.67	1,666.00
Taxation Rate – per cent	-	3%	3%	-
Potential rates revenue p.a. Kshs	**-**	**36.1**	**8.9**	**45.0**

Source: Embu County Government and Consultants' Estimates

- Land reserved for cultural or religious purposes, and un-alienated trust land managed by the county government on behalf of the local community is exempted from rates.
- Land reserved or used for commercial, industrial and residential purposes, whether owned or used by private entities (individuals and corporates) or by government (national, county or government entities) is subject to property tax at 3% of their site values indicated in the valuation roll.

Land rating is, potentially, the one of the most important revenue source for the County in Embu Town. Rates revenue on qualifying land with total sites values of Kshs 1,666 Million, at the current 3% p.a. rate struck, would yield Kshs 45 Million annually. Actual rates collection in 2010/11 was Kshs. 14.80 Million and, in 2013/14, actual collections dropped to Kshs. 6.14 Million. Rates revenue collection efficiency over those two years dipped from 30% to 20% of the source potential.

Rates do not include fees and charges for land use planning and control services such as beacon identification, plots survey, issue of clearance certificates, and approval of building plans and

hearing and determination of land disputes. These are levied on per transaction basis on the users of the services.

Single Business Permit (SBP)

Embu County is empowered to control the conduct, location and operation of certain businesses, trades and occupations within its area, through issuance of licences and permits. It is also empowered to levy fees on licences and permits it issues to raise funds to pay costs associated with control of business. For ease of collection, the national policy encourages consolidation of fees payable on all business activities of an individual entity into one single business permit (SBP). Businesses licensing is the fourth most important source of revenue for the sub-county after motor vehicle parking fees, market fees and property rating. In 2013/14 about 15% of the sub-county's total revenue was derived from SBPs.

In 2013/14 the county issued permits to 7,987 businesses in Embu Town with Kshs. 88.79 Million SBPs revenue potential, yet its actual SBPs revenue was Kshs. 5.75 Million, representing 43% of the potential revenue.

Embu County has a schedule of fees and charges for its services. The schedule was last revised and approved by County Assembly in its 2013/14 Finance Bill. A listing of licenses and permits issued is maintained and shows at any given moment, businesses that have paid for their licenses since start of the financial year. This record is not a good base for identifying and enforcing collection of license fees from those that operate without obtaining valid licences and for establishment of potential licensing revenue due to the county.

Services User fees and charges

The County Government is empowered by law to levy, in respect of each service or facility it provides, a user charge to raise revenue to cover the cost of providing and sustaining the service. Embu County Government levies the following fees and charges for the purpose of defraying costs of providing related services to residents of the town:

Motor vehicles parking fees

Motor vehicle parking fees is the sub-county's number one revenue earner. Every time a public transport vehicle enters Embu town or parks at any of the designated bus termini, a parking fee of between Kshs. 30 and Kshs. 1000 depending on its size and registered use of the vehicle, is charged on it.

9.6.2 The Urbanisation dividend

The above has shown that revenue collection has been poor. This affects the ability of the County to deliver services and operate as a self-sustaining entity. If these weaknesses of the current collection system were rectified the County would have substantial revenues. This matter requires urgent attention.

However, there are other matters which should be considered which can assist to make the County – and more particularly Embu town – financially sustainable. These can be classified as the "Urbanisation Dividend". The principle of this is that urbanisation creates increased land values, and the public sector has an opportunity to benefit from these increases.

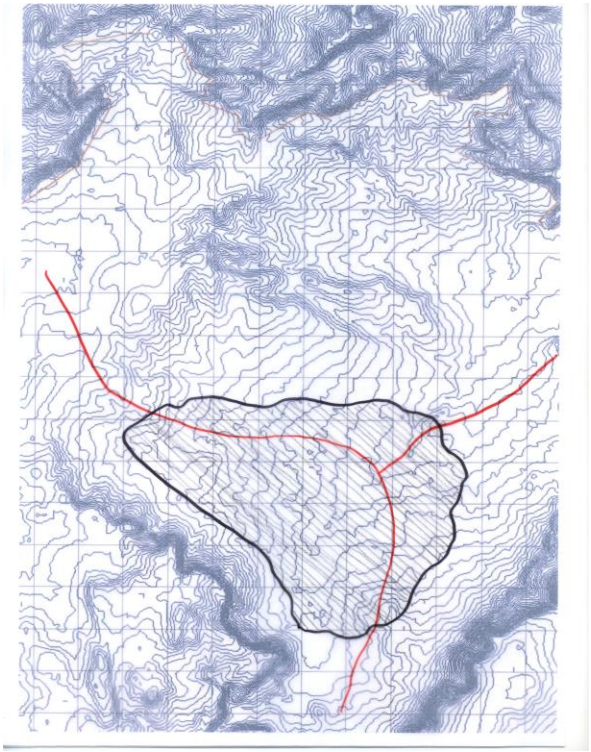
Although Counties receive annual transfers from central government – the equitable share – this will never be enough to meet their capital development requirements. Similarly, donor funds, such as those from the World Bank, will never be enough to meet the needs of communities that are growing rapidly, and which have been starved of investment funds for a long time.
It is often not recognised that the urbanisation process is – or should be – a profitable one. Equally, urban areas are the main source of wealth for Kenya: County and urban governments should design their financial strategies to take advantage of this.
The first, and most important, step is therefore to put in place a financial management system that harnesses all the potential sources of revenue in an equitable and efficient manner.
There are four main tools:

1. Leveraging land values
2. Using planning consent as a financial tool
3. Maximising the role of the private sector
4. Taxation

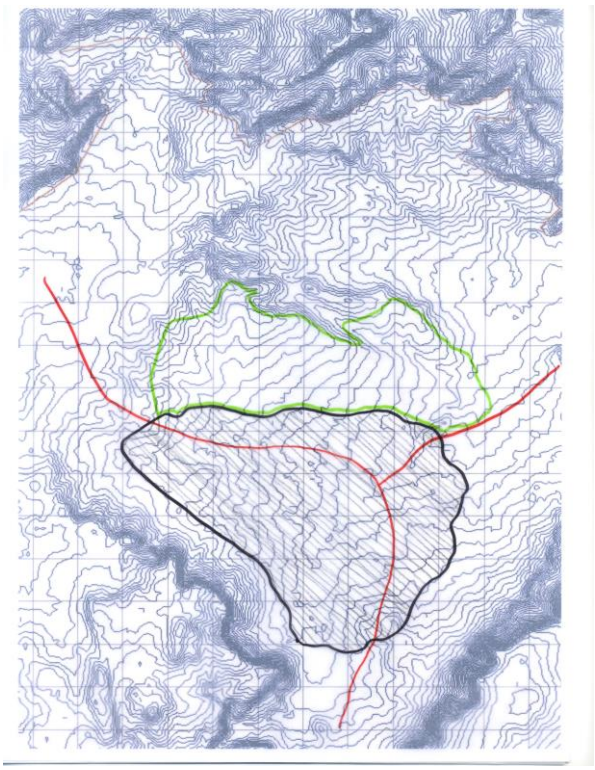
9.6.3 Leveraging land values

As urban areas expand, the value of land on the periphery will rise. Land which is serviced with roads, water and other services will be more valuable than unserviced land. Moreover, the increase in land values of serviced land tends to be much more than the cost of laying the services.

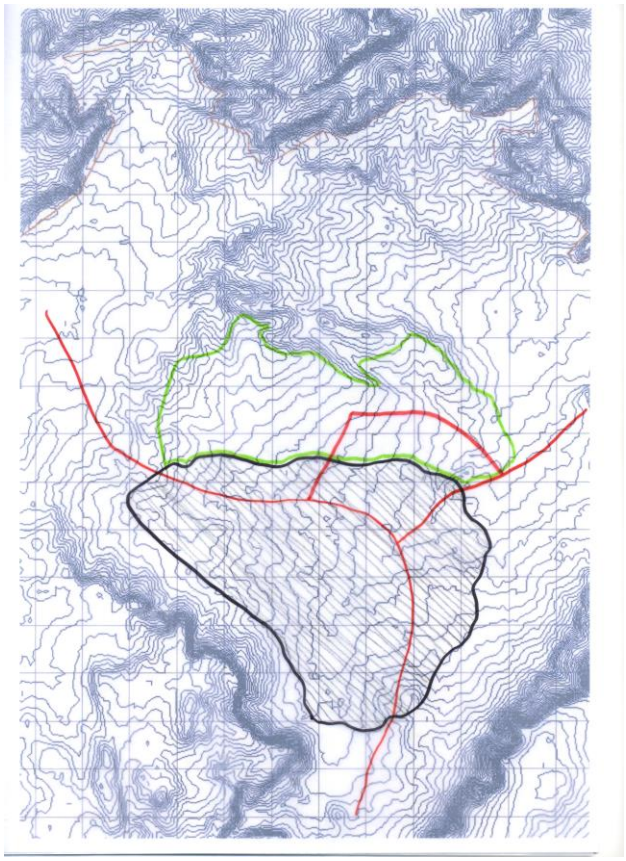
Thus it is in the interest of urban governments to acquire land on the urban periphery with a view to developing it. The process is illustrated in the diagrams below.



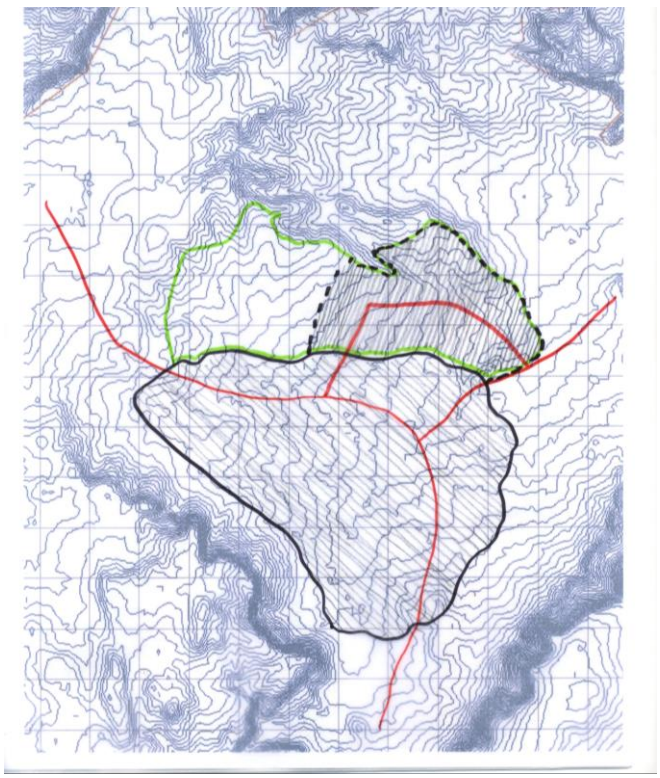
An example: the town is shown by the boundary in black. It is served by on major through road, and another road heading to the North East. Population projections show that it will double in size in 30 years.



To the North of the town is a relatively flat area of agricultural land. The town acquires the land required for its future expansion at agricultural values.



The town services the land with a new road and thereby opens it up for development



The town can now sell serviced land to developers and private individuals or firms at urban values.

9.6.4 Using planning consent as a financial tool

It is a well-known fact that land zoned as agricultural is worth less than land zoned, for example, as residential. The difference in values is the basis for leveraging land values as described above, but this applies to public land in which the public sector receives the benefit of the increases.

In the case of privately owned land, rezoning will bring windfall profits to the land owners. However, the planning authority has the opportunity to charge for development rights. These charges should be related to the cost of providing services to the land. Thus, in any subdivision application, consent will be conditional on payment of a development levy. Funds from the development levy will be retained in a separate account which can – and should – be used for infrastructure development. This system has been used in many countries with good effect.

9.6.5 Maximising the role of the private sector

It is in the interest of the County/Urban governments to encourage investment in the development of a town. Public sector investment must be the starting point, but the role of the private sector must also be recognised. Creative thinking about how to partner with the private sector can yield substantial dividends for both parties. For example, if a private developer wishes to develop a residential estate, it is quite reasonable for the planning authority to require them to develop the roads (for example) within the estate to a certain standard, and hand them over to the County on completion without charge; and to pay for the cost of the access road and bulk services (e.g. water) serving the development.

In the case of development on publicly held land, the County/Urban government may invite bids from the private sector about what they will pay to develop the land, and may impose conditions. These conditions may, for example, state that a certain percentage of houses should be developed for the low income groups. Such public private partnerships can yield cost effective and socially appropriate developments.

9.6.6 Taxation

Kenyan towns (with the possible exception of Mombasa) have neglected the potential of Rates income. There are many reasons for this, including:

- The cost of revaluation has meant that most valuation rolls are decades old
- The cost and time of dealing with appeals against valuations deters authorities from revaluation
- Typically, Rates Accounts are annual and efforts to recover debts are expensive
- Many of the biggest culprits in terms of arrears are politically influential figures
- Recovery of debts through the courts is slow and expensive
- There is no system to bring new properties onto the Valuation Roll
- Most Rates are based on land only, thus not fully recognising the value of the improvements (=buildings) on the land

Worldwide it is not unusual for Rates income (in many countries, described as Property Tax) to be more than half of the total income of an urban government. As a tax it has the advantage of being progressive (i.e. people with more expensive properties pay more than those with less valuable ones) and relatively simple. The problems regarding appeals against valuations and debt recovery affect many jurisdictions, but there are solutions in sight which should be given consideration.

Regarding valuations, it is possible to have values for each block, or neighbourhood; in which case every property within that block will pay the same, and the finer distinctions between one building and another are ignored.

Regarding debt, in South Africa municipalities buy their electricity from the national service provider, and sell it on to the individual household or business. This means that they have the right to disconnect a customer who is in arrears. They have the legal power to charge Rates on a monthly basis, so rates, electricity and water are on the same account. This ensures that all three are paid regularly, and if they are not paid, the electricity is turned off. This is a powerful weapon which ensures a steady stream of revenue for the municipality. (It is worth noting that the City of

Johannesburg's estimates of Rates revenue for the financial year 2014/2015 is about $684 million[15]. A substantial sum.

The value of the Rates income cannot be underestimated. Every development within the urban boundary is a long term and ever increasing income stream. If, as is the case in Johannesburg, the rates are increased on an annual basis, then they become a highly valuable source of income which should far outstrip the current sources such as market fees, parking and the Single Business Permit.

9.7 Public private partnerships

9.7.1 What are PPPs and why do we need them?

The public sector is always dependent on the private sector for the delivery of services, whether it is construction of roads and offices or the supply of stationery. Are these PPPs? For example, if a contractor builds a road for the government, he will have to quote a price for the construction. He is taking the risk that, for example, his workers could go on strike and demand double wages; or that the soils of the land on which the road is being built are very poor. In such a case the government takes none of the risk: it is the private contractor who runs the risk of making a loss on the project. Equally he might make a huge profit because, for example, the soils are much better than he thought. Is this a PPP?
There are two typical characteristics for PPPs which make them different from ordinary service contracts.

- There is a sharing of the responsibility and the risks of the project.
- The relationship between the parties is a long term one, typically a minimum of five years, with a maximum of 30 years.

9.7.2 What are the advantages of PPPs?

The most common motivation for PPPs is that the public sector lacks the funds required. For example, construction of major highways requires massive capital. If a PPP is used, which allows the private company to recover its costs over a long-term period through tolls, the road can be built and operated without requiring expenditure from the National treasury.
A second reason is that the private sector can bring skills to the public sector which it may lack, For example, the public sector may not have enough people to operate a water system including the purification plant, billing and other management issues: it can enter into a PPP and thereby ensure that the skills to operate the system are obtained.

9.7.3 What are the risks of PPPs?

Anyone who has been married a long time will know that long-term relationships are not straightforward. Someone who seemed to be very reliable might turn out to be the opposite; someone who seemed to be financially secure might loose everything.

Similarly in a PPP, an arrangement that seemed perfect at the time may collapse later. For example, a County enters into a PPP with a company to remove the rubbish in the centre of town. The contract includes the payment of a sum by the County upfront to allow the contractor to buy trucks to collect the garbage. The money is paid, but only about half of the rubbish is collected. The contractor says that the amount of rubbish he had estimated when he signed the agreement had increased, so it was not his fault. The County says that the agreement stipulates that all garbage has to be removed. So the agreement collapses.

A major risk is that conditions will change so much that the project becomes unviable, or that the private sector partner lacks the funds necessary to continue.

At the root of many disputes are badly defined criteria by which performance can be measured, and whether the public client is able to manage the performance of the partner.

These guidelines have been prepared to assist the public party – in this case the County – to enter into a PPP which yields the best performance at the best possible price. At the heart of such a

[15] City of Johannesburg: 2013/14 – 2014/2015 Draft Medium Term Budget

partnership is a contract which is sufficiently well prepared to allow the parties to adapt the terms in light of changing circumstances, because in the long run if either party does not receive a fair deal the PPP will fail. Moreover the contract must protect both parties against exploitation by the other.

What follows is a summary of a highly technical process, and in all large PPPs the public party is advised to engage an experienced transaction adviser who can advise on the most cost effective arrangement, and protect it against the risks inherent in poorly drafted contracts.

9.7.4 Project Preparation: the sequence

The sequence for the preparation of a project is as follows:

1. Conceptualization
    i. Identify nature of project
    ii. Test whether it is suitable for using a PPP approach
    iii. Test against County's and government priorities
    iv. Include in the County's multi-year budget and/or multi-year plan
    v. Set up project team
    vi. Appoint technical consultants if required
2. Feasibility Study
    i. Needs analysis
    ii. Options analysis
    iii. Value assessment
    iv. Procurement plan
3. Preparing for bidding
    i. Set up procurement process
    ii. Invite expressions of interest
    iii. Prepare draft PPP agreement
    iv. Prepare Request for Proposal documents
4. Tendering and bid evaluation
    i. Issue requests for proposals (tenders)
    ii. Conduct due diligence on interested parties (financial ability, reputation, experience)
    iii. Compliance with bid conditions
5. Negotiations and financial close
    i. Reach agreement on all outstanding issues
    ii. Finalize project documentation
6. Project monitoring
    i. Provision for Reporting
    ii. Provision for inspections
    iii. Mechanisms for handling complaints

9.7.5 Project conceptualization

Even though the project development process must allow for changes in the project design as it evolves, perhaps the most important stage of any project is the first one which defines **what** is needed, **how** it will be addressed and, in general terms, assesses the **project feasibility**. This is sometimes described as a pre-feasibility study. It should be conducted carefully so as to ensure that all relevant factors are considered, and that an objective appraisal of the potential for a PPP is made.

It is useful to examine these points in more detail.

What is supposed to be done, and how can the present system be improved?
The fundamental principle is that PPPs must operate within a mandate provided by government policy and be provided for in the Government's or County's long term planning and budgeting.

As a first step it is useful to consider the vision and mission of the County, and the government policy which identifies its deliverables. What functions is the County supposed to provide? This establishes the need.

The second stage is to evaluate, in general terms, how well the County is meeting the need.

If there are shortcomings, are these due to:

- Lack of capital?
- Lack of management skills?
- Lack of technical skills?

What is the budget for the provision of these services? Can it be increased? What constraints is the County facing in terms of budget?

From this analysis, the project sponsor (by which we mean the County) should, as objectively as possible, analyse what the cause of these problems is. Is this a short-term problem or a long-term one? What will the private sector bring to the project which the public sector cannot?

It is easy to make assumptions regarding what the private sector will bring, but it is also important to know that its input **will come at a cost**. The sponsor should look very carefully at the status quo to determine what can be improved within the existing management and budgetary framework, remembering that PPPs – while seeming to offer solutions – can also cost substantial sums of money to establish and operate, and can have negative consequences such as resistance by labour, or public objections to private sector participation which can cause political conflict.

There is also the fundamental requirement of public policy that PPPs should represent good value for money. This does not always mean that they will be cheaper from the first day of operation, but that they are, in the long run, offering services at a lower cost than the public sector can.

In this connection it is important to assess whether, if the problem seems to be a shortage of capital, whether there might be other sources of capital which might be used. For example, government and state owned enterprises might be able to borrow funds from a development bank or obtain a loan from a private enterprise at preferential rates.

9.7.6 What type of PPP would be appropriate?

It is important to look at what type of PPP is required.

In principle there are four categories of PPP:

1. The long term devolution of responsibility for the management of public assets to a private company, in which the revenue is collected directly from the public (toll road, water supplies). These are known as concessions.
2. The construction and/or rehabilitation, and operation and maintenance of assets, under which the government pays the private provider on the basis of the degree to which those assets are used. There is however often a “take or pay” or availability charge. This can be used for commercial services (such as power plants).
3. The construction and/or rehabilitation, and operation and maintenance of social facilities such as community halls or markets.
4. The operation of a service on behalf of the public entity, typically taking responsibility for operation and maintenance for a fixed fee.

The table on the next page shows the components which often constitute a PPP, most of which can be combined to suit the needs of the project. In essence they represent the risk elements which will be transferred to the private sector in various combinations.

For example the project may consist of

- Design, build, operate
- Design, build, operate, maintain
- Design, build, operate, own
- Finance, design, build, operate, maintain
- Finance, design, build, operate, train, maintain, transfer
- Etc.

There is no such thing as best practice for PPPs due to the wide range of conditions which they must meet, but there are several models which have stood the test of time.

More detailed guidelines were included in the Interim Report. It is hoped that these will provide the information necessary to adopt the most appropriate solution. However, these guidelines are no substitute for expert advice which is essential in order to successfully implement a PPP which represents good value for money and provides a high standard of service.

Main Type	Description	Risks transferred	Potential application	Advantages	Disadvantages
Service Contract Outsourc-ing	A non-capital intensive service is provided using a publicly owned asset	Manage-ment	Catering/ security	Management is relieved of the day-to-day management responsibility	Monitoring to ensure quality of service must be relatively intensive
Design	The private sector designs the facility	Design	Together with construction in turnkey projects. Highly specialized projects	Design is tailored to functionality	Changes are extremely expensive
Build	The private sector constructs the facility as part of a larger package	Construct-ion	Together with design in turnkey projects. Highly specialized projects	Private contractors can optimize the design to account for their construction systems. Skills can be obtained	Can easily promote corruption and is often neither transparent nor competitive
Operation and Mainten-ance	A non-capital intensive service is provided using a public or privately owned asset but accepting responsibility for maintenance and refurbishment. Sometimes rehabilitation costs are included in the contract.	Manage-ment and mainten-ance	Used where service standards need improvement and in combination with other options	Private sector skills are imported and applied. Service levels show improvements	Is not necessarily more affordable
Finance	The private sector finances the facility (always in combination with extended options)	Financing viability and profitability	Always used in combination with other options	Relieves government of need to provide capital	
Own	The private sector owns (and operates) the facility for a specified period before transferring it back to government	Design Construct-ion financing and viability	Always used in combination with other options	Provides legal protection and collateral. Can be used to address financier's credit risk	

9.8 Planning implementation under the new constitution

9.8.1 Rights and duties

The new constitution provides rights for citizens regarding participation in public affairs, and duties on behalf of Counties and urban governments to share information and seek the vies of citizens. Nowhere, however, is it stated that citizens have powers to insist that their demands are met, nor is their any corresponding guidance on how the authorities should respond to citizen demands and proposals.

Rights

Section 96 of the County Government Act however, specifies a right that citizens have under the Constitution.

> **Access to information**
> (1) Every Kenyan citizen shall on request have access to information held by any county government or any unit or department thereof or any other State organ in accordance with Article 35 of the Constitution.

Duties

Section 89 of the County Government Act, states:

> County government authorities, agencies and agents have a duty to respond expeditiously to petitions and challenges from citizens.

In Section 87, this duty is described in following terms:

> (Citizen participation in county governments shall be based upon the following principles—) . . .
> (e) 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;
> (g) recognition and promotion of the reciprocal roles of non-state actors' participation and governmental facilitation and oversight.

Section 90 of the County Government Act gives Counties the power to conduct a referendum, provided a sufficient percentage (25%) of the voters within the area concerned have demanded it, However, it is important to note that this is not a duty: the operative word is "may", not "must".

> **Matters subject to local referenda**
> (1) A county government may conduct a local referendum on among other local issues—
> (a) county laws and petitions; or
> (b) planning and investment decisions affecting the county for which a petition has been raised and duly signed by at least twenty five percent of the registered voters where the referendum is to take place.
> (2) The Elections Act (No. 24 of 2011) shall apply, with necessary modifications, with regard to a referendum referred to under subsection (1).

It is worth noting that one of the grounds for conducting a referendum is "planning and investment decisions".

9.8.2 Areas in which citizen participation should be solicited

Section 87 of the County Government Act states:

> **Principles of citizen participation in counties**
> Citizen participation in county governments shall be based upon the following principles—
> (b) 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;
> (f) promotion of public-private partnerships, such as joint committees, technical teams, and citizen commissions, to encourage direct dialogue and concerted action on sustainable

development.

The Urban Areas and Cities Act has more detailed descriptions of what is required, but this does not apply to any of the towns in Cluster III. It will therefore not be referred to further.

9.8.3 Relevant areas for citizen participation in relation to the Kenya Municipal Programme

In the context of the present project, the relevant provision from the County Government Act is stated as:

> Reasonable access to the process of formulating and implementing policies, laws, and regulations, including the approval of development proposals, projects and budgets. (Section 87 (b))

This may be interpreted as:

Policies and regulations

The Terms of Reference include the need to draft proposals regarding development control, which falls under the rubric of policies and regulations.

> The plan should be prepared along with the land use zoning regulations (code) which will facilitate easy implementation of the plan proposals. The land use zoning regulations (code) will be prescribed to facilitate easy interpretation and disposal of day to day references received on land matters.

Development Proposals

The main output of the project is to prepare development proposals. The Terms of Reference state that

The strategic structure plan will at a minimum:

- Identify the location of future residential areas
- Identify the location of future commercial and industrial areas
- Identify the location of extend (sic) of environmental and historical conservation areas
- Articulate a road hierarchy and identify movement corridors
- Incorporate good urban design principles that are characteristic of the area as perceived by the residents
- Consider and incorporate community vision principles derived from participatory community reference groups/meetings

9.8.4 Projects and budgets

The objective of the Capital Investment Plans is to identify projects and their budgetary implications. The Terms of Reference state:

> The participatory process will result in a three year rolling capital investment plan (CIP) that reflects publicly agreed local priorities for investment in municipal services and is both financially realistic and feasible. The CIP will include estimated costs and responsibilities for implementation of agreed investments, as well as a financing plan.

This is the only section which refers directly to plans being the generated by public participation through the use of the terms “publicly agreed” and “agreed investments”.

There is also a somewhat different obligation on Counties, in section 87 of the County Government Act, regarding Public Private Partnerships (PPPs).

> (f) 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
> (g) recognition and promotion of the reciprocal roles of non-state actors’ participation and

governmental facilitation and oversight.

Thus if PPPs are envisaged – a real possibility for some services – this sub-section should be applied.

9.8.5 The nature of participation

The project has used three methods to obtain the views of a wide range of stakeholders and ensure that their representatives are invited to the workshops. The methods are:

- Discussions with all interest groups in the town. These include residents' associations, market operators, jua kali entrepreneurs, chamber of commerce and industry, individual enterprises, utility providers, police, workers and management in health and education institutions, transport operators, religious and educational leaders, people with special needs, public officers and political leaders,
- Focus groups for specific groups, such as women's groups, youth, market women, etc.
- Workshops, namely:
- Launch workshop
- Mapping, situational analysis, and visioning workshop
- Preliminary Plans workshop
- Capital Investment Plan workshop
- Final workshop.

These methods have done and will do provide very important and useful input into the planning process. However, the project will end shortly which will mark the beginning of the implementation phase.

9.8.6 Implementing participation

Relationship between the actors

Though the above methods are in keeping with the act and serve a very important purpose, they are essentially consultative, in that they are devices to seek the advice and opinion of stakeholders.

True participation is however different, because it involves the sharing of power. It is a prerequisite for site specific interventions, most notably in informal settlement upgrading. However, when it comes to actually starting a process, most professionals are uncertain where to begin.

The starting point for participation is that If development doesn't work *with* people it cannot succeed. It is taken for granted that people will always welcome development, as it is good for them, but all too often things turn out differently. This can be ascribed to imposed systems which are constrained by institutional limitations and inappropriate rules. This report is therefore an outline of methodologies which reflect the values of the people who will the participants in and beneficiaries of the development.

For such a process to succeed there must be structures within which it must take place. Bottom-up development is not the same as laissez faire, and requires management in just the same way as all other development does. Thus, while the perceptions of the poor regarding their environment and their future are important, even as their aspirations are, it is neither desirable nor practical to absolve the formal structures of government and civil society of any duty of care and/or necessity to play a role.

The focus should therefore be on the interface between the poor and the structures of government and society in all their forms, because it is in this relationship that so much of conventional development has been weak. Typically the formal structures of the state, whether national regional or local government, are typically very uneasy about this interface (with a few notable exceptions).

We believe that it is, in many cases, a mixture of ignorance and fear that prevents agencies from adopting a more people-centred approach. In this they are undoubtedly assisted by accountants who will warn of the perils and cost of public participation, and the traditional design professionals whose motivations are the maintenance of high standards (or, a more cynical point of view, might be to protect their interests by creating exclusivity).

The *hows* are more important than the *whats*. By this we mean that there seem to be certain threads which run through successful projects which are derived more from how the project was designed than the solution finally adopted. The solutions are less important than the design process – and by design we are not talking about the form of physical solutions, but the relationships between, and duties of, all the parties involved in any development activity.

The *hows*, therefore concern the manner in which a programme is designed, an essential part of which is a knowledge of the essential ingredients. This report tries to unpack those essential ingredients and to show how they relate to each other. But the what – how those ingredients will be mixed in the final solution – is something which can never be standardised. It must respond to local conditions, whether economic, legal, human or environmental. Taking all factors into account every intervention is bound to be, and probably should be, different.

9.8.7 Process of participation

The first task is to ask. A random survey around the community will give a quick idea of whether there are organisations which can be taken to represent the community. During the same informal survey, the question must be asked regarding the organisations to which the person is affiliated. These are typically religious, women's/youth groups, work-based groups (e.g. informal traders), and savings groups. There may be political ones as well. This will then provide a universe from which to invite representatives to attend a workshop in which a representative committee will be established. But before any meeting is called, the next stage is to meet the heads of each of these organisations and canvass their ideas about how to proceed. In brief, the process is participatory from the start, but using the gradualist approach to ensure that the right people participate.

How the next stage proceeds will vary. Typically all interested parties will get together and will form a committee. The degree of formality of this committee may vary: for some it is enough to keep the whole process almost casual; for others there should be a constitution which will specify the procedures for elections, management of funds, and other matters. In some cases, the committee will establish a financing arm which can then be used as a recognised body to which public and private funds can be donated or leant. This is where the concept of "good government" comes in. It is very helpful if the community can be given support in these matters, and thereby save everyone much time. For example, in a project in South Africa, community groups were assisted to form Trusts into which USAID funds could be deposited. A firm of lawyers was contracted to do all the paperwork involved for all 28 communities involved, and the process was quick (about two weeks) and easy. Similarly, a draft constitution was available which could be used as a basis for each group to develop their own.

As soon as a representative group has been formed they need to meet and develop a working methodology. This should encompass two critical components: how to consult the community as a whole before making major decisions, and how to give feedback to the community in terms of progress. These issues are easily agreed at the beginning of a process, but need constant attention if they are to be implemented in practice. We look at this in more detail below.

At this stage, an important technical point must be addressed: what is the role of the political representative, the Member of the County Assembly. He or she will typically be nervous about the role of the committee, as it will seem to undermine his/her duty to represent the community.

This is an issue which must be addressed with care, in two ways. The first task will be to include the MCA in the early discussions regarding the formation of a committee. There may already have be Ward Committee with similar functions. Ward Committees exist, under one name or another, in many jurisdictions, and while they look good on paper they are typically marred by the lack of a specific role, and the fact that the MCA either chooses the representatives or plays a big role in selecting them. Ward Committees therefore can pose a threat to effective community involvement.

For this reason the MCA can be convinced that the new committee is a development tool, which will help the development of the area. It will collaborate closely with the ward committee and the MCA will be represented on it, and is a tool to accelerate development which will be to the MCA's benefit.

To make sure that the MCA is supportive of the initiative he or she must be fully involved in the process, and must see it as a means of advancing his or her interests.

In turn the County/municipality must establish its own presence in the area. Sending in a community liaison person who chooses when to be there, and whose role is to tell the community what is going to happen, is not the idea.

Before we try and define the role of the public sector team in a community we should ask what the public will expect of them.

They will require good communication. This is not just a question of putting up a few posters, or addressing public meetings, but communicating information in a language and style that the residents can understand.

Communication can take many forms: for example in Zambia the project commissioned a top pop group to praise the virtues of alternative technology (compressed soil blocks) in one of their songs, which, incidentally, was at the top of the pops for six months. Street theatre and radio shows can also be effective. The written word can be important, but the spoken word usually has more impact.

A very important part of this is that all local government staff who come to the site in any capacity must speak with the same voice and either be able to answer questions, or to be able to say that they don't know and refer the questioner to the right person.

They will need to take informed decisions. In order to do this they will need to have not only the correct information, but the opportunity to interrogate it. They will not, and should not have to, be given information on a take-it-or-leave it basis. Experts must therefore be available to respond to queries, whether they are about land tenure, property taxes, road construction or by-laws. If they do not understand the need for something they cannot be expected to support it. Cognitive dissonance will set in, and the engagement of the community can be lost.

Services should be provided in a way that meets the needs of the residents in terms of hours of operation, location, and the attitude of the staff.

We cannot be prescriptive about how to meet these needs, but examples which have been seen to work have the following characteristics.

- The local government has an office – no matter how small – within the community. It can be in an existing house if need be. At the very least it offers a location to which people can go to make contact.
- The office is staffed by someone from the community, and paid by the local government. This person is basically a liaison person who understands the needs of the community and the way that the local government operates.
- The local government team in the settlement can be very small or quite big, but whatever the size its main function is to act as a facilitator. What it must not be is a means by which decisions made "in the office" are communicated to the people; or, even worse, an enforcement agency designed, for example, to get the people to comply with the by-laws.
- The local government team must have the support of the head office to get answers to questions raised by the community, and to mobilise resources.

In other words, the local government is placing its resources at the disposal of the community to help them develop solutions that it (the community) wants and which work. Equally important is for the team and the community to be given time to take decisions. It is terribly easy, and very tempting, to get an instant decision. Thus, an MCA, for example, may get support by acclamation for a project to bring a new road into the settlement, but this is not a decision that will get the support of the community if they find that a huge number of houses will be demolished to make it possible. A sustainable decision, to which people feel committed, takes time, during which dissonances have time to be resolved.

Community decision-making follows a pattern, and in the world of real development we must understand that it is essential to allow the time for decisions to be made, and that time spent at this stage can save far more time which might be required to resolve conflicts at a later stage.

Systematic decision-making

There are three stages in decision-making.

The first stage is to have the information. This is, in a sense the foundation for a process, which is cannot proceed effectively until those involved – which should be every resident – internalise and assimilate the information. However effective mass communications are, people will usually want to ask questions to clarify matters in their mind. They must therefore have an opportunity to question someone about matters which they are not clear about. In the process trust will develop between the community and the local authority. The best environment for the transfer of information is the small group of between 15 and 25 persons in which people are less shy than in a large public meeting, and quieter people will feel free to ask questions.

The second stage is for people to look at the possibilities and consider their options. Among the types of issues will be the trade-off between standards and costs; the trade off between the provision of additional facilities and the loss of dwelling units; and the question of the routing of improved roads and the like. This stage should continue at the small group level, as many questions will arise and debates may occur. The technical nature of some questions will mean that field staff will not be equipped to deal with them; and even if they know the answers they should consciously decide not to answer them because they lack the authority to do so. Thus the second stage may include some strong questioning and debate around technical issues.

The third stage is the development of consensus. This requires good management so that people whose views are being considered do not feel excluded and resentful.

It might need some out-of-the-box thinking. For example a substantial number of people might prefer to live with only minor improvements to their infrastructure, because they cannot afford anything better. Because the saving in engineering terms is only effective if a geographical area is serviced to a specific standard those who opt for such reduced standards can swap houses[16] with those who want to benefit from substantially increased standards. Therefore some areas will be serviced to a high standard, and others to a lower one, and charges that each household pays will reflect that.

Consensus building has to be achieved steadily, and cannot be rushed. But we must recognise that there will be some people who will refuse to collaborate, either for economic, social or political reasons. How such people are brought into the consensus model requires tact and persuasion. The objective should be to give the person a voice and then bring social pressure to bear. Often people who are individualistic and stubborn will be willing to sacrifice their personal welfare for the common good if they are given the opportunity to do so voluntarily. But when they are put into a corner, and forced to collaborate, they may make life very difficult. Obviously there is no standard method for forcing compliance, but if we refer back to the role of cognitive dissonance, we recall that there must be either a penalty or reward. In this case the preferable route is to reward the person, for example by huge public acclaim, offers of additional land (or whatever) in compensation, or assistance in kind[17].

[16] Swapping houses may sound rather an odd concept, but it worked very well in Zambia where people who were living in a congested area and who wanted larger plots, and were willing to build a new house, swapped with someone whose house was due to be demolished to make way for a new road. In that way, one family surrendered their unit which was to be demolished to move into an existing house, the owners of which had been given a new plot. Similar concepts were well received in Swaziland. (Martin, Mathema et al: Mbabane Upgrading and Finance Project; Cities Alliance, Washington DC, January 2007, p130.)

[17] In community-driven projects the use of financial compensation creates the potential for substantial conflict between the residents and the compensating authority. On the one hand, if payments are too low they will achieve nothing but disgruntlement; if they are too high they will create perverse incentives to attract compensation. In Swaziland, for example, the cost of compensation paid, largely for destruction of trees and hedges, but also of a few houses, was greater than the cost of the improvements to the roads and water systems. The fact that the valuers were paid a percentage of the sums paid out might have been a factor in inflating the sums paid. Be that as it may, there is nevertheless a likelihood that if the community had been given the responsibility for handling these funds the distribution might have been very different. By contrast, in Zambia, no one received compensation, and there was only one serious complaint: a bar owner was in the way of the road. Knowing that there was no compensation if his property was demolished, he refused to move. The community agreed with him – it would have been unfair for him to have lost such a valuable asset – so the route of the road was changed to allow him to stay.

The second point about negotiation and conflict resolution is to remove the words right and wrong, and look at the situation from the point of view of what gains can be made from a settlement.

The situation is always made more intractable where people have adopted a public position. If so, they will lose face if they "give in" and can be seen to be weak. They ask themselves:

- If I "give in" will I be criticised for it?
- Will I lose power and authority?
- How will my committee see me, if I am seen to be sympathising with the other side?

It is these sorts of issue which can be the biggest stumbling block to movement in any conflict resolution process.

At the same time, leaders may ask themselves whether their long-term reputation will be enhanced more if they have a record of resolving disputes or creating them, and whether by alienating parts of the community they are sending the right message.

There is no doubt that resolving conflict is harder work in the short term than the "non-negotiable" position; but conflicts have a way of re-surfacing and, like a dormant disease, erupting into nasty sores at a later stage.

The following quotation from the famous Dale Carnegie sums up this point:

> You want the approval of those with whom you come into contact. You want recognition of your true worth. You want a feeling that you are important in your little world. You don't want to listen to cheap, insincere flattery, but you do crave sincere appreciation. You want your friends to be, as Charles Schwab put it, "hearty in their approbation and lavish in their praise." All of us want that.
>
> So, let's obey the Golden Rule, and give unto others what we would have others give unto us[18].

The *style* with which conflict is approached is as important as the *content*. The same book gives guidance on how to stop disagreement becoming an argument. This includes:

- Welcome the disagreement
- Distrust your first instinctive impression
- Control your temper
- Listen first
- Look for areas of agreement
- Be honest
- Promise to think over your opponents' ideas and study them carefully
- Thanks your opponents sincerely for their interest
- Postpone action to given both sides time to think through the problem.

> Could my opponents be right? Partly right? Is there truth or merit in their position or argument? Is my reaction one which will relieve the problem, or will it just relieve any frustration? Will my reaction drive my opponents further away or draw them closer to me? Will my reaction elevate the estimation good people have of me? Will I win or lose? What price will I have to pay if I win? If I am quiet about it, will the disagreement blow over? Is this difficult situation an opportunity for me?[19]

These attitudinal attributes can make or break any attempt to build consensus, and it is in the last paragraph of this quotation that the essence of the whole concept of successful negotiation lies. What will work for *both sides*? That is the much-clichéd win-win situation.

[18] Carnegie, Dale (1982) How to win friends and influence people: Pocket Books, New York, p101.

[19] Op cit, p122; quoting from Bits and Pieces, published by the Economic Press, Fairfield, N.J.

There is one more very important quality: patience. Decisions which are rushed through for the sake of appearance of consensus can unravel with disarming speed. So, however, tempting it may be, we do not grab at the first straw of agreement, but make sure that agreement is reached with a complete understanding by both sides of precisely what has been agreed and how it will be implemented.

There is also a need for specific skills.

- The community facilitator has a job which requires experience to deal with conflict in a non-directive way: this is much harder than it sounds. He or she also has to understand the technical issues involved, without purporting to become an expert. He or she must be a friend and servant of the community while honestly and conscientiously serving the local government.
- Secondly there is a need for the leadership, and the community at large, to understand and be able to manage effective conflict resolution and consensus building.

9.8.8 Putting participation theory into practice

What follows is therefore a proposal for new ways of working which are not money-led, nor project-led, but are sustainable in the very best term of the word. This way of working gives the residents of informal settlements, which is used here as an example, a meaningful role in devising their own answers to their problems, and gives them a political and economic stake within the system of governance. In order to do so, it requires local government to treat them as partners, an act of trust that is not always easy. But unless and until it does do, it will not succeed to make a genuine difference. Moreover, trust in this case does not just mean trust in the social sense, but the financial sense as well: the community must be given control over resources.

No public agency ever has enough money to serve everyone's needs. Capital for development must therefore be rationed, and costs are recovered either through user charges or formal loan mechanisms. The needy and disadvantaged must compete for resources against other claims: the major highway, the new market, the sewage works; street lighting in upper-income areas. But we have to assume that they will be given a fair slice of the cake. The traditional budget system is based on projects: so much for the new highway, to be spread over three years; so much for the market etc etc.

This budgeting system is subject to fickle and volatile political pressures. The correct route for good government is to ensure that a fixed percentage of the annual budget is allocated to specific purposes, e.g. urban upgrading in specified areas. This system is no different in principle from Kenya's constitutional guarantee, under section 202, whereby Counties are allocated "an equitable share" of the national revenue, as of right. The same principle can be applied to other state budgetary systems, including local government.

Allocating the money is one thing, but how is responsibility for its expenditure to be managed?

Before attempting to answer this question we must suggest certain principles by which it would be distributed. For example:

- Predictability: although it is not necessary for allocations to be made annually (indeed, this might not be helpful, as the sums could be too small to spend effectively) it should accrue on a regular basis, so that, for example, there are payments on a rotating three yearly basis.
- Amounts would be determined on the basis of the population and the need, using an objectively verifiable formula.
- The money would be granted to a community trust from which is would be disbursed direct to suppliers and contractors. In this way no funds would be handled physically by the community members.
- Payments would be released in stages by local government on presentation of satisfactory documentation.

Clearly there are many difficulties in such an arrangement, and there will be temptations to corrupt practices. Typical ones are to inflate contract prices and receive kickbacks, or accept bribes for the award of tenders. Unfortunately, these practices are found at all levels of government, and even in

the private sector, so we cannot expect community-based money management to be particularly different

However, experience has shown is that the following principles are very important:

- Wherever possible the community must have a financial and/or physical stake in the work. Thus, a condition for accessing the funding could be that the community must either provide, say, 10% of the grant sum up front, or must provide labour in lieu of it.
- Wherever possible money matters should be managed by women. They show themselves to be better custodians of resources and generally more trustworthy. The experience of micro-lenders with a huge variety of people of different cultures and at different economic levels has demonstrated this in many ways. It will usually be necessary to have a sexually mixed group, but women's active participation should be actively supported. One way of doing this might be to place responsibility for the account in the hands of those who have already proved their competence in money matters, for example in a group lending scheme.
- Temptations should be removed, for example, as we have already mentioned, there should be no cash.
- Deterrents should be in place: for example all the committee members should have a very clear idea of how auditing works and the chances of them getting caught out if they embezzle or enter corrupt relationships.
- Transparency is essential, so as to limit the potential for backroom deals.

If such safeguards can be established, how would the system work? Let us assume that a road is being upgraded. The location and design of the road has been agreed, and it is known to be within the allocation which is due to be released within a few months. Engineers appointed by the County, with support and consent from the community, have completed the working drawings and tenders have been received. The community follows public sector bidding guidelines in how tenders are awarded, and advised by the consulting engineers recommend a contractor for appointment.

At this stage the involvement of the community has been to decide, with technical advice, the route of the road and the standard of construction. Now, tenders are received and it is found that prices are above the budget. There are now three choices, and they have to be made within (say) 90 days if the tender price is not to increase.

1. Reduce the length of road to be built, and include the remainder in the allocation to be received within three years.
2. Reduce the standard of the road, for example, by making it slightly narrower, or with a lower standard of surfacing.
3. The community makes up the shortfall.

From this short scenario, the enormous value of placing the community in charge, in terms of empowerment and the taking of responsible decisions within the framework of real financial constraints becomes clear. Engineers may find the risks of such a delegation of power quite frightening. In prospect could be delays in decision-making which jeopardise the contract award, scaring off contractors due to the unfamiliar nature of the arrangement, etc.

In fact the opposite is likely to be true. People will not delay a decision when it affects their immediate interests – this sort of behaviour is much more likely when a body like the County has to take a decision for a community of which no MCA is a resident. And as for contractors' fear that community involvement in the contract will lead to disruption and irresponsible interference, experience shows that such contracts are far more likely to run into problems where the people are not involved. For example, in Lusaka, the contractors welcomed the communities' participation in the process, and there were no conflicts.

To continue the scenario: the contractor is appointed on the basis that the standards will remain the same and a shorter length of road will be built. Thereafter the contract is supervised by the resident Engineer. A community member volunteers to work with the resident engineer to see how quality checks are undertaken, and how work is measured for payment. An officially designated community person sits as an observer in the official contract site meetings, and the engineer reports on a regular basis to the project monitoring committee.

The contractor submits a payment certificate to the project monitoring committee which then approves it and passes it to the community trust fund for payment. The Trust would follow similar financial management guidelines to those applicable to any fiscally prudent organisation, whether public or private. For example the cheque would be made out by a private sector book-keeper appointed for the purpose, and would be signed by the Treasurer and Chairman of the Trust. A complete paper trail would be available for audit and public scrutiny.

If local government is to be a supporter, and not controller of local affairs, what would the role of other potential actors be?

What is the role of NGOs? Surely they should play an important role in such arrangements? Many have the skills to facilitate community involvement, to help people manage money, to mobilise community self help, to train the leadership and the like.

Although there are many very experienced and talented people work for NGOs, they are sometimes treated with scepticism by many communities. However, NGOs can be used as an initial reservoir for skills regarding participation which can be used until properly trained local government manpower is available. If they are to be used as that, the staff would be seconded to local government, and would not be seen to be working for the NGO itself. This would be the starting point for good government within the communities.

However, there are other, important, roles which NGOs can play. One of them is to support the needs of the disadvantaged; for example the orphans, exploited tenants or small scale traders whose livelihood is threatened by zealous law enforcement, etc.

Another very important role is to train and support training activities. They – especially some of the larger ones – will be able to access the very special skills required for the effective training of community participation activators, and similar work, for example the community builders.

Annexure 1

Notice of Intension of Plan: Embu

Notice of Intention to Plan (30th July 2014)

REPUBLIC OF KENYA

MINISTRY OF LAND, HOUSING AND URBAN DEVELOPMENT
DIRECTORATE OF URBAN DEVELOPMENT
KENYA MUNICIPAL PROGRAM
Country: Kenya
Name of Project: Kenya Municipal Program (KMP)
Credit No: 4714-KE

PUBLIC NOTICE

EMBU COUNTY GOVERNMENT

COMMENCEMENT OF THE PREPARATION OF EMBU STRATEGIC INTEGRATED URBAN DEVELOPMENT PLAN

Reference is made to the Constitution of Kenya articles 6, 60, 66, 67, 184, 186, and the First and Fourth Schedules; National Land Commission Act; County Government Act; Urban Areas and Cities Act; Physical Planning Act, Physical Planners Registration Act and other enabling legislations.

Notice is hereby given that the **Embu County Government** has commenced the preparation of **Embu Town Strategic Integrated Urban Development Plan** for the period 2014-2035. The development plan covers an area of about 102 km² in Embu town and its environs.

The purpose of the plan is to provide a framework for integrated socio-economic development, investment and development control of the town in a sustainable environment. The plan preparation project is expected to take 12 month from April 2014.

It is a constitutional and statutory requirement that stakeholders and members of the general public do participate in all planning and developments activities of the county. The Embu County Government therefore invites stakeholders and members of the general public to participate in the preparation of the plan. Any person or institution that wishes to participate in or has comments on the planning project can reach or may forward any such comments to the **County Secretary** at the address below.

County Secretary
Embu County Government
P. O. Box 36 – 60100 Embu.
Telephone: +254771204003; +254703192924
Email:info@embu.go.ke
Website: www.embu.go.ke
Dated this 30th July 2014.

NYERI COUNTY GOVERNMENT

COMMENCEMENT OF THE PREPARATION OF NYERI STRATEGIC INTEGRATED URBAN DEVELOPMENT PLAN

Reference is made to the Constitution of Kenya articles 6, 60, 66, 67, 184, 186 and the First and Fourth Schedules; National Land Commission Act; County Governments Act; Urban Areas and Cities Act; Physical Planning Act, Physical Planners Registration Act and other enabling legislations.

Notice is hereby given that the **Nyeri County Government** has commenced the preparation of **Nyeri Town Strategic Integrated Urban Development Plan** for the period 2014-2035. The development plan covers an area of about 267 km² in Nyeri town and its environs.
The purpose of the plan is to provide a framework for integrated socio-economic development, investment and development control of the town in a sustainable environment. The plan preparation project is expected to take 12 month from April 2014.

It is a constitutional and statutory requirement that stakeholders and members of the general public do participate in all planning and developments activities of the county. The Nyeri County Government therefore invites stakeholders and members of the general public to participate in the plan preparation process. Any person or institution that wishes to participate in or has comments on the planning project can reach or may forward any such comments to the **County Secretary** at the address below.

County Secretary,
Nyeri County Government
P. O. Box 1112-10100 Nyeri.
Telephone: +2540612030700
Email: nyericountysecretary@gmail.com
Website: www.nyeri.go.ke
Dated this 30th July 2014.

MACHAKOS COUNTY GOVERNMENT

COMMENCEMENT OF THE PREPARATION OF MACHAKOS STRATEGIC INTEGRATED URBAN DEVELOPMENT PLAN

Reference is made to the Constitution of Kenya articles 6, 60, 66, 67, 184, 186, and the First and Fourth Schedules; National Land Commission Act; County Governments Act; Urban Areas and Cities Act; Physical Planning Act, Physical Planners Registration Act and other enabling legislations.

Notice is hereby given that the **Machakos County Government** has commenced the preparation of **Machakos Town Strategic Integrated Urban Development Plan** for the period 2014-2035. The development plan covers an area of about 519 km² in Machakos town and its environs.

The purpose of the plan is to provide a framework for integrated socio-economic development, investment and development control of the town in a sustainable environment. The plan preparation project is expected to take 12 month from April 2014.

It is a constitutional and statutory requirement that stakeholders and members of the general public do participate in all planning and developments activities of the county. The Machakos County Government therefore invites stakeholders and members of the general public to participate in the preparation of the plan. Any person or institution that wishes to participate in or has comments on the planning project can reach or may forward any such comments to the **County Secretary** at the address below.

County Secretary
Machakos County Government
P. O. Box 1996 – 90100 Machakos.
Telephone: +254-44-20246/21158
Email: Website: www.machakosgovernment.com
Dated this 30th July 2014

NAKURU COUNTY GOVERNMENT

COMMENCEMENT OF THE PREPARATION OF NAKURU STRATEGIC INTEGRATED URBAN DEVELOPMENT PLAN

Reference is made to the Constitution of Kenya articles 6, 60, 66, 67, 184, 186 and the First and Fourth Schedules; National Land Commission Act; County Governments Act; Urban Areas and Cities Act; Physical Planning Act, Physical Planning Act and other enabling legislations.

Notice is hereby given that the **Nakuru County Government** has commenced the preparation of **Nakuru Town Strategic Integrated Urban Development Plan** for the period 2014-2035. The development plan covers an area of about 350 km² in Nakuru town and its environs.

The purpose of the plan is to provide a framework for integrated socio-economic development, investment and development control of the town in a sustainable environment. The plan preparation project is expected to take 12 month from April 2014.

It is a constitutional and statutory requirement that stakeholders and members of the general public do participate in all planning and developments activities of the county. The Nakuru County Government therefore invites stakeholders and members of the general public to participate in the preparation of the plan. Any person or institution that wishes to participate in or has comments on the planning project can reach or may forward any such comments to the **County Secretary** at the address below:

County Secretary
Nakuru County Government
P. O. Box 2870 – 20100 Nakuru.
Telephone: +254-051-221680
Email: nakurucountygovernor@gmail.com;
Website: www.nakuru.go.ke.
Dated this 30th July 2014.

NAKURU COUNTY GOVERNMENT

COMMENCEMENT OF THE PREPARATION OF NAIVASHA STRATEGIC INTEGRATED URBAN DEVELOPMENT PLAN

Reference is made to the Constitution of Kenya articles 6, 60, 66, 67, 184, 186 and the First and Fourth Schedules; National Land Commission Act; County Governments Act; Urban Areas and Cities Act; Physical Planning Act, Physical Planners Registration Act and other enabling legislations.

Notice is hereby given that the **Nakuru County Government** has commenced the preparation of **Naivasha Town Strategic Integrated Urban Development Plan** for the period 2014-2035. The development plan covers an area of about 950 km² in Naivasha town and its environs.

The purpose of the plan is to provide a framework for integrated socio-economic development, investment and development control of the town in a sustainable environment. The plan preparation project is expected to take 12 month from April 2014.

It is a constitutional and statutory requirement that stakeholders and members of the general public do participate in all planning and developments activities of the county. The Nakuru County Government therefore invites stakeholders and members of the general public to participate in the preparation of the plan. Any person or institution that wishes to participate in or has comments on the planning project can reach or may forward any such comments to the **County Secretary** at the address below.

County Secretary
Nakuru County Government
P. O. Box 2870 - 20100 Nakuru.
Telephone: +254-051-221680
Email: nakurucountygovernor@gmail.com;
Website:www.nakuru.go.ke
Dated this 30th July 2014.

KIAMBU COUNTY GOVERNMENT

COMMENCEMENT OF THE PREPARATION OF THIKA STRATEGIC INTEGRATED URBAN DEVELOPMENT PLAN

Reference is made to the Constitution of Kenya articles 6, 60, 66, 67, 184, 186, and the First and Fourth Schedules; National Land Commission Act; County Government Act; Urban Areas and Cities Act; Physical Planning Act, Physical Planners Registration Act and other enabling legislations.

Notice is hereby given that the **Kiambu County Government** has commenced the preparation of **Thika Town Strategic Integrated Urban Development Plan** for the period 2014-2035. The development plan covers an area of about 113 km² in Thika town and its environs.

The purpose of the plan is to provide a framework for integrated socio-economic development, investment and development control of the town in a sustainable environment. The plan preparation project is expected to take 12 month from April 2014.

It is a constitutional and statutory requirement that stakeholders and members of the general public do participate in all planning and developments activities of the county. The Kiambu County Government therefore invites stakeholders and members of the general public to participate in the preparation of the plan. Any person or institution that wishes to participate in or has comments on the planning project can reach or may forward any such comments to the **County Secretary or Chief Officer** at the address below.

David Gatimu
Chief officer-Lands, Housing and Physical Planning
Kiambu County Government
P. O. Box 2344 – 00900 Kiambu.
Telephone:+2540675858167/171
Website: www.kiambu.go.ke
Dated this 30th July 2014.

ENOSH M. ONYANGO
HEAD OF URBAN DEVELOPMENT DIRECTORATE

Annexure 2

List of stakeholders for workshops: Embu

List of Stakeholders for Workshop: Embu

Category	Number
Elected Representatives	
H.E. The Governor	1
H.E. The Deputy Governor	1
All ….. County Assembly Representatives	20
Local Member of Parliament	1
Minister of Land, Environment, Housing and Planning	1
Officials from Central Government	
Representative from Directorate of Housing	1
Representative from Directorate Physical Planning	1
Representative from National Land Commission	1
Representative from Land Survey	1
Representatives from Urban Development Directorate (Client)	10
UN HABITAT	2
Officials from County Government	
County Secretary	1
Chief Officers	1
County Physical Planning Officer	1
County Surveyor	1
County Engineer	1
County Director of Environment (Local NEMA Representative)	1
Officials of County Ministry of Finance	1
Assistant Director of Dept of Industries -	1
Officials of County Ministry of Trade	1
Manyata Sub-County Administrator	1
Town Manager or Any Other Appointed Official	1
MD, Water Supply and Sewerage Company	1
Local Representative Officer, Kenya Power and Lighting	1
Local Representative Officer, Post Office	1
Local Representative Officer, Ministry of Information, Communication and Technology	1
County Disability Network Children's Department	1
Education, Youth & Social Welfare Officers Department	1
Manyata sub-county MPs office & Women Rep. Embu County (MP women Rep.)	1
County Public Health Officer	1
Representatives of Cultural Groups	4
Faith Based Organization	
Representative of Anglican Church	1
Representative of Catholic Church	1
Representative of Protestant	1
Hindu	1
Representative of Muslims	1
Security	

Category	Number
Representative, Office Commanding Police Division	1
County Inspectorate	1
Representative of Development Practitioners	
i. Planner	1
ii. Surveyor	1
iii. Engineer	1
iv. Architect	1
v. Environmentalist	1
Farmers	
i. Small Scale Farmers	1
ii. Large Scale Farmers	1
iii. Horticulturists	1
Opinion Leaders	
i. Retired Teachers	1
ii. Retired Civil Servants	1
iii. Other Eminent Citizens	1
Educationists	
i. Principals, Polytechnics	2
ii. Principals, Colleges	2
Other Organizations	
Representative of Matatu Owner's Association	1
Representative of Matatu Welfare Association	1
Chairman of Boda Boda Association	1
Chairman of Chamber of Commerce and Industry (073396272763)	1
Secretary or Vice Chairman or CEO of Chamber of Commerce and Industry	1
Chairperson of the Main Masaku Market (Food)	1
Madaraka Market Committee, Jamhuri Market Committee	2
Business Community/ Moi Market Committee of CBD	2
Chairpersons of the Wholesale and Mtumba Market	1
Embu Hawkers Association	2
Street Vendor Association/ Chairperson Kenya National Alliance of Street Vendors and Informal Traders	4
Chairman and Secretary; Jua Kali Association	2
Others	
Informal Settlement Committee	4
Representative of NGOs	2
Social Workers	2
Private Practitioner-Doctor	1
Cultural Groups	2
Local Urban Forum Representatives	6
Common Citizens from all 6 wards	6
Embu Residents Association	4

Category	Number
Property Consultants	2
Maendeleo Ya Wanawake (Women's Development Association)-1 from each ward	6
Youth Organization (1 from each ward)	6
Kenya Football Federation, Local Chapter	1
Representative of Vulnerable Persons Groups/ People with Disabilities	2
Local Representatives of Main Political Parties	3
Any Others as deemed fit by County Government	
Total	**151**

Annexure 3

Embu Launch Workshop Proceedings

Embu Launch Workshop

Held on 4th August 2014, at the Izaak Walton Inn

3.1Introduction

The objective of the Launch Workshop was to familiarize the key stakeholders as identified through stakeholder analysis. The key stakeholders include MCAs; County Officials; representatives of organisations like Chambers of Commerce & Industry, Religious, Matatus, Bodabodas, Hawkers, Jua Kali, informal settlements, Police, Development Practicners, Opinion Leader, Farmers, Cultural Groups, Educationist, other community based organisations and civil society organisations, etc. with the purpose, process and expected outcomes of the Project. The list of all stakeholder invited for the workshop is given in Annexure 2.

As articulated in the ToR, the launch workshop was organised on 04th August 2014 in Embu at 10.00 AM. Invitations were given to all the selcted key stakehoders. Around 120 participants attended the workshop.

3.2 Proceedings

Welcoming remarks
Mr Mmbai introduced the theme of the workshop by stressing that planning was now inclusive: irrespective of gender, age, economic activity, physical capacity and so on everyone was involved. This was in contrast to the old way of doing things when the only contact with planning was to go to the Physical Planning Office if one had a problem to be shown a plan. The customer had no idea how, why when it was prepared. There was no consultation about, for example, the standard of a new road, or plans for the CBD. This was all changing, and the County had ideas to make Embu a vibrant town.

While waiting for the Governor to be free to officially open the Workshop he asked those attending to introduce themselves and to state their expectations for the Workshop. Followng that he invited the participants to state what they saw as the main challenges facing Embu today.

The list below summarises the contributions:

- Drainage
- Land grabbing
- Implementation of policies
    - For example the policy of requiring underground parking in the CBD
- Poor roads
- Poor planning
- Lack of places for recreation
- Too many bars
- Conflicting land uses
- Poor infrastructure
- Lack of good playing fields
- Poor dumping site
- Bad attitude of residents
- Poor garbage control
- Poor waste management
- Lack of car parking space
- Grabbing of public open spaces for other uses
- Lack of land for expansion
- Land subdivisions around the CBD
- Congestion at entry points of the town – need for a bypass

Introduction by Embu County Government

The Chief Officer for Planning, Eng. Steve Njiru then invited the representatives of the Kenya Municipal Programme (KMP), from the Urban Development Department, to introduce the project. Mr Isaac Mungania said that the KMP was funded by the World Bank, with co-financing by the Swedish International development Agency (SIDA). It had four components: Institutional strengthening, participatory strategic urban planning, investment in infrastructure and service delivery, and project management, monitoring and evaluation. This project fell under component 2. The twelve month contract for the work had been awarded following the World Bank/GOK procurement process. It had three components: Digital Mapping, Integrated Strategic Urban Development Plans and Capital Investment Plans. This launch workshop was an opportunity for stakeholders to learn about the methodology the consultants would use, express their views and make their inputs.

Address by Mr. Isaac Mungania, KMP

The Deputy Majority Leader in the County Assembly The Hon Mr. Kanjogu said he had been requested by the Deputy Speaker to express their appreciation of the good turnout at the Workshop and to pass on the regrets of many members who could not attend as they were attending a budget meeting in Nairobi. He said there were many challenges in Embu, so this project was very timely, and they wanted to thank the Government and the World Bank for their support. He said that the County Government Act placed great emphasis on the need for spatial planning and the process to be used, and he wished everyone present good luck in creating a vision for the future.

The Member of the County Executive Committee (CEC) for Lands Water Environment and Natural Resources, Mr Josphat Kithumbu said the County Government was looking far ahead – 50–100 years – because in addition to the legislative requirements, they believed strongly that planning was critical for human settlements. The County has four sub-counties and 20 wards, with Embu as the headquarters of the County. It was founded in 1906 and has grown from 4km2 to 80km2, with a projected population of 127,344 in 2015. The physical plan was not up to date. He wanted to make sure that the consultants captured all the points that would be raised today.

Address by Mr Josphat Kithumbu, CEC

He said he was concerned that only a small part of the CBD had modern infrastructure. The town also needed a bypass that would start at the Kenya School of Government. There was a large part of the town, behind the Government institutions that had no proper road access. There was also the question as to whether it was appropriate to have an agricultural research institute (KARI) right in town. that area would be perfect for high quality residential use, based on neighbourhood principles, supported by a shopping centre like the Village Market in Nairobi. The facilities at the Kigari high altitude training centre should be upgraded, and enhanced by adding a hospitality and Tourism training centre.An industrial area needed to be established where land is cheap. A dual carriageway road should be built to the airport, and the sewage treatment ponds should be relocated. The CBD should be modernised with high rise buildings and underground car parks. A modern bus park was required, and traffic flow had to be managed to eliminate traffic jams within seven years.

Another project to be considered was the creation of an international stadium and creation of adequate parking near the stadium. the area near the Izaac Walton which housed many academic institutions was to become the academic quarter, but there was a need to rationalise land holdings as some institutions had much more than they needed. The Shauri Yako slum needed to be relocated and the land developed into a modern market. Kaunda Estate should be upgraded, and the Provincial Hospital turned into a Teaching Hospital and Cancer Hospital.

Governor's Official Opening

The County Governor started his address by pointing out that the first Italian Missionaries to the area called it the Terra Amata, which is Italian for the Beloved Country. He then referred to his work with the Kenya Airports Authority which had to plan 20 years ahead, and he had been closely involved in planning the greenfield second terminal for the Jomo Kenyatta international Airport in Nairobi, not to mention many other airports throughout Kenya.

Address by H.E. Embu County Governor

He said the MEC had given a very good introduction to their plans for Embu. The County is talking about a City, not a town, and they already had many plans and projects in the pipeline. They had interested Japanese investors in the High Altitude Training Centre, were constructing a new KShs 700 million road to Makutano, were planning an ICT park, and were in dialogue with cities in Europe, Asia and America which would offer good examples for the growth of Embu. There was a team in Nairobi currently negotiating the budget, but they would not rely solely on the 40% from National Treasury. They would do PPPs and invest heavily in infrastructure. They would have modern street lighting on all main roads this year, and would embark on a programme to improve stormwater drainage. They were concerned about the lack of clear zoning, and wanted to turn the area opposite the Provincial Commissioner's office into a commercial zone.

They were going to acquire land for a second runway, and design it so that it could be used as a backup for JKIA when conditions were not suitable for landing there: presently aircraft were diverted to Mombasa or Kisumu which were a long way away. They were also looking at Embu's location in relation to the Juba and Isiolo trade corridors to Nairobi, and saw potential for a railway linking them to Nairobi via Embu.They had plans to spedn three billion shillings on construction of apartments in Embu, some of which would be in the CBD.

Other plans they were looking at were a Museum and an international conference centre.

Having outlined his plans for the future, the Governor wished all participants well in their deliberations and officially opened the workshop.

Eng.Steve Njiru then invited Ms Joyce Kariuki to make some remarks. She started by pointing out that the project was planned when Local Authorities were alive and well, and the planning system was very different from what it was today. All plans used to be approved in Nairobi, but now the Counties were in charge, and national legislation now has to be adapted to local legislation to create the correct legislative framework. The Institute of Planners was advocating action in this regard. Another problem was that Embu is not large enough to qualify as a municipality, but the Urban Areas and Cities Act is being revised, and once Embu has a Strategic Development Plan it will be eligible for municipal status. She attached great importance to the use of GIS in planning, which this project supported, which will be of value to many others such as traffic experts, the police and others. Technology transfer was important. She said that control of land use was fundamental.

She spoke of the problem of the original boundary of the planning area which included part of Kirinyaga County. This had not been a problem under the previous system which allowed the creation

of special planning areas; however under the new system the County could not plan for a different County. The boundaries had been revised, but the question of how to deal with Murinduko Njukiini, which was effectively part of Embu town, and used its facilities, remained. It could only be solved by political negotiation.

Consultant's Presentation

Mr Martin, Team Leader for the consultants, was then invited to give his presentation following which the Workshop broke for lunch.

Presentation by Team Leader

The Plenary

After lunch Mr Omwenga showed a slide of the announcement that had appeared in the press on the previous Wednesday – the Commencement of the Preparation of Embu Strategic Integrated Urban Development Plan. He said that this reflected the new attitude to planning whereby people were invited to participate actively. He said this didn't just apply today, but for the whole duration of the project. Following this, he invited participants to make comments and ask questions to the consultants.

These are summarised below:

- There is a need for sporting facilities for children at the local level
- A modern bus park is required – next to the stadium is a good location
- Government offices are scattered all over: they should be located together to make for a more efficient and convenient arrangement
- The police lines were an eyesore and the houses needed upgrading
- Embu could be a medical centre for the whole of Kenya
- There was a need for housing for military veterans
- There was a need to repossess land that had been grabbed
- A need for eco-tourism sites
- Sustainability was very important
- Need to recycle waste water
- Embu was a good location for a conference centre

Mr. Mmbai moderating the discussion

- Shauri Yako should not be relocated: it should be upgraded
- There were not enough vehicles for garbage removal
- The University should be located 100km from the town.
- It was shocking that the rivers became sewers due to poor sewage management
- There was a need for a market on the road from Meru which would attract passing trade
- There was a need for the County to establish an Urban Management Board or Committee to oversee implementation of plans
- The presentation said that industries were dying. What was going wrong?

In response to some points the CO said that the County did not have responses to all the points raised, but some issues were already being addressed.

Regarding the location of the sewage plant, the County already had allocated Kshs 10 million to buy land adjacent to a parcel of 10 acres the County already owned. They were going to establish a public private partnership to construct and manage a modeen sewage treatment plant.

Regarding land grabbing, in March a complete audit of land transactions had been conducted. The report had been received and was to be submitted to the County Assembly for approval. Once this had been received the County would recapture all land parcels that had been illegally grabbed under the previous administration. Moreover such land grabbing would never be allowed again.

The Majengo and Shauri – people would be relocated. In the case of Shauri Yako and Grogan 600 houses had been identified for relocation, but a site for them to move to had not yet been identified.

The County was looking carefully into ways of improving the management of storm water.

Negotiations were in progress regarding the relocation of KARI and the use of part of the ASK ground for a SME Park.

Regarding solid waste disposal Mr Mmbai pointed out that if well managed solid waste could be a source of income – a lot had to do with collection and disposal methods.

The same might be true of the existing bus park: was the problem with the layout or the management of the buses and traffic flow?

He said that the consultants would have to study these issues and come up with answers. It was, meanwhile, the job of the stakeholders – the participants in this workshop – to monitor the management of the town.

Concerning the small industrial area already designated, he said many of the plots had been sub-let mainly to jua kali operators, so the area was not fulfilling its role as a site to add value to produce.

He also mentioned a problem with land allocation. When government land is sold the buyer has to demonstrate that he or she has the funds and is required to complete the development within 24 months. However, this is not enforced.

Mr Kumar promised that the consultants would incorporate all the needs expressed in the workshop, would apply the relevant norms and standards to the situation, and using population projections would then be able to make specific proposals.

Mrs Helen Nzainga, Urban Planner, noting down concerns of participants

Mrs Nzainga said that there were many problems affecting all sections of the community. There was a need for urban renewal or redevelopment. The situation in Embu was similar to that of many other towns such as Nyeri, Thika and Nanyuki which had experienced a decline in industrial activity. She said that the fact that there was much government-owned land was an opportunity to turn challenges into opportunities, lemons into lemonade.

Mr Mairura Omwenga pointed to the bottled water supplied to the participants which had been bottled in Kitengela, an area with virtually no natural water sources. How much better would it be if Embu bottled water which could come from the pristine slopes of Mount Kenya. What opportunities, he asked, are we missing?

A member of the Embu Gender Task force made the point that outsiders were causing problems such as creating slums, and she claimed that street children came from outsiders. Other points raised from the floor reiterated points made already, such as the bus park, need for a new wholesale market, and the need for better street lighting. In addition there was a strong plea for attention to be paid to the needs of people with disabilities for whom even the roads and pavements were too rough to use a wheelchair, and many government buildings had no access for the disabled. There was also a need for land for a rehabilitation centre. Moreover information for the disabled was completely lacking. Another participant spoke of the need for stalls for shoe-shiners, as in Nairobi. Finally a participant raised the question of how prepared the County was for disaster management.

The workshop was closed by the Chief Officer at 4.20 who thanked the participants for their contributions.

Workshop in progress

Annexure 4

Preliminary Map Validation, Situational Assessment and Visioning Workshop

Preliminary Map Validation, Situational Assessment and Visioning Workshop

Held on 24th November 2014, at the Izaak Walton Inn, Embu
Time: 9.00AM

4.1 Introduction

The objective of the preliminary map validation, situational analysis and vision workshop was to present the preliminary maps and situational analysis and generate a vision by the key stakeholders of the town. The project terms of reference suggest that the preliminary map validation, and situational analysis workshop and the visioning workshop were to be held separately but it was suggested by County Officials and agreed by the Kenya Municipal Programme (KMP) team that the two workshops should be combined. The key stakeholders included Members of County Assembly (MCAs); County Officials; representatives of organisations responsible for Commerce and Industry, Religions, Matatus, Bodabodas, Hawkers, Jua Kali, informal settlements, Police, Development Practitioners, Opinion Leaders, Farmers, Cultural Groups, Education, other community based organisations and civil society organisations, etc. The list of all stakeholders invited for the workshop is given in Annexure 2.

Invitations were sent to all the selected key stakeholders by the County. Around 170 participants attended the workshop.

4.2 Proceedings of Workshop

Introduction and Presentation on Mapping and Situational Analysis

The Chief Officer Lands, Water, Environment and Natural Resources, Eng Stephen Njiru opened the workshop by inviting a participant to lead those present in a prayer. This was followed by all members introducing themselves.

Opening Remarks by the Chief Officer

Following this he drew attention to the fact that this was not the first workshop, and the fact that the County had already put forward several ideas regarding the future development of the town. He said that the County had regular meeting with the consultants, and there was a requirement for a high level meeting quarterly. This workshop, he said, was playing this role as well as giving participants the opportunity to contribute their ideas. The consultants would then study these ideas and come up with ideas for the community to consider.

Mr Solomon Ambwere, Head Components 2, KMP spoke on behalf of the KMP. He listed common problems that planners must consider such as security, the economy, roads, poverty, informal settlements, health, water and sanitation and urban growth. He said it was the job of those present to raise the issues that concerned them for analysis by the consultants. He said that Embu, as the capital of the County, had an important role, and one for which a structure must be developed.

Mr. Ambwere addressing on behalf of KMP

He said that the KMP had been established to facilitate planning in many towns in Kenya. There were many issues to be considered, such as:

- Creation of a sustainable settlement structure

- Dealing with informality
- Urban Management
- A balanced distribution of people and money
- Competitiveness of Embu town with others including Nyeri and Meru.
- Proper distribution of resources
- Major catalysts for infrastructure development
- Linkages
- Access
- Mobility
- Sustainability of infrastructure developed
- Environmental issues
- the example of Kigali, which is spotless to be considered for development of town
- Need for a mind-set change
- Problem of poor management
- Social and cultural issues

He said we did not have to look far to see an example of good urban development – Nice City, on the road to Nairobi – which immediately made your face light up when you saw it.

Eng. Njiru then invited the consultants to make presentation.

The presentation has the following 3 components:

- Digital Topographical Mapping
- Existing Conditions of Embu Town,
- Visioning

Mr. Satish Kumar, Urban Planner, started the presentation giving description of the process used for the aerial photography and mapping, with examples of the maps produced. He explained the process of digital topographical mapping that included collection of cadastral maps, scanning of cadastral maps, digitization of cadastral maps, establishment of Ground Control Points by taking reference from existing Survey of Kenya Control Points, preparing a flight path, aerial photography, processing of aerial photographs, geo-referencing of aerial photographs, feature extraction from processed aerial photographs through digitization, preparation of topographical maps, ground verification of extracted features, finalization of topographical maps, overlaying of cadastral maps and topographical maps, preparation of final digital topo-cadastral map, etc.

Presentation by Consultants

This was followed by a presentation of the existing situation by Mr. Richard Martin, Project Team Leader. The existing conditions included the current status in terms of the regional setting, land use planning, economy, traffic and transportation, water supply, sewerage and sanitation, storm water

drainage, solid waste management, informal settlements, environment, tourism, revenue and public finance management system, etc.

After a coffee break Eng. Njiru illustrated few aspects to be considered during development of vision for the town, including population growth, density and efficiency, the need to consider people and the need for an integrated strategy.

Address by the Deputy Speaker

The Deputy Speaker of the County Assembly, the Hon. Ibrahim Swaleh, invited the Deputy Leader of the majority party in the County Assembly, and Chair of the Land and Planning Committee, the Hon Kanjogu Mugo, to address the gathering. He spoke of the need to prepare for the 2017 election and for everyone to pull up their socks.

He was followed by the Chair of the Lands and Natural Resources Committee, the Hon Mercy Mbae, who urged those present to support the planning effort.

Address by Hon Mercy Mbae and Hon Agatha Muthoni

She was followed by the former Mayor of Embu the Hon Agatha Muthoni, and nominated member of the County Assembly. She said she had not intended to come until she learned that the KMP would be represented. Since the project had been initiated while she was mayor, therefore, she was very interested in seeing the progress. She was happy to learn that the new bus park had been completed and a new market was to be developed shortly. She said the top priority was to provide land for new services, including a new site for the sewage treatment works and a solid waste dump site so that within five years real progress could be shown to people.

The Deputy Speaker thanked the participants for attending, and said that this workshop was an example of the County fulfilling its constitutional obligations of consulting with the stakeholders. He said there were many big issues, particularly population growth – where would people be housed? It was due to population pressure that slums and informal settlements were created and the residents of those areas needed to be consulted. Other problems were that the market was too small and there had been grabbing of public land. He reiterated the need of expansion of sewerage network and collection and disposal of solid waste management scientifically which otherwise cause environmental pollution and diseases. It must therefore be improved, possibly by bringing in the private sector.

Eng. Njiru also emphasized the importance of participation by the stakeholders to assist in analysis of current situation and create a vision for future. He said the plan should lead to strategic annual goals and budgets, supported by the stakeholders and monitored through performance indicators.

The Chief Officer, Infrastructure, Engineer J. N. Muragare spoke of the need for plans to be based on respect for the environment and the views of the people. He spoke of the problems of people encroaching on road reserves.

The Minister for Lands, Water and Natural Resources, Mr. J M Kithumbo, said the priority should be to know where we are, where we want to go, and how to get there. He referred to Melinda Gates statement that "sight without vision" is what she hates most. He said there are clear steps to be followed.

- Plan
- Mobilise people
- Work out a strategy about how to get there

He said the example of the sewage treatment works was useful. It had been built at the previous stadium site, and was now the sight that greeted visitors to the town. He said planning to eliminate problems, for example the congestion in the town centre, should be done with our children, and our children's children in mind.

Address by Mr. J. M. Kithumbo

He mentioned about different models of urban growth, but one that Embu would follow should not lead it to be a concrete jungle. He looked forward to a city, reflecting its proximity to Mount Kenya, where the residents would be breathing fresh air. That was why their boundaries were so generous.

He said planning required difficult decisions to be made. For example structures might have to be moved to make way for roads, industry or other uses. Land grabbers need to be booked to get the land released. Participation was essential during the process, not afterwards.

Address by H. E. the Governor, Martin Wambora:
The Governor started by welcoming all present and saying how glad he was to see such a large turnout. He said he looked forward to more such events, but that they should be limited in number – say two next year.

He said that they considered Embu as a City. It was larger than many towns in Europe that were Cities, so it was correct to call it one. Referring to the consultant's presentation, he said that Embu should go the route of Barcelona (people centric development), and make a people-friendly city.

Address by H.E. the Governor of Embu

He congratulated the consultants on collecting good data and doing analysis of existing situation of town. He said that digital topographic mapping would help the county to manage the land more

efficiently. He said Embu had plenty of land, and he was pleased to report that the extension of the runway of the airport from 900 metres to 1.5 Km is almost complete allowing mid-sized planes having seating capacity of 50 – 60 people to land here.
He mentioned about many challenges including:

- ignoring pedestrians
- parking
- open spaces
- lack of planning, as evident from the scattered development
- buildings developed without attention to the need for car parking
- the need to collect revenue he way forward is to aim for a city which is:
    - well planned
    - people friendly
    - not congested
    - enough parking
    - adequate infrastructure
    - properly zoned
    - with good sewerage, and the treatment works situated outside the town
    - with good solid waste management disposal (three different bids have been received, the County might now proceed to invite competitive bids)

Other issues to be considered include:

- improved management of storm water
- build footpaths over storm water drains
- improve social infrastructure (noting that the new bus park has been opened)
- commercial buildings in the central business district (CBD) were “worn out”
- learn from the experiences of Kigali and Cape Town
- build on its strength as a commercial centre
- aim to become the best destination for local and foreign business
- take advantage of the new route to Mount Kenya
- build high class hotels should be built
- build on its role as the centre of macadamia nut production (and coffee: a new coffee mill was to be opened soon).
- strengthen opportunities for employment (a training in agriculture for about 100 youth was to be started early next year).

Feedback on presentation of Digital Topographic Mapping and Situational Analysis: There were no specific feedback in terms of comments on digital topographic mapping but the county officials including H.E. the Governor of Embu appreciated mapping work and informed the participants about the usefulness and benefits of mapping like effective land management, quick planning decision and development, etc.
As far as feedback in terms of comments on situational analysis is concerned, there were no comments from participants and situational analysis was generally appreciated county officials especially by H.E. the Governor of Embu. Although at this stage there were no specific comments on presentation of Situational Analysis but all the participants were requested to identify issues, problems and or solutions based on the presentation on the same during the next part of workshop i.e. Group Exercises for Formulation of City Vision.

4.3 Presentation and Group Exercises for Formulation of City Vision

After explaining the existing conditions in Embu town, Mr. Martin covered the factors to be considered in visioning exercises namely what planning is for, avoiding the mistakes of past, population growth rate, land requirement, investment, planning for efficiency, planning for people, principles of urban development strategy (productive, inclusive, well governed and sustainable). He then explained that understanding existing conditions would help people to think about their dream city for the horizon year 2035. He then explained that the visioning exercise should be divided into two parts: raising issues based on the understanding the existing conditions and creating vision statements. He asked the participants to picture where the town would be, and what type of town they would like it to be in

next 20 years. The participants were then divided into five thematic groups viz. infrastructure; economy; environment and tourism; land, housing and informal settlements and; social services and recreation. The aspects covered under the thematic groups are presented below along with the name of facilitator:

Infrastructure
- Roads
- Parking
- Public transport (buses, matatus, bodabodas), terminal provisions.
- Water
- Sewerage
- Electricity
- Institutional and governance issues

Facilitators: Mr. John Ndekei (Infrastructure Planning Expert) and Mr. Peter K'Ojwang, (Transport Planner)

Economy
- Industry
- Commerce
- Financial and professional services
- Jua Kali
- Hawkers
- Public finance
- Livelihoods
- Institutional and governance issues

Facilitator: Mr. Phanuel Wekesa (Institutional and Financial Expert)

Environment and Tourism
- Protection of
  - Rivers
  - Wetlands
  - Forests
  - Areas of natural beauty
- Environmental regulation and control
- Tourism
- Solid waste collection
- Disposal
- Management
- Role of communities

Facilitator: Dr. Thenya Thuita, (Environmental and Social Development Specialist)

Land, Housing and Informal Settlements:
- Land management
- Land Subdivision
- Planning
- Housing Needs
- Supply
- Role of County
- Public private partnerships
- Informal settlements and housing for the poor
- Institutional and governance issues

Facilitator: Mr. Satish Kumar (Urban Planner)

Social Services and Recreation facilities
- Education
- Health
- Community facilities
- Playgrounds
- Parks

- Cemeteries and crematorium
- Places of worship
- Institutional and governance issues

Facilitators: Mr. Richard Martin (Team Leader) and Mr. Simon Kamau (Urban Planner)

The presentations of the group discussions

The main objective of dividing the participants into groups was to discuss the status and issues of each sector and then ask for the group members' visions. Each group selected a Chairman and Secretary. The Secretary was expected to keep notes of the proceedings and chairman was to present the findings of the discussion in the plenary session. The group facilitators briefed the group members about the objectives of group discussion. The facilitators provided notes to group members regarding the main issues for discussion. The chairmen were asked to state that each member should feel to contribute without any fear as the outcomes would not mention the names of particular participants.

Following group presentations the chairman invited questions and any additions (additional to the group findings) from the floor, which contributions were duly noted. The recommendations of group discussions, along with contributions during the plenary, are presented below.

Group 1: Infrastructure

<u>Transportation:</u>

The following were identified as problematic areas that need to be addressed to have a good transportation system.

- Passenger Service Vehicles Terminus
  - Two termini were identified; the main terminus and old stage.
  - The matatu terminus was found to be congested, poorly managed and located and serviced with very narrow road network. As a result, the group observed congestion along the access routes connecting the terminus and continuous traffic friction.
  - Congestion around matatu stage

Group Discussion

- Parking
  - The group observed that a properly designated parking facility was lacking. As a result, on-street parking is common phenomenon, even at non designated areas.
  - There is a lack of enforcement measure for keeping minimum space for parking in all commercial and institutional buildings

- Motor cycle riders (boda boda)
  - The group observed that there is high proportion of motorcycles in the traffic stream as a direct indicator of the latent transport demand owing to;
    - The absence of the conventional motorized modes of transport due to the prevailing poor road conditions that make motorcycle usage more attractive.
    - Poor attitudes of motorized traffic road users,
    - Traffic friction due to narrow roads and lack of designated lanes
    - Poorly located boda boda operating locations
    - Lack of pedestrian facilities such as zebra crossings and signage

  - Unsafe operating conditions for boda boda due to lack of speed calming, speed limits and traffic segregation e.g. by use of pedestrian footbridges and fly overs
  - Lack of training facilities to educate boda boda on safe road use
  - Lack of designated boda boda lanes
  - Pedestrian/motorcycle/matatu conflict due to the lack of pedestrian footpaths on all urban roads
- No pedestrian footpaths on the road sides
- No pedestrian footpaths on the road sides
- Land use conflicts, in particular, location of Uchumi and other supermarkets in the vicinity of the terminus, poor integration of traders/hawkers and unregulated taxi parking were found to aggravate traffic congestion.

Water Supply:

- The whole town is not covered with piped water supply
- In spite of having adequate supply of water, distribution is not done across the town to serve the whole population

Presentation of Group Findings

Sewerage System:

- The current treatment site is an eyesore and the county government is in the process of acquiring an alternative site to relocate the treatment plant so as to serve a bigger area.
- Coverage of sewered areas needs to be expanded. Currently only the CBD and some estates are covered. A new network is needed to cover the area not covered.

Storm Water Drainage

- Inadequate drainage system in the town
- Water logging during rain near the stadium area
- In some part of the town the drains are encroached

Solid Waste Management

- Inadequate mechanism to collect waste across the town
- The County Government only collects a small portion of solid waste generated.
- Discourage burning of solid waste
- No segregation of waste at source
- Proper designation of garbage collection points/relocate and increase collection points and bins. The current garbage collection points in the town were felt to be inadequate and dysfunctional.
- Recycling of wastes through recycling plants is not available for waste

Solutions: The solutions suggested by the group members are also presented here below:

Transportation

- A modern new stage to accommodate businesses and passenger service to use them be designed
- Institution of proper terminus management protocol for new facility should be created
- It was suggested that design of passenger service vehicle terminus be considered
- A bypass road is required to divert bypass trips and additional road expansion to augment existing roadway capacity
- The County Government should be asked to identify land and put up a central parking facility to serve private cars.

- Identify land for road expansion
- Put up more matatu stages
- Stage should not have premises (kiosks) surrounding it. They should be replaced with movable kiosks
- Re-organize parking by using a multi-storey bus terminus
- New bypass/additional roads
- Zebra crossing/road signs/security lights/high mast lighting/CCTV cameras needed

Water Supply

- Water supply to be increased to reach more residents to meet growing demand
- Provide more intake areas and tanks /reservoirs
- Rain water needs to be harvested
- Construct dams and water pans for storage
- Increase water supply/storage dry areas
- Collect rain water
- Construct dams/water pans for rain water harvesting

Sewerage

- Relocate and expand coverage and maintenance in the outskirts

Storm Water Drainage

- Drainage flow comes from up the Embu-Meru road. A cut off drain should be done near the Izaak Walton hotel to drain the floods towards the cultural centre and avoid the CBD.
- A new drainage system is required towards the CBD from the PC area to the stream through the cultural centre
- Storm water to be diverted from farm lands and estates and direct it to a dam
- Drainage to cover whole town towards surrounding estates (entire planning area)
- Construct of drainage at cultural centre
- Health concerns: divert storm water from farm lands, estates and divert to a dam in forest
- Construct a huge dam in the forest
- Cover the entire planning area

Solid Waste Management (SWM)

- Manage solid waste from the source by sorting it to different types
- Identify/establish proper disposal sites
- Construct and developed new sanitary landfill site
- Supermarkets to be made to package using biodegradable materials
- County to improve management of vehicles collecting garbage/improve on service delivery
- Create employment for youth, women and social groups in garbage collection. The group opposed the idea of foreign firms being engaged in solid waste management.
- Additional budget for garbage collection should be allocated
- Supply households with adequate bins for garbage collection.
- Educate on solid waste management from the source
- Discourage burning
- Re-locate garbage collection point from CBD and increase the points and the bins
- Improve service delivery and pay on quantity
- Use local human resource to address issues of SWM

Vision Statements: The group suggested the following visions for Embu town:

- Embu town with functional and efficient road network, that link key activity centres
- Embu town with well panned transport facilities such as terminus, bus stops and designated parking area.
- Embu town with a road system that includes pedestrian facilities and associated road furniture such as road humps, zebra crossings etc
- Embu city with transport that promotes clean air and supports greenery
- Embu town with all major transport systems linked together (air, road and rail systems)

- A town that provide adequate and affordable infrastructure facilities like water supply, sewerage, roads, drainage, etc. to all its citizens

Feedback

The feedback received, in terms of additional issues and observations for infrastructure sector included:

- Need for infrastructure planning to include the needs of persons with disabilities
- Construct a bypass road and add more exit points from Embu to Nairobi and towns to the south of Embu.
- Look into the possibilities to design a new CBD.
- Lack of organized designated places for boda bodas
- Replacement of street lighting lamps takes too long time
- Some of the lamps are on during the day and off at night
- Many areas do not have street lights
- Provide more washrooms in the markets
- Need for a fly-over in Embu to improve circulation.
- Recycle solid waste and eliminate supermarket plastic bags

Feedback by Participant

Group 2: Economy and Finance
Operations Issues

Industries

- Poor infrastructure (specially road networks)
- High cost of production due to high cost of raw materials
- High cost of electricity
- Shortage of raw materials
- Lack of skilled manpower in the town (may not be able to attract the requisite labour experts)
- Inappropriate working clothes i.e. helmets, aprons etc.

Office/Shops

- High cost in terms of rent and overheads i.e. paying rent six months advance
- Lack of goodwill in business
- Lack of essential services i.e. water and electricity
- Frontage (accessibility of location / premise) being used by some business people
- Billboards cost a huge sum
- Jua Kali & Hawkers
    - Lack of proper sanitation in jua kali areas
    - Poor structures of jua kali workshops
    - Lack of modern machinery with artisans
    - Risking life by hawking on highway
    - Hawkers face harassment from county askaris
    - Poor drainage system
    - County staff are not well trained,

Group Discussion

and they actually don't understand their work to manage the businesses of jua kali and hawkers

Regulation Issues

- Some of the regulations are inappropriate especially in the matatu operations, for example paying a license for business and then pay for a billboard, another for garbage collection and yet another for sewage system

Governance and Public Finance issues

- The status of Municipality or Town has not been conferred on Embu under the Urban Areas and Cities Act
- The town is managed directly by the county government and does not have appropriate and adequate staff specifically for the urban area
- Staffs are inadequately equipped with computer skills and equipment and systems.
- The nature, size, location and condition of the sub-county's capital asset base have not been determined.
- There are no sufficient parking places in the town for buses, matatus, taxis and boda bodas.
- The sub-county levies a site (unimproved) value as opposed to the improved (site plus improvement) value rate.
- Property tax registers and the valuation rolls are not up to date and few people pay taxes and land rates
- The county's accounting function is not fully computerized.
- Parking charges are very high though parking spaces are not adequate and they should be improved
- Water and sewerage charges are not reasonable as they are based on generous estimates of consumption resulting in higher charges than what actual meter readings would lead to.
- Only a small percentage of revenue due to the county is collected and accounted for at the county treasury, most is lost through corruption and use of unofficial receipt books
- Embu county collects much less revenue from Embu town area than what the former Municipality of Embu used to collect from the same area
- There are no proper and complete records maintained, and no proper reports issued to show how revenue collected are used.
- Poor debt recovery methods which could be solved by digitizing the whole process

Presentation of Group Findings

Visioning: The group would like to see an Embu town that:

- Meets the needs of residents and stakeholders.
- Availability of increased access for business financing
- Increased access to appropriate and sufficient business planning, management and regulatory assistance at national and county government levels
- Youth, women, people with disabilities and other minority groups are empowered to participate fully in development activities of their communities
- The town is the transit stop for the easiest climbing route to the tip of the elegant Mt. Kenya

Feedback: No feedback was received, in terms of additional issues for economy sector.

Group 3: Environment and Tourism

Environmental Issues and observations:

Riverine areas:

- Protection of rivers was one of the major concerns because of the following reasons:
  - Pollution of the rivers in built up areas and farming areas.
  - Some people empty their septic tanks into the rivers
  - Some people dump their solid waste into the rivers.
  - The county government of Embu should enforce laws to protect their rivers and including charging penalties on anyone violating like the laws, rules and regulations within Environment Management and Coordination Act (EMCA) and Water Resource Management Authority (WRMA) Act.

Group Discussion

  - National Environmental Management Authority (NEMA) should also step up and punish those encroaching and polluting the rivers using the EMCA regulations, which is clear on the polluter pays principal.
  - The county government of Embu should invest in capacity building among the communities in order to promote sustainable use of riparian areas and biodiversity conservation.

Wetlands

- The Upper Dallas area is a privately owned land and therefore for conservation, it must be compensated for.
- The wetland was posing a health threat to the communities, thus residential settlement should be located away from the ecosystem
- The wetland is a hindrance to development because it is prime land.
- Wetlands should be protected, reclaimed from land grabbers and conserved.
- Wetlands play a major role in flood control, recharging the rivers, supporting the socioeconomic livelihood of the communities, biological diversity which can attract ecotourism in the region, and also play an important role in water purification.

Drainage

- Poor drainage has resulted to infrastructure and property destruction for example in Grogon and Shauri Yoyo and some other areas, storm water sweeps through peoples' property and structures and even causes loss of life.
- Uncollected solid waste blocks the drainage system resulting in flooding.
- There is a lot of waterlogging around the stadium, which needs an improved drainage system.
- During flooding the rivers are polluted by waste water.
- The county government of Embu should invest in water harvesting techniques so that the water can be used during dry seasons.
- The infrastructure developed on top of the drainage system.

Soil erosion

- There is recurring soil erosion in the steep and hilly terrain due to uncontrolled settlements and also due lack of sufficient vegetation cover on some of the steep terrains like in Karue Hills where there is scanty vegetation. Improve vegetation cover to help in reducing siltation and water treatment cost
- The afforestation and reforestation of such areas should be practised.
- The county government of Embu should support greening programme which can create jobs for youths.

Noise

- The county government should enact laws to regulate noise in Embu County and it should also work hand in hand with NEMA to ensure that NEMA regulations on noise pollution are adhered to by all.
- The County Government of Embu and NEMA should sensitize people on the maximum amount of noise in decibels permitted by law, so that they don't find themselves on the wrong side of the law.

Presentation of Group Findings

Green Spaces

- There is lack of enough green spaces such as parks and playgrounds. More green spaces are needed in future especially because people envision Embu as a fast growing urban town.
- Enforcement of 80% building construction by the County Government of Embu is important to promote healthy living environment with 20% being used to air circulation
- The County Government of Embu should encourage school greening programme, town beautification programme and creation of parks and playgrounds.
- The trees and grass should be planted along the roads and open spaces to promote green environment.
- The current sewage treatment plant site should be converted to be a recreational facility and new site designated.

Solid Waste

- The challenges of solid waste management are due to rapid population growth and lack of proper management.
- The current dumpsite is too close to airstrip (about 1km away) which poses danger and may cause accidents since waste attracts birds.
- A new dumping site should be well managed landfill that can be constructed at Gachoka or Riandu or Kamwimbi or Muraro.
- People should try and reduce waste generation by changing their habit of using polythene bags to using Kiondos or long lasting bags
- The County Government of Embu should enact laws to regulate the use of polythene bags in Embu and if possible to ban them in Embu.
- The county government of Embu should discourage the residents from dumping anywhere or in the open steep sloping areas, because during rain the solid waste is washed into the rivers.
- The County Government of Embu should discourage burning of solid waste.
- The County Government should privatise solid waste management so that the young people can take it up as new opportunities for job creation.
- The waste should be segregated before dumping.
- The County Government should train people on the importance of reusing and recycling of some of the solid waste.

Medical Waste

- Some medical waste dumped carelessly poses a health challenge to the communities and especially to the children.
- The County Government of Embu should construct an incinerator to be used by both the public and private hospitals among other institutions that generate hazardous waste.
- The County Government of Embu should sensitize residents of Embu on the importance of waste segregation. These should also be communicated to health centres to avoid mixing the general waste with hazardous waste.

Sewerage

- The location of sewage treatment plant is damaging the image of the county and town
- The sewage system covers only 4.7km2 which is only 20% of the urban area; the other households use septic tank or pit latrines.
- The sewage treatment plant pollutes rivers like River Rupingazi when it overflows or the pump breaks down.
- The sewage treatment plant should be relocated to Gachoka and the current site be transformed to a recreational facility.

Energy Sources

- The majority of the people use a combination of paraffin and charcoal, which results in indoor pollution that can cause respiratory disease.
- The County Government of Embu should make electricity available to all the residents to ease pressure on the natural resources especially the forest. At the same time promotion of energy saving jikos with less smoke could be done through public private partnership (PPP)
- There is need for protecting the forest by the County Government.

Tourism:

- There is inadequate tourism infrastructure in the town, but there are options from the surrounding ecosystem such as Njukiri west forest

Institutional and governance issues:

- The county government should educate people on functions of the national government and those of the county government in relation to environmental issues.
- The implementation and enforcement of environmental impact assessment (EIA) and implementation of environmental planning and management proposals by NEMA and other responsible stakeholders must be strictly adhered to.

Vision statements: The following were the statements proposed by the group members for Embu Town Vision 2035:

- All the roads to be tarmac
- A clean, green and healthy environment
- A well-managed solid waste and liquid waste management.
- Embu to be a leading ecotourism destination.
- Embu to be leading in public participation in environmental issues.
- A town with good aesthetic value than its current state.
- Embu town to be a green, healthy, ecotourism hub or town.

Feedback: There was no feedback after the presentation in the plenary.

Group 4: Land, Housing and Informal Settlements

Land

- Lack of information on land
- High cost of land in urban areas
- Lack of connectivity of land and other infrastructure
- Lack of title deeds for institutions land
- Land grabbing of public land
- Lack of development control and zoning specification
- No policy on land use in any public land
- Discrimination on gender in inheritance of land as in most of the cases inherited properties go to male heir

Group Discussion

- Public land is being grabbed by private
- Most of land not in good use like KARI land
- Allocation of trust land is misused as few get the land
- No time frame for approval of building plans and other applications
- No land database for public land
- Public land that has been grabbed has not been reclaimed
- No comprehensive records of land
- Excess subdivision of land to uneconomical portions
- Public land in town hinders development especially the university-the surrounding land belong to government
- No valuation rolls
- Committee officials in case of community land hold title for other members and do not give land to members
- Some of the owners do not have title deeds

Housing

- Cost of land and construction materials is very high
- Poor infrastructure to service the houses
- Lack of designs and guidance in town for housing construction
- No sewer connections and septic tanks are costly
- Inadequate houses for renting
- Long procedure in approving building plans
- In absence of title deeds, financial institutions do not give loan for housing construction

Informal Settlements

- High poverty levels in slums and informal settlements
- Squatters in government land should be given title deeds
- People have refused to develop land expecting grants
- To improve housing condition, the County Government should built low cost housing
- High rise settlements to be promoted in informal areas
- Encourage Sacco's & social groups to engage in cheap houses investments
- County government to come up with a land use master plan to capture the needs of informal settlements
- Training of informal settlers & empowering them/capacity building

Presentation of Group Findings

Vision: The following vision statements were made by the group members:

- City with high rise buildings
- A properly planned green city
- A clean, secure city with street lights all over
- Ultra-modern city accessible with corresponding infrastructure
- A clean town with adequate parking, good infrastructure and shopping malls
- A town with enough tarmac roads, adequate recreation parks and enough industries
- A city with a good environment, passable roads and social amenities

- A city with adequate security and decongestion
- City that controls population
- A city with a 24 hours life
- With good health facilities and food security
- With proper disaster management

Feedback

The feedback received, in terms of additional issues and observations for land, housing and informal settlements included:

- Lack of any clear guideline for use of land taken for public purposes after sub-division
- Lack of clear policy for land uses
- Lack of implementation of development controls to regulate the development
- No justification for having different land rates in different areas
- Shortages of houses in town especially due to influx of students from Embu University

Group 5: Social Services and Recreation

Education

- Inadequate training facilities for teachers in public schools
- Inadequate resources are allocated for the education sector
- Provision of more bursaries needed for public schools
- Special schools and rehabilitation centres to be constructed to accommodate children with special needs and drug addicts respectively
- More schools for the less fortunate. There is no school for the blind
- More educational facilities needed at all levels: primary, secondary, colleges, polytechnic etc.
- Lack of continuous community education on social and economic issues
- There is no Information Communication Technology (ICT) Centre in town to train people on modern methods of communication

Group Discussion

Security

- Employ more police officers to provide proper security
- Embrace nyumba kumi ideology in true spirit
- There should be an emergency response department in Embu town dedicated to local emergencies to allow residents to make direct calls for response in case of emergency. It has been observed that everything is tied to security and one has to call emergency number (999) in Nairobi for response. Communication in case of emergencies therefore should be improved
- Security deteriorates due to corruption
- There is no desk for gender issues in police stations

Health

- Inadequate medical stocks in dispensaries
- Lack of well qualified staff to operate in dispensaries
- Dispensaries are not open for 24 hours
- Embu general hospital should have all equipment for diagnostic purposes i.e. scanning

Park and Recreation

- There is no place for relaxation purposes
- There are charges to enter the present Moi stadium
- A social hall should be provided in every sub-county garden like the ones in Nairobi
- Lack of parks and recreations places especially at neighbourhood level

Presentation of Group Findings

Markets

- The present CBD market is congested – every hour there are over 2000 people either selling or buying goods in the market, one person needs a space of about 3 square feet which not available currently.
- To increase the space in the CBD multi-storey commercial buildings should be created
- Improve other markets within the town like Kangaru Market (the problem is the road access), Majimbo market, Kathangari Market.
- Sewerage and drainage to be improved
- Make the markets 24 hours economies
- There are no day care centres for children in market places where women can put children and do shopping easily.
- Inadequate street lighting inside and outside the markets cause insecurity

Vision statements: The following were the statements proposed by the group members:

- Embu town with adequate educational facilities through training of more teachers, channelling more resources in education, providing more special schools and rehabilitation centres
- Embu town with adequate modern ICT centres to enhance communication among other skills
- Embu town with adequate and efficient security services for all genders
- Embu town with adequate and efficient health facilities and services through having medical facilities operating 24hrs and fully equipped
- To have a town with adequate and well distributed social and recreational facilities
- To have a town with ample modern markets that cater for all gender needs

Feedback

The feedback received, in terms of additional issues and observations for social sector included:

- There is negligence of the boy child in the present-day society. Nobody seems to care of or about him and that's why the number of street boys and alcoholic men is rising. Even the current constitution has highly favoured the girl child and less considerate on the boy child
- Improve sanitation in the markets. The current public toilet in the municipal market is dirty, small and is shared among male and female gender
- Move the existing sewer pumping station from the municipal market to improve sanitation
- Create public toilets in mitumba market and other smaller markets too
- There is only one water point at the municipal market which is not enough. Also mitumba market lacks a water point

Closing remarks by Eng. Njiru

and should be provided with in addition to providing for the same in other markets

4.4 Next Steps

Mr Martin said that at the next workshop the consultants would present alternative plans for Embu for consideration by the stakeholders. This would be followed by review of proposed Capital Investment Plans. The final workshop would be held to present the final plan.

4.5 Closing Remarks

Mr Kibe and Eng Njiru made closing remarks thanking the participants for their support and inviting them to contact the consultants if they had other contributions to make.

The workshop closed at 5.30 p.m.

4.6 Vision Formulation

The consultants have compiled all the vision statements stated by various participants during the group discussion and also considered the various critical issues and challenges of the town and formulated the following city vision:

Embu Vision 2035

"Embu will be the educational and commercial hub of the Mount Kenya region along with focus on agro-based industrial development, that provide adequate and affordable infrastructure and services to its citizens; a secure, well planned, well governed, clean and green town that is environmentally, socially and economically sustainable; a town with all resources to be competitive at national and international level."

Workshop Photographs

Annexure 5

Validation workshop report for the Draft ISUDP Proposals

Proceedings of Validation workshop report for the Draft ISUDP

5.1 Introduction

The workshop took place on 8th June 2015 at the Izaak Walton hotel in Embu. The objective of the Draft Integrated Strategic Urban Development Plan (ISUDP) Workshop was to present the draft plan to key stakeholders including Members of the County Assembly (MCAs); county officials; members of organisations representing commerce and industry, religions, matatus, boda bodas, hawkers, jua kali, informal settlements, police, development practitioners, opinion leaders, farmers, cultural groups, education, other community based organisations and civil society organisations, etc. The list of all stakeholders invited for the workshop is attached at Annexure 2.
The programme is given below:

Programme

Time	Activity	By
08.30 – 09.00	Registration	Consultants
09.30 – 09.35	Prayer	Embu County Government (ECG)
09.35 – 09.45	Introductory Remarks – Chief Officer, Lands, Water, Environment and Natural Resources	ECG
09.45 – 10.00	Introductory Remarks –KMP	Urban Development Directorate (UDD)
10.00 – 10-10	Introduction by CEC Lands, Water, Environment and Natural Resources	ECG
10-10-10.15	H.E. Governor's Welcome and Keynote Speech	ECG
10.15 to 10.45	Coffee Break	ECG
10.45-13.00	Presentation of Draft Proposals	Consultants
13.00-13.45	Lunch	-
13.45-15.00	Plenary: presentation by small groups (10 minutes per group)	-
15.00-15.15	Summary or Consultants Responses	Consultants
15.15-15.30	Closure and Vote of Thanks	ECG

Around 100 participants attended the workshop.

5.2 Proceedings:

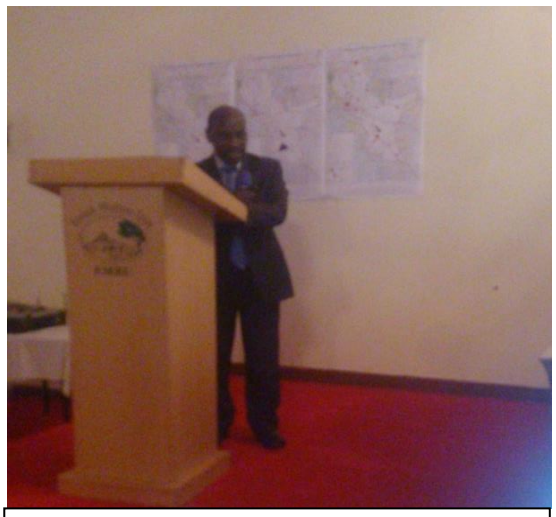
Eng. Njiru, Chief Officer, Lands, Water, Environment and Natural Resources

After a word of welcome, Eng. Njiru, the Master of Ceremonies (MC), invited one of the participants to lead those present in prayer. Following that the members introduced themselves. The MC informed the participants about the objective of the Draft Proposal Workshop and read out the schedule of the workshop. After that he invited the CEC for for Lands, Water, Environment and Natural Resources for keynote address.

County Chief Officer Lands Eng. Steve Njiru

Dr Jamleck Muturi, CEC for for Lands, Water, Environment and Natural Resources: The CEC highlighted the following points for the overall development of Embu town:

- Embu to be developed as an institutional city
- The LAPSSET corridor will make a major economic impact
- High altitude training is an important attraction
- The airport is being expanded, which will put us in a stronger position
- Traffic congestion is a major issue faced by the people of Embu every day
- Parking spaces in CBD are not adequate
- There is a need to develop transport infrastructure to address issues like traffic jams. We can think of new bypasses
- Pedestrian movement and bicycling should be encouraged: this will also reduce pollution
- Security is an important concern
- Liquid and solid waste management needs to be improved
- Recreational facilities in Embu are minimal, no playgrounds for children or facilities for adults such as a golf course
- We need to protect the environment
- We need to make Embu a city to be proud of in future



Dr. Jamleck Muturi, CEC- Lands

After the keynote address by CEC, the MC invited Mr Elizaphan Kibe, KMP representative, for an introduction on behalf of KMP.

Mr. Elizaphan Kibe, Project Coordinator, Cluster III, KMP: Mr Kibe started by thanking the local participants who had been consistent in all the workshops and for making a positive contribution to shaping up the draft proposals. He said that consultants had done a good work but the plan was in draft stage and there would be chances for improvement up to the final stage of approval. He urged the participants to listen carefully and participate fully as was their right under the constitution.

After the introduction by Mr. Kibe, the MC invited the Deputy Speaker for his views on Embu Town Planning.

Mr. Elizaphan Kibe, KMP

Hon. Ibrahim Swaleh, Deputy Speaker, Embu County Assembly: The deputy speaker started by highlighting the importance of recreational facilities in the overall development of a healthy town. He said that without more recreation facilities to utilise their energy, young people would be attracted to drugs and if adequate recreational facilities are not provided there will be a need for more and more rehabilitation centres in the town. Therefore, it is better to provide adequate numbers of recreational facilities. He further emphasized that grabbing of public land must be stopped as it can be utilized for better public purposes. He urged the members of the county assembly to participate positively in the development of Embu town and Embu County. The deputy speaker also introduced the Chairman of Finance Committee of County Assembly, who supported the development effort of Embu Town. After that the MC invited the H.E. the Governor, Embu County to open the workshop.

H.E. the Governor, Embu County: H.E. the Governor welcomed all the participants and commended the work done by consultants. He asked the participants to contribute positively during the workshop. H.E. highlighted the following points in the overall development of Embu town:

- A bypass should be located outside the city. Bypasses within a city never work.
- Health facilities, education facilities to be provided for the future project population

- Zones mentioned in the presentation to be explained
- Embu will be the first county in Kenya to have a large tooth pick factory based on bamboo
- A golf course can be developed at Njukiri forest, developers are ready to invest
- The stadium will be left in its present location and further improved by creating more facilities
- Multi-storey car parking is required to be developed in the Mitumba area
- Multi-storey high density housing can be developed through PPPs
- Storm water drains can be covered and thereby converted to walkways
- Two major rivers pass through Embu: their potential needs to be utilized
- Landscaping is needed along CBD roads

H.E. The Governor, Embu County

After presenting his views on town development, H.E. opened the workshop for further proceedings.

Presentation by the consultants

The consultants then proceeded to give their presentation. It included the following components:

- Project methodology and value of aerial photography and mapping
- The planning concept
- Land use plan
- The town we want (qualitative aspects of planning)
- Project identification
- Project prioritisation

Mr. Richard Martin, Project Team Leader and Mr. Satish Kumar, Urban Planner gave the presentations.

Presentation by Consultants

The Consultants explained in detailed the relevance of aerial photography and mapping in planning as it will make the tasks of implementers easy at the time of implementation. All land records have been digitised, which can be readily made available through GIS software. The presentation covered the planning concept comprising the regional setting, growth direction, environmental sensitivity, digital elevation models, spatial development models, hierarchies of planning units, etc. After that the land use plan including land requirements for residential, commercial, industrial, educational, recreational, public purposes, transportation, etc. was also explained.

The consultants explained that based on the current and projected gap considering the population of year 2035, projects had been identified to facilitate development and improve the quality of life of the citizens of Embu. The identified projects presented were related to physical infrastructure (water supply, sewerage and sanitation, solid waste management, stormwater drainage, fire safety, street lighting and transportation), housing and informal settlements, environment and disaster management, tourism and heritage, economic development and institutional framework.
At the end of presentation the Consultants requested the participants to list their top five priority projects, using the form provided.

5.3 Plenary session

After the presentation by the Consultants, Eng. Njiru opened the floor for comments by the participants and monitored the process. The MC requested the participants not to repeat the question asked by fellow participants. The following questions/observations were put by the participants:

- Rental accommodation should be built for the growing number of students
- Cover the open drains within CBD area to use them as footpath
- Repair the water hydrants to make them functional
- Create off-street parking within the CBD
- Option of underground parking within stadium should be explored
- Reduce the pollution within town
- Develop more police stations
- Expand the existing prison
- Housing projects in CBD – 2 bedroom/3 bedroom apartments can be developed in the CBD
- Drains in the CBD should be covered and street lights in the CBD should be on for 24 hours this will improve safety and overall environment of the CBD.
- Water company should be included as a stakeholder
- CBD parking is a major issue
- We need to keep provision for worker housing in Embu. Workers move from one place to another and they need a proper place to live in town
- Make the town economy into a 24 hour economy as currently business activities are only up to 9 p.m.
- Acquire the land for road reserves immediately after plan preparation and protect them
- Plant fruit trees
- Promote stormwater harvesting in houses
- Conserve the rivers within planning area
- A vocational centre for people with disabilities is needed
- The government should take care of street children whose parents are drug addicts or are in prison
- Earlier Embu Municipality used to be one of the best town in terms of revenue collection in Kenya but now much less revenue is collected from the town area
- Despite of being the largest producer of macadamia nuts in Kenya, there is no manufacturing unit within Embu County. We need to promote the processing of macadamia nuts to provide employment opportunities to local people
- Coffee processing should be encouraged within Embu Town
- The plan should allow for expansion of university land
- The plan must address balanced development all over the town. Presently the north part of the town is less developed
- The needs to be provision for special schools for orphans, HIV positive patients and children whose parents are in prison
- The number of street children is increasing day by day. A rehabilitation centre for street children and drug addicts must be provided in the plan
- A training institute for persons with disabilities must be provided in the plan, so that people with disabilities can find jobs
- There are no parking places for persons with disabilities in the CBD,
- There are no suitable infrastructure facilities for people with disabilities within government buildings
- Public transport vehicles are also not friendly for people with disabilities

- Provide sporting facilities for people with disabilities
- Government should act to improve squatter settlements in Kaigoro. People want policies in place, so that problems of squatter settlement in future can be addressed
- The tourism industry should be encouraged
- All government staff and officials need training so as to upgrade their skills
- A major issue in Embu is congestion in Kubukubu Road: the bus stage should be relocated and all the roads paved with tarmac.
- The government should advise private land owners how to utilize the land and recommend type of development suitable for it
- Lack of off-street parking in the CBD area
- Promote high rise development in residential areas
- The government should provide better infrastructure facilities for the jua kali sector
- Inadequate security within the town
- Plan should provide for old age homes
- Does the plan integrate all other on-going and planned development within town area
- Create integrated commercial activities along with recreational activities
- Make the stadium an income generating facility by using it for other purposes
- Create eco-tourism sites along the major rivers within the town planning area
- Facilities for elderly people must be provided in the plan
- ISUDP plan should be harmonized with other plans in place, and it should take recommendations from other plans

The Draft ISUDP proposals were well appreciated and approved by all participants. The participants were in agreement that consultants had prepared a very good plan and if all the proposals were implemented then the plan would make Embu a big regional urban centre.

Feedback by Participants

5.4 The Consultants' responses

The Consultants' replies to the questions are presented below

	Questions	Answers
1	Rental accommodation should be built for the growing number of students	Under the included residential areas, rental accommodation should be promoted
2	Cover the open drains within CBD area to use them as footpath	It can be done along with the implementation of Drainage Master (on-going project for stormwater drainage)
3	Repair the water hydrants to make them functional	Included in the plan
4	Create off-street parking within the CBD	Included in the plan
5	Option of underground parking within stadium should be explored	Not feasible in terms of cost
6	Reduce the pollution within town	It will be a byproduct of implementation of plan
7	Develop more police stations	Included in the plan
8	Expand the existing prison	Included in the plan
9	Housing projects in CBD – 2 bedroom/3 bedroom apartments can be developed in CBD	CBD is already highly congested but wherever possible mixed use can be allowed as also recommended in the plan.
10	Drains in CBD should be covered and street lights in CBD should be on for 24 hours this will improve safety and overall environment of CBD.	Recommended in the plan
11	Water company should be included as a stakeholder	It is a stakeholder and various consultations have been done with EWASCO separately also
12	CBD parking is a major issue	Two multi-storey parks have been included in the CBD
13	We need to keep provision for worker housing in Embu. Worker move from one place to another and they need a proper place to live in town	Provisions for low cost housing given
14	Make the town economy as 24 hour economy as currently business activities are only up to 9 p.m.	With increased security and facilities, the business hours will increase in the CBD
15	Acquire the land for road reserves immediately after plan preparation and protect them	This is applicable at the implementation stage
17	Promote storm water harvesting in houses	Included in the plan
18	Conserve the rivers within planning area	Adequate riparian reserve recommended
19	A vocational centre for people with disabilities is needed	Youth polytechnics included in the plan
20	The government should take care of street children whose parents are drug addicts or are in prison	Land allocated for orphanages in the plan
21	Earlier Embu Municipality used to be one of the best town in terms of revenue collection in Kenya but now much less revenue is collected from the town area	Measures to increase revenue included in the plan
22	Despite of being the largest producer of macadamia nuts in Kenya, there is no manufacturing unit within Embu County. We need to promote the processing of macadamia nuts to provide employment opportunities to local people	Adequate land reserved for industrial development
23	Coffee processing should be encouraged within Embu Town	
24	The plan should allow for expansion of university land	Adequate land allocated for

	Questions	Answers
		educational development
25	The plan must address balanced development all over the town. Presently the north part of the town is less developed	Decentralized development included in the plan
26	Provision of special schools for orphans, HIV positive patients and children whose parents are in prison must be there in the plan	Included in the plan
27	The number of street children is increasing day by day. A rehabilitation centre for street children and drug addicts must be provided in the plan	Rehabilitation centres included in the plan
28	Training institute for persons with disabilities must be provided in the plan, so that people with disabilities can find jobs	Included in the plan
29	There are no parking places for persons with disability in CBD,	Included in the plan
30	There are no suitable infrastructure facilities for people with disabilities within government buildings	
31	Public transport vehicles are also not friendly for people with disabilities	
32	Provide sporting facilities for people with disabilities	Adequate land is allocated for sport activities
33	Government should act to improve squatter settlements in Kaigoro. People want policies in place, so that problems of squatter settlement in future can be addressed	Administrative decision
34	Tourism industry to be encouraged	Recommended in the plan
35	All government staff and officials need training so as to upgrade their skills	Recommended in the plan
36	A major issue in Embu is congestion in Kubukubu Road: the bus stage should be relocated and all the roads paved with tarmac.	Adequate provision in the plan to decongest including bypass roads, new bus station and road widening
37	The government should advise private land owners how to utilize the land and recommend type of development suitable for it	Development control regulations included in the plan
39	Promote high rise development in residential areas	High density development is included in all residential areas and re-densification of existing residential areas is also included
40	The government should provide better infrastructure facilities for the jua kali sector	Recommended in the plan
42	Plan should provide for old age homes	Old age home included in the plan
43	Does the plan integrate all other on-going and planned development within town area?	Plan integrates other on-going projects within planning area
44	Create integrated commercial activities along with recreational activities	Included in the plan
45	Make stadium as income generating area by using it for other purposes	Administrative decision
46	Create eco-tourism sites along the major rivers within the town planning area	Included in the plan
48	ISUDP plan should be harmonized with other plans in place, ISUDP should take recommendations from other plans	Plan integrates other on-going projects within planning area

Apart from the abovementioned questions, the participants raised some concerns about inadequate infrastructure and services within the planning area.

5.5 Closure and Vote of Thanks

The MC thanked all the participants for their constructive contribution during the workshop. He noted that the draft plan has covered all aspect to make it an integrated development plan. He thanked the consultants for preparing a comprehensive plan. He also thanked the KMP team for all the logistic support for workshop. Finally the workshop ended with a word of prayer.

5.6 Prioritisation of projects

At the end of the proceedings the Consultants collected the project prioritisation forms. The final result of the prioritisation is presented below:

Weighted Votes

In this table, a project selected "1" gets five points, one selected "2" gets four points, one selected "3" get three points etc.

Unweighted votes

In this table all votes are counted as "1". Thus there is no difference in points between projects selected 1, 2, 3, 4 or 5.

Number of valid voting papers: 81

Project priorities (weighted analysis)

Project	Weighted
Improved local health services	181
Improved Security	132
Good Housing	78
Improved solid waste removal and treatment	72
Improved water supply	67
Improved/more Storm water drainage	64
Better conditions for jua kali	58
Improved markets	57
New bypass road	55
Easy process of taking title deeds	52
Regularisation of informal settlements	49
Environmental conservation	41
Improve tourist and heritage sites	40
More street lighting	39
More recreational facilities parks and playgrounds	37
Improved conditions in the CBD	35
Improved/new schools/more educational facilities	28
Improved procedure for planning and building approval	19
More police stations	18
Improved system for payment of SBP/Rates	14
More electrical connections	13
New industrial park	13
Sewers to all houses	11
Improved bus/matatu park	9
Improved procedure for starting a business	7
Modern shopping facilities	7
Truck terminal cum logistic park	6
Improved fire services	4

Project priorities (unweighted analysis)

Projects	**Unweighted Votes**
Improved local health services	47
Improved security	36
Improved solid waste removal and treatment	29
Improved markets	24
Good housing	22
Improved water supply	20
Better conditions for jua kali	19
Easy process of taking title deeds	18
Improved/more storm water drainage	18
Improve tourist and heritage sites	17
New bypass road	16
More recreational facilities parks and playgrounds	16
Environmental conservation	15
More street lighting	14
Regularisation of informal settlements	12
Improved/new schools/more educational facilities	12
Improved conditions in the CBD	10
More electrical connections	10
More police stations	7
Sewers to all houses	7
Improved bus/matatu park	6
New industrial park	5
Improved procedure for planning and building approval	5
Improved system for payment of SBP/Rates	5
Improved fire services	3
Truck terminal cum logistic park	3
Improved procedure for starting a business	3
Modern shopping facilities	2

Workshop in progress

Annexure 6

Final workshop – 6 October 2015

Final Workshop
Final workshop (Project launch for implementation) – 6 October 2015

Proceedings of the Final workshop
6.1 Introduction
The workshop took place on 6th October 2015 at the Izaak Walton hotel in Embu. The objective of the Workshop was to present the fnal proposals and hand over the ISUDP to the County Government for administrative approcval. Stakeholders invited for the workshop included Members of the County Assembly (MCAs); county officials; members of organisations representing commerce and industry, religions, matatus, boda bodas, hawkers, jua kali, informal settlements, police, development practitioners, opinion leaders, farmers, cultural groups, education, other community based organisations and civil society organisations, etc. The list of all stakeholders invited for the workshop is attached at Annexure 2.

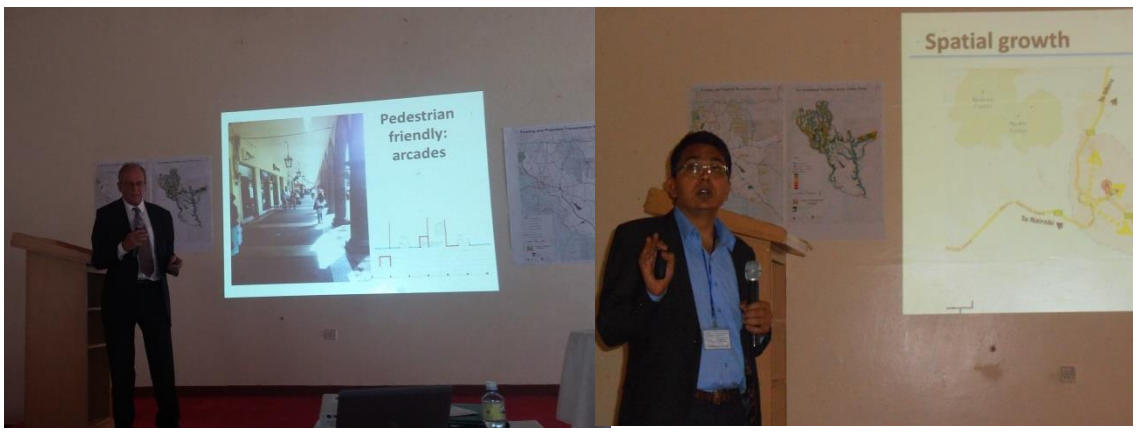
Around 200 participants attended the workshop.


Mr. Mmbai, moderating the proceedings

6.2 Proceedings
Mr. Denial Mmbai,
After a word of welcome, Mr. Mmbai, the Master of Ceremonies (MC), invited one of the participants to lead those present in prayer. Following that the members introduced themselves. The MC informed the participants about the objective of the final Workshop and read out the schedule of the workshop. After that he invited the consultants for making presentation.

Presentation by the consultants
The consultants then proceeded to give their presentation. It included the following components:
- Project methodology and value of aerial photography and mapping
- The planning concept
- Land use plan
- The town we want (qualitative aspects of planning)
- Project identification
- Project implementation plan
- Capital Investment Plans

Mr. Richard Martin, Project Team Leader and Mr. Satish Kumar, Urban Planner gave the presentations.



Presentation by Consultants

Then the MC invited the Chief Officer (CO) for Lands, Water, Environment and Natural Resources to make his address.

Mr. Steve Njeru, CO, Lands, Water, Environment and Natural Resources

The CO said that consultants have worked together with County to prepare the plan and the plan is integrated covering all developmental aspects. The plan is also based on latest aerial photographs, which also provides accurate data cadstral map in the digital form. Now main challenge is to implement the same.

Then the MC invited the CEC for for Lands, Water, Environment and Natural Resources to make his address.

Address by the Chief Officer, Land

Address by Mr. J M Kithumbo, CEC, Land

Mr. J M Kithumbo, CEC for for Lands, Water, Environment and Natural Resources: The CEC commended the work done by consultants. He highlighted that ISUDP is an integrated plan which will take care of existing and future demand of various facilities of Embu town.

Then the MC invited H.E. the Governor, Embu County for his address and receiving the final ISUDP document from the Consultants.

H.E. the Governor, Embu County: H.E. the Governor welcomed all the participants and commended the work done by consultants. He said that ISUDP will change the image of Embu town by improving the quality of life of people. ISDUP is a futuristic document for comprehensive and integrated development of town.

Then the MC invited Mr. Richard Martin, Team Leader of the Project to hand over the final ISUDP to H.E. the Governor of Embu.

Mr. Martin handed over the Final ISUDP to H.E. the Governor of Embu. After receiving the document, H.E. said that now the plan is finalized it was time to implement the same. The press coverage of the event is presented below.

Address by H.E. Embu County Governor

Mr. Martin handing over ISUDP of Embu to H.E. Embu County Governor

Other photographs of workshop

Press coverage of the Final Workshop (*Tuesday, October 8, 2015/The Standard*)

Thursday, October 8, 2015 / The Standard

Town set for Sh15 billion facelift

EMBU COUNTY

By JOSEPH MUCHIRI

Embu town will be transformed into a modern city complete with two bypasses, a railway line, modern stadium and recreational parks, according to an integrated strategic development plan released yesterday.

Once the plan is implemented, the city will boast dual carriageways, ring roads, pavements on all roads and multi-storey parking spaces.

The plan was prepared by Intercontinental Consultants and Technocrats Ltd and will be implemented in the next 20 years.

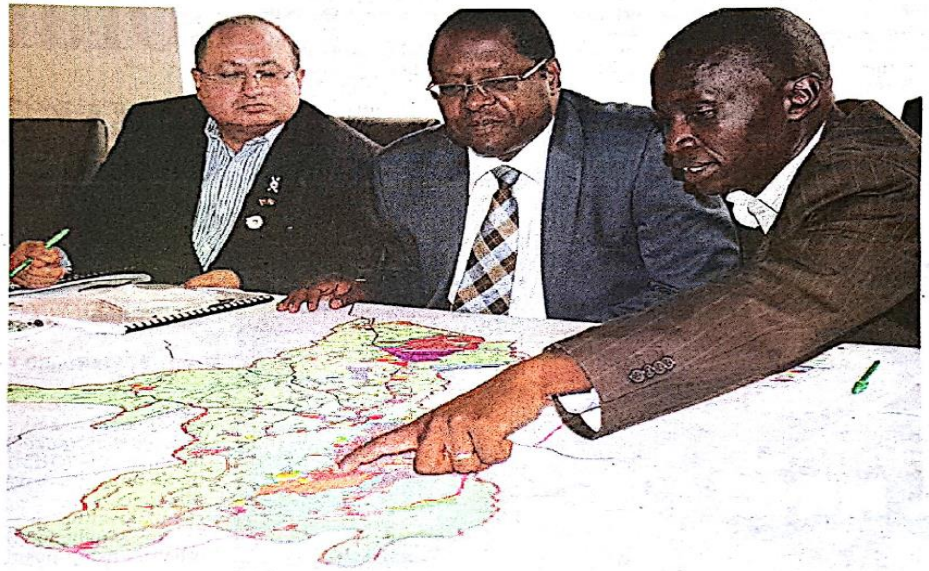
The purpose of the plan is to provide a framework for integrated socio-economic development, investment and development control of the town in a sustainable environment.

It was presented to Governor Martin Wambora and will be approved by the Cabinet.

Wambora said implementing the plan that would cover about 102 square kilometers of the town and its surroundings would cost Sh15 billion

"The programme will be partly funded by the World Bank in conjunction with the national government and is aimed at transforming the county into an agribusiness, industrial, transport and tourist hub as well as de-congest Embu town," said Wambora.

He said the World Bank has already embarked on Sh280 million storm water project that will improve drainage in the town.



FROM LEFT: Chamber of Commerce and Industry, Embu Branch Chairman Vimal Chadha, Governor Martin Wambora and Embu Lands Executive Josphat Kithumbu study a map during the launch of the county's integrated strategic development plan yesterday. [PHOTO: JOSEPH MUCHIRI/ STANDARD]

Wambora said they will ensure maximum use of land, adding that those living close to the affected areas will be reallocated and compensated.

"We are working closely with Britam Insurance and Housing Finance to construct Sh3 billion new housing units targeting middle class residents. We are targeting available government land and have identified 82 hectares of land where the new housing units will be constructed.

The governor added: "We will take over some Kenya Agriculture Research and Livestock Organisation and provide them with another land in Mwea near River Thiba."

He said already, they are sourcing Sh300 million to shift the sewerage plant 30km from the town along the Embu-Kiritiri road.

Wambora said a recreational park will be established at the existing sewerage site.

He also said they are working with development partners to start the construction of the final phase of the Embu stadium at a cost Sh100 million before the end of this year.

He said the phase will involve constructing a tartan track where marathoners can do their practice before going for international competitions.

Annexure 7

Minimum land subdivision of agriculture areas in Embu town

Agriculture and subdivision size

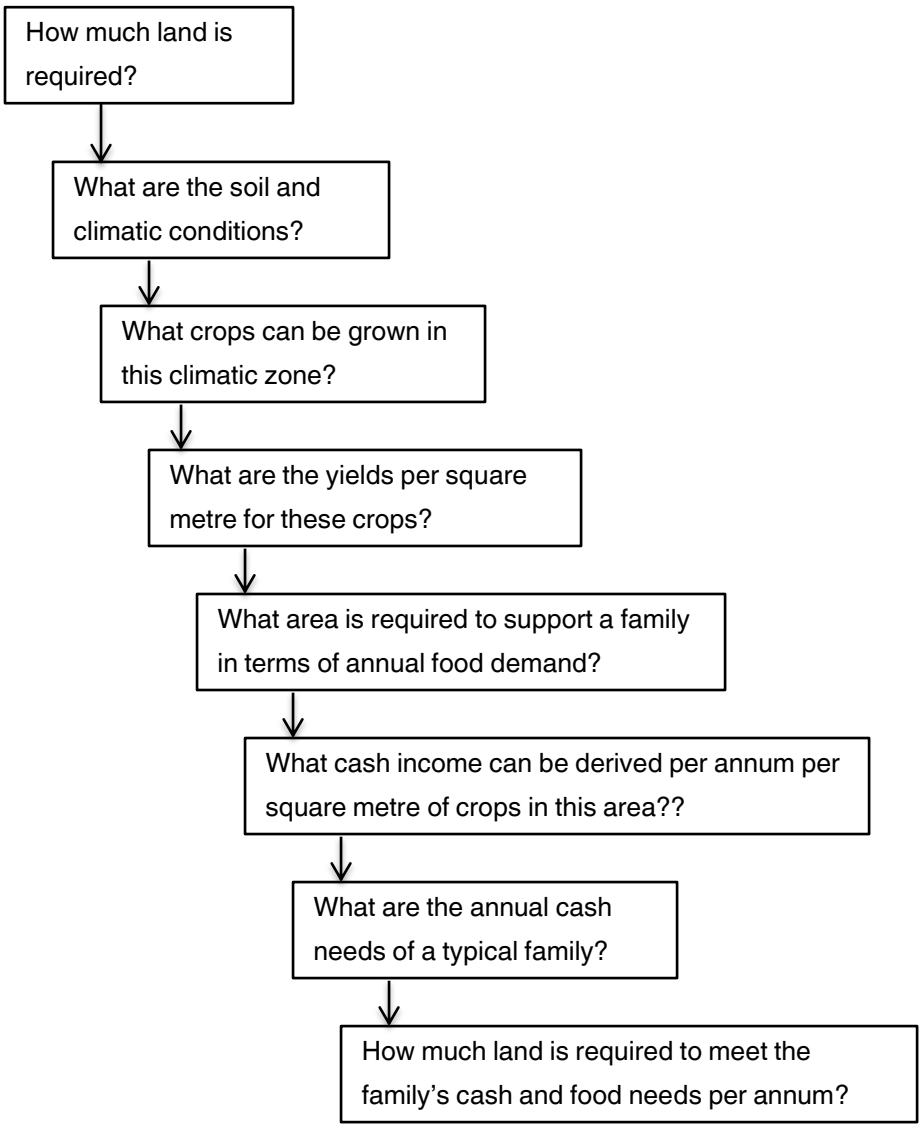
There are two possible criteria on which to base subdivision decisions:

- Whether the land is large enough to sustain subsistence agriculture
- Whether the land should be zoned agricultural

Viability as a subsistence farm

It makes no sense to subdivide to the extent that a farm is no longer economically viable. If this is the criterion, the second question is how to determine what that size is. This, in turn depends on the climate and soils and therefore what crops can be grown. Lastly there is the question as to what are the minimum yields to support a family of, say, five.

The decision tree is therefore as follows:



The farm should be adequate to provide for the following:

1. Food
2. Cash needs
   - seeds and fertiliser
   - education
   - health
   - reserves for bad years and funds for emergencies

Food

The calorific requirements of a typical family of five per day are approximately as follows:

Man	2770
Woman	2200
Oldest child	1800
Middle child	1500
Youngest child	1000
Total	**9270**

Agricultural productivity

Embu's planning area falls into two different climatic zones[1] as shown on the map overleaf.

These are as follows:

The first, UM 3, is a "marginal coffee zone". This is a relatively fertile zone in which maize yields, with fertilizer, are up to 3,000 kg per Ha.

The second, UM 4, is a "sunflower-maize zone". Yields in this zone are slightly lower at 2,800kg per Ha.

In both cases the most suitable cereal crop is maize. The food requirements relative to yield are therefore:

Yield and food requirements for 1Ha

Food requirement	Zone UM 3 Maize	Zone UM 4 Maize
Calories per kg	3585	3390
Number of kg of flour/day	2.59	2.59
Annual need	943.81	943.81
Yield (kg/Ha)		
Yield/Ha/rainy season	1 500	1 400
Yield/Year	3,000	2,800
Surplus for sale	2,056	1,856
Cash value/kg	30	30
Total cash (Kshs)	**61,686**	**55,686**

Farm Inputs

[1] Jaetzold, Ralph; Schmidt, Helmut; Hornetz, Berthold:Farm Management Handbook, Vol II, Natural Conditions and Farm Management Information, Part c East Kenya, Subpart C1, Eastern Province, Ministry of Agriculture, Nairobi, 2006.

Seeds and fertilisers are required to produce the yields stated above. The cost of these will be as follows:

Input costs (Kshs) per Hectare[2]

	Maize			Sorghum		
	Kg/Ha	cost/kg	Total	Kg/Ha	cost/kg	Total
Seed	20	40	800	20	30	600
Fertilizer	300	46	13 800	100	46	4 600
Total			14 600			5 200

Cash needs

Subsistence farmers need cash for a variety of needs[3]. A working minimum for a family of 5 could be as follows:

Non-food expenditure		Allocation of surplus
Education	10%	12 500
Health	5%	6 250
Transport etc	5%	6 250
Savings	20%	25 000
Total %	40%	50 000

The importance of the savings category is twofold:

1. In years of drought, or in cases of floods/fires etc they can be used to make up the difference between normal and reduced yields due to such natural causes
2. They are available to deal with family emergencies such as funerals etc.

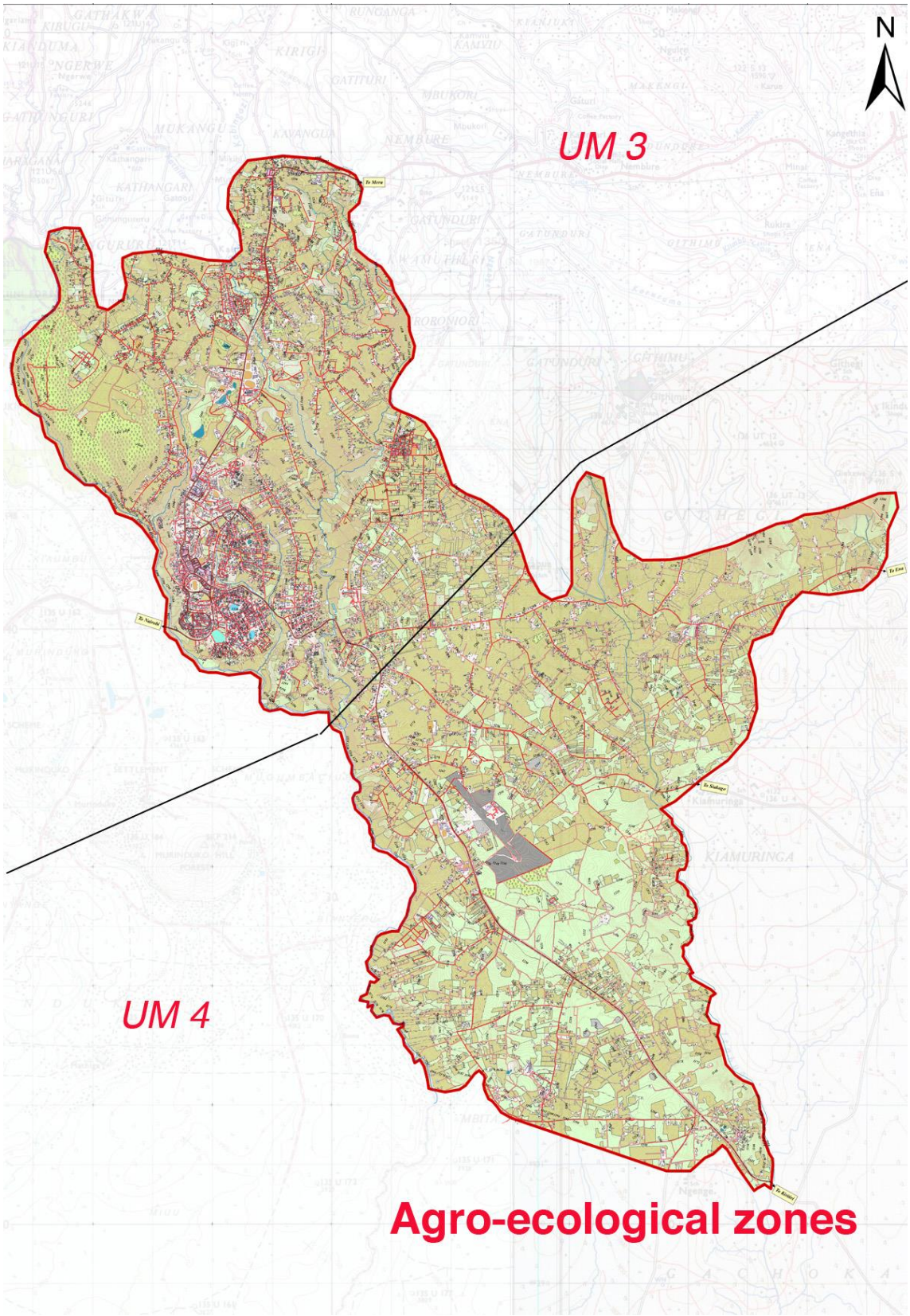
[2] Rates of return to fertlilizer: Evidence from field experiments in Kenya, Poverty Action Lab, 2008

Ochieng LA; Mathenge PW, Muasya, R: Sorghum Seed qualiter as affected by variety, harvesting stage and fertilizer application in Bomet County of Kenya, ajfand, Vol 13, No4, September 2013.

FAO: Fertlizier use by crop in Zimbabwe, (undated)

[3] Dose, Henrietta: Securing household income among smallscale farmers in Kakemega District: Possibilities and limitations of diversification; GIGA working papers, Hamburg 2007.

Simiyu, Christine Nanjala: Remittance and Household Expenditures in Kenya; Journal of Emerging Issues in Economics, Finance and Banking, Vol 2, No 3, September 2013.


N
UM 3
UM 4
Agro-ecological zones

What is the minimum size?

The data above show the difference in value between different zones, and therefore the difference in land area required for a viable subsistence farm. Based on the yields and costs available the result of the analysis is as follows:

Land area required to provide sufficient income and food

	UM3	UM4
Yield/kg/Ha	3 000	2 800
Amount required for food	944	944
Surplus	2 056	1 856
Cash value of surplus	61 686	55 686
Cash needs: farm inputs	14 600	14 600
Household expenditure	50 000	50 000
Total cash outlay	64 600	64 600
Excess cash required over income from 1Ha	2 914	8 914
Sale price: Kshs/kg	30	30
No kg required	97	297
Kg/Ha	3 000	2 800
Area required to produce required	0,03	0,11
Total land required (Ha)	**1,03**	**1,11**

The data above demonstrates that it is possible for a family of five to survive on between 1.03 and 1.11 hectare on much of the land around Embu. It will be important to recognise the difference between these two areas in terms of productivity and economic viability.

Land use and planning

However, the above recommendations should apply to land zoned agriculture. For land zoned residential, normal minimum plot sizes – as recommended under the ISUDP – should be adopted.

Annexure 8

Class of occupancy of buildings

Class of or Occupancy buildings

Class of or Occupancy building	Occupancy
A1	**Entertainment and public assembly** Occupancy where persons gather to eat, drink, dance or participation other recreation
A2	**Theatrical and indoor sports** Occupancy where persons gather for the viewing of theatrical, operatic, orchestral, choral, cinematographic or sport performance
A3	**Place of instruction** Occupancy where school children, students or other persons assemble for the purpose of tuition or learning
A4	**Worship** Occupancy where persons assemble for the purpose of worshipping
A5	**Outdoor sports** Occupancy where persons view outdoor sport events
B1	**High risk commercial services** Occupancy where a non-industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with extreme rapidity or give rise to poisonous fumes, or cause explosions
B2	**Moderate risk commercial services** Occupancy where a non-industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with moderate rapidity but is not likely to give rise to poisonous fumes or cause explosions
B3	**Low risk commercial services** Occupancy where a non-industrial process is carried out and where neither the material handled nor the process carried out fails into the high or moderate risk category
C1	**Exhibition hall** Occupancy where goods are displayed primarily for viewing by the public
C2	**Museum** Occupancy comprising a museum, art gallery or library
D1	**High risk industrial** Occupancy where an industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with extreme rapidity or give rise to poisonous fumes, or cause explosions
D2	**Moderate risk industrial** Occupancy where an industrial process is carried out and where either the material handled or the process carried out is liable, in the event of fire, to cause combustion with moderate rapidity or give rise to poisonous fumes, or cause explosions
D3	**Low risk industrial** Occupancy where an industrial process is carried out and where neither the material handled nor the process carried out falls into the high or moderate risk category
D4	**Plant room** Occupancy comprising usually unattended mechanical or electrical services

Class of or Occupancy building	Occupancy
	necessary for the running of a building
E1	**Place of detention** Occupancy where people are detained for punitive or corrective reasons or because of their mental condition
E2	**Hospital** Occupancy where people are cared for or treated because of physical or mental disabilities and where they are generally bed-ridden
E3	**Other institutional (residential)** Occupancy where groups of people who either are not fully fit, or who are restricted in their movements or their ability to make decisions , reside and are cared for
F1	**Large shop** Occupancy where merchandise is displayed and offered for sale to the public and the floor area exceeds 250m^2
F2	**Small shop** Occupancy where merchandise is displayed and offered for sale to the public and the floor area doesn't exceed 250m^2
F3	**Wholesaler store** Occupancy where goods are displayed and stored and where only a limited selected group of persons is present at any one time
G1	**Office** Occupancy comprising offices, banks, consulting rooms and other similar usage
H1	**Hotel** Occupancy where persons rent furnished rooms, not being dwelling unit
H2	**Dormitory** Occupancy where groups of people are accommodated in one room
H3	**Domestic residence** Occupancy consisting of two or more dwelling units on a single unit
H4	**Dwelling house** Occupancy consisting of a dwelling unit on its own site, including a garage and other domestic outbuildings, if any
J1	**High risk storage** Occupancy where material is stored and where the stored material is liable, in the event of fire, to cause combustion with extreme rapidity or give rise to poisonous fumes, or cause explosions
J2	**Moderate risk storage** Occupancy where material is stored and where the stored material is liable, in the event of fire, to cause combustion with moderate rapidity but is not likely to give rise to poisonous fumes, or cause explosions
J3	**Low risk storage** Occupancy where the material does not fall into the high o moderate risk category
J4	**Parking garage** Occupancy used for storing or parking of more than 10 motor vehicles

Source: Kenya Planning and Building Codes, 2009